



**CIRCULAR**

CIR/MRD/DRMNP/25/2014

August 27, 2014

To  
All recognized Clearing Corporations/Stock Exchanges

Dear Sir / Madam,

**Sub: Core Settlement Guarantee Fund, Default Waterfall and Stress Test**

- 1) Vide circular no. SMD/POLICY/SGF/CIR-13/97 dated June 09, 1997 SEBI prescribed the "Guidelines for Settlement Guarantee Fund (SGF) at Stock Exchanges", which, inter-alia, covered criteria for corpus of the fund, contribution to the fund, management of the fund, access to / usage of the fund and recoupment of the fund corpus.
- 2) After an extensive study on the structure of Indian securities market, which has undergone significant structural changes in the past decade, SEBI notified the Securities Contracts (Regulation) (Stock Exchanges and Clearing Corporations) Regulations, 2012, (SECC) on June 20, 2012 to regulate recognition, ownership and governance in stock exchanges and clearing corporations. The SECC Regulations, inter-alia, state the following:

**39 Fund to guarantee settlement of trades**

*(1) Every recognised clearing corporation shall establish and maintain a Fund by whatever name called, for each segment, to guarantee the settlement of trades executed in respective segment of a recognised stock exchange.*

*(2) . . .*

*(3) . . .*

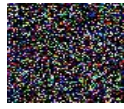
*(4) . . .*

*(5) In the event of a clearing member failing to honour his settlement obligations, the Fund shall be utilized to complete the settlement.*

*(6) The corpus of the Fund shall be adequate to meet the settlement obligations arising on account of failure of clearing member(s).*

*(7) The sufficiency of the corpus of the Fund shall be tested by way of periodic stress tests, in the manner specified by the Board.*

- 3) In order to promote and sustain an efficient and robust global financial infrastructure, the Committee on Payments and Settlement Systems (CPSS) and the International Organization of Securities Commissions (IOSCO) updated the standards applicable for systemically important financial market infrastructures (central counterparties, payment systems, trade repositories and securities settlement systems) with the Principles for Financial Market Infrastructures (PFMIs).



## भारतीय प्रतिभूति और विनियम बोर्ड Securities and Exchange Board of India

SEBI as a member of IOSCO is committed to the adoption and implementation of the new CPSS-IOSCO standards of PFMI. As required under PFMI, to provide greater legal basis for settlement finality, netting and rights of FMIs over collateral, Securities Contracts (Regulation) (Stock Exchanges and Clearing Corporations) (Amendment) Regulations, 2013 were notified on September 02, 2013. Vide circular dated September 04, 2013, SEBI required FMIs under its regulatory purview to comply with the PFMI applicable to them. The FMI principles, inter-alia, include standards regarding participant default rules and procedures, minimum financial resources to cover credit and liquidity exposure of central counterparties and testing (stress testing, reverse stress testing, back testing).

- 4) Based on deliberations in the Risk Management Review Committee of SEBI and further discussions with clearing corporations, stock exchanges and market participants, it has been decided to issue granular norms related to core settlement guarantee fund, stress testing and default procedures which would bring greater clarity and uniformity as well as align the same with international best practices while enhancing the robustness of the present risk management system in the clearing corporations. These norms are aimed at achieving mainly the following objectives:
  - a) create a core fund (called core settlement guarantee fund), within the SGF, against which no exposure is given and which is readily and unconditionally available to meet settlement obligations of clearing corporation in case of clearing member(s) failing to honour settlement obligation,
  - b) align stress testing practices of clearing corporations with FMI principles (norms for stress testing for credit risk, stress testing for liquidity risk and reverse stress testing including frequency and scenarios),
  - c) capture in stress testing, the risk due to possible default in institutional trades,
  - d) harmonise default waterfalls across clearing corporations
  - e) limit the liability of non-defaulting members in view of the Basel capital adequacy requirements for exposure towards Central Counterparties (CCPs),
  - f) ring-fence each segment of clearing corporation from defaults in other segments, and
  - g) bring in uniformity in the stress testing and the risk management practices of different clearing corporations especially with regard to the default of members.

### **Core Settlement Guarantee Fund (Core SGF)**

#### **Objective of Core SGF**

- 5) Clearing Corporation (CC) shall have a fund called Core SGF for each segment of each Recognised Stock Exchange (SE) to guarantee the settlement of trades executed in respective segment of the SE. In the event of a clearing member (member) failing to honour settlement commitments, the Core SGF shall be used to fulfill the obligations of that member and complete the settlement without affecting the normal settlement process.



### Corpus of Core SGF

6) The corpus of the fund should be adequate to meet out all the contingencies arising on account of failure of any member(s). The risk or liability to the fund depends on various factors such as trade volume, delivery percentage, maximum settlement liability of the members, the history of defaults, capital adequacy of the members, the degree of safety measures employed by the CC/SE etc. A fixed formula, therefore, cannot be prescribed to estimate the risk or liability of the fund. However, in order to assess the fair quantum of the corpus of Core SGF, CC should consider the following factors:

- Risk management system in force
- Current and projected volume/turnover to be cleared and settled by the CC on guaranteed basis
- Track record of defaults of members (number of defaults, amount in default)

7) However, *Minimum Required Corpus of Core SGF (MRC)* for each segment of each stock exchange shall be subject to the following:

- i) The MRC shall be fixed for a month.
- ii) By 15th of every month, CC shall review and determine the MRC for next month based on the results of daily stress tests of the preceding month. (For example, by 15th February, CC shall determine MRC for March based on results of various stress tests conducted in January). CC shall also review and determine by 15th of every month, the adequacy of contributions made by various contributors and any further contributions to the Core SGF required to be made by various contributors (as per clause 8) for the next month.
- iii) For every day of the preceding month (i.e., January as per example in (ii) above), uncovered loss numbers shall be estimated by the various stress tests for credit risk conducted by the CC for the segment (as per clause 18) and highest of such numbers shall be taken as worst case loss number for the day.
- iv) Average of all the daily worst case loss numbers determined in (iii) above shall be calculated.
- v) The MRC for next month (i.e., March as per example in (ii) above) shall be *higher of* the average arrived in at step iv above and the segment MRC as per previous review (i.e., review done on 15th January for the month of February).

### Contribution to Core SGF

8) At any point of time, the contributions of various contributors to Core SGF of any segment shall be as follows:



## भारतीय प्रतिभूति और विनिमय बोर्ड Securities and Exchange Board of India

- a. Clearing Corporation contribution: CC contribution to Core SGF shall be at least 50% of the MRC. CC shall make this contribution from its own funds. CC contribution to core SGFs shall be considered as part of its net worth.
- b. Stock Exchange contribution: Stock Exchange contribution to Core SGF shall be at least 25% of the MRC (can be adjusted against transfer of profit by Stock Exchange as per Regulation 33 of SECC Regulations, which may be reviewed in view of these guidelines).
- c. Clearing Member primary contribution: If the CC wishes, it can seek risk based contribution from Clearing Members (CMs) of the segment (including custodial clearing members) to the Core SGF subject to the following conditions:
  - that total contribution from CMs shall not be more than 25% of the MRC,
  - that no exposure shall be available on Core SGF contribution of any CM (exposure-free collateral of CM available with CC can be considered towards Core SGF contribution of CM), and
  - that required contributions of individual CMs shall be pro-rata based on the risk they bring to the system.

CC shall have the flexibility to collect CM primary contribution either upfront or staggered over a period of time. In case of staggered contribution, the remaining balance shall be met by CC to ensure adequacy of total Core SGF corpus at all times. Such CC contribution shall be available to CC for withdrawal as and when further contributions from CMs are received.

The above prescribed limits of contribution by CC, SE and CMs may be reviewed by SEBI from time to time considering the prevailing market conditions.

- 9) Any penalties levied by CC (as per Regulation 34 of SECC Regulations) shall be credited to Core SGF corpus.
- 10) Interest on cash contribution to Core SGF shall also accrue to the Core SGF and pro-rata attributed to the contributors in proportion to their cash contribution.
- 11) CC shall ordinarily accept cash collateral for Core SGF contribution. However, CC may accept CM contribution in the form of bank FDs too. CC shall adhere to specific guidance which may be issued by SEBI from time to time in this regard.

### **Management of Core SGF**

- 12) The Defaulter's Committee/SGF utilization Committee of the Clearing Corporation shall manage the Core SGF.



## भारतीय प्रतिभूति और विनिमय बोर्ड Securities and Exchange Board of India

The CCs shall follow prudential norms of Investment policy for Core SGF corpus and establish and implement policies and procedures to ensure that Core SGF corpus is invested in highly liquid financial instruments with minimal market and credit risk and is capable of being liquidated rapidly with minimal adverse price effect.

The instruments in which investments may broadly be made are Fixed Deposit with Banks (only those banks which have a net worth of more than INR 500 Crores and are rated A1 (or A1+) or equivalent, , Treasury Bills, Government Securities and money market/liquid mutual funds subject to suitable transaction/investment limits and monitoring of the same. The CCs shall further ensure that the financial instruments in which the Core SGF corpus is invested remain sufficiently diversified at all times.

SEBI may prescribe the investment norms in this regard from time to time.

### **Access to Core SGF**

- 13) CC may utilise the Core SGF in the event of a failure of member(s) to honour settlement commitment.

### **Further contribution to / Recoupment of Core SGF**

- 14) Requisite contributions to Core SGF by various contributors (as per clauses 7 and 8) for any month shall be made by the contributors before start of the month.

In the event of usage of Core SGF during a calendar month, contributors shall, as per usage of their individual contribution, immediately replenish the Core SGF to MRC.

In case there is failure on part of some contributor(s) to replenish its (their) contribution, same shall be immediately met, on a temporary basis during the month, in the following order:

- (i) By CC
- (ii) By SE

### **Review of Core SGF**

- 15) The monthly review results shall be communicated to the Risk Management Committee and the Governing Board of the Clearing Corporation. The exception reporting shall be made to SEBI detailing the outcome of the review by the CC Governing Board, including steps taken to enhance the Core SGF.

### **Default waterfall**

- 16) The default waterfall of CC for any segment shall generally follow the following order –



## भारतीय प्रतिभूति और विनिमय बोर्ड Securities and Exchange Board of India

- I. monies of defaulting member (including defaulting member's primary contribution to Core SGF(s) and excess monies of defaulter in other segments).
- II. Insurance, if any.
- III. CC resources (equal to 5% of the segment MRC).
- IV. Core SGF of the segment in the following order:
  - i. Penalties
  - ii. CC contribution to the extent of at least 25% of the segment MRC
  - iii. Remaining Core SGF: CC contribution, Stock Exchange contribution and non-defaulting members' primary contribution to Core SGF on pro-rata basis.
- V. Proportion of remaining CC resources (excluding CC contribution to core SGFs of other segments and INR 100 Crore) equal to ratio of segment MRC to sum of MRCs of all segments.\*
- VI. CC/SE contribution to Core SGFs of other segments (after meeting obligations of those segments) and remaining CC resources to that extent as approved by SEBI.
- VII. Capped additional contribution by non-defaulting members of the segment.\*\*
- VIII. Any remaining loss to be covered by way of pro-rata haircut to payouts.\*\*\*

\* INR 100 Crore to be excluded only when remaining CC resources (excluding CC contribution to core SGFs of other segments) are more than INR 100 Crore.

\*\*CC shall limit the liability of non-defaulting members towards additional contribution to a multiple of their required primary contribution to Core SGF and the framework regarding the same should be disclosed. In case of shortfall in recovery of assessed amounts from non-defaulting members, further loss can be allocated to layer 'VI' with approval of SEBI.

\*\*\*In case loss allocation is effected through haircut to payouts, any subsequent usage of funds shall be with prior SEBI approval. Further, any exit by CC post using this layer shall be as per the terms decided by SEBI in public interest.

### **Stress testing and back testing**

- 17) CC shall effectively measure, monitor, and manage its credit exposures to its participants and those arising from its payment, clearing, and settlement processes.
- 18) **Stress test for credit risk:** CC shall carry out daily stress testing for credit risk using at least the standardized stress testing methodology prescribed for each segment viz. equity, equity derivatives and currency derivatives in the Annexure. Apart from the stress scenarios prescribed for cash market and derivatives market segments in the Annexure, CCs shall also develop own scenarios for a variety of 'extreme but plausible market conditions' (in terms of both defaulters' positions and possible price changes in liquidation periods, including the risk that liquidating such positions could have an impact on the market) and carry out stress testing using



self-developed scenarios. Such scenarios should include relevant peak historic price volatilities, shifts in other market factors such as price determinants and yield curves, multiple defaults over various time horizons and a spectrum of forward-looking stress scenarios in a variety of extreme but plausible market conditions.

Also, for products for which specific stress testing methodology has not been prescribed in this circular, CCs shall develop extreme but plausible market scenarios (both hypothetical and historical) and carry out stress tests based on such scenarios and enhance the corpus of Core Settlement Guarantee Fund/reserves, as required by the results of such stress tests.

- 19) **Liquidity stress test and adequacy of liquidity arrangements:** CC shall ensure that it maintains sufficient liquid resources to manage liquidity risks from members, settlement banks and those generated by its investment policy. CC shall daily test the adequacy of its liquidity arrangements in order to ensure that its liquid resources are adequate to meet simultaneous default of at least two clearing members and their associates that would generate the largest aggregate liquidity obligation for the CC in extreme but plausible market conditions and compare such obligation with the resources mentioned hereunder:
  - a) Cash
  - b) Committed lines of credit available to CC
- 20) **Reverse stress test:** CC shall periodically carry out reverse stress tests designed to identify under which market conditions and under what scenarios the combination of its margins, Core SGF and other financial resources prove insufficient to meet its obligations (e.g. simultaneous default of top N members or N% movement in price of top 2 scrips by turnover or 20% movement in price of top N scrips by turnover etc.)
- 21) **Back testing for adequacy of margins:** CC shall daily conduct back testing of the margins collected vis-à-vis the actual price changes for the contracts being cleared and settled in every segment to assess appropriateness of its margining models.
- 22) **Adequacy of financial resources:** CC shall ensure that it maintains sufficient financial resources to cover a wide range of potential stress scenarios that should include, but not be limited to, the default of the two participants and their associates that would potentially cause the largest aggregate credit exposure to the CC in extreme but plausible market conditions. Thus, CC shall continuously monitor the adequacy of financial resources (as available in its default waterfall) against the uncovered loss estimated by the various stress tests conducted by the CC and take steps to beef up the same in case of shortfall.
- 23) On at least a monthly basis, CC shall perform a comprehensive and thorough analysis of stress testing scenarios, models, and underlying parameters and



**भारतीय प्रतिभूति और विनिमय बोर्ड**  
**Securities and Exchange Board of India**

assumptions used to ensure they are appropriate for determining the CCP's required level of default protection in light of current and evolving market conditions. CC shall perform this analysis of stress testing more frequently when the products cleared or markets served display high volatility, become less liquid, or when the size or concentration of positions held by a CC's participants increases significantly. A full validation of CC's risk-management model shall be performed at least annually.

- 24) The results of tests carried out as per clauses 18, 19, 20, 21 and 22 above and review conducted as per clause 23 shall be monitored by the Risk Management Committee of the CC and the same should be communicated for discussion and review by the Board of the CC.
- 25) Clearing corporations and Stock Exchanges are directed to:
- take necessary steps to put in place systems for implementation of the circular, including necessary amendments to the relevant bye-laws, rules and regulations;
  - bring the provisions of this circular to the notice of their members and also disseminate the same on its website;
  - make the following details available on its website:
    - Policy on composition and contributions to be made to the Core SGF;
    - Investment policy for Core SGF;
    - Default waterfall for each segment along with the quantum of resources available in each layer of default waterfall;
  - implement the provisions of this circular by December 1, 2014 and communicate to SEBI the status of implementation.
- 26) This circular is being issued in exercise of powers conferred under Section 11 (1) of the Securities and Exchange Board of India Act, 1992 to protect the interests of investors in securities and to promote the development of, and to regulate, the securities market.
- 27) This circular is available on SEBI website at [www.sebi.gov.in](http://www.sebi.gov.in), under the category "Circulars".

Yours faithfully,

**Shashi Kumar**  
**General Manager**  
**Division of Risk Management and New Products**  
**Market Regulation Department**  
[shashikumarv@sebi.gov.in](mailto:shashikumarv@sebi.gov.in)

**Encl: as above**





## Annexure

### Standard Stress Test Scenarios

Day of Stress test – 'S' day

#### Cash Market Segment:

##### Scenario 1: Default by 2 Brokers

1. CC shall compute the 'Cumulative Funds pay-in', 'Cumulative Funds pay-out', 'Cumulative Securities pay-in' and 'Cumulative Securities pay-out' of all members as on the end of pay-in deadline on the 'S' day. For this purpose cumulative pay-in/payout of each member's trades (shall include non-institutional trades as well as 2X% by value of those institutional trades which have not yet been confirmed by the custodian) undertaken on 'S-2' day, 'S-1' day and on 'S' day till the pay-in deadline shall be considered. (X being the highest daily % by value of custodial rejects in the previous 12 months)
2. Any early pay-in of funds/securities shall be ignored.
3. It shall be assumed that each clearing member would default in meeting its 'cumulative funds pay-in' and 'cumulative securities pay-in' obligations.
4. **Loss:**
  - I. Securities pay-in failure of the member: It shall be assumed that the failure to bring in securities would result in financial close-out and the clearing corporation would suffer a loss of 20% (at the minimum) of the value of such securities pay-in obligation.
  - II. Funds pay-in obligation failure of the member: The assumed loss on liquidation of securities that would have been paid-out to the defaulting member shall be –
    - a. Group 1 securities – 20%
    - b. Group 2 & 3 securities – 20% scaled up by root of 3.
  - III. Gross loss due to member = (Funds pay-in) + (120% of securities pay-in) - (funds pay-out) - (liquidation value of securities pay-out)
5. **Coverage:**

Clearing corporation shall calculate the gross loss (as per 4 above) for each clearing member and assess that against the defaulting clearing members' **required margins** (In case of early pay-in, those margins which would have been applicable had the early pay-in was not made, to be considered. Excess collateral, if any, shall be ignored) and other mandatory deposits to find the credit exposure of CC towards each member. Equity scrips as collateral, if any, shall be valued with minimum 20% haircut.
6. Clearing Corporation shall calculate the total credit exposure due to simultaneous default of at least two clearing members (based on residual loss calculated in 5 above) and their associates causing highest credit exposure



**Scenario 2: Default by 1 Custodian**

1. CC shall compute the 'Cumulative Funds pay-in', 'Cumulative Funds pay-out', 'Cumulative Securities pay-in' and 'Cumulative Securities pay-out' of all custodians as on the end of pay-in deadline on the 'S' day. For this purpose cumulative pay-in/payout of each custodian's trades (shall include those trades which have been confirmed by the custodian) undertaken on 'S-2' day, 'S-1' day and on 'S' day till the pay-in deadline shall be considered.
2. Any early pay-in of funds/securities shall be ignored.
3. It shall be assumed that each custodian would default in meeting its 'cumulative funds pay-in' and 'cumulative securities pay-in' obligation.
4. **Loss:**
  - I. Securities pay-in failure of the member: It shall be assumed that the failure to bring in securities would result in financial close-out and the clearing corporation would suffer a loss of 20% (at the minimum) of the value of such securities pay-in obligation.
  - II. Funds pay-in obligation failure of the member: The assumed loss on liquidation of securities that would have been paid-out to the defaulting member shall be –
    - a. Group 1 securities – 20%
    - b. Group 2 & 3 securities – 20% scaled up by root of 3.
  - III. Gross loss due to member = (Funds pay-in) + (120% of securities pay-in) - (funds pay-out) - (liquidation value of securities pay-out)
5. **Coverage:**

Clearing corporation shall calculate the gross loss (as per 4 above) for each custodian and assess that against the defaulting custodians' **required margins** (In case of early pay-in, those margins which would have been applicable had the early pay-in was not made, to be considered. Excess collateral, if any, shall be ignored) and other mandatory deposits to find the credit exposure of CC towards each custodian. Equity scrips as collateral, if any, shall be valued with minimum 20% haircut.
6. Clearing Corporation shall calculate the total credit exposure due to default of the custodian (based on residual loss calculated in 5 above) causing highest credit exposure.

**Equity Derivatives and Currency Derivatives segments:**

The loss on closing out of client/proprietary positions shall be as per the following scenarios:

Hypothetical

Price movement in respect of each underlying to the extent of 1.5 times the normal price scan range (PSR) and 1.5 times the normal volatility scan range shall be considered.

**Scenario 1:** Underlying price increasing by 1.5 PSR, volatility increasing by 1.5 VSR.

**Scenario 2:** Underlying price decreasing by 1.5 PSR, volatility increasing by 1.5 VSR.



Historical:

Price movement in respect of each underlying over the last 10 years to be considered. The maximum percentage price movement shall be applied to the price on the day for which the stress test is being done:

**Scenario 3:** Maximum percentage rise over a period of 1 day

**Scenario 4:** Maximum percentage fall over a period of 1 day

All open positions shall be assumed to be squared up at the theoretical price corresponding to the revised prices of the underlying in each of the scenarios 1, 2, 3 and 4. The net profit/loss in squaring off the portfolio is to be calculated under each of the scenarios 1, 2, 3 and 4.

For each clearing member, the credit exposure to CC shall be calculated as follows:

- a) The time of stress test shall be the time of pay-in deadline.
- b) It shall be assumed that clearing member will default at the time of pay-in.
- c) Loss shall be calculated at client portfolio level.
- d) For each client, residual loss shall be equal to → (loss due to close-out of client positions – margin supporting client positions)
- e) All residual losses (residual profits to be ignored) for all clients shall be grossed to compute total residual losses due to client positions.
- f) Loss due to close-out of proprietary positions shall be considered.
- g) Loss at (e) and loss at (f) and the net pay-in/pay-out requirement of the clearing member (pay-in and pay-out pertaining to requirements of both S-1 and S (till pay-in time) day to be reckoned) shall be assessed against required margins (excluding margin supporting client positions and excess collateral, if any) and other mandatory deposits of defaulting member to calculate credit exposure of CC to the member. Equity scrips as collateral, if any, shall be valued with minimum 20% haircut.

For each of the scenarios 1, 2, 3 and 4, Clearing Corporation shall calculate the total credit exposure due to simultaneous default of at least 2 clearing members (and their associates) causing highest credit exposure.