NOTICE TO MEMBERS
No. 2013–240
October 4, 2013

REQUEST FOR COMMENTS

AMENDMENT TO CDCC OPERATIONS MANUAL AND RISK MANUAL: BANKING HOLIDAY

On July 31, 2013, the Board of Directors of the Canadian Derivatives Clearing Corporation (CDCC) approved amendments to its Operations Manual and Risk Manual. The purpose of the proposed amendments is to change the methodology used to calculate the extra margin required due to Remembrance Day Holiday (Banking Holiday).

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

Process for Changes to the Rules

CDCC is recognized as a clearing house under section 12 of the *Derivatives Act* (Québec) by the Autorité des marchés financiers (AMF).

The Board of Directors of CDCC has the power to approve the adoption or amendment of Rules and Operations Manual 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:

M^e^ 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

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

M^e 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

Analysis

1. Banking Holiday

Nature and Purpose of Proposed Changes:

Contrary to other Canadian holidays, the equity and equity derivatives markets are opened on Remembrance Day (the "Banking Holiday"), however settlement infrastructures are closed.

CDCC proposes to change the methodology used to calculate the extra margin required due to the Banking Holiday. The current methodology consists of collecting an extra 10% margin two business days prior to the Banking Holiday and releasing it back on the day following the Banking Holiday. In its assessment of the credit risk of its Clearing Members, CDCC has to consider the particularities of that holiday (the Banking Holiday) in a way that is more specific than the 10% margin increase rule.

Since the equity and indexes derivatives markets are opened on the Banking Holiday but CDCC has limited capabilities in the event of a Clearing Member defaulting, the methodology used to calculate the extra margin should be charged on Clearing Members' active on the equity/index options and futures market. More precisely, CDCC proposes to increase the number of liquidation days used in the initial margin calculation of those products by an additional day.

Description and Analysis of Impacts:

The Banking Holiday has the following impacts on CDCC's activities:

- The Toronto Stock Exchange is opened, which means that equities and ETFs (Exchange Traded Funds) are trading;
- The Montreal Stock Exchange is opened for equity and index derivatives (options and futures);
- The Montreal Stock Exchange is closed for Interest Rate derivatives;
- The Fixed Income Clearing Service is closed at CDCC (no new novation);
- The Converge service is opened at CDCC, however the options buyer must have enough excess margin to cover the premium to be paid;
- Intraday Margin calculations are run as per a regular day but shortfalls cannot be processed.

Pursuant to the risk model used by CDCC to calculate margin requirements, the Banking Holiday has an impact on the following two components:

- Mark-to-Market: Any Cash Settlement computed on Friday, November 8, 2013 will, in fact, be collected and paid on Tuesday, November 12, 2013. The amount will also include any option premiums paid or received from trades taking place on the Banking Holiday. The one day lag between the settlement amount calculation and the settlement amount payment is standard in CDCC's risk model.

- Initial Margin: Equity and equity derivatives prices fluctuate on the Banking Holiday but volumes are usually thinner than on a regular day. Consequently, CDCC might require an additional day to liquidate a defaulting Member's portfolio. This would ultimately be translated into an initial margin increase on equity options and futures.

Due to the described impacts on CDCC's manner to conduct business on the Banking Holiday, an extra margin amount equivalent to 10% of the margin requirement was collected. In order to be more precise, CDCC proposes to increase the number of liquidation days used in the initial margin calculation of equity and index products by an additional day. The table below shows the extra margin collected under the two methodologies from 2009 to 2012.

Table 1 - Comparison of the Banking Holiday extra margin based on the current and the modified methodology

Year	Total Margin collected - 10% Rule (historical value)	Total Margin collected - proposed change	Variation (in %)
2012	179 349 746.27 $	203 850 215.52 $	14%
2011	209 975 423.24 $	241 546 406.25 $	15%
2010	153 290 076.64 $	216 905 045.70 $	41%
2009	206 629 311.64 $	367 770 474.28 $	78%

The increase in the total extra margin collected under the new methodology depends on the percentage of the total margin that is due to SXF and equity options positions. Tables 2 and 3 show the variation in the extra margin under the 2 methodologies for the 5 members holding the biggest directional positions (in terms of open interest) in SXF and equity options.

Table 2 - Comparison of the Banking Holiday extra margin based on the current and the modified methodology for 5 most active Members on SXF - 2009 to 2012				
Year	Member	Total Margin collected - 10% Rule (historical value)	Total Margin collected - proposed change	Variation (in %)
2012	X	20 030 024 $	30 940 643 $	54%
	W	17 895 942 $	18 687 320 $	4%
	Z	13 088 544 $	16 182 079 $	24%
	P	34 425 011 $	41 023 742 $	19%
	B	18 592 507 $	24 374 679 $	31%
	Total	104 032 027 $	131 208 463 $	26%
2011	X	18 834 556 $	25 424 339 $	35%
	AD	13 770 044 $	11 093 141 $	-19%
	Z	15 636 846 $	25 620 825 $	64%
	Y	10 133 756 $	13 084 294 $	29%
	B	21 287 302 $	25 517 320 $	20%
	Total	79 662 504 $	100 739 919 $	26%
2010	X	18 921 445 $	26 826 448 $	42%
	W	12 771 739 $	22 194 085 $	74%
	R	6 279 821 $	8 343 673 $	33%
	B	17 792 407 $	31 004 212 $	74%
	Z	18 992 778 $	38 477 072 $	103%
	Total	74 758 189 $	126 845 490 $	70%
2009	X	30 063 603 $	59 794 184 $	99%
	B	27 043 080 $	50 181 357 $	86%
	Z	36 775 709 $	75 204 125 $	104%
	W	31 040 499 $	64 310 010 $	107%
	P	23 006 645 $	30 488 263 $	33%
	Total	147 929 536 $	279 977 939 $	89%

Table 3 - Comparison of the Banking Holiday extra margin based on the current and the modified methodology for 5 most active Members on Equity Options - 2009 to 2012				
Year	Member	Total Margin collected - 10% Rule (historical value)	Total Margin collected - proposed change	Variation (in %)
2012	I	7 145 140 $	13 783 497 $	93%
	AF	7 560 965 $	6 666 406 $	-12%
	X	20 030 024 $	30 940 643 $	54%
	P	34 425 011 $	41 023 742 $	19%
	W	17 895 942 $	18 687 320 $	4%
	Total	87 057 081 $	111 101 608 $	28%
2011	I	8 706 646 $	14 935 779 $	72%
	X	18 834 556 $	25 424 339 $	35%
	A	5 078 763 $	7 144 185 $	41%
	AF	9 352 819 $	6 292 758 $	-33%
	W	18 839 624 $	9 893 058 $	-47%
	Total	60 812 409 $	63 690 119 $	5%
2010	I	7 461 988 $	12 685 788 $	70%
	P	30 644 003 $	37 873 710 $	24%
	A	2 915 304 $	4 079 155 $	40%
	AF	4 400 274 $	4 244 537 $	-4%
	X	18 921 445 $	26 826 448 $	42%
	Total	64 343 013 $	85 709 638 $	33%
2009	I	10 075 744 $	21 304 998 $	111%
	P	23 006 645 $	30 488 263 $	33%
	A	5 362 110 $	7 264 204 $	35%
	AF	7 700 346 $	4 527 746 $	-41%
	X	30 063 603 $	59 794 184 $	99%
	Total	76 208 448 $	123 379 395 $	62%

Tables 2 and 3 demonstrate that the extra margin collected for the Banking Holiday will be charged to the most active Clearing Members on the SXF and equity options markets. The average increase in the contribution of the 5 biggest SXF holders is 51%. Similarly, the average increase in the contribution of the 5 biggest equity options holders is 32%.

As a complement to the Impacts, CDCC has produced a Risk Analysis Grid that is available for consultation if required. The Risk Analysis Grid is aimed to capture and summarize the major risks related to the proposed changes. In summary, the proposed change of the Banking Holiday has little, if no, impact to overall market, credit and liquidity risk since this change is a targeted increase in the margin requirement for Equity Options and Equity Index Futures that trade on the Banking Holiday day (products that are increasing the risk during the Banking Holiday). Also, this change, has no significant Operational and Legal Risk impacts.

Drafting Process:

The proposed changes were elaborated by the Risk Management department with no market consultation.

Impacts on Technological Systems:

The proposed change does not require any significant change to CDCC's Systems.

Benchmarking:

Not applicable

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

800 Victoria Square
3rd Floor
Montréal, Québec
H4Z 1A9
Tel. : 514-871-3545
Fax: : 514-871-3530

CANADIAN DERIVATIVES CLEARING CORPORATION
CORPORATION CANADIENNE DE COMPENSATION DE PRODUITS DÉRIVÉS

OPERATIONS MANUAL

VERSION OF ~~SEPTEMBER 30~~, 2013

TMX | CDCC

TABLE OF CONTENTS

PREAMBLE AND DEFINITIONS

PREAMBLE

This Amended and Restated Operations Manual cancels and supersedes the previous versions thereof.

CDCC and its Clearing Members are contractually bound by the Membership Agreement which is constituted by the Application for Membership when accepted by CDCC, as may be amended from time to time, which incorporates by reference the Rules of CDCC, as may be amended from time to time. The Rules of CDCC include this Operations Manual, as may be amended from time to time. In the case of conflict, the provisions of the Rules (excluding the Operations Manual) prevail over this Operations Manual. The provisions of the Rules (including this Operations Manual), in the case of conflict, prevail over the provisions of the Application for Membership.

The Operations Manual provides practical details with respect to (i) certain definitions, (ii) timelines, (iii) reports, (iv) trade processing, (v) open positions, (vi) exercises, tenders, assignments and delivery, (vii) settlement, (viii) additional margin processing, and (ix) clearing fees. The Operations Manual contains two schedules which are integral parts thereof: (a) the Risk Manual providing practical details with respect to margin and other risk management processes, including the Default Manual as an Appendix, and (b) the templates of depository agreements.

All times specified in this Operations Manual refer to Eastern Time, unless otherwise indicated.

All amounts specified in this Operations Manual refer to Canadian currency, unless otherwise indicated.

All capitalized terms used in this Operations Manual shall have the meanings assigned to them in the Rules unless the context otherwise requires or unless specifically defined differently herein.

DEFINITIONS

"Acceptable Collateral" – Margin Deposits by Clearing Members in a form that is acceptable to CDCC as set forth in Section A-709 of the Rules.

"Assignee" – a Clearing Member that holds a Short Position in an Options contract or a Long Position in a Futures contract and which is assigned by CDCC the obligation to make delivery of the Underlying Interest, resulting from the submission of an Exercise Notice or a Tender Notice by another Clearing Member (referred to as Exerciser or Tenderer) holding a Long Position in the relevant Series of Options or a Short Position in the relevant Series of Futures.

"Automatic Exercise" – a process by which the CDCC Clearing Application will exercise In-the-Money Options at a pre-determined threshold.

"CDCC Clearing Application" – CDCS and all the processes associated with it, as may be supplemented or otherwise changed from time to time.

"Closing Transaction" – any Transaction that is either a Closing Buy Transaction, a Closing Purchase Transaction, a Closing Sell Transaction or a Closing Writing Transaction, as such terms are defined in the Rules, and in all cases that reduces or eliminates the Clearing Member's Open Interest.

"Converge" – marketing brand of the portion of the CDCC Clearing Application that captures and processes OTCI Transactions, including Fixed Income Transactions.

PREAMBLE AND DEFINITIONS

"Difference Fund" – any and all deposits from a Clearing Member to CDCC as additional Margin, in accordance with Sections A-702, A-705, A-710, B-412, C-303, C-517 or D-307 of the Rules, or otherwise as set forth in Section 8-2 hereof.

"Exerciser" – a Clearing Member that holds a Long Position in a particular Series of Options and submits an Exercise Notice to CDCC.

"Expiry Friday" – the third Friday of the month, unless that Friday is not a Business Day, then the Business Day preceding the third Friday of the month.

"FIFO Period" – the quarterly delivery period for Futures contracts on Government of Canada bonds, in accordance with Contract Specifications of the relevant Exchange.

"Forward Repurchase Transaction" – a Repurchase Transaction with respect of which the Open Leg has not settled yet at the time of the relevant report.

"FTP Downloads" – Clearing Members' access to files and reports on an FTP server that is part of the CDCC Clearing Application.

"Inquiry Screen" – Graphical User Interface (GUI) view of the CDCC Clearing Application.

"Large Value Transfer System" or "LVTS" – an electronic wire system introduced by the Canadian Payments Association in February 1999 to facilitate the transfer of irrevocable payments in Canadian dollars across the country.

"Fixed Income Mark-to-Market Amounts" – any and all Net MTM Repo Rate Payments, Net OCF MTM Payments and Net MTM Reversal Requirements, as such terms are defined in Section D-601 of the Rules.

"Mini Futures Contract" – a Future that has the same Underlying Interest as a Standard Futures Contract but having a Unit of Trading that is a ratio of the Standard Futures Contract in accordance with applicable Contract Specifications.

"Net Settlement Position" – All the future Net Delivery Requirements and Net Payment Against Delivery Requirements of a Clearing Member, as reported by CDCC on a daily basis, taking into account all Fixed Income Transactions that have settled during the day and all new Fixed Income Transactions that have been novated to CDCC.

"Open Position File" – database of the CDCC Clearing Application which compiles the Open Positions of all Clearing Members. Each Clearing Member can access the information pertaining to his accounts only, not to other Clearing Members' accounts.

"Opening Transaction" – any Transaction that is either an Opening Buy Transaction, an Opening Purchase Transaction, an Opening Sell Transaction or an Opening Writing Transaction, and in all cases that create or increase the Clearing Member's Open Interest.

"Operational Notices" – formal notifications to the Clearing Members, representing items that are not published on CDCC's website. These documents are available on the Secured Website.

PREAMBLE AND DEFINITIONS

"OTCI Equity Options" – over the counter options on an equity, bearing characteristics that differ from Exchange traded Options and are cleared by CDCC through *Converge.*

"Position Transfer" – this is the CDCC Clearing Application function to move a position from one Clearing Member to another.

"Production Schedule" – sum of time lines that are followed by CDCC, as set forth in Section 2 of this Operations Manual.

"Request for Standard vs Mini Offset" – the request by a Clearing Member, in such form as prescribed by CDCC, to offset one (1) or more Long Position(s) on a Standard Futures Contract against the equivalent number of Short Positions on the corresponding Mini Futures Contract (totalling the same quantity of the Underlying Interest in accordance with the ratio prescribed in the Contract Specifications of the Mini Futures Contract), having the same Delivery Month and booked in the same Clearing Member's account, or the other way around.

"Running Repurchase Transaction" – a Repurchase Transaction with respect of which the Open Leg has already settled at the time of the relevant report.

"Secured Website" – Clearing Members only secured web site that requires a sign on and password, where CDCC publishes Operational Notices as well as documents that are meant only for the Clearing Members.

"Specific Deposit" – a Put Escrow Receipt, a Call Underlying Interest Deposit or a Futures Underlying Interest Deposit which are accepted by CDCC as Underlying Interest Equivalent to cover a specific Short Position.

"Standard Futures Contract" – a Future in relation to which a Mini Futures Contract exists.

"Tenderer" – a Clearing Member that holds a Short Position in a particular Series of Futures and submits a Tender Notice, or is deemed to do so in accordance with the Rules, to CDCC.

"**Unsettled Items**" – any delivery of the Underlying Interest of an Option that has not been settled at the Central Securities Depository.

TIME FRAMES

ON-LINE ACCESS

Clearing Members must be connected to the CDCC Clearing Application using their PC terminals to perform a variety of functions. (Clearing Members must supply their own PC terminals and Internet connection, at their own cost).

All instructions (corrections, Open Position changes, Position Transfers, Deposits, withdrawals, and submission of Exercise Notices and Tender Notices) must be entered on-line.

The CDCC Clearing Application allows Clearing Members to view their current information throughout the day electronically (except during scheduled maintenance or unforeseen outages). In addition, Clearing Members can download their reports after 7:00 p.m. every day using the FTP Download function.

Should a Clearing Member not have electronic access (due to technical issues) to the CDCC Clearing Application, CDCC can perform instructions on behalf of the Clearing Member. This requires a phone call from the Clearing Member to CDCC, along with the appropriate form faxed or scanned and e-mailed to CDCC. Such form must be authorized with the approved Clearing Member's stamp.

The regular business hours of CDCC are 7:00 a.m. to 5:30 p.m. on every Business Day.

With respect to operational activity related to Options with an Expiration Date on Expiry Friday, CDCC staff members are on-site from 7:00 a.m. to forty-five (45) minutes after delivery of the Options Exercised and Assigned Report (MT02).

TIME FRAMES

TIME FRAMES FOR ON-LINE ACCESS

ON EVERY BUSINESS DAY

Activity	Deadlines
Settlement Time with respect to payments for overnight settlement	7:45 a.m.
Fixed Income Transactions – Morning Netting Cycle Timeframe in respect of any Pending Payment Against Delivery Requirements (Morning Net Payment Against Delivery Requirements sent to CDS for settlement during the Morning Net DVP Settlement Timeframe)	10:00 to 10:15 a.m.
Morning Net DVP Settlement Timeframe	10:15 to 10:30 a.m.
Morning Intra-Day Margin Call	10:30 a.m.
Afternoon Intra-Day Margin Call	1:15 p.m.
Specific Deposits (same day withdrawal)	1:15 p.m.
Fixed Income Transactions – – Afternoon Netting Cycle Timeframe in respect of any Pending Settlement Requirements (Afternoon Net DVP Settlement Requirements sent to CDS for settlement by End of Day DVP Settlement Time)	2:00 to 2:15 p.m.
Cash Deposits (Margin Deposits) – under $2,000,000 (same day deposit)	2:45 p.m.
Cash Deposits (Margin Deposits) – of and over $2,000,000 (2 Business Days notice)	2:45 p.m.
Cash withdrawal requests (Margin Deposits) – under $2,000,000 (same day withdrawal)	2:45 p.m.
Cash withdrawal requests (Margin Deposits) – of and over $2,000,000 (2 Business Days notice)	2:45 p.m.
Fixed Income Transactions – (Same Day Transactions) – Submission Cut-Off Time	3:30 p.m.
All assets deposits other than cash (Margin Deposits)	3:30 p.m.
All assets withdrawal requests other than cash (Margin Deposits) for same day withdrawal	3:30 p.m.
All assets substitution requests other than cash (Margin Deposits) for same day substitution	3:30 p.m.
Specific Deposits (overnight valuation)	3:30 p.m.
End of Day DVP Settlement Time	4:00 p.m.
OTCI (other than Fixed Income Transactions) – Unmatched entry	4:30 p.m.
Position Transfers	5:25 p.m.

TIME FRAMES

Same Day and T+1 Trade corrections	5:30 p.m.
Open Position changes	5:30 p.m.
Fixed Income Transactions and Futures contracts on Acceptable Securities – Netting Cut Off Time (Netted settlement instructions (Net Delivery Requirements and Net Payment Against Delivery Requirements) sent to CDS for settlement on the next business day)	5:30 p.m.

TIME FRAMES

TIME FRAMES FOR ON-LINE ACCESS (continued)

ON EVERY BUSINESS DAY (continued)

Activity	Deadlines
Futures – Request for Standard vs Mini Offset	5:00 p.m.
Futures – Tender Notices submission	5:30 p.m.
Options – Exercise Notices submission	5:30 p.m.
CDCC Clearing Application shutdown – Close of Business	5:30 p.m.
Fixed Income Transactions – available (next Business Day start)	7:00 p.m.
Unsettled Item	
Confirmation of settled items to be sent to CDCC	4:15 p.m.
Daily Capital Margin Monitoring Calls	
CDCC notifies Clearing Members of additional Margin required	9:30 a.m.
Clearing Member's obligation to cover any deficit	12:00 (noon)

TIME FRAMES FOR ON-LINE ACCESS (continued on next page)

TIME FRAMES

TIME FRAMES FOR ON-LINE ACCESS (continued)

EXPIRY FRIDAY

Activity	Deadlines
Reports available (FTP Download): ➢ Expiry Report (MX01) ➢ Expiry Options Daily Transaction Report (MT01) ➢ List of Options/Cash Adjustments (MT03)	7:15 p.m.
CDCC Clearing Application available for: ➢ Trade corrections ➢ Open Position changes ➢ Position Transfers ➢ Changes to Automatic Exercises ➢ Exercise Notices input ➢ Cancel / correct Friday's exercises	7:15 p.m. to 10:15 p.m.
CDCC Clearing Application shutdown: ➢ CDCC processes expiry entries	10:15 p.m.
Reports available (FTP Download): ➢ List of Expiry Adjustments Report (MX02) ➢ Expiry Difference Report (MX03)	10:30 p.m.
CDCC Clearing Application available again for: ➢ Review of expiry entries ➢ Corrections to expiry entries	10:30 p.m. to 10:45 p.m.
CDCC Clearing Application shutdown ➢ Close of Business	10:45 p.m.
Reports available (FTP Download): ➢ Options Exercised and Assigned Report (MT02) ➢ Other reports and files also available	12:30 a.m.

TIME FRAMES FOR ON-LINE ACCESS (continued on next page)

TIME FRAMES

TIME FRAMES FOR ON-LINE ACCESS (continued)

FIFO PERIOD

Activity	Deadlines
Daily reporting by Clearing Members of the Long Positions in each of their accounts in chronological order	5:30 p.m.
Submission of Tender Notices	5:30 p.m.

PLEDGING

Clearing Members must input requests for deposit or withdrawal of Acceptable Collateral on the pledging screen of the CDCC Clearing Application.

CDCC monitors the pledging screens between 9:00 a.m. and 3:30 p.m. on Business Days.

CDCC verifies the validity of each deposit made by Clearing Members and ensures that withdrawals do not create deficits in the Clearing Members' accounts (Margin, Clearing Fund or Difference Fund). Any request for the withdrawal of a Specific Deposit should be entered prior to when the intra-day margin call process runs as deposits are valued at this time. Any withdrawal of this type entered after such time will not be processed as such withdrawal cannot be properly valued.

The entries on the pledging screen of the CDCC Clearing Application are matched by CDCC to corresponding entries on the reporting system of the relevant Central Securities Depository.

In some cases an exchange of document at a CDCC Office by the Clearing Members (accompanied by a screen print of the entry bearing the Clearing Member's stamp) may be accepted by CDCC as constituting a physical deposit or withdrawal.

After performing all the validation processes, CDCC confirms within the CDCC Clearing Application the Clearing Members' deposits and/or withdrawals.

Deposits, withdrawals and changes thereto will be reflected on the immediately following Business Day Deposits and Withdrawals Report (MA01). In accordance with CDCC's Rules, any discrepancies that the Clearing Member notices against its own records should be reported to CDCC immediately.

CDCC - REPORTS

REPORT REFERENCES

Clearing Member reports contain the following information:

Transactions	Reports relating to Clearing Member's Transactions such as trade entries, trade corrections, trade rejections and exercises/tenders. These reports start with the alpha code MT.
Fees	Report relating to the collection of service fees from the Clearing Member. These reports start with the alpha code MB.
Settlements	Reports relating to Premiums, Settlement of Gains and Losses, and Margin. These reports start with the alpha code MS.
Assets	Reports relating to the maintenance of Clearing Member assets as well as depository information. These reports start with the alpha code MA.
Delivery	Reports relating to delivery obligations and unsettled deliveries. These reports start with the alpha code MD.
Positions	Reports relating to positions held by Clearing Members separately for Futures, Options, OTCI and Fixed Income Transactions. These reports start with the alpha code MP.
Expiry	Reports used by Clearing Members to verify expiring positions and automatic exercises. These reports start with the alpha code MX.
Risk	Reports relating to risk management. These reports start with the alpha code MR.

CDCC - REPORTS

REPORT DETAILS

Report Code	Report Name	Report Description
Daily:		
MA01	Deposits and Withdrawals Report	Details on Clearing Member's deposits and withdrawals for Margin, Clearing Fund and Difference Fund. (**Note**: will find the letters D, W and PW next to the date of deposit)
MD01	Options Unsettled Delivery Report	Lists unsettled deliveries for Options.
MD51	Futures Unsettled Delivery Report	Lists unsettled deliveries for Futures - the issue and number of Futures contracts which must be delivered - the account to which the delivery has been assigned and the opposite Clearing Member - the Settlement Amount and settlement date
MD70	Fixed Income Net Settlement Delivery Status Report	Status of Clearing Member's settlement activity at the Central Securities Depository with respect to Acceptable Securities on that day.
MP01	Options Open Positions Report	Lists the Clearing Member's Open Positions for puts and calls.
MP02	Sub-Account Options Open Positions Report	Lists all Options Open Positions in sub-accounts of the Clearing Member's Client Account(s), Firm Account(s) and Multi-Purpose Account(s).
MP21	Contract Adjustment Report	Lists the Clearing Member's Long Positions and Short Positions before and after the relevant contract adjustment.
MP51	Futures Open Positions Report	Lists the Clearing Member's Futures and Options on Futures Open Positions for all accounts.
MP70	Fixed Income Forward Repo Position Report	Lists the Clearing Member's Repurchase Transactions accepted for clearing by CDCC.
MP71	Fixed Income Repo Conversion Position Report	Lists all of the Clearing Member's Repurchase Transactions that have progressed from Forward Repurchase Transactions to Running Repurchase Transactions on that day.
MP73	Fixed Income Running Repo Open Positions Report	Lists all of the Clearing Member's Running Repurchase Transactions as of that day.
MP75	Fixed Income Forward Net Settlement Positions Report	Lists all of the Clearing Member's forward Net Settlement Positions obligations.
MP79	Daily Repo Rate Mark to Market Report	Lists the Clearing Member's MTM Repo Rate Payments, OCF MTM Payments and Net MTM Reversal Requirement for that day.
MR05	*OTCI (Converge)* Position Limits Usage Report	Lists Clearing Member's percentage of OTCI (*Converge)* Position Limits used.
MR50	Daily Capital Margin Monitoring Report	Lists Clearing Member's Margin and capital requirements. Identifies if additional Margin is required.
MS01	Daily Settlement Summary Report	Lists assets balances with Margin requirements and cash settlement in Canadian and U.S. dollars.
MS03	Trading and Margin Summary Report	Lists Options Premiums, Settlement of Gains and Losses, Futures Premiums and Margin requirements for each sub-account. **Note**: Does not include trade adjustments (T+ 1)
MS05	SPAN Performance Bond Summary Report	The report shows the Performance Bond (Margin) requirements for each Clearing Member by type of account.
MS07	Intra-Day Margin Report	Margin call details with Margin requirements by account.
MS08	Daily Margin Activity Report	Lists details of positions by Class Group with Margin requirements.
MS70	Fixed Income Net Settlement	Lists all of the Clearing Member's Fixed Income Transactions

CDCC - REPORTS

	Position Activity Report	activities that contribute to its Net Settlement Position.
MS75	Fixed Income End of Day Settlement Instruction Report	Detail of Clearing Member's net settlement instructions to be sent to the Central Securities Depository after Netting Cut-Off Time.
MT01	Options Daily Transaction Report	Lists details for all Option contracts from previous Business Day.
MT02	Options Exercised and Assigned Report	Lists totals for Options Exercised Positions and Assigned Positions by Series of Options (including the debit and credit dollar values of the Transactions).
MT03	List of Options/Cash Adjustments Report	Lists all trade adjustments and Open Position changes including cash adjustments and Position Transfers.
MT05	Options Consolidated Activity Report	Lists all positions with activity including Option Premiums.
MT06	Options Sub-Account Consolidated Activity Report	Lists positions with activity including Option Premiums for only the sub-accounts of Client, Firm and Multi-Purpose.
MT10	Unconfirmed Items Report	Lists all items that remained unconfirmed by the opposite member at the end of the current Business Day.
MT29	Trades Rejection Modification Report	Lists all original and modified trade rejections for the Clearing Member.
MT51	Final Futures Daily Transaction Report	Lists trade details for all Futures and Options on Futures activity.
MT52	Futures Tenders and Assignments Report	Lists all Tender Notices and Assigned Positions details.
MT53	List of Futures/Cash Adjustments Report	Lists details on all Futures and Options on Futures trade adjustments, Open Position changes, including cash adjustments and Position Transfers.
MT54	Futures Trading Summary Report	Lists all Series of Futures and Options on Futures and prices, and volumes at which each were traded. Lists number of contracts bought and sold for each Series of Futures Trade Prices.
MT66	Futures Sub-Account Consolidated Activity Report	Lists Futures and Options on Futures positions with activity including Settlement of Gain and Losses and Futures Premiums respectively, for the sub-accounts of Client, Firm and Multi-Purpose.
MT70	Fixed Income Novated Transactions Report	Lists the Clearing Member's daily Fixed Income Transactions novated to CDCC in accordance with the CDCC Clearing Application.
MT71	Fixed Income CSD Novated Trades Report	Lists the data transmitted to CDCC by the Central Securities Depository with respect to the Clearing Member's daily Fixed Income Transactions submitted for clearing.
MT73	Fixed Income Trade Rejection Report	Lists details of Clearing Member's daily Fixed Income Transactions that were rejected (DK) by CDCC or by the Clearing Member itself.
MT74	Fixed Income Not-Novated Transactions Report	Lists the Clearing Member's daily Fixed Income Transactions that were not novated to CDCC, including all rejected and orphaned trades.
MT92	Options on Futures Exercised & Assigned Report	Lists totals for Options on Futures Exercised Positions and Assigned Positions by Series. **Note**: Futures Options Exercised Positions and Assigned Positions value is nil
MT99	Detailed Futures Consolidated Activity Report	Detailed list of all Futures position with activity, including Settlement of Gains and Losses. Detailed list of all Options on Futures positions and activity including Futures Premiums.
Monthly:		
MA71	Clearing Fund Statement	Identifies the Clearing Member's Clearing Fund obligation. Lists the Clearing Member's current Deposits within the Clearing Fund and what is owed.

CDCC - REPORTS

MB01	Monthly Clearing Fees Invoice	This report contains summarization of the monthly clearing fees in an invoice format – THIS IS NOT TO BE PAID. The system automatically includes the collection of the fees within the daily settlement on the morning of the fifth business day of the month.
MB02	Monthly Clearing Fees Details Report	This report contains the following four sub-reports: ''Fees'' – this is product by sub-account. ''Summary by Category'' – this is summarization by product. ''Summary by Account Operation Type'' – this is a summary of the operational charges by sub-account.
MB03	Monthly Fixed Income Clearing Fees Invoice	This report details the clearing fees that are due with respect to Fixed Income Transactions by each Clearing Member.
MT40	Broker Ranking by Account Report	Individual Clearing Member ranking within CDCC for contracts, value traded and transactions (trade only) by month with year to date.
FIFO Period:		
MP56	FIFO Position Report	Lists Series of Futures with positions in chronological order, contracts in positions.
MP60	FIFO Declaration vs. Open Position Report	Lists Clearing Member's Futures positions and FIFO long positions declaration.
Options on Futures Expiry:		
MT51	Final Futures Daily Transaction Report	Lists trade details for all Futures and Options on Futures activity.
MX11	Futures Options Expiry Report	Lists all expiring Options on Futures with In-the-Money Options or Out-Of-the-Money Options amounts and Automatic Exercise positions for Expiry.
MX12	Futures Options Expiry Adjustments Report	Lists all trade adjustments and Open Positions changes on expiring Series only.
MX13	Futures Options Expiry Difference Report	Lists all reported changes, deletions and/or additions to exercises on the Futures Options Expiry Report (MX11).
Options Expiry (Friday Evening):		
MT01	Options Daily Transaction Report	Lists trade details for all expiring Option contracts for the Business Day.
MT02	Options Exercised and Assigned Report	Lists totals for Options Exercised Positions and Assigned Positions by Series of Options (including the debit and credit dollar values of the transactions).
MX01	Expiry Report	Lists all expiring Options with In-the-Money Options or Out-of-the-Money Options amounts and Automatic Exercise positions for Expiry.
MX02	List of Expiry Adjustments Report	Lists all trade adjustments and Open Positions changes on expiring Series of Options only.
MX03	Expiry Difference Report	Lists all reported changes, deletions and/or additions to exercises on the Expiry Report.
OTCI Expiry:		
MX01	Expiry Report	Lists all expiring Options with In-the-Money Options or Out-of-the-Money Options amounts and Automatic Exercise positions for Expiry.
Business Day following Expiry:		
MP11	Expired Options Positions Report	Lists the Clearing Member's balance of expired Options positions following the Friday Expiry process.
MP12	Expired Futures Options Positions Report	Lists the Clearing Member's balance of expired Futures Options positions following the Friday Expiry process.

TRADE PROCESSING

INTRODUCTION

All Exchange Transactions are processed electronically. In all cases both the selling and buying trade data is sent to the relevant Exchange's electronic trading system, which then transmits the matched trades to CDCC. The CDCC Clearing Application verifies the trade information and, if incorrect, rejects it for correction and resubmission. If the trade information is valid, the Clearing Members' Open Positions are immediately updated. The Exchange Transaction is reported on the Options Daily Transaction Report (MT01) or on the Final Futures Daily Transaction Report (MT51), as the case may be.

OTCI Transactions (other than Fixed Income Transactions) are also submitted electronically. Clearing Members submit their individual trade details onto the trade capture screens of *Converge*, which will match, validate and confirm the transactional details to the submitting Clearing Members. OTCI Options are reported on the Options Daily Transaction Report (MT01). No corrections will be permitted for OTCI Transactions after CDCC issues a Trade Confirmation.

Fixed Income Transactions can be transmitted through Acceptable Marketplaces to CDCC through a number of methods. The Clearing Members must use one of the following methods:

1. use the trade capture screens of *Converge*
2. transmit trade legs through other electronic means for matching within *Converge*
3. transmit matched trades through other electronic means acceptable to CDCC
4. trade at an ATS which will transmit matched trades through acceptable electronic means to CDCC
5. trade at an IDB which will transmit matched trades through acceptable electronic means to CDCC
6. use the CDS trade matching facility routing matched trades to CDCC

Fixed Income Transactions are reported on the Fixed Income CSD Information Report (MT71).

The reports referred to herein are available for FTP Downloads on the morning of the Business Day after Transactions are submitted for clearing to CDCC. In accordance with CDCC's Rules, Clearing Members must verify that such reports are correct.

TRADE PROCESSING

EXCHANGE TRANSACTIONS (OPTIONS AND FUTURES)

Positions of each Clearing Member are carried by CDCC for Client Account(s), Firm Account(s) and Multi-Purpose Account(s), each of which is maintained separately. CDCC supplies reports for each account.

Such separation requires that each Clearing Member designates whether a Transaction is submitted for a “Client”, “Firm” or “Multi-Purpose” when submitting a Transaction for clearing. Furthermore, if separate sub-accounts are maintained for each account type, each Transaction must be coded to indicate the appropriate sub-account information.

It is required that a Closing Transaction for a Client Account be designated as such on the trade input. Such designation is not required for a Netted Client Account, a Multi-Purpose Account or a Firm Account, as CDCC carries net position records in the Open Position File for each of these accounts.

All Transactions for a Client Account which are not specifically designated as Closing Transactions shall be processed by CDCC as Opening Transactions. Opening Purchase Transactions increase the Long Position and Opening Writing Transactions increase the Short Position, in the particular Series of Options involved, as reported in the Clearing Member's Client Account. Opening Buy Transactions increase the Long Position and Opening Sell Transactions increase the Short Position, in the particular Series of Futures involved, as reported in the Clearing Member's Client Account.

Conversely, all Transactions designated as Closing Transactions decrease the Short Position and Long Position, respectively, for the particular Series of Options or Series of Futures in the reporting Clearing Member's Client Account. The CDCC Clearing Application verifies that all the Closing Transactions are valid and if the volume of a Closing Transaction exceeds the Open Position, the CDCC Clearing Application will reject it and replace it by a Closing Transaction not exceeding the Open Position and by an Opening Transaction for the remaining Open Position that could not be closed.

The designation of a Transaction as “opening” or “closing” can be modified by the Close of Business.

CDCC maintains both the Long Position and the Short Position for each Series of Options and Series of Futures for Client Accounts but only maintains a net Long Position or net Short Position for each Series of Options and Series of Futures for Netted Client Accounts, Multi-Purpose Accounts and Firm Accounts.

TRADE PROCESSING

FIXED INCOME TRANSACTIONS

Positions of each Clearing Member are carried by CDCC for Client Account(s), Firm Account(s) and Multi-Purpose Account(s), each of which is maintained separately. CDCC supplies reports for each account.

Such separation requires that each Clearing Member designates whether a Transaction is submitted for a “Client”, “Firm” or “Multi-Purpose” when submitting a Transaction for Clearing. Furthermore, if separate sub-accounts are maintained for each account type, each Transaction must be coded to indicate the appropriate sub-account information.

All Repurchase Transactions and Cash Buy or Sell Trades must be submitted for clearing to CDCC through an Acceptable Marketplace or through the CDS trade matching facility routing matched trades to CDCC.

Once a Repurchase Transaction or Cash Buy or Sell Trade is received by CDCC, a variety of validations will occur. These validations ensure that all transactional details match and CDCC does not accept any Repurchase Transaction or Cash Buy or Sell Trade bearing attributes that are not acceptable for clearing.

Upon issuance of a Trade Confirmation by CDCC, the Repurchase Transaction or Cash Buy or Sell Trade is novated to CDCC, such that the original Repo or Cash Buy or Sell Trade between the two Fixed Income Clearing Members is cancelled and replaced by two equivalent Fixed Income Transactions, one between the Seller and CDCC and one between the Buyer and CDCC.

OPEN POSITIONS

INTRODUCTION

Having accepted a Transaction, the next step in the CDCC Clearing Application is the determination of the Open Position. Each Clearing Member can view all the information related to their accounts on the Open Position File which records the open Long Position and Short Position for each Series of Options and Series of Futures, OTCI and Fixed Income Transactions for each account type, updating the information as each Transaction is accepted.

Each Clearing Member is responsible for reconciling the information recorded on the Open Position File and all relevant reports issued by CDCC against their internal records. Careful attention must be paid to account designation and whether the Transaction is coded as “opening” or “closing” in the relevant file or report. Reports are available for FTP Download as per Section 2 of this Operations Manual.

Open Interest is updated automatically as each Transaction, Exercise Notice and Tender Notice is processed.

ADJUSTMENTS OF OPEN POSITIONS

GENERAL

Occasionally the need will arise to adjust an already processed Transaction. In such cases, the adjustment will affect the Clearing Member's Open Position accordingly. For example, an adjustment designed to change the original Opening Buy Transaction (or Opening Purchase Transaction) to a Closing Buy Transaction (or Closing Purchase Transaction) will result in a decrease in the Long Position and in the Short Position in the Series of Futures (or Series of Options) involved equal to the volume of the original Transaction. Any Settlement of Gains and Losses (or Premium) adjustments will be shown as adjustments on the relevant report.

Generally this situation will occur when:

1. The transactional details were incorrectly recorded, e.g. Clearing Member number, price, series and volume.

2. Information pertaining to only one side of the Transaction such as the opening/closing or account designation was erroneously reported on the original trade.

3. The source document of the relevant Exchange was input incorrectly.

4. Transfer of Open Positions from one account to another account of a Clearing Member.

5. Transfer of Open Positions from an account of one Clearing Member to an account of another Clearing Member.

Types of Adjustments

The following adjustments are acceptable for Exchange Transactions and OTCI (other than Fixed Income Transactions):

1. Same Day Trade Corrections (T). Same day trade corrections are only permitted on account type, sub-account designation and opening/closing and no corrections are permitted on OTCI Transactions after a Trade Confirmation has been issued by CDCC.

2. Trade Date + 1 Corrections (T+1). Modifications of any type are subject to approval by the relevant Exchange and no corrections permitted on OTCI Transactions.

OPEN POSITIONS

3. Open Position Changes. For OTCI Transactions, these will be performed through the Position Transfer function of the CDCC Clearing Application. Note: there is a Position Transfer fee per contract.

4. Position Transfers. Specific function of the CDCC Clearing Application to move positions from one Clearing Member to another or between accounts of a same Clearing Member on a post trade basis. Note: there is a Position Transfer fee per contract.

5. Standard vs Mini Offset. Upon the receipt of a Request for Standard vs Mini Offset in the prescribed form, CDCC will offset (i) one or more existing Standard Futures Contract Long Position(s) against the equivalent number of existing Mini Futures Contract Short Positions (totalling the same quantity of the Underlying Interest in accordance with the ratio prescribed in the Contract Specifications of the Mini Futures Contract) having the same Delivery Month and booked in the same Clearing Member's account, or (ii) a number of existing Mini Futures Long Positions against one or more Standard Futures Short Position(s) (totalling the same quantity of the Underlying Interest in accordance with the ratio prescribed in the Contract Specifications of the Mini Futures Contract) having the same Delivery Month and booked in the same Clearing Member's account, based on the instructions provided in the Request for Standard s Mini Offset. Such Long Positions and Short Positions shall be offset at the previous day's Settlement Price, with the effect of reducing the Open Positions that the Clearing Member has on the relevant Series of Futures in the relevant account.

The following adjustments are acceptable for Fixed Income Transactions:

1. Open Position Changes. These will be performed through the Position Transfer function of the CDCC Clearing Application. Note: there is a Position Transfer fee per contract.

2. Position Transfers. Specific function of the CDCC Clearing Application to move positions from one Clearing Member to another or between accounts of a same Clearing Member on a post trade basis. Note: there is a Position Transfer fee per contract.

Conditions applicable to adjustments:

If there are any adjustments that affect another Clearing Member (on the opposite side of the original Transaction), both Clearing Members must come to an agreement as to the adjustments to be implemented. If one Clearing Member does not enter any changes through the CDCC Clearing Application, the Transaction will stay as is with respect to both Clearing Members.

Notification of all adjustments must be completed prior to the time specified in Section 2 of this Operations Manual. All completed adjustments are processed when they have been verified and validated by CDCC.

EXERCISES, TENDERS, ASSIGNMENTS AND DELIVERIES

INTRODUCTION

OPTIONS

At the time of exercise of an Option, CDCC is responsible for issuing settlement records that will facilitate the delivery of the Underlying Interest to the Clearing Member who chooses to exercise that Option (in case of the exercise of a call Option) or the payment of the relevant Exercise Price (in the case of the exercise of a put Option). When a Clearing Member exercises an Option, CDCC assigns the delivery obligation to a Clearing Member who is the writer of Options in the same Series of Options in any one of its Client Account(s), Firm Account(s), or Multi-Purpose Account(s).

Assignment is made specifically to one of these accounts by CDCC. If assignment is made to a Client Account, the Clearing Member is responsible for allocating it to a specific client. If assignment is made to a Multi-Purpose Account, the Clearing Member must allocate it to the specific Multi-Purpose Account designated by CDCC.

Delivery of the Underlying Interest and payment of the Exercise Price is to be effected by Clearing Members through the settlement method instructed by CDCC.

FUTURES

All Futures which have not been closed out by the last trading day will be marked-to-market up to and including the close of the last trading day. In addition, the seller of a Future must submit a Tender Notice in the Delivery Month in accordance with applicable Contract Specifications.

When a seller of a Future submits a Tender Notice to CDCC, CDCC assigns it to a Clearing Member which is the buyer of a Future in the same Series of Futures in any one of its accounts. Assignment is made specifically to one of these accounts by CDCC. If assignment is made by CDCC to a Client Account, the Clearing Member is responsible for allocating it to a specific client. If assignment is made to a specific Multi-Purpose Account, the Clearing Member must allocate it to the specific Multi-Purpose Account designated by CDCC.

EXERCISES, TENDERS, ASSIGNMENTS AND DELIVERIES

EXPIRY PROCEDURES

Operations Notices are sent to Clearing Members setting forth the expiry procedures and it is the responsibility of Clearing Members to ensure that they have adequate processes in place to meet requirements and timelines prescribed by CDCC.

OPTIONS

For all information pertaining to the Option expiry procedures, Clearing Members should refer to the Operational Notices which are issued approximately two (2) weeks prior to the Expiration Date.

CDCC's Responsibilities on Expiry Friday

1. Review/modify Underlying Interest prices and notify the Clearing Members of any changes.
2. Notify Clearing Members (via e-mail) of any changes in the Production Schedule.
3. Notify Clearing Members (via e-mail) of the status of expiry processes.
4. Assist Clearing Members.

Clearing Members' Responsibilities on Expiry Friday

1. Ensure that the staff responsible for expiry is familiar with all expiry procedures and processes.
2. Validate entries using the Inquiry Screens or the relevant reports:
    a. Verify that all Open Positions and adjustments match internal records, enter any new Transaction or Open Position adjustments accordingly.
    b. Verify that the number of Options that will be automatically exercised on Expiration Date are correct.
    c. For any changes, indicate on the Expiry Response Screen under the "Override" column the total number of Options for each Series of Options to be exercised.
    d. Verify any Out-Of-The-Money Options or At-the-Money Options to be exercised and enter the number of Options under the "Override" column.
3. Validate changes using the reports and/or the on-line access to CDCC Clearing Application (in accordance with timeframes set forth in Section 2 of this Operations Manual).
4. If required, make any allowed modifications (in accordance with timeframes set forth in Section 2 of this Operations Manual).

Daily Expirations (other than Expiry Friday)

When CDCC receives Underlying Interests' closing and opening prices from the relevant Exchange, the prices are specified on the relevant Expiry Report and are used to determine the In-the-Money Options and the Out-of-the-Money Options.

Clearing Members have until the Close of Business on any Business Day up to the Expiration Date to submit an Exercise Notice with respect to American Style Options to CDCC. European Style Options can only be exercised on their Expiration Date.

OTCI Options can expire on any Business Day.

Typically, exercise instructions must be entered online on the CDCC Clearing Application by Clearing Members. However, if unavailable, the following manual process can be used to submit Exercise Notices to CDCC:

EXERCISES, TENDERS, ASSIGNMENTS AND DELIVERIES

1. The proper CDCC Exercise Notice form must be used.
2. The authorization stamp of the Clearing Member must be affixed on the form.
3. The properly delivered Exercise Notice will be accepted at any CDCC office.
4. The Exercise Notice must be properly delivered by five minutes before Close of Business.
5. The Clearing Member staff who deliver the Exercise Notice must be available until CDCC processes the exercise.

The CDCC Clearing Application will ensure that there are sufficient Option Open Positions of the relevant Series of Options in the relevant account of the Clearing Member for exercising the relevant Exercise Notice; if not, CDCC will reject the Exercise Notice. If there are sufficient Option Open Positions, the Clearing Member's Long Position is immediately reduced by the number of Option Open Positions exercised.

AN EXERCISE NOTICE CAN BE CANCELLED UNTIL CLOSE OF BUSINESS ON THE DAY IT IS SUBMITTED.

EXERCISES, TENDERS, ASSIGNMENTS AND DELIVERIES

OPTIONS

Exercises

Delivery and payment on Exercised Positions are due on the Exercise Settlement Date.

Until Exercise Settlement Date, CDCC continues to require sufficient Margin to ensure that, if a Clearing Member defaults, any Exercise Notice submitted by it or assigned to it, as the case may be, will be completed.

Exercised Positions and Assigned Positions are reported to Clearing Members through relevant reports listed in Section 3 of this Operations Manual.

Assignments

After the Close of Business on any Business Day on which an Exercise Notice is submitted to CDCC, assignment of such Exercise Notice is made on a random selection basis, in which each account of a Member is treated separately. The reason for the separation is to ensure that each Clearing Member's Client Account(s), Firm Account(s), and Multi-Purpose Account(s) have the same probability of being assigned Exercise Notices. When a Clearing Member is assigned an Exercise Notice for a given account (e.g. the Firm Account) it may not allocate that assignment to another account (e.g. a Client Account).

An attempt will be made by CDCC to assign an Exercise Notice for more than 10 Options contracts in blocks not exceeding 10 contracts in each Series of Options.

Exercise Notices assigned to a Clearing Member's Client Account shall be allocated by the Clearing Member to any of its clients based on any method which is equitable and consistent with the rules of the relevant Exchange.

Automatic Exercise - Options and Options on Futures

To safeguard Clearing Members from possible errors, CDCC has instituted an Automatic Exercise procedure for expiring Series of Options. In simple terms, all In-the-Money Options and Options on Futures over predetermined thresholds are automatically exercised by CDCC, unless Clearing Members instruct otherwise.

CDCC establishes predetermined thresholds and informs Clearing Members that every Option and Option on Future above that threshold will be automatically exercised. CDCC will not automatically exercise any At-the-Money Option. CDCC provides a method for Clearing Members to make changes to the Automatic Exercise function of the CDCC Clearing Application. This allows Clearing Members to either opt in or opt out of the Automatic Exercise with respect to the Options and Options on Future they hold. For example, a Member can choose not to exercise an Option that is above the predetermined threshold but to exercise another Option that is At-the-Money or Out-of-the-Money.

EXERCISES, TENDERS, ASSIGNMENTS AND DELIVERIES

Exercised and Assigned Option Contracts

a) **Exercised Positions**

A Clearing Member who has exercised an Option has an obligation to either deliver the Underlying Interest (in the case of a Put Option) or pay the Exercise Price (in the case of a Call Option).

b) **Assigned Positions**

A Clearing Member who has been assigned an Exercise Notice has the obligation to pay the Exercise Price upon delivery of the Underlying Interest (in the case of a Put Option) or to deliver the Underlying Interest against payment (in the case of a Call Option).

EXERCISES, TENDERS, ASSIGNMENTS AND DELIVERIES

FUTURES

Submission of Tender Notices

Tender Notices must be submitted before Close of Business during the relevant FIFO Period (which, subject to any contract adjustment by the Exchange, shall be as follows):

CGB, CGF and LGB	three Business Days prior to the first Business Day of the Delivery Month up to and including the fourth to last Business Day of the Delivery Month.
Share futures	three Business Days prior to the first Business Day of the Delivery Month up to and including the fourth to last Business Day of the Delivery Month.
CGZ	two Business Days prior to the first Business Day of the Delivery Month up to and including the third to last Business Day of the Delivery Month.
MCX	before Close of Business on the last trading day.

All outstanding Short Positions in BAX, SXF, SXM, SCF, Sectorial Indices, Options on Futures are automatically tendered on the last trading day, as per Contract Specifications, after Close of Business.

All outstanding Short Positions in ONX, OIS are automatically tendered on the first Business Day of the contract month, as per Contract Specifications, after Close of Business.

Assignment of Tender Notices

CDCC assigns all Tender Notices to open Long Positions on a random basis with the exception of the Government of Canada Bond Futures (CGB, LGB, CGF and CGZ). Assignments for the CGB, LGB, CGF and CGZ Futures are processed on a First-In-First-Out (FIFO) basis.

Delivery of the Underlying Interest and payment of the Settlement Price is effected by Clearing Members as instructed by CDCC.

FIRST-IN-FIRST-OUT (FIFO) ASSIGNMENT PROCESS

Description of Procedures

The Delivery Months for the CGB, CGF, LGB and CGZ Futures contracts are March, June, September and December as prescribed by the Exchange. When a Member submits a Tender Notice with respect to a Short Position, a Long Position is assigned on a First-In-First-Out (FIFO) basis. CDCC sends out an Operational Notice prior to each relevant FIFO Period to remind Clearing Members of the procedures involved.

On the sixth Business Day prior to the first Business Day of the Delivery Month, each Clearing Member holding Long Positions in the relevant Series of Futures must declare on the CDCC Clearing Application its Long Positions in chronological order for each of its accounts. The entries must include the date the position was opened, the number of

contracts and the account. When CDCC assigns a Tender Notice, the Long Position with the oldest date will be assigned first and the Long Position with the most recent date will be assigned last.

During the FIFO Period, Clearing Members must ensure that they update their declarations on a daily basis before Close of Business.

FIXED INCOME TRANSACTIONS

CDCC acts as central counterparty to all Fixed Income Transactions that are submitted by Clearing Members to CDCC for clearing. All Fixed Income Transactions shall be submitted for clearing to CDCC through an Acceptable Marketplace or through the CDS trade matching facility routing matched trades to CDCC. As a result of these Transactions being novated to CDCC, CDCC will be either the buyer or the seller of all settlement records that are sent to the Central Securities Depository.

Various transmissions of settlement records will be sent by CDCC to the Central Securities Depository on a daily basis.

Same Day Transactions gross settlement records

For Same Day Transactions, two settlement records consisting of settlement instructions (Gross Delivery Requirements and Gross Payment Against Delivery Requirements) will be sent gross to the Central Securities Depository to be settled on a real-time basis throughout the day immediately after each Same Day Transaction is novated to CDCC until the Submission Cut-Off Time specified in Section 2 of this Operations Manual.

Forward Settlement Transactions and Futures Contracts on an Acceptable Security net settlement records

For Forward Settlement Transactions and Futures Contracts on Acceptable Securities, settling on the next Business Day, two settlement records consisting of net settlement instructions (Net Delivery Requirements and Net Payment Against Delivery Requirements) will be sent to the Central Securities Depository on a net basis at the Netting Cut Off Time specified in Section 2 of this Operations Manual for settlement on the next Business Day.

Morning net DVP settlement process

In respect of any Pending Payment Against Delivery Requirements at the Morning Netting Cycle Timeframe specified in Section 2 of this Operations Manual, CDCC shall send new settlement records (Morning Net Payment Against Delivery Requirements) to the Central Securities Depository reducing any Pending Payment Against Delivery Requirements of a Clearing Member in favour of CDCC by any Pending Payment Against Delivery Requirements of CDCC in favour of the same Clearing Member. The Clearing Member shall have sufficient funds in its cash account at CDS to settle the lesser of (i) its Morning Net Payment Against Delivery Requirement and (ii) the amount of the CDCC Daylight Credit Facility during the Morning Net DVP Settlement Timeframe specified in Section 2 of this Operations Manual.

Afternoon net DVP settlement process

In respect of any Pending Settlement Requirements at the Afternoon Netting Cycle Timeframe specified in Section 2 of this Operations Manual, CDCC shall send new settlement records (Afternoon Net DVP Settlement Requirements) to the Central Securities Depository reducing any Pending Delivery Requirements of a Clearing Member in favour of CDCC by any Pending Delivery Requirements of CDCC in favour of the same Clearing Member in respect of the same Acceptable Security, and/or reducing any Pending Payment Against Delivery Requirements of a Clearing Member in favour of CDCC by any Pending Payment Against Delivery Requirements of CDCC in favour of the same Clearing

Member. The Clearing Member shall have sufficient funds and sufficient Acceptable Securities in its cash and securities accounts at CDS to settle its Afternoon Net DVP Settlement Requirements by the End of Day DVP Settlement Time specified in Section 2 of this Operations Manual.

Delivery

Securities delivery against payment is effected on a DVP basis through the Central Securities Depository.

In the event of a failed or partial delivery, CDCC will take appropriate action in accordance with Section A-804 of the Rules.

CDCC shall determine the net settlement instructions by Clearing Member, CUSIP/ISIN and Settlement Date for all Transactions comprised in the Forward Settlement Transactions netting process (as specified in the above section entitled as such) submitted to CDCC for clearing as of the Netting Cut Off Time. These settlement instructions shall be submitted to the relevant Central Securities Depository on a daily basis and in the form and settlement tranche acceptable to the Central Securities Depository for this purpose.

For Same Day Transactions, CDCC shall determine the gross settlement instructions (Gross Delivery Requirements and Gross Payment Against Delivery Requirements) by Clearing Member and the applicable CUSIP/ISIN, and submit such instructions to the relevant Central Securities Depository (in the form and settlement tranche acceptable to such Central Securities Depository) immediately after each Same Day Transaction is novated to CDCC for real-time settlement. Notwithstanding the foregoing, at the Morning Netting Cycle Timeframe, CDCC shall cancel previously issued Pending Payment Against Delivery Requirements and replace them by Morning Net Payment Against Delivery Requirements by Clearing Member (as specified in the above section entitled “Morning net DVP settlement process”).

In the event of a Failed Delivery for a particular settlement tranche to a Net Delivery Requirement or to an Afternoon Net DVP Settlement Requirement consisting of an obligation to deliver Acceptable Securities by the End of Day DVP Settlement Time specified in Section 2 of this Operations Manual, CDCC shall, on a best efforts basis, attempt to coordinate a partial delivery among those Receivers of Securities for that particular settlement tranche of the relevant Acceptable Security. In the event that no partial settlement is possible, the settlement tranche will be included in the Rolling Delivery Obligation of the failing Clearing Member and CDCC shall re-attempt settlement of the failed settlement tranche on the next Business Day. In the case of a Failed Delivery with respect to a Gross Delivery Requirement resulting from a Same-Day Transaction submitted after the Afternoon Netting Cycle Timeframe and before the Submission Cut-Off Time to be settled by the End of Day DVP Settlement Time, CDCC will failed or partially deliver the same quantity of Acceptable Securities on the Clearing Member who is the Receiver of Securities with respect to the relevant Same Day Transaction.

In the event of a Failed Payment Against Delivery at the Morning Net DVP Settlement Timeframe specified in Section 2 of this Operations Manual, CDCC shall impose a fine on the Clearing Member corresponding to the charges which are levied on CDCC for the usage of the CDCC Daylight Credit Facility as a result of this Failed Payment Against Delivery. If the Clearing Member still does not have sufficient funds in its cash account at the Central Securities Depository to settle the relevant Morning Net Payment Against Delivery Requirement, or in the amount of the CDCC Daylight Credit Facility (whichever is less) by 11:00 a.m., the Clearing Member shall be deemed a Non-Conforming Member, in addition to any other remedies that CDCC may apply to such situation in accordance with Subsection A-806(1) of the Rules.

In the event of a Failed Payment Against Delivery at the End of Day DVP Settlement Time specified in Section 2 of this Operations Manual, the Clearing Member shall be deemed a Non-Conforming Member and shall be required to pay to CDCC any charges which are levied on CDCC for the overnight financing of this Failed Payment Against Delivery, in addition to any other remedies that CDCC may apply to such situation in accordance with Subsection A-806(2) of the Rules.

EXERCISES, TENDERS, ASSIGNMENTS AND DELIVERIES

Buy In Process

As set forth in Subsection A-804(3) of the Rules, CDCC may effect a buy-in transaction on its own initiative or pursuant to a formal request by a Receiver of Securities affected by a Failed Delivery by purchasing the missing quantity of the relevant Acceptable Securities on the open market.

When initiated by a Receiver of Securities, the buy-in process shall be as followed:

1. The Receiver of Securities who wants to initiate a buy-in must send to CDCC the appropriate Buy-In Scan Form (which is accessible on CDCC's Secured Website) duly completed, with the following information:
    a. Clearing Member's Name;
    b. Clearing Member's Number
    c. The Acceptable Security (ISIN) involved;
    d. The total quantity of the Failed Delivery;
    e. The quantity requested in the buy-in;
    f. The buy-in delivery date, which shall be the current Business Day + not less that two (2) complete Business Days.

    The Buy-In Scan Form must be submitted to CDCC in the prescribed format with the authorization stamp of the Clearing Member properly affixed on the form (with initials).

2. Upon receiving the duly completed Buy-In Scan Form from a Receiver of Securities, CDCC will work with the Provider(s) of Securities responsible for the Failed Delivery in order to validate if the delivery can be made within the number of Business Days specified in the Buy-In Scan Form (the "Buy-In Notice Delay").

3. At the expiry of the Buy-In Notice Delay, if the Provider(s) of Securities has not delivered the relevant Acceptable Securities, CDCC will initiate a cash trade on the open market.

4. Once delivery is received by CDCC on the cash trade, CDCC will deliver the Acceptable Securities to the Receiver of Securities that requested the buy-in transaction.

5. All fees incurred to CDCC, including all costs with respect to the buy-in transaction shall be charged to the Provider(s) of Securities responsible for the Failed Delivery. Such fees will be included on the Monthly Clearing Fees Details Report (MB01) of the second Business Day of each month as a separate pay figure, payable to CDCC on the 5th Business Day of each month through LVTS or any other payment method approved by CDCC.

SETTLEMENT

INTRODUCTION

CDCC provides the mechanism for a single cash settlement with respect to amounts which are not settled through a Central Securities Depository due by a Clearing Member to CDCC and by CDCC to such Clearing Member on a daily basis, as prescribed in Paragraph A-801(2)(a) of the Rules. Clearing Members are able to make a single payment to CDCC or receive a single payment from CDCC that represents the net value of their purchases, sales, gains and losses and on a monthly basis clearing fees. Additionally, the CDCC Clearing Application incorporates the amounts due from the Clearing Members for Margin and the exercise/assignment Settlement Amounts of cash settled Transactions.

Settlement of trading in a given currency is kept separate throughout the clearing procedure. All payments in the Canadian currency to and from CDCC are collected via an irrevocable payment processing system, known as the Large Value Transfer System (LVTS), or any other payment method approved by CDCC. Any US dollar payments are collected via a payment processing system known as Financial Electronic Data Interchange (FEDI). As described in the Risk Manual, the amount of Margin due from the Clearing Member is computed on the basis of that day's Open Positions shown on the relevant report.

SETTLEMENT COMPUTATION

The calculation of a Clearing Member's Net Daily Settlement amount is based on Transactions (including adjustments, exercises, tenders and assignments) and Margin requirements, and on a monthly basis clearing fees.

The Net Daily Settlement amount for each Clearing Member is determined in the following manner:

(i) Total Margin required and any additional margin requirements for each account is compared with Margin Deposits.

(ii) The premiums, gains and losses, cash settled exercise/assignment Settlement Amounts, Fixed Income Mark-to-Market Amounts and cash adjustment for each account type (Client Account(s), Firm Account(s) and Multi-Purpose Account(s)) are netted to a single pay or collect figure.

(iii) If additional margin is required, CDCC will instruct the Clearing Member to facilitate payment to CDCC.

(iv) Miscellaneous charges such as clearing fees are also included on a monthly basis. In addition, applicable fines or any other amounts due would be collected on a monthly basis.

All cash settlements to CDCC are to be made to CDCC’s settlement account at the Bank of Canada, or to any other account of CDCC with a Schedule I bank, as designated by CDCC.

FINES

CDCC applies fines with regards to late payments to discourage Clearing Members from being late in the performance of their payment obligations.

SETTLEMENT

Overnight Settlement

Payments for overnight settlement (mark-to-market, premiums, margin shortfalls etc.) must be received by 7:45 a.m. the next Business Day.

If a payment is late, CDCC will notify the Clearing Member that it is being fined. The fine structure is as follows:
Based on a rolling thirty days – if there has been a prior occurrence within the preceding thirty days, it is the second occurrence.

If the late payment is caused by an infrastructure problem, fines will not be imposed.

First occurrence of a late payment:

- if CDCC has the payment in its Bank of Canada account by 7:55 a.m. the next Business Day, there will be no fine.
- if the payment is received by 8:30 a.m. the next Business Day, CDCC will impose a $1,000 fine.
- if the payment is received by 8:59 a.m. the next Business Day, CDCC will impose a $2,500 fine.
- if the payment is not received by 9:00 a.m. the next Business Day, CDCC will deem the Clearing Member Non-conforming

On the second or more occurrences of a late payment:

- if CDCC has the payment in its Bank of Canada account by 7:55 a.m. the next Business Day, CDCC will impose a $1,000 fine
- if the payment is received after 7:55 a.m. but before 8:30 a.m. the next Business Day, CDCC will impose a $5,000 fine.
- if the payment is received by after 8:30 a.m. but before 8:59 a.m. the next Business Day, CDCC will impose a $10,000 fine.
- if the payment is not received by 9:00 a.m. the next Business Day, CDCC will deem the Clearing Member Non-conforming.

Intraday Margin Calls

CDCC encourages its Clearing Members to cover intraday Margin calls with collateral other than cash.

Clearing Members have one (1) hour from notification to cover an intraday Margin call. If the payment is late, the following fines shall apply:

- if the payment is received later than 1 hour after but before 1 hour and 15 minutes from notification, CDCC will impose a $500 fine.
- if the payment is received later than 1 hour and 15 minutes but before 1 hour and 30 minutes from notification, CDCC will impose a $1,000 fine.
- if the payment is not received by 1 hour and 30 minutes from notification, CDCC will deem the Clearing Member Non-conforming

Collection of Fines

CDCC will collect any applicable fines with the month-end clearing fee billing.

ADDITIONNAL MARGIN PROCESSING

CLEARING FUND

Each Clearing Member approved to clear Exchange Transactions and/or OTCI Transactions and/or Fixed Income Transactions shall maintain a deposit in the Clearing Fund of the amounts from time to time required by the CDCC in accordance with Rule A-6. The Clearing Fund has been established to protect CDCC and its members from potential defaults and other market events.

Each Clearing Member's contribution includes a required Base Deposit and a Variable Deposit, calculated on a monthly basis. The details of the Base and Variable Deposits are set forth in Rule A-6.

Clearing Fund Statement Report

On the first Business Day of each month, CDCC will issue to each Clearing Member a Clearing Fund Statement that lists the current amount of the Clearing Member's Deposits and the amount of Deposit required on the basis of the monthly calculation of the Variable Deposit.

Any deficit between the amounts held on deposit and the monthly requirement must be satisfied by 2:00 p.m. on the next Business Day.

Deposits

Deposits to the Clearing Fund shall be in cash or in Government Securities, subject to the same criteria as the Margin, as set forth in Schedule A hereof, the Risk Manual.

Deposits to the Clearing Fund are made and valued in the same manner and are subject to the same deadlines as for Margin deposits, as set forth in Section 2 of this Operations Manual.

Withdrawals

Clearing Members may request to withdraw any surplus amount from the Clearing Fund, subject to applicable deadlines, as set forth in Section 2 of this Operations Manual.

Substitutions

Substitutions of assets (other than cash) in the Clearing Fund are made in the same manner and subject to the same deadlines as Margin Fund substitutions of assets (other than cash), as set forth in Section 2 of this Operations Manual..

ADDITIONNAL MARGIN PROCESSING

DIFFERENCE FUND

The Difference Fund is Margin Deposits held by CDCC 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. CDCC accepts Deposits to the Difference Fund in the forms of Margin set forth in Section A-709 of the Rules, in the proportions specified therein.

(1) Unsettled Items Margin

Security Funds, as such term is defined in Sections B-401, C-501 and D-301 of the Rules, corresponding to an amount equal to not less than 105% of the market value of the Underlying Interest which a Clearing Member has failed to timely deliver, in accordance with Sections B-412, C-517 and D-307 respectively of the Rules.

(2) Daily Capital Margin Monitoring

The amount by which the Margin requirements of a Clearing Member exceeds its capital, in accordance with Section A-710 of the Rules.

(3) Advance Calls for Settlement of Losses

An amount that CDCC estimates will be needed to meet losses resulting from particular marked conditions or price fluctuations, in accordance with Section C-303 of the Rules.

(4) OTCI Additional Margin

An amount representing the premium value collected from the Buyer before an OTCI Option is confirmed, which amount shall be available for withdrawal the morning after the Transaction has been processed, in accordance with Section D-107 of the Rules.

~~(5) Banking Holidays Additional Margin~~

~~An amount corresponding to 10% of Margin requirements is required to be posted as additional margin by Clearing Members on banking holidays, which is released on the morning of the following Business Day.~~

(5~~6~~) Intra-Day Margin

Additional margin may be requested from a Clearing Member, at CDCC's sole discretion at any time and from time to time as it deems appropriate, due to some adverse change in the market of a given Underlying Interest or in the financial position of the Clearing Member, in accordance with Section A-705 of the Rules.

Deposits, Withdrawals, Substitutions

Deposits, withdrawals and substitutions of assets (other than cash) in the Difference Fund are made in the same manner and subject to the same deadlines as Margin Fund deposits, withdrawals and substitutions of assets (other than cash), in accordance with Section 2 of this Operations Manual.

Note:
Information with respect to the Margin Fund is to be found in the Risk Manual, Schedule A of this Operations Manual.

CLEARING FEES

Clearing services fees

Clearing fees are charged to both Clearing Members submitting a Transaction for clearing to CDCC and are based on the number of contracts involved. There is a minimum monthly clearing fee charge with respect to each product type (Futures, Options, OTCI (other than Fixed Income Transactions), Fixed Income Transactions). Once a Clearing Member, otherwise eligible to do so in accordance with the Rules, starts using a particular clearing service by submitting a first Transaction of such product type, the applicable minimum monthly clearing fee shall be charged to the Clearing Member thereafter whether the Clearing Member actually uses the services or not during any given month, until the Clearing Member duly notifies CDCC in writing that it wishes to withdraw from the clearing services for that product type, effective sixty (60) days after CDCC receives such notice, provided there is no outstanding Transaction of such product type standing to an account of the Clearing Member at such time. Notwithstanding the foregoing, with respect to Fixed Income Clearing, the applicable minimum monthly clearing fee shall be charged to the Fixed Income Clearing Member upon the request to use this clearing service being submitted by the Clearing Member in the form prescribed by CDCC and countersigned by CDCC. Clearing Members should refer to the CDCC website www.cdcc.ca for a complete list of applicable fees.

Clearing fees are collected as a separate pay figure and are payable to CDCC on the morning of the 5th Business Day of each month through LVTS or any other payment method approved by CDCC. The MB01 Monthly Clearing Fees Invoice, MB02 Monthly Clearing Fees Details Reports and MB03 Monthly Fixed Income Clearing Fees Invoice are generated on every 2nd Business Day of each month and are available to Clearing Members on the morning of the 3rd Business Day of each month.

Fees for additional services

There are a number of discretionary services available to Clearing Members, in addition to the normal clearing services. These are published periodically as an Operational Notice to Members and can be viewed on the Secured Website. CDCC issues a statement on a monthly basis for these services. The fees are collected as per the date on the statement through LVTS or any other payment method approved by CDCC.

Fees for cost incurred at CDS (or other Central Securities Depository)

Any settlement cost incurred by CDCC within CDSX (or the settlement platform of another Central Securities Depository) will be charged to the Clearing Member with which CDCC is settling. Such cost will be included on the Monthly Clearing Fees Details Report (MB01) of the second Business Day of each month as a separate pay figure, payable to CDCC on the 5th Business Day of each month through LVTS or any other payment method approved by CDCC.

CLEARING MEMBER SECURITY OFFICER

Clearing Members shall designate up to three (3) individuals within their firm who will be responsible for handling the Clearing Member's User Profiles ("Security Officers"). The designation of Securities Officers is done by filing with CDCC a SOLA Clearing – Security Officer Identification form, which form shall be renewed on an annual basis.

Once duly designated, a Security Officer shall submit a SOLA Clearing User Profile Request form to request that CDCC add or delete a User Profile (this form is accessible on CDCC's Secured Website).

The Security Officer must complete this form with the authorization stamp of the Clearing Member properly affixed on the form (with initials). When the form is complete, the Clearing Member can either scan the form and send it to the Member Services group e-mail address: cdccops@cdcc.ca, or fax the form to one of CDCC's offices.

Upon receipt of the form, the process for the addition / deletion is performed by one of CDCC's senior managers.

TMX | CDCC

Risk Manual

Table of Contents

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:

PSR = Underlying Interest Price x MI x 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' assignation 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;
- Bonds issued by certain provincial governments and provincial Crown corporations determined as acceptable by CDCC[1], excluding real return issues, zero coupon bonds, and bonds with a maturity of less than one year.

- The bonds must be repayable at maturity;
- The bonds must be denominated in Canadian dollars;
- The coupon type must be fixed, real return, step-up or zero (Treasury bills are eligible);
- The net amount outstanding[2] must be greater than or equal to $250 million;
- The bonds' prices must be issued by a source that is acceptable to the Corporation.

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] To be acceptable by CDCC, the credit rating of the issuer must be investment grade and not lower than 6 notches below the credit rating of the Government of Canada, as stated by Standard & Poor's (or another recognized rating agency). For example, if the Government of Canada has an AAA rating, the lowest rating eligible would be A-.

[2] 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:

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

Where 'n' is the number of liquidation days[3], '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:

PSR = Underlying Interest Price x MI x Contract Size.

[3] The Corporation uses the following number of liquidation days 'n' as follows:

- For Futures contracts and Options contracts n = 2 days;
- For OTCI options n = 5 days;
- For Fixed Income Transactions, where the Underlying Interest is issued by the Government of Canada or a federal Crown corporation n = 2 days; and
- For Fixe Income Transactions, where the Underlying Interest is issued by a provincial government or a provincial Crown corporation n = a + 2 days, where a = number of additional days.

'a' is based on a quantitative and qualitative analysis, established according to the degree of liquidity of the Underlying Interest which is derived from parameters such as but not limited to traded volume, Government of Canada/ provincial yield spreads and international guidelines. For a provincial government or provincial Crown corporation issuer 'a' is determined at least once a year and communicated to Clearing Members by written notice.

Furthermore, in anticipation of Remembrance Day (the "Banking Holiday") the Corporation will add one more day to the number of liquidation days 'n'. Hence, for Options and Futures contracts where the Underlying Interest is an Equity (i.e. Stock and ETF) or an Index the liquidation period will increase to three Business Days prior and up to the Banking Holiday, and for OTCI options, the liquidation period will increase to six Business Days prior and up to the Banking Holiday. The additional margin amount for the Banking Holiday will be released on the morning of the following Business Day.

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 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[4]		•	•
Inter-Commodity Spread Charge[5]		•	•
Short Option Minimum (SOM) amount	•		
Liquidity Interval[6]	•		

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 = Underlying Interest Price x MI x Contract Size

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).

[4] Not applicable to Share Futures Contracts.
[5] Idem 4
[6] Applicable for OTCI options with Physical Settlement/Delivery only

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:

$$PSR = MI \times P_0 \times Contract\ Size.$$

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 x 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) model[7] 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.

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

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.

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:

$$PSR_F = MI_F \times F_0 \times Contract\ Size$$

and,

$$PSR_I = MI_I \times P_0 \times Contract\ Size$$

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.

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.

Short Option Minimum

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

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

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

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

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 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:

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

Where 'n' is the number of liquidation days (see footnote 3), '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:

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

Where 'n' is the number of liquidation days (see footnote 3), 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:

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

Where D is the duration of the security and the contract size is the transaction's Nominal Value divided by 100. However, for all securities that belong to the 3-month, 6-month and 1-year buckets, CDCC uses a fixed duration 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 – 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:

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

Where 'n' is the number of liquidation days (see footnote 3), '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:

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

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

The Inter-Commodity margin relief percentages between the different Buckets are calculated by the Corporation's risk department and updated 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 (5~~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.

  URR = Stress Margin – Base Margin

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

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

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

$$\Omega = \underset{i=1}{\overset{n}{Max}}\left(\mu_{URR^i}^{60}\right)$$

- 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.

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

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 Bucket[8]. Here are the historical percentage variations applied:

Scenario 1 (Black Monday)			
	1987-10-16	1987-10-19	Variation
SXF™ – S&P/TSX 60 Index Standard Futures [9]	174.75	154.63	-11.51%
BAX™ – Three-Month Canadian Bankers' Acceptance Futures [10]	90.81	90.69	-0.14%
CGB™ – 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%

[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.

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%
0-5 years Provincial yields			1.7657%
5-10 years Provincial yields			2.3651%
10-20 years Provincial yields			2.1760%
20-30 years Provincial yields			2.4687%
Scenario 2 (Financial Crisis 2008)			
	2008-10-17	2008-10-20	Variation
SXF™ – S&P/TSX 60 Index Standard Futures	568.5	622.7	9.53%
BAX™ – Three-Month Canadian Bankers' Acceptance Futures	97.63	97.75	0.12%
CGB™ – 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%
0-5 years Provincial yields			-0.0475%
5-10 years Provincial yields			-0.1232%
10-20 years Provincial yields			-0.3703%
20-30 years Provincial yields			-0.2787%
Scenario 3 (Russian Default)			
	1998-08-26	1998-08-27	Variation

SXF™ – S&P/TSX 60 Index Standard Futures	356.54	333.25	-6.53%
BAX™ – Three-Month Canadian Bankers' Acceptance Futures	94.56	93.77	-0.84%
CGB™ – 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%
0-5 years Provincial yields			-1.2163%
5-10 years Provincial yields			-1.7576%
10-20 years Provincial yields			-1.8987%
20-30 years Provincial yields			-1.4248%
Scenario 4 (Bond Market Crash)			
	1994-04-01	1994-04-04	Variation
SXF™ – S&P/TSX 60 Index Standard Futures	221.09	215.97	-2.32%
BAX™ – Three-Month Canadian Bankers' Acceptance Futures	93.53	92.92	-0.65%
CGB™ – 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%
0-5 years Provincial yields			-0.5813%
5-10 years Provincial yields			-2.6390%
10-20 years Provincial yields			-3.0077%
20-30 years Provincial yields			-3.4743%

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 factor[12]. 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 Governement 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 keys 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