



NOTICE TO MEMBERS

No. 2012-180

September 26, 2012

REQUEST FOR COMMENTS

AMENDMENTS TO RULES A-1, A-7 AND TO THE RISK MANUAL CANADA MORTGAGE BONDS AS ACCEPTABLE COLLATERAL

On July 30, 2012, The Board of Directors of Canadian Derivatives Clearing Corporation (CDCC) approved amendments to Section A-102 and to Section A-709 of the CDCC Rules and to the Risk Manual. The purpose of the proposed amendments is to add Canada Mortgage Bonds as an acceptable form of margin.

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

Process for Changes to the Rules

CDCC is a recognized self-regulatory organization (SRO) by the Autorité des marchés financiers (AMF) and as such, carries on activities as a clearing house and as an SRO in Québec.

The Board of Directors of CDCC has the power to approve the adoption or amendment of Rules of CDCC. Amendments are submitted to the AMF in accordance with the self-certification process.

Comments on the proposed amendments must be submitted within 30 days following the date of publication of the present notice. Please submit your comments to:

Pauline Ascoli
Assistant Secretary
Canadian Derivatives Clearing Corporation
Tour de la Bourse
P.O. Box 61, 800 Victoria Square
Montréal, Québec H4Z 1A9
E-mail: legal@m-x.ca

Canadian Derivatives Clearing Corporation

The Exchange Tower	800 Victoria Square
130 King Street West, 5 th Floor	3 rd Floor
Toronto, Ontario	Montréal, Québec
M5X 1J2	H4Z 1A9
Tel. : 416-367-2463	Tel. : 514-871-3545
Fax :: 416-367-2473	Fax: : 514-871-3530

www.cdcc.ca

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

*Anne-Marie Beaudoin
Corporate Secretary
Autorité des marchés financiers
Tour de la Bourse, P.O. Box 246
800 Victoria Square, 22nd Floor
Montréal, Québec H4Z 1G3
E-mail: consultation-en-cours@lautorite.qc.ca*

For any question or clarification, Clearing Members may contact the CDCC Member Services.

Glenn Goucher
President and Chief Clearing Officer

Canada Mortgage Bonds as Acceptable Margin Fund Deposit

AMENDMENT TO CDCC RULES AND RISK MANUAL

A. Overview

CDCC requires Clearing Members to deposit collateral of acceptable types to secure the CCP's exposure to credit risk. Currently, only cash, government securities and valued securities are expressly enumerated as acceptable forms of margin in the CDCC Rules. The purpose of this change is to add Canada Mortgage Bonds as an acceptable form of margin.

B. Analysis

Nature and Purpose of Proposed Changes:

In the CDCC Rules, Section A-709 Forms of Margin, enumerates the acceptable types of Margin Deposits that may be used to satisfy Margin Fund requirements. The purpose of the proposed change to this section of the Rules is to expand the list of acceptable types of Margin Deposits to include Federal Agency debt issued by Canada Housing Trust. A definition of "Canada Mortgage Bond" is being added to Section A-102 Definitions. Also the Risk Manual has a specific section on forms of collateral, which is amended accordingly.

Description and Analysis of Impacts:

As part of its margining process, CDCC requires collateral, or Margin Deposits, to be posted by Clearing Members to cover the risks associated with the transactions cleared by CDCC. In order to ensure that CDCC adequately manages the risks to which it is exposed, CDCC policies as they relate to acceptable Margin Deposits require Clearing Members to provide liquid securities with very low credit risk. Canada Mortgage Bonds fulfill both of these requirements as they represent a highly traded asset class and are guaranteed by the Canada Mortgage and Housing Corporation which is an agency of the federal government.

CDCC does not anticipate any adverse impacts with this proposed change other than providing Clearing Members with an additional class of securities with which to satisfy their margin requirements.

Drafting Process:

The drafting process was driven by CDCC with no market consultation.

No other alternatives were considered.

Impacts on Technological Systems:

The proposed changes should have no impact on the technological systems of CDCC, Clearing Members or other market participants.

Benchmarking:

The proposed changes are aligned with the operations of other global CCPs/CSDs. For example:

Canadian Depository for Securities, CDS Financial Risk Model, Eligible Collateral, Page 36.

([http://www.cds.ca/cdsclearinghome.nsf/Downloads/-EN-CDSFinancialRiskModel-Version6.0/\\$File/CDS+Financial+Risk+Model_Version+6.0.pdf?OpenElement](http://www.cds.ca/cdsclearinghome.nsf/Downloads/-EN-CDSFinancialRiskModel-Version6.0/$File/CDS+Financial+Risk+Model_Version+6.0.pdf?OpenElement))

Fixed Income Clearing Corporation, Eligible Collateral, Includes federal agency securities including mortgage backed securities.

(http://www.dtcc.com/news/newsletters/dtcc/2006/nov/new_collateral_rules.php)

LCH.Clearnet Ltd., Eligible Collateral. Includes federal agency and mortgage backed securities:

(http://www.lchclearnet.com/member_notices/circulars/2010-04-16.asp)

C. Public Interest

This amendment to the CDCC Rules is not contrary to the public interest.

D. Process

The proposed amendment is submitted for approval by the CDCC Board. Once the approval has been obtained, the proposed amendment, 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 for information. The proposed amendment and analysis will also be submitted for approval to the Bank of Canada in accordance with the Oversight Regulatory Agreement.

E. Attached Documents

- Rule A-1, Section A-102 amended
- Rule A-7, Section A-709 amended
- Risk Manual, pages 32-33 amended

PART A – GENERAL

RULE A-1 DEFINITIONS

Section A-101 Scope of Application

Unless the context otherwise requires or unless different meanings are specifically defined, for all purposes of these Rules the capitalized terms used herein shall have the meanings given them in Section A-102.

Section A-102 Definitions

“Acceptable Instrument Types” or “Acceptable OTCI” – Over-The-Counter Instruments which are determined by the Corporation as acceptable for clearing with the Corporation.

“Acceptable Underlying Interests” – is an Underlying Interest which is determined by the Corporation as acceptable for clearing by the Corporation.

“Acceptable Marketplace” – a bilateral or multilateral marketplace, other than an Exchange, where buyers and sellers conclude transactions in Acceptable Instrument Types including bilateral trades between two Fixed Income Clearing Members and which meets any of the following requirements (i) in the case of a marketplace which is an alternative trading system (“ATS”), it has qualified as such and complies with the applicable requirements of National Instrument 21-101 – Marketplace Operations (“21-101”) and National Instrument 23-101 – Trading Rules (“23-101”) as determined by the Corporation, and (ii) in the case of an inter-dealer bond broker (“IDBB”), it has qualified as such and complies with applicable IROC Rules including IROC Rule 2800 and applicable requirements of 21-101 and 23-101 as determined by the Corporation, and (iii) in the case of bilateral trades between Fixed Income Clearing Members involving an SRO Clearing Member, the SRO Clearing Member complies with applicable requirements of 21-101 and 23-101 as determined by the Corporation.

“Acceptable Security” – a Security determined by the Corporation as acceptable for purposes of clearing Fixed Income Transactions and Futures for which the deliverable security is a fixed income security.

“Acceptable Treasury Bills” – A short-term debt instrument, having a maturity of less than one year, issued by the Government of Canada and sold at a discount.

“Acceptance Criteria” – the criteria established by the Corporation for acceptance or rejection of an OTCI in accordance with the provisions of Section D-104.

“Additional Deposit” – the additional amount which may be required to be added to a Clearing Fund deposit pursuant to Section A-606.

“Affiliate” – means, in relation to any Clearing Member, any Entity controlled, directly or indirectly, by the Clearing Member, any entity that controls, directly or indirectly, the Clearing Member, or any Entity directly or indirectly under common control with the Clearing Member. For this purpose, “control” of any Clearing Member or Entity means ownership of a majority of the voting power of the Clearing Member or Entity.

“Afternoon Net DVP Settlement Requirement” – has the meaning assigned to this term by Section D-601.

“Afternoon Netting Cycle Timeframe” – has the meaning assigned to this term by Section D-601.

“American Option” (or American Style Option) – an Option which can be exercised at any time from issuance until its Expiration Date.

“Amounts Due” – has the meaning assigned to this term by Subsection D-409(10).

“Application for Membership” – the Application for Membership, which when completed by a Clearing Member candidate and accepted by the Corporation forms the Membership Agreement together with the Rules which are incorporated by reference in and form a part of the Membership Agreement, as such Application for Membership may from time to time be amended, changed, supplemented or replaced in whole or in part.

“Approved Depository” – a financial institution approved by the Corporation to act in such capacity in accordance with the criteria set forth in Subsection A-212(8).

“Approved Processes” – any CDCS function for processing Transactions for clearing by the Corporation. CDCC may make available more than one Approved Process in respect of any clearing service.

“Assigned Position” – the position of the Clearing Member in any account for which such Clearing Member is the assigned Clearing Member in such account.

“At-the-Money Option” – a call Option or a put Option with an Exercise Price that is equal to the Market Price of the Underlying Interest.

“Authorized Representative” – a person for whom the Clearing Member has filed evidence of authority pursuant to Section A-202.

“Bank Clearing Member” – a Clearing Member that is a bank to which the Bank Act (Canada), as amended from time to time, applies.

“Base Deposit” – the minimum Clearing Fund deposit required of each Clearing Member pursuant to Section A-603.

“Board” – the Board of Directors of the Corporation.

“Business Day” – any day on which the Corporation is open for business. The term Business Day shall exclude the Expiration Date of any Options which expires on a Saturday.

“By-laws” – the By-laws of the Corporation as the same may be amended from time to time.

“Calculation Agent” – means the Corporation when calculating certain close-out amounts as provided in Subsection A-409(9).

“Call Underlying Interest Deposit” – the deposit by an Approved Depository acting on behalf of a Clearing Member or a client thereof of the Underlying Interest of a call Option to the Corporation through a Central Securities Depository.

“Canada Mortgage Bond” – a bullet pay type of bond investment, issued by Canada Housing Trust and guaranteed as to full and timely payment by the Canada Mortgage and Housing Corporation, which bond features semi-annual interest payments and principal at maturity.

“Capital Adequacy Return (CAR)” – the documents specified from time to time by the Office of the Superintendent of Financial Institutions in its guidelines relating to capital adequacy requirements applicable to banks.

“Cash” – money in the lawful currency of Canada.

“Cash Settlement Amount” – means the amount determined by the Calculation Agent in accordance with Subsection A-409(6).

“Cash Settlement Payment Default” – has the meaning assigned to this term by Subsection A-409(6).

“Cash Settlement Payment Request” – has the meaning assigned to this term by Subsection A-409(6).

“Cash Settlement Amount Calculation Request” – has the meaning assigned to this term by Subsection A-409(6).

“Cash Settlement Amount Calculation Request Date” – has the meaning assigned to this term by Subsection A-409(6).

“CDCC Daylight Credit Facility” – means the daylight credit facility of the Corporation, the amount of which is subject to change from time to time, with prior notice to Clearing Members.

“CDCC Materials” – any material, data and information developed, created or compiled by the Corporation and provided by the Corporation to the Clearing Members in any form, and including the software, trade-marks, logos, domain names, documentation (including the Rules), Approved Processes, technical information, systems (including the clearing systems and electronic transmission systems), hardware and networks, that comprises the CDCS provided by the Corporation to the Clearing Members.

“CDCS” – stands for “Canadian Derivatives Clearing Service” and refers to the clearing and settlement system operated by CDCC, which is governed by the Rules.

“CDS” – CDS Clearing and Depository Services Inc., acting as Central Securities Depository in Canada or acting in any other capacity, or any successor thereof.

“Central Securities Depository” – any central securities depository acceptable to the Corporation, including CDS.

“Class Group” – all Options and Futures relating to the same Underlying Interest.

“Class of Futures” – all Futures covering the same Underlying Interest.

“Class of Options” – all Options of the same style within the same maturity category on the same Underlying Interest.

“Clearing Fund” – the fund established pursuant to Rule A-6 Clearing Fund Deposits.

“Clearing Member” – an applicant who has been admitted to membership in the Corporation.

“Client” – those customers of a Clearing Member who are not Market Makers or trading on behalf of a broker.

“Client Account” – the account or accounts required to be established for Transactions of the Clearing Members' Clients pursuant to Sections B-102, B-103, C-102, C-103, D-102 and D103.

“Clients Settlement Account” – the account established by Section A-403.

“Close of Business” – the time at which the Business Day ends, as specified in the CDCC Operations Manual. The time may, at the sole discretion of the Corporation, be modified to address shortened trading days on Exchanges.

“Closing Buy Transaction” – an Exchange Transaction the result of which is to reduce or eliminate a Short Position in the Series of Futures involved in such transaction.

“Closing Purchase Transaction” – an Exchange Transaction the result of which is to reduce or eliminate a Short Position in the Series of Options involved in such transaction.

“Closing Sell Transaction” – an Exchange Transaction the result of which is to reduce or eliminate a Long Position in the Series of Futures involved in such transaction.

“Closing Writing Transaction” – an Exchange Transaction the result of which is to reduce or eliminate a Long Position in the Series of Options involved in such transaction.

“Commodity” – any agricultural product, forest product, product of the sea, mineral, metal, hydrocarbon fuel, natural gas, electric power, currency or precious stone or other gem, and any goods, article, service, right or interest, or class thereof, whether in the original or processed state.

“Competent Authority” – has the meaning assigned to this term by Subsection A-409(3).

“Confirmation Transmission” – the electronic transmission made by a Clearing Member to the Corporation confirming that the Expiry Report detailed in Section B-307 is accepted.

“Consolidated Activity Report” – daily report listing either Options, Futures or OTCI transactions.

“Contract Specifications” – the specifications prescribed by the relevant Exchange with respect to a particular Option or Future.

“Corporation or CDCC” – Canadian Derivatives Clearing Corporation.

“CORRA Rate” – has the meaning assigned to this term by Section D-601.

“Corresponding CDCC Delivery Requirement” – has the meaning assigned to this term by Subsection A-804(4).

“Coupon Income” – has the meaning assigned to this term by Section D-601.

“CUSIP/ISIN” – acronyms respectively standing for Committee on Uniform Security Identification Procedures and International Securities Identification Number, herein used to refer to a security identifier assigned by CDS to any Acceptable Security.

“Daily Settlement Summary Report” – the report designated as such by the Corporation as described in the Operations Manual.

“Default Manual” – any manual designated as such by the Corporation, as amended from time to time.

“Default Value” – means the value determined by the Calculation Agent in accordance with Subsection A-409(6).

“Delivery Agent” – the party through which the Corporation will effect the transfer of the Underlying Interest between the buyer and seller.

“Delivery Default” – has the meaning assigned to this term by Subsection A-409(6).

“Delivery Month” – the calendar month in which a Future may be satisfied by making or taking delivery.

“Delivery Request” – has the meaning assigned to this term by Subsection A-409(6).

“Deposit” – a payment, deposit or transfer, whether of cash, securities, certificates, property, Underlying Interests, Underlying Interest Equivalents or other interests or rights.

“Depository Agreement” – an agreement entered into between the Corporation and an Approved Depository.

“Depository Receipt” – a Put Escrow Receipt, a Call Underlying Interest Deposit or a Futures Underlying Interest Deposit.

“Derivative Instrument” – means a financial instrument, the value of which derives from the value of an Underlying Interest. Without limiting the foregoing, this Underlying Interest may be a commodity or a financial instrument such as a stock, a bond, a currency, a stock or economic index or any other asset.

“Detailed Futures Consolidated Activity Report” – the report created by the Corporation on a daily basis reporting the aggregate position held by a Clearing Member, which also contains the Settlement of Gains and Losses for that Clearing Member for that day.

“Early Termination Date” – has the meaning assigned to this term by Subsection A-409(7).

“Electronic Communication” – means, in respect of the Corporation, any one or more of the following: the posting of a notice, report or other information on the Corporation’s website, the transmission of a notice, report or other information to a Clearing Member by means of electronic mail and the making available on the Corporation’s computer, in a form accessible to a Clearing Member, a notice, report or other information.

“Emergency” – Situation materially affecting the Corporation’s operations resulting from i) riot, war or hostilities between any nations, civil disturbance, acts of God, fire, accidents, strikes, earthquakes, labour disputes, lack of transportation facilities, inability to obtain materials, curtailment of or failure in obtaining sufficient power, gas or fuel, computer malfunction (whether mechanical or through faulty

operation), malfunction, unavailability or restriction of the payment, computer or bank wire or transfer system and any other cause of inability that is beyond the reasonable control of the Corporation; ii) any action taken by Canada, a foreign government, a province, state or local government or body, authority, agency or corporation, and any Exchange, Central Securities Depository, Acceptable Marketplace, Market Centre and Delivery Agent ; iii) the bankruptcy or insolvency of any Clearing Member or the imposition of any injunction or other restraint by any government agency, court or arbitrator upon a Clearing Member which may affect the ability of that member to perform its obligations; iv) any circumstance in which a Clearing Member, a Central Securities Depository or any other Entity has failed to perform contracts, is insolvent, or is in such financial or operational condition or is conducting business in such a manner that such Entity cannot be permitted to continue in business without jeopardizing the safety of assets, of any Clearing Member or the Corporation; or v) any other unusual, unforeseeable or adverse circumstance.

“End of Day DVP Settlement Time” – has the meaning assigned to this term by Section D-601.

“Entity” – shall include an individual, a corporation, a partnership, a trust and an unincorporated organization or association.

“European Option” (or European Style Option) – an Option which can be exercised only on its Expiration Date.

“Event of Default” – has the meaning assigned to this term by Subsection A-409(2).

“Exchange” – an exchange whose trades are guaranteed and/or cleared by the Corporation.

“Exchange Transaction” – a transaction through the facilities of an Exchange for:

- a) the purchase or writing of an Option or the reduction or elimination of a Long or Short Position in an Option; or
- b) the buying or selling of a Future or the reduction or elimination of a Long or Short Position in a Future.

“Exercise Notice” – a notice to the Corporation in the form prescribed by the Corporation, notifying the Corporation of the intent of the Clearing Member executing such notice to exercise an Option.

“Exercised Position” – the position of a Clearing Member in any account in respect of Transactions providing optionality to the holder and which may have been exercised by such Clearing Member in such account.

“Exercise Price” – the specified price per unit at which the Underlying Interest may be purchased (in the case of a call) or sold (in the case of a put) upon the exercise of an Option. (Sometimes referred to as the Strike Price).

“Exercise Settlement Amount” – the amount which must be paid by the Corporation to the Clearing Member exercising a put Option or who has been assigned a call Option, against delivery of the Underlying Interest.

“Exercise Settlement Date” – the date prescribed by the relevant Exchange within Contract Specifications of a particular Option.

“Expiration Date” – unless otherwise specified the Saturday immediately following the third Friday of the month and year in which the Option expires.

“Expiration Time” – the time on the Expiration Date, as fixed by the Corporation, at which the Option expires. Unless changed by the Corporation, the Expiration Time shall be 10:00 a.m. on the Expiration Date.

“Expiry Response Screen” – a computer display also known as the “Expiry Workspace” made available to Clearing Members in connection with Rule B-3.

“Failed Delivery” – has the meaning set out (i) in Subsection A-804(1) with respect to the delivery of an Acceptable Security, (ii) in Section B-407 with respect to the delivery under an Option, (iii) in Section C-512 with respect to the delivery under a Future of an Underlying Interest other than an Acceptable Security, or (iv) in Section D-304 with respect to the delivery under an OTCI that is not a Fixed Income Transaction.

“Failed Payment Against Delivery” – has the meaning assigned to this term by Section A-806.

“Failure to Pay” – has the meaning ascribed to this term by Subsection A-409(4).

“Final Settlement Amount” – is the amount determined by the Calculation Agent in accordance with Subsection A-409(10).

“Firm” – a Clearing Member acting for its own account.

“Firm Account” – the account or accounts required to be established for Firm Transactions of the Clearing Members pursuant to Sections B-102, B-103, C-102, C-103, D-102 and D-103.

“Fixed Income Clearing Member” – has the meaning assigned to this term by Section D-601.

“Fixed Income Transaction” – has the meaning assigned to this term by Section D-601.

“Forward Curve” – the summary representation of the price of a commodity on a forward basis obtained by amalgamating all Reference Prices by tenor as defined in Section D-201.

“Forward Price” – the price extracted from the Forward Curve and used in the daily Mark-to-Market Valuation and margining processes as defined in Section D-202.

“Future” – a contract:

- a) in the case of a Future settled by delivery of the Underlying Interest, to make or take delivery of a specified quantity and quality, grade or size of an Underlying Interest during a designated future month at a price agreed upon when the contract was entered into on an Exchange; or
- b) in the case of a Future settled in cash, to pay to or receive from the Corporation the difference between the final settlement price and the trade price pursuant to standardized terms and conditions set forth by the Exchange where the contract is concluded and which is cleared by the Corporation.

“Futures Underlying Interest Deposit” – the deposit by an Approved Depository acting on behalf of a Clearing Member or a client thereof of the Underlying Interest of a Future to the Corporation through a Central Securities Depository.

“Futures Sub-Accounts Consolidated Activity Report” – the report created by the Corporation on a daily basis reporting the aggregate position held by a Clearing Member in each of its sub-accounts, which also contains the Settlement of Gains and Losses for that day with respect to each sub-account.

“Good Deliverable Form” – Underlying Interests shall be deemed to be in good deliverable form for the purposes hereof only if the delivery of the Underlying Interests in such form would constitute good delivery under the Contract Specifications.

“Gross Delivery Requirement” – the quantity of Acceptable Securities required to be physically delivered through a Central Securities Depository by or to a Clearing Member, expressed on a gross basis, in accordance with Subsection D-606(10).

“Gross Payment Against Delivery Requirement” – the amount required to be paid against physical delivery through a Central Securities Depository by or to a Clearing Member, expressed on a gross basis, in accordance with Subsection D-606(10).

“Guaranteeing Delivery Agent” – a Delivery Agent who bears the responsibility of guaranteeing the acquisition or delivery of the Underlying Interest in the event of a delivery failure.

“include”, “includes” and “including” – where used in these Rules, means “include”, “includes” and “including”, in each case, without limitation.

“Insolvency Event” – has the meaning assigned to this term by Subsection A-409(3).

“Insolvency Proceedings” – has the meaning assigned to this term by Subsection A-409(3).

“In-the-Money-Option” – a call Option with an Exercise Price that is less than the Market Price of the Underlying Interest or a put Option where the Exercise Price exceeds the Market Price of the Underlying Interest.

“Instrument” – shall mean a bill, note or cheque within the meaning of the Bills of Exchange Act (Canada) or any other writing that evidences a right to the payment of money and is of a type that in the ordinary course of business is transferred by delivery with any necessary endorsement or assignment, but does not include a security.

“Intra-Day Margin Call” – shall mean the requirement to deposit supplementary Margin, as determined by the Corporation in accordance with Section A-705, at any time the Corporation deems necessary, and notably at such times as specified in Section 2 of the Operations Manual.

“Joint Regulatory Financial Questionnaire and Report” – the documents required under the applicable rules of the Investment Industry Regulatory Organization of Canada.

“Liquidating Settlement Account” – the account created following the default of a Clearing Member to recognize the value of all gains, losses, and expenses due to or from the Non-Conforming Member during the liquidation of positions and Margin Deposits, in accordance with Section A-402.

“Long Position” – a Clearing Member’s interest as:

- a) the holder of one or more Options of a Series of Options; or
- b) the buyer of one or more Futures of a Series of Futures; or
- c) the buyer of an Over-The-Counter Instrument.

“Margin” – any and all the deposits required or made pursuant to Rule A-7 Margin Requirements.

“Margin Deposit” – means, collectively,

- a) any and all Securities, Cash, Instruments, cheques, Underlying Interest, Underlying Interest Equivalent, Long Positions and Short Positions;
- b) any and all of the deposits required or made pursuant to Rule A-6 Clearing Fund Deposits, Rule A-7 Margin Requirements, and Rule B-4 Delivery and Payment with Respect to Options Exercised, Rule C-5 Delivery of Underlying Interest of Futures and Rule D-3 Physical Delivery of Underlying Interest on Over-the-Counter Instruments, including Margin, Base Deposit, Additional Deposit, Variable Deposit, Put Escrow Receipts, Call Underlying Interest Deposits, and Futures Underlying Interest Deposits, and any other form of deposit as from time to time are accepted by the Corporation; and
- c) any and all securities pledged or assigned to the Corporation through the facilities of a Central Securities Depository;

deposited by or on behalf of the Clearing Member with the Corporation.

“Mark-to-Market Valuation” – the value determined by the Corporation representing the liquidation value of a Transaction or account held by a Clearing Member as defined in Section D-202.

“Market Centre” – the local facility where the exchange of Underlying Interests occurs.

“Market Maker” – an individual who has been approved by the Exchange on which he trades to trade for his own account or for the account of the Exchange member or non-member by which he is employed or for which he acts as agent in Options or Futures, and may include a futures trader, an options trader, a trader member, a market maker and a market specialist.

“Market Maker Account” – the account or accounts required to be established for Exchange Transactions of the Clearing Member’s Market Makers pursuant to Sections B-102, B-103, C-102 and C-103.

“Market Price” – the aggregate price of the Unit of Trading of the Underlying Interest as determined by the Exchange or Exchanges involved.

“Matured Amounts” – any financial cash flows resulting from the expiration of an OTCI.

“Maturity Date” – the date on which final obligations related to a Transaction are executed.

“Morning Net Payment Against Delivery Requirement” – has the meaning assigned to this term by Section D-601.

“Morning Net DVP Settlement Timeframe” – has the meaning assigned to this term by Section D-601.

“Morning Netting Cycle Timeframe” – has the meaning assigned to this term by Section D-601.

“Multi-Purpose Account” – a Market Maker Account and/or a Netted Client Account.

“Net Daily Premium” – when applied to any account of a Clearing Member for any Settlement Time, means the net amount payable to or by the Corporation at such Settlement Time in respect of all Exchange Transactions of the Clearing Member in Options in such account as a purchasing Clearing Member and a writing Clearing Member.

“Net Daily Settlement” – the amount shown on the Daily Settlement Summary Report.

“Net Delivery Requirement” – with respect to Acceptable Securities, the quantity thereof required to be physically delivered through a Central Securities Depository by or to a Clearing Member, expressed on a net basis, in accordance with Paragraph A-801(2)(d); and with respect to any Underlying Interest of an OTCI that physically settles other than Acceptable Securities, the quantity of such Underlying Interest needed to be delivered through the relevant Delivery Agent by or to a Clearing Member, expressed on a net basis, in accordance with Section D-303.

“Net Payment Against Delivery Requirement” – the amount required to be paid against physical delivery through a Central Securities Depository by or to a Clearing Member, expressed on a net basis, in accordance with Paragraph A-801(2)(c).

“Netted Client Account” – a type of Client Account that requires specific documentation be signed between the Clearing Member and the Corporation, in which the Transactions of a sole Client are held on a net basis.

“Netting Cut Off Time” – means, with respect to a Business Day and a Clearing Member, a time specified in the Operations Manual on such Business Day for purposes of determining, in respect of such Clearing Member, all net payment and delivery obligations owing by or to such Clearing Member in accordance with these Rules on such Business Day.

“Non-Conforming Member” – the meaning assigned to this term by Section A-1A04.

“Non-delivered Assets” – has the meaning assigned to this term by Subsection A-409(6).

“Non-Payment of the Cash Settlement Amount following a Delivery Default” – has the meaning assigned to this term by Subsection A-409(6).

“Notional Quantity” – the size of the OTCI transaction expressed either outright, or in accordance with the Unit of Trading and the number of contracts underlying the OTCI transaction.

“Open Interest” or “Open Position” – the position of a buyer or a seller of an Option, of a Future or of an OTCI.

“Opening Buy Transaction” – an Exchange Transaction the result of which is to create or increase a Long Position in the Series of Futures involved in such transaction.

“Opening Purchase Transaction” – an Exchange Transaction the result of which is to create or increase a Long Position in the Series of Options involved in such Exchange Transaction.

“Opening Sell Transaction” – an Exchange Transaction the result of which is to create or increase a Short Position in the Series of Futures involved in such transaction.

“Opening Writing Transaction” – an Exchange Transaction the result of which is to create or increase a Short Position in the Series of Options involved in such Exchange Transaction.

“Operations Manual” – the manual designated as such by the Corporation and any schedule to the Operations Manual including the Risk Manual, as amended from time to time.

“Option” – a contract which, unless otherwise specified, gives the buying Clearing Member the right to buy (a call) or sell (a put) a specified quantity of an Underlying Interest at a fixed price during a specified time period and which obligates the writing Clearing Member to sell (a call) or buy (a put) the Underlying Interest, pursuant to standardized terms and conditions set forth by the Exchange where the contract is concluded or to the terms determined by the Corporation as acceptable and which is cleared by the Corporation.

“Option Type” – put Option or call Option.

“Options Daily Transaction Report” – a report created by the Corporation providing the net premium payable/receivable.

“Out-of-the-Money Option” – a call Option with an Exercise Price that exceeds the Market Price of the Underlying Interest or a put Option where the Exercise Price is less than the Market Price of the Underlying Interest.

“Over-The-Counter Instrument” or “OTCI” – refers to any bilaterally negotiated transactions as well as any transactions concluded on any Acceptable Marketplaces.

“Payment Default” – has the meaning assigned to this term by Subsection A-409(5).

“Payment Request” – has the meaning assigned to this term by Subsection A-409(5).

“Pending Payment Against Delivery Requirements” – has the meaning assigned to this term by Section D-601.

“Pending Delivery Requirements” – has the meaning assigned to this term by Section D-601.

“Postponed Payment Obligation” – with respect to the Corporation, the amount by which its Afternoon Net DVP Settlement Requirement consisting of an obligation to pay against delivery of Acceptable Securities or its Gross Payment Against Delivery Requirement resulting from any Same Day Transaction submitted after the Afternoon Netting Cycle Timeframe and before the Submission Cut-Off Time, as the case may be, in favour of a Provider of Securities has been reduced as a result of the Provider of Securities’ failure to deliver Acceptable Securities on the Business Day they were due by the End of Day DVP Settlement Time and the payment by the Corporation of such reduction has been postponed until full delivery by the Provider of Securities in accordance with Subsection A-804(1); and with respect to a Clearing Member who is a Receiver of Securities, the amount by which its Afternoon Net DVP Settlement Requirement consisting of an obligation to pay against delivery of Acceptable Securities or its

Gross Payment Against Delivery Requirement resulting from any Same Day Transaction submitted after the Afternoon Netting Cycle Timeframe and before the Submission Cut-Off Time, as the case may be, in favour of the Corporation has been reduced as a result of the Corporation's failure to deliver Acceptable Securities on the Business Day they were due by the End of Day DVP Settlement Time and the payment by such Clearing Member of such reduction has been postponed until full delivery by the Corporation in accordance with Subsection A-804(2).

“President” – the person appointed by the Board as chief executive officer and chief administration officer of the Corporation.

“Product Type” – the attribute of an OTCI which describes the rights and obligations of the counterparties involved in the transaction insofar as cash flows are concerned.

“Provider of Securities” – a Clearing Member who owes to the Corporation a Net Delivery Requirement with respect to an Acceptable Security in accordance with Subsection D-606(3) and Paragraph A-801(2)(d) or a Gross Delivery Requirement with respect to an Acceptable Security in accordance with Subsection D-606(10), as the case may be.

“Put Escrow Receipt” – a receipt, in a form acceptable to the Corporation, issued by an Approved Depository certifying that it holds Cash in the amount of the Exercise Price of a put Option on behalf of a Clearing Member or a client thereof, in trust for the Corporation.

“Receiver of Securities” – a Clearing Member who is owed by the Corporation a Net Delivery Requirement with respect to an Acceptable Security in accordance with Subsection D-606(3) and Paragraph A-801(2)(d) or a Gross Delivery Requirement with respect to an Acceptable Security in accordance with Subsection D-606(10), as the case may be.

“Reference Price” – the price determined by the Corporation in accordance with Section D-201.

“Registry” – any registry designated by the Corporation which, for the purpose of clearing Futures Contracts on Carbon Dioxide Equivalent (CO₂e) Units, has been established in order to ensure the accurate accounting of holding, transfer, acquisition, surrender, cancellation and replacement of the Carbon Dioxide Equivalent (CO₂e) Units.

“Risk Limits” – refers to the set of risk management limits imposed by the Corporation on Clearing Members' clearing activities as updated from time to time by the Corporation.

“Risk Manual” – the manual designated as such by the Corporation and any schedule to the Risk Manual including the Default Manual, as amended from time to time.

“Rolling Delivery Obligation” – with respect to a Clearing Member who is a Provider of Securities, the quantity of a given Acceptable Security that it has failed to deliver to the Corporation under an Afternoon Net DVP Settlement Requirement consisting of an obligation to deliver Acceptable Securities under Subsection A-801(4) or a Gross Delivery Requirement resulting from any Same Day Transaction submitted after the Afternoon Netting Cycle Timeframe and before the Submission Cut-Off Time under Subsection D-606(10), as the case may be, on the Business Day it was due by the End of Day DVP Settlement Time, which is rolled into the calculation of the next Business Day's Net Delivery Requirement (and the Net Delivery Requirement of each subsequent Business Day) of such Clearing Member, in accordance with, and until such time as set out under, Subsection A-804(1); and with respect to the Corporation and a Clearing Member who is a Receiver of Securities, the quantity of a given

Acceptable Security that the Corporation has failed to deliver to such Clearing Member under an Afternoon Net DVP Settlement Requirement consisting of an obligation to deliver Acceptable Securities under Subsection A-801(4) or a Gross Delivery Requirement resulting from any Same Day Transaction submitted after the Afternoon Netting Cycle Timeframe and before the Submission Cut-Off Time under Subsection D-606(10), as the case may be, on the Business Day it was due by the End of Day DVP Settlement Time (as a direct consequence of a Provider of Securities' failure to deliver all or a part of its Afternoon Net DVP Settlement Requirement consisting of an obligation to deliver Acceptable Securities or its Gross Delivery Requirement resulting from any Same Day Transaction submitted after the Afternoon Netting Cycle Timeframe and before the Submission Cut-Off Time, as the case may be, in respect of such Acceptable Security on such Business Day) which is rolled into the calculation of the Corporation's next Business Day's Net Delivery Requirement (and the Net Delivery Requirement of each subsequent Business Day) in favour of such Clearing Members, in accordance with, and until such time as set out under, Subsection A-804(2).

“Rules” – shall mean the Rules of the Corporation and the Operations Manual, as any such rules, and manual may from time to time be amended, changed, supplemented or replaced in whole or in part.

“SRO Clearing Member” – a Clearing Member that is within the audit jurisdiction of the Investment Industry Regulatory Organization of Canada.

“Same Day Transaction” – has the meaning assigned to this term by Section D-601.

“Security” – shall mean a document that is

- (a) issued in bearer, order or registered form;
- (b) of a type commonly dealt in upon securities exchanges or markets or commonly recognized in any area in which it is issued or dealt in as a medium for investment;
- (c) one of a class or series or by its terms is divisible into a class or series of documents; and
- (d) evidence of a share, participation or other interest in property or in an enterprise or is evidence of an obligation of the issuer;

and includes such a document, not evidenced by a certificate, the issue and any transfer of which are registered or recorded in records maintained for that purpose by or on behalf of the issuer.

“Series of Futures” – all Futures of the same class covering the same quantity of an Underlying Interest and having the same delivery month.

“Series of Options” – all Options of the same class, the same type, covering the same quantity of an Underlying Interest and having the same Exercise Price and Expiration Date.

“Settlement Accounts” – has the meaning set out in Section A-217.

“Settlement Amount” – the amount calculated in accordance with these Rules payable to the delivering Clearing Member upon delivery of or cash settlement for the Underlying Interest in respect of a Transaction.

“Settlement of Gains and Losses” – the settlement with the Corporation of the gains and losses on Open Positions in Futures pursuant to Section C-302.

“Settlement Price” – the official daily closing price of a Future, as determined in accordance with Section C-301.

“Settlement Time” – means, with respect to a Transaction and a particular Business Day, the time on such Business Day as established by the Corporation in the Operations Manual and if no Business Day is specified, the time on the Business Day immediately following a trade day, a calculation date or a Coupon Payment Date, as applicable, as established by the Corporation in the Operations Manual, by which time Settlement of Gains and Losses, premium payments, all Margin requirements and all other payments in respect of such Business Day, trade day, calculation date or Coupon Payment Date must be submitted to the Corporation.

“Short Position” – a Clearing Member’s obligation as:

- a) the writer of one or more Options of a Series of Options; or
- b) the seller of one or more Futures in a Series of Futures; or
- c) the seller of an Over-The-Counter Instrument.

“Spread Position”

- a) the situation in which there is carried in a Clearing Member's Client Account both an Option in the Short Position and an Option of the same Class of Options in the Long Position; or
- b) the situation in which there is carried in a Clearing Member’s Client Account both a Long Position and a Short Position in Futures.

“Straddle Position” – an equal number of call and put Options covering the same Underlying Interest and having the same Exercise Price and Expiration Date.

“Style of Options” – the classification of an Option as either an American Option or a European Option. (Parts A and B of these Rules shall apply to both Styles of Options unless a specific Style of Option is designated).

“Submission Cut-Off Time” – has the meaning assigned to this term by Section D-601.

“Tender Notice” – a notice to the Corporation in the form prescribed by the Corporation, notifying the Corporation of the intent of the Clearing Member executing such notice to deliver the Underlying Interest of the Future.

“Termination Value” – means the amount determined by the Calculation Agent in accordance with Subsection A-409(10).

“Trade Confirmation” – the official document issued to a Clearing Member which details the attributes of the OTCI transaction and which signals the acceptance of the transaction for clearing by the Corporation.

“Trade Price” – the price agreed upon for the Future when the contract is entered into on an Exchange.



“Transactions” – All Futures, Options and Over-The-Counter Instruments which are determined by the Corporation as acceptable for clearing.

“Transaction Value” – has the meaning assigned to this term by Subsection A-409(10).

“Type of Options” – the classification of an Option as either a “put” or a “call”.

“Uncovered Residual Risk” – The amount of risk determined by the Corporation to be uncovered by the Margin model, resulting from an estimation of the loss the Corporation would face in an extreme but plausible market stress test scenario. This Uncovered Residual Risk is calculated and attributed to Clearing Members through their Clearing Fund contribution.

“Underlying Interest” – Asset which underlies and determines the value of a Derivative Instrument or of an OTCI. The Underlying Interest may be a commodity or a financial instrument such as a stock, a bond, a currency, a stock or economic index or any other asset.

“Underlying Interest Equivalent” – the items specified in Section A-708.

“Unit of Trading” – in respect of any Series of Futures and Series of Options and any Fixed Income Transaction means the number of units of the Underlying Interest which has been designated by the Corporation and the Exchange on which the Derivative Instrument is traded (as applicable) as the number to be the subject of a single Future or Option contract or of the Acceptable Security, as applicable.

“Variable Deposit” – the Clearing Fund deposit which may be required in addition to a Base Deposit pursuant to Section A-603.

RULE A-7 MARGIN REQUIREMENTS

Section A-701 Margin Maintenance and Purpose

- (1) Prior to the Settlement Time on every Business Day, every Clearing Member shall be obligated to deposit Margin with the Corporation, as determined by the Corporation, in respect of
 - (a) each Long Position,
 - (b) each Short Position,
 - (c) each Assigned Position,
 - (d) each exercised Option position, and
 - (e) each tendered Futures position.

in each account maintained by such Clearing Member with the Corporation at the opening of such Business Day, including each such position that arises out of a Transaction having a Settlement Time on such Business Day, but excluding Short Positions and Assigned Positions for which either the Underlying Interest or the Underlying Interest Equivalent as specified in Section A-708 has been deposited with the Corporation. When determining whether additional Margin is required from a Clearing Member, the Corporation shall take into account, subject to Subsection A-704(2), all Margin Deposits deposited by or on behalf of such Clearing Member with the Corporation (and not returned to such Clearing Member).

- (2) The Corporation shall apply the Non-Conforming Member's Margin Deposit (including, without limitation, Margin and Clearing Fund), subject to Subsection A-701(3), to the discharge of:
 - (a) the Non-Conforming Member's obligation with respect to any Transaction accepted by the Corporation, whether such failure is caused or not by the Non-Conforming Member;
 - (b) a failure or anticipated failure to make any payment to the Corporation required of a Non-Conforming Member, whether such failure is attributable to the Non-Conforming Member or not;
 - (c) any loss or expense anticipated or suffered by the Corporation upon the liquidation of the Non-Conforming Member's position;
 - (d) any loss or expense anticipated or suffered by the Corporation pertaining to the Non-Conforming Member's obligations in respect of exercised Options or tendered Futures or OTCI for which settlement has not yet been made or in connection with hedging transactions effected for the account of the Corporation pursuant to Rule A-4 in respect of the Non-Conforming Member's positions in Options, Futures and OTCI;
 - (e) any protective or hedging transaction effected for the account of the Corporation pursuant to Rule A-4 in respect of the Non-Conforming Clearing Member's positions in Options and Futures;

- (f) any protective or hedging transaction effected for the account of the Corporation pursuant to Rule A-4 in respect of the Non-Conforming Clearing Member's positions in any OTCI; or
- (g) any other situation determined by the Board.

(3) Each Clearing Member grants to and in favour of the Corporation a first ranking pledge of, lien on and security interest and hypothec in, all property including, without limitation, property deposited as Margin Deposit (including, without limitation, Margin and Clearing Fund) deposited by the Clearing Member with the Corporation or which may, from time to time be in the possession or control of the Corporation, or in the possession or control of a person acting on behalf of the Corporation, to secure the performance by the Clearing Member of all of its obligations to the Corporation, provided, however, that Margin Deposits with respect to a Client Account shall only secure the performance by the Clearing Member of its obligations in respect of that Client Account, and Margin Deposits with respect to a Market Maker Account shall only secure the performance by the Clearing Member of its obligations in respect of that Market Maker Account. Notwithstanding the foregoing, if the Clearing Member does not identify its Deposits with respect to each of its accounts, the Corporation shall use all Margin Deposits without distinction as securing all the obligations of the Clearing Member in respect of all its accounts. The Clearing Member shall execute and deliver to the Corporation such other documents as the Corporation may from time to time request for the purpose of confirming or perfecting the pledge, lien, security interest and hypothec provided to the Corporation by the Clearing Member; provided that the failure by the Corporation to request or by the Clearing Member to execute and deliver such documents shall not limit the effectiveness of the foregoing sentence.

(4) Except as permitted under Subsection A-609(4) in respect of Clearing Fund deposits, and without limiting the right of the Corporation to invest the Margin Deposits in the form of cash under Subsections A-608(1) and A-709(1), the Corporation shall not pledge, repledge, hypothecate, rehypothecate or transfer any property deposited by a Clearing Member which has not been designated as a Non-Conforming Member by the Corporation as Margin Deposit as security for, or in connection with, the Corporation's own obligations to any person.

(5) Without limiting the rights of the Corporation under Subsection A-701(2), at the sole discretion of the Corporation, all property deposited with the Corporation as Margin Deposit (including, without limitation, Margin and Clearing Fund) by a Clearing Member which has been designated as a Non-Conforming Member may be pledged, repledged, hypothecated, rehypothecated or transferred by the Corporation as security for, or in connection with, the Corporation's own obligations to any person incurred in order to obtain liquidity or credit for the purpose of assisting the Corporation to honour its obligations on a timely basis further to the designation by the Corporation of such Clearing Member as being a Non-Conforming Member. In such circumstances, the Corporation shall pledge such Non-Conforming Member's Margin Deposits before pledging the Clearing Fund deposits of other Clearing Members, in accordance with Subsection A-609(4). The Corporation shall be deemed to continue to hold all Margin Deposit deposited with the Corporation, regardless of whether the Corporation has exercised its rights under this Subsection 701(5).

Section A-702 Discretionary Margin Rule

The amount of Margin which a Clearing Member may otherwise be required to deposit with the Corporation pursuant to this Rule A-7 may be varied by the Corporation at any time and from time to time without advance notice whenever the Corporation, in its sole discretion, considers such variation necessary or advisable for the protection of the Corporation, Clearing Members or the investing public.

Section A-703 Daily Margin Activity Report

- (1) Each Business Day, the Corporation shall issue to each Clearing Member for each account maintained by the Clearing Member with the Corporation a report (“Daily Margin Activity Report”) which shall show the amount of Margin required to be deposited with the Corporation by virtue of the Clearing Member's positions. All Margin requirements shall be satisfied by Settlement Time on each Business Day notwithstanding any error in such report.
- (2) If for any reason the Daily Margin Activity Report is not available to a Clearing Member, it shall be the responsibility of that Clearing Member to ascertain from the Corporation the amount of Margin required to be deposited with the Corporation, so that the Margin requirements are met before Settlement Time each Business Day.

Section A-704 Withdrawals of Margin

- (1) Subject to Subsection A-704(2), in the event that on any particular day the amount of a Clearing Member's Margin on deposit exceeds the amount required to be deposited by such Clearing Member on such day pursuant to this Rule A-7, as shown by a report (“Deposits/Withdrawals Report”) for such day, the Corporation shall authorize the withdrawal of the amount of the excess upon the submission to the Corporation, by such Clearing Member during the hours specified by the Corporation, of a withdrawal request in the form prescribed by the Corporation provided that the Clearing Member shall provide the Corporation with sufficient prior notice of such withdrawal request as set out in the Operations Manual.
- (2) If a Clearing Member has excess Margin deposited in respect of any Firm Account, the Corporation shall be entitled to apply such excess (or a portion thereof) as is necessary to meet the Margin requirements in respect of a Client Account or Market Maker Account. If a Clearing Member has excess Margin deposited in respect of any Client Account or any Market Maker Account, the Clearing Member shall not be entitled to apply such excess (or a portion thereof) to meet the Margin requirements in respect of a Firm Account; provided, however, that if the Clearing Member does not identify its Deposits with respect to each of its accounts, the Corporation shall apply the Margin deposited by a Clearing Member indistinctively to meet the Margin requirements in respect of all its accounts.

Section A-705 Intra-Day Margin Calls

- (1) Section 2 of the Operations Manual specifies one Intra-Day Margin Call in the morning (the “Morning Intra-Day Margin Call”) and another one in the afternoon (the “Afternoon Intra-Day Margin Call”). The Corporation may also require the deposit of supplementary Margin by any Clearing Member in any account at any time during any Business Day which the Corporation, in its sole discretion, considers necessary or advisable to reflect changes during such day in the Market Price of any Underlying Interest, or changes in the financial position of the Clearing Member or to protect the Corporation, Clearing Members or the public.
- (2) Subject to Subsection A-704(2), if a Clearing Member has excess Margin on deposit with the Corporation, the Corporation shall be entitled, upon determining that supplementary Margin is required, immediately to apply such portion of the excess Margin as is necessary to meet the supplementary Margin requirements. The Corporation shall notify the Clearing Member as soon as practicable of such application. If there is no excess Margin then on deposit, the Corporation will notify the Clearing Member of the amount of supplementary Margin required. Such supplementary Margin shall be deemed to be owing upon a Clearing Member receiving notice thereof and shall be deposited by the Clearing Member within one hour of the Clearing Member

receiving such notice, or such longer time as may be permitted by the Corporation. Credit for all such supplementary Margin deposits, shall be reflected on the Daily Settlement Summary Report on the following Business Day.

Section A-706 Margin Calculations

The Corporation uses SPAN® for its risk-based Margin system which analyzes Options and Futures positions in each account of each Clearing Member. The system projects a liquidating value for each such account and collects sufficient Margin to cover the Corporation's projected costs in the event that such a liquidation should be required. Offsetting positions are considered and, where determined prudent, the Corporation may reduce its Margin requirements.

The Corporation uses a proprietary margining system for the purposes of margining any OTCI transactions presented to the Corporation for clearing. The components of margin for all OTCI transactions are as follows:

- (a) Outstanding settlement amounts not yet paid;
- (b) Mark-to-Market Valuation from current Open Positions within each account; and
- (c) A worst-case liquidating value for each account.

Margin off-sets are considered in the margining process and where determined prudent, the Corporation may reduce the Margin Requirements for specific accounts.

The Corporation provides Clearing Members with information on the calculation of Margins on request.

Section A-707 Margin on Options Spread Positions Carried in Client Accounts

- (1) Where a Clearing Member maintains an Options Spread Position in its Client Account, the Clearing Member may inform the Corporation of this fact with a view to reducing the Margin required on the positions held in that account by filing a report ("Options Spread Position Report") with the Corporation.
- (2) Each Clearing Member shall maintain a record of each Spread Position held for in its Client Account identifying the client, the Client Account in which the Spread Position is held, and the specified Long Positions and Short Positions making up the Spread Position.
- (3) Prior to the time established by the Corporation, on every Business Day, each Clearing Member shall inform the Corporation, in the form prescribed, of the quantity and composition of any additions to or deletions from the Spread Positions carried for individual clients.
- (4) No Clearing Member shall inform the Corporation of a Spread Position or permit a Spread Position to remain recorded by the Corporation unless the Clearing Member is simultaneously carrying in the relevant Client Account Long and Short Positions for an equal number of Options of the same Class of Options and the margin required to be deposited by such client in respect of such positions has been reduced accordingly. The filing by a Clearing Member of an Options Spread Position Report shall constitute the certification by the Clearing Member to the Corporation that such filing is

authorized, is in accordance with the foregoing and is in compliance with all applicable laws and regulations.

- (5) If a Client Account with the Corporation has Spread Positions for a Series of Options in respect of which the Corporation has been notified and the total Long Position in such Series of Options is reduced by the filing of an Exercise Notice or the execution of a closing transaction in such account, such reduction shall also be applied by the Corporation against the Spread Position in such account. If the Clearing Member wishes such reduction to be applied in a different manner, it shall so instruct the Corporation by filing an appropriate spread instruction.

Section A-708 Underlying Interest and Underlying Interest Equivalent

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 or Underlying Interest Equivalent as herein defined.

- (1) For **CALL OPTIONS** the Underlying Interest or Underlying Interest Equivalent shall mean:
- (a) Equity Options –
 - (i) the underlying Security or any Security exchangeable or convertible without restriction, other than the payment of Cash, into the underlying Security shall be acceptable, provided that neither the Security nor the right to exchange or convert lapses throughout the life of the Option. Where the payment of money is a condition of conversion such Cash shall be deposited with the Corporation at the same time as the convertible Security. This provision applies to warrants, rights, and convertible Securities.
 - (ii) a Call Underlying Interest Deposit issued by an Approved Depository in favour of the Corporation.
 - (b) Bond Options – Government of Canada Bonds (excluding Canada Savings Bonds) which:
 - (i) are the underlying bond; or
 - (ii) have been determined by the Corporation as acceptable on the basis that they:
 - have higher coupon rates;
 - have an aggregate face value at maturity of at least \$1,000,000,000;
 - trade at a premium of \$5 greater than the underlying bond; and
 - mature no sooner than 2 years prior to the underlying bond.
 - (c) Silver Options – silver certificates issued by organizations acceptable to the Corporation.
 - (d) Cash Settlement Options

- (i) Government Securities as specified in Section A-709 equal in value to the aggregate current value (which for the purposes of this Section have the meaning attributed thereto in Section B-1001 as the context requires) of the Option at the close of trading on the Business Day prior to the deposit.
- (ii) If the value of the government Securities deposited for each contract falls below the value of the aggregate current value on any Business Day the Corporation may call for an additional deposit or Margin.
- (e) Options on short term money-market instruments expiring in one year or less
The Underlying Interest or any other instrument acceptable to the Corporation.
- (f) Futures Options – Government of Canada Bonds (excluding Canada Savings Bonds) which:
 - (i) are the underlying bond; or
 - (ii) have been determined by the Corporation as acceptable.
- (g) Gold Options – gold certificates issued by organizations acceptable to the Corporation.
- (2) For **PUT OPTIONS** Underlying Interest and Underlying Interest Equivalent shall mean:
 - (a) Cash deposited at the Corporation in the amount of the relevant Exercise Price,
 - (b) a Put Escrow Receipt issued by an Approved Depository in favour of the Corporation.
- (3) For **FUTURES** Underlying Interest and Underlying Interest Equivalent shall mean:
 - (a) any Underlying Interest which would be considered to be in Good Deliverable Form on the corresponding Futures contracts.
 - (b) a Futures Underlying Interest Deposit issued by an Approved Depository in favour of the Corporation.

For cash settlement Futures, the Corporation may impose from time to time at its sole discretion Margin requirements on the Underlying Interest or Underlying Interest Equivalent as determined by the Corporation.

Section A-709 Forms of Margin

Required Margin may be deposited with the Corporation, subject to Section A-212, in one or more of the following forms:

- (1) **Cash** - Clearing Members may deposit Cash by way of an irrevocable funds transfer to the Corporation. Funds so deposited may, from time to time, be partially or wholly invested by the Corporation for its account and, to the extent not so invested, shall be deposited to the credit of the Corporation in such financial institutions as the Board may select. Any interest or gain received or accrued on the investment of such funds shall belong to the Corporation. Such funds shall not be used by the Corporation as working capital.

- (2) **Government Securities** – Clearing Members may deposit, as hereinafter provided, Acceptable Treasury Bills and such other government Securities as may be specified by the Corporation, which are freely negotiable and which shall be valued at a discounted rate to their market value, as determined by the Corporation from time to time in accordance with the methodology set forth in the Risk Manual. Such valuation rate shall be applied to the Market Value of the relevant Securities. “Market Value” as used in this Subsection A-709(2) shall be determined on the close of each Business Day by the Corporation through reference to one or more data supply services retained by the Corporation for such purpose. If a market value is required to be determined on a non-Business Day, and the data supply service does not provide a market value for such day, the market value on the immediately preceding Business Day shall be used. If no market value is generally available for any government Securities accepted by the Corporation as a form of Margin, such Securities shall be valued at an amount determined by the Corporation.

The government Securities shall be deemed to be deposited with the Corporation at the time the Corporation accepts the government Securities as Margin. All interest or gain received or accrued on such government Securities prior to any sale or negotiation thereof shall belong to the depositing Clearing Member and such interest will be paid to such depositing Clearing Member by the relevant issuer.

For each Clearing Member, at least two thirds of the total Margin required against all of its accounts combined must be covered by Cash, Acceptable Treasury Bills or any combination thereof.

- (3) **Canada Mortgage Bonds** – Clearing Members may deposit, as hereinafter provided, Canada Mortgage Bonds as may be specified by the Corporation, which are freely negotiable and which shall be valued at a discounted rate to their market value, as determined by the Corporation from time to time in accordance with the methodology set forth in the Risk Manual. Such valuation rate shall be applied to the Market Value of the relevant Securities. “Market Value” as used in this Subsection A-709(3) shall be determined on the close of each Business Day by the Corporation through reference to one or more data supply services retained by the Corporation for such purpose. If a market value is required to be determined on a non-Business Day, and the data supply service does not provide a market value for such day, the market value on the immediately preceding Business Day shall be used. If no market value is generally available for any Canada Mortgage Bonds accepted by the Corporation as a form of Margin, such Securities shall be valued at an amount determined by the Corporation.

The Canada Mortgage Bonds shall be deemed to be deposited with the Corporation at the time the Corporation accepts the Canada Mortgage Bonds as Margin. All interest or gain received or accrued on such Canada Mortgage Bonds prior to any sale or negotiation thereof shall belong to the depositing Clearing Member and such interest will be paid to such depositing Clearing Member by the relevant issuer.

(43) **Valued Securities**

- (a) In addition to the Underlying Interest and Underlying Interest Equivalent which may be deposited under Section A-708, Clearing Members may deposit any Security listed on any duly recognized Canadian Exchange (such Security, a “Valued Security”), against their total

Margin requirements. This Margin shall be deemed to be deposited with the Corporation at the time the Corporation accepts the Securities.

- (b) No value will be given for any Valued Security on any one day when the closing price thereof or, if there was no trading in such Valued Security on such day on any applicable Exchange, the previous closing price is less than \$10 on any applicable Exchange.
- (c) Valued Securities so deposited will be marked-to-the-market daily and 50% of this daily value applied against the total Margin required against all accounts combined.
- (d) No more than 10% of the total Margin required against all accounts combined may be covered by any one Valued Security.
- (e) For each Clearing Member, no more than 15% of the total Margin required against all of its accounts combined may be covered by Valued Securities.
- (f) No value will be given for any Valued Securities deposited by a Clearing Member if such Valued Securities are issued by an Affiliate of such Clearing Member.

(45) **Other Forms of Margin Deposit** - The Corporation may from time to time accept other forms of Margin deposit as determined in its sole discretion. The Corporation may alter any such accepted form of deposit and may at any time cease accepting any alternative form of deposit previously accepted by it. Where a previously accepted form of deposit is determined to be no longer acceptable by the Corporation, it shall notify all Clearing Members who shall promptly replace all such unacceptable forms of deposit with forms of deposit acceptable to the Corporation.

Section A-710 Daily Capital Margin Monitoring Calls

The Corporation will monitor the Margin requirement of a Clearing Member as a percentage of its capital. In the event that this ratio exceeds 100%, additional margin in the amount of the excess over the ratio of 100% will be collected from the Clearing Member in the form of acceptable Margin in accordance with Section A-709.



Risk Manual

Version of February 29, 2012

Table of Contents

Glossary	
Acceptability of Underlying Interests	4
Acceptable Underlying Interests of Equity Options	4
Acceptable Underlying Interests of Share Futures	4
Acceptable Underlying Interests of OTCI	4
Acceptable Underlying Interests of Cash Buy Or Sell Trades.....	4
Acceptable Underlying Interests of Repurchase Transactions	5
Margin Deposit	6
Margin Fund.....	6
Initial Margin	6
Margin Interval (MI) Calculation	6
Initial margin Calculation	7
Initial Margin for Options Contracts	8
Initial Margin for Futures Contracts	15
Initial Margin for Fixed Income Transactions.....	18
Variation Margin	24
Options Contracts	24
Futures Contracts	24
Fixed Income Transactions	24
Account Structure.....	25
Difference Fund	26
Clearing Fund	27
Member Contribution.....	27
Stress Scenarios	28
Forms of Collateral	32
Cash	32
Government Securities	32
Valued Securities.....	32
Calculating the Haircuts for Government Securities.....	32
the Haircuts for Valued Securities	33
Haircut Policy.....	33
Monitoring Program	34
Backtesting	34
Stress Testing.....	34
Contract Adjustment	36

Glossary

Margin Interval: Parameter established by the Corporation which reflects the maximum price fluctuation that the Underlying Interest could be expected to have during the liquidation period. The Margin Interval (MI) calculations are based on the historical volatility of the Underlying Interest and these calculations are re-evaluated on a weekly basis. If necessary, the Corporation may update the Margin Intervals more frequently. The Margin Interval is used to calculate the Initial Margin of every Derivative Instrument.

Haircut: Percentage discounted from the market value of Securities pledged as collateral for Margin Deposit. The discount reflects the price movement volatility of the collateral pledged. Thus, this reduction assures that even if the collateral's market value declines, there is time to call for additional collateral to adjust its value to the required level.

Initial Margin: The Initial Margin covers the potential losses that may occur over the next liquidation period as a result of market fluctuations. The Initial Margin amount is calculated using the historical volatility of the Underlying Interest return for Options contracts, futures prices for Futures contracts and yield-to-maturity (YTM) of the on-the-run security for Fixed Income Transactions.

Variation Margin: The Variation Margin takes into account the portfolio's liquidating value (this is also known as the Replacement Cost or RC) which is managed through the Mark-to-Market daily process.

Price Scan Range: The maximum price movement reasonably likely to occur, for each Derivative Instrument or, for Options, 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:

$$\text{PSR} = \text{Underlying Interest Price} \times \text{MI} \times \text{Contract Size}$$

Volatility Scan Range: The maximum change reasonably likely to occur for the volatility of each Option's Underlying Interest price.

Risk Array: A Risk Array (RA) 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).

Combined Commodity: The Risk Engine divides the positions in each portfolio into groupings called Combined Commodities. Each Combined Commodity represents all positions on the same ultimate Underlying Interest – for example, all Futures contracts and all Options contracts ultimately related to the S&P/TSX 60 Index.

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 the values of the Underlying Interest according to several scenarios representing adverse changes in normal market conditions.

Active Scenario: The number of the Risk Arrays scenario that gives the largest amount (worst case scenario).

Short Option Minimum: Rates and rules to provide coverage for the special situations associated with portfolios of deep out-of-the-money short option positions. This amount will be called if it is higher than the result of the Risk Arrays.

Liquidity Interval: 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.

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’ assignment will be dynamic in that they will change from one Bucket to the other as the Acceptable Security nears maturity.

MTM Price Valuation: The MTM Price Valuation is the difference between the market value of the Security and the funds borrowed. This amount is collateralized and should be credited (or debited) to the Repo Party’s Margin Fund and debited (or credited) to the Reverse Repo Party’s Margin Fund.

Intra-Commodity (Inter-Month) Spread Charge: Underlying Interests’ prices, from a maturity month to another are not perfectly correlated. Gains on a maturity month should not totally offset losses on another. To fix this issue, the Risk Engine allows the user to calculate and to apply a margin charge relative to the Inter-Month spread risk in order to cover the risk of these two positions.

Inter-Commodity Spread Charge: The Corporation considers the correlation that exists between different classes of Futures contracts when calculating the 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.

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

Risk Engine: The Corporation uses the Standard Portfolio Analysis system (SPAN®) as its Risk Engine.

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.

Summary

The Corporation applies rigorous risk management methods to protect their Clearing Members.

The main aspects of risk management that are specifically addressed in this manual are as follows:

- The acceptability of Underlying Interests;
- The Margin calls that occur when a member's potential loss exceeds its Margin Deposit;
- The monitoring of each Clearing Member's credit risk by regular tracking of Margin Deposit and Capital;
- The Clearing Member's contribution to the Clearing Fund;
- The management of the forms of collateral accepted for Margin Deposit and the calculation of the Haircuts that apply to these assets;
- The monitoring program;
- The adjustments in contract terms; and
- The default management process.

ACCEPTABILITY OF UNDERLYING INTERESTS

ACCEPTABLE UNDERLYING INTERESTS OF EQUITY OPTIONS

- *Section B-603* of the Rules sets out the eligibility criteria for Equity Options.
- *Section B-604* of the Rules sets out the ineligibility criteria for Equity Options.

CDCC reviews and publishes quarterly the eligibility threshold and deficiency threshold in terms of market capitalization and volume (expressed as an average daily volume of the last 20 business days) for clearing Equity Options.

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 the eligibility threshold and deficiency threshold in terms of market capitalization and volume (expressed as an average daily volume of the last 20 business days) for clearing Share Futures.

ACCEPTABLE UNDERLYING INTERESTS OF OTCI

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

CDCC reviews and publishes quarterly on its website a list of the single name equities and ETFs that are Acceptable Underlying Interests for clearing OTCI.

Between two quarterly publications of the list of Acceptable Underlying Interests, a Clearing Member who wishes to clear OTCI 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.

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; and
- Bonds issued by Canada Post;
- The bonds must be repayable at maturity;
- The bonds must be denominated in Canadian dollars;
- The coupon type must be fixed, real return, step-up or zero (Treasury bills are eligible);
- The net amount outstanding¹ must be greater than or equal to \$250 million;
- The bonds' prices must be issued by a source that is acceptable to the Corporation.

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 Transaction if they meet the following criteria:

- The Underlying Interest must be an Acceptable Underlying Interests 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.

¹ The net amount outstanding is defined as the outstanding amount issued on the market minus the stripped coupon bonds and issuer repurchases.

MARGIN DEPOSIT

The Corporation has three different funds for margining purposes and each serves a specific purpose:

- Margin Fund
- Difference Fund
- Clearing Fund

MARGIN FUND

The Margin Fund is composed of the Initial Margin and the Variation Margin. The Initial Margin covers the potential losses and market risk that may occur as a result of future adverse price movements across the portfolio of each Clearing Member under normal market conditions. Furthermore, in the event of a default, the Corporation is faced with closing out the defaulters' portfolio within a short period (the liquidation period). In a complementary manner, Variation Margin is a daily payment process that covers the market risk due to the change in price since the previous day, ahead of the default of one of its Clearing Members. Variation Margin is settled in cash for Futures contracts and collateralized for Options contracts, OTCI and Fixed Income Transactions.

INITIAL MARGIN

As fundamental inputs to calculate the 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.

Specifically, the Corporation uses three standard deviations to consider a confidence level over 99% under the normal distribution's assumption. The Corporation also considers a variable number of days as an acceptable liquidation period. The Initial Margin amount is calculated using the historical volatility of the daily price returns of the Underlying Interests for Options contracts, the daily price returns of the futures prices for Futures contracts and the yield-to-maturity (YTM) daily variation of the on-the-run security for Fixed Income Transactions. The historical volatility, combined with the liquidation period and the confidence level gives the Margin Interval (MI) as described below.

MARGIN INTERVAL (MI) CALCULATION

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

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

$$MI = 3 \times \sqrt{n} \times \text{Max}[\sigma_{20 \text{ days}}, \sigma_{90 \text{ days}}, \sigma_{260 \text{ days}}]$$

Where 'n' is the number of liquidation days², 'σ' is the standard deviation of the daily variation over 20, 90 and 260 days, and 3 is equivalent to 99.87% for a one-tail confidence interval under the normal distribution's assumption.

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 the section 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:

$$\text{PSR} = \text{Underlying Interest Price} \times \text{MI} \times \text{Contract Size.}$$

INITIAL MARGIN CALCULATION

To calculate the Initial Margin, the Risk Engine uses the MI which is converted to 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 obtained by varying the values of the Underlying Interest according to several scenarios representing adverse changes in normal market conditions. The Scanning Risk is always calculated at the Combined Commodity level.

For contracts belonging to the same Combined Commodity, the Risk Engine adds up the Risk Arrays results of 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 Scanning Risk is the Initial Margin for the Combined Commodity.

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 Initial Margin and the Inter-Commodity Spread Charge which tends to decrease the Scanning Risk to take advantage of the

² For Fixed Income Transactions, Futures contracts and Options contracts, the Corporation uses 2 days as an acceptable liquidation period. For OTCI options, the Corporation uses 5 days.

correlations between the different constituents of the Combined Commodity. Another example is the specific case of short deeply out-of-the-money options wherein the Risk Engine calculates a minimum amount called Short Option Minimum (SOM) which otherwise attracts little or no 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 Initial Margin is slightly different for Options contracts, Futures contracts and Fixed Income Transactions. The following table summarizes the list of variables used to calculate the Initial Margin by cleared product category:

Input variables to calculate the Initial Margin	Options contracts (including OTCI options)	Futures contracts and Share Futures	Fixed Income Transactions
Scanning Risk	•	•	•
Intra-Commodity (Inter-Month) Spread Charge ³		•	•
Inter-Commodity Spread Charge ⁴		•	•
Short Option Minimum (SOM) amount	•		
Liquidity Interval ⁵	•		

INITIAL MARGIN FOR OPTIONS CONTRACTS

This section describes how the 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:

$$PSR = \text{Underlying Interest Price} \times MI \times \text{Contract Size}$$

³ Not applicable to Share Futures Contracts.

⁴ Idem 3

⁵ Applicable for OTCI options with Physical Settlement/Delivery only

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

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 the intra-day margin processes, CDCC relies on the previous day's closing prices for those Option contracts for which it has open interest.

However, since the Initial Margin driven by Option contracts is relatively small with respect to the total 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. The details of this method are described in the section on Risk Arrays.

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

Example 1:

Let's assume that the price of an Option contract is X_0 , its Underlying Interest price is P_0 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:

$$PSR = MI \times P_0 \times \text{Contract Size.}$$

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

$$PSR = MI \times P_0 \times 100$$

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. $PSR = MI \times P_0$.

Scenario 1:

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 Barone-Adesi & Whaley (1987) model⁶ 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 (BAW)	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 Initial Margin of this position.

⁶ The Corporation uses BAW (1987) model since most of the listed equity options that are cleared are American style.

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 n^{th} 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 n^{th} contract that belong to the same Combined Commodity in order to get the total RA_2 for the Combined Commodity. And so forth for obtaining 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 Future 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:

$$PSR_F = MI_F \times F_0 \times \text{Contract Size}$$

and,

$$PSR_I = MI_I \times P_0 \times \text{Contract Size}$$

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 (BAW)	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 (BAW)	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 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 (as for the short Put option of the previous example), 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 Initial Margin for each Combined Commodity, for each member's account and sub-account. Thus, the 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.

In the event of a sharp 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)⁷ for short positions in each Combined Commodity. This amount will be called if it is higher than the result of the Risk Arrays.

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

The Corporation's Risk Arrays file is published every day on the Chicago Mercantile Exchange (CME) website.

OTCI TRANSACTIONS FOR WHICH THE UNDERLYING INTEREST IS A SECURITY

The Initial Margin calculation process for OTCI Transactions for which the Underlying Interest is a Security 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

The Corporation uses the Barone-Adesi and Whaley (BAW) model to evaluate the Options that have an American style and the Black and Scholes (BS) model to evaluate the Options that have a European style. 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 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 to be evaluated.

Then, the volatility that corresponds to the strike price of the Option to be evaluated 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 evaluated. However, if the expiry date of the Option to be evaluated 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

⁷ At the Corporation, the Short Option Minimum (SOM) is equal to 25% of the Price Scan Range.

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 transactions for which the Underlying Interest is a Security, 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.

UNSETTLED ITEMS

Options contracts with physical delivery that have been exercised or expired in the money without being settled (i.e. the Underlying Interest is not delivered yet) are considered as Unsettled Items and the Corporation has to manage the settlement risk associated with these products until the whole quantity of the Underlying Interest is completely delivered/settled. For instance, when such Option contract expires in the money, the Underlying Interest is delivered three days after the expiry date consistent with current market settlement conventions. The Corporation has to charge a Margin requirement to cover the Replacement Cost (RC) of the Option contract and its Potential Future Exposure (PFE) as well. The procedure is as follows:

To cover the Replacement Cost of the Option contract, the Corporation requests a Margin requirement equal to the intrinsic value of the Option times the position (quantity of Options). However, when the writer of a put Option has deposited a Put Escrow Receipt to cover the total amount of the strike price in accordance with Section A-708 of the Rules, the Corporation will not require Margin on the relevant put Option. In the same manner, when the writer of a call Option has deposited a Call Underlying Interest Deposit to cover the total quantity of the Underlying Interest deliverable thereunder in accordance with Section A-708 of the Rules, the Corporation will not require Margin on the relevant call Option.

To cover the Potential Future Exposure of the Option contract, the Corporation requests a margin requirement amount to cover any potential Underlying Interest price movement over two days and within three standard deviations (under the normal distribution's assumption).

INITIAL MARGIN FOR FUTURES CONTRACTS

This section describes how the initial margin is calculated for the Futures contracts,

which includes the Index Futures, Interest Rate Futures, Government of Canada Bonds Futures and Shares Futures.

The first part of the example # 2 of the previous section on Risk Arrays 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 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 Initial Margin for a Futures contract is always equal to its Price Scan Range (PSR).

However, when the holder of a short position on a Futures contract has deposited a Futures Underlying Interest Deposit to cover the total quantity of the Underlying Interest deliverable thereunder in accordance with Section A-708 of the Rules, the Corporation will not require Margin on the relevant Futures contract.

INTRA-COMMODITY (INTER-MONTH) SPREAD CHARGE

The different Futures contracts belonging to the same Combined Commodity have generally positively 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 positions on futures maturing in one month with the short positions on futures maturing in another month. The resulting Margin Requirement on these two Futures contracts belonging to the same Combined Commodity, assumes a perfect correlation between the two Futures contracts. Thus the gain of one position is offsetted by the loss of the other position. However, the Futures contracts prices with different maturity months are not perfectly correlated. Gains on a Futures contracts with a certain expiry month should not totally offset losses on a Futures contracts whose expiry month is different. To fix this issue, the Risk Engine allows the user to calculate and to apply a margin charge relative to the Inter-Month spread risk, in order to cover the risk of these two positions. This margin is called Inter-Month Spread Charge or Intra-Commodity Spread Charge (because it is calculated within the Combined Commodity).

Intra-commodity (Inter-month) Spread Charge on correlated futures positions are calculated by the Corporation's risk department and updated regularly.

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

$$ICSC = 3 \times \sqrt{n} \times \text{Max}[\sigma_{20 \text{ days}}, \sigma_{90 \text{ days}}, \sigma_{260 \text{ days}}]$$

Where 'n' is the number of liquidation days (see footnote 2), 'σ' is the standard deviation of the Futures combination's daily profit and loss (P&L) over 20, 90 and

260 days, and 3 is equivalent to 99.87% under the normal distribution's assumption.

INTER-COMMODITY SPREAD CHARGE

Similarly, the Corporation considers the correlation that exists between different classes of Futures contracts when calculating the 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 according to the historical correlation of the returns of the two Futures contracts.

When calculating the Initial Margin on a portfolio with several long and short futures positions, 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 Future contract that can be offset by a position on the other Future 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.

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

The Corporation also considers the positive (negative) correlation that exists between the different interest rate Futures contracts and the Fixed Income Transactions, and provides a margin benefit for a combination of any Futures contracts with the opposite (same) Fixed Income Transactions.

Spread Priority

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

- 1) Use the yearly historical data of the different Futures contracts and calculate the correlation matrix.
- 2) 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.
- 3) 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.

- 4) 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 Future contract of the same combination. The remaining position (or quantity of Future contracts) of any contract of this first combination will be matched with another position to form another combination according 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 Spread Charge). Any remaining (outright) positions in these Futures contracts positions will be considered for Inter-Commodity Spread Charge with Fixed Income Transactions.

INITIAL MARGIN FOR FIXED INCOME TRANSACTIONS

At the Corporation, a Fixed Income Transaction can be 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, two or three 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.

A Repurchase Transaction is a transaction whereby the seller (the Repo Party) agrees to sell a security to a buyer (the Reverse Repo Party) on a given date (the purchase date) and simultaneously agrees to buy the same security back from the Reverse Repo Party at a later date (the repurchase date) at a fixed price (the repurchase price). Thus, a Repo is equivalent to a cash transaction combined with a forward contract. The cash transaction results in a transfer of money from the buyer to the seller in exchange for a legal transfer of the security from the seller to the buyer, while the forward contract ensures repayment by the seller to the buyer and return of the securities from the buyer to the seller. The difference between the repurchase price and the purchase price is the Price Differential calculated with the agreed Repo Rate, while the settlement date of the forward contract (i.e. the repurchase date) is the maturity date of the transaction.

In such Repurchase Transaction, there are two sources of risk that the Corporation needs to consider and cover. The potential Purchased Security's price fluctuation and the Floating Price Rate fluctuation over the life of the Repurchase Transaction. 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 Purchased Security's price fluctuation.

SECURITY PRICE RISK

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

The methodology to calculate the Initial Margin 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 Repurchase 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 as 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:

$$MI = 3 \times \sqrt{n} \times \text{Max}[\sigma_{20\text{ days}}, \sigma_{90\text{ days}}, \sigma_{260\text{ days}}]$$

Where n is the number of liquidation days, σ is the standard deviation of the YTM's daily variation of the on-the-run security over the reference period and 3 is to allow a confidence level over 99% under the normal distribution's assumption.

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. Since the bond's convexity effect is very small with respect to its duration, the Initial Margin is calculated for a physical cash trade exactly the same way as for Futures contracts. The first part of the example # 2 of the section on Risk Arrays shows how the Scanning Risk is calculated for a Futures contract. As for a Futures contract, the Initial Margin for a physical security can also be obtained straightforwardly by calculating its Price Scan Range (PSR).

Therefore, the Initial Margin amount related to the security's price of a Repurchase Transaction on one security belonging to a Bucket is calculated as follows:

$$\text{Initial Margin 1} = \text{Security's Price} \times MI \times D \times \text{Contract Size}$$

Where D is the duration of the security and the contract size is the transaction's Purchase Price divided by 100. However, for all securities that belong to the 3-month, 6-month and 1-year buckets, CDCC uses a fixed duration set to 0.25, 0.5 and 1 respectively.

Thus, all Repo related Fixed Income Securities belonging to the same Bucket have the same Margin Interval but each specific Repo related security of the same Bucket has a different Initial Margin driven by its own price and its own duration.

In the above formula of the Price Scan Range, only the first part of the Initial Margin of a Repurchase Transaction is calculated, namely, the Initial Margin 1. As mentioned above, there are two sources of risk for a Repurchase Transaction. This is the Initial Margin of the first source of risk, the security's price. In the next section, the second part of the Initial Margin of a Repurchase Transaction which covers the second source of risk, the Floating Price Rate, is described. Finally, both Initial Margins are added up to get the total Initial Margin of a Repurchase Transaction. However, the Initial Margin 1 corresponds to the total Initial Margin for a Cash Buy or Sell Trade.

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: $VFC's\ price = 100 - \text{Floating Price Rate}$. For an overnight Repurchase Transaction the 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 Initial Margin that covers the Floating Price Rate related risk is then added to the portion of Initial Margin that covers the security price related risk to get the total Initial Margin for a Repurchase Transaction.

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

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 offsetted 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 fix this issue, the Risk Engine allows the user 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 Inter-Month Spread Charge or Intra-Commodity 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 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:

$$ICSC = 3 \times \sqrt{n} \times \text{Max}[\sigma_{20 \text{ days}}, \sigma_{90 \text{ days}}, \sigma_{260 \text{ days}}]$$

Where 'n' is the number of liquidation days (see footnote 2), 'σ' is the standard deviation of the securities combination's daily profit and loss (P&L) over 20, 90 and 260 days, and 3 is equivalent to 99.87% under the normal distribution's assumption.

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 Initial Margin for opposite or similar positions on two different Acceptable Securities belonging to different Buckets would be the sum of both Initial Margins. However, two different Fixed Income Transactions in different Acceptable Securities belonging to two different Buckets can benefit from a reduction in their Initial Margins because of the consideration given to their correlation. The formula to get the portfolio's Initial Margin is:

$$\text{Total Initial Margin} = (\text{Initial Margin}_{\text{Position 1}} \times \text{Hedge Ratio}_{\text{Position 1}} + \text{Initial Margin}_{\text{Position 2}} \times \text{Hedge Ratio}_{\text{Position 2}}) \times (1 - \text{Margin Relief})$$

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 regularly.

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.

Spread Priority

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

- 1) Use the yearly historical data of the different Fixed Income Securities and calculate the correlation matrix.
- 2) 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.
- 3) 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.
- 4) 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.

For a better understanding of this process, please refer to the spread priority example of the section Fixed Income Transactions, and to the third scenario of the *IM_repo_3_scenarios.xls* file available at the Corporation website.

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 year	3 year	5 year	7 year	10 year	15 year	20 year	30 year
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 year				100%	76%	59%	68%	69%	78%	75%	69%
3 year					100%	82%	87%	86%	93%	90%	89%
5 year						100%	91%	55%	57%	89%	88%
7 year							100%	80%	91%	70%	94%
10 year								100%	82%	95%	43%
15 year									100%	69%	97%
20 year										100%	67%
30 year											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.

VARIATION MARGIN

OPTIONS CONTRACTS

For Options contracts, the Variation Margin is collateralized daily.

FUTURES CONTRACTS

For Futures contracts, the Variation Margin is financially settled every day based on the settlement price as determined by the relevant marketplace.

FIXED INCOME TRANSACTIONS

MTM REPO RATE VALUATION

The Mark-To-Market (MTM) process essentially transfers any losses due to market fluctuations in the Floating Price Rate which is determined from the overnight index swap curve from one party to the Repurchase Transaction to the other. Each open position will be Marked-to-Market on a daily basis with the resulting cash movements settling during the morning settlement cycle. This amount is called the MTM Repo Rate Payment.

The MTM process works as follows. On one hand, if the Floating Price Rate decreases during the life of the Repurchase Transaction, the Repo Party must pay the difference between the original Repo Rate and the new Floating Price Rate. On the other hand, if the Floating Price Rate increases, the Reverse Repo Party must pay the difference between the new Floating Price Rate and the original Repo Rate.

In addition, when one party to the Repurchase Transaction pays the MTM, it is necessary to compensate that Clearing Member for the opportunity cost of funds (OCF) which was forfeited.

The MTM process is important since it ensures that, in the event of default, the Corporation will be able to replace the defaulting Clearing Member's Repurchase Transaction without incurring any additional losses beyond the current valuation.

Since the MTM and OCF are related to the Repo Rate and the Floating Price Rate, these two components are applied only to Repurchase Transactions and not to Cash Buy or Sell Trades.

Here is an example of the MTM and the OCF calculations:

$$MtM_t = A \times (OIS\ rate_t - original\ Repo\ Rate) \times t/365 - MtM_{t-n}$$

and

$$OCF_t = MtM_{t-n} \times Corra_{t-n} \times n/365$$

where

A = Purchase Price

t = Remaining term (in days)

OIS rate_t = Interest rate derived from the OIS curve with a remaining term of t days

Original Repo Rate = the contractual Repo Rate

n = Number of days between t and the last business day. It's usually equal to 1 except when there is a week-end or a Holiday.

MTM PRICE VALUATION

At each margin run process (two intra-days and one end of day process), the Clearing Engine compares the Market Value of the Purchased Security to the Repurchase Price. The Corporation is exposed to the Reverse Repo Party when the Market Value of the Purchased Security exceeds the Repurchase Price, and inversely, the Corporation is exposed to the Repo Party when the Repurchase Price exceeds the Market Value of the Purchased Security; therefore, this difference needs to be considered in the event of a Clearing Member default.

The MTM price valuation amount is the difference between the Market Value of the Purchased Security and the Repurchase Price. This amount is collateralized and should be credited to the Repo Party's Margin Fund and debited to the Reverse Repo Party's Margin Fund when the Market Value of the Purchased Security exceeds the Repurchase Price, and the other way around when the Repurchase Price exceeds the Market Value of the Purchased Security. It should be noted that MTM price valuation is also applicable for Cash Buy or Sales Trades. In this situation, the MTM price valuation amount is the difference between the Market Value of the Purchased Security and the Purchase Price.

ACCOUNT STRUCTURE

The Corporation uses three types of accounts for Margin calculation purposes and positions management: Firm Account, Multi-Purpose Account and Client Account. All the account types are treated on a net account basis for Futures contracts, OTCI and Fixed Income Transactions. However, Options contracts are treated differently depending on the account type they are held in. If they are held in a Firm Account or a Multi-Purpose Account, they are treated on a net account basis, whereas if they are held in a Client Account, they are treated on a gross account basis, which means that only short Options contracts are considered when computing the Initial Margin.

Gross accounts allow calculation of Initial Margin for different clients that clear through one Clearing Member. Since each client has its own risk profile, the Initial Margin must be computed separately for each client and must not allow offsets

between positions that belong to different clients. Subsequently, only Short Positions in Options contracts are considered when calculating the Initial Margins for the Client Account.

Net accounts allow calculation of Initial Margin for the Clearing Member's own positions (Firm Account), for a Market Maker positions (Market Maker Account) or for the positions of a particular single Client (Netted Client Account). In this case, the Initial Margin must consider the possible offsets between all positions. Therefore, all positions held in one Firm Account or one Multi-Purpose Account are used to calculate the Initial Margin for this account.

The Initial Margins calculated for each account are then aggregated at the Clearing Member level to get the Initial Margin by Clearing Member.

In order to cover the Initial Margin described above, Clearing Members shall deposit an acceptable form of Deposits in accordance with Section A-709 of the Rules.

DIFFERENCE FUND

As defined in Section 8.2 of the Operations Manual, the Difference Fund is Margin Deposits held by the Corporation as discretionary margin, such as: (1) Unsettled Items Margin, (2) Daily Capital Margin Monitoring, (3) Advance calls for settlement of losses, (4) OTCI Additional Margin, (5) Banking Holidays Additional Margin, and (6) Intra-Day Margin. The Corporation accepts Deposits to the Difference Fund in the same form and proportion as for the Margin Fund, as set forth in Section A-709 of the Rules.

Despite the fact that the Difference Fund is used to cover all the above elements, the sub-section regarding the Daily Capital Margin Monitoring intends to capture the credit risk. Consequently, this sub-section is described in details thereunder.

Daily Capital Margin Monitoring:

The Corporation measures the credit exposure to its Clearing Members on a daily basis through the Daily Capital Margin Monitoring Calls (the Difference Fund). The capital level is derived from regulatory reports received on a monthly basis in a timely manner (and on a quarterly basis if it is a Bank Clearing Member).

As prescribed in Section A-710 of the Rules, the Corporation may call for a contribution in the Difference Fund from Members that are undercapitalized in relation to their respective Initial Margin. The Corporation compares the Clearing Member's capital amount to the Initial Margin on a daily basis and requires, if applicable, that the Clearing Member makes up any difference in the form of acceptable Deposits. Each Clearing Member's capital is analyzed and updated on a monthly basis.

In order to determine the contribution to the Difference Fund of Clearing Members, the Corporation uses the Net Allowable Assets (NAA). The Net Allowable Asset is a more restrictive type of capital, since it is the net result of the financial statement capital less the non allowable assets. Non allowable assets are composed of less liquid assets like capitalized leases, Investments in and Advances to Subsidiaries, etc. For Bank Clearing Members, the Corporation uses the Net Tier 1 capital.

The Corporation has access to the Clearing Member's financial statements from the CIPF (Canadian Investor Protection Fund), and the OSFI (Office of the Superintendent of Financial Institutions Canada) for Bank Clearing Members.

In addition to the monthly update of capital numbers, the Corporation performs a qualitative analysis of the financial statements of each member. The Corporation has defined specific thresholds to analyze the profitability, the margin required, the liquidity and the capital level. The Corporation could ask Clearing Members for more clarifications, if necessary.

Indeed, Investment Industry Regulatory Organization of Canada (IIROC) evaluates the financial condition of its Members. If an IIROC Member, who is also a Clearing Member, fails the tests designed to detect the risk of insolvency, the Corporation will be notified by IIROC. The Clearing Member itself shall also advise the Corporation immediately if it enters in an early warning level situation. IIROC may issue two types of warning, early warning level 1 or 2. This is function of the severity of the financial deficiency. The Corporation will be informed by IIROC and will closely monitor the situation. IIROC may impose sanctions or restrictions against the Member. The Corporation will judge if it necessary to take any additional actions and will report the situation to the Risk Management and Advisory Committee (RMAC).

CLEARING FUND

The Clearing Fund deposits are set out in Rule A-6.

These provisions aim to cover extreme but plausible market events. The Clearing Fund is a reserve fund put in place to respond to the deficit that may occur when the Margin Fund and the Difference Fund of a defaulting Clearing Member no longer cover his market exposure. The Clearing Fund is an obligation shared by all the Clearing Members and this Fund is structured to mitigate the Uncovered Residual Risk ("URR"). The URR accounts for the fact that extreme market conditions could generate a major loss for certain Clearing Members, causing the potential default of a Clearing Member.

As it is indicated in Section A-603 of the Rules, the required Clearing Fund contribution of each Clearing Member is composed of Base Deposits plus a Variable Deposit specific to each Clearing Member. Clearing Fund Base Deposits and Variable Deposit could be modified by the Corporation. Clearing Members will be notified of any change pursuant to Section A-604 of the Rules. In accordance with Section A-611 of the Rules, whenever a Clearing Member ceases to be a Clearing Member of the Corporation, the balance of the Clearing Fund owed to the former Clearing Member will be paid to that former Clearing Member, thirty days after all outstanding items have been fulfilled from the Clearing Member's accounts, with the Corporation.

MEMBER CONTRIBUTION

For the purposes of application of Rule A-6, the Corporation issues an amount of Deposit to each Clearing Member on a monthly re-evaluation basis of the following

elements:

- Each Clearing Member's contribution is based on his Uncovered Residual Risk (URR), which represents the difference between his stress margin and base margin, as shown in the below formula. The stress margin is calculated using a stressed Margin Interval which is equal to the Margin Interval times a stress factor. The two calculations are based on open positions on the preceding day of the calculations.

$$\text{URR} = \text{Stress Margin} - \text{Base Margin}$$

- The last sixty business days are used to determine the average URR of each Clearing Member.

$$\mu_{URR}^{60} = \frac{\sum_{t=1}^{60} URR_t^i}{60}$$

- The Corporation determines the size of the Clearing Fund (Ω) based on the maximum average URR amongst all Clearing Members.

$$\Omega = \text{Max}_{i=1}^n (\mu_{URR}^{60})$$

- Each Clearing Member's contribution (C) to the Clearing Fund is determined according to the weight of his respective average URR, with respect to the sum of all the average URRs of all Clearing Members.

$$C^i = \Omega \cdot \frac{\mu_{URR}^{60}}{\sum_{i=1}^n \mu_{URR}^{60}}$$

STRESS SCENARIOS

The Corporation uses four stress scenarios to evaluate the biggest loss amongst all Clearing Members. This loss is utilized to determine the size of the Clearing Fund. A shortfall is equal to the difference between the loss incurred under a stress scenario, reduced of the Margin Fund and the Difference Fund, both belonging to the Clearing Member. By consequence, the size of the Clearing Fund should be at least equal to the greatest shortfall. The stress scenarios use end-of-month positions.

The four stress scenarios currently used by the Corporation are:

- Black Monday (1987)
- Financial Crisis (2008)
- Russian Default (1998)
- Bond Market Crash (1994)

The Corporation regularly assesses whether it is appropriate to add other stress scenarios to the existing scenarios.

The Corporation mostly stresses Futures contracts and Fixed Income Transactions that are considered to be the highest Initial Margin drivers, by historical stressful events. Note that for Fixed Income Transactions, the variations are based on the most representative Fixed Income Securities of each Bucket⁸. Here are the historical percentage variations applied:

Scenario 1 (Black Monday)			
	1987-10-16	1987-10-19	Variation
SXF TM – S&P/TSX 60 Index Standard Futures ⁹	174.75	154.63	-11.51%
BAX TM – Three-Month Canadian Bankers' Acceptance Futures ¹⁰	90.81	90.69	-0.14%
CGB TM – Ten-Year Government of Canada Bond Futures ¹¹	74.40	76.93	3.40%
Fixed Income Security Buckets			
0-3 months GoC yields			0.1857%
3-6 months GoC yields			0.4864%
6-12 months GoC yields			1.0164%
1-2 years GoC yields			1.1663%
2-3 years GoC yields			1.4660%
3-5 years GoC yields			1.7657%
5-7 years GoC yields			2.0654%
7-10 years GoC yields			2.3651%
10-15 years GoC yields			2.1761%
15-20 years GoC yields			2.1760%
20-30 years GoC yields			2.4687%
Scenario 2 (Financial Crisis 2008)			
	2008-10-17	2008-10-20	Variation
SXF TM – S&P/TSX 60 Index Standard	568.5	622.7	9.53%

⁸ Selected Government of Canada (GoC) Benchmark Bond yields

⁹ The SXF contract has started trading in 1999. Thus, these prices represent the Futures Contract and not the S&P/TSX 60 Index, which is the Underlying Interest of the contract.

¹⁰ The BAX contract was introduced in April 1988. Consequently, the historical price is obtained by using the 3 month US LIBOR interest rates.

¹¹ The CGB contract was introduced in September 1989. Consequently, the theoretical price is obtained by calculating a 10-year bond, 6% coupon rate actualized with a 10-year Canadian Government rate extracted from an on-the-run Canadian Government Bond.

Futures			
BAX TM – Three-Month Canadian Bankers' Acceptance Futures	97.63	97.75	0.12%
CGB TM – Ten-Year Government of Canada Bond Futures	117.16	117.14	-0.02%
Fixed Income Security Buckets			
0-3 months GoC yields			-0.0056%
3-6 months GoC yields			0.0354%
6-12 months GoC yields			0.0719%
1-2 years GoC yields			0.1318%
2-3 years GoC yields			0.1635%
3-5 years GoC yields			0.1883%
5-7 years GoC yields			0.1247%
7-10 years GoC yields			0.0528%
10-15 years GoC yields			0.1163%
15-20 years GoC yields			0.1718%
20-30 years GoC yields			0.1491%
Scenario 3 (Russian Default)			
	1998-08-26	1998-08-27	Variation
SXF TM – S&P/TSX 60 Index Standard Futures	356.54	333.25	-6.53%
BAX TM – Three-Month Canadian Bankers' Acceptance Futures	94.56	93.77	-0.84%
CGB TM – Ten-Year Government of Canada Bond Futures	122.15	121.3	-0.70%
Fixed Income Security Buckets			
0-3 months GoC yields			-0.2069%
3-6 months GoC yields			-0.3263%
6-12 months GoC yields			-0.5015%
1-2 years GoC yields			-1.0739%
2-3 years GoC yields			-1.0429%
3-5 years GoC yields			-1.3803%
5-7 years GoC yields			-0.8457%
7-10 years GoC yields			-1.4312%
10-15 years GoC yields			-1.5248%

15-20 years GoC yields			-1.2586%
20-30 years GoC yields			-1.3089%
Scenario 4 (Bond Market Crash)			
	1994-04-01	1994-04-04	Variation
SXF TM – S&P/TSX 60 Index Standard Futures	221.09	215.97	-2.32%
BAX TM – Three-Month Canadian Bankers' Acceptance Futures	93.53	92.92	-0.65%
CGB TM – Ten-Year Government of Canada Bond Futures	105.17	102.38	-2.65%
Fixed Income Security Buckets			
0-3 months GoC yields			0.0268%
3-6 months GoC yields			0.1060%
6-12 months GoC yields			0.1814%
1-2 years GoC yields			0.3710%
2-3 years GoC yields			0.4517%
3-5 years GoC yields			0.7702%
5-7 years GoC yields			0.6207%
7-10 years GoC yields			0.8582%
10-15 years GoC yields			1.0067%
15-20 years GoC yields			0.7665%
20-30 years GoC yields			0.5196%

The procedure to value the size of the Clearing Fund and the contributions of each Clearing Member is performed every month. As previously mentioned, the consideration of the results of the different stress scenarios leads the Corporation to select a stress factor¹². Therefore, the stress factor depends on Clearing Members' positions (risk profile of each Clearing Member) that vary every day, and the Margin Intervals. After selecting the stress factor, the Corporation monitors and controls the level of the Clearing Fund throughout the month.

¹² The stress factor generally has a value of 1.5, 2, 2.5 or 3. It is generally adjusted by 50% intervals.

FORMS OF COLLATERAL

The forms of collateral that may be deposited with CDCC are prescribed in Section A-608 and Section A-709 of the Rules.

The different forms of collateral are valued by accounting for their potential loss in the event that liquidation is required. Accordingly, the value of the Margin Deposits is discounted in relation to their market value. This discount, commonly called the Haircut, applies to Valued Securities, [Canada Mortgage Bonds](#) and Government Securities, as prescribed in Section A-709 of the Rules.

For the purposes of application of the provisions of Section A-608 and Section A-709 of the Rules, CDCC proceeds as follows:

CASH

Cash amounts are accepted only in Canadian dollars.

GOVERNMENT SECURITIES [AND CANADA MORTGAGE BONDS](#)

CDCC accepts Acceptable Treasury Bills and other Government of Canada and United States Government bonds, in addition to the bonds of certain Canadian provinces, as Margin Deposits. For each issue accepted in advance, a concentration limit equal to \$250 million or 10% of the total issue outstanding, whichever is less, is applied. The concentration limit is in effect for all Government Securities [and Canada Mortgage Bonds](#) at the Corporation level. Acceptance of the issues is conditional on the availability of a price from a source that CDCC determines to be acceptable and reliable. The Government Securities [and Canada Mortgage Bonds](#) accepted as Margin are reviewed by CDCC on a regular basis.

VALUED SECURITIES

CDCC accepts Valued Securities listed on any duly recognized Canadian Exchange against their total Margin requirements. These Securities should respect the criteria set forth in Section A-709 of CDCC's Rules.

CALCULATING THE HAIRCUTS FOR GOVERNMENT SECURITIES [AND CANADA MORTGAGE BONDS](#)

The Haircuts are calculated based on the following methodology and assumptions:

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

- Confidence interval over 99% obtained by using 3 standard deviations, and the assumption that the bond can be liquidated at a reasonable price in N days. (N will be determined according to the type of products and prevailing market conditions);
- Liquidity risk valued according to the bid-ask spread of the issues (if this spread is unavailable, the liquidation window will be expanded and will depend on market conditions); and
- 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;
- Any other factor considered relevant.

THE HAIRCUTS FOR VALUED SECURITIES

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

HAIRCUT POLICY

The Haircuts are reviewed at least semi-annually and may be reviewed on an ad hoc basis if any event occurs. The Clearing Members are informed of these reviews by written notice and the Haircuts related to Government Securities and Canada Mortgage Bonds are also published on CDCC's website with their effective dates.

MONITORING PROGRAM

The Corporation conducts daily backtesting and stress testing.

BACKTESTING

Backtesting is performed on a daily basis. Backtesting helps the Corporation to assess the robustness of the existing models and measures 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 Corporation has put in place appropriate internal procedures if the backtesting results are not sufficient to cover minimum coverage at the product level and at the portfolio level.

If the results of the backtesting fail to reach the desired minimum coverage, the situation is investigated. If necessary, the results are escalated to upper management. At this level, a decision is made to adjust the current risk parameters and/or ultimately to change the risk methodology. As set in Section A-702 of the Rules, the Corporation has the discretion to adjust the Initial Margin. This can be done at the product level by increasing the Margin Interval, or by asking a Clearing Member for additional Initial Margin.

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

STRESS TESTING

The stress testing is also conducted on a daily basis. The Corporation uses different 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. Another goal of the stress test is to better understand the different relationships among the different positions of the Clearing Members. The various results may contribute to enhance the risk methodology of the Corporation. If it is concluded that these changes in the market are permanent, the Corporation may integrate the new dynamics in the Initial Margin.

The scenarios are historical and theoretical. The historical stress scenarios aim to simulate the biggest historical events that would affect Clearing Members. The historical stress scenarios are used to determine the size of the Clearing Fund. Moreover, in the case of the stress testing monitoring program, the stress scenarios help the Corporation to have a complete view of the risk profile of the current positions undertaken by each Clearing Member, and by all of them simultaneously (the portfolio-level coverage assessment).

In addition, the Corporation performs theoretical stress testing. For example, the

Corporation simulates the impact of a parallel and twist shifts in the interest rate curve; large moves (up or down) in specific contracts and/or Underlying Interests; and the impact of multiple Clearing Members defaults.

Also the results of the scenarios are designed to ensure that the Corporation captures any corporate relationships between different affiliated Clearing Members.

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

CONTRACT ADJUSTMENT

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

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

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



Canadian Derivatives Clearing
Corporation
The Exchange Tower
130 King Street West
5th Floor
Toronto, Ontario
M5X 1J2
Tel. : 416-367-2463
Fax : 416-367-2473
e-mail: risk@cdcc.ca

Corporation canadienne de compensation de
produits dérivés
Tour de la Bourse
800 Victoria Square
3rd Floor
Montréal, Québec
H4Z 1A9
Tel. : 514-871-3545
Fax : 514-871-3530
e-mail: risk@cdcc.ca
