CDS Clearing and Depository Services Inc. (CDS®)

MATERIAL AMENDMENTS TO CDS PROCEDURES RELATED TO THE CONTINUOUS NET SETTLEMENT (CNS) DEFAULT FUND REQUEST FOR COMMENTS

A. DESCRIPTION OF THE PROPOSED CDS PROCEDURE AMENDMENTS

CDS implemented the process and calculation methodology for determining the size of CDS's CNS Default Fund (the "Default Fund") on January 1, 2015. During the consultation period prior to that implementation, CDS undertook to review the Default Fund calculation methodology to ensure that CDS's approach was compliant with international standards.[1] More specifically, CDS undertook to review and, if necessary, amend the Default Fund calculation methodology to ensure that the difference between the 99.5 percentile largest loss and the 100 percentile largest-loss exposure, occurring under extreme, but plausible, market conditions was collateralized. The present proposed amendments are the result of that review and are intended to ensure that the Default Fund is collateralized on a Cover-1 basis with a high degree of probability.

The Default Fund is intended to cover the *residual* 1% (tail Value-at-Risk, or "VaR") stress losses that the CNS Participant Fund does not cover under *normal* market conditions. Although these tail events (stress losses) are expected to occur only 1% of the time, the size of these tail events can be significantly larger than those covered 99% of the time by the CNS Participant Fund.

The proposed amendments to the Procedures describe the new Default Fund methodology which CDS intends to use to calculate the size of the Default Fund. The existing and proposed methodologies are described in detail below. CDS has also provided an assessment of the impact of the change from the current CNS Default Fund collateral calculation to the proposed methodology, and has included a comparison of the actual CNS Default Fund collateral requirements (since the CNS Default Fund was implemented) against the collateral requirements pursuant to the proposed methodology.

Proposed Amendments

CDS's current methodology is designed to allocate the average of the two preceding months' 99.5% largest loss under extreme but plausible/stress-testing market conditions (net of the CNS Participant Fund collateral requirement) amongst all CNS service members.

The existing methodology has the following limitations:

1. The Default Fund is subject to sudden pro-cyclical increases in collateral requirements.
2. The methodology's short, two-month, lookback period means that the 99.5 percentile worst loss *of the current month* is very likely to be lower than the calculated amount/size of the Default Fund at the start of the month.

[1] Principle 4 – Credit Risk – of the CPMI-IOSCO Principles for Financial Market Infrastructures (Bank for International Settlements, "Assessment methodology for the principles for FMIs and the responsibilities of authorities", April, 2012) states that *"a Central Counterparty (CCP) should maintain additional financial resources sufficient to cover a wide range of potential stress scenarios that should include, but not be limited to, the default of a participant and its affiliates that would potentially cause the largest aggregate credit exposure for the CCP in extreme but plausible market conditions."*

3. The existing calculation methodology does not collateralize the 100% largest-loss exposure under extreme but plausible market conditions, and cannot, consequently, be considered a Cover-1 methodology.

In order to collateralize the Default Fund *on a Cover-1 basis*, and collateralize the largest potential stress-test loss by any one Participant, CDS is proposing a new methodology to:

1. Determine the appropriate size of the Default Fund to achieve Cover-1 protection under extreme but plausible stress-test market conditions; and,
2. Equitably mutualize the new Cover-1 requirements for the Default Fund amongst all CNS CCP service Participants based on the risk each Participant poses to the CNS service under extreme but plausible stress-test market conditions.

New Methodology

To ensure compliance with CPMI-IOSCO PFMI Principle 4, CDS proposes to implement a Tiered Cover-1 CNS Default Fund.

The Default Fund will consist of two tiers based on activity level of the Participant in the Service.

- Tier 1 will be based on the daily CNS outstanding positions of all CNS Participants*, excluding* those CNS outstanding positions that are included in Tier 2.

- Tier 2 will be based on the specific subset of CNS outstanding positions: the positions of those CNS participants whose activity levels have demonstrated spikes in CNS activity on certain specific business days.[2] For those CNS participants determined to have demonstrated CNS activity on any one of those specific business days in the lookback period, then all of those specific business days are included in the subset of CNS outstanding positions used to size the Tier 2 Default Fund collateral requirement. For other day's CNS outstanding positions, are included in the subset of CNS outstanding positions considered in the sizing of the Tier 1 Default Fund collateral requirement.

The use of two tiers is consistent with the longstanding operating principle that requires Participants to bear responsibility for the financial – or other - risks they pose to the operations of the clearing and settlement system.

Tier 1: Non-Triple Witching Activity

Non-Triple Witching Activity is defined as all CNS service Participants' CNS activity *excluding the activity on those days identified as Triple Witching days for that subset of CNS service Participants identified as having Triple Witching activity on those days which are defined as Triple Witching activity days*.

[2] For example, a subset of CNS participants have CNS activity spikes on days associated with the exercise of equity options and equity futures positions in the cash market – so-called Triple-Witching activity days. The affected days are: (i) the day(s) on which CNS transactions deemed to be Triple-Witching-related novate (i.e., value date minus one); and, (ii) the day on which CNS outstanding positions deemed to be Triple-Witching-related are eligible to settle (i.e., value date).

Tier 2: Triple Witching Activity

CDS's review revealed that a subset of CNS service Participants are far more active (i.e., submit more transactions for clearing and settlement) on certain well-defined/deterministic days. More specifically, a subset of CNS Participants have more outstanding equity positions submitted for CNS settlement coincident with the exercise date of index options, index futures, options on single stocks and single stock futures[3] (hereinafter, such incremental outstanding position activity levels are referred to as "Triple Witching Activity"). Triple Witching activity occurs once a quarter; or four times a year.

Since CNS transactions are novated on value date minus one, Triple Witching Activity impacts CNS outstanding position volumes, and the sizing of the CNS Default Fund, 8 days a year – on the day the positions are scheduled to settle[4] and the day prior to that settlement day (due to the novation of trades submitted for CNS settlement on value date minus one).

In order to determine whether a CNS Participant had Triple Witching activity, CDS proposes to implement a volatility threshold: A Participant will be deemed to have Triple Witching activity when the day-over-day increase in that Participant's contribution to the CNS Participant Fund is greater than or equal to 100% that Participant's contribution on the day such trading activity is first guaranteed by CDS's CCP service (i.e., the corresponding value date minus one).

To determine the scale of the residual stress-test losses used to calculate the Default Fund, the residual profit, or residual loss, of unwinding each day's CNS outstanding positions is calculated for every Participant, for every day of the lookback period, using all of the stress-test scenarios, and *net* of the market value of the CNS collateral.

The Default Fund is then calculated so as to collateralize, the largest daily residual stress-test losses over the lookback period.

The daily residual stress-test profits and losses are calculated based on the following inputs:

1. Post stress-test profit or cost of unwinding a Participant's CNS outstanding positions on that day plus CNS mark-to-market payments owing;

2. Post stress-test value of the lesser of a Participant's CNS Participant Fund pledged collateral or the CNS Participant Fund collateral fund requirement on that day;

3. The daily sum of #1 and #2, above, for every stress-test scenario, which is either daily residual stress-test profit or the daily residual stress-test loss.

The CNS Default Fund is designed to collateralize, on a mutualized basis, the risk associated with CNS Participants' outstanding positions that would result in the *largest credit risk under extreme, but plausible, market conditions*.

[3] Currently, CNS Participants identified as having Triple Witching Activity are only required to post an *estimate* of the CNS Participant Fund collateral requirement prior to the date the corresponding positions are novated and guaranteed by the CNS service.
[4] Otherwise commonly known as "value date".

Mutualization is achieved by allocating the Default Fund requirements on a pro-rata basis taking account of the cumulative CNS Participant Fund collateral requirements over the lookback period for those days associated with either of Tiers 1 or 2.

Tier 1

The largest residual stress-test loss of the CNS outstanding positions contained in Tier 1 (as defined above) is used to size the CNS Default Fund for all days in the quarter which do not have associated Triple Witching Activity – with a monthly rebasing. The largest Tier 1 residual stress-test loss of the CNS Default Fund is then allocated amongst all CNS service Participants in accordance with their pro rata share of the cumulative CNS Participant Fund collateral requirement across all CNS service members over the lookback period for those days and participants having Tier 1 CNS outstanding positions.[5]

As part of CDS's monthly review of the size of the Default Fund, CNS participants will be advised of any changes to their Tier 1 Default Fund collateral requirement which may be required to ensure the Default Fund remains Cover-1. Tier 1 Default Fund requirements will be enforced for all CNS Participants throughout the month (subject to intra-month re-sizing – see below).

Tier 2

The difference between the largest residual stress loss of the CNS outstanding positions contained in Tier 2 and the largest residual stress loss of the CNS outstanding positions in Tier 1 is allocated against those CNS Participants having Triple Witching Activity on Triple Witching activity days (i.e., the day Triple Witching trades are novated by CNS and the next day (value date), when such trades are first eligible to settle). The allocation of the Tier 2 Default Collateral requirement will be *incremental* to the Tier 1 allocation – and only against those CNS Participants identified as having Triple Witching activity – with the incremental collateral due on the day prior to the novation of that month's Triple Witching activity.

The incremental Tier 2 Default Fund collateral requirement is allocated against those Participants identified as having Triple Witching activity, based on their pro-rata share of the cumulative CNS Participant Fund collateral requirement on the Triple Witching activity days in the lookback period across all CNS service Participants identified as having Triple Witching activity over the lookback period.[6]

As part of the monthly review of the size of the CNS Default Fund, CNS Participants will advised of any revisions to their Tier 2 Default Fund collateral requirement. Tier 2 collateral requirements will be effective for a period of 5 – 10 business days, subject to the affected Participants' CNS Participant Fund collateral requirement returning to a level similar to that which existed prior to the novation of that month's Triple Witching activity.

[5] For those participants *not having* Triple Witching Activity, the sum of their CNS Participant Fund collateral requirements on each day in the lookback period forms the basis for determining their pro rata share. Alternatively, for those participants *having* Triple Witching Activity the allocation is based on the sum of their CNS Participant Fund collateral requirements for all days in the lookback period *excluding those 8 days deemed to be the Triple Witching days of the lookback period*.

[6] Eight days every year – for every quarter the day Triple Witching trades reach value date minus one (i.e., the day they are novated) and on their value date (the day they are first eligible to settle).

Regularly Scheduled Review of CNS Default Fund Size and Allocation Base

The size of the Default Fund will be based on a lookback period of 1-year and will be subject to scheduled monthly reviews of the size of the Default Fund.

The rebasing of the allocation of the collateral requirements of the Default Fund amongst Participants will be also be done monthly – concurrent with the review of the size of the Default Fund and also based on a 1-year lookback period.

Intra-month Monitoring

The determination of the daily residual stress-test profits and losses will be performed every business day between the regularly scheduled monthly reviews of the Default Fund size to ensure that the Default Fund remains Cover-1 compliant intra-month.

CDS Risk Management will monitor daily residual stress-test losses intra-month. In the event that an intra-month residual stress-test loss (in either the non-Triple Witching or Triple Witching days) exceeds the Tier 1 and/or Tier 2 residual stress losses used to calculate the size of the Default Fund, CDS Risk Management will make an intra-month Default Fund collateral call against both Tier 1 and Tier 2 Participants according to the following criteria and thresholds:

i. Single CNS Participant Cover-1 breach:
    - Targeted collateral call to the CNS Participant responsible for the breach
ii. Two CNS Participant Cover-1 breach & both breaches being individually less than 10% of CNS Default Fund:
    - Targeted collateral call to those CNS Participants responsible for the breach
iii. Two CNS Participant Cover-1 breach & either of the individual breaches being greater than 10% of CNS Default Fund:
    - Allocation to all CNS Participants of the new Cover-1 amount
iv. More than two CNS Participants breaches
    - Allocation to all CNS Participants of the new Cover-1 amount

For example, if an intra-month stress-test loss exceeding the stress-test loss used to calculate the size of Tier 1 of the Default Fund, on a non-Triple Witching day, the above calls will kick in when additional collateral is required for either: (a) the Tier 1 collateral requirement to remain Cover-1 - for both (i) and (ii); or (b) on the new Tier 1 amount across all CNS service Participants – for both (iii) and (iv).

Alternatively, if an intra-month stress-test loss on a Triple Witching day occurs, the above calls will kick in when additional collateral is required for either: (a) the Tier 2 collateral requirement to remain Cover-1 - for both (i) and (ii); or (b) on the new Tier 2 amount across all CNS service Participants – for both (iii) and (iv).

In all instances, the allocation is based on the year to date lookback period.

Impact on the CNS Default Fund

The following table provides a CNS service view of the impact of the proposed changes to the Default Fund; Corresponding Participant-level analyses have been provided to CNS Participants individually.

			Tiered CNS Default Fund			
	CNS Default Fund (February 2017)		Non - TW Days			
Company Code*	Allocation	Pro-rata (Cum CNS PF)	Allocation	Pro-rata (Cum CNS PF)	Total - on TW Days	Pro-rata (Cum CNS PF)
Totals	**285,804,999.89**	**100.00%**	**154,854,670.49**	**100.00%**	**912,716,421.09**	**100.00%**
Averages	7,328,333.33	2.56%	3,970,632.58	2.56%	23,402,985.16	2.56%
Max	35,325,490.61	12.36%	16,145,097.40	10.43%	190,454,784.15	20.87%
Min	106.20	0.00%	80.94	0.00%	80.94	0.00%
# of Participants			39		39	

CNS losses not covered by pre-funded sources

Although the size of Default Fund is calculated to be pre-funded on a Cover-1 basis, any loss at the end of the close-out period which had not been prefunded will be allocated on a pro-rata basis to surviving CNS service members based on their CNS Participant Fund collateral requirements at the effective date (as described in CDS Participant Rule 5.7.4).

B. NATURE AND PURPOSE OF THE PROPOSED CDS PROCEDURE AMENDMENTS

The proposed amendments to the Procedures are made in conjunction with corresponding changes to CDS's Risk Model.

C. IMPACT OF THE PROPOSED CDS PROCEDURE AMENDMENTS

(a) CDS Clearing – The Amendments will ensure CDS's observance of the PFMIs and adoption of a recognized international standard for market infrastructures. The Amendments will also enhance risk management by fortifying CDS's waterfall structure.

(b) CDS Participants – The Amendments will benefit Participants by providing them with access to a market infrastructure that meets global standards.

(c) & (d) Other Market Participants and Securities and Financial Markets in General – The Amendments will help mitigate systemic risk to Canadian capital markets.

C.1 Competition

The Amendments apply to all CDS Participants who currently use, or may choose in the future to use, the CNS CCP service. From a fair access perspective, no CDS Participant will be disadvantaged or otherwise prejudiced with the introduction of these changes except to the extent reasonably require to ensure CDS's risk management process is implemented.

C.2 Risks and Compliance Costs

The Amendments to the processing of a CNS CCP service Participant default will result in changes to CDS's Risk Model and the resulting management of financial risks in CDS's clearing, settlement and depository services. With the exception of the increased collateral requirements described above, CDS does not foresee other risks or compliance costs accruing to CDS Participants or other stakeholders.

C.3 Comparison to International Standards

The PFMIs are minimum international standards for enhancing the safety and efficiency of clearing, settlement and recording arrangements. The standards aim to limit systemic risk and foster transparency and financial stability. They apply to CCPs, central securities depositories ("CSDs") and security settlement systems ("SSS"). CDS engages in all three of these market infrastructure activities. According to the terms of CDS's recognition order requirements, CDS is required to observe PFMIs as soon as possible.

As noted above, CDS must comply with PFMI Principle 4 (Credit Risk)[7], which requires that a CCP cover a residual portion of its losses with non-defaulting participants' resources through a pooling-of-resources arrangement, such as a default fund.[8]

D. DESCRIPTION OF THE PROCEDURE DRAFTING PROCESS

The proposed procedures were developed out of the necessity for CDS, and our services, to comply with the PFMIs. CDS prepared several detailed analyses describing the proposed Default Fund risk mitigation strategy. These analyses were tabled, iteratively, at the monthly Risk Advisory Committee ("RAC"), a CDS Participant committee CDS received input from the RAC on the concept and methodology underpinning the proposal. The proposed amendments are the result of that iterative consultation.

The proposed amendments are presented to the Strategic Development Review Committee ("SDRC") for their review and approval. The SDRC reviews proposed Procedure changes that may have operating or systems development implications to Participants, and the SDRC may propose additional or alternative system or operating changes to CDS. The SDRC's membership includes representatives from a cross-section of the CDS Participant community which meets monthly.

The SDRC is expected to comment on the operational aspects of this Amendment as described in "Material Amendments to CDS Procedures. Amendments Related to the Introduction of a CNS Default Fund" to be published concurrently with this Notice.

CDS Customer Service account managers will provide ongoing communication and status updates of proposed changes to clients and will solicit input on those changes.

CDS facilitates consultation through a variety of means, including regularly scheduled SDRC subcommittee meetings and monthly meetings with service bureaus to discuss potential development

[7] See Footnote 1, *supra*.
[8] *Ibid.,* "Approaches to loss allocation" p. 157.

impacts to them. As a courtesy, development initiatives are presented to the Investment Industry Regulatory Organization of Canada's ("IIROC") Financial Administrators Section ("FAS") working group.

D.5 Alternatives Considered

Alternatives with minor variations of the proposed waterfall were considered. The proposed methodology is the result of input received from the members of the RAC.

D.6 Implementation Plan

The amendments to CDS Procedures and CDS Risk Model are expected to become effective upon approval by CDS's Recognizing Regulators (as described below) following public notice and comment.

CDS Customer Service account managers will provide ongoing communication and status updates of proposed changes to clients and will solicit input on those changes.

CDS facilitates consultation through a variety of means, including regularly scheduled SDRC subcommittee meetings and monthly meetings with service bureaus to discuss potential development impacts to them. As a courtesy, development initiatives are presented to the Investment Industry Regulatory Organization of Canada's ("IIROC") Financial Administrators Section ("FAS") working group.

E. TECHNOLOGICAL SYSTEM CHANGES

There are no technological system changes required by CDS, CDS Participants, or their service bureaus.

F. COMPARISON TO OTHER CLEARING AGENCIES

A default fund is a fundamental concept contained in the PFMIs, and is expected to be universally adopted amongst PFMI compliant CCPs worldwide. Many CCPs already have such a fund in place. CDS compared the proposed method used to determine the Default Fund to its global peers and found the proposed methodology to be consistent with the implemented practices, or practices intended to be implemented, of other CCPs. In fact, a default fund is a common feature of most other CCPs worldwide (e.g. Singapore's CDP "Clearing Fund" in Rule 7 and Eurex Clearing AG "Lines of Defence waterfall in Rule 6).

G. PUBLIC INTEREST ASSESSMENT

CDS is recognized as a clearing agency by the Ontario Securities Commission pursuant to section 21.2 of the Ontario Securities Act, by the British Columbia Securities Commission pursuant to Section 24(d) of the British Columbia Securities Act and by the Autorité des marchés financiers ("AMF") pursuant to section 169 of the Québec Securities Act. In addition CDS is deemed to be the clearing house for CDSX®, a clearing and settlement system designated by the Bank of Canada pursuant to section 4 of the Payment Clearing and Settlement Act. The Ontario Securities Commission, the British Columbia Securities Commission, the Autorité des marchés financiers and the Bank of Canada are collectively referred to as the "Recognizing Regulators". Pursuant to each of the foregoing, CDS must conduct its operations in a manner that is consistent with the public interest.

CDS has determined, in light of the foregoing description, and the supporting analyses, that the proposed amendments are not contrary to the public interest.

H. COMMENTS

Comments on the proposed amendments should be in writing and submitted within 30 calendar days following the date of publication of this notice in the Ontario Securities Commission/Autorité des marchés financiers Bulletins to:

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Copies should also be provided to the Autorité des marchés financiers, British Columbia Securities Commission and the Ontario Securities Commission by forwarding a copy to each of the following individuals:

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CDS will make available to the public, upon request, all comments received during the comment period.

I. PROPOSED CDS PROCEDURE AMENDMENTS

Access the proposed amendments to the CDS Procedures on the User documentation revisions web page (http://www.cds.ca/cdsclearinghome.nsf/Pages/-EN-UserDocumentation?Open).

16.1.2 CNS default fund

CDS calculates the CNS Default Fund collateral requirement on a monthly basis using stress testing results to determine an appropriately funded default fund.

CDS's Tiered CNS Default Fund consists of two tiers, each based on the respective activity levels of the participant(s) in the Service. This tiered structure ensures that CDS remains compliant with international standards, including the requirement to account for uncovered residual risk (generally known as "Cover-1"), and ensures that Participants bear responsibility for the financial – or other – risks they pose to the operations of the clearing and settlement system.

- Tier 1 is based on the daily CNS outstanding positions of all CNS Participants, *excluding* CNS outstanding positions included in Tier 2.
- Tier 2 is based on the specific subset of CNS outstanding positions attributed to those CNS participants whose activity levels have demonstrated spikes in CNS activity (in other words, volatility) on certain specific business days.[1] For these CNS participants, only CNS outstanding positions from those specific business days are used to size the Tier 2 Default Fund collateral requirement. CNS outstanding positions for all other business days are used to size the Tier 1 Default Fund collateral requirement.

Tier 1: Non-Triple Witching Activity

Non-Triple Witching Activity consists of all CNS Service participants' CNS activity *excluding activity on those days identified as Triple Witching days for CNS Service participants identified as having Triple Witching Activity on days which are defined as Triple Witching Activity days*.

Tier 2: Triple Witching Activity

Triple Witching activity occurs once per quarter (four (4) times per year), and affects CNS Participants whose outstanding equity positions submitted for CNS settlement increase coincident with the exercise date of index options, index futures, options on single stocks and single stock futures[2] ("Triple Witching Activity").

[1] For example, a subset of CNS participants have CNS activity spikes on days associated with the exercise of equity options and equity futures positions in the cash market – so-called Triple-Witching activity days. The affected days are: (i) the day(s) on which CNS transactions deemed to be Triple-Witching-related novate (i.e., value date minus one); and, (ii) the day on which CNS outstanding positions deemed to be Triple-Witching-related are eligible to settle (i.e., value date).

[2] Currently, CNS Participants identified as having Triple Witching Activity are only required to post an *estimate* of the CNS Participant Fund collateral requirement prior to the date the corresponding positions are novated and guaranteed by the CNS service.

CNS transactions are novated on value date minus one and, as a result, Triple Witching Activity impacts CNS outstanding position volumes, and the size of the CNS Default Fund, 8 days a year – these 8 days include the day the positions are scheduled to settle [1] (i.e., the third Friday of the last month of every quarter) and the day prior to that settlement day (due to the novation of trades submitted for CNS settlement on value date minus one).

CDS uses a volatility threshold to determine whether a CNS participant had Triple Witching Activity. A participant will be deemed to have Triple Witching Activity when the day-over-day increase in that participant's contribution to the CNS Participant Fund is greater than or equal to (≥) 100% of that participant's contribution on the day such trading activity is first guaranteed by CNS (i.e., the corresponding value date minus one).

To determine the scale of the residual stress-test losses used to calculate the Default Fund, the residual profit, or the residual loss, resulting from unwinding each day's CNS outstanding positions is calculated for every participant for every day of the look-back period, using all of the stress-test scenarios, and net of the market value of the CNS collateral.

The Default Fund is then calculated to collateralize the largest of the daily residual stress-test losses over the lookback period.

The daily residual stress-test profits and losses are calculated based on the following inputs:

- The post stress-test profit from, or cost of unwinding, a participant's CNS outstanding positions on that day, plus CDS mark-to-market payments owing;
- The post stress-test value of the lesser of: (a) a participant's CNS Participant Fund pledged collateral, and (b) the CNS Participant Fund collateral fund requirement on that day;
- The daily sum of items #1 and #2, above, for every stress-test scenario, consisting of either the daily residual stress-test profit or the daily residual stress-test loss.

The CNS Default Fund collateralizes, on a mutualized basis, the risk associated with CNS Participants' outstanding positions that would result in the *largest credit risk under extreme, but plausible, market conditions*; the CNS Default Fund allocates the collateral requirements on a pro-rata basis, taking account of the cumulative CNS Participant Fund collateral requirements, over the look-back period, for those business days associated with either of Tier 1 or Tier 2 activity.

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[1] Otherwise commonly known as "value date".

Tier 1

The largest residual stress-test loss of the CNS outstanding positions in Tier 1 (as defined above) is used to calculate the size of the CNS Default Fund for all days in the quarter which do not have associated Triple Witching Activity, and are re-based monthly. The largest Tier 1 residual stress-test loss of the CNS Default Fund is then allocated amongst all CNS Service participants according to their pro rata share of the cumulative CNS Participant Fund collateral requirement over the look-back period for those days, and for participants with Tier 1 CNS outstanding positions.[1]

CDS's monthly review of the size of the Default Fund will advise CNS participants of any changes to their Tier 1 Default Fund collateral requirement required to ensure the Default Fund remains Cover-1. Tier 1 Default Fund requirements will be enforced for all CNS participants throughout the month (subject to intra-month re-sizing – see below).

Tier 2

The difference between the largest residual stress-test loss of the CNS outstanding positions contained in Tier 2, and the largest residual stress-test loss of the CNS outstanding positions in Tier 1, is allocated against those CNS participants having Triple Witching Activity on Triple Witching Activity days (i.e., the day Triple Witching trades are novated by CNS, and the next day (value date), when such trades are first eligible to settle).

Tier 2 Default Collateral requirements will be allocated incrementally to, and in addition to, the Tier 1 allocation – and only against CNS participants identified as having Triple Witching Activity – the incremental collateral will be deemed to be due on the day prior to the novation of that month's Triple Witching Activity.

The incremental Tier 2 Default Fund collateral requirement is based on a participant's pro-rata share of the cumulative CNS Participant Fund collateral requirement on Triple Witching Activity days during the lookback period, and across all CNS Service participants identified as having Triple Witching Activity during that period.[2]

[1] For those participants not having Triple Witching Activity, the sum of their CNS Participant Fund collateral requirements on each day in the lookback period forms the basis for determining their pro rata share. Alternatively, for those participants having Triple Witching Activity the allocation is based on the sum of their CNS Participant Fund collateral requirements for all days in the lookback period e*xcluding those 8 days deemed to be the Triple Witching days of the lookback period*.

[2] Eight days every year – for every quarter the day Triple Witching trades reach value date minus one (i.e., the day they are novated) and on their value date (the day they are first eligible to settle).

CDS's monthly review of the size of the CNS Default Fund will advise CNS participants of any revisions to their Tier 2 Default Fund collateral requirement. Tier 2 collateral requirements will remain in effect for a period of 5 – 10 business days, subject to the affected participants' CNS Participant Fund collateral requirement returning to a level similar to that which existed prior to the novation of that month's Triple Witching Activity.

Regularly Scheduled Review of CNS Default Fund Size and Allocation Base

The size of the Default Fund will be based on a look-back period of one (1) year, and will be subject to scheduled monthly reviews.

The rebasing of the allocation of the collateral requirements of the Default Fund amongst participants will be also be done monthly – concurrent with the review of the size of the Default Fund and will be based on a one (1) year look-back period.

Intra-month Monitoring

Daily residual stress-test profits and losses will be calculated every business day between the regularly scheduled monthly reviews of the Default Fund size to ensure that the Default Fund remains Cover-1 compliant intra-month.

CDS Risk Management monitors daily residual stress-test losses intra-month. In the event that an intra-month residual stress-test loss (in either the non-Triple Witching or Triple Witching days) exceeds the Tier 1 and/or Tier 2 residual stress losses used to calculate the size of the Default Fund, CDS Risk Management will make an intra-month Default Fund collateral call against both Tier 1 and Tier 2 participants according to the following criteria and thresholds:

1. Single CNS Participant Cover-1 breach:
    - Targeted collateral call to the CNS Participant responsible for the breach
2. Two CNS Participant Cover-1 breach & both breaches being individually less than 10% of CNS Default Fund:
    - Targeted collateral call to those CNS Participants responsible for the breach
3. Two CNS Participant Cover-1 breach & either of the individual breaches being greater than 10% of CNS Default Fund:
    - Allocation to all CNS Participants of the new Cover-1 amount
4. More than two CNS Participants breaches
    - Allocation to all CNS Participants of the new Cover-1 amount

Examples:

1. If an intra-month stress-test loss exceeding the stress-test loss used to calculate the size of Tier 1 of the Default Fund, on a non-Triple Witching day, the above calls will be made when additional collateral is required for either: (a) the Tier 1 collateral requirement to remain Cover-1 - for both (1) and (2); or (b) on the new Tier 1 amount across all CNS service Participants – for both (3) and (4).

2. If an intra-month stress-test loss on a Triple Witching day occurs, the above calls will be made when additional collateral is required for either: (a) the Tier 2 collateral requirement to remain Cover-1 – for both (1) and (2); or (b), on the new tier 2 amount across all CNS Service participants – for both (3) and (4).

In all instances, the allocation is based on the year-to-date lookback period.

~~The size of the CNS Default Fund will be determined by first accumulating CNS stress losses for the prior month, ranking the losses from smallest loss to largest loss and identifying the 0.5% largest stress loss – the 00.5% Tail VaR. Next, an average of the prior two months will be calculated to determine the size of the CNS Default Fund. A two-month equally-weighted moving average is likely to be less procyclical and less volatile than simply using a month--by-month methodology.~~

~~Once the size of the default fund has been determined, each CNS participant's CNS Default Fund collateral requirement will be based on a pro-rata contribution based on their average CNS Participant Fund collateral requirement for the prior two months.~~

16.2 Determining diversification eligibility

For a security to be eligible for diversification, it must have at least 90 days of price history and sufficient trading volumes. IRMS uses liquidity to determine a security's holding period and whether it is eligible for diversification. The holding period is the number of days that CDS estimates it might take to execute the close-out transactions for CNS positions, both outstanding and value-dated. The maximum holding period that can be applied to a security is 10 days. The criteria used to determine the liquidity of a security is based on trading volumes and percentage of trading days as indicated in the table below.

Liquidity classification	Average daily trading volume (20 business days)	Percentage of trading days (260 business days)	Holding period	Diversification eligibility
Higher than typical	>=50,000 shares	>=80%	2 days	Yes
Typical	>=25,000 shares	>=70%	3 days	Yes
Less than typical	>=10,000 shares	>=50%	5 days	Yes
Illiquid	>=0	>=10%	10 days	No

16.1.2 CNS default fund

CDS calculates the CNS Default Fund collateral requirement on a monthly basis using stress testing results to determine an appropriately funded default fund.

CDS's Tiered CNS Default Fund consists of two tiers, each based on the respective activity levels of the participant(s) in the Service. This tiered structure ensures that CDS remains compliant with international standards, including the requirement to account for uncovered residual risk (generally known as "Cover-1"), and ensures that Participants bear responsibility for the financial – or other – risks they pose to the operations of the clearing and settlement system.

- Tier 1 is based on the daily CNS outstanding positions of all CNS Participants, *excluding* CNS outstanding positions included in Tier 2.
- Tier 2 is based on the specific subset of CNS outstanding positions attributed to those CNS participants whose activity levels have demonstrated spikes in CNS activity (in other words, volatility) on certain specific business days.[1] For these CNS participants, only CNS outstanding positions from those specific business days are used to size the Tier 2 Default Fund collateral requirement. CNS outstanding positions for all other business days are used to size the Tier 1 Default Fund collateral requirement.

Tier 1: Non-Triple Witching Activity

Non-Triple Witching Activity consists of all CNS Service participants' CNS activity *excluding activity on those days identified as Triple Witching days for CNS Service participants identified as having Triple Witching Activity on days which are defined as Triple Witching Activity days*.

Tier 2: Triple Witching Activity

Triple Witching activity occurs once per quarter (four (4) times per year), and affects CNS Participants whose outstanding equity positions submitted for CNS settlement increase coincident with the exercise date of index options, index futures, options on single stocks and single stock futures[2] ("Triple Witching Activity").

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[1]For example, a subset of CNS participants have CNS activity spikes on days associated with the exercise of equity options and equity futures positions in the cash market – so-called Triple-Witching activity days. The affected days are: (i) the day(s) on which CNS transactions deemed to be Triple-Witching-related novate (i.e., value date minus one); and, (ii) the day on which CNS outstanding positions deemed to be Triple-Witching-related are eligible to settle (i.e., value date).

[2]Currently, CNS Participants identified as having Triple Witching Activity are only required to post an *estimate* of the CNS Participant Fund collateral requirement prior to the date the corresponding positions are novated and guaranteed by the CNS service.

CNS transactions are novated on value date minus one and, as a result, Triple Witching Activity impacts CNS outstanding position volumes, and the size of the CNS Default Fund, 8 days a year – these 8 days include the day the positions are scheduled to settle [1] (i.e., the third Friday of the last month of every quarter) and the day prior to that settlement day (due to the novation of trades submitted for CNS settlement on value date minus one).

CDS uses a volatility threshold to determine whether a CNS participant had Triple Witching Activity. A participant will be deemed to have Triple Witching Activity when the day-over-day increase in that participant's contribution to the CNS Participant Fund is greater than or equal to (≥) 100% of that participant's contribution on the day such trading activity is first guaranteed by CNS (i.e., the corresponding value date minus one).

To determine the scale of the residual stress-test losses used to calculate the Default Fund, the residual profit, or the residual loss, resulting from unwinding each day's CNS outstanding positions is calculated for every participant for every day of the look-back period, using all of the stress-test scenarios, and net of the market value of the CNS collateral.

The Default Fund is then calculated to collateralize the largest of the daily residual stress-test losses over the lookback period.

The daily residual stress-test profits and losses are calculated based on the following inputs:

- The post stress-test profit from, or cost of unwinding, a participant's CNS outstanding positions on that day, plus CDS mark-to-market payments owing;
- The post stress-test value of the lesser of: (a) a participant's CNS Participant Fund pledged collateral, and (b) the CNS Participant Fund collateral fund requirement on that day;
- The daily sum of items #1 and #2, above, for every stress-test scenario, consisting of either the daily residual stress-test profit or the daily residual stress-test loss.

The CNS Default Fund collateralizes, on a mutualized basis, the risk associated with CNS Participants' outstanding positions that would result in the *largest credit risk under extreme, but plausible, market conditions*; the CNS Default Fund allocates the collateral requirements on a pro-rata basis, taking account of the cumulative CNS Participant Fund collateral requirements, over the look-back period, for those business days associated with either of Tier 1 or Tier 2 activity.

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[1] Otherwise commonly known as "value date".

Tier 1

The largest residual stress-test loss of the CNS outstanding positions in Tier 1 (as defined above) is used to calculate the size of the CNS Default Fund for all days in the quarter which do not have associated Triple Witching Activity, and are re-based monthly. The largest Tier 1 residual stress-test loss of the CNS Default Fund is then allocated amongst all CNS Service participants according to their pro rata share of the cumulative CNS Participant Fund collateral requirement over the look-back period for those days, and for participants with Tier 1 CNS outstanding positions.[1]

CDS's monthly review of the size of the Default Fund will advise CNS participants of any changes to their Tier 1 Default Fund collateral requirement required to ensure the Default Fund remains Cover-1. Tier 1 Default Fund requirements will be enforced for all CNS participants throughout the month (subject to intra-month re-sizing – see below).

Tier 2

The difference between the largest residual stress-test loss of the CNS outstanding positions contained in Tier 2, and the largest residual stress-test loss of the CNS outstanding positions in Tier 1, is allocated against those CNS participants having Triple Witching Activity on Triple Witching Activity days (i.e., the day Triple Witching trades are novated by CNS, and the next day (value date), when such trades are first eligible to settle).

Tier 2 Default Collateral requirements will be allocated incrementally to, and in addition to, the Tier 1 allocation – and only against CNS participants identified as having Triple Witching Activity – the incremental collateral will be deemed to be due on the day prior to the novation of that month's Triple Witching Activity.

The incremental Tier 2 Default Fund collateral requirement is based on a participant's pro-rata share of the cumulative CNS Participant Fund collateral requirement on Triple Witching Activity days during the lookback period, and across all CNS Service participants identified as having Triple Witching Activity during that period. [2]

[1]For those participants not having Triple Witching Activity, the sum of their CNS Participant Fund collateral requirements on each day in the lookback period forms the basis for determining their pro rata share. Alternatively, for those participants having Triple Witching Activity the allocation is based on the sum of their CNS Participant Fund collateral requirements for all days in the lookback period e*xcluding those 8 days deemed to be the Triple Witching days of the lookback period*.

[2]Eight days every year – for every quarter the day Triple Witching trades reach value date minus one (i.e., the day they are novated) and on their value date (the day they are first eligible to settle).

CDS's monthly review of the size of the CNS Default Fund will advise CNS participants of any revisions to their Tier 2 Default Fund collateral requirement. Tier 2 collateral requirements will remain in effect for a period of 5 – 10 business days, subject to the affected participants' CNS Participant Fund collateral requirement returning to a level similar to that which existed prior to the novation of that month's Triple Witching Activity.

Regularly Scheduled Review of CNS Default Fund Size and Allocation Base

The size of the Default Fund will be based on a look-back period of one (1) year, and will be subject to scheduled monthly reviews.

The rebasing of the allocation of the collateral requirements of the Default Fund amongst participants will be also be done monthly – concurrent with the review of the size of the Default Fund and will be based on a one (1) year look-back period.

Intra-month Monitoring

Daily residual stress-test profits and losses will be calculated every business day between the regularly scheduled monthly reviews of the Default Fund size to ensure that the Default Fund remains Cover-1 compliant intra-month.

CDS Risk Management monitors daily residual stress-test losses intra-month. In the event that an intra-month residual stress-test loss (in either the non-Triple Witching or Triple Witching days) exceeds the Tier 1 and/or Tier 2 residual stress losses used to calculate the size of the Default Fund, CDS Risk Management will make an intra-month Default Fund collateral call against both Tier 1 and Tier 2 participants according to the following criteria and thresholds:

1. Single CNS Participant Cover-1 breach:
   - Targeted collateral call to the CNS Participant responsible for the breach
2. Two CNS Participant Cover-1 breach & both breaches being individually less than 10% of CNS Default Fund:
   - Targeted collateral call to those CNS Participants responsible for the breach
3. Two CNS Participant Cover-1 breach & either of the individual breaches being greater than 10% of CNS Default Fund:
   - Allocation to all CNS Participants of the new Cover-1 amount
4. More than two CNS Participants breaches
   - Allocation to all CNS Participants of the new Cover-1 amount

Examples:

1. If an intra-month stress-test loss exceeding the stress-test loss used to calculate the size of Tier 1 of the Default Fund, on a non-Triple Witching day, the above calls will be made when additional collateral is required for either: (a) the Tier 1 collateral requirement to remain Cover-1 - for both (1) and (2); or (b) on the new Tier 1 amount across all CNS service Participants – for both (3) and (4).

2. If an intra-month stress-test loss on a Triple Witching day occurs, the above calls will be made when additional collateral is required for either: (a) the Tier 2 collateral requirement to remain Cover-1 – for both (1) and (2); or (b), on the new tier 2 amount across all CNS Service participants – for both (3) and (4).

In all instances, the allocation is based on the year-to-date lookback period.

16.2 Determining diversification eligibility

For a security to be eligible for diversification, it must have at least 90 days of price history and sufficient trading volumes. IRMS uses liquidity to determine a security's holding period and whether it is eligible for diversification. The holding period is the number of days that CDS estimates it might take to execute the close-out transactions for CNS positions, both outstanding and value-dated. The maximum holding period that can be applied to a security is 10 days. The criteria used to determine the liquidity of a security is based on trading volumes and percentage of trading days as indicated in the table below.

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Less than typical	>=10,000 shares	>=50%	5 days	Yes
Illiquid	>=0	>=10%	10 days	No

If a security is classified as illiquid, it is not eligible for diversification and is assigned a 10-day holding period. If the security has less than 10 per cent trading days in last 260 days, it also receives a 100 per cent haircut.