CHAPTER 2: TRADING SOFTWARE AND TECHNOLOGY

1. INTERNET TRADING

1.1. Conditions to be met by Broker for providing Internet Based Trading Service[1]

1.1.1. To provide Internet Based Trading Service the broker will be required to apply to the respective stock exchange for a formal permission. The stock exchange should grant approval or reject the application as the case may be, and communicate its decision to the member within 30 calendar days of the date of completed application submitted to the exchange.

1.1.2. However before giving permission to broker to start internet based services, stock exchange shall ensure that the broker meets the minimum conditions/ criteria mentioned in this Master Circular. The criteria are mentioned as below:

1.1.2.1. Net worth Requirement

The broker must have a minimum net worth of Rs.50 lacs if the broker is providing the Internet based facility on his own. However, if some brokers collectively approach a service provider for providing the internet trading facility, net worth criteria as stipulated by the stock exchange will apply. The net worth shall be computed in the manner as follows:

- Capital + Free Reserves
- Less non-allowable assets viz.,
    a) Fixed assets
    b) Pledged securities
    c) Member's card
    d) Non-allowable securities (unlisted securities)
    e) Bad deliveries
    f) Doubtful debts and advances*
    g) Prepaid expenses, losses
    h) Intangible assets
    i) 30% of marketable securities

* Explanation – Includes debts/advances overdue for more than three months or given to associates.

1.1.2.2. Operational and System Requirements:

[1] Circular No. SMDRP/POLICY/CIR- 06/2000 dated January 31, 2000

1.1.2.2.1. **Operational Integrity** – The Stock Exchange must ensure that the system used by the broker has provision for security, reliability and confidentiality of data through use of encryption technology. (Basic minimum security standards are specified in following paras). The Stock Exchange must also ensure that records maintained in electronic form by the broker are not susceptible to manipulation.

1.1.2.2.2. **System Capacity -** The Stock Exchange must ensure that the brokers maintain adequate backup systems and data storage capacity. The Stock Exchange must also ensure that the brokers have adequate system capacity for handling data transfer, and arranged for alternative means of communications in case of Internet link failure.

1.1.2.2.3. **Qualified Personnel -** The Stock Exchange must lay down the minimum qualification for personnel to ensure that the broker has suitably qualified and adequate personnel to handle communication including trading instructions as well as other back office work which is likely to increase because of higher volumes.

1.1.2.2.4. **Written Procedures - Stock Exchange must develop uniform written** procedures to handle contingency situations and for review of incoming and outgoing electronic correspondence.

1.1.2.2.5. **Signature Verification/ Authentication -** It is desirable that participants use authentication technologies. For this purpose, it should be mandatory for participants to use certification agencies as and when notified by Government / SEBI. They should also clearly specify when manual signatures would be required.

1.1.2.3. **Client Broker Relationship**

1.1.2.3.1. **Know Your Client -** The Stock Exchange must ensure that brokers comply with all requirements of "Know Your Client" and have sufficient, verifiable information about clients, which would facilitate risk evaluation of clients.

1.1.2.3.2. **Broker-Client Agreement -** Brokers must enter into an agreement with clients spelling out all obligations and rights. This agreement should also include inter alia, the minimum service standards to be maintained by the broker for such services specified by SEBI/Exchanges for the Internet based trading from time to time. Exchanges shall prepare a model

agreement for this purpose. The broker's agreement with clients should not have any clause that is less stringent/contrary to the conditions stipulated in the model agreement prepared by the Exchanges for this purpose.

1.1.2.3.3. **Investor Information -** The broker web site providing the internet based trading facility should contain information meant for investor protection such as rules and regulations affecting client broker relationship, arbitration rules, investor protection rules etc. The broker web site providing the Internet based trading facility should also provide and display prominently, hyper link to the web site/ page on the web site of the relevant stock exchange(s) displaying rules/ regulations/circulars. Ticker/quote/order book displayed on the web-site of the broker should display the time stamp as well as the source of such information against the given information.

1.1.2.3.4. **Order/Trade Confirmation -** Order/Trade confirmation should also be sent to the investor through email at client's discretion at the time period specified by the client in addition to the other mode of display of such confirmations on real time basis on the broker web site. The investor should be allowed to specify the time interval on the web site itself within which he would like to receive this information through email. Facility for reconfirmation of orders which are larger than that specified by the member's risk management system should be provided on the internet based system.

1.1.2.3.5. **Handling Complaints by Investors -** Exchanges should monitor complaints from investors regarding service provided by brokers to ensure a minimum level of service. Exchanges should have separate cell specifically to handle Internet trading related complaints and should also have facility for on-line registration of complaints on their web-site.

1.1.2.4. **Risk Management**

1.1.2.4.1. Exchanges must ensure that brokers have a system-based control on the trading limits of clients, and exposures taken by clients. Brokers must set pre-defined limits on the exposure and turnover of each client.

1.1.2.4.2. The broker systems should be capable of assessing the risk of the client as soon as the order comes in. The client should be informed of acceptance/rejection of the order within a reasonable period. In case system based control rejects an order because of client having exceeded

limits etc., the broker system may have a review and release facility to allow the order to pass through.

1.1.2.4.3. Reports on margin requirements, payment and delivery obligations, etc. should be informed to the client through the system.

1.1.2.4.3.1. **Contract Notes** - Contract notes must be issued to clients as per existing regulations, within 24 hours of the trade execution.

1.1.2.4.3.2. **Cross Trades** - As in the case of existing system, brokers using Internet based systems for routing client orders will not be allowed to cross trades of their clients with each other. All orders must be offered to the market for matching.

1.1.2.4.3.3. **Others –** The other criteria's mentioned deal with Network Security Protocols and Interface Standards, Network Security, Standards of Web Interface Protocols and System operations.

In addition to the requirements mentioned above, all existing obligations of the broker as per current regulations will continue without changes.

1.2. Securities Trading through Wireless medium on Wireless Application Protocol (WAP) platform[2]

1.2.1. A broker providing stock trading through WAP must be a SEBI registered broker who also has an Internet website which complies with all the requirements laid down by SEBI at Para 1.1 in this Master Circular. Further, some additional requirements are to be met by the broker for providing securities transaction through WAP, which are as follows:

1.2.1.1. Network Security

1.2.1.1.1. The break in data encryption at the WAP gateway server raises security issues. Until the shortcoming is addressed by WAP, the WAP server should be hosted by the broker itself and not by a third party.

1.2.1.1.2. Suitable firewalls should be installed between trading set-up directly connected to an Exchange trading system and the WAP server.

[2] Circular No. SMDRP/Policy/Cir-48/2000 dated October 11, 2000

1.2.1.1.3. WTLS (Wireless Transport Layer Security) level security or a higher level of security (as and when available) for wireless communication is mandatory for wireless transactions.

1.2.1.1.4. The WTLS encrypts data upto the WAP Gateway server. Transmission from the WAP Gateway server to the Internet server should be secured using Secured Socket Level Security, preferably with 128 bit encryption, for server access through Internet. Alternately, the WAP Gateway server and Internet server may be co-hosted. The server resource should not be shared for any other applications.

1.2.1.1.5. The following security measures applicable for fixed Internet based systems should be made mandatory:

1.2.1.1.5.1. User ID

1.2.1.1.5.2. First Level password (Private code)

1.2.1.1.5.3. Automatic expiry of passwords at the end of a reasonable duration. Reinitialize access on entering fresh passwords

1.2.1.1.5.4. All transaction logs with proper audit facilities to be maintained in the system.

1.2.1.1.6. Digitally signed transactions ensure client authentication and support non-repudiation. Digital certification should be mandatory for participants as and when certification agencies are notified by Government / SEBI.

1.2.1.1.7. In case of failure of the network, alternative means of communication such as telephone, Internet or e-mail should be available.

1.2.1.2. **Price Quotes/ Order/ Trade Confirmations**

1.2.1.2.1. Stock quotes should be time-stamped.

1.2.1.2.2. All orders and trades must be identified by a unique ID. Order confirmation must be provided to the user on submitting the order. Order modification/ cancellation facilities must also be provided. This may be provided using alternate protocols in case the same is not supported by WAP.

1.2.1.2.3. Trade confirmation should be provided to the user through e-mail and/or on the mobile phone.

1.2.1.3. **System operations**

1.2.1.3.1. Brokers should follow the similar logic/priorities used by the Exchange to treat client orders.

1.2.1.3.2. Orders/ trades placed through either fixed Internet or WAP system should be accessible from both systems.

1.2.1.3.3. Brokers should maintain all activities/ alerts log with audit trail facility.

1.2.1.3.4. Broker Web Server should have internally generated unique numbering for all client order/trades.

1.2.1.4. **Risk Management**

1.2.1.4.1. It is emphasised that risk management should be comprehensive and the risk management systems should take into account the overall positions of clients, irrespective of the medium of trading.

1.3. Securities Trading using Wireless Technology[3]

1.3.1. It has been decided that SEBI registered brokers who provide Internet Based Trading as specified by SEBI shall be eligible to provide securities trading using wireless technology. All relevant requirements applicable to internet based trading shall also be applicable to securities trading using wireless technology.

1.3.2. Securities Trading using Wireless technology shall include devices such as mobile phone, laptop with data card, etc, that use Internet Protocol (IP).

1.3.3. In addition, the stock exchange shall ensure that the broker complies with the following:

1.3.3.1. There shall be secure access, encryption and security of communication for internet based trading and securities trading using wireless technology. The policy and regulation of the Department of Telecommunications ("DOT") shall govern the level of encryption.

1.3.3.2. Adequate measures should be taken for user identification, authentication and access control using means such as user-id, passwords, smart cards, biometric devices or other reliable means, to prevent misuse of facility by unauthorized persons.

1.3.3.3. Unique identification number as given in case of internet based trading shall be made applicable for securities trading using wireless technology.

1.3.3.4. In case of failure of the wireless network, alternative means of communication for placing orders should be available.

1.3.3.5. Additional provisions specifying possible risks, responsibilities and liabilities associated with securities trading using wireless technology

[3] Circular No. CIR/MRD/DP/ 25/2010 dated August 27, 2010

should be incorporated in the Broker-Client agreement as an addendum or by bringing to the notice of clients, who are desirous of availing such facility, and taking their concurrence on the same.

1.3.3.6. As it may not be possible to give detailed information to the investor on a hand held device e.g. mobile phones, it may be ensured that minimum information may be given with addresses of the Internet web site/web page where detailed information would be available.

1.3.3.7. Order confirmation should be provided to the user on submitting the order. Order modification / cancellation facilities should also be provided. Trade confirmation should be provided to the user, along with history of trades for the day.

1.3.3.8. Session login details should not be stored on the devices used for internet based trading and securities trading using wireless technology.

1.3.3.9. Network security protocols and interface standards should be as per prevalent industry standards and sound audit trails should be available for all transactions conducted using wireless devices.

1.3.3.10. The broker's server routing orders to the exchange trading system shall be located in India.

1.3.3.11. Stock exchanges shall arrange for periodic systems audits of broker systems to ensure that requirements specified in the circulars are being met.

1.3.3.12. Stock exchange shall also include securities trading using wireless technology in their ongoing investor awareness and educational programme

1.4. Additional Requirements for Internet Based Trading (IBT) and Securities trading using Wireless Technology (STWT)[4]

1.4.1. The stock exchange shall ensure that the broker comply with the following:

1.4.1.1. The broker shall capture the IP (Internet Protocol) address (from where the orders are originating), for all IBT/ STWT orders.

1.4.1.2. The brokers system should have built-in high system availability to address any single point failure.

1.4.1.3. There should be secure end-to-end encryption for all data transmission between the client and the broker through a Secure Standardized Protocol. A procedure of mutual authentication between the client and the broker server should be implemented.

[4] Circular No. CIR/MRD/DP/08/2011 dated June 30, 2011

1.4.1.4. The broker system should have adequate safety features to ensure it is not susceptible to internal/ external attacks.

1.4.1.5. In case of failure of IBT/ STWT, the alternate channel of communication shall have adequate capabilities for client identification and authentication.

1.4.1.6. Two-factor authentication for login session may be implemented for all orders emanating using Internet Protocol. Public Key Infrastructure (PKI) based implementation using digital signatures, supported by one of the agencies certified by the government of India, is advisable. Further the two factors in the Two-factor authentication framework should not be same.

1.4.1.7. In case of no activity by the client, the system should provide for automatic trading session logout.

1.4.1.8. Further to the above, the following practice is advisable –

1.4.1.8.1. The back-up and restore systems implemented by the broker should be adequate to deliver sustained performance and high availability. The broker system should have on-site as well as remote site back-up capabilities.

2. DIRECT MARKET ACCESS FACILITY[5]

2.1. Direct Market Access ("DMA") is a facility which allows brokers to offer clients direct access to the exchange trading system through the broker's infrastructure without manual intervention by the broker. Some of the advantages offered by DMA are direct control of clients over orders, faster execution of client orders, reduced risk of errors associated with manual order entry, greater transparency, increased liquidity, lower impact costs for large orders, better audit trails and better use of hedging and arbitrage opportunities through the use of decision support tools / algorithms for trading.

2.2. While ensuring conformity with the provisions of the Securities Contracts (Regulation) Act, 1956 (42 of 1956), Stock Exchanges may facilitate Direct Market Access for investors subject to the following conditions:

2.2.1. Application for Direct Market Access (DMA) facility

2.2.1.1. Brokers interested to offer DMA facility shall apply to the respective stock exchanges giving details of the software and systems proposed to be used, which shall be duly certified by a Security Auditor as reliable.

2.2.1.2. The stock exchange should grant approval or reject the application as the case may be, and communicate its decision to the member within 30 calendar days of the date of completed application submitted to the exchange.

2.2.1.3. The stock exchange, before giving permission to brokers to offer DMA facility shall ensure the fulfillment of the conditions specified hereinafter.

2.2.2. Operational specifications

2.2.2.1. All DMA orders shall be routed to the exchange trading system through the broker's trading system. The broker's server routing DMA orders to the exchange trading system shall be located in India.

2.2.2.2. The broker should ensure sound audit trail for all DMA orders and trades, and be able to provide identification of actual user-id for all such orders and trades. The audit trail data should available for at least 5 years.

2.2.2.3. Exchanges should be able to identify and distinguish DMA orders and trades from other orders and trades. Exchanges shall maintain statistical

[5] Circular No. MRD/ DoP/SE/Cir- 7 /2008 dated April 03, 2008.

data on DMA trades and provide information on the same to SEBI on a need basis.

2.2.2.4. The DMA system shall have sufficient security features including password protection for the user ID, automatic expiry of passwords at the end of a reasonable duration, and re-initialisation of access on entering fresh passwords.

2.2.2.5. In case where the clients access the DMA server of the broker through a third party service provider, the password maintenance and authentication can be done either by the broker of by third party network service provider, so long as the exchange/broker ensures secured access and communication and a sound audit trail for all DMA orders/ trades. The authorized user and client details should be part of the order details received and authenticated at the DMA server of the broker.

2.2.2.6. Brokers should follow the similar logic/priorities used by the Exchange to treat DMA client orders. Brokers should maintain all activities/ alerts log with audit trail facility. The DMA Server should have internally generated unique numbering for all such client order/trades.

2.2.2.7. A systems audit of the DMA systems and software shall be periodically carried out by the broker as may be specified by the exchange and certificate in this regard shall be submitted to the exchange.

2.2.2.8. The exchanges and brokers should provide for adequate systems and procedures to handle the DMA trades.

2.2.3. **Terms and Conditions**[6]

2.2.3.1. Exchange shall specify from time to time the categories of investors to whom the DMA facility can be extended. Currently, this facility is available for institutional clients. Brokers shall specifically authorize clients or investment managers acting on behalf of clients for providing DMA facility, after fulfilling Know Your Client requirements and carrying out necessary due diligence. The broker shall maintain proper records of such due diligence.

2.2.3.2. In order to bring uniformity on the requirement of documentation for trading account opening process, the specific Broker – Client Agreement for the purpose of DMA shall be replaced with the "Terms and Conditions" document as specified at Annexure I. The "Terms and Conditions" shall be provided to the client or investment manager acting on behalf of a client (s)

[6] Circular No. CIR/MRD/DP/20/2012 dated August 02, 2012

for availing the DMA facility. In case the DMA facility provided by the stock broker is used by the client the paragraphs one to eighteen of Part A of Annexure I shall be applicable. In case the DMA facility provided by the stock broker is used by the client through an investment manager the paragraphs one to eighteen of Part B of Annexure I shall be applicable and additionally, the investment manager shall provide to the stock broker the details as specified at Annexure II.

2.2.4. **DMA Facility through Investment Manager**[7]

2.2.4.1. The facility of DMA provided by the stock broker shall be used by the client or an investment manager of the client. A SEBI registered entity shall be permitted to act as an investment manager on behalf of institutional clients. In case the facility of DMA is used by the client through an investment manager, the investment manager may execute the necessary documents on behalf of the client(s).

2.2.4.2. The exchange/ broker shall ensure that proper audit trails are available to establish identity of the ultimate client.

2.2.5. **Risk Management**

2.2.5.1. The broker shall ensure that trading limits/ exposure limits/ position limits are set for all DMA clients based on risk assessment, credit quality and available margins of the client. The broker system shall have appropriate authority levels to ensure that the limits can be set up only by persons authorized by the risk / compliance manager.

2.2.5.2. The broker shall ensure that all DMA orders are routed through electronic/automated risk management systems of the broker to carry out appropriate validations of all risk parameters including Quantity Limits, Price Range Checks, Order Value, and Credit Checks before the orders are released to the Exchange.

2.2.5.3. All DMA orders shall be subjected to the following limits:

2.2.5.3.1. Order quantity / order value limit in terms of price and quantity specified for the client.

2.2.5.3.2. All the position limits which are specified in the derivatives segment as applicable.

[7] Circular No. MRD/ DP/20/2012 dated August 02, 2012

2.2.5.3.3. Net position that can be outstanding so as to fully cover the risk emanating from the trades with the available margins of the specific client.

2.2.5.3.4. Appropriate limits for securities which are subject to limits on Foreign Portfolio Investors ("FPIs") as specified by the Reserve Bank of India ("RBI").

2.2.5.4. The broker may provide for additional risk management parameters as they may consider appropriate.

2.2.6. **Broker to be liable for DMA trades**

2.2.6.1. The broker shall be fully responsible and liable for all orders emanating through their DMA systems. It shall be the responsibility of the broker to ensure that only clients who fulfill the eligibility criteria are permitted to use the DMA facility.

2.2.7. **Cross Trades**

2.2.7.1. Brokers using DMA facility for routing client orders shall not be allowed to cross trades of their clients with each other. All orders must be offered to the market for matching.

2.2.8. **Other legal provisions**

2.2.8.1. In addition to the requirements mentioned above, all existing obligations of the broker as per current regulations and circulars will continue without change. Exchanges may also like to specify additional safeguards / conditions as they may deem fit for allowing DMA facilities to their brokers.

3. ELECTRONIC CONTRACT NOTE

3.1. Use of Digital Signature on Contract Notes[8]

Pursuant to the discussions in the Secondary Market Advisory Committee ("SMAC") and provisions of the Information Technology Act, 2000 ("IT Act, 2000") it is clarified that the brokers are allowed to issue contract notes authenticated by means of digital signatures provided that the broker has obtained digital signature certificate from Certifying Authority under the IT Act, 2000. Mode of confirmation by the client may be as specified in the agreement between the broker and the client.

3.2. Issuance of Contract Notes in electronic form[9]

The contract notes can be issued by the brokers in electronic form authenticated by means of digital signatures.

3.3. Electronic issuance of contract notes – Additional conditions[10]

All the members of stock exchanges who are desirous of issuing Electronic Contract Notes ("ECNs") to their clients shall comply with the following conditions:

3.3.1. Issuing ECNs when specifically consented

The digitally signed ECNs may be sent only to those clients who have opted to receive the contract notes in an electronic form, either in the Member – Client agreement / Tripartite agreement or by a separate letter. The mode of confirmation shall be as per the agreement entered into with the clients.

[8] Circular No. SMDRP/POLICY/CIR-56/00 dated December 15, 2000
[9] Circular No. SEBI/SMD/SE/15/2003/29/04 dated April 29, 2003
[10] Circular No. MRD/DoP/SE/Cir-20/2005 dated September 8, 2005

3.3.2. **Where to send ECNs**

The usual mode of delivery of ECNs to the clients shall be through e-mail. For this purpose, the client shall provide an appropriate e-mail account to the member which shall be made available at all times for such receipts of ECNs.

3.3.3. **Requirement of digital signature**

All ECNs sent through the e-mail shall be digitally signed, encrypted, non-tamperable and shall comply with the provisions of the IT Act, 2000. In case the ECN is sent through e-mail as an attachment, the attached file shall also be secured with the digital signature, encrypted and non-tamperable.

3.3.4. **Requirements for acknowledgement, proof of delivery, log report etc.**

3.3.4.1. Acknowledgement

The acknowledgement of the e-mail shall be retained by the member in a soft and non-tamperable form.

3.3.4.2. Proof of delivery

3.3.4.2.1. The proof of delivery i.e., log report generated by the system at the time of sending the contract notes shall be maintained by the member for the specified period under the extant regulations of SEBI/stock exchanges and shall be made available during inspection, audit, etc.

3.3.4.2.2. The member shall clearly communicate to the client in the agreement executed with the client for this purpose that non-receipt of bounced mail notification by the member shall amount to delivery of the contract note at the e-mail ID of the client.

3.3.4.3. Log Report for rejected or bounced mails

3.3.4.3.1. The log report shall also provide the details of the contract notes that are not delivered to the client/e-mails rejected or bounced back.

3.3.4.3.2. Also, the member shall take all possible steps (including settings of mail servers, etc.) to ensure receipt of notification of bounced mails by the

member at all times within the stipulated time period under the extant regulations of SEBI/stock exchanges.

3.3.5. **When to issue or send in Physical mode**

3.3.5.1. Issue in Physical mode

In the case of those clients who do not opt to receive the contract notes in the electronic form, the member shall continue to send contract notes in the physical mode to such clients.

3.3.5.2. Send in Physical mode

Wherever the ECNs have not been delivered to the client or has been rejected (bouncing of mails) by the e-mail ID of the client, the member shall send a physical contract note to the client within the stipulated time under the extant regulations of SEBI/stock exchanges and maintain the proof of delivery of such physical contract notes.

3.3.6. **General requirements**

3.3.6.1. ECNs through website

In addition to the e-mail communication of the ECNs in the manner stated above, in order to further strengthen the electronic communication channel, the member shall simultaneously publish the ECN on his designated web-site in a secured way and enable relevant access to the clients.

3.3.6.2. Access to the website

In order to enable clients to access the ECNs posted in the designated website in a secured way, the member shall allot a unique user name and password for the purpose, with an option to the client to access the same and save the contract note electronically or take a print out of the same.

3.3.6.3. Preservation/Archive of electronic documents

The member shall retain/archive such electronic documents as per the extant rules/regulations/circulars/guidelines issued by SEBI/Stock Exchanges from time to time.

3.4. **Format for Issuance of Electronic Contract Notes**[11]

3.4.1. In order to streamline the issuance of electronic contract notes as a legal document like the physical contract note, the exchanges are advised to implement the following:

3.4.1.1. The exchanges would prescribe a standard format for the electronic contract note (based on the model format prescribed at Annexure III (for Equity) and (for Debt[12]) in its bye-laws, rules and regulations.

3.4.1.2. The exchange bye-laws, rules and regulations for issuance of electronic contract note shall be amended to include all the standard pre-printed terms and conditions in the physical contract note. The electronic contract note would mention the relevant bye-laws / rules / regulations of the exchange subject to which the said contract note is being issued.

3.4.1.3. The exchange shall also modify / amend other relevant bye-laws, rules and regulations with respect to signing of the electronic contract note with a digital signature so as to make the modified format of the electronic contract note a valid legal document like the physical contract note.

3.4.1.4. The mechanism of record keeping of electronic contract notes in a soft non-tamperable form shall be prescribed by the exchange in compliance with the provisions of the Information Technology Act, 2000.

[11] Circular No. DNPD/Cir-9/04 dated February 03, 2004

[12] Circular No. SEBI/MRD/SE/Cir-11/2004 dated February 25, 2004

4. STRAIGHT THROUGH PROCESSING

4.1. Mechanism[13]

4.1.1. Straight Through Processing ("STP") is generally understood to be a mechanism that automates the end to end processing of transactions of financial instruments. It involves use of a system to process or control all elements of the work flow of a financial transaction, what are commonly known as the Front, Middle, Back office and General Ledger. In other words, STP allows electronic capturing and processing of transactions in one pass from the point of order origination to final settlement. STP thus streamlines the process of trade execution and settlement and avoids manual entry and re-entry of the details of the same trade by different market intermediaries and participants. Usage of STP enables orders to be processed, confirmed, settled in a shorter time period and in a more cost effective manner with fewer errors. Apart from compressing the clearing and settlement time, STP also provides a flexible, cost effective infrastructure, which enables e-business expansion through online processing and access to enterprise data.

4.1.2. It has been mandated that all the institutional trades executed on the stock exchanges would be processed through the STP System**.**

4.2. The system flow of the STP framework[14]

4.2.1. While several STP Service Providers provide STP service to the market participants to resolve the issue of inter-operability between the STP Service Providers it was decided in consultation with the stock exchanges and the STP Service Providers that a STP Centralised Hub would be setup.

4.2.2. The system flow for the STP framework shall be as follows:

4.2.2.1. STP user intending to send an instruction would send the message to his STP service provider after digitally signing the same.

4.2.2.2. The STP service provider would verify the signature of the STP user and forward it to the

[13] Circular No. DNPD/Cir- 22 /04 dated April 01, 2004

[14] Circular No. DNPD/Cir-23/04 dated April 27, 2004

- recipient STP user, if the recipient STP user is availing services of the same STP service provider or the
- STP centralized hub if the recipient STP user is not with the same STP service provider. In such a case the STP service provider would be required to prepare a message as per the STP centralized hub prescribed message format, enclose the user's message, digitally sign the message and then send it to the STP centralized hub.

4.2.2.3. On receipt of the message by the STP centralized hub, the STP centralized hub would:

4.2.2.3.1. verify the signature of the sending STP service provider only.
4.2.2.3.2. send an acknowledgment to the sending STP service provider.

4.2.2.4. The STP centralized hub would forward the message to the recipient STP service provider after digitally signing on the message.

4.2.2.5. The recipient STP service provider on receipt of the message from the STP centralized hub shall verify the signature of the STP centralized hub, verify if the recipient STP user is associated with it and send an appropriate acknowledgment with digital signature to the STP centralized hub. The STP centralized hub would in turn forward the acknowledgment (received from the recipient STP service provider) duly signed to the sending STP service provider.

4.2.2.6. The recipient STP service provider shall forward the message to the recipient STP user. The recipient STP user would receive the message and verify the signature of the recipient STP service provider and sending STP user.

4.2.3. To enable inter-operation, the STP centralized hub would provide a utility / client software to the STP service provider. The STP service provider's point of interface with the STP centralized hub would be through this utility / client software. The PKI (Public key infrastructure) system for the interface shall be implemented at a later stage.

4.2.4. The block diagram of the entire STP System is placed at Annexure IV.

4.3. SEBI (STP centralised hub and STP service providers) Guidelines, 2004[15]

4.3.1. SEBI in order to regulate the STP service has issued the SEBI (STP centralised hub and STP service providers) Guidelines, 2004 (herein referred to as "STP Guidelines") which also prescribe the model agreement between the STP centralised hub and the STP service providers.

4.3.2. The STP guidelines specify the eligibility criteria and conditions of approval for the STP centralised hub and the STP service providers, obligations and responsibilities of the STP centralised hub and the STP service providers and code of conduct for the STP service providers. The STP centralised hub and the STP service providers shall abide by these Guidelines.

4.3.3. To prescribe contractual obligations between the STP centralised hub and the STP service providers and to facilitate standardisation of service, a model agreement between the STP centralised hub and the STP service providers has also been prescribed by SEBI and is prescribed as Schedule II of the STP Guidelines. The agreement between the STP centralised hub and the STP service provider shall include the provisions included in the model agreement.

4.4. Work flow for institutional investors[16]

4.4.1. SEBI in consultation with the STP centralized hub, STP service providers and the STP users has prescribed the transaction work flow for the STP system. All institutional investors shall follow the following transaction work flow on a mandatory basis:

4.4.1.1. A contract note in electronic form in the prescribed format (IFN 515 messaging format) shall be issued by the broker & sent to the custodian and/ or the institutional investor.

4.4.1.2. In case the contract note is processed directly by the institutional investor, the institutional investor shall send the trade confirmation of acceptance or rejection of the contract note to the broker by using the IFN 598 messaging format. The custodian shall also send the confirmation of acceptance or rejection of such contract note to the broker using the messaging standard IFN 548.

4.4.1.3. In case the contract note is processed by the custodian on behalf of the institutional investor, the custodian shall send the confirmation of

[15] Ref.No. DNPD/Cir-24/04 dated May 26, 2004 (STP Guidelines)

[16] Ref.No. DNPD/Cir-25/04 dated June 10, 2004

acceptance or rejection of the contract note to the broker by using the IFN 548 messaging format.

4.4.1.4. The institutional investor shall send settlement instructions to its custodian in IFN 540 to IFN 543 messaging formats to the custodian for the following trade types:

4.4.1.4.1. IFN 540: settlement instruction for a clearing house buy trade

4.4.1.4.2. IFN 541: settlement instruction for a delivery-v/s-payment (DVP) buy trade

4.4.1.4.3. IFN 542: settlement instruction for a clearing house sell trade

4.4.1.4.4. IFN 543: settlement instruction for a delivery-v/s-payment (DVP) sell trade

4.4.1.5. The custodian shall confirm/ reject the execution of the settlement instructions to the institutional investor in IFN 544 to IFN 547 messaging formats in the following manner:

4.4.1.5.1. IFN 544: confirmation / rejection of an instruction received in messaging format IFN 540

4.4.1.5.2. IFN 545: confirmation / rejection of an instruction received in messaging format IFN 541

4.4.1.5.3. IFN 546: confirmation / rejection of an instruction received in messaging format IFN 542

4.4.1.5.4. IFN 547: confirmation / rejection of an instruction received in messaging format IFN 543

4.4.1.6. It is clarified that if a message (for the activities mentioned above) is sent using the STP centralised hub framework from one user to another user, then the confirmation / rejection for such a message shall also be sent using the STP centralised hub framework.

4.4.2. Please refer to the format for the electronic contract note prescribed at Annexure III. After deliberation with the STP service providers and the market participants, the following changes have been incorporated to the existing messaging format (IFN 515):

4.4.2.1. The mandatory requirement of mentioning the relevant bye-laws / rules / regulations of the exchange subject to which the said contract note is being issued on each contract note stands modified in the following manner:

4.4.2.1.1. The requirement is not mandatory but optional.

4.4.2.1.2. The broker shall ensure that the relevant bye-laws / rules / regulations of the exchange subject to which the contract note is being issued, is mentioned in the broker-client agreement and the tripartite agreement between the broker-AP-client agreement (if applicable).

4.4.2.1.3. The existing field for the above provision shall not be deleted and may be used as a free text field for one constituent to communicate remarks (if any) to another constituent.

4.4.2.2. The clause of 'payment of consolidated stamp duty' for each contract note shall be mentioned in the broker-client agreement and the tripartite agreement between the broker-AP-client agreement (if applicable). The said clause may be stated in the free text field (as mentioned in point 2 (a) (iii) above) of each contract note.

4.4.2.3. In the field "market type" (field 70E) a category of 'TT' i.e. trade for trade and 'OT' i.e. Others shall be added to represent the supplementary categories of market types.

4.4.2.4. The order time was prescribed as a mandatory field in the contract note. The order time shall now be included in the optional fields.

4.4.2.5. There are certain securities which are not de-materalised and hence do not have an ISIN code. For such securities (where ISIN number is not available) the STP users would be required to input the security code given by the exchange in the ISIN number field. In case the number length of the exchange scrip code is shorter than the prescribed field length of 12 characters, the code shall be prefixed with zeros.

4.4.2.6. In order to maintain a complete audit trail, it is clarified that in case an electronic contract note is rejected, the custodian (in messaging format IFN 548) or the fund manager (in messaging format IFN 598) shall be required to send a rejection message to the broker. Only on receipt of the rejection message, the broker shall cancel the rejected contract note and issue a fresh contract note bearing a new number.

4.4.2.7. In order to bring in standardisation in the input of the identification codes in the prescribed messaging standards, it is clarified that the following codes shall be used by the various entities:

4.4.2.7.1. **Brokers**: SEBI registration number

4.4.2.7.2. **Mutual Funds and schemes of Mutual Funds:** SEBI registration number for Mutual Funds and Unique client code issued by the exchanges for schemes

4.4.2.7.3. **FPIs:** SEBI registration number for the Foreign Portfolio Investors ("FPIs")

4.4.2.7.4. **Custodians:** SEBI registration number

4.4.2.7.5. **STP service providers and STP centralised hub:** PAN

4.4.2.7.6. **Depositories and exchanges / clearing house / clearing corporation:** PAN

4.4.2.7.7. **Other Institutional Investors like financial institutions, banks etc.:** Unique client code issued by the exchanges

4.4.2.8. All market participants shall issue the electronic contract note for institutional trades in the modified format**.**

4.4.3. After consultation with the market participants and confirming their preparedness, it has been decided to make the messaging formats for IFN 540, IFN 541, IFN 542, IFN 543, IFN 544, IFN 545, IFN 546, IFN 547, IFN 548 and IFN 598 (in addition to IFN 515) mandatory for all institutional trades.

4.4.4. It is reiterated that the STP system shall be initially mandatory for all institutional trades in the equity segment.

4.4.5. The standard terms of contract as are required to be mentioned in the Contract Notes as per the Bye-laws and Regulations of exchanges, which are not contained in electronic contract notes, shall be incorporated in the Client Broker Agreement or where applicable, the Tripartite Agreement between the stock broker, AP and the client. The stamp duty in respect of the electronic contract notes shall be paid by the broker.

4.5. Clarification[17]

4.5.1. Descriptors as stated above shall mean the following:

4.5.1.1. IFN 540: settlement instruction for a buy trade free of payment

4.5.1.2. IFN 541: settlement instruction for a buy trade against payment

4.5.1.3. IFN 542: settlement instruction for a sell trade free of payment

4.5.1.4. IFN 543: settlement instruction for a sell trade against payment

4.5.1.5. IFN 544: confirmation of a settlement instruction for a buy trade free of payment (response to IFN 540)

[17] Ref. No. DNPD/14785/04 dated July 08, 2004

4.5.1.6. IFN 545: confirmation of a settlement instruction for a buy trade against payment (response to IFN 541)

4.5.1.7. IFN 546: confirmation of a settlement instruction for a sell trade free of payment (response to IFN 542).

4.5.1.8. IFN 547: confirmation of a settlement instruction for a sell trade against payment (response to IFN 543).

4.5.2. It is also clarified that in the IFN 515 message, if trade is intended to be settled by the custodian with the Clearing Corporation (by accepting the settlement obligation), then it shall be termed as "FREE" and if the trade is intended to be settled by the broker with the Clearing Corporation then it shall be termed as "APMT" (meaning against payment) in the tag 22h of the IFN 515 message.

4.6. **Modifications in the prescribed messaging formats**[18]

In order to integrate the STT in the STP system, it would be necessary to provide for necessary fields in the appropriate messaging standards. After deliberation with the STP centralised hub and the STP service providers, it has been decided to make the following modifications in the prescribed messaging formats:

4.6.1. Message Types that shall be modified are **IFN515, IFN540, IFN541, IFN542 and IFN543**

A Qualifier shall be used to identify Securities Transaction Tax Amount: "**COUN**", Country, National Federal Tax.

4.6.2. The change in the ISO Structure for the impacted message types shall be as follows:

[18] Ref. No. DNPD/Cir-28/04 dated September 28, 2004

M	16R		AMT	Start of block	
M	19A	Amount	:4!c//3!a11d	To identify the Securities Transaction Tax Amount	Format: (Qualifier) //(Currency Code) (Amount) For: Securities Transaction tax Amount Qualifier: "COUN" (4 Upper case Characters) Narrative: "INR" (3 Upper Letters) Amount: Up to 10 digits (only Integer value allowed) followed by a comma (used as decimal sign) . Comma is mandatory. Amount can be zero or greater than zero.
M	16S		AMT	End of block	

4.6.3. Securities Transaction Tax Block shall be placed before the Settlement Amount Block in the stated Message Types. (**IFN515, IFN540, IFN541, IFN542 and IFN543)**

4.6.4. Securities Transaction Tax block will be **mandatory amount block** in IFN515 and **optional amount block** in IFN540, IFN541, IFN542 and IFN543.

4.6.5. If the Contract Note (issued by means of IFN 515) is rejected on the basis of Securities Transaction Tax amount, then the reason for the rejection shall be specified in the "Tag70D Narrative" field and "Tag 24B Reason" specified should be "NARR".

5. TRADING TERMINALS

5.1. Testing of software used in or related to Trading and Risk Management [19]

5.1.1. Meaning

For the purpose of this section, 'Software' shall mean electronic systems or applications used by stock brokers / trading members for connecting to the stock exchanges and for the purposes of trading and real-time risk management, including software used for Internet Based Trading ("IBT"), Direct Market Access ("DMA"), Securities Trading using Wireless Technology ("STWT"), Smart Order Routing ("SOR"), Algorithmic Trading ("AT"), etc.

5.1.2. Testing of Software

In addition to the testing and approval requirements specified through various circulars issued by SEBI on IBT, DMA, STWT, SOR and AT, stock exchanges shall frame appropriate testing policies for functional as well as technical testing of the software. Such framework shall at the minimum include the following:

5.1.2.1. **Testing in a simulated test environment**: Stock exchanges shall provide suitable facilities to market participants / software vendors to test new software or existing software that have undergone change. Subjecting the new software or existing software that have undergone change to such testing facility shall be mandatory for market participants, before putting it in use.

5.1.2.2. **Mock testing**

5.1.2.2.1. Stock exchanges shall organize mock trading sessions on regular basis, at least once in a calendar month, to facilitate testing of new software or existing software that has undergone any change of functionality, in a close-to-real trading environment. Stock exchanges shall suitably design and plan such mock trading sessions to ensure maximum participation and sufficient trading volumes for the purpose of testing.

[19] Circular No. CIR/MRD/DP/24/2013 dated August 19, 2013 and CIR/MRD/DP/06/2014 dated February 07, 2014

5.1.2.2.2. Stock exchanges shall mandate a minimum time period for such testing in the mock trading sessions.

5.1.2.2.3. In order to improve the efficacy of the mock trading sessions, all stock brokers / trading members shall ensure that all user-ids approved for Algo trading, irrespective of the algorithm having undergone change or not, shall participate in the mock trading sessions.

5.1.2.2.4. User Acceptance Test ("UAT"): The stock broker/ trading member shall undertake UAT of the software to satisfy itself that the newly developed/ modified software meets its requirements.

5.1.2.2.5. The requirement of mandatory mock trading sessions to facilitate testing of new software or existing software that has undergone any change of functionality shall be optional, if a Stock Exchange provides suitable simulated test environment to test new software or existing software that has undergone any change of functionality and ensures the following[20]:

5.1.2.2.5.1. The test environment shall be made available to all the members.

5.1.2.2.5.2. The test environment shall be made available for at least two hours after market hours and at least on two trading days in a week.

5.1.2.2.5.3. For the purpose of testing, Stock Exchange shall make available data from at least one trading day in all segments and the same shall not be older than one month from the day of the testing environment.

5.1.2.2.5.4. All trading members (excluding those who use only Exchange provided front end and/or ASP services) having approved Algorithms available with the member, irrespective of the algorithm having undergone change or not, shall participate in the Simulated Environment at least on one trading day during each calendar month at all the exchanges where they are members. This shall be audited and reported in the System Auditors report.

5.1.2.2.5.5. Exchange shall provide a daily log, including Algos used, of members participation in Simulated Environment to all participating members. The Exchange shall provide summary report of such activity to SEBI in the monthly development report ("MDR").

5.1.2.3. With respect to testing of software related to (a) fixes to bugs in the software, (b) changes undertaken to the stock brokers' software/ systems pursuant to a change to any stock exchange's trading system, and (c) software purchased from a software vendor that has already been tested in

[20] Circular No. SEBI/HO/MRD1/DSAP/CIR/P/2020/234 dated November 24, 2020

the mock environment by certain number of stock brokers, stock exchanges may prescribe a faster approval process to make the process of approval expeditious.

5.1.3. Stock brokers / trading members shall also engage system auditor(s) to examine reports of mock tests and UAT in order to certify that the tests were satisfactorily undertaken.

5.1.4. Stock exchanges shall monitor compliance of stock brokers / trading members, who use trading algorithm, with regard to the requirement of participation in mock trading session as mandated with this circular. In cases where stock exchanges find that the stock broker / trading member has failed to participate in such mock trading sessions, stock exchange shall call for reasons and if found unsatisfactory, shall suspend the proprietary trading rights of the stock broker/ trading member for a minimum period of one trading day.

5.1.5. Stock exchanges shall also ensure that the system auditors examine the compliance of stock broker / trading member, who use trading algorithms, with regard to the requirement of participation in mock trading session, as mandated with this circular, and provide suitable comments in the periodic system audit report. In cases where the system audit report indicate that the stock broker / trading member has failed to participate in such mock trading sessions, stock exchange shall call for reasons from the stock broker/trading member and if found unsatisfactory, shall suspend the proprietary trading rights of the stock broker / trading member for a minimum period of one trading day.

5.1.6. For pre-approval / periodic system audit of Computer-to-Computer Link ("CTCL") or Intermediate Messaging Layer ("IML"), IBT, DMA, STWT, SOR and AT, stock brokers / trading members shall engage a system auditor with any of the certifications as specified at Para 7.1.4 in this Master Circular. While finalizing the system auditor, stock brokers / trading members shall ensure the system auditor does not have any conflict of interest with the stock broker and the directors/promoters of the system auditor are not directly or indirectly related to the current directors or promoters of stock broker / trading member.

5.1.7. **Approval of Software of stock broker / trading member**

5.1.7.1. Stock brokers / trading members shall seek approval of the respective stock exchanges for deployment of the software in the securities market by submitting necessary details required by stock exchange including details of software, tests undertaken and certificate / report provided by the

system auditor. Stock exchange may seek additional details as deemed necessary for evaluating the application of the stock broker / trading member.

5.1.7.2. Stock exchanges shall grant approval or reject the application of the stock broker as the case may be, and communicate the decision to the stock broker / trading member within fifteen working days from the date of receipt of completed application (or within any other such time period specified vide SEBI circulars on DMA, IBT, STWT, SOR, AT, etc.). In case of rejection of the application, the stock exchange shall also communicate reasons of rejection to the stock broker / trading member within such time period.

5.1.7.3. Before granting approval to use software in securities market, stock exchange shall ensure that the requirements specified by SEBI / stock exchange with regard to software are met by the stock broker / trading member.

5.1.7.4. Stock exchanges may suitably schedule the requirements of mock testing, certification of test reports by system auditor(s) and the software approval process, so as to facilitate a speedy approval and a smooth transition of the stock brokers to the new / upgraded software.

5.1.8. In order to ensure that stock brokers are not using software without requisite approval of the stock exchanges, stock exchanges are advised to put in place suitable mechanism to prevent any unauthorized change to the approved software.

5.1.9. **Undertaking to be provided by stock brokers / trading members**

5.1.9.1. Stock brokers / trading members shall submit an undertaking to the respective stock exchanges stating the following at the minimum:

5.1.9.2. M/s (name of the stock broker / trading member) will take all necessary steps to ensure that every new software and any change thereupon to the trading and/or risk management functionalities of the software will be tested as per the framework prescribed by SEBI / stock exchange before deployment of such new / modified software in securities market.

5.1.9.3. M/s (name of the stock broker / trading member) will ensure that approval of the stock exchange is sought for all new / modified software and will comply with

various requirements specified by SEBI or the stock exchange from time to time with regard to usage, testing and audit of the software.

5.1.9.3.1. The absolute liability arising from failure to comply with the above provisions shall lie entirely with M/s (name of the stock broker / trading member) .

5.1.9.4. Stock exchanges may include additional clauses as deemed necessary in the undertaking.

5.1.10. Sharing of Application Programming Interface (API) specifications by the stock exchange with stock brokers / trading members

5.1.10.1. API is an interface that enables interaction of software with other software and typically includes language and message format that is used by an application program to communicate with the operating system or other application program. Stock brokers / trading members and software vendors require relevant API specifications to facilitate interaction of the developed software with the systems of the stock exchanges.

5.1.10.2. Technical Advisory Committee (TAC) had engaged with stock exchanges, software vendors and stock brokers / trading members to review the framework of sharing of APIs by stock exchanges.

5.1.10.3. Based on the recommendations of the committee, it is decided that stock exchanges shall provide relevant API specifications to all stock brokers / trading members and software vendors who are desirous of developing software for the securities market, after establishing their respective credentials.

5.1.10.4. In case of refusal to share APIs, stock exchanges shall provide reasons in writing to the desirous stock brokers / trading members or software vendors within a period of fifteen working days from the date of receipt of such request for sharing of API.

5.1.10.5. Further, stock exchanges shall not selectively release updates / modifications, if any, of the existing API specifications to few stock brokers / trading members or software vendors ahead of others and shall provide such updated / modified API specifications to all stock brokers / trading members and software vendors with whom the earlier API specifications were shared.

5.1.11. **Penalty on malfunction of software used by stock broker/ trading member:**

Stock exchanges shall examine the cases of malfunctioning of software used by stock brokers / trading members and apply deterrent penalties in form of fines or suspension to the stock broker/trading member whose software malfunctioned. In addition, stock brokers/trading members shall implement various mechanisms including the following to minimize their losses in the event of software malfunction:

5.1.11.1. include suitable clauses in their agreement with the software vendors to define liabilities of software vendor and stock broker / trading member in case of software malfunction, and / or,

5.1.11.2. consider taking suitable insurance cover to meet probable losses in case of software malfunction.

5.1.12. With regard to changes / updates to stock broker's trading software that intend to modify the 'look and feel' and do not affect the risk management system of the stock broker or the connectivity of the trading software with stock exchange's trading system, it is clarified that mock testing and consequent system audit may not be insisted upon by the stock exchanges.

5.1.13. Stock exchanges shall direct their stock brokers to put in place adequate mechanism to restore their trading systems to 'production state' at the end of testing session so as to ensure integrity of stock brokers' trading system.

5.2. **Standing Committee**[21]

5.2.1. A standing Committee shall be set up by each Stock Exchange to investigate the problem of computerised trading system, such as hanging/ slowdown/ breakdown. The Standing Committee shall introduce an outside computer expert. The Committee will submit a report to the Governing Board of the Stock Exchange and the Governing Board shall deliberate on the report and take suitable action/remedial measure.

5.2.2. The standing committee is required to be set up with the objective to investigate problems of computerised trading system, such as, **hanging**/ **slowdown**/

[21] Circular No. MRD/DoP/SE/Cir- 14/2006 dated September 28, 2006

breakdown. With the view to ensure implementation/ compliance, the exchanges are advised as under:

5.2.2.1. All instances of hanging /slowdown / breakdown and any other problem in the computerized trading system, even if the disruption is less than five minutes, should be reported to the Committee for its consideration.

5.2.2.2. The Committee, upon examination of the issue/s shall submit a report to the Governing Board of the Stock Exchange.

5.2.2.3. The Governing Board of the Stock Exchange shall deliberate on the aforesaid report and take suitable action / remedial measure.

5.2.2.4. Further, in case of stoppage beyond five minutes the exchange should also explain and report to SEBI about the incident as well as the remedial measures taken. The Stock Exchange shall also issue a press release in this regard for greater transparency and in the interest of investors.

5.3. Expansion of trading terminals of the Exchange[22]

The stock exchanges are allowed to set-up terminals at any place in the country, subject to the following conditions:

5.3.1. The Exchange shall ensure that there is adequate monitoring and surveillance mechanism for such outstation terminals in order to oversee the trades;

5.3.2. All such trades shall be subject to usual margin, capital adequacy and inter-day trading limits fixed for the brokers by the Exchange;

5.3.3. The Exchange shall ensure that investors eventually do not pay the brokerage on such trades exceeding the maximum brokerage permitted as per the rules of the Exchanges; and

5.3.4. The Exchange shall introduce the system of guaranteeing trades or set up a Clearing Corporation.

5.4. Broad Guidelines for opening Trading Terminals abroad[23]

The guidelines relating to eligibility norms, RBI permission, Permission from Foreign Regulatory Authority, Operation of terminals, Contract note, Settlement Procedure, Surveillance and Monitoring, Jurisdiction etc. for opening trading terminals abroad are provided below.

[22] Circular No. SMD/POLICY CIR-33/99 dated October 15, 1999

[23] Circular No. SMDRP/POLICY/TTA-14072/CIR-23/99 dated July 12, 1999

With the rapid expansion of the Indian capital market it was felt that a facility should be provided whereby an eligible overseas investor can place an order on a real-time basis, rather than telephonically. The Stock Exchanges/ Members shall follow the following guidelines for opening and maintaining the trading terminals abroad:

5.4.1. **Eligibility Criteria**

Such trading terminals shall be opened only by the Stock Brokers of the stock exchanges registered with SEBI and opening of terminals through APs shall not be permitted. These terminals shall be opened by the members only after obtaining permission from the respective stock exchanges.

5.4.2. **RBI Permission**

Such terminals abroad would be opened subject to the guidelines laid down by the RBI from time to time.

5.4.3. **Permission by the Foreign Regulatory Authorities**

The installation of such trading terminals shall be subject to the prior permission of the concerned regulatory authorities of the respective foreign countries, wherever required.

5.4.4. **Operation of the terminals**

Any investor abroad who is permitted to invest in India i.e. NRIs/OCBs/FPIs/PIOs shall be able to place orders on the trading terminal of the Exchange available at the office of the Indian broker maintained abroad. The order fed on the live terminal shall be executed on the computer of the Exchange in India. The service to the clients shall be provided by the broker's overseas office and its local office. These terminals shall include any of other options that the respective exchange may provide for connecting its trading terminal abroad to its trading system in India.

5.4.5. **Contract Note**

The contract note in favour of the client abroad shall be issued in India, however the same could be printed in the broker's office abroad and shall be subject to the jurisdiction of the respective stock exchanges.

5.4.6. **Capital Adequacy, Margins System & Brokerage**

5.4.6.1. All such trades would be subject to usual margins, capital adequacy and intra-day trading limits and such other requirements fixed for the brokers by the Exchange.

5.4.6.2. The respective stock exchange shall ensure that investors do not pay the brokerage on such trades exceeding the maximum brokerage permitted as per the rules, regulations and bye-laws of the exchange.

5.4.6.3. No Negotiated Deals shall be permitted through these terminals and only screen based order matching system shall be available on these terminals.

5.4.7. **Settlement Procedure**

All trades shall be settled in India in dematerialized form only. Clients with status of FPIs shall settle the trade through their registered custodian/ designated bank. Clients with the status of NRIs/PIOs/**OCBs** shall settle the trade through a designated bank. Such a designated bank shall be responsible for repatriation of funds.

5.4.8. **Monitoring & Surveillance**

The respective stock exchange shall ensure that there is adequate monitoring and surveillance mechanism for such overseas terminals in order to oversee trades.

5.4.9. **Grievance Redressal Mechanism**

5.4.9.1. The investors' grievance for such cases shall be resolved by the respective Indian Stock Exchange through the existing arbitration mechanism.

5.4.9.2. The concerned Stock Exchange shall ensure that their members have the adequate arrangements for resolving the investors grievances and timely

settlement of arbitration cases arising out of trades which are executed on these terminals.

5.4.10. **Jurisdiction**

The agreement between the trading member and constituent should, inter alia, state that, all trades, transactions and contracts are subject to the Rules, Bye Laws and Regulations of the Exchange and shall be deemed to be and shall take effect as wholly made, entered into and to be performed in the city of _____, India and the parties to such trade shall be deemed to have submitted to the jurisdiction of the Courts in _____, India for the purpose of giving effect to the provisions of the Rules, Bye Laws and Regulations of the Exchange.

5.5. **Safeguards to avoid trading disruption in case of failure of software vendor**[24]

Software vendors who provide software to market participants and market infrastructure institutions for the purpose of trading, risk management, clearing and settlement play a crucial role in the securities market. Any inability on the part of such software vendors to provide software or related services in timely and continuous manner may create a situation of stress in the securities market. In view of the above, stock exchanges may advise the stock brokers to take the following measures:

5.5.1. Explore the possibility of establishing a 'software escrow arrangement' with their existing software vendors.

5.5.2. In case of large stock brokers, consider reducing dependence on a single software vendor for trading and risk management systems, by engaging more than one software vendor.

5.5.3. Consider including the following in their contracts with the software vendors:

5.5.3.1. access to documents related to design and development specifications in the event software vendor fails to provide continuous and timely services to the stock broker;

5.5.3.2. development of expertise at the end of the stock broker through appropriate training with regard to software usage and maintenance;

[24] Circular No. CIR/MRD/DP/07/2014 dated February 11, 2014

5.5.3.3. appropriate penalty clauses for cases of disruptions to the trading system of the stock broker on account of (a) software vendor failing to provide continuous and timely services to the stock broker or (b) glitches to the software provided by the software vendor;

5.5.3.4. obligation on the part of the software vendor to cooperate in case of audit of software including forensic audit, if required.

6. SMART ORDER ROUTING

6.1. Introduction of Smart Order Routing[25]

6.1.1. SEBI has received proposal from the stock exchanges and market participants for introducing Smart Order Routing ("SOR") which allows the brokers trading engines to systematically choose the execution destination based on factors viz. price, costs, speed, likelihood of execution and settlement, size, nature or any other consideration relevant to the execution of the order.

6.1.2. Upon examination of the proposal, feedback of the stock exchanges and based on the recommendations of the Technical Advisory Committee, it has been decided to permit SOR in Indian Securities Market.

6.1.3. Stock Exchanges are advised to ensure the following conditions with regard to SOR:

6.1.3.1. Stock broker interested to offer SOR facility shall apply to the respective stock exchanges.

6.1.3.2. Stock broker shall submit a third party system audit of its SOR system and software. Stock exchanges shall disseminate to its stock brokers a list of approved system auditors (CISA or equivalent) qualified to undertake such system audits.

6.1.3.3. Stock broker shall provide the following to the respective stock exchanges:

6.1.3.3.1. An undertaking to the respective stock exchanges that SOR shall route orders in a neutral manner.

6.1.3.3.2. Provide the features of the SOR to stock exchange.

6.1.3.4. Stock exchange shall communicate its decision to the broker within 30 calendar days from the date of receipt of complete application by the stock exchange. Stock exchange shall not consider testing and demonstration of the SOR system/software as a criterion for declaring the application of the broker as 'complete'. Further, testing

[25] Circular No. CIR/MRD/DP/26/2010 dated August 27, 2010

and demonstration of SOR system/software, if required, shall be suitably scheduled within the aforesaid period of 30 calendar days.

In case of rejection of the application on smart order routing of a stock broker, the stock exchange shall communicate such reasons of rejections to the stock broker. Further, the decision of the stock exchange on the SOR application of the stock broker and reasons for rejection of the SOR application shall also be communicated to all the other stock exchanges where the broker's SOR facility intends to route orders.[26]

6.1.3.5. Stock exchange shall ensure that brokers adhere to the best execution policy while using SOR.

6.1.3.6. SOR facility shall be provided to all class of investors.

6.1.3.7. Stock Broker shall communicate to all clients the features, possible risks, rights, responsibilities and liabilities associated with the smart order routing facility. The client desirous of availing such facility shall do so by entering into a broker-client agreement, as applicable. For the existing clients, the same shall be implemented through an addendum to the existing broker-client agreement, as applicable.[27]

6.1.3.8. Stock broker shall maintain logs of all activities to facilitate audit trail. Broker shall maintain record of orders, trades and data points for the basis of decision.

6.1.3.9. In case the client has availed Smart Order Routing facility and does not want to use the same for a particular order, the same shall be well documented by the stock broker.

6.1.3.10. System audit of the SOR systems and software shall be periodically carried out by the brokers as may be specified by the exchange and certificate in this regard shall be submitted to the exchange.

6.1.3.11. Stock exchange shall ensure that SOR is not used to place orders at venues other than the recognised stock exchanges.

6.1.3.12. The stock broker shall carry out appropriate validation of all risk parameters before the orders are placed in the SOR system.

[26] Circular No. CIR/MRD/DP/ 36 /2010 dated December 09, 2010
[27] Circular No. CIR/MRD/DP/ 36 /2010 dated December 09, 2010

6.1.3.13. Stock exchange shall provide unique identification number for the orders placed through SOR system. Further, stock exchanges shall maintain data on SOR orders and trades.

6.1.3.14. Stock exchange shall have necessary surveillance mechanism in place to monitor trading done through SOR.

6.1.3.15. Stock broker shall ensure that alternative mode of trading system is available in case of failure of SOR facility.

6.1.3.16. Stock exchange shall ensure that within a period of three months from implementation of SOR, a system is put in place to time stamp market data feed that is disseminated to the market, if the same is not already available.

6.1.3.17. Stock exchange shall strengthen investor grievance cell in order to address complaints, if any, received with regard to SOR. Further, in case of any disputes or complaints, stock exchanges shall share necessary data as and when required in order to facilitate necessary examination.

6.1.3.18. Stock exchange shall synchronise their system clocks with atomic clock before the start of market.

6.1.3.19. The broker server routing orders placed through the SOR system to the exchange trading system shall be located in India. Stock exchange shall permit SOR approved brokers to offer SOR facility through all their servers irrespective of their location in India.[28]

6.1.3.20. All other existing obligations for the broker as per current regulations and circulars will continue.

6.1.3.21. Stock exchange may specify additional safeguards as they deem fit for allowing SOR facility to their brokers.

6.1.3.22. Stock exchange shall permit smart order routing for all orders, without restricting to any specific type of order. The choice on order types shall be left to the client.[29]

6.1.3.23. If stock exchange desires to advise its brokers to seek re-approval, it may do so only in case of [30]

6.1.3.23.1. Inclusion of a new stock exchange for offering SOR facility; and/or,

[28] Circular No. CIR/MRD/DP/ 36 /2010 dated December 09, 2010
[29] Circular No. CIR/MRD/DP/ 36 /2010 dated December 09, 2010
[30] Circular No. CIR/MRD/DP/ 36 /2010 dated December 09, 2010

6.1.3.23.2. Material changes in the software/system of the SOR facility.

7. ALGORITHMIC TRADING

7.1. Broad Guidelines on Algorithmic Trading[31]

Definition

7.1.1. **Algorithmic Trading:** Any order that is generated using automated execution logic shall be known as algorithmic trading.

Guidelines to the stock exchanges and the stock brokers

7.1.2. Stock exchanges shall ensure the following while permitting algorithmic trading:

7.1.2.1. The stock exchange shall have arrangements, procedures and system capability to manage the load on their systems in such a manner so as to achieve consistent response time to all stock brokers. The stock exchange shall continuously study the performance of its systems and, if necessary, undertake system upgradation, including periodic upgradation of its surveillance system, in order to keep pace with the speed of trade and volume of data that may arise through algorithmic trading.

7.1.2.2. In order to ensure maintenance of orderly trading in the market, stock exchange shall put in place effective economic disincentives with regard to high daily order-to-trade ratio of algo orders of the stock broker. Further, the stock exchange shall put in place monitoring systems to identify and initiate measures to impede any possible instances of order flooding by algos.

7.1.2.3. In order to discourage repetitive instances of high daily order-to-trade ratio, stock exchanges shall impose an additional penalty in form of suspension of proprietary trading right of the stock broker for the first trading hour on the next trading day in case a stock broker is penalized for maintaining high daily order-to-trade ratio, provided penalty was imposed on the stock broker on more than ten occasions in the previous thirty trading days.

[31] Circular No. CIR/MRD/DP/09/2012 dated March 30, 2012 and Circular No. CIR/MRD/DP/16/2013 dated May 21, 2013

7.1.2.4. The stock exchange shall ensure that all algorithmic orders are necessarily routed through broker servers located in India and the stock exchange has appropriate risk controls mechanism to address the risk emanating from algorithmic orders and trades. The minimum order-level risk controls shall include the following:

7.1.2.4.1. Price check - The price quoted by the order shall not violate the price bands defined by the exchange for the security. For securities that do not have price bands, *dummy filters* shall be brought into effective use to serve as an early warning system to detect sudden surge in prices.

7.1.2.4.2. Quantity Limit check - The quantity quoted in the order shall not violate the maximum permissible quantity per order as defined by the exchange for the security.

7.1.2.5. In the interest of orderly trading and market integrity, the stock exchange shall put in place a system to identify dysfunctional algos (i.e. algos leading to loop or runaway situation) and take suitable measures, including advising the member, to shut down such algos and remove any outstanding orders in the system that have emanated from such dysfunctional algos. Further, in exigency, the stock exchange should be in a position to shut down the broker's terminal.

7.1.2.6. Terminals of the stock broker that are disabled upon exhaustion of collaterals shall be enabled manually by the stock exchange in accordance with its risk management procedures.

7.1.2.7. The stock exchange may seek details of trading strategies used by the algo for such purposes viz. inquiry, surveillance, investigation, etc.

7.1.2.8. In order to strengthen the surveillance mechanism related to algorithmic trading and prevent market manipulation, stock exchanges are directed to take necessary steps to ensure effective monitoring and surveillance of orders and trades resulting from trading algorithms. Stock exchanges shall periodically review their surveillance arrangements in order to better detect and investigate market manipulation and market disruptions.

7.1.2.9. The stock exchange shall include a report on algorithmic trading on the stock exchange in the Monthly Development Report (MDR)

submitted to SEBI inter-alia incorporating turnover details of algorithmic trading, algorithmic trading as percentage of total trading, number of stock brokers / clients using algorithmic trading, action taken in respect of dysfunctional algos, status of grievances, if any, received and processed, etc.

7.1.2.10. The stock exchange shall synchronize its system clock with the atomic clock before the start of market such that its clock has precision of atleast one microsecond and accuracy of atleast +/- one millisecond.

7.1.3. Stock exchange shall ensure that the stock broker shall provide the facility of algorithmic trading only upon the prior permission of the stock exchange. Stock exchange shall subject the systems of the stock broker to initial conformance tests to ensure that the checks mentioned below are in place and that the stock broker's system facilitate orderly trading and integrity of the securities market. Further, the stock exchange shall suitably schedule such conformance tests and thereafter, convey the outcome of the test to the stock broker.

For stock brokers already providing algo trading, the stock exchange shall ensure that the risk controls specified in this circular are implemented by the stock broker.

7.1.4. The stock brokers that provide the facility of algorithmic trading shall subject their algorithmic trading system to a system audit every six months in order to ensure that the requirements prescribed by SEBI / stock exchanges with regard to algorithmic trading are effectively implemented. Such system audit of algorithmic trading system shall be undertaken by a system auditor who possess any of the following certifications:

7.1.4.1. CISA (Certified Information System Auditors) from ISACA;
7.1.4.2. DISA (Post Qualification Certification in Information Systems Audit) from Institute of Chartered Accountants of India (ICAI);
7.1.4.3. CISM (Certified Information Securities Manager) from ISACA;

7.1.4.4. CISSP (Certified Information Systems Security Professional) from International Information Systems Security Certification Consortium, commonly known as (ISC)².

7.1.5. Deficiencies or issues identified during the process of system audit of trading algorithm / software shall be reported by the stock broker to the stock exchange immediately on completion of the system audit. Further, the stock broker shall take immediate corrective actions to rectify such deficiencies / issues.

7.1.6. In case of serious deficiencies / issues or failure of the stock broker to take satisfactory corrective action, the stock exchange shall not allow the stock broker to use the trading software till deficiencies / issues with the trading software are rectified and a satisfactory system audit report is submitted to the stock exchange. Stock exchanges may also consider imposing suitable penalties in case of failure of the stock broker to take satisfactory corrective action to its system within the time-period specified by the stock exchanges. Further, the stock exchange shall subject the stock broker systems to more frequent system audits, if required.

7.1.7. The stock broker, desirous of placing orders generated using algos, shall satisfy the stock exchange with regard to the implementation of the following minimum levels of risk controls at its end -

7.1.7.1. *Price check* – Algo orders shall not be released in breach of the price bands defined by the exchange for the security.

7.1.7.2. *Quantity check* – Algo orders shall not be released in breach of the quantity limit as defined by the exchange for the security.

7.1.7.3. *Order Value check* - Algo orders shall not be released in breach of the 'value per order' as defined by the stock exchanges.

7.1.7.4. *Cumulative Open Order Value check* – The individual client level cumulative open order value check, may be prescribed by the broker for the clients. Cumulative Open Order Value for a client is the total value of its unexecuted orders released from the stock broker system.

7.1.7.5. *Automated Execution check* – An algo shall account for all executed, un-executed and unconfirmed orders, placed by it before releasing further order(s). Further, the algo system shall have pre-defined parameters for an automatic stoppage in the event of algo execution leading to a loop or a runaway situation.

7.1.7.6. All algorithmic orders are tagged with a unique identifier provided by the stock exchange in order to establish audit trail.

7.1.8. The other risk management checks already put in place by the exchange shall continue and the exchange may re-evaluate such checks if deemed necessary in view of algo trading.

7.1.9. The stock broker, desirous of placing orders generated using algos, shall submit to the respective stock exchange an undertaking that -

7.1.9.1. The stock broker has proper procedures, systems and technical capability to carry out trading through the use of algorithms.

7.1.9.2. The stock broker has procedures and arrangements to safeguard algorithms from misuse or unauthorized access.

7.1.9.3. The stock broker has real-time monitoring systems to identify algorithms that may not behave as expected. Stock broker shall keep stock exchange informed of such incidents immediately.

7.1.9.4. The stock broker shall maintain logs of all trading activities to facilitate audit trail. The stock broker shall maintain record of control parameters, orders, trades and data points emanating from trades executed through algorithm trading.

7.1.9.5. The stock broker shall inform the stock exchange on any modification or change to the approved algos or systems used for algos.

7.1.10. The stock exchange, if required, shall seek conformance of such modified algo or systems to the requirements specified in the circular.

8. ANNUAL SYSTEMS AUDIT

8.1. System and Network Audit of Market Infrastructure Institutions [32]

8.1.1. Market Infrastructure Institutions ("MIIs") are required to conduct System and Network Audit as per the framework mentioned in Annexure V and Terms of Reference ("TOR") mentioned in Annexure VI. MIIs are also required to maintain a list of all the relevant SEBI circulars/ directions/ advices, etc. pertaining to technology and compliance thereof, as per format placed at Annexure VII and the same shall be included under the scope of System and Network Audit.

8.1.2. MIIs are also required to submit information with regard to exceptional major Non-Compliances (NCs)/ minor NCs observed in the System and Network Audit as per format placed at Annexure VIII and are required to categorically highlight those observations/NCs/suggestions pointed out in the System and Network Audit (current and previous) which remain open.

8.1.3. The Systems and Network Audit Report including compliance with SEBI circulars/ guidelines and exceptional observation format along with compliance status of previous year observations shall be placed before the Governing Board of the MII and then the report along with the comments of the Management of the MII shall be communicated to SEBI within a month of completion of audit.

8.1.4. Further, along with the audit report, MIIs are required to submit a Joint declaration from the Managing Director(MD)/Chief Executive Officer(CEO) and Chief Technology Officer (CTO) certifying a) the security and integrity of their IT Systems b) correctness and completeness of data provided to the Auditor c) entire network architecture, connectivity (including co-lo facility) and its linkage to the trading infrastructure are in conformity with SEBI's regulatory framework to provide fair equitable, transparent and non-discriminatory treatment to all

[32] Circular No. SEBI/HO/MRD1/MRD1_DTCS/P/CIR/2022/58 dated May 02, 2022

the market participants d) internal review of Critical Systems as defined in SEBI circular dated March 22, 2021 was carried out during the Audit period, including the Failure Modes and Effects Analysis (FMEA).

8.2. **Annual System Audit of Stock Brokers**[33]

8.2.1. The stock exchanges should ensure that system audit of stock brokers / trading members are conducted in accordance with the prescribed guidelines placed at Annexure IX.

8.2.2. Exchanges are advised to keep track of findings of system audits of all brokers on quarterly basis and ensure that all major audit findings, specifically in critical areas, are rectified / complied in a time bound manner failing which follow up inspection of such brokers may be taken up for necessary corrective steps / actions thereafter, if any.

8.2.3. Stock Exchange should report all major non-compliances / observations of system auditors, broker wise, on a quarterly basis to SEBI.

[33] Circular No. CIR/MRD/DMS/34/2013 dated November 06, 2013

9. BUSINESS CONTINUITY PLAN AND DISASTER RECOVERY

9.1. Guidelines for Business Continuity Plan (BCP) and Disaster Recovery (DR) of Market Infrastructure Institutions (MIIs)[34]

9.1.1. The framework for Business Continuity Plan (BCP) and Disaster Recovery (DR) shall be as under:

9.1.1.1. Stock Exchanges and Clearing Corporations (which, along with Depositories, are collectively referred as Market Infrastructure Institutions – MIIs) shall have in place BCP and DRS so as to maintain data and transaction integrity.

9.1.1.2. Apart from DRS, all MIIs shall also have a Near Site (NS) to ensure zero data loss.

9.1.1.3. The DRS should preferably be set up in different seismic zones and in case due to certain reasons such as operational constraints, change of seismic zones, etc., minimum distance of 500 kilometer shall be ensured between PDC and DRS so that both DRS and PDC are not affected by the same disaster.

9.1.1.4. The manpower deployed at DRS/NS shall have the same expertise as available at PDC in terms of knowledge/ awareness of various technological and procedural systems and processes relating to all operations such that DRS/NS can function at short notice, independently. MIIs shall have sufficient number of trained staff at their DRS so as to have the capability of running live operations from DRS without involving staff of the PDC.

9.1.1.5. All MIIs shall constitute an Incident and Response team (IRT)/ Crisis Management Team (CMT), which shall be chaired by the Managing Director (MD) of the MII or by the Chief Technology Officer (CTO), in case of non-availability of MD. IRT/ CMT shall be responsible for the actual declaration of disaster, invoking the BCP and shifting of operations from PDC to DRS whenever required. Details of roles, responsibilities and actions to be performed by employees, IRT/ CMT and support/outsourced staff in the event of any Disaster shall be defined and documented by the MII as part of BCP-DR Policy Document.

[34] Circular No. SEBI/HO/MRD1/DTCS/CIR/P/2021/33 dated March 22, 2021

9.1.1.6. The Technology Committee of the MIIs shall review the implementation of BCP-DR policy approved by the Governing board of the MII on a quarterly basis.

9.1.1.7. MIIs shall conduct periodic training programs to enhance the preparedness and awareness level among its employees and outsourced staff, vendors, etc. to perform as per BCP policy.

9.1.2. **Configuration of DRS/NS with PDC**

9.1.2.1. Hardware, system software, application environment, network and security devices and associated application environments of DRS / NS and PDC shall have one to one correspondence between them.

9.1.2.2. MIIs should develop systems that do not require configuration changes at the end of trading members/ clearing members/ depository participants for switchover from the PDC to DRS. Further, MIIs should test such switchover functionality by conducting unannounced live trading from its DRS for at least 1 day in every six months. Unannounced live trading from DRS of MIIs shall be done at a short notice of 45 minutes after 90 days from the date of this circular.

9.1.2.3. In the event of disruption of any one or more of the 'Critical Systems' (as defined below), the MII shall, within 30 minutes of the incident, declare that incident as 'Disaster' and take measures to restore operations including from DRS within 45 minutes of the declaration of 'Disaster'. Accordingly, the Recovery Time Objective(RTO)- the maximum time taken to restore operations of 'Critical Systems' from DRS after declaration of Disaster- shall be 45 minutes, to be implemented within 90 days from the date of the circular. 'Critical Systems' for an Exchange/ Clearing Corporation shall include Trading, Risk Management, Collateral Management, Clearing and Settlement and Index computation. 'Critical Systems' for a Depository shall include systems supporting settlement process and inter-depository transfer system.

9.1.2.4. MIIs to also ensure that the Recovery Point Objective (RPO) - the maximum tolerable period for which data might be lost due to a major incident- shall be 15 minutes.

9.1.2.5. Solution architecture of PDC and DRS / NS should ensure high availability, fault tolerance, no single point of failure, zero data loss, and data and transaction integrity.

9.1.2.6. Any updates made at the PDC should be reflected at DRS/ NS immediately (before end of day) with head room flexibility without compromising any of the performance metrics.

9.1.2.7. Replication architecture, bandwidth and load consideration between the DRS / NS and PDC should be within stipulated RTO and ensure high availability, right sizing, and no single point of failure.

9.1.2.8. Replication between PDC and NS should be synchronous to ensure zero data loss whereas, the one between PDC and DRS and between NS and DRS may be asynchronous.

9.1.2.9. Adequate resources (with appropriate training and experience) should be available at all times to handle operations at PDC, NS or DRS, as the case may be, on a regular basis as well as during disasters.

9.1.3. **DR drills/ Testing**

9.1.3.1. DR drills should be conducted on a quarterly basis. In case of Exchanges and Clearing Corporations, these drills should be closer to real life scenario (trading days) with minimal notice to DRS staff involved.

9.1.3.2. During the drills, the staff based at PDC should not be involved in supporting operations in any manner.

9.1.3.3. The drill should include running all operations from DRS for at least 1 full trading day.

9.1.3.4. Before DR drills, the timing diagrams clearly identifying resources at both ends (DRS as well as PDC) should be in place.

9.1.3.5. The results and observations of these drills should be documented and placed before the Governing Board of Stock Exchanges/ Clearing Corporations/ Depositories. Subsequently, the same along with the comments of the Governing Board should be forwarded to SEBI within a month of the DR drill.

9.1.3.6. The System Auditor while covering the BCP – DR as a part of mandated annual System Audit should check the preparedness of the MII to shift its operations from PDC to DRS unannounced and also comment on documented results and observations of DR drills.

9.1.3.7. 'Live' trading sessions from DR site shall be scheduled for at least two consecutive days in every six months. Such live trading sessions from the DRS shall be organized on normal working days

(i.e. not on weekends / trading holidays). The Stock Exchange/ Clearing Corporation/ Depository shall ensure that staff members working at DRS have the abilities and skills to run live trading session independent of the PDC staff.

9.1.3.8. Stock Exchanges, Clearing Corporations and Depositories shall include a scenario of intraday shifting from PDC to DRS during the mock trading sessions in order to demonstrate its preparedness to meet RTO/RPO as stipulated above.

9.1.3.9. MII should undertake and document Root Cause Analysis (RCA) of their technical/ system related problems in order to identify the causes and to prevent reoccurrence of similar problems.

9.1.4. **BCP – DR Policy Document**

9.1.4.1. MIIs shall put in place a comprehensive BCP-DR policy document outlining the following:

9.1.4.1.1. Broad scenarios that would be defined as a Disaster for an MII (in addition to definition provided in para 4 (c) of the circular).

9.1.4.1.2. Standard Operating Procedure to be followed in the event of Disaster.

9.1.4.1.3. Escalation hierarchy within the MII to handle the Disaster.

9.1.4.1.4. Clear and comprehensive Communication Protocols and procedures for both internal and external communications from the time of incident till resumption of operations of the MII.

9.1.4.1.5. Documentation policy on record keeping pertaining to DR drills.

9.1.4.1.6. Scenarios demonstrating the preparedness of MIIs to handle issues in Critical Systems that may arise as a result of Disaster.

9.1.4.1.7. Preparedness of Depositories to handle any issue which may arise due to trading halts in Stock Exchanges.

9.1.4.1.8. Framework to constantly monitor health and performance of Critical Systems in normal course of business.

9.1.4.2. The BCP-DR policy document of MII should be approved by Governing Board of the MIIs after being vetted by Technology Committee and thereafter communicated to SEBI. The BCP-DR policy document should be periodically reviewed at least once in six months and after every occurrence of disaster.

9.1.4.3. In case an MII desires to lease its premise at the DRS to other entities including to its subsidiaries or entities in which it has stake,

the MII should ensure that such arrangements do not compromise confidentiality, integrity, availability, targeted performance and service levels of the MII's systems at the DRS. The right of first use of all the resources at DRS including network resources should be with the MII. Further, MII should deploy necessary access controls to restrict access (including physical access) of such entities to its critical systems and networks.

9.1.5. MIIs should ensure that clause 9.1.3.6 and 9.1.4.1.5 mentioned above is also included in the scope of System Audit.

9.2. Business Continuity Plan (BCP) and Disaster Recovery (DR) framework – Limited Purpose Clearing Corporation (LPCC)[35]

9.2.1. The Securities Contracts (Regulation) (Stock Exchanges and Clearing Corporations) (Amendment) Regulations, 2018 has been amended to provide for a Limited Purpose Clearing Corporation ("LPCC").

9.2.2. The LPCC has been permitted to have arrangements with any of the existing Clearing Corporations for the purposes of putting in place a BCP and DR mechanism.

9.2.3. The framework governing arrangements with existing Clearing Corporations for the purpose of BCP and DR is placed at Para 1 in Annexure X.

9.3. Standard Operating Procedure for handling of technical glitches by Market Infrastructure Institutions (MIIs) and payment of "Financial Disincentives" thereof[36]

9.3.1. MIIs (i.e. Stock Exchanges, Clearing Corporations and Depositories) are systemically important institutions as they, inter-alia, provide infrastructure necessary for the smooth and uninterrupted functioning of the securities market.

9.3.2. With increasing dependence on technology, as the operations and functioning of MIIs are fully automated right from order entry to order matching to trade confirmation leading up to clearing and settlement of

[35] Circular No. SEBI/HO/MRD2/DCAP/CIR/P/227 dated November 06, 2020
[36] Circular No. SEBI/HO/MRD1/DTCS/CIR/P/2021/590 dated July 05, 2021

trades, the instances of technical glitches at MIIs, leading to business disruption/unavailability of services provided by MIIs, have been occurring, despite various mechanisms stipulated by SEBI such as Business Continuity Planning, Disaster Recovery policies, System Audit etc.

9.3.3. The general practice in the computing/technology industry to deal with business disruption/unavailability of services, is to work with specified downtime and for downtimes beyond such specified time, a pre-defined penalty structure is included in Service Level Agreement.

9.3.4. Considering the criticality of smooth functioning of systems of MIIs (as any disruption adversely impacts all classes of investors / market participants as well as the credibility of the securities market), specifying a pre-defined threshold for downtime of systems of MIIs becomes desirable. For any downtime or unavailability of services, beyond such pre-defined time, there is a need to ensure that "Financial Disincentive" is paid by the MIIs as well as Managing Director (being the executive head in-charge of all the day to day operations) and Chief Technology Officer (being the executive head in-charge of technology) of the MII. This will encourage MIIs to constantly monitor the performance and efficiency of their systems and upgrade/ enhance their systems etc. to avoid any possibility of technical glitches/disruption/disaster and restart their operations expeditiously in the event of glitch/disruption/disaster.

9.3.5. Accordingly, after extensive discussion with various stakeholders, it has been decided that, MIIs shall:

9.3.5.1. Follow the Standard Operating Procedure (SOP) for handling technical glitches as detailed at **Annexure XI**, and,

9.3.5.2. Comply with the "Financial Disincentive" structure as detailed at **Annexure XII**.

9.3.6. The aforesaid "Financial Disincentives", when triggered automatically under pre-defined conditions, as detailed in Annexure XII, shall be credited to the Investor Protection Fund / Core Settlement Guarantee Fund maintained by the MII.

9.4. Measures to strengthen tracking and reporting of delay in pay-in/pay-out for rolling settlement

9.4.1. SEBI carried out review of existing SOP with regard to tracking of instances of delay in normal rolling settlement and reporting thereof to

SEBI along with the joint monthly report submitted by the CCs/depositories.

9.4.2. The Competent Authority has approved the following measures subsequent to the aforesaid review to strengthen tracking of intermediate activities in rolling settlement and reporting of settlement delays. This is without prejudice to financial disincentives, if any, emanating from delay in completion of pay-in/pay-out activities.

9.4.3. **For tracking of intermediate activities constituting rolling settlement**

9.4.3.1. CCs and Depositories may put in place systems to ensure:

9.4.3.2. All intermediate activities that may impact rolling settlement (i.e. from trade date to settlement) are streamlined and the process flow is optimized. If there are dependencies / data shared with other CC/Depository, discussions may be done with the concerned CC / Depository with regard to optimization. Further, all intermediate activities are time stamped with start and finish time of the activity.

9.4.3.3. Such intermediate activities are defined along with outer timelines for each activity after discussion with the concerned stakeholders such as members/participants, DVP agent, participating banks, other Market Infrastructure Institutions (MIIs) etc. to achieve final pay-in and pay-out within SEBI stipulated timelines.

9.4.3.4. Process flow and associated timelines, so decided, are intimated to all the stakeholders and delay in completion of any of these activities, should be traceable and attributable to one or more entity / MII, as the case may be.

9.4.3.5. Procedures to handle various exceptions i.e. scenarios that could result in settlement delay are documented along with the steps to be taken towards completing settlement processes at the earliest in case of exceptions.

9.4.3.6. On the basis of the aforesaid, CCs and Depositories may separately prepare a Comprehensive Standard Operating Procedure (CSOP) which is mutually agreed upon by other CCs and Depositories as

far as all the timelines and exception handling are concerned. This CSOP would be submitted to SEBI after approval of the Governing Boards of CCs and Depositories.

9.4.3.7. Further, the said CSOP shall also cover action points emanating from 9.4.4 below and would be reviewed periodically by the MIIs to incorporate any regulatory/system changes.

9.4.4. **For reporting of Delay in rolling settlement cycle**

9.4.4.1. In case of delay in completion of any of the intermediate activities beyond their pre-agreed time, the respective CCs/Depositories would inform the impacting CCs/Depositories regarding delay in completion of the intermediate activity at their end on immediate basis.

9.4.4.2. CCs shall intimate delay in settlement beyond the stipulated timelines for settlement for rolling settlement to SEBI (under intimation to depositories). This intimation should be given within one hour of such SEBI stipulated timelines and should inter-alia mention - reasons for delay, entity/MII responsible for the delay and likely completion time of the settlement process.

9.4.4.3. CCs and Depositories shall submit a separate report to SEBI, on a monthly basis (replacing the existing joint monthly report), wherein following details are inter-alia provided:

9.4.4.3.1. Day wise completion time for pay-in and pay-out activities
9.4.4.3.2. Details about settlement delays for the month
9.4.4.3.3. Intermediate activity that caused the delay and reason(s) thereof
9.4.4.3.4. Steps taken to address the root cause of the issue
9.4.4.3.5. Review of instances of delay to understand areas of improvement etc.

9.4.4.4. CCs / Depositories would also submit a report to their Governing Boards on quarterly basis with regard to instances of delay attributable to them in the said quarter. If settlement delay is on account of technical reasons, findings are to be evaluated by the

SCOT of the CC / Depository before referring to the Governing Board. The report would inter-alia include the details of individual instances of settlement delay along with reasons thereof and corrective / preventive actions taken.

9.5. **Advisory on Security Patch Management Policy**

All the MIIs are advised to ensure the following:

9.5.1. The security patch management policy is audited by an external auditor.

9.5.2. Appropriate changes, if necessary, are made to the existing policy on security patch management.

9.6. **Standard Operating Procedure for handling of Stock Exchange Outage and extension of trading hours thereof**[37]

9.6.1. Trading hours of stock exchanges are pre-defined and known to all market participants including the other Market Infrastructure Institutions (MIIs) to enable them to carry out activities related to continuous trading in securities.

9.6.2. If due to any technical reason or otherwise, continuous trading on stock exchanges is disrupted, it is of paramount importance that not only all market participants including other MIIs, are promptly informed about the outage but also the trading hours are extended, if required, so as to provide opportunity for smooth closure of intraday positions.

9.6.3. With a view to ensure that any outage at stock exchange(s) is handled in a harmonized and consistent manner, the matter was discussed with the MIIs and Standard Operating Procedure with regard to handling of such stock exchange outage in Cash Market and Equity Derivatives segment is detailed below.

Definition of Stock Exchange Outage

9.6.4. Stock Exchange Outage shall mean stoppage of continuous trading, either suo moto by exchange or by virtue of reasons beyond control of stock exchange. Further, stoppage of continuous trading shall not include trading halt on account of index based market-wide circuit breaker.

[37] Circular No. SEBI/HO/MRD-TPD-1/CIR/P/2023/7 dated January 09, 2023

Reporting Requirements for outage

9.6.5. The stock exchange that suffered the outage (referred to as affected stock exchange) shall intimate about the outage to various stakeholders as mentioned below:

S No.	Communication to	Reporting
i.	Market Participants / Trading Members / Other MIIs	Immediate but not later than 15 minutes from occurrence of outage. Through broadcast message and by publishing on its website
ii.	SEBI	Immediate after occurrence of outage. Through an email to dedicated email id : techglitch@sebi.gov.in

9.6.6. Further, the affected stock exchange shall update about the ongoing outage in the time intervals of 45 minutes from the initial intimation, as mentioned above, until normalcy to operations is restored. Extension of trading hours, if applicable (as mentioned later), shall be mentioned in the intimation by the affected stock exchange.

Trading on unaffected segment(s) / exchanges and Resumption of trading on affected stock exchange

9.6.7. In the event of disruption of trading in one or more market segments of affected stock exchange, qualifying as outage, trading in other unaffected segments of the affected exchange shall continue and all other unaffected exchanges shall continue to trade in all of their market segments.

9.6.8. Affected stock exchange would restore operations to normalcy at the earliest including from the Disaster Recovery Site and carry out various activities, in terms of Para 9.1 and 9.3 in this Master Circular.

9.6.9. A pre-opening session similar to normal pre-opening session would be conducted for effective price discovery, before resumption of trading. Further, there shall be an advance intimation of at least 15 minutes to various market participants with regard to resumption of trading or start of pre-opening session, as applicable.

Extension of trading hours in case of outage

9.6.10. If the trading on the affected stock exchange resumes to normalcy at least one hour (excluding 15 minutes of pre-opening session, if applicable)

before the normal scheduled market closure, trading hours on that day for all stock exchanges would remain unchanged.

9.6.11. If the trading on the affected stock exchange does not resume to normalcy even one hour (excluding 15 minutes of pre-opening session, if applicable) before the scheduled market closure, trading hours for all stock exchanges would automatically get extended for additional one and half hours for that day and the same would be intimated by the affected stock exchange to market participants, other MIIs and SEBI latest by one hour fifteen minutes before the normal scheduled market closure. Subsequent to the communication from the affected stock exchange, the unaffected stock exchanges would also suitably issue a notice with regard to extension of trading hours on their stock exchanges.

9.6.12. If the trading on the affected stock exchange does not resume to normalcy even 45 minutes (excluding 15 minutes of pre-opening session, if applicable) post normal scheduled market closure, in the case of extension of trading hours, no further trading would be allowed on the affected stock exchange for that day and other stock exchanges would continue to operate till the extended time provided at para 11 above to enable smooth closure/settlement of intraday positions. The affected exchange would have to suitably intimate the same to market participants, other MIIs and SEBI latest by 45 minutes post normal scheduled market closure.

9.6.13. If the occurrence of outage as mentioned in para 4 above, happens during the last trading hour of normal operation and latest before 15 minutes of normal scheduled market closure, trading hours for all stock exchanges would automatically get extended by one and half hours for that day and the same would be intimated by the affected stock exchange to market participants, other MIIs and SEBI immediately but not later than 10 minutes from the occurrence of outage. Subsequent to the communication from the affected stock exchange, the unaffected stock exchanges would also suitably issue a notice with regard to extension of trading hours on their stock exchanges.

9.6.14. Exchanges have to put in place a common close out policy to ensure uniform methodology of settlement of open positions, in case continuous trading didn't happen in Cash Market or Equity Derivative Segment of the exchange during last half an hour of trading for the day due to outage.

9.6.15. Extension of trading hours, if any, for Cash Market would result in equivalent extension of trading hours in Equity Derivative Segment and vice versa, provided trading hours at the start of the day are aligned for both Cash Market and Equity Derivative Segment. Further, Extension of

trading hours in the Cash Market would also result in equivalent extension to other secondary market mechanisms conducted during trading hours such as Offer for Sale, Buy back etc.

9.6.16. For illustration, a few scenarios pertaining to extension of trading hours are tabulated herewith with the assumptions that trading hours for two exchanges A and B in Cash Market and Equity Derivative Segment, at start of the day, are from 09:15 to 15:30 (i.e. excluding pre-opening and post-closing session) and all segments of exchange B are operating unaffected.

S No	Occurrence of outage	Event	Extension of trading hours
1	In Equity Derivative Segment of exchange A	Normalcy in the said segment restored latest by 14:30	No extension of trading hours for exchange A and B
2	In Cash Market of exchange A	Start of Pre-opening latest by 14:15	No extension of trading hours for exchange A and B
3	Any time during the trading hours in Cash Market on exchange A	Failure to start Pre-opening by 14:15 on exchange A	Trading hours in Cash Market and Equity Derivative Segment of exchange A and B extended till 17:00 and announcement in this regard to be made latest by 14:15 by the affected stock exchange. Note that such announcement is to be made on the basis of assessment by stock exchange on the likely resumption of normalcy.
		Failure to start Pre-opening by 16:00 on exchange A	No trading permitted in Cash Market on exchange A for the day. Equity Derivative Segment on exchange A and Cash Market and Equity Derivative Segment on

			exchange B would continue to trade till 17:00. The affected stock exchange to announce latest by 16:15.
4	At 15:05 on exchange A in Cash Market		Trading hours in Cash Market and Equity Derivative Segment of exchange A and B extended till 17:00 and announcement to be made by affected stock exchange within 10 minutes of occurrence of outage i.e. by 15:15
5	At 15:16 on exchange A in Cash Market		No extension of trading hours for exchange A and B

Updation of BCP document of MII

9.6.17. MIIs shall update their BCP document subsequent to the instant circular and submit the same to SEBI subsequent to approval of their Governing Boards within 2 months.

10. CYBER SECURITY AND CYBER RESILIENCE

10.1. Cyber Security and Cyber Resilience framework of Stock Exchanges, Clearing Corporations and Depositories[38]

10.1.1. SEBI as a member of the International Organization of Securities Commissions ("IOSCO") has adopted the Principles for Financial Market Infrastructures ("PFMI") laid down by Committee on Payments and Market Infrastructures ("CPMI") and IOSCO and has issued guidance for implementation of the principles in the securities market.

10.1.2. Principle 17 of PFMI that relates to management and mitigation of 'Operational risk' requires that systemically important market infrastructures institutions "*should identify the plausible sources of operational risk, both internal and external, and mitigate their impact through the use of appropriate systems, policies, procedures, and controls. Systems should be designed to ensure a high degree of security and operational reliability and should have adequate, scalable capacity. Business continuity management should aim for timely recovery of operations and fulfilment of the FMI's obligations, including in the event of a wide-scale or major disruption*."

Stock Exchanges and Clearing Corporations (hereafter referred as *Market Infrastructure Institutions* or *MIIs*) are systemically important market infrastructure institutions. As part of the operational risk management, these MIIs need to have robust cyber security framework to provide essential facilities and perform systemically critical functions relating to trading, clearing and settlement in securities market.

10.1.3. Based on the consultations and recommendations of Technical Advisory Committee ('TAC'), it has been decided to lay down the framework placed at **Annexure XIII** that MIIs would be required to comply with regard to cyber security and cyber resilience.

[38] Reference: Circular CIR/MRD/DP/13/2015 dated July 06, 2015 and Circular SEBI/HO/MRD1/MRD1_DTCS/P/CIR/2022/68 dated May 20, 2022

10.2. **Cyber Security and Cyber Resilience framework – Limited Purpose Clearing Corporation (LPCC)**[39]

10.2.1. A Limited Purpose Clearing Corporation ("LPCC") has been permitted to have arrangements with any of the existing Clearing Corporations for the purposes of Cyber Security.

10.2.2. The framework governing arrangements with existing Clearing Corporations for the purpose of Cyber Security is placed at Para 2 in **Annexure X**.

10.3. **Strengthening Resiliency of Websites of Stock Exchanges and Clearing Corporations**

10.3.1. MII shall take necessary steps to ensure that its website(s) are resilient to cyber-attack(s).

10.3.2. Redundant websites: MII shall host its website(s) at multiple DNS (Domain Naming Servers) and hosts. MII shall put-in place suitable systems to switch to alternate website(s) hosted on a different DNS / hosts in the event of a cyber-attack on its primary website(s) and at the same time, shall take necessary steps to recover from the cyber-attack on the its primary website(s).

10.3.3. Web Application Firewall (WAF): MII shall mandatorily deploy Web Application firewalls of demonstrated capabilities.

10.3.4. Continuous monitoring of the website(s): MII shall deploy suitable and adequate resources for 24x7 monitoring of its website(s), including monitoring of their website(s) through the SOCs (Security Operations Center).

10.3.5. MII shall periodically conduct penetration testing of its website(s) and related systems, at the minimum, once in a calendar year.

10.3.6. In cases where services of 3rd party vendors / service providers are availed by the MII for hosting of its website(s) and for other related areas, MII shall ensure that the cyber security and resilience framework of such 3rd party vendors / service providers are as per the requirements specified by SEBI for MIIs. Further, MII shall include audit of the cyber security and resilience framework of such 3rd party vendors / service providers (limited to the services availed by MIIs) in the scope of its annual system audit.

[39] Circular No. SEBI/HO/MRD2/DCAP/CIR/P/227 dated November 06, 2020

10.3.7. MII shall implement the principles mentioned in the '*Guidelines for Indian Government Websites*' developed by *National Informatics Centre (NIC)* and adopted by *Department of Administrative reforms and Public Grievances (DARPG)* on the areas of 'Website Hosting', 'Website Management', 'Development', etc. The said guidelines are available at http://web.guidelines.gov.in/assets/documents/pdf/hand_book.pdf

10.3.8. MII shall frame and implement a Web Server Security Policy that should cover Network and Host Security Policy, Web Server Backup and Logging Policy, Web Server Administration and Updation Policy, Classification of documents to be published on Web Server, Password Management Policy, Encryption Policy, and Physical Security

10.3.9. In addition to the above, MIIs shall ensure implementation of the following:

10.3.9.1. MIIs shall advise their auditors to give additional emphasis on the Application Security audit.

10.3.9.2. MIIs shall include suitable IT / Cyber security related certifications requirements in the criteria for selection of software developers / vendors.

10.3.9.3. MIIs shall ensure that their software vendors undertake security audit of their systems on a periodic basis (at least once a year).

10.4. Bolstering Cyber Resiliency

10.4.1. In order to bolstering cyber resiliency MIIs should take following steps:

10.4.1.1. In addition to the current detection and prevention tools deployed at the MIIs for Network Traffic Analysis and other SIEM solutions, MIIs should start using User and Entity Behaviour Analytics (UEBA) tools for combating cyber threats.

10.4.1.2. The Indian-CERT has set-up a Cyber Swachhta Kendra for analyzing BOTs/malware characteristics and providing information and enabling citizens for removal of BOTs/malware. MIIs should share their public facing IPs with the Cyber Swachhta Kendra for monitoring purposes.

10.4.1.3. The Standing Committee on Technology (SCOT) of Exchanges and Clearing Corporations and the IT Strategy Committees (IT-CS) of Depositories should on a quarterly basis review the cyber security preparedness of the respective MIIs and also appraise the Board of MII regarding the same.

10.4.1.4. MIIs should place the details of Cyber-threat vectors and Cyber-attack scenarios and the corresponding action plan / steps taken to manage such threat vectors and scenarios, before its SCOT or IT-CS for assessing the adequacy of steps taken / efficacy of plans and further improvements. Thereafter, the MII should place a report in this regard before its Board before submitting the same to SEBI.

10.4.1.5. In addition to the periodic vulnerability assessment and penetration testing conducted by MIIs to evaluate security posture of the MII, the MIIs should also conduct periodic table-top exercises, mock drills, etc. to improve its preparedness to handle cyber breach/incident. Such exercises should be followed up with a detailed review before its SCOT or IT-CS.

10.5. Comprehensive Review of Cyber Security at Stock Exchanges, Clearing Corporations and Depositories (MIIs)

10.5.1. As stated at Para 10.1 in this Master Circular, SEBI had prescribed the Cyber Security and Cyber Resilience framework that Stock Exchanges, Clearing Corporations and Depositories are required to implement.

10.5.2. With the view to further strengthen the said framework and increase the level of cyber security at MIIs, SEBI has been issuing various advisories based on the extant cyber threats in the Indian securities markets from time to time.

10.5.3. Based on internal deliberations, guidance received from CERT-ln and the recommendations of SEBI's High Powered Steering Committee on Cyber Security (“HPSC-CS”) it has been decided that MIIs should conduct a comprehensive review/ audit of Cyber Security.

10.5.4. ln this regard, you are advised to conduct a detailed review/ audit of the implementation of the SEBI circular and advisories issued by SEBI from time to time w.r.t. Cyber Security as per the framework placed below. The framework includes:

10.5.4.1. Auditor Selection Norms
10.5.4.2. Scope of Review/ Audit for Cyber Security of MIIs
10.5.4.3. Format of Review / Audit Report
10.5.4.4. Standardized Observation Reporting Format

10.5.5. The stipulated timeline for the auditor to submit the report from commencement of the review / audit is 6 weeks.

10.5.6. The Cyber Security Review Audit Reports and compliance status of the same should be placed before the Standing Committee on Technology (SCOT) of Stock Exchanges/ Clearing Corporations and before the IT Strategy committee (IT-SC) of Depositories for review. The SCOT / IT-SC should also review the corrective actions taken by the MII and submit its report to the Governing Board of the MII.

10.5.7. The comments of the SCOT/ IT-SC and the Governing Board of the MII should be communicated to SEBI.

10.5.8. In order to achieve uniformity in reporting across MIIs, the review/ audit report format and the format followed by the auditor while reporting findings / observations is being standardized. The draft structure of the report and the Standardized Observation Reporting Format are placed herein.

10.5.9. As advised by the HPSC-CS, the MIIs should conduct the comprehensive review/audit at least two times a year.

10.5.10. MIIs are advised to submit a compliance report to SEBI within one month of the review/audit and the report on corrective action report within three months post the submission of the compliance report.

Auditor Selection Norms

1.1 Auditors must be compulsorily CERT-In empanelled.

1.2 Auditor must preferably have a minimum 3 years of experience in IT audit of Banking and Financial Services preferably in the Securities Market e.g. stock exchanges, clearing houses, depositories etc. The audit experience should have covered all the major areas mentioned under SEBI's Audit Terms of Reference (TOR). Auditing experience of the Cyber Security Framework of NIST for an organization will be an added advantage.

1.3 The Auditor must have experience in / direct access to experienced resources in the areas covered under TOR. IT is recommended that resources employed shall have relevant industry recognized certifications e.g. CISA (Certified

Information Systems Auditor) from ISACA, CISM (Certified Information Securities Manager) from ISACA, GSNA (GIAC Systems and Network Auditor), CISSP (Certified information Systems Security Professional) from International Information Systems Security Certification Consortium, commonly known as (ISC).

1.4 The Auditor should have ISMS / IT audit/governance frameworks and processes conforming to leading industry practices like CobiT.

1.5 The Auditor must not have any conflict of interest in conducting fair, objective and independent audit of the Exchange / Depository. IT should not have been engaged over the last three years in any consulting engagement with any departments / units of the entity being audited.

1.6 The Auditor may not have any cases pending against its previous auditees, which fall under SEBI's jurisdiction, which point to its incompetence and/or unsuitability to perform the audit task.

1.7 The auditor must have experience of performing VAPT.

1.8 The Auditor must compulsorily use only licensed tools.

1.9 The Auditor must compulsorily enter into a Non-Disclosure Agreement (NDA) with the auditee. Under no circumstances, the data sought during the review or the audit report subsequently should leave the jurisdiction of India.

Scope of Review for Cyber Security of MIIs

1.1 Annexure XIII in this Master Circular on Cyber Security and Cyber Resilience framework of Stock Exchanges, Clearing Corporation and Depositories

1.2 SEBI Advisory dated October 19, 2016

1.3 SEBI Advisory dated November 24, 2016 on Strengthening Resiliency of Websites of Stock Exchanges, Clearing Corporations and Depositories

1.4 SEBI Advisory dated May 15, 2017 on WannaCry Ransomware

1.5 SEBI Advisory dated June 30, 2017 on Petya Ransomware

1.6 SEBI Advisory dated September 04, 2017 on Locky Ransomware

1.7 SEBI Advisory dated August 09, 2017 w.r.t. Communique from NCSC

1.8 Cyber Threat Vectors and Cyber Attack Scenarios communicated.

In order to achieve uniformity in reporting across MIIs, the review/ audit report format and the format followed by the auditor while reporting findings/ observations be standardized. The structure of the report and the Standardized Observation Reporting Format are also attached.

Format of Review / Audit Report

1.1 Identification of auditee (Address & contact information)
1.2 Dates and Location(s) of audit
1.3 Terms of reference (as agreed between the auditee and auditor), including the standard / specific scope for audit
1.4 Audit plan (audit subject identification, pre-audit planning, data gathering methodology etc) followed.
1.5 Explicit reference to key auditee organizational documents (by date or version) including policy and procedure documents. (List of documentary evidence)
1.6 Additional mandatory or voluntary standards or regulations applicable to the auditee
1.7 Summary of audit findings including identification tests, tools used and results of tests performed (Standard Observation Reporting Format, as highlighted in paragraph 11 below ,to be followed by auditor while reporting findings / observations
1.8 Analysis of vulnerabilities and issues of concern
1.9 Recommendations for action
1.10 Specific Best practices implemented by the auditee in a generalized manner without infringing on Intellectual property rights (IPRs).
1.11 Personnel involved in the audit, including identification of any trainees.

Standardized Observation Reporting Format

Note:

MII's are expected to submit following information with regards to each major/minor NCs/ suggestion / Observation made in the Cyber Security Review Audit

MIIs should also categorically highlight those observations/NCs/Suggestions pointed out in their System Audit (current & previous) which are not yet complied with, which corresponding to the current review finding.

I. For Preliminary Audit

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Audit Period	**Observation No**	**Description of Finding**	**Department of MII**	**Status / Nature of Findings**	**C/ I/ A Affected**	**Risk Rating of Findings as per Auditor**	**SEBI Cyber Security Clause**	**Audited By**	**Test Cases used**	**Root Cause Analysis**	**Impact Analysis**	**Corrective Action proposed by auditor**	**Deadline for the Corrective Action**	**Management response in case of acceptance of assoc**	**Whether similar issue was observed in any of the previ**	**List of Documentary evidence verified during review / audit (Annexure**

														iate Risks	**ous 3 syste m audit s**	**Nos.)**

Description of all Table heads

1. **Audit Period –** This indicates the period of the audit**.**
2. **Observation Number –** (Self-explanatory term.)
3. **Description of Findings/ Observations –** Description of the findings in sufficient detail, referencing any accompanying evidence.
4. **Department of MII –** Corresponding Department (s) of MII where finding was observed / Department responsible for closing the finding.
5. **Status / Nature of Findings –** The category can be specified for example:
    a. Non-Conformity (Major / Minor)
    b. Work In progress
    c. Observation
    d. Suggestion

6. **C/I/A Affected –** Principle of Confidentiality / Integrity / Availability affected due to issue left unaddressed.
7. **Risk Rating of Findings as per Auditor -** A rating has to been given for each of the observations based on their impact and severity to reflect the risk exposure, as well as the suggested priority for action.

Rating	Description
HIGH	Weakness in control which represent exposure to the organization or risks that could lead to instances of noncompliance with the requirements of TORs. These risks need to be addressed with utmost priority.
MEDIUM	Potential weakness in controls, which could develop into an exposure or issues that represent areas of concern and may impact internal controls. These should be addressed reasonably promptly.
LOW	Potential weaknesses in controls, which in combination with other weakness can develop into an exposure. Suggested improvements for situations not immediately/directly affecting controls.

8. **SEBI Cyber Security Clause –** The clause corresponding to this observation w.r.t SEBI Circular dated July 06, 2015 on Cyber Security
9. **Audited By –** Name (s) of audit team member
10. **Test Cases used –** The details of test cases used for arriving at this observation, provide annexure numbers in case of detailed test cases.
11. **Root Cause Analysis –** A detailed analysis on the cause of the nonconformity
12. **Impact Analysis –** An analysis of the likely impact on the operations/activity of the organization
13. **Corrective Action proposed by auditor –** The action taken to correct the non- conformity
14. **Deadline for the Corrective Action –** The auditor should specify the deadline not only for the corrective action on the system where the NC/ Observation was found, but also should specify the deadline for corrective action on systems where similar observations could have been found/ are found.
15. **Management response in case of acceptance of associate Risks**
16. **Whether similar issue was observed in any of the previous 3 system audits**
17. **List of Documentary evidence verified during review/ audit (Annexure Nos.)**

10.6. Cyber Security and Cyber Resilience framework of Stock Exchanges, Clearing Corporations and Depositories[40]

10.6.1. Recognizing the need for a robust Cyber Security and Cyber Resilience framework at Market Infrastructure Institutions (MIIs), i.e., Stock Exchanges, Clearing Corporations and Depositories, a detailed regulatory framework on cyber security and cyber resilience has been prescribed.

10.6.2. With the view to further strengthening the aforesaid framework particularly in respect of monitoring of cyber threats and cyber resiliency, the matter was discussed with SEBI's Technical Advisory Committee (TAC), SEBI's High Powered Committee on Cyber Security (HPSC-CS) and the MIIs.

10.6.3. Accordingly, it has been decided that MIIs shall have a Cyber Security Operation Center (C-SOC) that would be a 24x7x365 set-up manned by dedicated security analysts to identify, respond, recover and protect from cyber security incidents.

10.6.4. The C-SOC shall function in accordance with the framework specified at Para 10.1 in this Master Circular. Illustrative list of broad functions and objectives to be carried out by a C-SOC are mentioned hereunder:

10.6.4.1. Prevention of cyber security incidents through proactive actions:

10.6.4.1.1. Continuous threat analysis,

10.6.4.1.2. Network and host scanning for vulnerabilities and breaches,

10.6.4.1.3. Countermeasure deployment coordination,

10.6.4.1.4. Deploy adequate and appropriate technology at the perimeter to prevent attacks originating from external environment and internal controls to manage insider threats. MIIs may implement necessary controls to achieve zero trust security model.

10.6.4.2. Monitoring, detection, and analysis of potential intrusions / security incidents in real time and through historical trending on security-relevant data sources.

10.6.4.3. Response to confirmed incidents, by coordinating resources and directing use of timely and appropriate countermeasures.

10.6.4.4. Analysis of the intrusions / security incidents (including Forensic Analysis and Root Cause Analysis) and preservation of evidence.

10.6.4.5. Providing situational awareness and reporting on cyber security status, incidents, and trends in adversary behavior to appropriate organizations including to CERT- In and NCIIPC.

10.6.4.6. Engineer and operate network defense technologies such as Intrusion Detection Systems (IDSes) and data collection / analysis systems.

[40] Refer SEBI Circular CIR/MRD/CSC/148/2018 dated December 07, 2018

10.6.4.7. MIIs to adopt security automation and orchestration technologies in C-SOC to automate the incident identification, analysis and response as per the defined procedures.

10.6.5. Further to the above, the C-SOC of MII shall, at the minimum, undertake the following activities:

10.6.5.1. In order to detect intrusions / security incidents in real time, the C-SOC should monitor and analyze on a 24x7x365 basis relevant logs of MII's network devices, logs of MII's systems, data traffic, suitable cyber intelligence (intel) feeds sourced from reliable vendors, inputs received from other MIIs, inputs received from external agencies such as CERT-In, etc. The cyber intelligence (intel) feeds may include cyber news feeds, signature updates, incident reports, threat briefs, and vulnerability alerts.

10.6.5.2. To this end, appropriate alert mechanisms should be implemented including a comprehensive dashboard, tracking of key security metrics and provide for cyber threat scorecards.

10.6.5.3. The C-SOC should conduct continuous assessment of the threat landscape faced by the MII including undertaking periodic VAPT (Vulnerability Assessment and Penetration Testing).

10.6.5.4. The C-SOC should have the ability to perform Root Cause Analysis, Incident Investigation, Forensic Analysis, Malware Reverse Engineering, etc. to determine the nature of the attack and corrective and/or preventive actions to be taken thereof.

10.6.5.5. The C-SOC should conduct periodic (at the minimum quarterly) cyber attack simulation to aid in developing cyber resiliency measures. The C-SOC should develop and document mechanisms and standard operating procedures to recover from the cyber-attacks within the stipulated RTO of the MII. The C-SOC should also document various scenarios and standard operating procedures for resuming operations from Disaster Recovery (DR) site of MII.

10.6.5.6. The C-SOC should conduct periodic awareness and training programs at the MII and for its members / participants / intermediaries with regard to cyber security, situational awareness and social engineering.

10.6.5.7. The C-SOC should be capable to prevent attacks similar to those already faced. The C-SOC should also deploy multiple honey pot services which are dynamic in characteristics to avoid being detected as honey pot by attackers.

10.6.6. As building an effective C-SOC requires appropriate mix of right people, suitable security products (Technology), and well-defined processes and procedures (Processes), an indicative list of areas that MIIs should consider while designing and implementing a C-SOC are as follows:

10.6.6.1. The MII shall ensure that the governance and reporting structure of the C-SOC is commensurate with the risk and threat landscape of the MII. The C-SOC shall be headed by the Chief Information Security Officer (CISO) of the MII. The CISO shall be designated as a Key Managerial Personnel (KMP) and relevant provisions relating to KMPs in the *Securities Contracts (Regulation) (Stock Exchanges and Clearing Corporations) Regulations, 2018* and the subsequent circulars issued by SEBI relating to KMPs, shall apply to the CISO.

10.6.6.2. While the CISO is expected to work closely with various departments of MIIs, including MII's Network team, Cyber Security team and Information Technology (IT) team, etc., the reporting of CISO shall be directly to the MD & CEO of the MII.

10.6.6.3. The roles and responsibilities of CISO may be drawn from Ministry of Electronics and IT notification No. 6(12)/2017-PDP-CERT-In dated March 14, 2017.41

10.6.6.4. The C-SOC should deploy appropriate technology tools of adequate capacity to cater to its requirements. Such tools shall, at the minimum, include Security Analytics Engine, Malware detection tools, Network and User Traffic Monitoring and Behavior Analysis systems, Predictive Threat Modelling tools, Tools for monitoring of System parameters for critical systems / servers, Deep Packet Inspection tools, Forensic Analysis tools, etc.

10.6.6.5. Each MII is advised to formulate a Cyber Crisis Management Plan (CCMP) based on its architecture deployed, threats faced and nature of operations. The CCMP should define the various cyber events, incidents and crisis faced by the MII, the extant cyber threat landscape, the cyber resilience envisaged, incident prevention, cyber crisis recognition, mitigation and management plan. The CCMP should be approved by the respective Standing Committee on Technology / IT- Strategy Committee of the MIIs and the governing board of the MII. The CCMP should also be reviewed and updated annually.

10.6.6.6. The C-SOC should have well-defined and documented processes for monitoring of its systems and networks, analysis of cyber security threats and potential intrusions / security incidents, usage of appropriate technology tools deployed by C-SOC, classification of threats and attacks, escalation hierarchy of incidents, response to threats and breaches, and reporting (internal and external) of the incidents.

10.6.6.7. The C-SOC should employ domain experts in the field of cyber security and resilience, network security, data security, end-point security, etc.

10.6.6.8. The MIIs are also advised to build a contingent C-SOC at their respective DR sites with identical capabilities w.r.t. the primary C-SOC in line with the

[41] CISO roles & responsibilities - Ministry of Electronics and IT notification No. 6(12)/2017-PDP-CERT-In dated March 14, 2017

circulars issued by SEBI in this regard. Additionally, the MIIs should perform monthly live-operations from their DR-C-SOC.

10.6.6.9. The C-SOC should document the cases and escalation matrices for declaring a disaster.

10.6.7. In view of the feedback received from MIIs, it has been decided that MIIs may choose any of the following models to set-up their C-SOC:

(i) MII's own C-SOC manned primarily by its internal staff
(ii) MII's own C-SOC, staffed by a service provider, but supervised by a full time staff of the MII (Refer to Para 10.67.3)
(iii) C-SOC that may be shared by the MII with its group entities (that are also SEBI recognized MIIs)
(iv) C-SOC that may be shared by the MII with other SEBI recognized MII(s).

10.6.7.1. The responsibility of cyber security of an MII, adherence to business continuity and recovery objectives, etc. should lie with the respective MII, irrespective of the model adopted for C-SOC.

10.6.7.2. The respective risk committee(s) of the MII should evaluate the risks of outsourcing the respective activity.

10.6.7.3. The MII may outsource C-SOC activities in line with the guidelines as given in Annexure XIV.

10.6.8. A report on the functioning of the C-SOC, including details of cyber-attacks faced by the MII, major cyber events warded off by the MII, cyber security breaches, data breaches should be placed on a quarterly basis before the board of the MII.

10.6.9. The system auditor of the MII shall audit the implementation of the aforesaid guidance in the annual system audit of the MII. The Scope and/or Terms of Reference (ToR) of the annual system would accordingly be modified to include audit of the implementation of the aforementioned areas.

10.6.10. Further, in continuation to the requirement specified at para 52 of Annexure III in this Master Circular, the C-SOC shall share relevant alerts and attack information with members / participants / intermediaries of the MII, other MIIs, external cyber response agencies such as CERT-In, and SEBI.

10.7. Cyber Security Operations Center for SEBI registered intermediaries[42]

10.7.1. Recognizing the need for a robust Cyber Security and Cyber Resilience framework at Market Infrastructure Institutions (MIIs), i.e. Stock Exchanges, Clearing Corporations and Depositories, SEBI has specified a detailed regulatory framework on cyber security and cyber resilience.

10.7.2. With the view to further strengthening cyber security in securities market the Cyber Security and Cyber Resilience framework has been extended to Stock Brokers/ Depository Participants.

10.7.3. During the discussions held with the market participants, it was gathered that compliance with the cyber security guidelines may be onerous for smaller intermediaries because of the lack of knowledge in cyber security and also the cost factor involved in setting up own Security Operations Center (SOC). These intermediaries may utilize the services of Market SOC which is proposed to be set up by MIIs with the objective of providing cyber security solution to such intermediaries. The intermediaries' membership in Market SOC is nonmandatory.

10.7.4. The particulars of the Market SOC will be as follows:

10.7.4.1. The Market SOC shall be set up as a separate entity and MIIs shall have at least 51% stake in the new entity.

10.7.4.2. Intermediaries who don't have capability to set up a SOC on their own can opt for the Market SOC.

10.7.4.3. The Market SOC should be in accordance to Annexure XIII in this Master Circular and should ensure that participating intermediaries are in compliance to the same, should they opt for the market SOC. Market SOC would provide only the technology perspective for the abovementioned cyber security guidelines and the people & process perspectives of cyber security as mandated by the aforementioned circular would still be have to be managed by the intermediaries.

10.7.4.4. The Market SOC should be evolving continuously in order to be able to manage new security controls and guidelines that may issue by SEBI from time to time.

10.7.4.5. The Market SOC to ensure that intermediaries participating in their SOC should adhere to the minimum IT guidelines and security protocols all the time.

[42] Refer Circular CIR/MRD/CSC/151/2018 dated December 14, 2018

10.7.4.6. MII will carry out audit of their Market SOC activity annually and submit the report to SEBI.

10.7.4.7. The Market SOC will issue an audit report as prescribed at Para 8.2 in this Master Circular, to the participating intermediary.

10.7.4.8. If an intermediary is subscribed to Market SOC, audit report submitted by intermediary through the Market SOC would be deemed compliant.

10.7.4.9. Approval for the Market SOC which is to be set up as a separate entity would be in terms of Regulation 38 of Securities Contracts (Regulation) (Stock Exchanges and Clearing Corporations) Regulations, 2018.

10.8. Reporting for Artificial Intelligence (AI) and Machine Learning (ML) applications and systems offered and used by Market Infrastructure Institutions (MIIs)[43]

Background

10.8.1. SEBI is conducting a survey and creating an inventory of the AI / ML landscape in the Indian financial markets to gain an in-depth understanding of the adoption of such technologies in the markets and to ensure preparedness for any AI / ML policies that may arise in the future.

Scope definition

10.8.2. Any set of applications/ software/ programs/ executable/ systems (computer systems) – cumulatively called application and systems, to carry out compliance operations / activities, where AI / ML is used for compliance or management purposes, is included in the scope of this circular. In order to make the scope of this circular inclusive of various AI and ML technologies in use, the scope also covers Fin-Tech and Reg-Tech initiatives undertaken by MIIs that involves AI and ML.

10.8.3. Technologies that are considered to be categorized as AI and ML technologies in the scope of this circular, are explained in Annexure XV.

[43] SEBI Circular SEBI/HO/MRD/DoP1/CIR/P/2019/24 dated January 31, 2019

Regulatory requirements

10.8.4. All MIIs shall fill in the AI / ML reporting form (Annexure XVI) in respect of the AI or ML based applications or systems as defined in Annexure XV offered or used by them, and submit the same in soft copy only at AI_MII_SE@sebi.gov.in (for Stock Exchanges)/ AI_MII_DEP@sebi.gov.in (for Depositories)/ AI_MII_CC@sebi.gov.in (for Clearing Corporations) to SEBI on a quarterly basis within 15 days of the expiry of the quarter.

10.9. Standard Operating Procedure for reporting of **C**yber **S**ecurity breaches, incidents and deficiencies and for imposition of "Financial Disincentive" on Market Infrastructure Institutions (MIIs)

Background

10.9.1. Stock exchanges, Depositories and Clearing Corporations are collectively referred to as Market Infrastructure Institutions (MIIs). These institutions are systemically important for the country's financial development and provide the infrastructure necessary for the securities market. A smooth and uninterrupted functioning of operations of the MIIs is essential for ensuring the continuity of the securities market. It is, therefore, critical for the MIIs to constantly monitor the performance of their internal processes and systems and upgrade/ enhance their systems with respect to cyber security and cyber resilience so as to eliminate cyber security deficiencies and prevent or minimize the possibility of a cyber security breach.

10.9.2. However, incidents of technical and administrative lapses at MIIs have been observed some of which have arisen due to non-compliance with the extant regulatory framework for cyber security and cyber resilience and which have hindered the smooth functioning of the MIIs and threatened the continuity of the securities market. In the event of such incidents, it should be incumbent on MIIs to address cyber security deficiencies and breaches in a timely manner by taking appropriate corrective actions. It has also been observed that the MIIs were non-compliant with the extant regulatory framework for cyber security and cyber resilience in the cyber audit reports and reports from other agencies.

10.9.3. It has, therefore, been decided to levy a "Financial Disincentive" on MIIs in the event of the following cases:

10.9.3.1. Non-compliance with the extant cyber security regulations and guidelines resulting in cyber security breaches, cyber-attacks, cyber security deficiencies or any other cyber security incidents

10.9.3.2. Lackadaisical approach or undue delay in addressing cyber security deficiencies and breaches

10.9.3.3. Non-reporting/ delay in reporting a cyber security incident/breach

The intent of this financial disincentive is to encourage the MIIs to constantly monitor the performance of their systems and upgrade/ enhance their systems so as to eliminate cyber security deficiencies and prevent or minimize the possibility of a cyber security breach.

10.9.4. In this regard, an SOP for reporting of cyber security breaches and deficiencies by MIIs and imposition of "Financial Disincentive", is placed below for information and necessary compliance.

Definitions

10.9.5. "*Cyber security deficiency*" shall be defined as a loophole, vulnerability or non-compliance observed in

10.9.5.1. the MII's stated internal cyber security policy/cyber security protocol/ operational guidelines/information security practices or

10.9.5.2. the cyber security guidelines specified by SEBI from time to time

which threatens or compromises the security, confidentiality, integrity or availability of the MII's computer resource or cyber assets.

10.9.6. "*Cyber security incident*" shall be defined as any real or suspected adverse event in relation to cyber security that violates, explicitly or implicitly, applicable cyber security policy resulting in unauthorized access, denial of service or disruption, unauthorized use of computer resource for processing or storage of information or changes to data or information without authorization.

10.9.7. "*Cyber security breach*" shall be defined as any incident or security violation that results in unauthorized or illegitimate access or use by a person as well as an entity, of data, applications, services, networks and/or devices through bypass of the underlying cyber security protocols, policies and mechanisms resulting in the compromise of the confidentiality, integrity or availability of data/information maintained in a computer resource or cyber asset. A cyber security breach is a subset of a cyber security incident.

10.9.8. "*Information security practices*" shall be defined as implementation of cyber security policies and standards in order to minimize the cyber security incidents and cyber security breaches.

10.9.9. "*Cyber security policy*" shall be defined as a set of documented business rules and processes for protecting information and the computer resource.

10.9.10. "*Cyber security protocol*" shall be defined as the official procedure or system of rules governing the cyber security operations of a MII. The cyber security protocol is usually as subset of the cyber security policy.

10.9.11. "*Operational guidelines*" refers to any additional set of rules and procedures issued internally by a MII that compliments its cyber security protocol and information security practices.

Reporting Requirements

10.9.12. The following reporting structure for cyber security deficiencies/ breach shall be adopted by the MIIs:

Sl. No.	Issue	Reporting
1.	Cyber Security Breach / Incident	• CERT-In • SEBI's Cyber Security Cell • Standing Committee on Technology of the MII • Governing Board of the MII
2.	Cyber Security Deficiencies	• Standing Committee on Technology of the MII • Governing Board of the MII • SEBI's Cyber Security Cell

Cases for levy of "Financial Disincentive"

10.9.13. The "Financial Disincentive" shall be levied in the following cases:

10.9.13.1. Cyber security breaches, cyber-attacks and any other cyber security incidents occurring on account of non-compliance of SEBI cyber security policies and guidelines and delay in reporting the Root Cause Analysis to SEBI in case of breaches, attacks and incidents.

For the above, a "Financial Disincentive" of Rs.10,00,000/- (ten lakhs) shall be levied for

10.9.13.1.1. each such cyber security breach, cyber-attack or any other cyber security incident on account of non-compliance of SEBI cyber security policies and guidelines

10.9.13.1.2. delay in reporting the Root Cause Analysis to SEBI in case of such breaches, attacks and incidents.

10.9.13.1.3. for cyber security breaches, cyber-attacks and any other cyber security incidents occurring otherwise and where there is a delay in submission of the RCA report

At present SEBI has prescribed a time period of two weeks from the date of the incident for submission of RCA reports.

10.9.13.2. Cyber Security deficiencies occurring on account of non-compliance of SEBI cyber security policies and guidelines observed during biannual cyber security audits mandated by SEBI at Para 10.5 in this Master Circular or reports from other agencies.

For the above, a "Financial Disincentive" of Rs.5,00,000/- (five lakhs) shall be levied for each such deficiency from the date of the report.

10.9.13.3. A cyber security breach / incident should be reported as soon as it is discovered as per the reporting structure specified at Para 10.9.12. A "Financial Disincentive" of Rs.10,00,000/- (ten lakhs) shall be levied on those MIIs that

10.9.13.3.1. Do not report a cyber security breach/incident, or

10.9.13.3.2. Delay the reporting of the cyber security breach/incident

10.9.13.4. Failure to timely address the cyber security deficiencies / breaches within the deadline set by SEBI/ HPSC-CS. The progressive slab-wise structure for imposition of "Financial Disincentive" shall be followed from the expiry of the deadline specified by SEBI/ HPSC-CS.

No. of working days post the stated deadline during which the deficiency/ cause of breach is not addressed	**"Financial Disincentive" (Rs) per working day**
First 15 working days	1 lakh per working day
Subsequent 15 working days	2 lakh per working day
Subsequent working days	5 lakh per working day

10.9.14. Notwithstanding the reporting structure mentioned at Para 10.9.12 above, the penalties would start being levied by SEBI at Para 10.9.13 as mentioned above.

Proceeds to be credited to SEBI's IPEF

10.9.15. Further, with a view to making such "Financial Disincentives" effective and meaningful, the amount realized from the same may be credited to the "Investor Protection and Education Fund" of SEBI in accordance with Section 11(1) of SEBI Act, 1992 read with Regulation 4(1)(j) of the Securities and Exchange Board of India (Investor Protection and Education Fund) Regulations, 2009, which is as follows:

Amounts to be credited to the Fund.
"*4. (1) The following amounts shall be credited to the Fund:-*
(a)…
(b)…

(j) such other amount as the Board may specify in the interest of investors."

10.9.16. The "Financial Disincentive" specified above shall continue to accrue till the time the issue has been addressed by the MII by taking appropriate corrective actions and the same has been validated by an independent third party.

10.9.17. The amount of "Financial Disincentive" realized as per the above structure shall be credited by MII to Investor Protection and Education Fund administered by SEBI as mentioned at Para 10.9.14 above.

10.9.18. Imposition of aforesaid "Financial Disincentive" shall be irrespective of any other action(s) initiated/ taken by SEBI.

10.10. Implementation of Cyber Capability Index

10.10.1. SEBI issued cyber-security framework/guidelines to be implemented by all the MIIs. In this regard, SEBI has developed a Cyber Capability Index (CCI) to gauge the cyber security preparedness of the MIIs. The index consists of the below mentioned domains:

10.10.1.1. Governance of Critical Infrastructure and Personnel
10.10.1.2. Identification of critical assets and risks
10.10.1.3. Protection of Critical Assets and Infrastructure
10.10.1.4. Monitoring and Detection of Critical Assets/ Infrastructure and Detection of Intrusion/ Unauthorized Access
10.10.1.5. Response and Recovery
10.10.1.6. Sharing of information
10.10.1.7. Training
10.10.1.8. Periodic Audit

10.10.2. Each of the eight domains contains a structured set of parameters. Each set of parameters shall determine the extent/level to which the organization has matured with respect to cyber security and cyber resilience in that domain.

10.10.3. MIIs are advised to rate their systems and processes on the Cyber Capability Index based on the rating framework (given below) on a quarterly basis. Additionally, they are required to submit their quarterly index scores along with the detailed breakup to their Standing Committee on Technology (SCOT) and their Governing Board. The report on the completed maturity index rating is then required to be submitted to SEBI.

10.10.4. MIIs were requested to start rating itself from the quarter of July to September 2019. Subsequently, MIIs are requested to rate itself every quarter and submit the report to SEBI by 30th of subsequent quarter.

Please find Annexures containing the following:

10.10.4.1. Annexure XVII - "MIL" containing Maturity Indicator Levels (MILs) &

10.10.4.2. Annexure XVIII - "Calculation" containing the illustration for Index calculation

Index Calculation Methodology

10.10.5. The 54 parameters for evaluation of cyber security and cyber resilience of a Market Infrastructure Institution (MII), as specified in Para 10.1, have been divided into 8 domains:

10.10.5.1. Governance of Critical Infrastructure and Personnel

10.10.5.2. Identification of critical assets and risks

10.10.5.3. Protection of Critical Assets and Infrastructure

10.10.5.4. Monitoring and Detection of Critical Assets/ Infrastructure and Detection of Intrusion/ Unauthorized Access

10.10.5.5. Response and Recovery

10.10.5.6. Sharing of information

10.10.5.7. Training

10.10.5.8. Periodic Audit

10.10.6. Each parameter has various Maturity Indicator Levels (MIL). The MII shall apply an MIL independently to each parameter within a domain/ sub-domain. An MII aspiring to achieve the highest MIL for each and every parameter and therefore the highest possible score within a Domain, would be an ideal scenario.

10.10.7. MIL 1 represents non-compliance with the parameter and therefore shall be assigned a value of zero. At MIL 2 (for most parameters), only the initial set of practices for the parameter is expected. However, the MII should not be hindered from undertaking additional practices to achieve higher MILs for that parameter. MIL 2 shall be assigned a score of 1, MIL 3 shall be assigned a score of 2 and so on (i.e. MIL <n> shall have a score of (n-1)).

10.10.8. For the purpose of being evaluated and rated on the Cyber Capability Index, an MII has to fulfill the minimum cut-off score for each of the 8 domains and 9 sub-domains. A MII is declared "Fail" in the evaluation process when it scores below the cut-off in at least one Domain/Sub-Domain, even if the overall index score is greater than or equal to 50.

10.10.9. The Domain-wise minimum cut-off scores and weightages in the index have been provided in the worksheet "Calculation" in the excel file. The worksheet contains three sample index scores and their calculations:

10.10.9.1. Index on maximum permissible score for every parameter (100)

10.10.9.2. Index on minimum cut-off score for every parameter (50)

10.10.9.3. Index on a random sample score for every parameter (89.02)

10.10.10. The formula for calculation of the Cyber Capability Index is as follows:

Index = $\sum$ ($ScoreParameter_i$ * $Weight_i$ (%)*100/$MaxParameter_i$)

where *i* ranges from 1 to 53

$ScoreParameter_i$ *is the score of the MII for that parameter*

$Weight_i$ *(%) is the weightage, in percentage, of the parameter in the index*

$MaxParameter_i$ *is the maximum permissible value of that parameter*

Score based Rating

10.10.11. Based on the value of the index, the cyber security maturity level of the MIIs shall be determined as follows:

Sr No	Rating	Index Score Range
1	Exceptional Cyber Security Maturity	90-100
2	Optimal Cyber Security Maturity	80-90
3	Manageable Cyber Security Maturity	70-80
4	Developing Cyber Security Maturity	60-70
5	Bare Minimum Cyber Security Maturity	50-60
6	FAIL	Not applicable as the MII has scored below the cut-off in at least one Domain / Sub-Domain

10.10.12. Based on the sample index scores calculated in the worksheet and the abovementioned details, the sample scores would be categorized as follows (for illustrative purposes):

Sr No	Rating	Index Score
1	Exceptional Cyber Security Maturity	100
2	Optimal Cyber Security Maturity	89.02
3	Bare Minimum Cyber Security Maturity	50

Action Point

10.10.13. MIIs are advised to rate their systems and processes on the Cyber Capability Index on a quarterly basis. Additionally, they are required to submit their quarterly index scores along with the detailed breakup to their Standing Committee on Technology (SCOT) and their Governing Board.

10.10.14. MIIs are advised to commence the rating exercise from the quarter ending September 30, 2019 and submit the report to SEBI by November 30, 2019. Thereafter, the rating exercise shall be done every quarter and the corresponding reports shall be submitted within 30 calendar days of the end of that quarter.

10.11. **Advisory on Cyber Audit and VAPT**

With regard to the cyber audit of the MIIs, the following needs to be ensured by the MIIs:

10.11.1. All MIIs should update the scope of the audit as and when any guidelines or advisory related to cyber security is issued by SEBI.

10.11.2. During cyber audit, evidence should be collected by inspecting physical assets, records/documents, testing of relevant systems, relevant system generated reports etc. in order to ascertain the compliance of various controls defined by SEBI.

10.11.3. The cyber audit report is to be submitted in the Standardized format placed below as **Annexure IX**.

10.11.4. Along with cyber audit reports, all MIIs are required to submit to SEBI the comments of their SCOT and Governing Board.

10.11.5. Scope of cyber audit shall also include testing the functional efficacy of the SOC.

10.11.6. VAPT exercise shall cover all possible ingress and egress points including broker ICT setup, co-location facility etc.

10.11.7. All MIIs shall conduct Periodic Training for the concerned employees regarding Cyber Security in line with existing SEBI circular dated July 06, 2015 and the same has to be checked by the Auditors during cyber audit.

10.11.8. The audit report shall include control wise compliance of all SEBI circulars/advisories along with the evidences.

10.11.9. All MIIs are advised to include the directions issued by SEBI pursuant to discussion in HPSC-CS in their regular bi-annual cyber audit.

10.11.10. In order to ascertain the compliance of clause 11 of SEBI circular dated July 06, 2015 regarding identification of critical assets, process of identification of critical assets and its implementation should be assessed during cyber audit.

10.11.11. In order to ascertain the compliance of clause 40 of SEBI circular dated July 06, 2015, whether minimum baseline standards followed for conducting VAPT are in line with the scope defined by SEBI should be checked during cyber audit. Minimum baseline standards defined by SEBI for conducting VAPT is mentioned as **Annexure XX** for ready reference.

All MIIs are advised to ensure the strict compliance of the said advisory and shall also bring the same to the notice of the concerned cyber auditors.

11. CO-LOCATION / PROXIMITY HOSTING

11.1. Co-location / proximity hosting facility offered by stock exchanges[44]

11.1.1. The facility of co-location or proximity hosting (or by whatever name called) is offered by the stock exchanges to stock brokers and data vendors whereby their trading or data-vending systems are allowed to be located within or at close proximity to the premises of the stock exchanges, and are allowed to connect to the trading platform of stock exchanges through direct and private network.

11.1.2. Based on the recommendations of SEBI's Technical Advisory Committee ("TAC"), stock exchanges are advised to follow the guidelines given below, while facilitating co-location / proximity hosting.

11.1.3. In order to ensure fair and equitable access to the co-location facility, stock exchanges shall:

11.1.3.1. provide co-location / proximity hosting in a fair, transparent and equitable manner.

11.1.3.2. ensure that all participants who avail co-location / proximity hosting facility have fair and equal access to facilities and data feeds provided by the stock exchange.

11.1.3.3. ensure that all stock brokers and data vendors using co-location / proximity hosting experience similar latency with respect to exchange provided infrastructure.

11.1.3.4. ensure that the size of the co-located / proximity hosting space is sufficient to accommodate all the stock brokers and data vendors who are desirous of availing the facility.

11.1.3.5. provide the flexibility to avail rack space in the co-location / proximity hosting so as to meet the needs of all stock brokers desirous of availing such facility.

11.1.3.6. expeditiously decide on the request of the desirous stock brokers / data vendors for availing co-location / proximity hosting and communicate the decision within fifteen working days from the receipt of the request from the stock brokers / data vendors. In case of a rejection, stock exchanges shall also provide reasons in writing to the stock brokers / data vendors.

[44] Circular No. CIR/MRD/DP/07/2015 dated May 13, 2015

11.1.3.7. facilitate stock brokers to receive data feeds from other recognised stock exchanges at the co-location facilities and allow routing of orders to other recognised stock exchanges from the co-location facilities.

11.1.3.8. make available on their websites description of the co-location / proximity hosting, including requirements to be fulfilled by stock brokers / data vendors who avail the facility, details on fees / charges associated with the facility, etc.

11.1.3.9. publish on their websites suitable quarterly reports on latencies observed at the exchange.

11.1.3.10. be able to identify orders emanating from the co-located servers of stock brokers and the resultant trades. Suitable statistics relating to such orders and trades shall be disseminated by the stock exchanges.

11.1.4. In order to ensure that the facility of co-location / proximity hosting does not compromise integrity and security of the data and trading systems, stock exchanges shall:

11.1.4.1. implement suitable mechanism to protect their systems and systems of stock brokers and data vendors at co-location / proximity hosting from unauthorized access.

11.1.4.2. frame guidelines on access and conduct of the personnel of stock brokers / data vendors in the premises of the stock exchange, including in the co-located space.

11.1.4.3. not provide access in any form to the personnel of stock brokers/ data vendors to the stock exchange's trading platform and databases.

11.2. Measures to strengthen Algorithmic Trading and Co-location/ proximity Hosting Framework[45]

11.2.1. SEBI, at Para 7 in this Master Circular, has put in place the broad guidelines for algorithmic trading in the securities market. Further, SEBI, at Para 11.1 and 11.3 in this Master Circular, has laid down guidelines to ensure fair and equitable access to the Co-location/proximity hosting facility offered by stock exchanges.

11.2.2. In order to address the concerns relating to algorithmic trading and co-location/ proximity hosting facility offered by stock exchanges and to provide a level playing field between Algorithmic/ Co-located trading and

[45] Circular No. SEBI/HO/MRD/DP/CIR/P/2018/62 dated April 09, 2018

manual trading, SEBI issued a discussion paper on August 5, 2016 requesting market participants to provide their views on the efficacy and need to introduce further mechanisms to address the aforementioned concerns.

11.2.3. In light of the public comments received and in consultation with Technical Advisory Committee ("TAC") of SEBI and Secondary Market Advisory Committee ("SMAC") of SEBI, it has been decided to introduce the following measures in connection with algorithmic trading and co-location/ proximity hosting framework facility offered by stock exchanges.

Managed Co-location Service

11.2.4. In order to facilitate small and medium sized Members, who otherwise find it difficult to avail colocation facility, due to various reasons including but not limited to high cost, lack of expertise in maintenance and troubleshooting, etc. to avail co-location facility, stock exchanges shall introduce 'Managed Co-location Services'. Under this facility, space/rack in co-location facility shall be allotted to eligible vendors by the stock exchange along with provision for receiving market data for further dissemination of the same to their client members and the facility to place orders (algorithmic / non-algorithmic) by the client members from such facility.

11.2.5. The vendors shall provide the technical knowhow, hardware, software and other associated expertise as services to trading members and shall be responsible for upkeep and maintenance of all infrastructure in the racks provided to them.

11.2.6. Stock exchanges shall supervise and monitor such facilities on a continuous basis. While allowing such services, stock exchanges shall continue to abide by the provisions at Para 11.1 and 11.3 in this Master Circular including remaining responsible and accountable for actions of vendors providing Managed Co-location Services and ensuring integrity, security and privacy of data, being handled at the facility.

11.2.7. Further, in order to have fair competition, stock exchanges are advised to ensure that multiple vendors are permitted for providing Managed Co-location Services at their co-location facility.

Measurement of Latency for Co-location and Proximity Hosting

11.2.8. Clause 3.9 of SEBI circular CIR/MRD/DP/07/2015 dated May 13, 2015, mandated stock exchanges to publish suitable quarterly reports on their websites on latencies observed at the exchange.

11.2.9. Currently, latency is measured by the Stock Exchange as the time taken to complete the round trip from the Core Router (Core Router is the place where both Colo-location orders and Non-colocation orders meet) to the matching engine and back. In order to bring in greater transparency, stock exchanges shall additionally publish minimum, maximum and mean latencies and latencies at 50th and 99th percentile.

11.2.10. Stock Exchanges shall also publish reference latency, which is the time taken for an order message to travel between a reference rack in the Colocation facility and the Core Router.

Free of Charge Tick-by-Tick Data feed (TBT Feed)

11.2.11. Tick-by-Tick (TBT) data feed offered by stock exchanges provides a detailed view of the entire order-book, which includes details relating to addition, modification and cancellation of orders and trades on a real-time basis.

11.2.12. In order to create a more level playing field among the different types of market participants, Stock Exchanges shall provide TBT Feeds to all the trading members, free of cost, subject to trading members creating the necessary infrastructure for receiving and processing it.

11.2.13. After assessing the needs of the market participants, stock exchanges may increase the depth of snapshot of 5 best bid and ask quotes currently being provided by them.

Penalty on Order to Trade Ratio (OTR)

11.2.14. In order to ensure orderly trading in the market, as mentioned at Para 7.1.2.2 in this Master Circular, stock exchanges were advised to put in place effective economic disincentives for high daily order-to-trade ratio (OTR) of algo orders placed by trading members. In order to encourage algo traders to place more orders closer to the last traded price (LTP), the following modification shall be carried out in the existing OTR framework:

11.2.14.1. Instead of orders placed within ±1%, orders placed within ±0.75% of the LTP shall be exempted from the framework for imposing penalty for high OTR.

11.2.14.2. Orders placed in the cash segment and orders placed under the liquidity enhancement schemes shall also be brought under the OTR framework.

11.2.15. Further, on the basis of request received from the stock exchange(s), the following modification shall be carried out in the existing OTR framework[46]:

11.2.15.1. Stock exchanges may be permitted to introduce additional slabs upto OTR of 2000 (from existing OTR of 500), and for OTR more than 2000. Such slabs can be introduced with deterrent incremental penalty, which stock exchanges may decide jointly.

11.2.15.2. On the third instance of OTR being 2000 or more, in last 30 days (rolling basis), the concerned member shall not be permitted to place any orders for the first 15 minutes on the next trading day as a cooling off action.

Unique Identifier for Algorithms / Tagging of Algorithms

11.2.16. Para 7.1.7.6 in this Master Circular prescribes that all algorithmic orders be tagged with a unique identifier provided by the stock exchange in order to establish audit trail.

11.2.17. In order to ensure enhanced surveillance, stock exchanges shall now allot a unique identifier to each algorithm approved by them. Stock exchanges shall ensure that every algorithm order reaching on exchange platform is tagged with the unique identifier allotted to the respective algorithm and that such unique identifier tags are part of the data set sent / shared with SEBI for surveillance purpose.

Testing Requirement for Software and Algorithms

11.2.18. Para 5.1 in this Master Circular prescribes the testing procedure to be followed by market participants before deployment of software and algorithms. In order to further streamline and strengthen the process of testing of software and algorithms, stock exchanges may provide a simulated market environment for testing of software including algos. Such a facility may be made available over and beyond the current framework of mock trading prescribed by SEBI.

Stock exchanges shall ensure that the tagging of each order each algorithm with its unique identifier is completed by September 30, 2018, while the other provisions of the circular shall be complied with at the earliest but not later than June 30, 2018.

[46] Circular No. SEBI/HO/MRD1/DSAP/CIR/P/2020/107 dated June 24, 2020

11.3. **Review of guidelines for Co-location / proximity hosting facility offered by stock exchanges**[47]

11.3.1. SEBI, in consultation with Technical Advisory Committee of SEBI (TAC), has reviewed the applicable provisions regarding guidelines to be followed by stock exchanges while facilitating co-location / proximity hosting, particularly with respect to the following:

11.3.1.1. Direct connectivity between colocation facilities of recognized stock exchanges.

11.3.1.2. Colocation services / data centre facilities entirely/ partially provided and managed by a third party data centre service provider.

11.3.1.3. Stock exchanges allowing stock brokers/ data vendors to connect to the stock exchange Trading system over an internal Local Area Network (LAN).

11.3.2. Pursuant to the aforementioned review, stock exchanges are advised to allow direct connectivity between colocation facility of one recognised stock exchange and the colocation facility of other recognized stock exchanges. Stock exchanges are also advised to allow direct connectivity between servers of a stock broker placed in colocation facility of a recognized stock exchange and servers of the same stock broker placed in colocation facility of a different recognized stock exchange. This facility should be available to all the colocated brokers, who are desirous to avail such connectivity, in a fair and equitable manner.

11.3.3. In addition to the above, in order to ensure fair and equitable access to the co-location facility it is clarified as under:

11.3.3.1. Colocation services provided by a third party or outsourced from a third party is deemed to be provided by the stock exchanges. Stock exchange shall ensure complete control and jurisdiction over the matters related to its co-location facility. Further, stock exchange will remain responsible and accountable for actions of such outsourced entity with respect to colocation services.

11.3.3.2. Stock exchanges shall submit a quarterly compliance report to SEBI regarding the outsourcing services after placing it before the board of the respective stock exchange.

[47] Circular No. CIR/HO/MRD/DP/CIR/P/2016/129 dated December 01, 2016

11.3.3.3. Facility that allows stock brokers/ data vendors to connect to the stock exchange trading system over a Local Area Network (LAN) shall fall within the definition of "Colocation / proximity hosting".

11.3.4. Further, it is clarified that, all provisions at Para 11.1 in this Master Circular on "Colocation / proximity hosting provided by stock exchanges" shall be made applicable, including for cases such as colocation facility entirely/ partially managed by a third party and facility available to stock brokers / data vendors to connect to stock exchange's system over LAN.

12. CAPACITY PLANNING

12.1. Capacity planning framework of stock exchanges and clearing corporations[48]

12.1.1. Being critical infrastructure of the securities market, it is imperative for the stock exchanges and clearing corporations to continuously assess and monitor their system capacities. Over the years, stock exchanges and clearing corporations have experienced increase in volumes owing to the growth of the market and have accordingly taken steps to increase capacities of their trading, clearing and settlement infrastructure.

12.1.2. Stock exchanges and Clearing corporations are advised to ensure the following requirements while planning capacities of their trading, clearing and settlement and risk management related infrastructure:

12.1.2.1. The installed capacity shall be at least 1.5 times (1.5x) of the projected peak load.

12.1.2.2. The projected peak load shall be calculated for the next 60 days based on the per-second peak load trend of the past 180 days.

12.1.2.3. All systems in trading, clearing and settlement ecosystem shall be considered in this process including all technical components such as network, hardware, software, etc., and shall be adequately sized to meet the capacity requirements.

12.1.2.4. In case the actual capacity utilisation exceeds 75% of the installed capacity, immediate action shall be taken to enhance the capacity.

12.1.3. Stock exchanges and clearing corporations shall implement suitable mechanisms, including generation of appropriate alerts, to monitor capacity utilisation on a real-time basis and shall proactively address issues pertaining to their capacity needs.

[48] Circular No. CIR/MRD/DP/17/2015 dated October 08, 2015

13. **Data Feeds**

13.1. **Capacity planning framework of stock exchanges and clearing corporations**[49]

13.1.1. SEBI in consultation with the Technical Advisory Committee (TAC) of SEBI had reviewed the market data feed mechanism of the stock exchanges.

13.1.2. Based on the recommendations of SEBI's Technical Advisory Committee (TAC), it has been decided that stock exchanges shall formulate a comprehensive policy document for providing stock market related data to the market participants in a fair and transparent manner, irrespective of the type of mechanism used by the stock exchanges for broadcasting of data.

13.1.3. In this context, stock exchanges shall ensure that:

13.1.3.1. Appropriate tools are deployed so as to monitor service quality of data feeds;

13.1.3.2. Appropriate mechanism (viz. load balancers, randomizers, etc.) to manage load across systems disseminating data in order to ensure consistent response time to all market participants;

13.1.3.3. All communication to the market participants, especially on all technology related matters such as Monitoring Tool, Load Balancer, Randomisation etc., are abundantly clear and precise providing all necessary details related to the concerned facility / service, including information on features, benefits, risks, etc. of the concerned facility / service, particularly for participants who have opted for colocation facility.

13.1.4. Further, SEBI, at Para 7.1.2.10 in this Master Circular, has directed stock exchanges to synchronize their system clocks with the atomic clock before the start of market such that their clocks have precision of at least one microsecond and accuracy of at least +/-one millisecond. In this regard, the stock exchange should ensure that all clocks of the servers and other related systems are synchronized. Stock exchanges may adopt suitable mechanism to ensure such synchronization of system clocks.

[49] Circular No. SEBI/HO/MRD/DP/CIR/P/2017/08 dated January 20, 2017

14. **REFERENCE: List of Circulars**

1. *Circular no. FITTC/DC/CIR-1/98 dated June 16, 1998*
2. *Circular No. SMDRP/POLICY/TTA-14072/CIR-23/99 dated July 12, 1999*
3. *Circular No. SMD/POLICY CIR-33/99 dated October 15, 1999*
4. *Circular No. SMDRP/POLICY/CIR- 06/2000 dated January 31, 2000*
5. *Circular No. SMDRP/Policy/Cir-48/2000 dated October 11, 2000*
6. *Circular No. SMDRP/POLICY/CIR-56/00 dated December 15, 2000*
7. *Circular No. SEBI/SMD/SE/15/2003/29/04 dated April 29, 2003*
8. *Circular No. SEBI/MRD/Policy/SE/15864/2003 dated August 21, 2003*
9. *Circular No. DNPD/ Cir-9/04 dated February 03, 2004*
10. *Circular No. SEBI/MRD/SE/Cir-11/2004 dated February 25, 2004*
11. *Ref. No. DNPD/Cir- 22 /04 dated April 01, 2004*
12. *Ref. No. DNPD/Cir-23/04 dated April 27, 2004*
13. *Ref.No. DNPD/Cir-24/04 dated May 26, 2004 (STP Guidelines)*
14. *Ref.No. DNPD/Cir-25/04dated June 10, 2004*
15. *Ref. No. DNPD/14785/04 dated July 08, 2004*
16. *Ref. No. DNPD/Cir-28/04 dated September 28, 2004*
17. *Circular No. MRD/DoP/SE/Cir-20/2005 dated September 8, 2005*
18. *Circular No. MRD/DoP/SE/Cir- 14/2006 dated September 28, 2006*
19. *Circular No. MRD/ DoP/SE/Cir- 7 /2008 dated April 03, 2008*
20. *Circular No. MRD/ DoP/SE/Cir- 03 /2009 dated February 20, 2009*
21. *Circular No. CIR/MRD/DP/ 25/2010 dated August 27, 2010*
22. *Circular No. CIR/MRD/DP/26/2010 dated August 27, 2010*
23. *Circular No. CIR/MRD/DP/ 36 /2010 dated December 09, 2010*
24. *Circular No. CIR/MRD/DP/8/2011 dated June 30, 2011*
25. *Circular No. CIR/MRD/DP/09/2012 dated March 30, 2012*
26. *Circular No. CIR/MRD/DP/20/2012 dated August 02, 2012*
27. *Circular No. CIR/MRD/DP/16/2013 dated May 21, 2013*
28. *Circular No. CIR/MRD/DP/24/2013 dated August 19, 2013*
29. *Circular No. CIR/MRD/DMS/34/2013 dated November 06, 2013*
30. *Circular No. CIR/MRD/DP/06/2014 dated February 07, 2014*
31. *Circular No. CIR/MRD/DP/07/2014 dated February 11, 2014*
32. *Circular No. CIR/MRD/DP/07/2015 dated May 13, 2015*
33. *Circular No. CIR/MRD/DP/13/2015 dated July 06, 2015*
34. *Circular No. CIR/MRD/DP/17/2015 dated October 08, 2015*
35. *Circular No. CIR/HO/MRD/DP/CIR/P/2016/129 dated December 01, 2016*

36. *Circular No. SEBI/HO/MRD/DP/CIR/P/2017/08 dated January 20, 2017*
37. *Circular no. SEBI/HO/MRD/DP/CIR/P/2018/62 dated April 09, 2018*
38. *Circular No. CIR/MRD/CSC/148/2018 dated December 07, 2018*
39. *Circular No. CIR/MRD/CSC/151/2018, dated December 14, 2018*
40. *Circular No. SEBI/HO/MRD/DoP1/CIR/P/2019/24 dated January 31, 2019*
41. *Circular No. SEBI/HO/MRD1/DSAP/CIR/P/2020/107 dated June 24, 2020*
42. *Circular No. SEBI/HO/MRD2/DCAP/CIR/P/227 November 06, 2020*
43. *Circular No. SEBI/HO/MRD1/DSAP/CIR/P/2020/234 November 24, 2020*
44. *Circular No. SEBI/HO/MRD1/DTCS/CIR/P/2021/33 March 22, 2021*
45. *Circular No. SEBI/HO/MRD1/DTCS/CIR/P/2021/590 dated July 05, 2021*
46. *Circular No. SEBI/HO/MRD1/MRD1_DTCS/P/CIR/2022/58 dated May 02, 2022*
47. *Circular No. SEBI/HO/MRD1/MRD1_DTCS/P/CIR/2022/68 dated May 20, 2022*
48. *Circular No. SEBI/HO/MRD-TPD-1/CIR/P/2023/7 dated January 09, 2023*

Annexure I

TERMS AND CONDITIONS

PART – A: DMA FACILITY USED BY THE CLIENT

1. The client is expected to be fully aware of the risks associated with the market and the financial instruments being traded on stock exchanges through DMA. The client shall be responsible for complying with laws, rules, regulations, notifications etc issued by regulatory authorities as may be applicable from time to time.

2. The client shall ensure that DMA facility provided by the Broker is used only to execute the trades of the client and shall not be used for transactions on behalf of any other person / entity.

3. The client shall be responsible for ensuring that, only persons authorized by it shall access and use the DMA facility provided by the Broker. All orders originating from such facility / system shall be deemed to be authorized by the client.

4. Where the client accesses or proposes to access the Broker's DMA platform through external applications, including but not restricted to services of third party service provider(s), own application(s), etc., the client shall ensure that such applications have adequate security features including but not limited to access controls, password protection etc; and that appropriate agreement(s) with such third party service provider(s) etc. for ensuring secured access and communication has been executed and are in place.

5. The client shall ensure that no person authorized by them to place orders through DMA facility provided by the broker has been / is involved in any adverse action by any regulatory authorities in any jurisdiction.

6. The client shall provide the names of authorized individual users to the broker prior to placing DMA orders.

7. The client shall not use or allow the use of DMA facility to engage in any form of market misconduct including insider trading and market manipulation or conduct that is otherwise in breach of applicable laws, rules and regulation.

8. The client is aware that Algorithmic trading i.e. generation of orders using automated execution logic is governed by Algorithmic trading guidelines issued by SEBI and Exchanges and requires prior approval of the exchanges. The client shall ensure that new algorithms and changes to existing approved algorithms are not used through the DMA facility without prior approval of concerned stock exchanges. The client shall ensure that it has necessary checks and balances, in place to identify and control dysfunctional algorithms and the Broker shall have the right to shut down the DMA facility and remove any outstanding client orders in case of any suspected dysfunctional algo.

9. The client is aware that authentication technologies and strict security measures are required for routing orders through DMA facility and undertakes to ensure that the password of the client and/or his representative are not revealed to any third party.

10. The client acknowledges that all DMA orders placed by them through the DMA facility would be validated by the risk management system of the broker. The Broker has the right to accept or reject any DMA order placed by the client at its sole discretion.

11. The client shall be solely responsible for all acts or omissions of any person using a DMA facility and shall be bound to accept and settle all transactions executed through the DMA facility provided by the Broker notwithstanding that such order(s) may have been submitted erroneously or by an unauthorized user, or that its data is inaccurate or incomplete when submitted, or the client subsequently determines for whatever reason that the order should not have been submitted.

12. The client shall notify the Broker in the event of DMA facility being compromised. Upon receipt of this notice, client's DMA facility shall be promptly disabled but the client shall continue to be responsible for any misuse of the DMA facility or any orders placed through the DMA facility as a result of the compromise of the DMA facility at their end. The Broker shall not be liable for any loss, liability or cost whatsoever arising as a result of any unauthorized use of DMA facility at the client's end.

13. In the event of winding-up or insolvency of the client or his otherwise becoming incapable of settling their DMA obligation, broker may close out the transaction of

the client as permissible under bye-laws, rules, regulations of the exchanges. The client shall continue to be liable for any losses, costs, damages arising thereof.

14. The client is fully aware of the risks of transmitting DMA orders to the Broker's DMA facility through vendor systems or service providers and the Broker is not responsible for such risks.

15. The client should be aware of the fact that neither the DMA facility will be uninterrupted nor error free nor the results that may be obtained from the use of the service or as to the timeliness, sequence, accuracy, completeness, reliability or content of any information, service or transaction provided through DMA. The DMA service is provided on an "as is", "as available" basis without warranties of any kind, either express or implied, including, but not limited to, those of information access, order execution, merchantability and fitness for a particular purpose. The Broker shall not be liable for any loss, damage or injury including but not limited to direct lost profits or trading losses or any consequential, special, incidental, indirect, or similar damages from the use or inability to use the service or any part thereof.

16. The Broker shall have the right to withdraw the DMA facility in case of:-
    a. Breach of the limits imposed by the broker or any regulatory authority.
    b. On account of any misuse of the DMA facility by the client or on instructions from SEBI/Exchanges.
    c. Any other reason, at the discretion of the broker

    Broker shall endeavor to give reasonable notice to the client in such instances

17. The Broker shall not be liable or responsible for non-execution of the DMA orders of the client due to any link/system failure at the client/ Broker/ exchange(s) end.

18. This document shall not be altered, amended and /or modified by the parties in a manner that shall be in contravention of any other provisions of this document. Any additional terms and conditions should not be in contravention with rules / regulations /bye-laws/circulars, of the relevant authorities including applicable stock exchanges as amended from time to time.

PART – B: DMA FACILITY USED BY THE CLIENT THROUGH AN INVESTMENT MANAGER

1. The client shall be solely responsible for all acts or omissions of any person using a DMA facility and shall be bound to accept and settle all transactions executed through the DMA facility provided by the Broker to the investment manager acting on behalf of the client, notwithstanding that such order(s) may have been submitted erroneously or by an unauthorized user, or that its data is inaccurate or incomplete when submitted, or the client subsequently determines for whatever reason that the order should not have been submitted.

2. The investment manager is expected to be fully aware of the risks associated with the market and the financial instruments being traded on stock exchanges through DMA. The investment manager shall be responsible for complying with laws, rules, regulations, notifications etc issued by regulatory authorities as may be applicable from time to time.

3. Where the DMA facility provided by the Broker is used to execute trade on behalf of one or more clients, by the investment manager, then it is represented and warranted that, at each time an order is placed by such investment manager through the DMA facility of the Broker -

    a. The investment manager has due authority to deal on behalf of the client(s) through the Broker, specifying the roles and responsibilities of the investment manager in execution of transactions on behalf of the client(s).
    b. The investment manager shall comply with any applicable laws, rules and regulations affecting or relating to trading operations.
    c. The investment manager and the client(s) are bound by the terms and conditions hereof;
    d. The investment manager using the DMA facility for routing client(s) orders shall not cross trades of their client(s) with each other. Accordingly, all orders should be offered in the market.
    e. The stock exchange or SEBI may at any time call for any information from a client(s) or an investment manager acting on behalf of the client(s) with respect to any matter relating to the activity of the investment manager. The investment manager shall also furnish any information specifying the roles and

responsibilities of the investment manager in execution of transactions on behalf of the client(s), as and when required by the exchanges or SEBI.

4. The investment manager shall be responsible for ensuring that, only persons authorized by it shall access and use the DMA facility provided by the Broker. All orders originating from such facility / system shall be deemed to be authorized by the client.

5. Where the investment manager accesses or proposes to access the Broker's DMA platform through external applications, including but not restricted to services of third party service provider(s), own application(s), etc., the investment manager shall ensure that such applications have adequate security features including but not limited to access controls, password protection etc; and that appropriate agreement(s) with such third party service provider(s) etc. for ensuring secured access and communication has been executed and are in place.

6. The investment manager shall ensure that no person authorized by them to place orders through DMA facility provided by the broker has been / is involved in any adverse action by any regulatory authorities in any jurisdiction.

7. The investment manager shall provide the names of authorized individual users to the broker prior to placing DMA orders.

8. The investment manager shall not use or allow the use of DMA facility to engage in any form of market misconduct including insider trading and market manipulation or conduct that is otherwise in breach of applicable laws, rules and regulation.

9. The investment manager is aware that Algorithmic trading i.e. generation of orders using automated execution logic is governed by Algorithmic trading guidelines issued by SEBI and Exchanges and requires prior approval of the exchanges. The investment manager shall ensure that new algorithms and changes to existing approved algorithms are not used through the DMA facility without prior approval of concerned stock exchanges. The investment manager shall ensure that it has necessary checks and balances, in place to identify and control dysfunctional algorithms and the Broker shall have the right to shut down the DMA facility and remove any outstanding client orders in case of any suspected dysfunctional algo.

10. The investment manager is aware that authentication technologies and strict security measures are required for routing orders through DMA facility and undertakes to ensure that the password of the investment manager and/or his representative are not revealed to any third party.

11. The investment manager acknowledges that all DMA orders placed by them through the DMA facility would be validated by the risk management system of the broker. The Broker has the right to accept or reject any DMA order placed by the investment manager at its sole discretion.

12. The investment manager shall notify the Broker in the event of DMA facility being compromised. Upon receipt of this notice, client's DMA facility shall be promptly disabled but the client shall continue to be responsible for any misuse of the DMA facility or any orders placed through the DMA facility as a result of the compromise of the DMA facility at their end. The Broker shall not be liable for any loss, liability or cost whatsoever arising as a result of any unauthorized use of DMA facility at the client's end.

13. In the event of winding-up or insolvency of the client or his otherwise becoming incapable of honoring their DMA obligation, broker may close out the transaction of the client as permissible under bye-laws, rules, regulations of the exchanges. The client shall continue to be liable for any losses, costs, damages arising thereof.

14. The investment manager is fully aware of the risks of transmitting DMA orders to the Broker's DMA facility through vendor systems or service providers and the Broker is not responsible for such risks.

15. The investment manager should be aware of the fact that neither the DMA facility will be uninterrupted nor error free nor the results that may be obtained from the use of the service or as to the timeliness, sequence, accuracy, completeness, reliability or content of any information, service or transaction provided through DMA. The DMA service is provided on an "as is", "as available" basis without warranties of any kind, either express or implied, including, but not limited to, those of information access, order execution, merchantability and fitness for a particular purpose. The Broker shall not be liable for any loss, damage or injury including but not limited to direct lost profits or trading losses or any consequential, special,

incidental, indirect, or similar damages from the use or inability to use the service or any part thereof.

16. The Broker shall have the right to withdraw the DMA facility in case of:
    a. Breach of the limits imposed by the broker or any regulatory authority.
    b. On account of any misuse of the DMA facility by the client/ investment manager or on instructions from SEBI/Exchanges.
    c. Any other reason, at the discretion of the broker

    Broker shall endeavor to give reasonable notice to the client in such instances.

17. The Broker shall not be liable or responsible for non-execution of the DMA orders of the client due to any link/system failure at the client/Broker/exchange(s) end.

18. This document shall not be altered, amended and /or modified by the parties in a manner that shall be in contravention of any other provisions of this document. Any additional terms and conditions should not be in contravention with rules/regulations/bye-laws/circulars, of the relevant authorities including applicable stock exchanges as amended from time to time.

Annexure II
On the letter head of the Investment manager

PART A

DETAILS OF THE INVESTMENT MANAGER:
NAME OF THE INVESTMENT MANAGER:
NAME OF THE HOME REGULATOR:
COUNTRY OF JURISDICTION OF HOME REGULATOR:

REGISTERED /REGULATED IN HOME JURISDICTION AS:

SEBI REGISTRATION NUMBER:

PART B
CLIENT(s) DETAILS:

S. No.	Name of the entity	Name of the regulator	Regulated in India as	Registration Number	PAN

Annexure III

Message IFN 515 - Broker to Custodian – Contract Note – Equity

Format Sequence

Mandatory Block A (General Information)

Status	Field	Field Name	Content and Options	Remarks	Rules
M	16R		GENL	Start of block	
M	20C	Reference	:4!c//16x	Type of CN, Exchange number and CN No.	Format: (Qualifier)//(References) Qualifier: "SEME" (4 Uppercase Characters) References: (Contract Type/ Exchange No. / Contract Number) Contract Type: A or B (1 Character Set) Exchange number (2 digits – e.g. Calcutta Stock Exchange will be 03) Contract Number: xxxxxxxxx (13Characters) The reference should not start or end with slash '/' and must not contain two consecutive slashes '//'.
M	23G		4!c	To indicate new message or cancellation of a previous message	Format: (Function) Function: "NEWM" or "CANC"
O	98A	Date	:4!c//8!n	Preparation Date	Format: (Qualifier)//(Date) Qualifier: "PREP" (4 Uppercase Characters)

					Date: YYYYMMDD (8 Digits)
M	22F	Indicator	:4!c//4!c	*Dummy (taken since mandatory)*	Format: (Qualifier)//(Indicator) Qualifier: " TRTR" (4 Uppercase Characters) Indicator: "TRAD" (4 Uppercase Characters)

Mandatory Subsequence A1 Linkages

M	16R		LINK	Start of block	
M	20C		:4!c//16x	To indicate the cancelled contract note (CANC). In case of NEWM, the field should contain "DUMMY" ,	Format: (Qualifier) //(Reference) Qualifier: " PREV" (4 Uppercase Characters) Reference: The reference no. as given in field SEME of the earlier contract note that is being cancelled. (16 Characters) *[In case of NEWM, the field should contain "DUMMY"]*
M	16S		LINK	End of Block	

End of Mandatory Subsequence A1 Linkages

M	16S		GENL	End of block	

Mandatory Block C (Confirmation details)

M	16R		CONFDET	Start of block	
M	98A	Trade Date	:4!c//8!n	To give details of the trade date.	Format: (Qualifier)//(Date) Qualifier: "TRAD" (4 Uppercase

					Characters) Date: "YYYYMMDD" (8 Digits)
M	98A	Settlement Date	:4!c//8!n	To give details of the settlement date.	Format: (Qualifier) / (Date) Qualifier: "SETT" (4 Uppercase Characters) Date: "YYYYMMDD" (8 Digits)

M	90B	Price	:4!c//4!c/3!a15d	To indicate the trade rate	Format: (Qualifier)/ /(Amount Type Code)/ (Currency Code) (Price) Qualifier: "DEAL" (4 Uppercase Characters) Amount Type Code: "ACTU" (4 Uppercase Characters) Currency Code: "INR" (3 Uppercase Alphabets) Price: Upto 15 digits (including decimal places and decimal sign) comma has to be used as decimal sign and is mandatory. Integer part of amount must contain atleast one digit.
O	**92A**	**Price**	**:4!c//[N]15d**	**To indicate brokerage rate per share**	**Format: (Qualifier)/ /(Amount Type Code)/ (Currency Code) (Price)** **Qualifier: "CORA" (4 Uppercase Characters)** **Sign (-/+)** **Price: Upto 15 digits (including decimal places and decimal sign) comma has to be used as decimal sign and is mandatory. Integer part of amount must contain atleast one digit.**
M	94B	Place	:4!c//4!c/30x	To identify the exchange	Format:(Qualifier)/ /(Place

					Code)/(Bic code / Narrative) Qualifier: "TRAD" (4 Uppercase Characters) Place Code: "EXCH" (4 Uppercase Characters) BIC code of the exchange will be used. Where BIC code is not available, please indicate full name of the Stock Exchange

M	22H	Indicator	:4!c//4!c	To indicate whether the trade is Buy [BUYI] / Sell [SELL]	Format: (Qualifier)//(Indicator) Qualifier: "BUSE" (4 Uppercase Characters) Indicator: "BUYI" or "SELL" (4 Uppercase Characters)
M	22H	Indicator	:4!c//4!c	To indicate where the trades is against payment [APMT] or free of payment [FREE]	Format: (Qualifier) //(Indicator) Qualifier: "PAYM" (4 Uppercase Characters) Indicator: "FREE" or "APMT" (4 Uppercase Characters)

Mandatory Sub Block C1 (Confirmation Parties)

M	16R		CONFPRTY	Start of block	
M	95Q	Party	:4!c//4*35x	To give details of the client as mentioned on the contract note.	Format: (Qualifier) //(Name, SEBI Regn No., Pan No.& Address of client.) Qualifier: "INVE" (4 Uppercase Characters) Name, SEBI Regn No., Pan No. &Address

O	97A	Account	:4!c//35x	To identify the safekeeping	Format: (Qualifier) //(Custodian Participant Code)

				account. All clients need to obtain a custodian participant code. Exchange will be identified based on 94B value in Confirmation Details irrespective of which exchange's Cust participant code is mentioned.	Qualifier: "SAFE" (4 Upper Characters) Custodian Participant Code: (35 Characters)

M	16S		CONFPRTY	End of block	

End of Mandatory Subsequence C1 (Confirmation Parties)

M	36B	Quantity of Financial Instrument	:4!c//4!c/15d	To define the trade quantity	Format: (Qualifier)//(Quantity Type Code) /(Quantity) Qualifier: "CONF" (4 Uppercase Characters) Quantity Type Code: "UNIT" (4 Uppercase Characters) Quantity: upto 15 digits (including decimal places and decimal sign) comma has to be used as decimal sign and is mandatory. Integer part of amount must contain atleast one digit.
M	35B	Identification of Security	[ISIN1!e12!c] [4*35x]	To identify the ISIN of the Scrip and company name.	Format: (Identification of Security) (Description of Security) Identification of Security: "ISIN" followed by the ISIN Code Description of Security: Description of the instrument(4 lines of 35 Characterss)

M	70E	Narrative	:4!c//10*35x	To identify Segment Type i.e. Rolling (DR) or Inter FII (DI) or Auction Rolling (AR) /Settlement Number	Format: (Qualifier) //(Narrative) Qualifier: "TPRO" (4 Upper Characters) Narrative: Line 1: "DR" or "DI" or "AR" / Settlement Number as mentioned on Stock Exchange system (35 Character Sets)
M	98C	Date/Time	:4!c//8!n6!n	To Identify order time	Format: (Qualifier) /(Date)/ (Time) Qualifier: "PROC" (4 Upper Characters) Date: YYYYMMDD Time : HHMMSS
M	16S		CONFDET	End of block	

End of Sequence C (Confirmation Details)
Mandatory Sequence D (Settlement Details)

M	16R		SETDET	Start of block	
M	22F	Indicator	:4!c//4!c	Dummy (since mandatory)	Format: (Qualifier) //(Indicator) Qualifier: "SETR" (4 Upper Characters) Indicator: "TRAD" (4 Upper Characters)

Mandatory Subsequence D1 (Settlement Parties)

M	16R			SETPRTY	Start of block	
M	95P	Party	:4!c//4!a2!a2!c[3!c]		Indicates the contracting broker Broker BIC code is used	Format: (Qualifier)//(BIC code of broker) Qualifier: "BUYR" in case of a Sale

	95Q	Party	:4!c//4*35x	**In case the BIC code doesn't exist** Indicates the Broker	"SELL" in case of a Purchase BIC Code of the contracting broker Format: (Qualifier)//(Name of broker) Qualifier: "BUYR" in case of a Sale "SELL" in case of a Purchase Name: of the contracting broker
O	70C	Narrative	:4!c//4*35x	To provide additional broker contact details	Format: (Qualifier) //(Narrative) Qualifier: "PACO" (4 Uppercase Upper Characters) Narrative: Exchange Broker code! SEBI Registration Number! Address of the Broker (140 Characters)
M	70E	Narrative	:4!c//10*35x	To provide for Declaration	Format: (Qualifier) //(Narrative) Qualifier: "DECL" (4 Uppercase Upper Characters) Narrative: Arbitration Clause (10 lines of 35 char each) Line 1: This contract is subject to Rules, Line 2: Byelaws and Regulations and Line 3: usages of (name of the exchange). In event Line4: of any claim (whether admitted or Line 5: not), difference or

					dispute arising Line 6: between you and me/us out of these Line 7: transactions, the matter shall be Line 8: referred to arbitration as provided Line 9: in the Rules, Byelaws and Line 10: Regulations of (name of the exchange).

M	16S		SETPRTY	End of block	

M	16R		SETPRTY	Start of block	

M	95P	Party	:4!c//4!a2!a2!c[3!c]	Indicates who will be delivering / receiving the securities. In case of Clearing House Trades bic code of the Clearing Corporation will be used else in case of Hand Delivery Trade the BIC of the broker will be used. **In case the BIC code doesn't exist** Indicates the Delivery Type. The name of the	Format: (Qualifier)//(BIC code of broker) Qualifier: "REAG" in case of a Sale "DEAG" in case of a Purchase BIC Code of the Clearing House (For Clearing House Trades) else BIC Code of the Broker (For Hand Delivery Trades)
	95Q	Party	:4!c//4*35x		Format: (Qualifier)//(Name of

				clearing corporation is to be used in case of a clearing house trade. In case of a hand delivery trade, the brokers name is to be used.	Clearing House) Qualifier: "REAG" in case of a Sale "DEAG" in case of a Purchase Name of the Clearing House (For Clearing House Trades) else Name of the Broker (For Hand Delivery Trades)

M	16S		SETPRTY	End of block	

End of Subsequence D1 (Settlement Parties)

Mandatory Subsequence D3 (Amounts)

M	16R		AMT	Start of block	

M	19A	Amount	:4!c//3!a15d	To identify the Deal Amount	Format: (Qualifier) //(Currency Code) (Amount) For: Deal Amount Qualifier: "DEAL" (4 Upper case Characters) Narrative: "INR" (3 Upper Letters) Amount: upto 15 digits (including decimal places and decimal sign) comma has to be used as decimal sign and is mandatory. Integer part of amount must contain atleast one digit.

M	16S		AMT	End of block	

M	16R		AMT	Start of block	

M	19A	Amount	:4!c//3!a15d	To identify the brokerage	For Brokerage: Qualifier: "EXEC" (4 Upper case Characters) Narrative: "INR" (3 Upper Letters) Amount: upto 15 digits (including decimal places and decimal sign) comma has to be used as decimal sign and is mandatory. Integer part of amount must contain atleast one digit.

M	16S		AMT	End of block	

M	16R		AMT	Start of block	

M	19A	Amount	:4!c//3!a15d	To identify the service tax	For Service Tax: Qualifier: "TRAX" (4 Upper case Characters) Narrative: "INR" (3 Upper Letters) Amount: upto 15 digits (including decimal places and decimal sign) comma has to be used as decimal sign and is mandatory. Integer part of amount must contain atleast one digit.

M	16S		AMT	End of block	

M	16R		AMT	Start of block	

M	19A	Amount	:4!c//3!a15d	To identify the settlement amount	For Settlement Amount Qualifier: "SETT" (4 Upper case

					Characters) Narrative: "INR" (3 Upper Letters) Amount: upto 15 digits (including decimal places and decimal sign) comma has to be used as decimal sign and is mandatory. Integer part of amount must contain atleast one digit.

M	16S		AMT	End of block	

End of Mandatory Subsequence D3 (Amounts)

M	16S		SETDET	End of block	

End of Sequence D Settlement Details

Optional Sequence E (Other Parties)

M	16R		OTHRPRTY	Start of block	

M	95Q	Party	:4!c//4*35x	Dummy (since mandatory)	Format: (Qualifier) //(Narrative) Qualifier: "EXCH" (4 Upper case Characters) Narrative: "ORDER DETAILS"

O	70D	Party	:4!c//6*35x	To identify the trade Ref. Number. The same field can be repeated multiple times to identify different order numbers	Format: (Qualifier) //(Narrative) Qualifier: "PART" (4 Upper case Characters) Narrative: Trade Ref. No (15Digits) Trade Ref. Qty (15 Digits)

					Trade Ref. Rate (15 Digits comma at appropriate place) Date: YYYYMMDD HHMMSS (15 Character Sets)

O	20C	Reference	:4!c//16x	To identify the Order number	Format: (Qualifier) //(Reference) Qualifier: "PROC" (4 Character Reference : Order number (16 Character Sets)
M	16S		OTHRPRTY	End of block	

-----| End of Sequence E Other Parties

Illustration - (IFN 515) Broker to Custodian – Contract Note – Equity

{IFN515}{ SENDERADDRS }{ RECVERADDRS }{

:16R:GENL

:20C::SEME//A0212345

:23G:NEWM

:98A::PREP//20020828

:22F::TRTR//TRAD

:16R:LINK

:20C::PREV//DUMMY

:16S:LINK

:16S:GENL

:16R:CONFDET

:98A::SETT//20020902

:98A::TRAD//20020828

:90B::DEAL//ACTU/INR200,00

:94B::TRAD//EXCH/XNSEINB1XXX

:22H::BUSE//SELL

:22H::PAYM//APMT

:16R:CONFPRTY

:95Q::INVE// Client Name , Sebi Reg No

Other Details

:97A::SAFE//CLNT_CODE

:16S:CONFPRTY

:36B::CONF//UNIT/1000,00

:35B:ISIN INE009A01021

INFOSYS TECH DEM INR5.00

:70E::TPRO//DR

:16S:CONFDET

:16R:SETDET

:22F::SETR//TRAD

:16R:SETPRTY

:95P::BUYR//Broker BIC Code

:70C::PACO// Exchange Broker code

Sebi Registration Number Address of the Broker

:16S:SETPRTY

:16R:SETPRTY

:95P::REAG//CCILINB1XXX

:16S:SETPRTY

:16R:AMT

:19A::DEAL//INR200000,00

:16S:AMT

:16R:AMT

:19A::EXEC//INR2000,00

:16S:AMT

:16R:AMT

:19A::TRAX//INR100,00

:16S:AMT

:16R:AMT

:19A::SETT//INR197900,00

:16S:AMT

:16S:SETDET

:16R:OTHRPRTY

:95Q::EXCH//ORDER DETAILS

:70D::PART//000000000001234

000000001000,00

000000000200,00

20020822 10:20:33

:20C::PROC//123123123

:16S:OTHRPRTY

-}

Illustrative Example Explained - IFN 515 - Broker to Custodian – Contract Note – Equity

Block GENL gives General information	**:16R:GENL**	
	:20C::SEME//A0212345	Indicates the contract note no Contract Type (1 Char) Exchange No. (2 Char) Contract Number
	:23G:NEWM	Indicates it is a new message
	:98A::PREP//20020828	Message preparation date
	:22F::TRTR//TRAD	

		:16R:LINK	
		:20C::PREV//DUMMY	For new message
		:16S:LINK	
		:16S:GENL	
Block CONFDET provides details about the trade being confirmed		**:16R:CONFDET**	
		:98A::SETT//20020902 :98A::TRAD//20020828	Settlement date (Value date) Trade Date
		:90B::DEAL//ACTU/INR200,00	Deal rate
		:94B::TRAD//EXCH/XNSEINB1XXX	Identifies the Exchange
		:22H::BUSE//SELL	Indicates that it's a sale transaction
		:22H::PAYM//APMT	Indicates that the transaction is against payment
	Confirmation Party details	**:16R:CONFPRTY**	
		:95Q::INVE// Client Name , Sebi Reg No Other Details	Provides details like client name, sebi reg no etc as provided in contract note
		:97A::SAFE//CLNT_CODE	Indicates the client code
		:16S:CONFPRTY	
		:36B::CONF//UNIT/1000,00	Indicates the Quantity of security
		:35B:ISIN INE009A01021 INFOSYS TECH DEM INR5.00	Name of the security (ISIN if available)
		:70E::TPRO//DR	Type of Trade

		:16S:CONFDET	
Block SETDET provides settlement details		**:16R:SETDET**	
		:22F::SETR//TRAD	
	Block SETPRTY provide details about settlement parties	**:16R:SETPRTY**	
		:95P::BUYR//Broker BIC Code :95P::REAG//CCILINB1XXX	Broker Code and that the trade is to be settled with Clearing House (CCIL)
		:70C::PACO// Exchange Broker code, Sebi Registration Number ,Address of the Broker	Broker details as provided in Contract Note
		:16S:SETPRTY	
	Block AMT provides details about the amounts involved	**:16R:AMT**	
		:19A::DEAL//INR200000,00 :19A::EXEC//INR2000,00 :19A::TRAX//INR100,00 :19A::SETT//INR197900,00	Deal amount Broker's commission Service tax Settlement amount
		:16S:AMT	
		:16S:SETDET	
Block OTHRPRTY provided details about the trade executed on the exchange		**:16R:OTHRPRTY**	
		:95Q::EXCH//ORDER DETAILS	Exchange order Number
		:70D::PART// 000000000001234 000000001000,00 000000000200,00 20020822 10:20:33	Trade details

	:20C::PROC//123123123	
	:16S:OTHRPRTY	

FN 515 - Broker to Custodian – Contract Note – Debt

Format Sequence

Mandatory Sequence A General Information

Status	**Tag**	**Generic Field Name**	**Content/Options**	***Remarks***	**Rules**
M	16R		GENL	Start of block	
M	20C	Reference	:4!c//16x	Type of CN CN, Exchange number and CN No.	Format: (Qualifier)/ /(References) Qualifier: "SEME" (4 Uppercase Characters) References: (Contract Type/ Contract Number) Contract Type: A or B (1 Character) Exchange number (2 digits – e.g. Calcutta Stock Exchange will be 03) Contract Number: xxxxxxxxxx (13 Characters) The reference should not start or end with slash / and

					must not contain two consecutive slashes //.
M	23G		4!c	To indicate new/cancellation.	Format: (Function) Function: "NEWM" or "CANC"
O	98A	Date	:4!c//8!n	Preparation Date	Format: (Qualifier)//(Date) Qualifier: "PREP" (4 Uppercase Characters) Date: YYYYMMDD (8 Digits)
M	22F	Indicator	:4!c//4!c	Dummy (taken since mandatory)	Format: (Qualifier) /(Indicator) Qualifier: " TRTR" (4 Uppercase Characters) Indicator: "TRAD" (4 Uppercase Characters)

Mandatory Subsequence A1 Linkages

M	16R		LINK	Start of block	
M	20C		:4!c//16x	To indicate the cancelled contract note (CANC). In case of NEWM, the field should contain "DUMMY" ,	Format: (Qualifier) /(Reference) Qualifier: " PREV" (4 Uppercase Characters) Reference: The reference no. as given in field SEME of the earlier contract note that is being cancelled. (16

					Characters) *[In case of NEWM, the field should contain "DUMMY"]*
M	16S		LINK	End of Block	

End of Mandatory Subsequence A1 Linkages

M	16S		GENL	End of block	

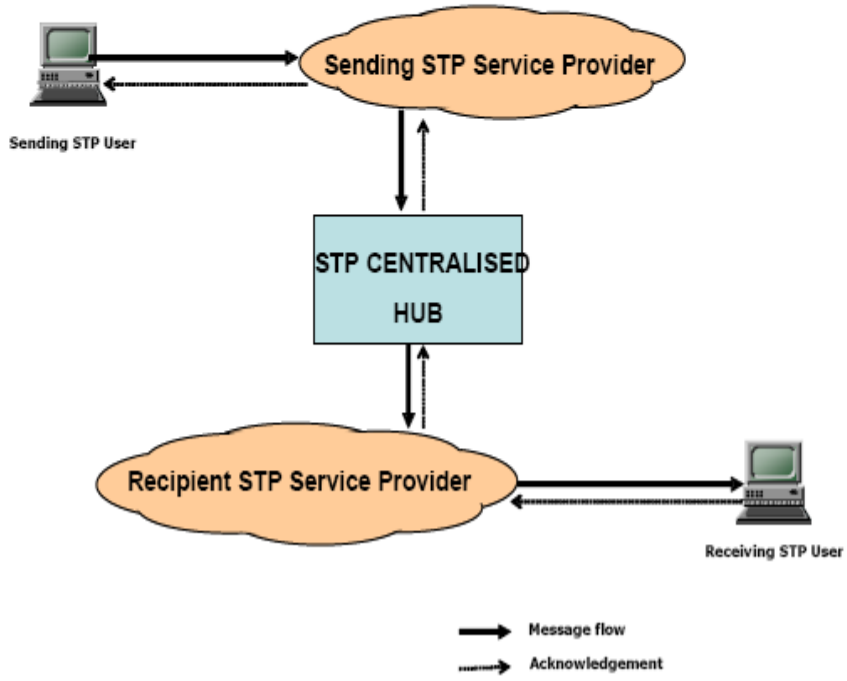
End of Sequence A General Information

Mandatory Sequence C Confirmation Details

M	16R		CONFDET	Start of block	

Annexure IV

Block Diagram of the STP System for inter STP Service Provider Transfer of messages



Annexure V

System and Network Audit Framework

Audit Process

1. For the System and Network Audit, the following broad areas shall be considered in order to ensure that the audit is comprehensive and effective:

   a. The Audit shall be conducted according to the Norms, Terms of Reference (TOR) and Guidelines issued by SEBI.

   b. The Governing Board of the Market Infrastructure Institution (MII) shall appoint the Auditors based on the prescribed Auditor Selection Norms and TOR.

   c. An Auditor can perform a maximum of 3 successive audits. However, such auditor shall be eligible for re-appointment after a cooling-off period of two years.

   d. Further, during the cooling-off period, the incoming auditor may not include:
   (i) Any firm that has common partner(s) with the outgoing audit firm; and
   (ii) Any associate/ affiliate firm(s) of the outgoing audit firm which are under the same network of audit firms wherein the term "same network" includes the firms operating or functioning, hitherto or in future, under the same brand name, trade name or common control.

   e. The number of years an auditor has performed an audit prior to this circular shall also be considered in order to determine its eligibility in terms of sub-clause c above.

   f. The scope of the Audit may be broadened by the Auditor to inter-alia incorporate any new developments that may arise due to issuance of circulars/ directions/ advice by SEBI from time to time.

   g. The audit shall be conducted once in a financial year and period of audit shall be 12 months. However, for the MIIs, whose systems have been identified as "protected system" by National Critical Information Infrastructure Protection

Centre (NCIIPC), the audit shall be conducted on a half yearly basis and audit period shall be of 6 months. Further, the audit shall be completed within 2 months from the end of the audit period.

h. In the Audit report, the Auditor shall include its comments on whether the areas covered in the Audit are in compliance with the norms/ directions/ advices issued by SEBI, internal policy of the MII, etc. Further, the audit report shall also include specific non-compliances (NCs), observations for minor deviations and suggestions for improvement. The audit report shall take previous audit reports into consideration and cover any open items therein. The auditor should indicate if a follow-on audit is required to review the status of NCs.

i. For each of the NCs/ observations and suggestions made by the Auditor, specific corrective action as deemed fit may be taken by the MII. The management of the MII shall provide its comments on the NCs, observations and suggestions made by the Auditor, corrective actions taken or proposed to be taken along with time-line for such corrective actions.

j. The Audit report along with the comments of management shall be placed before the Governing Board of the MII. The Audit report along with comments of the Governing Board shall be submitted to SEBI, within 1 month of completion of audit.

k. The follow-on audit should be completed within one month of the corrective actions taken by the MII. After the follow-on audit, the MII shall submit a report to SEBI within 1 month from the date of completion of the follow-on audit. The report shall include updated Issue-Log to indicate the corrective actions taken and specific comments of the Auditor on the NCs and the corrective actions.

l. In cases wherein follow-on audit is not required, the MII shall submit an Action Taken Report (ATR) to the Auditor. After verification of the ATR by the Auditor, the MII shall submit a report to SEBI within 1 month from the date of completion of verification by the Auditor. The report shall include updated Issue-Log to indicate the corrective actions taken and specific comments of the auditor on the ATR.

m. The overall timeline from the last date of the audit period till completion of final compliance by MII, including follow-on audit, if any, should not exceed one year/6 months (as applicable). In exceptional cases, if MII is of the view that compliance with certain observations may extend beyond said period, then the concerned MII shall seek specific approval from the Governing Board.

Auditor Selection Norms

2. MII shall ensure compliance with the following norms while appointing Auditor:

a. The auditor must have minimum 3 years of demonstrable experience in IT audit of securities market participants e.g. stock exchanges, clearing corporations, depositories, intermediaries, etc. and/ or financial services sector i.e. banking, insurance, Fin-tech etc.

b. The team performing system and network audit must have experience in / direct access to experienced resources in the areas covered under TOR. It is recommended that resources deployed by the Auditor for the purpose of system and network audit shall have relevant industry recognized certifications e.g. CISA (Certified Information Systems Auditor) from ISACA, CISM (Certified Information Securities Manager) from ISACA, GSNA (GIAC Systems and Network Auditor), CISSP (Certified Information Systems Security Professional) from International Information Systems Security Certification Consortium, commonly known as (ISC).

c. The Auditor shall have experience in working on Network Audit/IT audit/governance/IT service management frameworks and processes conforming to industry leading practices like CobiT/ ISO 27001 and beyond.

d. The Auditor should have the capability to undertake forensic audit and undertake such audit as part of system and network audit, if required.

e. The Auditor must not have any conflict of interest in conducting fair,

objective and independent audit of the exchange / depository/ clearing corporation. It should not have been engaged over the last three years in any consulting engagement with any departments / units of the entity being audited.

f. The Auditor should not have any cases pending against it, which point to its incompetence and/or unsuitability to perform the audit task.

g. The proposed audit agency must be empanelled with CERT-In.

h. Any criteria, in addition to the aforesaid criteria, that the MII may deem fit for the purpose of selection of Auditor.

Audit Report Guidelines

3. The Audit report should cover each of the major areas mentioned in the TOR and compliance with SEBI circulars/directions/advices, etc. related to technology. The Auditor in the Audit Report shall give its views indicating the NCs to the standards or observations or suggestions. For each section, auditors should also provide qualitative inputs/suggestions about ways to improve the processes, based upon the best industry practices.

4. The auditor shall certify that entire network architecture, connectivity (including co-lo facility) and its linkage to the trading infrastructure are in conformity with SEBI's regulatory framework to provide fair equitable, transparent and non-discriminatory treatment to all the market participants.

5. The report should also include tabulated data to show NCs / observations for each of the major areas in the TOR.

6. The audit report to include point-wise compliance of areas prescribed in Terms of Reference (TOR) and areas emanating from relevant SEBI circulars/directions/advices along with any accompanying evidence.

7. Evidences should be specified in the audit report while reporting/ closing an issue.

8. A detailed report with regard to the system and network audit shall be submitted to SEBI. The report shall include an Executive Summary as per the following format:

Issue Log Column Heading	Description	Responsibility
Major Area	Comprehensive identification of major areas in compliance with various SEBI circulars / norms and internal policies of MII	Auditor/Auditee
Point wise Compliance	Point-wise list of areas/relevant clauses in TOR against which compliance is being audited (in tabular format)	Auditor
Description of Finding/ Observation	Describe the findings in sufficient detail, referencing any accompanying evidence (e.g. procedure manual, interview notes, reports etc.)	Auditor
Reference	Reference to the section in detailed report – where full background information about the findings are available	Auditor
Process/ Unit	Process or unit where the audit is conducted and the finding pertains to	Auditor
Category of Findings	Major/Minor Non-compliance, Observation, Suggestion etc.	Auditor
Audited By	Which Auditor covered the findings	Auditor
Root Cause Analysis	A detailed analysis on the cause of the Non-compliance	Auditee
Remediation	The action (to be) taken to correct the Non-compliance	Auditee
Target Completion Date for Remedial Action	The date by which remedial action must be/will be completed	Auditor/Auditee
Status	Status of finding on reporting date (open/close)	Auditor/Auditee

Verified By	Auditing personnel (upon verification that finding can be closed)	Auditor
Closing Date	Date when finding is verified and can be closed	Auditor

Annexure VI

System and Network Audit Program – Terms of Reference (TOR)

1. The scope of audit shall encompass all the IT resources including hardware, software, network, policies, procedures etc. of MIIs (Primary Data Centre (PDC), Disaster Recovery Site (DRS) and Near Site (NS)).

2. **IT environment**
   2.1. Organization details
      a. Name
      b. Address
      c. IT team size (in house- employees)
      d. IT team size (vendors)
   2.2. IT and network set up and usage
      a. PDC, DRS, NS and Regional/ Branch offices (location, owned/ outsourced)
      b. Connectivity amongst PDC, NS and DRS
      c. IT infrastructure / applications pertaining to the activities done as a MII
      d. System Architecture
      e. Network Architecture
      f. Telecommunication network

3. **IT Governance**
   3.1. Whether IT Governance framework exists to include the following:
      a. IT organization structure including roles and responsibilities of key IT personnel;
      b. IT governance processes including policy making, implementation and monitoring to ensure that the governance principles are followed;
   3.2. IT policies and procedures

a. Whether the organization has a defined and documented IT policy? If yes, is it approved by the Governing Board (GB)?
b. Is the current System Architecture including infrastructure, network and application components describing system linkages and dependencies, documented?
c. Whether defined and documented Standard Operating Procedures (SOPs) for the following processes are in place?
   i. IT Assets Acquisition
   ii. Access Management
   iii. Change Management
   iv. Backup and Recovery
   v. Incident Management
   vi. Problem Management
   vii. Patch Management
   viii. Data Centre Operations
   ix. Operating Systems and Database Management
   x. Network Management
   xi. DRS Operations
   xii. Data Retention and Disposal
   xiii. Asset Inventory
   xiv. IT asset refresh/replacement policy
   xv. Database Security
   xvi. Interface Security
   xvii. Application Security
   xviii. Password Security
   xix. Archived and Backed up Data Security

3.3. Whether the above mentioned SOPs is reviewed at periodic intervals or upon the occurrence of any major event? In this regard, whether any organization policy has been formulated by the MII?

4. **Business Controls**

4.1. General Controls for Data Centre Facilities

a. Application Access – segregation of duties, database and application access etc. (Approved Policy clearly defining roles and responsibilities of the personnel handling business operations)
b. Maintenance Access – vendor engineers

c. Physical Access Controls – permissions, logging, exception reporting & alerts
d. Environmental Controls – fire protection, AC monitoring, etc.
e. Fault Resolution Mechanism
f. Folder Sharing and Back Up Controls – safeguard of critical information on local desktops
g. Incidences of violations in the previous audit report and corrective action(s), if any, taken
h. Any other controls, as deemed fit, by the MII

4.2. Software change control

a. Whether pre-implementation review of application controls (including controls over change management) was undertaken?
b. Adherence to secure Software Development Life Cycle (SDLC) / Software Testing Life Cycle (STLC) standards/ methodologies
c. Whether post implementation review of application controls was undertaken?
d. Is the review of processes to ensure data integrity post implementation of new application or system followed by implementation team?
e. User awareness
f. Processing of new feature request
g. Fault reporting / tracking mechanism & process for resolutions
h. Testing of New releases / Bug-fixes – Testing process (automation level)
i. Version Control – History, Change Management process etc.
j. Development / Test/ Production environment – Segregation
k. New Release in Production – Promotion, Release note approvals
l. Production Issues / disruptions reported in the previous audit report, root cause analysis & corrective actions taken, if any
m. Software Development Stage
n. Software Design to ensure adequate system capacity to enable functioning in a degraded manner in the event of a crash
o. Any other controls, as deemed fit, by the MII

4.3. Data Communication/ Network Controls

a. Network Administration – Redundancy, Monitoring, breakdown resolution etc.
b. WAN Management – Connectivity provisions for business continuity

c. Encryption - Router based as well as during transmission
d. Connection Permissions – Restriction on need to have basis
e. Fallback Mechanism – Dial-up connections controls etc.
f. Hardware based Signing Process
g. Incidences of access violations in the previous report & corrective actions taken, if any
h. Any other controls, as deemed fit, by the MII

4.4. Security Controls
a. Secured e-mail with other entities such as SEBI, other partners
b. Email Archival Implementation

4.5. Access Policy and Controls
a. Defined and documented policies and procedures for managing access to applications and infrastructure – PDC, DRS, NS, branches (including network, operating systems and database) and approved by relevant authority
b. Review of access logs
c. Access rights and roles review procedures for all systems
d. Segregation of Duties (SOD) matrix describing key roles
e. Risk acceptance for violation of SOPs and alternate mechanism put in place
f. Privileged access to system and record of logs,
g. Periodic monitoring of access rights for privileged users
h. Authentication mechanisms used for access to systems including use of passwords, One Time Passwords (OTP), Single Sign on, etc.
i. Any other controls, as deemed fit, by the MII

4.6. Electronic Document Controls

4.7. General Access Controls

4.8. Performance Audit
a. Comparison of changes in transaction volumes since previous audit
b. Review of systems (hardware, software, network) performance over the period
c. Review of the current volumes against the last performance test and against the current system utilization

4.9. Business Continuity / Disaster Recovery Facilities
a. a. Business Continuity Planning (BCP) manual, including Business Impact Analysis (BIA), Risk Assessment and Disaster Recovery (DR) process, Roles

and responsibilities of Incident Response Team (IRT) /Crisis Management Team (CMT), employees, support/outsourced staff

b. Implementation of policies
c. Back-up procedures and recovery mechanism using back-ups
d. Storage of Back-up (Remote site, DRS etc.)
e. Redundancy – Equipment, Network, Site etc.
f. DRS installation and Drills - Management statement on targeted resumption capability (in terms of time required & extent of loss of data)
g. Evidence of achieving the set targets during the DR drills in event of various disaster scenarios
h. Debrief / review of any actual event when the DR/BCP was invoked during the year
i. User awareness and training
j. Is Recovery Time Objective (RTO) /Recovery Point Objective (RPO) during BIA documented?
k. Is annual review of BCP-DR or in case of major change in business/ infrastructure undertaken?
l. Is quarterly review regarding implementation of BCP policy done by Standing Committee of Technology (SCOT) of the MII?
m. Testing of BCP-DR plan through appropriate strategies including simulations, DR drills, system recovery, etc.
n. Is the recordkeeping of quarterly DR drills, live trading sessions from DRS being maintained?
o. Is BCP-DR policy document prepared and implemented in line with SEBI circular on BCP and DR of MII?

4.10. IT/Network Support & IT Asset Management

a. Utilization Monitoring – including report of prior year utilization
b. Capacity Planning – including projection of business volumes
c. Capacity and performance management process for the network/systems
d. IT (S/W, H/W & N/W) Assets, Licenses & maintenance contracts
e. Comprehensive review of Assets life cycle management (Acquisition, commissioning, deployment, monitoring, maintenance and de commissioning) and relevant records related to it.
f. Insurance
g. Disposal – Equipment, media, etc.

5. Entity Specific Software used for or in support of trading/clearing systems / peripheral systems and critical processes

6. **Human Resources Management**

   6.1. Screening of Employee, Third party vendors / contractors

   6.2. Onboarding

   6.3. Offboarding

   6.4. Consequence Management (Incident / Breach of policies)

   6.5. Awareness and Trainings

   6.6. Non-Disclosure Agreements (NDAs) and confidentiality agreement

7. **Network Audit**

   7.1. The audit shall cover entire network infrastructure which shall inter-alia includes physical verification and tracing of the connectivity paths, server configuration, physical checking wire to wire connectivity and configurations of computer networking devices etc.

   7.2. The audit shall require tracing of the connectivity and network diagram based on the physical audit.

   7.3. The audit shall cover the link, the path, device-level redundancy, no single-point failures, high availability, and fault tolerance aspects in the network.

   7.4. The audit shall cover entire network that is used to connect members to the MIIs (POP, MPLS, VSAT, COLO, etc.)

   7.5. The audit shall cover applications, internal networks, servers, etc. of the MIIs/offered by the MIIs to its members that are used for trading, risk management, clearing and settlement etc.

   7.6. Network performance and design

   7.7. Network Security implementation

   7.8. Network health monitoring and alert system

7.9. Log management process

7.10. Service level definition for vendors/Service level management

7.11. Governance process for network service delivery by vendors

8. The results of all testing that was conducted before deployment of any IT system/application in production environment, shall be checked by auditor during system audit.

9. **IT Vendor Selection and Management**

9.1. Identification of eligible vendors

9.2. Dissemination process of Request for Proposal (RFP)

9.3. Definition of criteria of evaluation

9.4. Process of competitive analysis

9.5. Approach for selection

9.6. Escrow arrangement for keeping source code

10. **E-Mail system**

10.1. Existence of policy for the acceptable use of electronic mail

10.2. Regulations governing file transfer and exchange of messages with external parties

10.3. Rules based on which e-mail addresses are assigned

10.4. Storage, backup and retrieval

11. **Redressal of Technological Complaints**

11.1. Ageing analysis of technology complaints

11.2. Whether all complaints received are brought to their logical conclusion?

12. **Any other Item(s)**

12.1. Electronic Waste Disposal

12.2. Observation(s) based on previous Audit Report(s)

12.3. Any other specific area(s) that may be informed by SEBI.

Annexure VII

Format for monitoring compliance with requirements emanating from SEBI circulars/guidelines/advisories related to technology

Sl. No.	Date of SEBI circular/ directions/ advice, etc.	Subject	Technological requirements specified by SEBI in brief	Mechanism put in place by the MIIs	Non compliances with SEBI circulars / directions, etc.	Compliance status (Open/ closed)	Comments of the Management	Time-line for taking corrective action in case of open observations

Annexure VIII

Exception Observation Reporting Format

Note: MIIs are expected to submit following information with regard to exceptional major non-compliances (NCs) / minor NCs observed in the System and Network Audit. MIIs should also categorically highlight those observations/NCs/suggestions pointed out in the System and Network Audit (current and previous) which are not yet complied with.

Name of the MII: _____

Name of the Auditor: _____

System and Network Audit Report Date: _____

Table 1: For preliminary audit

Audit period	Observation No.	Description of finding	Department of MII	Status/ Nature of finding	Risk Rating of finding as per Auditor	Audit TOR clause	Root Cause Analysis	Impact Analysis	Corrective Actions proposed by auditor	Deadline for the corrective action	Management response in case of acceptance of associated risks	Whether similar issue was observed in any of the previous 3 Audits

Description of relevant Table heads

1. **Audit Period –** This indicates the period of audit
2. **Description of findings/observations –** Description of the findings in sufficient details, referencing any accompanying evidence
3. **Status/ Nature of Findings –** The category can be specified for example:
    a. Non-compliant (Major/Minor)
    b. Work in progress
    c. Observation
    d. Suggestion
4. **Risk Rating of finding** - A rating has to be given for each of the observations based on its impact and severity to reflect the risk exposure as well as the suggested priority for action

Rating	Description
HIGH	Represents weakness in control with respect to threat(s) that is /are sufficiently capable and impacts asset (s) leading to regulatory non-compliance, significant financial, operational and reputational loss. These observations need to be addressed with utmost priority.
MEDIUM	Represents weakness in control with respect to threat(s) that is /are sufficiently capable and impacts asset (s) leading to exposure in terms of financial, operational and reputational loss. These observations need to be addressed in reasonable timeframe.
LOW	Represents weaknesses in control, which in combination with other weakness can develop into an exposure. Suggested improvements for situations not immediately/directly affecting controls.

5. **Audit TOR clause –** The TOR clause corresponding to this observation
6. **Root Cause analysis –** A detailed analysis on the cause of the non-conformity.
7. **Impact Analysis –** An analysis of the likely impact on the operations/ activity of the organization
8. **Corrective Action –** The action taken to correct the non-conformity

Table 2: For follow on/ follow up system audit

Preliminary Audit Date	Preliminary Audit Period	Preliminary Observation Number	Preliminary Status	Preliminary Corrective Action as proposed by Auditor	Current Finding	Current Status	Revised Corrective Action, if any	Deadline for the Revised Corrective Action	Reason for delay in implementation / compliance

Description of relevant Table heads

1. **Preliminary Status –** The original finding as per the preliminary System and Network Audit Report
2. **Preliminary Corrective Action –** The original corrective action as prescribed in the preliminary System and Network Audit Report
3. **Current Finding –** The current finding w.r.t. the issue
4. **Current Status –** Current Status of the issue viz. compliant, non-compliant, work in progress (WIP)
5. **Revised Corrective Action –** The revised corrective action prescribed w.r.t. the Non-compliant/ WIP issues

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Annexure IX

Stock Broker System Audit Framework

Audit Process

1. System Audit of stock brokers should be conducted with the following periodicity:
    a. Annual system audit is prescribed for stock brokers who satisfy any of the following criteria.
        i. Stock Brokers who use [**Computer-to-Computer Link (CTCL)** or **Intermediate Messaging Layer (IML)]**[50] **/ Internet Based Trading (IBT)/ Direct Market Access (DMA)/ Securities Trading using Wireless Technology (STWT) / Smart Order Routing (SOR)** and have presence in more than 10 locations or number of terminals are more than 50.
        ii. Stock Brokers who are depository participants or are involved in offering any other financial services.
    b. Half yearly system audit has been prescribed for stock brokers who use Algorithmic Trading or provide their clients with the facility of Algorithmic Trading as per SEBI Circular CIR/MRD/16/2013 dated May 21, 2013**.**
    c. For all other stock brokers, system audit shall be conducted once in two years.
2. Such audit shall be conducted in accordance with the Norms, Terms of Reference (ToR) and Guidelines issued by SEBI and / or by stock exchanges. Separate ToRs are specified for the following categories of brokers:
    a. **Type I Broker**: Brokers who trade through exchange provided terminals such as NSE's NEAT, BSE's BOLT, MCX-SX's TWS, etc. (ToR attached as Annexure 1);[51]
    b. **Type II Broker**: Brokers who trade through API based trading terminals like [CTCL or IML] or IBT/DMA/STWT or SOR facility and who may also be TYPE I Brokers. (ToR attached as Annexure 2)
    c. **Type III Broker**: Brokers who use Algorithmic Trading facility to trade and who may also be TYPE II Brokers. (ToR attached as Annexure 3)
3. Stock brokers shall select auditors as per the selection norms provided in the guidelines and directions issued by stock exchanges and SEBI from time to time. The Auditor may perform a maximum of 3 successive audits of the stock broker.

[50] or other similar trading facilities

[51] Vide Letter MRD/DMS/OW/9500/2015 dated March 31, 2015, SEBI informed Stock Exchanges that System Audit requirement for Type I brokers may be kept on hold till further communication from SEBI.

4. The stock exchanges shall periodically review ToR of such system audit and, if required, shall suitably revise the ToR after taking into consideration developments that have taken place in the securities market since the last review of ToR, observations reported in the audit reports of the stock brokers and directions issued by SEBI from time to time in this regard.
5. The auditor in its report shall specify compliance / non-compliance status with regard to areas mentioned in ToR. Observations on minor / major deviations as well as qualitative comments for scope for improvement shall also be specified in the report. The auditor shall also take into consideration the observations / issues mentioned in the previous audit reports and cover open items in the report. The audit report submitted by the auditor should be forwarded to the stock exchange by the Stock Broker along with management comments, within 1 month of submission of report by the auditor.
6. Stock exchange shall ensure that the management of the stock broker provides their comment about the non-compliance / non-conformities (NCs) and observations mentioned in the report. For each NC, specific time-bound (within 3 months of submission of report by the exchange) corrective action must be taken and reported to the stock exchange. The auditor should indicate if a follow-on audit is required to review the status of NCs.
7. In order to ensure that the corrective actions are taken by the stock broker, follow-on audit, if any, shall be scheduled by the stock broker within 6 months of submission of the audit report by the system auditor.
8. The system auditors should follow the reporting standard as specified in Annexure 4 of this Framework for the executive summary of the System Audit report to highlight the major findings of the System Audit.

Auditor Selection Norms

1. The Auditor shall have minimum 3 years of experience in IT audit of securities market participants e.g. stock exchanges, clearing corporations, depositories, stock brokers, depository participants etc. The audit experience should cover all the major areas mentioned under Terms of Reference (ToR) of the system audit specified by SEBI / stock exchange.
2. It is recommended that resources employed shall have relevant industry recognized certifications e.g. D.I.S.A. (ICAI) Qualification, CISA (Certified Information System Auditor) from ISACA, CISM (Certified Information Securities Manager) from ISACA, CISSP (Certified Information Systems Security Professional) from

International Information Systems Security Certification Consortium, commonly known as (ISC).

3. The Auditor should have experience of IT audit/governance frameworks and processes conforming to industry leading practices like CobiT.
4. The Auditor shall not have any conflict of interest in conducting fair, objective and independent audit of the Stock Broker. Further, the directors / partners of Auditor firm shall not be related to any stock broker including its directors or promoters either directly or indirectly.
5. The Auditor shall not have any cases pending against its previous audited companies/firms, which fall under SEBI's jurisdiction, which point to its incompetence and/or unsuitability to perform the audit task.

Annexure 1

Terms of Reference (ToR) for Type I Broker

The system auditor shall at the minimum cover the following areas:

1. **System controls and capabilities**
    a. **Order Tracking** – The system auditor should verify system process and controls at exchange provided terminals with regard to order entry, capturing of IP address of order entry terminals, modification / deletion of orders, status of the current order/outstanding orders and trade confirmation.
    b. **Order Status/ Capture –** Whether the system has capability to generate / capture order id, time stamping, order type, scrip details, action, quantity, price and validity etc.
    c. **Rejection of orders –** Whether system has capability to reject orders which do not go through order level validation at the end of the stock broker and at the servers of respective stock exchanges.
    d. **Communication of Trade Confirmation / Order Status –** Whether the system has capability to timely communicate to Client regarding the Acceptance/ Rejection of an Order / Trade via various media including e-mail; facility of viewing trade log.
    e. **Client ID Verification –** Whether the system has capability to recognize only authorized Client Orders and mapping of Specific user Ids to specific predefined location for proprietary orders.
2. **Risk Management System (RMS)**
    a. **Online risk management capability –** The system auditor should check whether the system of online risk management (including upfront real-time risk management) is in place for all orders placed through exchange provided terminals.
    b. **Trading Limits –**Whether a system of pre-defined limits / checks such as Order Quantity and Value Limits, Symbol wise User Order / Quantity limit, User / Branch Order Limit, Order Price limit, etc) are in place and only such orders which are within the parameters specified by the RMS are allowed to be pushed into exchange trading engines. The system auditor should check that no user or branch in the system is having unlimited limits on the above parameters.
    c. **Order Alerts and Reports –**Whether the system has capability to generate alerts when orders that are placed are above the limits and has capability to

generate reports relating to Margin Requirements, payments and delivery obligations.

d. **Order Review –**Whether the system has capability to facilitate review of such orders were not validated by the system.

e. **Back testing for effectiveness of RMS –** Whether the system has capability to identify trades which have exceeded the pre-defined limits (Order Quantity and Value Limits, Symbol wise User Order / Quantity limit, User / Branch Order Limit, Order Price limit) and also exceed corresponding margin availability of clients. Whether deviations from such pre-defined limits are captured by the system, documented and corrective steps taken.

f. **Log Management –** Whether the system maintains logs of alerts / changes / deletion / activation / deactivation of client codes and logs of changes to the risk management parameters mentioned above. Whether the system allows only authorized users to set the risk parameter in the RMS.

3. **Password Security**

a. **Organization Access Policy** – Whether the organization has a well-documented policy that provides for a password policy as well as access control policy for the exchange provided terminals.

b. **Authentication Capability** – Whether the system authenticates user credentials by means of a password before allowing the user to login, and whether there is is a system for authentication of orders originating from Internet Protocol by means of two-factor authentication, including Public Key Infrastructure (PKI) based implementation of digital signatures.

c. **Password Best Practices –** Whether there is a system provision for masking of password, system prompt to change default password on first login, disablement of user id on entering multiple wrong passwords (as defined in the password policy document), periodic password change mandate and appropriate prompt to user, strong parameters for password, deactivation of dormant user id, etc.

4. **Session Management**

a. **Session Authentication –** Whether the system has provision for Confidentiality, Integrity and Availability (CIA) of the session and the data transmitted during the session by means of appropriate user and session authentication mechanisms like SSL etc.

b. **Session Security** – Whether there is availability of an end-to-end encryption for all data exchanged between client and broker systems. or other means of ensuring session security

c. **Inactive Session –** Whether the system allows for automatic trading session logout after a system defined period of inactivity.
d. **Log Management** – Whether the system generates and maintain logs of Number of users, activity logs, system logs, Number of active clients.

5. **Network Integrity**
   a. **Seamless connectivity** – Whether stock broker has ensured that a backup network link is available in case of primary link failure with the exchange.
   b. **Network Architecture –** Whether the web server is separate from the Application and Database Server.
   c. **Firewall Configuration** – Whether appropriate firewall is present between stock broker's trading setup and various communication links to the exchange. Whether the firewall is appropriately configured to ensure maximum security.
6. **Access Controls**
   a. **Access to server rooms** – Whether adequate controls are in place for access to server rooms and proper audit trails are maintained for the same.
   b. **Additional Access controls** – Whether the system provides for any authentication mechanism to access to various components of the exchange provided terminals. Whether additional password requirements are set for critical features of the system. Whether the access control is adequate.
7. **Backup and Recovery**
   a. **Backup and Recovery Policy –** Whether the organization has a well-documented policy on periodic backup of data generated from the broking operations.
   b. **Log generation and data consistency** - Whether backup logs are maintained and backup data is tested for consistency.
   c. **System Redundancy –** Whether there are appropriate backups in case of failures of any critical system components.
8. **BCP/DR** (Only applicable for Stock Brokers having BCP / DR site)
   a. **BCP / DR Policy –** Whether the stock broker has a well-documented BCP/ DR policy and plan. The system auditor should comment on the documented incident response procedures.
   b. **Alternate channel of communication –** Whether the stock broker has provided its clients with alternate means of communication including channel for communication in case of a disaster. Whether the alternate channel is capable of authenticating the user after asking for additional details or OTP (One-Time-Password).

c. **High Availability** – Whether BCP / DR systems and network connectivity provide high availability and have no single point of failure for any critical operations as identified by the BCP/DR policy.

d. **Connectivity with other FMIs –** The system auditor should check whether there is an alternative medium to communicate with Stock Exchanges and other FMIs.

9. **Segregation of Data and Processing facilities –** The system auditor should check and comment on the segregation of data and processing facilities at the Stock Broker in case the stock broker is also running other business.

10. **Back office data**

    a. **Data consistency –** The system auditor should verify whether aggregate client code data available at the back office of broker matches with the data submitted / available with the stock exchanges through online data view / download provided by exchanges to members.

    b. **Trail Logs –** The system auditor should specifically comment on the logs of Client Code data to ascertain whether editing or deletion of records have been properly documented and recorded and does not result in any irregularities.

11. **IT Infrastructure Management** (including use of various Cloud computing models such as Infrastructure as a service (IaaS), Platform as a service (PaaS), Software as a service (SaaS), Network as a service (NaaS))

    a. **IT Governance and Policy –** The system auditor should verify whether the relevant IT Infrastructure-related policies and standards exist and are regularly reviewed and updated. Compliance with these policies is periodically assessed.

    b. **IT Infrastructure Planning –** The system auditor should verify whether the plans/policy for the appropriate management and replacement of aging IT infrastructure components have been documented, approved, and implemented. The activities, schedules and resources needed to achieve objectives related to IT infrastructure have been integrated into business plans and budgets.

    c. **IT Infrastructure Availability (SLA Parameters) –** The system auditor should verify whether the broking firm has a process in place to define its required availability of the IT infrastructure, and its tolerance to outages. In cases where there is huge reliance on vendors for the provision of IT services to the brokerage firm the system auditor should also verify that the mean time to

recovery (MTTR) mentioned in the Service Level Agreement (SLA) by the service provider satisfies the requirements of the broking firm.

d. **IT Performance Monitoring (SLA Monitoring) –** The system auditor should verify that the results of SLA performance monitoring are documented and are reported to the management of the broker.

12. **Exchange specific exceptional reports –** The additional checks recommended by a particular exchange need to be looked into and commented upon by the system auditor over and above the ToR of the system audit.

Annexure 2

ToR for Type II Broker

The system auditor shall at the minimum cover the following areas:

1. **System controls and capabilities (CTCL / IML terminals and servers)**
    a. **Order Tracking** – The system auditor should verify system process and controls at CTCL / IML terminals and CTCL/ IML servers covering order entry, capturing of IP address of order entry terminals, modification / deletion of orders, status of current order/outstanding orders and trade confirmation.
    b. **Order Status/ Capture –** Whether the system has capability to generate / capture order id, time stamping, order type, scrip details, action, quantity, price and validity, etc.
    c. **Rejection of orders –** Whether system has capability to reject orders which do not go through order level validation at CTCL servers and at the servers of respective stock exchanges.
    d. **Communication of Trade Confirmation / Order Status –** Whether the system has capability to timely communicate to Client regarding the Acceptance/ Rejection of an Order / Trade via various media including e-mail; facility of viewing trade log.
    e. **Client ID Verification –** Whether the system has capability to recognize only authorized Client Orders and mapping of Specific user Ids to specific predefined location for proprietary orders.
    f. **Order type distinguishing capability –** Whether system has capability to distinguish the orders originating from (CTCL or IML) / IBT/ DMA / STWT.
2. **Software Change Management** - The system auditor should check whether proper procedures have been followed and proper documentation has been maintained for the following:
    a. Processing / approval methodology of new feature request or patches
    b. Fault reporting / tracking mechanism and process for resolution
    c. Testing of new releases / patches / modified software / bug fixes
    d. Version control- History, Change Management process, approval etc.
    e. Development / Test / Production environment segregation.
    f. New release in production – promotion, release note approvals
    g. Production issues / disruptions reported during last year, reasons for such disruptions and corrective actions taken.
    h. User Awareness

The system auditor should check whether critical changes made to the (CTCL or IML) / IBT / DMA / STWT/ SOR are well documented and communicated to the Stock Exchange.

3. **Risk Management System (RMS)**
    a. **Online risk management capability –** The system auditor should check whether system of online risk management including upfront real-time risk management, is in place for all orders placed through (CTCL or IML) / IBT / DMA / STWT.
    b. **Trading Limits –** Whether a system of pre-defined limits /checks such as Order Quantity and Value Limits, Symbol wise User Order / Quantity limit, User / Branch Order Limit, Order Price limit, etc., are in place and only such orders which are within the parameters specified by the RMS are allowed to be pushed into exchange trading engines. The system auditor should check that no user or branch in the system is having unlimited limits on the above parameters.
    c. **Order Alerts and Reports –** Whether the system has capability to generate alerts when orders that are placed are above the limits and has capability to generate reports relating to margin requirements, payments and delivery obligations.
    d. **Order Review –** Whether the system has capability to facilitate review of such orders that were not validated by the system.
    e. **Back testing for effectiveness of RMS –** Whether system has capability to identify trades which have exceeded the pre-defined limits (Order Quantity and Value Limits, Symbol wise User Order / Quantity limit, User / Branch Order Limit, Order Price limit) and also exceed corresponding margin availability of clients. Whether deviations from such pre-defined limits are captured by the system, documented and corrective steps taken.
    f. **Log Management –** Whether the system maintains logs of alerts / changes / deletion / activation / deactivation of client codes and logs of changes to the risk management parameters mentioned above. Whether the system allows only authorized users to set the risk parameter in the RMS.
4. **Smart order routing (SOR)** - The system auditor should check whether proper procedures have been followed and proper documentation has been maintained for the following:
    a. **Best Execution Policy** – System adheres to the Best Execution Policy while routing the orders to the exchange.

b. **Destination Neutral –** The system routes orders to the recognized stock exchanges in a neutral manner.
c. **Class Neutral –** The system provides for SOR for all classes of investors.
d. **Confidentiality** - The system does not release orders to venues other than the recognized stock Exchange.
e. **Opt–out** – The system provides functionality to the client who has availed of the SOR facility, to specify for individual orders for which the clients do not want to route order using SOR.
f. **Time stamped market information** – The system is capable of receiving time stamped market prices from recognized stock Exchanges from which the member is authorized to avail SOR facility.
g. **Audit Trail -** Audit trail for SOR should capture order details, trades and data points used as a basis for routing decision.
h. **Server Location –** The system auditor should check whether the order routing server is located in India.
i. **Alternate Mode -** The system auditor should check whether an alternative mode of trading is available in case of failure of SOR Facility

5. **Password Security**
   a. **Organization Access Policy** – Whether organization has a well-documented policy that provides for a password policy as well as access control policy for exchange provided terminals and for API based terminals.
   b. **Authentication Capability –** Whether the system authenticates user credentials by means of a password before allowing the user to login, and whether there is a system for authentication of orders originating from Internet Protocol by means of two-factor authentication, including Public Key Infrastructure (PKI) based implementation of digital signatures.
   c. **Password Best Practices –** Whether there is a system provision for masking of password, system prompt to change default password on first login, disablement of user id on entering multiple wrong passwords (as defined in the password policy document), periodic password change mandate and appropriate prompt to user, strong parameters for password, deactivation of dormant user id, etc.

6. **Session Management**
   a. **Session Authentication –** Whether system has provision for Confidentiality, Integrity and Availability (CIA) of the session and the data transmitted

during the session by means of appropriate user and session authentication mechanisms like SSL etc.

b. **Session Security –** Whether there is availability of an end-to-end encryption for all data exchanged between client and broker systems or other means of ensuring session security. Whether session login details are stored on the devices used for IBT and STWT.

c. **Inactive Session –** Whether the system allows for automatic trading session logout after a system defined period of inactivity.

d. **Log Management –** Whether the system generates and maintains logs of Number of users, activity logs, system logs, Number of active clients.

7. **Database Security**
   a. **Access** – Whether the system allows CTCL or IML database access only to authorized users / applications.
   b. **Controls –** Whether the CTCL or IML database server is hosted on a secure platform, with Username and password stored in an encrypted form using strong encryption algorithms.
8. **Network Integrity**
   a. **Seamless connectivity –** Whether the stock broker has ensured that a backup network link is available in case of primary link failure with the exchange.
   b. **Network Architecture –** Whether the web server is separate from the Application and Database Server.
   c. **Firewall Configuration –** Whether appropriate firewall is present between stock broker's trading setup and various communication links to the exchange. Whether the firewall is appropriately configured to ensure maximum security.

9. **Access Controls**
   a. **Access to server rooms –** Whether adequate controls are in place for access to server rooms and proper audit trails are maintained for the same.
   b. **Additional Access controls –** Whether the system provides for two factor authentication mechanism to access to various CTCL or IML components. Whether additional password requirements are set for critical features of the system. Whether the access control is adequate.
10. **Backup and Recovery**
    a. **Backup and Recovery Policy –** Whether the organization has a well-documented policy on periodic backup of data generated from the broking operations.

b. **Log generation and data consistency** - Whether backup logs are maintained and backup data is tested for consistency
c. **System Redundancy –** Whether there are appropriate backups in case of failures of any critical system components

11. **BCP/DR** (Only applicable for Stock Brokers having BCP / DR site)
    a. **BCP / DR Policy –** Whether the stock broker has a well-documented BCP/ DR policy and plan. The system auditor should comment on the documented incident response procedures.
    b. **Alternate channel of communication –** Whether the stock broker has provided its clients with alternate means of communication including channel for communication in case of a disaster. Whether the alternate channel is capable of authenticating the user after asking for additional details or OTP (One-Time-Password).
    c. **High Availability –** Whether BCP / DR systems and network connectivity provide high availability and have no single point of failure for any critical operations as identified by the BCP/ DR policy.
    d. **Connectivity with other FMIs –** The system auditor should check whether there is an alternative medium to communicate with Stock Exchanges and other FMIs.
12. **Segregation of Data and Processing facilities –** The system auditor should check and comment on the segregation of data and processing facilities at the Stock Broker in case the stock broker is also running other business.
13. **Back office data**
    a. **Data consistency –** The system auditor should verify whether aggregate client code data available at the back office of broker matches with the data submitted / available with the stock exchanges through online data view / download provided by exchanges to members.
    b. **Trail Logs –** The system auditor should specifically comment on the logs of Client Code data to ascertain whether editing or deletion of records have been properly documented and recorded and does not result in any irregularities.
14. **User Management**
    a. **User Management Policy –** The system auditor should check whether the stock broker has a well-documented policy that provides for user management and the user management policy explicitly defines user, database and application Access Matrix.

b. **Access to Authorized users –** The system auditor should check whether the system allows access only to the authorized users of the CTCL or IML System. Whether there is a proper documentation of the authorized users in the form of User Application approval, copies of User Qualification and other necessary documents.

c. **User Creation / Deletion –** The system auditor should check whether new users' ids were created / deleted as per CTCL or IML guidelines of the exchanges and whether the user ids are unique in nature.

d. **User Disablement –** The system auditor should check whether non-complaint users are disabled and appropriate logs (such as event log and trade logs of the user) are maintained.

15. **IT Infrastructure Management** (including use of various Cloud computing models such as Infrastructure as a service (IaaS), Platform as a service (PaaS), Software as a service (SaaS), Network as a service (NaaS))

    a. **IT Governance and Policy –** The system auditor should verify whether the relevant IT Infrastructure-related policies and standards exist and are regularly reviewed and updated. Compliance with these policies is periodically assessed.

    b. **IT Infrastructure Planning –** The system auditor should verify whether the plans/policy for the appropriate management and replacement of aging IT infrastructure components have been documented, approved, and implemented. The activities, schedules and resources needed to achieve objectives related to IT infrastructure have been integrated into business plans and budgets.

    c. **IT Infrastructure Availability (SLA Parameters) –** The system auditor should verify whether the broking firm has a process in place to define its required availability of the IT infrastructure, and its tolerance to outages. In cases where there is huge reliance on vendors for the provision of IT services to the brokerage firm the system auditor should also verify that the mean time to recovery (MTTR) mentioned in the Service Level Agreement (SLA) by the service provider satisfies the requirements of the broking firm.

    d. **IT Performance Monitoring (SLA Monitoring) –** The system auditor should verify that the results of SLA performance monitoring are documented and are reported to the management of the broker.

16. **Exchange specific exceptional reports –** The additional checks recommended by a particular exchange need to be looked into and commented upon by the System Auditor over and above the ToR of the System audit.

17. **Software Testing Procedures** - The system auditor should check whether the stock broker has complied with the guidelines and instructions of SEBI / stock exchanges with regard to testing of software and new patches, including the following:
    a. **Test Procedure Review –** The system auditor should evaluate whether the procedures for system and software testing were proper and adequate.
    b. **Documentation –** The system auditor should verify whether the documentation related to testing procedures, test data, and resulting output were adequate and follow the organization's standards.
    c. **Test Cases –** The system auditor should review the internal test cases and comment upon the adequacy of the same with respect to the requirements of the Stock Exchange and SEBI.

Annexure 3

ToR for Type III Broker

The system auditor shall at the minimum cover the following areas:

1. **System controls and capabilities (CTCL/IML Terminals and servers)**
    a. **Order Tracking** – The system auditor should verify system process and controls at CTCL / IML terminals and CTCL/ IML servers covering order entry, capturing IP address of order entry, modification / deletion of orders, status of current order/outstanding orders and trade confirmation.
    b. **Order Status/ Capture –** Whether the system has capability to generate / capture order id, time stamping, order type, scrip details, action, quantity, price and validity etc.
    c. **Rejection of orders –** Whether the system has capability to reject orders which do not go through order level validation at CTCL servers and at the servers of respective exchanges.
    d. **Communication of Trade Confirmation / Order Status –** Whether the system has capability to timely communicate to client regarding the Acceptance/ Rejection of an Order / Trade via various media including e-mail; facility of viewing trade log.
    e. **Client ID Verification –** Whether the system has capability to recognize only authorized Client Orders and mapping of Specific user Ids to specific predefined location for proprietary orders.
    f. **Order type distinguishing capability –** Whether the system has capability to distinguish the orders originating from (CTCL or IML) / IBT / DMA / STWT / SOR / Algorithmic Trading.
2. **Software Change Management** - The system auditor should check whether proper procedures have been followed and proper documentation has been maintained for the following:
    a. Processing/approval methodology of new feature request or patches
    b. Fault reporting / tracking mechanism and process for resolution
    c. Testing of new releases / patches / bug fixes
    d. Version control- History, Change Management process, approval etc.
    e. Development / Test/ Production environment segregation.
    f. New release in production – promotion, release note approvals
    g. Production issues/ disruptions reported during last year, reasons for such disruptions and corrective actions taken.
    h. User Awareness

The System Auditor should check whether critical changes made to the (CTCL or IML) / IBT / DMA / STWT / SOR are well documented and communicated to the Stock Exchange.

3. **Risk Management System (RMS)**
    a. **Online risk management capability –** The system auditor should check whether the online risk management including upfront real-time risk management, is in place for all orders placed through (CTCL or IML) / IBT/ DMA / SOR / STWT / Algorithmic Trading.
    b. **Trading Limits –** Whether a system of pre-defined limits / checks such as Order Quantity and Value Limits, Symbol wise User Order / Quantity limit, User / Branch Order Limit, Order Price limit, etc., are in place and only such orders which are within the parameters specified by the RMS are allowed to be pushed into exchange trading engines. The system auditor should check that no user or branch in the system is having unlimited limits on the above parameters.
    c. **Order Alerts and Reports –** Whether the system has capability to generate alerts when orders that are placed are above the limits and has capability to generate reports relating to margin requirements, payments and delivery obligations.
    d. **Order Review –** Whether the system has capability to facilitate review of such orders that were not validated by the system.
    e. **Back testing for effectiveness of RMS –** Whether the system has capability to identify trades which have exceeded the pre-defined limits (Order Quantity and Value Limits, Symbol wise User Order / Quantity limit, User / Branch Order Limit, Order Price limit) and also exceed corresponding margin availability of clients. Whether deviations from such pre-defined limits should be captured by the system, documented and corrective steps taken.
    f. **Log Management –** Whether the system maintains logs of alerts / changes / deletion / activation / deactivation of client codes and logs of changes to the risk management parameters mentioned above. Whether the system allows only authorized users to set the risk parameter in the RMS.
4. **Smart order routing (SOR)** - The system auditor should check whether proper procedures have been followed and proper documentation has been maintained for the following:
    a. **Best Execution Policy** – System adheres to the Best Execution Policy while routing the orders to the exchange.

b. **Destination Neutral –** The system routes orders to the recognized stock exchanges in a neutral manner.
c. **Class Neutral –** The system provides for SOR for all classes of investors.
d. **Confidentiality** - The system does not release orders to venues other than the recognized stock Exchange.
e. **Opt–out –** The system provides functionality to the client who has availed of the SOR facility, to specify for individual orders for which the clients do not want to route order using SOR.
f. **Time stamped market information** – The system is capable of receiving time stamped market prices from recognized stock Exchanges from which the member is authorized to avail SOR facility.
g. **Audit Trail -** Audit trail for SOR should capture order details, trades and data points used as a basis for routing decision.
h. **Server Location –** The system auditor should check whether the order routing server is located in India.
i. **Alternate Mode -** The system auditor should check whether an alternative mode of trading is available in case of failure of SOR Facility

5. **Algorithmic Trading** - The system auditor should check whether proper procedures have been followed and proper documentation has been maintained for the following:
    a. **Change Management –**Whether any changes (modification/addition) to the approved algos were informed to and approved by stock exchange. The inclusion / removal of different versions of algos should be well documented.
    b. **Online Risk Management capability-** The CTCL or IML server should have capacity to monitor orders / trades routed through algo trading and have online risk management for all orders through Algorithmic trading and ensure that Price Check, Quantity Check, Order Value Check, Cumulative Open Order Value Check are in place.
    c. **Risk Parameters Controls –** The system should allow only authorized users to set the risk parameter. The System should also maintain a log of all the risk parameter changes made.
    d. **Information / Data Feed –** The auditor should comment on the various sources of information / data for the algo and on the likely impact (run away /loop situation) of the failure one or more sources to provide timely feed to the algorithm. The system auditor should verify that the algo automatically stops further processing in the absence of data feed.

e. **Check for preventing loop or runaway situations** – The system auditor should check whether the brokers have real time monitoring systems to identify and shutdown/stop the algorithms which have not behaved as expected.

f. **Algo / Co-location facility Sub-letting –** The system auditor should verify if the algo/ co-location facility has not been sub-letted to any other firms to access the exchange platform.

g. **Audit Trail –** The system auditor should check the following areas in audit trail:
   i. Whether the audit trails can be established using unique identification for all algorithmic orders and comment on the same.
   ii. Whether the broker maintains logs of all trading activities.
   iii. Whether the records of control parameters, orders, traders and data emanating from trades executed through algorithmic trading are preserved/ maintained by the Stock Broker.
   iv. Whether changes to the control parameters have been made by authorized users as per the Access Matrix. The system auditor should specifically comment on the reasons and frequency for changing of such control parameters. Further, the system auditor should also comment on the possibility of such tweaking leading to run away/loop situation.
   v. Whether the system captures the IP address from where the algo orders are originating.

h. **Systems and Procedures –** The system auditor should check and comment on the procedures, systems and technical capabilities of stock broker for carrying out trading through use of Algorithms. The system auditor should also identify any misuse or unauthorized access to algorithms or the system which runs these algorithms.

i. **Reporting to Stock Exchanges –** The system auditor should check whether the stock broker is informing the stock exchange regarding any incidents where the algos have not behaved as expected. The system auditor should also comment upon the time taken by the stock broker to inform the stock exchanges regarding such incidents.

6. Password Security

a. **Organization Access Policy** – The system auditor should whether the stock broker has a well-documented policy that provides for a password policy as

well as access control policy for exchange provided terminals and for API based terminals.

b. **Authentication Capability –** Whether the system authenticates user credentials by means of a password before allowing the user to login. Whether there is a system for authentication of orders originating from Internet Protocol by means of two-factor authentication, including Public Key Infrastructure (PKI) based implementation of digital signatures.

c. **Password Best Practices –** Whether there is a system should for masking of password, system prompt to change default password on first login, disablement of user id on entering multiple wrong passwords (as defined in the password policy document), periodic password change mandate and appropriate prompt to user, strong parameters for password, deactivation of dormant user id, etc.

7. Session Management

a. **Session Authentication –** Whether the system has provision for Confidentiality, Integrity and Availability (CIA) of the session and the data transmitted during the session by means of appropriate user and session authentication mechanisms like SSL etc.

b. **Session Security –** Whether there is availability of an end-to-end encryption for all data exchanged between client and broker system or other means of ensuring session security. Whether session login details are stored on the devices used for IBT and STWT.

c. **Inactive Session –** Whether the system allows for automatic trading session logout after a system defined period of inactivity.

d. **Log Management –** Whether the system generates and maintains logs of number of users, activity logs, system logs, number of active clients.

8. Database Security

a. **Access –** Whether the system allows CTCL or IML database access only to authorized users / applications.

b. **Controls –** Whether the CTCL or IML database server is hosted on a secure platform, with username and password stored in an encrypted form using strong encryption algorithms.

9. Network Integrity

a. **Seamless connectivity –** Whether the stock broker has ensured that a backup network link is available in case of primary link failure with the exchange.

b. **Network Architecture –** Whether the web server is separate from the Application and Database Server.

c. **Firewall Configuration –** Whether appropriate firewall are present between the stock broker's trading setup and various communication links to the exchange. Whether the firewalls should be appropriately configured to ensure maximum security.

10. Access Controls

a. **Access to server rooms –** Whether adequate controls are in place for access to server rooms, proper audit trails should be maintained for the same.

b. **Additional Access controls -** Whether the system should provide for two factor authentication mechanism to access to various CTCL or IML components. Whether additional password requirements are set for critical features of the system. Whether the access control is adequate.

11. Backup and Recovery

a. **Backup and Recovery Policy –** Whether the organization has a well-documented policy on periodic backup of data generated from the broking operations.

b. **Log generation and data consistency** – Whether backup logs are maintained and backup data should be tested for consistency.

c. **System Redundancy –** Whether there are appropriate backups in case of failures of any critical system components.

12. BCP/DR (Only applicable for Stock Brokers having BCP / DR site)

a. **BCP / DR Policy –** Whether the stock broker has a well-documented BCP / DR policy and plan. The system auditor should comment on the documented incident response procedures.

b. **Alternate channel of communication –** Whether the stock broker has provided its clients with alternative means of communication including channel for communication in case of a disaster. Whether the alternate channel is capable of authenticating the user after asking for additional details or OTP (One-Time-Password).

c. **High Availability –** Whether BCP / DR systems and network connectivity provide high availability and have no single point of failure for any critical operations as identified by the BCP / DR policy.

d. **Connectivity with other FMIs –** The system auditor should check whether there is an alternative medium to communicate with Stock Exchanges and other FMIs.

13. **Segregation of Data and Processing facilities –** The system auditor should check and comment on the segregation of data and processing facilities at the Stock Broker in case the stock broker is also running other business.
14. **Back office data**
    a. **Data consistency –** The system auditor should verify whether aggregate client code data available at the back office of broker matches with the data submitted / available with the stock exchanges through online data view / download provided by exchanges to members.
    b. **Trail Logs –** The system auditor should specifically comment on the logs of Client Code data to ascertain whether editing or deletion of records have been properly documented and recorded and does not result in any irregularities.
15. **User Management**
    a. **User Management Policy –** The system auditor should verify whether the stock broker has a well-documented policy that provides for user management and the user management policy explicitly defines user, database and application access matrix.
    b. **Access to Authorized users –** The system auditor should verify whether the system allows access only to the authorized users of the CTCL or IML system. Whether there is a proper documentation of the authorized users in the form of user application approval, copies of user qualification and other necessary documents.
    c. **User Creation / Deletion –** The system auditor should verify whether new user's ids should be created / deleted as per CTCL or IML guidelines of the exchanges and whether the user ids are unique in nature.
    d. **User Disablement –** The system auditor should verify whether non-complaint users are disabled and appropriate logs such as event log and trade logs of the user should be maintained
16. **IT Infrastructure Management** (including use of various Cloud computing models such as Infrastructure as a service (IaaS), Platform as a service (PaaS), Software as a service (SaaS), Network as a service (NaaS))
    a. **IT Governance and Policy –** The system auditor should verify whether the relevant IT Infrastructure-related policies and standards exist and are regularly reviewed and updated. Compliance with these policies is periodically assessed.
    b. **IT Infrastructure Planning –** The system auditor should verify whether the plans/policy for the appropriate management and replacement of aging IT

infrastructure components have been documented, approved, and implemented. The activities, schedules and resources needed to achieve objectives related to IT infrastructure have been integrated into business plans and budgets.

c. **IT Infrastructure Availability (SLA Parameters) –** The system auditor should verify whether the broking firm has a process in place to define its required availability of the IT infrastructure, and its tolerance to outages. In cases where there is huge reliance on vendors for the provision of IT services to the brokerage firm the system auditor should also verify that the mean time to recovery (MTTR) mentioned in the Service Level Agreement (SLA) by the service provider satisfies the requirements of the broking firm.

d. **IT Performance Monitoring (SLA Monitoring) –** The system auditor should verify that the results of SLA performance monitoring are documented and are reported to the management of the broker.

17. **Exchange specific exceptional reports –** The additional checks recommended by a particular exchange need to be looked into and commented upon by the system auditor over and above the ToR of the system audit.
18. **Software Testing Procedures** - The system auditor shall audit whether the stock broker has complied with the guidelines and instructions of SEBI / stock exchanges with regard to testing of software and new patches including the following:
    a. **Test Procedure Review –** The system auditor should review and evaluate the procedures for system and program testing. The system auditor should also review the adequacy of tests.
    b. **Documentation –** The system auditor should review documented testing procedures, test data, and resulting output to determine if they are comprehensive and if they follow the organization's standards.
    c. **Test Cases –** The system auditor should review the test cases and comment upon the adequacy of the same with respect to the requirements of the Stock Exchange and various SEBI Circulars.

Annexure 4

Executive Summary Reporting Format

I. For Preliminary Audit

Audit Date	Observation No	Description of Finding	Department	Status / Nature of Findings	Risk Rating of Findings	Audit TOR Clause	Audited By	Ro Cau Anal

Description of relevant Table heads

1. **Audit Date –** This indicates the date of conducting the audit.
2. **Description of Findings/ Observations –** Description of the findings in sufficient detail, referencing any accompanying evidence (e.g. copies of procedures, interview notes, screen shots *etc*.)
3. **Status/ Nature of Findings -** the category can be specified for example:
   a. Non-Compliant
   b. Work in progress
   c. Observation
   d. Suggestion

4. **Risk Rating of Findings –** A rating has to been given for each of the observations based on their impact and severity to reflect the risk exposure, as well as the suggested priority for action.

Rating	Description
HIGH	Weakness in control those represent exposure to the organization or risks that could lead to instances of noncompliance with the requirements of TORs. These risks need to be addressed with utmost priority.
MEDIUM	Potential weakness in controls, which could develop into an exposure or issues that represent areas of concern and may impact internal controls. These should be addressed reasonably promptly.
LOW	Potential weaknesses in controls, which in combination with other weakness can develop into an exposure.

	Suggested improvements for situations not immediately/directly affecting controls.

5. **Audit TOR Clause –** The TOR clause corresponding to this observation
6. **Root cause Analysis** –A detailed analysis on the cause of the nonconformity
7. **Impact Analysis –** An analysis of the likely impact on the operations/ activity of the organization
8. **Suggested Corrective Action** –The action to be taken by the broker to correct the nonconformity

II. <u>For Follow on / Follow up System Audit</u>

Preliminary Audit Date	Sr. No	Preliminary Observation Number	Preliminary Status	Preliminary Corrective Action	Current Finding	Current Status	Revise Correct Actio

Description of relevant Table heads

1. **Preliminary Status –** The original finding as per the preliminary System Audit Report
2. **Preliminary Corrective Action –** The original corrective action as prescribed in the preliminary System Audit report
3. **Current Finding –** The current finding w.r.t. the issue.
4. **Current Status –** Current status of the issue viz Compliant, Non-Compliant, Work In Progress (WIP)
5. **Revised Corrective Action –** The revised corrective action prescribed w.r.t. the Non-Compliant / WIP issues

Annexure X

1. In order to ensure compliance with the guidelines for Business Continuity Plan (BCP) and Disaster Recovery (DR), prescribed at Para 9.1 in this Master Circular, LPCC is permitted to have arrangements with any of the existing Clearing Corporations who are in compliance with the existing regulatory BCP/DR requirements. However, for any issues / disputes arising on account of such arrangement, the LPCC shall be liable. Hence, the LPCC shall incorporate necessary provision into its agreement with the service providers for its BCP/DR arrangement with them.

2. Similarly, in order to ensure compliance with the requirements relating to the prescribed Cyber Security and Cyber Resilience framework at Para 10.1 and 10.6 in this Master Circular, LPCC is permitted to have outsourcing arrangements for cyber security with any of the existing Clearing Corporations for the purposes of Cyber Security. For any issues / disputes arising on account of such arrangement, LPCC would be liable.

ANNEXURE XI

Standard Operating Procedure (SOP) for handling of technical glitches

Definition of "Technical Glitch"

1. Technical glitch shall mean any malfunction in the systems of an MII. Malfunction in the systems of the MII shall include malfunction in its (a) hardware, or; (b) software, or; (c) any products/ services provided by the MII, whether on account of inadequate infrastructure/ systems or otherwise, which may lead to either stoppage or variance in the normal functions/ operations of systems of the MII.

Reporting Requirements

2. The following reporting structure for technical glitches shall be adopted by the MIIs:

Sl. No.	Disruption	Reporting
1.	No business disruption	• Standing Committee on Technology (SCOT) of MII • Governing Board of MII
2.	Business disruption	• SCOT of MII • Governing Board of MII • SEBI

Business disruption shall mean either stoppage or variance in the normal functions/operations of systems of the MII thereby impacting normal/regular service delivery of the MII.

2.1. With regard to incidents resulting in business disruption, the following shall be submitted by the MIIs to SEBI:

(i) Information of technical glitch on immediate basis but not later than 2 hours from the time of occurrence of the glitch; provided that glitches of the nature of a disaster- as defined above at Para 9.1.2.3 - shall be reported immediately upon declaration of disaster.

(ii) Preliminary report within 24 hours of the occurrence of the glitch.

(iii) Comprehensive Root Cause Analysis (RCA) report and corrective action taken to address the technical glitch within 21 days of the incident. Such report shall be submitted to SEBI, after placing the same before the Standing Committee on Technology and the Governing Board of the MII and confirming compliance with their observations.

(iv) RCA submitted by the MIIs should inter-alia include exact cause of the technical glitch (including root cause from vendor(s), if applicable), exact duration of the technical glitch, chronology of events, list of business

processes/systems and time for which they were impacted, recommendations of SCOT / Governing Board of MII, details of corrective/ preventive measures taken (or to be taken) by MII along with timelines and any other aspect relevant to the technical glitch. As part of the RCA, MIIs are required to demonstrate compliance with various requirements of this SOP. The RCA shall include details regarding time of incident, time when operations were restored and in the event of a disaster, time when disaster was declared.

2.2. All communication and information with regard to technical glitch shall be shared by the MII with SEBI through a dedicated e-mail id viz. techglitch@sebi.gov.in

Placing before Technical Advisory Committee (TAC)

3. With regard to the incidents wherein business is disrupted, the RCA and corrective action taken, as submitted by the MII, shall be placed before TAC of SEBI. TAC/ SEBI, if it so desires, may seek additional information/ clarification from the MII regarding the technical glitch.

4. In case TAC finds the actions taken by the MII as inadequate, then, based on the recommendations of TAC, the MII shall be required to address the technical glitch by taking appropriate corrective actions, within the timeline specified by TAC/SEBI. While deciding such timeline, criticality of the malfunction and/or the services/ applications affected by the same shall also be taken into consideration.

ANNEXURE XII

"Financial Disincentive" structure with regard to handling of technical glitches

Failure to timely submit RCA

1. In case of delay in submission or submission of incomplete/ inadequate RCA by an MII, a "financial disincentive" of Rs.1,00,000 per working day shall be paid by the MII for each working day of delay from the timeline specified at Para 2.1(iii) of Annexure XI above or any revised timeline specified by TAC/SEBI for submission of exact RCA.

Failure to timely address technical glitch

2. In order to ensure that MIIs address technical glitch within the timeline specified by TAC/SEBI, the following progressive slab-wise "financial disincentive" shall be paid from the expiry of the timeline specified by TAC/ SEBI:

S No.	No. of working days during which failure continues (i.e. after expiry of the timeline specified by TAC/ SEBI)	Financial disincentive to be paid by the MII (Rs.)
i.	First 15 working days	2 lakh per working day
ii.	Subsequent 15 working days	3 lakh per working day in addition to S No. (i) above
iii.	Beyond 30 working days	25 lakh in addition to S No (i) and (ii) above

Failure to declare disaster within stipulated timelines

3. It has been mandated that, in the event of disruption of any one or more of the 'Critical Systems', the MII shall, within 30 minutes of the incident, declare that incident as 'Disaster'. In case of delay in declaration of disaster beyond the timeline specified by SEBI, the following "financial disincentive" shall be paid:

S No.	Delay in declaration of disaster beyond abovementioned timeline specified by SEBI	Financial disincentive Equivalent (Rs.)
i.	Financial disincentive on MII	10% of average of standalone net profit for previous two financial years or Rs. 2 cr., whichever is higher.
ii.	Financial disincentive on Managing Director (MD) and Chief Technology Officer (CTO) of MII separately	10% each of their annual pay (both fixed and variable components) for the financial year when the disaster occurred

Failure to restore operations within Recovery Time Objective (RTO)

4. In the event of a disaster, if an MII fails to restore its operations within the RTO prescribed by SEBI, i.e. to restore operations of 'Critical Systems' including from

Disaster Recovery Site within 45 minutes of declaration of Disaster, the following "financial disincentive" shall be paid:

S No.	Failure to restore operations within the RTO prescribed by SEBI	Financial disincentive Equivalent (Rs.)
i.	Financial disincentive on MII	10% of average of standalone net profit for previous two financial years or Rs. 2 cr., whichever is higher.
ii.	Financial disincentive on MD and CTO of MII separately	10% each of their annual pay (both fixed and variable components) for the financial year when the disaster occurred

"Financial disincentive" under Clause 3 and Clause 4 above, in relation to the same disaster, shall be paid only once either under Clause 3 or Clause 4.

5. Further, if an MII fails to restore operations of Critical Systems including from Disaster Recovery Site within three hours from the occurrence of the disaster, the following additional "financial disincentive" (over and above S No 3 or 4 above) shall be paid:

S No.	Failure to Restore operations of Critical systems beyond abovementioned timeline	Financial disincentive Equivalent (Rs.)
i.	Financial disincentive on MII	10% of average of standalone net profit for previous two financial years or Rs. 2 cr., whichever is higher.
ii.	Financial disincentive on MD and CTO of MII separately	10% each of their annual pay (both fixed and variable components) for the financial year when the disaster occurred

Failure to restore normalcy in cases of business disruption, not being in the nature of a Disaster

6. In the event of any business disruption, which is not required to be declared as "Disaster", if an MII fails to restore normalcy of operations within 75 minutes of the incident, the following slab wise "financial disincentive" shall be paid by the MII:

S No.	Failure to Restore normalcy within	Financial disincentive (Rs.)
i.	75 minutes to 3 hours of the incident	Rs. 50 lacs
ii.	Beyond 3 hours of the incident	Rs.1 crore

7. The amount of "financial disincentive" paid as per the above structure shall be credited by MII to the following funds maintained by it:

S No.	Financial Disincentive on MIIs, MD and CTO	Credited to Funds
i.	Stock Exchange	Investor Protection Fund (IPF)
ii.	Clearing Corporation	Core Settlement Guarantee Fund (Core SGF)
iii.	Depositories	Investor Protection Fund (IPF)

8. Further, the MII shall submit a compliance report within 90 days of occurrence of disaster/ business disruption to SEBI providing details of payment of "financial disincentives" including computation of "financial disincentives" as per the SOP and the date when the amount was credited to the aforementioned funds. With regard to "financial disincentive" on the MD/CTO of the MII arising out of the variable pay component, the compliance report shall be submitted within 30 days of determination of variable pay of the concerned officials for the financial year when the disaster occurred.
9. With regard to the requirement of payment of "financial disincentive" on the aforesaid officials of the MII (i.e. MD and CTO), the MII shall insert a suitable clause in the terms of appointment of these officials and/ or in the Internal Code of Conduct of the MII to comply with the "financial disincentive" requirements.
10. The financial disincentives automatically triggered under predefined circumstances as stated in clauses 1,2,3,4,5,6 above shall be paid by the MIIs. However, these financial disincentives shall be without prejudice to any action as may be initiated by SEBI.

Annexure XIII

1. Cyber attacks and threats attempt to compromise the Confidentiality, Integrity and Availability (CIA) of the computer systems, networks and databases.[52] Cyber security framework include measures, tools and processes that are intended to prevent cyber attacks and improve cyber resilience. Cyber Resilience is an organisation's ability to prepare and respond to a cyber-attack and to continue operation during, and recover from, a cyber attack.

Governance

2. As part of the operational risk management framework to manage risk to systems, networks and databases from cyber attacks and threats, MII should formulate a comprehensive cyber security and cyber resilience policy document encompassing the framework mentioned hereunder. The policy document should be approved by the Board, and in case of deviations from the suggested framework, reasons for such deviations should also be provided in the policy document. The policy document should be reviewed by the MII's Board at least annually with the view to strengthen and improve its cyber security and cyber resilience framework.
3. The cyber security and cyber resilience policy should include the following process to identify, assess, and manage cyber security risk associated with processes, information, networks and systems.
    a. 'Identify' critical IT assets and risks associated with such assets,
    b. 'Protect' assets by deploying suitable controls, tools and measures,
    c. 'Detect' incidents, anomalies and attacks through appropriate monitoring tools / processes,
    d. 'Respond' by taking immediate steps after identification of the incident, anomaly or attack,
    e. 'Recover' from incident through incident management, disaster recovery and business continuity framework.
4. The Cyber security policy should encompass the principles prescribed by National Critical Information Infrastructure Protection Centre (NCIIPC) of National Technical Research Organisation (NTRO), Government of India in the report titled 'Guidelines for Protection of National Critical Information Infrastructure' and subsequent revisions, if any, from time to time.
5. MII should also incorporate best practices from standards such as ISO 27001, ISO 27002, COBIT 5, etc., or their subsequent revisions, if any, from time to time.

[52] Confidentiality refers to limiting access of systems and information to authorized users, Integrity is the assurance that the information is reliable and accurate, and Availability refers to guarantee of reliable access to the systems and information by authorized users

6. MII should designate a senior official as Chief Information Security Officer ("CISO") whose function would be to assess, identify and reduce cyber security risks, respond to incidents, establish appropriate standards and controls, and direct the establishment and implementation of processes and procedures as per the cyber security and resilience policy approved by the Board of the MII.
7. The Standing Committee on Technology[53] of the stock exchanges , the clearing corporations and the the depositories should on a quarterly basis review the implementation of the cyber security and resilience policy approved by their Boards, and such review should include review of their current IT and cyber security and resilience capabilities, set goals for a target level of cyber resilience, and establish a plan to improve and strengthen cyber security and cyber resilience.
8. MII should establish a reporting procedure to facilitate communication of unusual activities and events to CISO or to the senior management in a timely manner.
9. The aforementioned committee and the senior management of the MII, including the CISO, should periodically review instances of cyber attacks, if any, domestically and globally, and take steps to strengthen cyber security and cyber resilience framework.
10. MII should define responsibilities of its employees, outsourced staff, and employees of vendors, members or participants and other entities, who may have access or use systems / networks of MII, towards ensuring the goal of cyber security.

Identify

11. MII should identify and classify/designate critical assets based on their sensitivity and criticality for business operations, services and data management. The critical assets should include business critical systems, internet facing applications /systems, systems that contain sensitive data, sensitive personal data, sensitive financial data, Personally Identifiable Information (PII) data, etc. All the ancillary systems used for accessing/communicating with critical systems either for operations or maintenance should also be classified as critical system. The Board of the MII shall approve the list of critical systems. To this end, MII should maintain up-to-date inventory of its hardware and systems, software and information assets (internal and external), details of its network resources, connections to its network and data flows.[54]
12. MII should accordingly identify cyber risks (threats and vulnerabilities) that it

[53]Refer SEBI Circulars SMD/POLICY/Cir-2/98 dated January 14, 1998 and SEBI/HO/MRD/DOP2DSA2/CIR/P/2019/13 dated January 10, 2019.
[54] Refer SEBI Circular SEBI/HO/MRD1/MRD1_DTCS/P/CIR/2022/68 dated May 20, 2022.

may face, along with the likelihood of such threats and impact on the business and thereby, deploy controls commensurate to the criticality.

13. MII should also encourage its third-party providers, such as service providers, stock brokers, depository participants, etc. to have similar standards of Information Security.

Protection

Access Controls

14. No person by virtue of rank or position should have any intrinsic right to access confidential data, applications, system resources or facilities.
15. Any access to MII's systems, applications, networks, databases, etc., should be for a defined purpose and for a defined period. MII should grant access to IT systems, applications, databases and networks on a need-to-use basis and based on the principle of least privilege. Such access should be for the period when the access is required and should be authorized using strong authentication mechanisms.
16. MII should implement strong password controls for users' access to systems, applications, networks and databases. Password controls should include a change of password upon first log-on, minimum password length and history, password complexity as well as maximum validity period. The user credential data should be stored using strong and latest hashing algorithms.
17. MII should ensure that records of user access are uniquely identified and logged for audit and review purposes. Such logs should be maintained and stored in encrypted form for a time period not less than two (2) years.
18. MII should deploy additional controls and security measures to supervise staff with elevated system access entitlements (such as admin or privileged users). Such controls and measures should inter-alia include restricting the number of privileged users, periodic review of privileged users' activities, disallow privileged users from accessing systems logs in which their activities are being captured, strong controls over remote access by privileged users, etc.
19. Account access lock policies after failure attempts should be implemented for all accounts.
20. Employees and outsourced staff such as employees of vendors or service providers, who may be given authorised access to the MII's critical systems, networks and other computer resources, should be subject to stringent supervision, monitoring and access restrictions.
21. Two-factor authentication at log-in should be implemented for all users that connect using online / internet facility.
22. MII should formulate an Internet access policy to monitor and regulate the use of internet and internet based services such as social media sites, cloud-based

internet storage sites, etc.

23. Proper 'end of life' mechanism should be adopted to deactivate access privileges of users who are leaving the organization or who access privileges have been withdrawn.

Physical security

24. Physical access to the critical systems should be restricted to minimum. Physical access of outsourced staff / visitors should be properly supervised by ensuring at the minimum that outsourced staff / visitors are accompanied at all times by authorised employees.
25. Physical access to the critical systems should be revoked immediately if the same is no longer required.
26. MII should ensure that the perimeter of the critical equipment room are physically secured and monitored by employing physical, human and procedural controls such as the use of security guards, CCTVs, card access systems, mantraps, bollards, etc. where appropriate.

Network Security Management

27. MII should establish baseline standards to facilitate consistent application of security configurations to operating systems, databases, network devices and enterprise mobile devices within the IT environment. The MII should conduct regular enforcement checks to ensure that the baseline standards are applied uniformly.
28. MII should install network security devices, such as firewalls as well as intrusion detection and prevention systems, to protect its IT infrastructure from security exposures originating from internal and external sources.
29. Anti-virus software should be installed on servers and other computer systems. Updation of Anti-virus definition files and automatic anti-virus scanning should be done on a regular basis.

Security of Data

30. Data-in motion and Data-at-rest should be in encrypted form by using strong encryption methods such as Advanced Encryption Standard (AES), RSA, SHA-2, etc.
31. MII should implement measures to prevent unauthorised access or copying or transmission of data / information held in contractual or fiduciary capacity. It should be ensured that confidentiality of information is not compromised during the process of exchanging and transferring information with external parties.
32. The information security policy should also cover use of devices such as mobile

phone, faxes, photocopiers, scanners, etc. that can be used for capturing and transmission of data.

33. MII should allow only authorized data storage devices through appropriate validation processes.

Hardening of Hardware and Software

34. Only a hardened and vetted hardware / software should be deployed by the MII. During the hardening process, MII should inter-alia ensure that default passwords are replaced with strong passwords and all unnecessary services are removed or disabled in equipments / software.
35. All open ports which are not in use or can potentially be used for exploitation of data should be blocked. Other open ports should be monitored and appropriate measures should be taken to secure the ports.

Application Security and Testing

36. MII should ensure that regression testing is undertaken before new or modified system is implemented. The scope of tests should cover business logic, security controls and system performance under various stress-load scenarios and recovery conditions.

Patch Management

37. MII should establish and ensure that the patch management procedures include the identification, categorization and prioritisation of security patches. An implementation timeframe for each category of security patches should be established to implement security patches in a timely manner.
38. MII should perform rigorous testing of security patches before deployment into the production environment so as to ensure that the application of patches do not impact other systems.

Disposal of systems and storage devices

39. MII should frame suitable policy for disposals of the storage media and systems. The data / information on such devices and systems should be removed by using methods viz. wiping / cleaning / overwrite, degauss and physical destruction, as applicable.

Vulnerability Assessment and Penetration Testing (VAPT)[55]

40. MII should carry out periodic vulnerability assessment and penetration testing (VAPT) which inter-alia includes all critical assets and infrastructure components

[55] Refer SEBI Circular SEBI/HO/MRD1/MRD1_DTCS/P/CIR/2022/68 dated May 20, 2022.

like Servers, Networking systems, Security devices, load balancers, other IT systems pertaining to the activities done as a role of MII etc., in order to detect security vulnerabilities in the IT environment and in-depth evaluation of the security posture of the system through simulations of actual attacks on its systems and networks.

MIIs should conduct VAPT at least once in a financial year. However, for the MIIs, whose systems have been identified as "protected system" by National Critical Information Infrastructure Protection Centre (NCIIPC), VAPT shall be conducted at least twice in a financial year. Further, all MIIs are required to engage only CERT-In empaneled organizations for conducting VAPT. The final report on said VAPT should be submitted to SEBI after approval from Standing Committee on Technology (SCOT) of respective MIIs, within 1 month of completion of VAPT activity.

41. Any gaps/vulnerabilities detected have to be remedied on immediate basis and compliance of closure of findings identified during VAPT shall be submitted to SEBI within 3 months post the submission of final VAPT report to SEBI.
42. In addition, MII should also perform vulnerability scanning and conduct penetration testing prior to the commissioning of a new system which is a critical system or part of an existing critical system.

Monitoring and Detection

43. MII should establish appropriate security monitoring systems and processes to facilitate continuous monitoring of security events and timely detection of unauthorised or malicious activities, unauthorised changes, unauthorised access and unauthorised copying or transmission of data / information held in contractual or fiduciary capacity, by internal and external parties. The security logs of systems, applications and network devices should also be monitored for anomalies.
44. Further, to ensure high resilience, high availability and timely detection of attacks on systems and networks, MII should implement suitable mechanism to monitor capacity utilization of its critical systems and networks.
45. Suitable alerts should be generated in the event of detection of unauthorized or abnormal system activities, transmission errors or unusual online transactions.

Response and Recovery

46. Alerts generated from monitoring and detection systems should be suitably investigated, including impact and forensic analysis of such alerts, in order to determine activities that are to be performed to prevent expansion of such incident of cyber attack or breach, mitigate its effect and eradicate the incident.

47. The response and recovery plan of the MII should aim at timely restoration of systems affected by incidents of cyber attacks or breaches. The recovery plan should be in line with the Recovery Time Objective (RTO) and Recovery Point Objective (RPO) specified by SEBI.
48. The response plan should define responsibilities and actions to be performed by its employees and support / outsourced staff in the event of cyber attacks or breach of cyber security mechanism.
49. Any incident of loss or destruction of data or systems should be thoroughly analyzed and lessons learned from such incidents should be incorporated to strengthen the security mechanism and improve recovery planning and processes.
50. MII should also conduct suitable periodic drills to test the adequacy and effectiveness of response and recovery plan.

Sharing of information

51. Quarterly reports containing information on cyber attacks and threats experienced by MII and measures taken to mitigate vulnerabilities, threats and attacks including information on bugs / vulnerabilities / threats that may be useful for other MIIs, should be submitted to SEBI.
52. Such details as are felt useful for sharing with other MIIs in masked and anonymous manner shall be shared using mechanism to be specified by SEBI from time to time.

Training

53. MII should conduct periodic training programs to enhance awareness level among the employees and outsourced staff, vendors, etc. on IT / Cyber security policy and standards. Special focus should be given to build awareness levels and skills of staff from non-technical disciplines.
54. The training program should be reviewed and updated to ensure that the contents of the program remain current and relevant.

Periodic Audit

55. The MIIs are mandated to conduct comprehensive cyber audit at least 2 times in a financial year. Along with the Cyber audit reports, henceforth, all MIIs are directed to submit a declaration from the MD/ CEO certifying compliance by the MII with all SEBI Circulars and advisories related to Cyber security issued from time to time.[56]

[56] Refer SEBI Circular SEBI/HO/MRD1/MRD1_DTCS/P/CIR/2022/68 dated May 20, 2022.

Annexure XIV

1. Level of support definitions for outsourcing/in-house are as follows:

1.1. Security Analyst Level 1 (L1): This function may be mostly outsourced

(a) Monitoring SIEM Solution console for identifying the security events generated by the log sources integrated with SIEM tools.
(b) Identification of security events that are false +ve before qualifying event as an incident.
(c) Identify the exceptions which are identified as an event (e.g. VA scanning performed by SEBI appointed 3rd party which may be identified as port scanning attack).
(d) Perform first level event analysis before qualifying the incidents.
(e) Qualifying the event as an incident using Knowledgebase.
(f) Escalating exceptions & Events to L2 level.
(g) Log Incident tickets in service management tool and assign it to the respective team.
(h) Follow-up for the closure of the incident tickets generated.

1.2. Security Analyst Level 2 (L2): Combination of Outsource / In-House

(a) Exception Analysis.
(b) Analysis of extended events.
(c) Confirmation of False +ve & update Knowledge Base.
(d) Qualify Incident & provide mitigation suggestions.
(e) Escalate incident to next level.
(f) Update /configuration correlation rules after approval.

1.3. Security Analyst Level 3 (L3): Combination of Outsource / In-House

(a) Analysis of escalated Incidents.
(b) Define correlation rules.
(c) Analysis of impact on SIEM over all correlation rules and operations for the correlation rules suggested by Level 2 Analyst.
(d) Approve correlation rules after the impact analysis.
(e) Perform impact analysis before deployment of correlation rules.
(f) Perform impact analysis for update and upgrade of SIEM & Advance security solutions components.

(g) Define Mitigation suggestions for newly identified incidents.
(h) Approve the reports before sharing with others.

1.4. SOC Manager (L4) : In-house

(a) Lead and manage Security Operations Centre.
(b) Provide strategic directions to SOC team and organization for security posture improvements.
(c) To identify key contacts for incident escalation and change management activities.
(d) Ensure compliance to SLA.
(e) Ensure process adherence and process improvisation to achieve operational objectives.
(f) Revise and develop processes to strengthen the current Security Operations.
(g) Responsible for team and vendor management.
(h) Responsible for overall use of resources and initiation of corrective action where required for Security Operations Center.
(i) Escalate to the other IT Infra. Management teams or application maintenance teams, as necessary.
(j) Overall responsibility for delivery of in scope activities as a part of this engagement.
(k) Point of contact for problem escalation and reporting.

1.5. Security Subject Matter Expert for Security technologies: In-house with reliance on external expertise

(a) Subject Matter Expert (SME) for SIEM and Advance security solutions.
(b) Assist you with troubleshooting steps to be performed by you in order to re-establish connectivity between the SIEM System and SEBI's locations.
(c) Provide software-level management for the SIEM System components;
(d) Verify data collection and log continuity;
(e) Manage user access including user and group permissions updates;
(f) Review application performance, capacity, and availability make recommendations as appropriate;

(g) Review SIEM System disk space usage;
(h) Verify time synchronization among SIEM System components;
(i) Perform archival management and retrieval per change management process;
(j) Provide problem determination / problem source identification for the SIEM System, consisting of creating tickets & tracking progress of Open tickets
(k) Managing tickets to resolution / closure, in accordance with the processes as defined in the Integrated and Transition vendor announcements & manage SIEM System update alerts;
(l) Install application patches and software updates in order to improve performance, or enable additional functionality

Illustrative Training Requirements

Security Analyst Level 1 (L1):

1) SEC401: Security Essentials Bootcamp Style https://www.sans.org/event/cyber-defence-canberra-2018/course/security- essentials-bootcamp-style
2) SEC301: Introduction to Cyber Security https://www.sans.org/course/introduction -cyber-security

Security Analyst Level 2 (L2):

1) SEC542: Web App Penetration Testing and Ethical Hacking https://www.sans.org/event/cyber-defence-canberra-2018/course/web-app- penetration-testing-ethical-hacking
2) SEC566: Implementing and Auditing the Critical Security Controls - In-Depth https://www.sans.org/private-training/course/implementing-auditing-critical-security- controls
3) SEC575: Mobile Device Security and Ethical Hacking https://www.sans.org/private-training/course/mobile-device-security-ethical-hacking

Security Analyst Level 3 (L3):

1) SEC504: Hacker Tools, Techniques, Exploits, and Incident Handling https://www.sans.org/event/cyber-defence-canberra-2018/course/hacker- techniques-exploits-incident-handling

2) FOR508: Advanced Digital Forensics, Incident Response, and Threat Hunting https://www.sans.org/event/digital-forensics-summit-2018/course/advanced-incident- response-threat-hunting-training
3) SEC501: Advanced Security Essentials - Enterprise Defender https://www.sans.org/private-training/course/advanced-security-essentials- enterprise-defender
4) MGT414: SANS Training Program for CISSP® Certification https://www.sans.org/course/sans-plus-s-training-program-cissp-certification-exam

SOC Manager (L4):

1) Cyber Security Specialist http://www.leaderquestonline.com/it-career-training/cybersecurity-specialist/
2) Managing Security Operations: Detection, Response, and Intelligence https://www.sans.org/event/rocky-mountain-2018/course/managing-security- operations-detection-response-and-intelligence
3) SIEM with Tactical Analytics https://www.sans.org/private-training/course/siem-with-tactical-analytics
4) SEC511: Continuous Monitoring and Security Operations https://www.sans.org/course/continuous-monitoring-security-operations
5) SEC599: Defeating Advanced Adversaries - Implementing Kill Chain Defenses https://www.sans.org/course/defeating-advanced-adversaries-kill-chain-defenses

Annexure XV – Systems deemed to be based on AI and ML technology

Applications and Systems belonging but not limited to following categories or a combination of these:

1. Natural Language Processing ("NLP"), sentiment analysis or text mining systems that gather intelligence from unstructured data. – In this case, Voice to text, text to intelligence systems in any natural language will be considered in scope. Eg: robo chat bots, big data intelligence gathering systems.

2. Neural Networks or a modified form of it. –In this case, any systems that uses a number of nodes (physical or software simulated nodes) mimicking natural neural networks of any scale, so as to carry out learning from previous firing of the nodes will be considered in scope. Eg: Recurrent Neural Networks and Deep Learning Neural Networks

3. Machine learning through supervised, unsupervised learning or a combination of both. – In this case, any application or systems that carry out knowledge representation to form a knowledge base of domain, by learning and creating its outputs with real world input data and deciding future outputs based upon the knowledge base. Eg: System based on Decision tree, random forest, K mean, Markov decision process, Gradient boosting Algorithms.

4. A system that uses statistical heuristics method instead of procedural algorithms or the system / application applies clustering or categorization algorithms to categorize data without a predefined set of categories.

5. A system that uses a feedback mechanism to improve its parameters and bases it subsequent execution steps on these parameters.

6. A system that does knowledge representation and maintains a knowledge base.

Annexure XVI - Form to report on AI and ML technologies – to be submitted quarterly

S/N	Head	Value
1	Entity SEBI registration number	
2	Registered entity category	
3	Entity name	
4	Entity PAN no.	
5	Application / System name	
6	Date used from	
7	Type of area where AI or ML is used (order execution / Surveillance / compliance / others). In case of others, please specify.	
8	What is the name of the Tool / Technology that is categorized as AI and ML system / Application and submissions are declared vide this response	<free text field>
9	How was the AI or ML project implemented	<Internally / through solution provider / Jointly with a solution provider or third party>
10	Are the key controls and control points in your AI or ML application or systems in accordance with circular(s) of SEBI that mandate/s cyber security control requirements	<free text field>
11	Is the AI / ML system included in the system audit	<Yes / No>
12	Describe the application /system and how it uses AI / ML	<free text field>
13	What safeguards are in place to prevent abnormal behavior of the AI or ML application / System	<free text field>

ANNEXURE XVII

S.No	Parameter	Maturity Indicator Level (MIL)	No of Levels	Maximum Permissible Score
Domain : Governance of Critical Infrastructure and Personnel				
1	As part of the operational risk management framework to manage risk to systems, networks and databases from cyber-attacks and threats, MII should formulate a comprehensive cyber security and cyber resilience policy document encompassing the framework mentioned hereunder. The policy document should be approved by the Board, and in case of deviations from the suggested framework, reasons for such deviations should also be provided in the policy document. The policy document should be reviewed by the MII's Board at least annually with the view to strengthen and improve its cyber security and cyber resilience framework.	MIL 1: No cyber security policy document. MIL 2: Policy approved by the Board. No deviations from suggested framework or if deviations observed, reasons provided. MIL 3: Policy document reviewed by MIIs Board at least annually. MIL 4: Policy document includes security framework more stringent than SEBI guidelines/ policy document reviewed multiple times during the year.	4	3
2	The cyber security and cyber resilience policy should include the following process to identify, assess, and manage cyber security risk associated with processes, information, networks and systems. a. 'Identify' critical IT assets and risks associated with such assets, b. 'Protect' assets by deploying suitable controls, tools and measures, c. 'Detect' incidents, anomalies and attacks through appropriate monitoring tools / processes, d. 'Respond' by taking immediate steps after identification of the incident, anomaly or attack, e. 'Recover' from incident through incident management, disaster recovery and business continuity framework.	MIL 1: No cyber security policy document. MIL 2: Policy document includes ad-hoc process to identify, assess and manage cyber security risk. MIL 3: Policy document includes planned and documented process to identify, assess and manage cyber security risk.	3	2

S.No	Parameter	Maturity Indicator Level (MIL)	No of Levels	Maximum Permissible Score
3	The Cyber security policy should encompass the principles prescribed by National Critical Information Infrastructure Protection Centre (NCIIPC) of National Technical Research Organisation (NTRO), Government of India in the report titled 'Guidelines for Protection of National Critical Information Infrastructure' and subsequent revisions, if any, from time to time.	MIL 1: No cyber security policy document. MIL 2: Policy document includes principles prescribed by NCIIPC, NTRO and Government of India MIL 3: Policy document is being revised annually to include changes prescribed by NCIIPC, NTRO and Government of India. MIL 4: Policy document is being revised multiple times in a year to include changes prescribed by NCIIPC, NTRO and Government of India.	4	3
4	MII should also incorporate best practices from standards such as ISO 27001, ISO 27002, COBIT 5, etc., or their subsequent revisions, if any, from time to time.	MIL 1: No cyber security policy document. MIL 2: Policy document includes best practices from standards such as ISO 27001, ISO 27002, COBIT 5, etc. MIL 3: Policy document is being revised annually to include best practices from standards such as ISO 27001, ISO 27002, COBIT 5, etc. MIL 4: Policy document is being revised multiple times in a year to include best practices from standards such as ISO 27001, ISO 27002, COBIT 5, etc.	4	3

S.No	Parameter	Maturity Indicator Level (MIL)	No of Levels	Maximum Permissible Score
5	MII should designate a senior official as Chief Information Security Officer (CISO) whose function would be to assess, identify and reduce cyber security risks, respond to incidents, establish appropriate standards and controls, and direct the establishment and implementation of processes and procedures as per the cyber security and resilience policy approved by the Board of the MII.	MIL 1: No CISO appointed MIL 2: CISO appointed without well-defined functions. MIL 3: CISO appointed with well-defined functions as per the cyber security and resilience policy. MIL 4: The functions of CISO are reviewed periodically and modified accordingly.	4	3
6	The Oversight Standing Committee on Technology of the stock exchanges and of the clearing corporations and the IT Strategy Committee of the depositories should on a quarterly basis review the implementation of the cyber security and resilience policy approved by their Boards, and such review should include review of their current IT and cyber security and resilience capabilities, set goals for a target level of cyber resilience, and establish a plan to improve and strengthen cyber security and cyber resilience.	MIL 1: No review conducted. MIL 2: Review conducted with less frequency than advised. MIL 3: Review conducted quarterly and only shortcomings as pointed out addressed MIL 4: Committee reviewed quarterly and also provided inputs to improve the strengthen cyber security framework which have been carried out.	4	3
7	MII should establish a reporting procedure to facilitate communication of unusual activities and events to CISO or to the senior management in a timely manner.	MIL 1: No procedure established to facilitate communication of unusual activities and events to CISO or to the senior management in a timely manner. MIL 2: Procedure established to facilitate communication of unusual activities and events, but not till the level of CISO. MIL 3: Procedure established to facilitate communication of unusual activities and events	4	3

S.No	Parameter	Maturity Indicator Level (MIL)	No of Levels	Maximum Permissible Score
		to CISO or to the senior management in a timely manner. MIL 4: Procedure established to facilitate communication of unusual activities and events to MD/CEO and the Governing Board.		
8	The aforementioned committee and the senior management of the MII, including the CISO, should periodically review instances of cyber attacks, if any, domestically and globally, and take steps to strengthen cyber security and cyber resilience framework.	MIL 1: No review of cyber-attacks is conducted. MIL 2: Review of cyber-attacks is conducted, but no remedial action is taken. MIL 3: Periodic review of cyber-attacks is conducted and prompt remedial action is taken. MIL 4: Periodic review of cyber-attacks is conducted and remedial action is taken. Preventive steps to counter similar attacks is also undertaken.	4	3
9	MII should define responsibilities of its employees, outsourced staff, and employees of vendors, members or participants and other entities, who may have access or use systems / networks of MII, towards ensuring the goal of cyber security.	MIL 1: Responsibilities of personnel who may have access or use systems/ networks is not defined. MIL 2: Responsibilities of personnel who may have access or use systems/ networks is mentioned but not clearly defined. MIL 3: Responsibilities of personnel who may have access or use systems/ networks are clearly defined. MIL 4: Responsibilities of	4	3

S.No	Parameter	Maturity Indicator Level (MIL)	No of Levels	Maximum Permissible Score
		personnel who may have access or use systems/ networks are defined. The same are periodically reviewed and revised accordingly.		
Domain : Identification critical assets and risks				
10	MII should identify critical assets based on their sensitivity and criticality for business operations, services and data management. To this end, MII should maintain up-to-date inventory of its hardware and systems, software and information assets (internal and external), details of its network resources, connections to its network and data flows.	MIL 1: MII has not identified any critical assets and is not maintaining any inventory of its hardware, software and information assets. MIL 2: MII has identified critical assets however is not maintaining any inventory of its hardware, software and information assets. MIL 3: MII has identified critical assets and is maintaining a basic inventory of its hardware, software and information assets. MIL 4: MII has identified critical assets and is maintaining a basic inventory of its hardware, software and information assets and is reviewing the same at least half-yearly. MIL 5: MII has identified critical assets and is maintaining a basic inventory of its hardware, software and information assets and is reviewing the same at least half-yearly. (Including its	5	4

S.No	Parameter	Maturity Indicator Level (MIL)	No of Levels	Maximum Permissible Score
		shadow inventory.)		
11	MII should accordingly identify cyber risks (threats and vulnerabilities) that it may face, alongwith the likelihood of such threats and impact on the business and thereby, deploy controls commensurate to the criticality.	MIL 1: MII has not identified / categorized / envisaged cyber threats. MIL 2: MII has identified / maintained a Software / Hardware inventory but has not categorized / envisaged cyber threats. MIL 3: MII has identified / maintained a Software / Hardware inventory and has categorized / envisaged probable cyber threats prevalent to the sector. MIL 4: MII has identified / maintained a Software / Hardware inventory and has categorized / envisaged probable cyber threats based on its deployed architecture and network architecture.	4	3
12	MII should also encourage its third-party providers, such as service providers, stock brokers, depository participants, etc. to have similar standards of Information Security.	MIL 1: MII has an outsourcing policy that does not enlist such a clause for its third party vendors. MIL 2: MII has an outsourcing policy that does not enlist such a clause for its vendors.	2	1
Domain : Protection of Critical Assets and Infrastructure				
Sub-Domain : Access Controls				
13	No person by virtue of rank or position should have any intrinsic right to access confidential data, applications, system resources or facilities.	MIL 1: MII has no documented and approved data classification methodology. MIL 2: MII has a documented and approved data classification methodology, however (any one) the previous 3 System Audits have pointed out observations	3	2

S.No	Parameter	Maturity Indicator Level (MIL)	No of Levels	Maximum Permissible Score
		pertaining to access matrices or email ids/ login ids of ex-employees. MIL 3: MII has a documented and approved data classification methodology, and none of the previous 3 System Audits have pointed out observations pertaining to access matrices or email ids/ login ids of ex-employees.		
14	Any access to MII's systems, applications, networks, databases, etc., should be for a defined purpose and for a defined period. MII should grant access to IT systems, applications, databases and networks on a need-to-use basis and based on the principle of least privilege. Such access should be for the period when the access is required and should be authorized using strong authentication mechanisms.	MIL 1: MII has no documented and approved access control methodology for systems, applications, networks, databases of the MII. MIL 2: MII has a documented and approved access control methodology for systems, applications, networks, databases of the MII. However the System Audit / Comprehensive review has highlighted observations pertaining to the same. MIL 3: MII has a documented and approved access control methodology for systems, applications, networks, databases of the MII. and the System Audit / Comprehensive review has no observations pertaining to the same. MIL 4 : MII has a documented and approved access control methodology for systems, applications, networks,	4	3

S.No	Parameter	Maturity Indicator Level (MIL)	No of Levels	Maximum Permissible Score
		databases of the MII. and the System Audit / Comprehensive review has no observations pertaining to the same. The MII policy for the same has a defined timelines for review.		
15	MII should implement strong password controls for users' access to systems, applications, networks and databases. Password controls should include a change of password upon first log-on, minimum password length and history, password complexity as well as maximum validity period. The user credential data should be stored using strong and latest hashing algorithms.	MIL 1: MII has no documented and approved password policy encompassing the requirements of the clause. MIL 2: MII has a documented and approved password policy however the same does not completely encompass the requirements of the clause. MIL 3: MII has a documented password policy encompassing the requirements of the clause, however the same is not approved.	3	2
16	MII should ensure that records of user access are uniquely identified and logged for audit and review purposes. Such logs should be maintained and stored in encrypted form for a time period not less than two (2) years.	MIL 1: MII does not have an explicit (documented and approved) data retention and log management and rotation policy with relevant SOPs for the same. MIL 2: MII has an explicit (documented and approved) data retention and log management and rotation policy with relevant SOPs for the same. However the System Audit / Comprehensive review has highlighted observations pertaining to the same. MIL 3: MII has an explicit (documented and approved) data retention and log	3	2

S.No	Parameter	Maturity Indicator Level (MIL)	No of Levels	Maximum Permissible Score
		management and rotation policy with relevant SOPs for the same. And the System Audit / Comprehensive review has highlighted no observations pertaining to the same.		
17	MII should deploy additional controls and security measures to supervise staff with elevated system access entitlements (such as admin or privileged users). Such controls and measures should inter-alia include restricting the number of privileged users, periodic review of privileged users' activities, disallow privileged users from accessing systems logs in which their activities are being captured, strong controls over remote access by privileged users, etc.	MIL 1: The MII does not have Privilege Identity Management (PIM) solution deployed at both production systems (core Systems) as well as on non-production systems. MIL 2: The MII has a Privilege Identity Management (PIM) solution deployed at production systems (core Systems) but not on non-production systems. MIL 3: The MII has a Privilege Identity Management (PIM) solution deployed at production systems (core Systems) but not on non-production systems.	3	2
18	Account access lock policies after failure attempts should be implemented for all accounts.	MIL 1: MII does not have a documented and approved account lock out policy. MIL 2 :The MII has a documented and approved account lock-out policy , however the policy doesn't segregate between different types of resources based on risk , user type etc. MIL 3: The MII has a documented and approved account lock-out policy , and	4	3

S.No	Parameter	Maturity Indicator Level (MIL)	No of Levels	Maximum Permissible Score
		the policy segregates the different types of resources based on risk , user type etc, however the System Audit / Comprehensive review has highlighted observations pertaining to the same. MIL 4: The MII has a documented and approved account lock-out policy , and the policy segregates the different types of resources based on risk , user type etc, and the System Audit / Comprehensive review has no observations pertaining to the same.		
19	Employees and outsourced staff such as employees of vendors or service providers, who may be given authorised access to the MII's critical systems, networks and other computer resources, should be subject to stringent supervision, monitoring and access restrictions.	MIL 1: MII does not have an approved policy for privileged identity management (PIM) for own staff as well as staff of vendors. MIL 2: MII has an approved policy for privileged identity management (PIM) for own staff however the same does not encompass the staff of vendors. MIL 3: MII has an approved policy for privileged identity management (PIM) for own staff which also encompass the staff of vendors, however the System Audit / Comprehensive review has highlighted observations pertaining to the same. MIL 4: MII has an approved	4	3

S.No	Parameter	Maturity Indicator Level (MIL)	No of Levels	Maximum Permissible Score
		policy for privileged identity management (PIM) for own staff which also encompass the staff of vendors , and the System Audit / Comprehensive review has no observations pertaining to the same.		
20	Two-factor authentication at log-in should be implemented for all users that connect using online / internet facility.	MIL 1: MII has not implemented a 2FA at log-in for all users that connect using online / internet facility, neither the MII has put in multi-step authentication as a compensating mechanism. MIL 2: MII has not implemented a 2FA at log-in for all users that connect using online / internet facility, neither the MII has put in multi-step authentication as a compensating mechanism. However, the MII is in process of implementing 2FA and is currently in the transition phases. MIL 3: MII has implemented a 2FA log-in for all users that connect using online / internet facility. However, the System Audit / Comprehensive review has highlighted observations pertaining to the same. MIL 4: MII has implemented a 2FA log-in for all users that connect using online / internet facility and the System Audit / Comprehensive review has no observations pertaining to the same.	4	3

S.No	Parameter	Maturity Indicator Level (MIL)	No of Levels	Maximum Permissible Score
21	MII should formulate an Internet access policy to monitor and regulate the use of internet and internet based services such as social media sites, cloud-based internet storage sites, etc.	MIL 1: MII has not formulated an internet access policy based on the controls specified in the clause. MIL 2: MII has formulated an internet access policy, however the same does not elaborate on the use of social media sites and / or cloud based storage sites / clients. MIL 3: MII has formulated an internet access policy and the same specifically addresses the issue of use of social media sites and / or cloud based storage sites / clients, however the System Audit / Comprehensive review has highlighted observations pertaining to the same. MIL 4: MII has formulated an internet access policy and the same specifically addresses the issue of use of social media sites and / or cloud based storage sites / clients and the System Audit / Comprehensive review has no observations pertaining to the same. The MII has not reviewed the policy in the past year. MIL 5: MII has formulated an internet access policy and the same specifically addresses the issue of use of social media sites and / or cloud based storage sites / clients and the	5	4

S.No	Parameter	Maturity Indicator Level (MIL)	No of Levels	Maximum Permissible Score
		System Audit / Comprehensive review has no observations pertaining to the same. The MII has reviewed the policy in the past year.		
22	Proper 'end of life' mechanism should be adopted to deactivate access privileges of users who are leaving the organization or who access privileges have been withdrawn.	MIL 1: MII has no policy for 'end of life' mechanism for all users. MIL 2: MII has a documented and approved policy for 'end of life' mechanism for all users. MIL 3: MII has a documented and approved policy for 'end of life' mechanism for all users, based on a need-to-use basis and on the principle of least privilege.	3	2
Sub-Domain : Physical Security				
23	Physical access to the critical systems should be restricted to minimum. Physical access of outsourced staff / visitors should be properly supervised by ensuring at the minimum that outsourced staff / visitors are accompanied at all times by authorised employees.	MIL 1: Physical access to critical systems is not monitored. MIL 2: Physical access to critical systems is restricted to minimum, but outsourced staff / visitors are not accompanied at all times by authorised employees MIL 3: Physical access to critical systems is restricted to minimum, and outsourced staff / visitors are accompanied at all times by authorised employees	3	2
24	Physical access to the critical systems should be revoked immediately if the same is no longer required.	MIL 1: Physical access to critical systems is not revoked, even if it is no longer required. MIL 2: Physical access to	2	1

S.No	Parameter	Maturity Indicator Level (MIL)	No of Levels	Maximum Permissible Score
		critical systems is revoked immediately, when it is no longer required.		
25	MII should ensure that the perimeter of the critical equipment's room are physically secured and monitored by employing physical, human and procedural controls such as the use of security guards, CCTVs, card access systems, mantraps, bollards, etc. where appropriate.	MIL 1: Critical equipment's room is not physically secured. MIL 2: Critical equipment's room is physically secured. MIL 3: Critical equipment's room is physically secured, and is utilizing latest security systems which is being updated on continuous basis.	3	2
Sub-Domain : Network Security Management				
26	MII should establish baseline standards to facilitate consistent application of security configurations to operating systems, databases, network devices and enterprise mobile devices within the IT environment. The MII should conduct regular enforcement checks to ensure that the baseline standards are applied uniformly.	MIL 1: No baseline standard of security configurations is implemented. MIL 2: Baseline standard of security configurations is implemented. But no regular enforcement checks are being conducted. MIL 3: Baseline standard of security configurations is implemented and regular enforcement checks are being conducted. MIL 4: Baseline standard of security configurations is implemented and regular enforcement checks are being conducted. Further, security configurations are being reviewed regularly.	4	3

S.No	Parameter	Maturity Indicator Level (MIL)	No of Levels	Maximum Permissible Score
27	MII should install network security devices, such as firewalls as well as intrusion detection and prevention systems, to protect its IT infrastructure from security exposures originating from internal and external sources.	MIL 1: No firewalls and intrusion detection and prevention systems are installed. MIL 2: Firewalls and intrusion detection and prevention systems are installed. MIL 3: Firewalls and intrusion detection and prevention systems are installed. The same are patched and updated regularly.	3	2
28	Anti-virus software should be installed on servers and other computer systems. Updation of Anti-virus definition files and automatic anti-virus scanning should be done on a regular basis.	MIL 1: No anti-virus software installed on servers and other computer systems. MIL 2: Anti-virus software installed on servers and other computer systems, but is not updated on regular basis. MIL 3: Anti-virus software installed on servers and other computer systems. The same is being updated on regular basis.	3	2
Sub-Domain : Security of Data				
29	Data-in motion and Data-at-rest should be in encrypted form by using strong encryption methods such as Advanced Encryption Standard (AES), RSA, SHA-2, etc.	MIL 1: MII has not identified critical data / classified data and is not encrypting data-in-motion/rest. MIL 2: MII is encrypting data-in-motion/rest but has not identified critical data / classified data. MIL 3: MII is encrypting data-in-motion/rest using strong encryption methods and has	5	4

S.No	Parameter	Maturity Indicator Level (MIL)	No of Levels	Maximum Permissible Score
		identified critical data / classified data , however the System Audit / Comprehensive review has highlighted observations pertaining to the encryption of data-in-motion/rest. MIL 4: MII is encrypting data-in-motion/rest using strong encryption methods and has identified critical data / classified data, and the System Audit / Comprehensive review has no observation(s) pertaining to the encryption of data-in-motion/rest and/or classification/ identification of critical data. MIL 5: MII is encrypting data-in-motion/rest using strong encryption methods and has identified critical data / classified data , and the System Audit / Comprehensive review has no observation(s) pertaining to the encryption of data-in-motion/rest and/or classification/ identification of critical data. Additionally the MII either reviews the data classification methodology on an annual basis or the MII improves upon the encryption standards deployed periodically.		
30	MII should implement measures to prevent unauthorised access or copying or transmission of data / information held in contractual or fiduciary capacity. It should be ensured that confidentiality of	MIL 1: MII has not identified critical data / classified data and does not have an approved data leakage prevention policy.	4	3

S.No	Parameter	Maturity Indicator Level (MIL)	No of Levels	Maximum Permissible Score
	information is not compromised during the process of exchanging and transferring information with external parties.	MIL 2: MII has identified critical data / classified data however it does not have an approved data leakage prevention policy. MIL 3: MII has identified critical data / classified data and has an approved data leakage prevention policy however the System Audit / Comprehensive review has highlighted observations pertaining to leakage of data. MIL 4: MII has identified critical data / classified data and has an approved data leakage prevention policy and the System Audit / Comprehensive review has no observations pertaining to leakage of data.		
31	The information security policy should also cover use of devices such as mobile phone, faxes, photocopiers, scanners, etc. that can be used for capturing and transmission of data.	MIL 1: The MIIs information security policy does not address the usage of, security of and prevention of data leakage through, various devices that can be used for capturing and transmission of data. MIL 2: The MIIs information security policy addresses the usage of, security of and prevention of data leakage through, various devices that can be used for capturing and transmission of data however the System Audit / Comprehensive review has	3	2

S.No	Parameter	Maturity Indicator Level (MIL)	No of Levels	Maximum Permissible Score
		highlighted observations pertaining to the same. MIL 3: The MIIs information security policy addresses the usage of, security of and prevention of data leakage through, various devices that can be used for capturing and transmission of data and the System Audit / Comprehensive review has no observations pertaining to the same.		
32	MII should allow only authorized data storage devices through appropriate validation processes.	MIL 1: MII does not have an approved hardware & software inventory management policy. MIL 2: MII has an approved hardware & software inventory management policy however it has not maintained a software and hardware inventory. (not even at a rudimentary level). MIL 3: MII has an approved hardware & software inventory management policy and it has maintained a basic software and hardware inventory. However, the System Audit / Comprehensive review has highlighted observations pertaining to the storage of data on devices without following the approved process.	4	3

S.No	Parameter	Maturity Indicator Level (MIL)	No of Levels	Maximum Permissible Score
		MIL 4: MII has an approved hardware & software inventory management policy and it has maintained a basic software and hardware inventory and the System Audit / Comprehensive review has no observations pertaining to the storage of data on devices without following the approved process.		
Sub-Domain : Hardening of Hardware and Software				
33	Only a hardened and vetted hardware / software should be deployed by the MII. During the hardening process, MII should inter-alia ensure that default passwords are replaced with strong passwords and all unnecessary services are removed or disabled in equipment / software.	MIL 1: Hardening of hardware/ software utilized by MIIs is not being conducted. MIL 2: The hardware/ software utilized by MIIs is hardened and vetted. MIL 3: During the hardening process default passwords are replaced with strong passwords and all unnecessary services are removed or disabled. MIL 4: The hardening process is regularly reviewed to plug vulnerabilities in the system.	4	3
34	All open ports which are not in use or can potentially be used for exploitation of data should be blocked. Other open ports	MIL 1: Open ports not in use are not blocked.	4	3

S.No	Parameter	Maturity Indicator Level (MIL)	No of Levels	Maximum Permissible Score
	should be monitored and appropriate measures should be taken to secure the ports.	MIL 2: Open ports which are not in use or can potentially be used for exploitation of data are blocked. MIL 3: Open ports which are not in use or can potentially be used for exploitation of data are blocked. Other open ports are monitored and measures are taken to secure the same. MIL 4: Status of open ports are reviewed regularly to decide whether the port should be kept open or not.		
Sub-Domain : Application Security and Testing				
35	MII should ensure that regression testing is undertaken before new or modified system is implemented. The scope of tests should cover business logic, security controls and system performance under various stress-load scenarios and recovery conditions.	MIL 1: No regression testing is undertaken. MIL 2: Regression testing is undertaken, but the scope is not as per SEBI guidelines. MIL 3: Regression testing is undertaken and the scope of tests is as per SEBI guidelines.	3	2
Sub-Domain : Patch Management				
36	MII should establish and ensure that the patch management procedures include the identification, categorisation and prioritisation of security patches. An implementation timeframe for each category of security patches should be established to implement security patches in a timely manner.	MIL 1: No patch management procedures are established. MIL 2: Patch management procedures are established to include the identification, categorisation and prioritisation of security patches MIL 3: Patch management procedures and implementation timeframe for each category of security	4	3

S.No	Parameter	Maturity Indicator Level (MIL)	No of Levels	Maximum Permissible Score
		patches are established. MIL 4: Patch management procedure is periodically reviewed to ensure quick updation of patches.		
37	MII should perform rigorous testing of security patches before deployment into the production environment so as to ensure that the application of patches do not impact other systems.	MIL 1: No testing of security patches undertaken. MIL 2: Testing of security patches undertaken before deployment into the production environment so as to ensure that the application of patches do not impact other systems. MIL 3: Patch testing policy has been adopted so that untested patches are not deployed in production environment.	3	2
Sub-Domain : Disposal of Systems and Storage Devices				
38	MII should frame suitable policy for disposals of the storage media and systems. The data / information on such devices and systems should be removed by using methods viz. wiping / cleaning / overwrite, degauss and physical destruction, as applicable.	MIL 1: No policy for disposals of the storage media and systems. MIL 2: Policy for disposals of the storage media and systems is adopted and is being implemented at all times.	2	1
Sub-Domain : Vulnerability Assessment and Penetration Testing				

S.No	Parameter	Maturity Indicator Level (MIL)	No of Levels	Maximum Permissible Score
39	MII should regularly conduct vulnerability assessment to detect security vulnerabilities in the IT environment. MII should also carry out periodic penetration tests, at least once in a year, in order to conduct an in-depth evaluation of the security posture of the system through simulations of actual attacks on its systems and networks.	MIL 1: MII's information security policy doesn't encompass periodically conducting VA and PT. MIL 2: MII's information security policy encompasses periodically conducting VA and PT however the MII has not been conducting either VA or PT as per the approved policy. MIL 3: MII's information security policy encompasses periodically conducting VA and PT and the MII has been conducting VA and PT as per the approved policy, however the System Audit / Comprehensive review has highlighted observations pertaining to the open areas found during the VA/PT. MIL 4: MII's information security policy encompasses periodically conducting VA and PT and the MII has been conducting VA and PT as per the approved policy, however the System Audit / Comprehensive review has no observations pertaining to the open areas found during the VA/PT. (i.e. all vulnerabilities found in the VA/PT were addressed by the MII in a time-bound manner.) MIL 5: In addition to MIL 4, the MII also fine tunes its VA	5	4
40	Remedial actions should be immediately taken to address gaps that are identified during vulnerability assessment and penetration testing.			

S.No	Parameter	Maturity Indicator Level (MIL)	No of Levels	Maximum Permissible Score
		and or PT (based on learnings) and also periodically changes vendors.		
41	In addition, MII should perform vulnerability scanning and conduct penetration testing prior to the commissioning of a new system which offers internet accessibility and open network interfaces.	(For new systems built internally or owned by the MII / its subsidiary) MIL 1: MII's information security policy doesn't encompass periodically conducting VA and PT for new systems (including those which offer internet accessibility and open network interfaces). MIL 2: MII's information security policy encompasses periodically conducting VA and PT for new systems (including those which offer internet accessibility and open network interfaces), however the MII has not been conducting either VA or PT as per the approved policy. MIL 3: MII's information security policy encompasses periodically conducting VA and PT for new systems (including those which offer	5	4

S.No	Parameter	Maturity Indicator Level (MIL)	No of Levels	Maximum Permissible Score
		internet accessibility and open network interfaces) and the MII has been conducting VA and PT as per the approved policy, however the System Audit / Comprehensive review has highlighted observations pertaining to the open areas found during the VA/PT for new systems (including those which offer internet accessibility and open network interfaces). MIL 4: MII's information security policy encompasses periodically conducting VA and PT for new systems (including those which offer internet accessibility and open network interfaces) and the MII has been conducting VA and PT as per the approved policy, however the System Audit / Comprehensive review has no observations pertaining to the open areas found during the VA/PT. (i.e. all vulnerabilities found in the VA/PT were addressed by the MII in a time-bound manner.) for new systems (including those which offer internet accessibility and open network interfaces) MIL 5 : In addition to MIL 4, the MII also fine tunes its VA and or PT for new systems (including those which offer internet accessibility and open network interfaces)(based on learnings) and also periodically changes vendors.		

S.No	Parameter	Maturity Indicator Level (MIL)	No of Levels	Maximum Permissible Score
Domain : Monitoring of Critical Assets/Infrastructure and Detection of Intrusion/Unauthorized Access				
42	MII should establish appropriate security monitoring systems and processes to facilitate continuous monitoring of security events and timely detection of unauthorised or malicious activities, unauthorised changes, unauthorised access and unauthorised copying or transmission of data / information held in contractual or fiduciary capacity, by internal and external parties. The security logs of systems, applications and network devices should also be monitored for anomalies.	MIL 1: MII has not established a C-SOC. MIL 2: The MII has a C-SOC , share with other MIIs (subsidiaries etc) , however the C-SOC doesn't have separate consoles for each MII and the C-SOC does not differentiate between the traffic of different MIIs it caters to. MIL 3: The MII has a C-SOC, shared with other MIIs with separate consoles for each MII and the C-SOC differentiates between the traffic of different MIIs however the System Audit / Comprehensive review has highlighted observations pertaining to the C-SOC's monitoring ability or the evaluation of logs by the C-SOC. MIL 4: The MII has a C-SOC, shared with other MIIs with separate consoles for each MII and the C-SOC differentiates between the traffic of different MIIs and the System Audit / Comprehensive review has no observations pertaining to the C-SOC's monitoring ability or the evaluation of logs by the C-SOC. MIL 5: The MII has a C-SOC, shared with other MIIs with separate consoles for each MII and the C-SOC differentiates	5	4

S.No	Parameter	Maturity Indicator Level (MIL)	No of Levels	Maximum Permissible Score
		between the traffic of different MIIs and the System Audit / Comprehensive review has no observations pertaining to the C-SOC's monitoring ability or the evaluation of logs by the C-SOC. Additionally, the C-SOC also periodically updates its monitoring parameters and has demonstrated in pre-emptive warding-off attacks.		
43	Further, to ensure high resilience, high availability and timely detection of attacks on systems and networks, MII should implement suitable mechanism to monitor capacity utilization of its critical systems and networks.	MIL 1: The MII does not have a dedicated capacity utilization monitoring mechanism consisting of appropriate systems and dedicated in-house staff. MIL 2: The MII does has a capacity utilization monitoring mechanism consisting of appropriate systems however the same is outsourced. Additionally, not all critical systems are being monitored by the same. MIL 3: The MII does has a capacity utilization monitoring mechanism consisting of appropriate systems however the same is outsourced. All critical systems are being monitored by the same, however the thresholds set for alerts are too high to timely ward-off attacks / untoward incidents. MIL 4: The MII does has a capacity utilization monitoring mechanism consisting of appropriate systems however the same is outsourced. All critical systems are being	5	4

S.No	Parameter	Maturity Indicator Level (MIL)	No of Levels	Maximum Permissible Score
		monitored by the same, the thresholds set for alerts are appropriate to timely ward-off attacks / untoward incidents as per the System Auditor. MIL 5: The MII does has a capacity utilization monitoring mechanism consisting of appropriate systems however the same is outsourced. All critical systems are being monitored by the same, the thresholds set for alerts are appropriate to timely ward-off attacks / untoward incidents as per the System Auditor. Additionally the MII is also quarterly reviewing the threshold parameters and also monitors shadow systems deployed for new projects.		
44	Suitable alerts should be generated in the event of detection of unauthorized or abnormal system activities, transmission errors or unusual online transactions.	MIL 1: The MII does not have an alert generation system in place MIL 2 : The MII has a well-defined, robust system in place for generation of alerts MIL 3 : In addition to MIL 2, the MII has a dedicated team of experts which continuously monitor and refine the alert definitions and alert generation system	3	2
Domain : Response and Recovery				

S.No	Parameter	Maturity Indicator Level (MIL)	No of Levels	Maximum Permissible Score
45	Alerts generated from monitoring and detection systems should be suitably investigated, including impact and forensic analysis of such alerts, in order to determine activities that are to be performed to prevent expansion of such incident of cyber-attack or breach, mitigate its effect and eradicate the incident.	MIL 1: The MII does not have a SOP in place for segmenting the security alerts based on its internal criteria, investigating the security alerts, and thereafter mitigating the incidents which led to the alerts. MIL 2: The MII has a documented and approved SOP in place for segmenting the security alerts based on its internal criteria, investigating the security alerts, and thereafter mitigating the incidents which led to the alerts. MIL 3: The MII has demonstrated instances where it has been regularly monitoring the alerts, investigating relevant security alerts, and has also been taking corrective actions to avoid / mitigate instances which led to the alerts. MIL 4: The MII has demonstrated instances where it has been regularly monitoring the alerts, investigating relevant security alerts, and has also been taking corrective actions to avoid / mitigate instances which led to the alerts. The MII has also been updating its security policy based on dominant / high risk alerts received.	4	3

S.No	Parameter	Maturity Indicator Level (MIL)	No of Levels	Maximum Permissible Score
46	The response and recovery plan of the MII should aim at timely restoration of systems affected by incidents of cyber-attacks or breaches. The recovery plan should be in line with the Recovery Time Objective (RTO) and Recovery Point Objective (RPO) specified by SEBI.	MIL 1: The MII does not have an approved BCP/DR Policy independent for itself (in case of sharing of DR Sites with subsidiary companies who are also MIIs). The same may be a document pertaining to the parent MII. MIL 2: The MII has an approved BCP/DR Policy independent for its own MII (incase of sharing of DR Sites with subsidiary companies who are also MIIs). MIL 3: The MII has an approved BCP/DR Policy independent for its own MII (incase of sharing of DR Sites with subsidiary companies who are also MIIs) and has been conducting mock and live DR Drills as per frequency specified by SEBI, however the System Audit / Comprehensive review has highlighted observations pertaining to the BCP/DR Plan or the DR Site or controls pertaining to the same. The MII also conforms to the RTO and RPO requirements as relevant to it. MIL 4: The MII has an approved BCP/DR Policy independent for its own MII (incase of sharing of DR Sites with subsidiary companies who are also MIIs) and has been conducting mock and live	4	3

S.No	Parameter	Maturity Indicator Level (MIL)	No of Levels	Maximum Permissible Score
		DR Drills as per frequency specified by SEBI, and the System Audit / Comprehensive review has no observations pertaining to the BCP/DR Plan or the DR Site or controls pertaining to the same. The MII also conforms to the RTO and RPO requirements as relevant to it.		
47	The response plan should define responsibilities and actions to be performed by its employees and support / outsourced staff in the event of cyber-attacks or breach of cyber security mechanism.	MIL 1: The MII does not have an approved BCP/DR Policy independent for itself (in case of sharing of DR Sites with subsidiary companies who are also MIIs). The same may be a document pertaining to the parent MII. MIL 2: The MII has an approved BCP/DR Policy independent for its own MII (incase of sharing of DR Sites with subsidiary companies who are also MIIs). However the same does not enunciate the responsibilities and actions to be performed by its employees and support / outsourced staff in the event of cyber-attacks or breach of cyber security mechanism. MIL 3: The MII has an approved BCP/DR Policy independent for its own MII (incase of sharing of DR Sites with subsidiary companies who are also MIIs). The same enunciates the responsibilities and actions to be performed by	3	2

S.No	Parameter	Maturity Indicator Level (MIL)	No of Levels	Maximum Permissible Score
		its employees in the event of cyber-attacks or breach of cyber security mechanism. However the policy does not lay down responsibilities and action for support / outsourced staff, as may be applicable.		
48	Any incident of loss or destruction of data or systems should be thoroughly analyzed and lessons learned from such incidents should be incorporated to strengthen the security mechanism and improve recovery planning and processes.	MIL 1: The MII does not have a documented and approved policy for analyzing the incidents pertaining to system glitches, cyber incidents. MIL 2: The MII has a documented and approved policy for analyzing the incidents pertaining to system glitches, cyber incidents, which also outlines the mechanism to place the RCA before the respective technology / Cyber security committees of the MII and thereafter the Board of the MII. MIL 3: The MII has been incorporating the learnings from the incidents occurred. The MII has also been timely been incorporating security control(s) measures. MIL 4: The MII has been incorporating the learnings from the incidents occurred. The MII has also been timely been incorporating security control(s) measures. The MII has also fine-tuned its recovery planning process based on such learnings.	4	3

S.No	Parameter	Maturity Indicator Level (MIL)	No of Levels	Maximum Permissible Score
49	MII should also conduct suitable periodic drills to test the adequacy and effectiveness of response and recovery plan.	MIL 1: The MII does not conduct the minimum number of mock and live drills from its DR site as specified by SEBI. MIL 2: The MII conducts the minimum number of mock and live drills from its DR site as specified by SEBI. However the scenarios developed do not include Cyber Attacks/ events. MIL 3: The MII conducts the minimum number of mock and live drills from its DR site as specified by SEBI. And the scenarios developed include Cyber Attacks/ events. MIL 4: The MII conducts the minimum number of mock and live drills from its DR site as specified by SEBI. And the scenarios developed include Cyber Attacks/ events. Additionally, the MII also conducts dedicated Cyber Drills , which may be in co-ordination with relevant agencies and its subsidiary companies who may be MIIs.	4	3
Domain : Sharing of Information				
50	Quarterly reports containing information on cyber attacks and threats experienced by MII and measures taken to mitigate vulnerabilities, threats and attacks including information on bugs / vulnerabilities / threats that may be useful for other MIIs, should be submitted to SEBI.	MIL 1: Quarterly reports are not being submitted. MIL 2: Quarterly reports on cyber attacks and counter measures taken are submitted to SEBI.	2	1
51	Such details as are felt useful for sharing with other MIIs in masked and anonymous	NA	NA	NA

S.No	Parameter	Maturity Indicator Level (MIL)	No of Levels	Maximum Permissible Score
	manner shall be shared using mechanism to be specified by SEBI from time to time.			
Domain : Training				
52	MII should conduct periodic training programs to enhance awareness level among the employees and outsourced staff, vendors, etc. on IT / Cyber security policy and standards. Special focus should be given to build awareness levels and skills of staff from non-technical disciplines.	MIL 1: No training programs are being conducted. MIL 2: Training programs are conducted but not periodically/or not all employees are involved. MIL 3: Periodic training programs are conducted for all the employees MIL 4: Periodic training programs are conducted for all the employees with special focus given to building awareness levels and skills of staff from non-technical disciplines	4	3
53	The training program should be reviewed and updated to ensure that the contents of the program remain current and relevant.	MIL 1: Training program not reviewed. MIL 2: Training program reviewed and updated periodically.	2	1
Domain : Periodic Audit				
54	The Terms of Reference for the System Audit of MII specified vide circular CIR/MRD/DMS/13/2011 dated November 29, 2011 shall be accordingly modified to include audit of implementation of the aforementioned areas.	MIL 1: Terms of Reference for the System Audit have not been modified. MIL 2: Terms of Reference for the System Audit have been modified to include areas mentioned in SEBI Cyber security circular dated July 06, 2015.	2	1

ANNEXURE XVIII

Calculation Methodology for Cyber Capability Index

Sr No	Domain	Sub-Domain	Total Parameters*	Parameters used for scoring in the Index	Maximum Permissible Score (A)	Minimum Cut-Off Score (B)	Weight in the Index (C)	Index on min score (D)	Index on max score (E)	Sample score (F)	Index on sample score (G)
1	Governance of Critical Infrastructure and Personnel	NA	9	9	26	9	11.0%	3.81	11.00	25.00	10.58
2	Identification of critical assets and risks	NA	3	3	8	3	10.0%	3.75	10.00	7.00	8.75
3	Protection of Critical Assets and Infrastructure	Access Controls	10	10	26	10	5.0%	1.92	5.00	25.00	4.81
		Physical Security	3	3	5	3	4.0%	2.40	4.00	4.00	3.20
		Network Security Management	3	3	7	3	4.0%	1.71	4.00	6.00	3.43
		Security of Data	4	4	12	4	4.0%	1.33	4.00	11.00	3.67
		Hardening of Hardware and Software	2	2	6	2	3.0%	1.00	3.00	5.00	2.50
		Application Security and Testing	1	1	2	1	3.0%	1.50	3.00	1.00	1.50
		Patch Management	2	2	5	2	3.0%	1.20	3.00	4.00	2.40
		Disposal of Systems and Storage Devices	1	1	1	1	3.0%	3.00	3.00	1.00	3.00
		Vulnerability Assessment and Penetration Testing	3	3	8	3	4.0%	1.50	4.00	7.00	3.50
4	Monitoring of Critical Assets/ Infrastructure and Detection of Intrusion/ Unauthorized Access	NA	3	3	10	3	11.0%	3.30	11.00	9.00	9.90
5	Response and Recovery	NA	5	5	14	5	10.0%	3.57	10.00	13.00	9.29

6	Sharing of Information	NA	2	1	1	1	5.0%	5.00	5.00	1.00	5.00
7	Training	NA	2	2	4	2	10.0%	5.00	10.00	3.00	7.50
8	Periodic Audit	NA	1	1	1	1	10.0%	10.00	10.00	1.00	10.00
	Total		**54**	**53**	**136**	**53**	**100.00 %**	**50.00**	**100.00**	**123.00**	**89.02**

Annexure XIX - Draft Cyber audit format

1. Background

2. Details of Auditee

3. Audit Team Member Details

Auditor name	
Auditor address	
Contact information	
Location of audit	
Audit team members and details of qualifications	

4. Scope of audit/Terms of reference (as agreed between the auditee and auditor), including the standard/specific scope for audit:

   a) Audit Period –

   b) Date of agreement between MII and auditor

   c) Engagement period-

   d) List of SEBI Circulars and Advisories covered:

   ---

   e) List of all IT infrastructure (including IT systems of PDC, DR, Near site, Co-lo facility) covered under audit

   ---

   f) Geographical locations covered under audit (PDC/DR/near site)

   g) VAPT (Vulnerability assessment and penetration testing)

   h) Any other specific item(s)

5. Methodology /Audit approach (audit subject identification, pre-audit planning, data gathering methodology, sampling methodology etc. followed)

6. Executive Summary of findings (including identification tests, tools used and results of tests performed)

S.No	Number of Non-conformity	Number of observations	Risk rating			Any other comments
			High	Medium	Low	
1						

7. Control-wise Compliance status of various SEBI Circulars /advisories

S.No	Control prescribed	*List of documentary evidence including physical inspection/sample size taken	Compliance status
1			
2			
…			
N			

*Explicit reference to the key auditee organisational documents (by date or version) including policy and procedure documents

8. Details of findings (including analysis of vulnerabilities/issues of concern and recommendation for action)

Description of finding (a)	
Name of system belongs to MII or third party vendor (b)	
Status/nature of findings (c)	
Risk rating of finding by auditor (d)	
C/I/A effected (e)	
Clause No. of SEBI Cyber security circular/advisory violated (f)	
Test cases used (g)	
Impact analysis (h)	
Root Cause analysis (i)	
Corrective Action proposed by auditor (j)	

Deadline for corrective action (k)	
Management response (l)	
Whether Similar Issue was observed in any of previous 3 audit (m)	
List of Documentary evidence verified during review/audit (n)	

a) Description of findings/observations – Description of the findings in sufficient details, referencing any accompanying evidence
b) Name of system belongs to MII or vendor-(Self Explanatory term)
c) Status/ Nature of Findings – The category can be specified, for example:

   a. Non-compliant (Major/Minor)
   b. Work in progress
   c. Observation

d) Risk Rating of finding - A rating has to be given for each of the observations based on its impact and severity to reflect the risk exposure as well as the suggested priority for action

Rating	**Description**
HIGH	Represents weakness in control with respect to threat(s) that is /are sufficiently capable and impacts asset (s) leading to regulatory non-compliance, significant financial, operational and reputational loss. These observations need to be addressed with utmost priority.
MEDIUM	Represents weakness in control with respect to threat(s) that is /are sufficiently capable and impacts asset (s) leading to exposure in terms of financial, operational and reputational loss. These observations need to be addressed reasonable timeframe.
LOW	Represents weaknesses in control, which in combination with other weakness can develop into an exposure. Suggested improvements for situations not immediately/directly affecting controls. .

e) C/I/A-Principle of Confidentiality/integrity/availability affected due to issued left unaddressed.
f) Clause No. of SEBI Cyber security circular/advisory violated-The clause corresponding to this observation w.r.t to SEBI circular on Cyber security/advisories issued by SEBI.
g) Test cases used –The details of test cases used for arriving at this observation, provide annexure numbers in case of detailed test cases.
h) Impact Analysis – An analysis of the likely impact on the operations/ activity of the organization

i) Root Cause analysis – A detailed analysis on the cause of the non-conformity.
j) Corrective Action proposed by auditor – The action taken to correct the non-conformity
k) Deadline for corrective action-The auditor should specify the deadline not only for the corrective action on the system where NC/observation was found, but also specify the deadline for corrective action on systems where similar observations could have been found/are found
l) Management response
m)Whether Similar Issue was observed in any of previous 3 audits
n) List of Documentary evidence verified during review/audit

9. Specific best practices implemented by the auditee in generalized manner without infringing on Intellectual Property Rights (IPRs)

10. Any other comments by auditor

11. Conclusion of cyber audit

Annexure XX - Minimum baseline standards for conducting VAPT

Comprehensive Scope for Vulnerability Assessment and Penetration Testing ("VAPT")

1. **Critical Asset definition:** Set-A entities shall identify and classify their critical IT systems. The systems that should essentially to be included in critical systems (not limited to):
   1.1. Any system that will have adverse impact on any kind of service of MIIs if compromised
   1.2. Stores/transmits any type of critical data (trading data, PII etc.)
   1.3. Devices/Network through which any critical systems connected (either physically or virtually)
   1.4. Systems directly/indirectly connected to any other critical systems
2. The scope of the IT environment taken for VAPT should be made transparent to SEBI and should include all critical assets and infrastructure components (not limited to) like Networking systems, Security devices, Servers, Databases, Applications, Systems accessible through WAN, LAN as well as public IPs, websites etc.

   The scope should include (not limited to):

VA of Infrastructure-Internal & External
VA of Applications-Internal & External
External Penetration Testing-Infrastructure & Application
Internal Penetration Testing-Infrastructure & Application
WiFi Testing
Network Segmentation
VA & PT of Mobile Applications
OS & DB Assessment
VAPT of Cloud implementation and deployments

3. **Testing methodology:** The VAPT should provide in-depth evaluation of the security posture of the system through simulations of actual attacks on its systems and networks. The testing methodology should adapt from the following:

   3.1. SEBI Circular on Cyber Security and Cyber Resilience Framework

   3.2. National Critical Information Infrastructure Protection Centre ("NCIIPC")

   3.3. CERT-In Guidelines

   3.4. The National Institute of Standards and Technology ("NIST") Special Publication 800115

   3.5. Latest ISO27001

   3.6. PCI-DSS standards

   3.7. Open Source Security Testing Methodology Manual ("OSSTMM")

   3.8. OWASP Testing Guide