

**DRAFT MAHARASHTRA ELECTRICITY REGULATORY COMMISSION
(STATE GRID CODE) REGULATIONS 2020**

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**DRAFT MAHARASHTRA ELECTRICITY REGULATORY COMMISSION
(STATE GRID CODE) REGULATIONS, 2020**

_____ **March,2020**

ELECTRICITY ACT, 2003

No. MERC/Legal/_____ In exercise of the powers conferred by clause (zp) of sub-section (2) of Section 181 read along with Section 86 (1) (h) of the Electricity Act, 2003 (36 of 2003), the Maharashtra Electricity Regulatory Commission (MERC) hereby makes the following Regulations, namely:

Preamble

Section 86(1)(h) of the Electricity Act (EA), 2003 requires the State Electricity Regulatory Commission to specify State Electricity Grid Code, in consistent with the Grid Code specified by Central Electricity Regulatory Commission (CERC) under Section 79(1) of the Electricity Act, 2003.

The Maharashtra Electricity Grid Code (MEGC) aims to lay down the rules, guidelines and standards to be followed by State Entities and Users, of Intra-State Transmission System (InSTS) to plan, develop, operate and maintain InSTS as an integrated part of Western Region Grid System and National Grid, in the most efficient, reliable and economic manner, while facilitating a healthy competition in the generation and supply of electricity.

These Regulations shall be known as Maharashtra Electricity Grid Code (MEGC) and shall contain the following parts, namely:

Part A: General – This part largely deals with the scope and application of these Regulations and with Grid Coordination Committee and related Committees formed for implementation of MEGC;

Part B: Planning Code – This Code specifies the principles, procedures and criteria to be used in the planning and development of InSTS;

Part C: Connection Code – This Code specifies the minimum technical and design criteria that shall be complied by Transmission Licensee and User connected to or seeking connection with the InSTS;

Part D: Operating Code – This Code describes the conditions under which the State Load Despatch Centre (SLDC) shall operate the InSTS and under which Users shall operate their facilities, insofar as necessary to maintain the security and quality of supply and safe operation of the InSTS under both normal and abnormal operating conditions;

Part E: Scheduling and Despatch Code – This Code deals with the provisions related to Scheduling and Despatch and Load Generation balance of State Entities during the day ahead and Intra-Day Operation in the State of Maharashtra;

Part F: Communication Code – This Code deals with the provisions related to the communication requirements of Users connected with the InSTS. It also sets out the User’s roles and responsibilities in communicating the information, communication boundary, testing and auditing of communication equipment, fault reporting and communication system availability.

Part G: Protection Code – This Code deals with the provisions related to protection requirements to safeguard the InSTS and User’s systems from faults or any other grid disturbance.

Part H: Metering Code – Metering Code specifies the Metering Arrangement for Interface Meters to be provided at Interface Locations at G<>T, T<>D, Inter-State Transmission System (ISTS) <>InSTS, InSTS<>Extra High Voltage (EHV), RE <>InSTS. It also sets out the requirement and procedures for metering in the InSTS.

Part I: Miscellaneous – This part deals with miscellaneous aspects such as data sharing, compliance with the SGC, the power to amend, the power to remove difficulties and dispute resolution etc. and other miscellaneous provisions.

1. Short Title, Extent and Commencement

- 1.1. These Regulations may be called the Maharashtra Electricity Regulatory Commission (State Grid Code) Regulations, 2020 (hereinafter referred to as MEGC, 2020).
- 1.2. These Regulations shall extend to the whole of the State of Maharashtra.
- 1.3. These Regulations shall come into force from the date of its publication in the Official Gazette and remain in force unless amended, varied, altered or modified by the Commission.
- 1.4. These Regulations shall repeal and supersede the Maharashtra Electricity Regulatory Commission (State Grid Code) Regulations, 2006 (hereinafter referred to as MEGC, 2006)

Provided that notwithstanding such repeal, anything done or any actions taken in pursuance of the procedures, codes, practice directions or provisions of MEGC 2006 shall be purported to have been undertaken as per provisions under MEGC 2020 to the extent such actions are not inconsistent or contrary to the provisions of the MEGC 2020.

Provided further that in the absence of any provision or any condition not specified under MEGC 2020 but if covered under IEGC, such provisions of IEGC as amended from time to time shall be applicable.

2. Definitions

- 2.1. In these Regulations, unless the context otherwise requires:
 - a) “**Act**” means the EA 2003 (36 of 2003) as amended from time to time;
 - b) “**Active Power**” means the product of voltage and the in-phase component of alternating current measured in units of watts and standard multiples thereof, i.e., 1,000 Watts = 1 kW; 1,000 kW = 1 MW; 1,000 MW = 1 GW; 1,000 GW = 1 TW;
 - c) “**Area Load Despatch Centre (ALDC)**” means a load despatch centre(s) established by Maharashtra State Load Despatch Centre (MSLDC) or STU or Transmission Licensee for load despatch and control in a particular area of the State which reports to SLDC;
 - d) “**Automatic Generation Control (AGC)**” means a mechanism that automatically adjusts the generation of a control area to maintain its Interchange Schedule Plus its share of frequency response;
 - e) “**Automatic Voltage Regulator (AVR)**” means continuously acting automatic excitation control system to control the voltage of a Generating Unit as measured at the generator terminals;
 - f) “**Available Transfer Capability (ATC)**” means the transfer capability of the inter-control area transmission system available for scheduling commercial transactions (through LTOA, MTOA and STO) in a specific direction, considering the network

security. Mathematically, ATC is the Total Transfer Capability less Transmission Reliability Margin;

- g) **“Bilateral Transaction”** means a transaction for exchange of energy (megawatt-hour [MWh]) between a specified buyer and a specified seller, directly or through a trading licensee or discovered at power exchange through anonymous bidding, from a specified point of injection to a specified point of drawal for a fixed or varying quantum of power (MW) for any time period during a month;
- h) **“Black Start Procedure”** means the procedure necessary to recover the grid from partial or total blackout in the State;
- i) **“Bulk Consumer”** refers to any consumer who avails supply at a voltage of 33 kV and above;
- j) **“Capacity Factor”**, in case of wind/solar generation, means maximum generation available at an aggregation point to the algebraic sum of capacity of each individual wind machine/solar panel connected to that point on grid;
- k) **“CEA/Authority”** means the Central Electricity Authority (CEA) as specified in the EA,2003;
- l) **“Central Generating Station”** means generating station of the companies owned or controlled by Central Government;
- m) **“Collective Transaction”** means a set of transactions discovered in Power Exchange through anonymous, simultaneous competitive bidding by buyers and sellers;
- n) **“Commission”** means the Maharashtra Electricity Regulatory Commission;
- o) **“Connectivity”** means the state of getting connected to the InSTS by a generating station, including captive generating plant a User or an Intra-State Transmission Licensee;
- p) **“Congestion”** means a situation where the demand for transmission capacity exceeds the Available Transfer Capability;
- q) **“Connection Agreement”** means an Agreement between State Transmission Utility (STU)/Intra-State Transmission Licensee other than STU and any person including Transmission System User (TSU) setting out the terms relating to connection to and/or use of the InSTS;
- r) **“Connection Point”** means a point at which a plant and/or apparatus connects to the Transmission/Distribution System;
- s) **“Data Acquisition System (DAS)”** means a system provided to record the sequence of operation in time, of the relays/equipment as well as the measurement of pre-selected system parameters;
- t) **“Demand”** means the demand of Power in MVA, Active Power in MW and Reactive Power in MVA_r of electricity unless otherwise stated;

- u) **“Disturbance Recorder (DR)”** means a device provided to record the behaviour of the pre-selected digital and/or analog values of the system parameters during an event;
- v) **“df/dt Relay”** means a relay which operates when the rate of change of system frequency (over time) goes higher than a specified limit and initiates load curtailment;
- w) **“Despatch Schedule”** means ex-power plant net MW and MWh output of a generating station, scheduled to be exported to the Grid from time to time;
- x) **“Event”** means an unscheduled or unplanned occurrence on a Grid including faults, incidents and breakdowns;
- y) **“Event Logging Facilities”** means a device provided to record the chronological sequence of operations of the relays and other equipment;
- z) **“Ex-Power Plant”** means net MW/MWh output of a generating station, after deducting auxiliary consumption and transformation losses.
- aa) **“Extra High Tension (EHT)”** means all voltages above 33 kilovolt (kV);
- bb) **“Fault Locator”** means a device provided at the end of a transmission line to measure/indicate the distance at which fault may have occurred;
- cc) **“Flexible Alternating Current Transmission (FACT)”** means a power electronics based system and other static equipment that provide control of one or more AC transmission system parameters to enhance controllability and increase in power transfer capability;
- dd) **“Force Majeure”** means any event which is beyond the control of the persons involved which they could not foresee or with a reasonable amount of diligence which could not be foreseen or which could not be prevented, and which substantially affect the performance by either person such as but not limited to: -
 - i) Acts of God, natural phenomena, including but not limited to floods, droughts, earthquakes and epidemics;
 - ii) Acts of any Government domestic or foreign, including but not limited to the war declared or undeclared, hostilities, priorities, quarantines, embargoes;
 - iii) Riot or Civil Commotion;
 - iv) Grid’s failure not attributable to persons involved;
- ee) **“Forced Outage”** means an outage of a generating unit or a transmission facility due to fault or other reasons which are unplanned;
- ff) **“Governor Droop”** means in relation to the operation of the governor of a generating unit, the percentage drop in system frequency which would cause the Generating Unit under restricted /free governor action to change its output from zero to full load;

- gg) **“High Tension (HT)”** means all voltages above and including 650 Volt and up to and including 33 kiloVolt;
- hh) **“Independent Power Producer (IPP)”** means a generating company not owned/controlled by the Central/State Government;
- ii) **“InSTS”** means any system for the conveyance of electricity by transmission lines within the area of the State and includes all transmission lines, sub-stations and associated equipment of Transmission Licensees (other than the Central Transmission Utility) in the State:

Provided that the definition of point of separation between a transmission system and distribution system and between a generating station and transmission system shall be guided by the provision of Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006 or any other Regulations of the Authority under Section 73 of the EA,2003 as amended from time to time;

- jj) **“Low Tension” (LT)”** means all voltages other than those defined as “high” or “extra high” voltage under Regulations specified by Authority and corresponding voltage classifications as may be specified in accordance with clause (c) of sub-section (2) of Section 185 of the Act or as specified by the Authority;
- kk) **“Maximum Continuous Rating (MCR)”** means the maximum continuous output in MW at generator terminal guaranteed by the manufacturer at rated parameters;
- ll) **“MoD Principles”** means the principles for the operation of Merit Order Despatch (MoD) and amendments thereof, as specified by the Commission in the State Grid Code and Deviation Settlement Mechanism Regulations and as amended from time to time;
- mm) **“Operation”** means a scheduled or planned action relating to the operation of a system;
- nn) **“Qualified Coordinating Agency (QCA)”** means the agency appointed by the Wind or Solar Energy Generators connected to a Pooling Sub-Station, or by an individual Generator connected directly to a Sub-Station, to perform the functions and discharge the obligations specified in the MERC (Forecasting, Scheduling and Deviation Settlement for Solar and Wind Generation) Regulations, 2018;
- oo) **“Spinning Reserve”** means the Capacities which are provided by the devices including generating station or units thereof synchronized to the grid and which can be activated on the direction of the System Operator and effect the change in active power;
- pp) **“State Generating Stations”** means the generating stations of state owned generation company, i.e., Maharashtra State Power Generation Company Limited.
- qq) **“State Grid”** means synchronous grid inter-connecting generators, load centres and intra-state transmission lines in the State.

- rr) **“State Entity”** means such person who is in the SLDC control area and whose metering and energy accounting is done at the state level;
- ss) **“Static VAR Compensator (SVR)”** means an electrical facility designed for the purpose of generating or absorbing Reactive Power;
- tt) **“Sub-Load Despatch Centre”** means the offices and associated facilities of SLDC set up at Ambazari (Eastern Maharashtra) for monitoring and control of the State Grid and includes any such offices and associated facilities set-up by SLDC in future;
- uu) **“Total Transfer Capability (TTC)”** means the amount of electric power that can be transferred reliably by the InSTS under a given set of operating conditions;
- vv) **“Transmission Reliability Margin (TRM)”** means the amount of margin kept in the total transfer capability necessary to ensure that the interconnected transmission network is secure under a reasonable range of uncertainties in the system conditions;
- ww) **“Under Frequency Relay”** means a relay which operates when the system frequency falls below a specified limit and initiates load curtailment;
- xx) **“User” or “InSTS User”** means a person such as In-State Generating Stations (InSGS) including, Captive Generating Plant or Transmission Licensee (other than the CTU and STU), or Distribution Licensee or Consumers connected to the InSTS;

Save as aforesaid and unless repugnant words and expressions used in these Regulations and not defined, but defined in the Act, or the CERC (Indian Electricity Grid Code) Regulations or Regulations of the Central Electricity Authority or any other Regulations of this Commission shall have the meaning assigned to them respectively in the Act or IEGC or any other regulations as the case may be. In case of any inconsistency between provisions of IEGC and the State Grid Code, the provisions of IEGC shall prevail to the extent the same can be applied in the State.

PART A: GENERAL

3. Objective

3.1. The MEGC brings together a single set of technical and commercial rules, encompassing all the Utilities connected to/or using InSTS and governs the relationship between various Users of InSTS, SLDC, as well as Regional Load Despatch Centre (RLDC). The objectives of these Regulations are:

- a) Documentation of principles and procedures which define the relationship between various Users of InSTS, ISTS, SLDC as well as RLDC and NLDC to promote coordination amongst all Users, STU/SLDC and CTU/RLDC, NLDC, RPC and CEA in any proposed development of the InSTS.
- b) Facilitation of optimal operation of the grid, facilitation of coordinated and optimal maintenance planning of generation and transmission facilities in the grid and facilitation of development and planning of economic and reliable State Grid.
- c) By specifying optimum design and operational criteria to assist Users in their requirement to comply with License obligations and hence ensure that a system of acceptable quality is maintained.
- d) To manage a coordinated generation and transmission outage programme for the State/Regional grid, considering all the available resources and considering transmission constraints, as well as, irrigation requirements. To minimize surplus or deficits, if any, to operate the system within Security limits.
- e) To set out and define the various procedures/mechanisms in line with MERC DSM Regulations, 2019 and provisions of these regulations such as Declared Capacity (DC) Demonstration, Commercial Operation Date (COD) declaration procedure, Reactive Power Pricing Mechanism and implementation of revised technical minimum.
- f) To improve cooperation by providing a mechanism for clear and consistent disclosure of all information and establishment of the strong communication mechanism between STU, SLDC, Transmission Licensees and InSTS Users.
- g) To facilitate large-scale grid integration of solar and wind generating stations while maintaining the grid stability and security envisaged under the SGC through estimating, scheduling and deviation settlement solar and wind generators.
- h) To set out a mechanism for accounting and settlement of Reactive Energy Charges in the State in line with the MERC MYT Regulations and IEGC,2010 as amended from time to time.

4. Scope of Regulation and Extent of Application

4.1. These Regulations shall apply to —

- a) All generators in the state connected to InSTS
- b) Transmission licensee in the State including STU;
- c) Maharashtra SLDC;
- d) Distribution Licensees including Deemed Distribution Licensees, Indian Railways;
- e) Open access consumers, EHV consumers connected to InSTS.

Provided that the Commission may issue directions relieving any Transmission Licensee or User, either suo-motu or based on an application submitted by such Transmission Licensee or User, of their obligations to implement or comply with the SGC to the extent as may be stipulated in the directions.

4.2. Transmission Licensee, forming part of the InSTS, and User, having a connection(s) to InSTS, as on date of notification of these Regulations shall be given a maximum period of one year to comply with the following requirements under these Regulations:

- a) Installation and Operation of meters in accordance with CEA Metering Code and Metering Code;
- b) Entering into a connection agreement in accordance with Regulation 21;
- c) Providing for protection systems in accordance with Regulation 23.3;
- d) Providing for communication facilities in accordance with Regulation 24;
- e) Providing for system recording instruments in accordance with Regulation 25;
- f) Provision of Free Governor Mode of Operation of generators in accordance with Regulation 29.11.

4.3. All Users who are connected to and/or use the InSTS shall comply with the provision of SGC.

5. Grid Coordination Committee (GCC)

5.1. A GCC shall be re-constituted by STU within 60 days from the date of notification of these Regulations.

5.2. GCC shall be the apex body for implementation of MEGC under these Regulations and constitute functional committees as specified in these Regulations to coordinate various activities specified in these Regulations.

5.3. GCC shall be responsible for the following matters, namely —

- a) Facilitating the implementation of these Regulations and procedures developed under these Regulations;
- b) Assessing and recommending remedial measures for issues that arise during the implementation of these Regulations and procedures developed under these Regulations;

Provided that, the GCC may formulate suitable procedures, code of operation, manual and guidelines or revise such procedures/guidelines/manuals/code under these Regulations by undertaking stakeholder consultation and shall submit the same to Commission.

- c) Review of the MEGC, in accordance with the provisions of these Regulations and propose amendments required if any to the Commission;
- d) Other matters as may be directed by the Commission from time to time.

5.4. The GCC shall comprise of the following members:

- a) Director, State Transmission Utility (STU) - Chairperson of GCC;
- b) Executive Director/Chief Engineer, SLDC - Member;
- c) Representative of STU - Member Convener;
- d) Representative of State-Owned Generating Company - Member;
- e) Representative of State-Owned Distribution Licensees in the State – Member;
- f) Representative of the Indian Railways in the State – Member;
- g) Representative of WRLDC – Member;
- h) Representative of Western Region Power Committee – Member;
- i) Representative of Maharashtra Energy Development Agency – Member;
- j) Representative of Renewable Generators in the State - Member;
- k) Representative of Transmission Licensees in the State, - Member;
- l) Representative of Privately-Owned Distribution Licensees Including Deemed Distribution Licensees – Member;
- m) Representative of Private-Owned Generating Companies Including IPPs and CPPs in the State - Member;
- n) Representative of Long Term Open Access (OA) Consumers connected to InSTS in the State – Member;
- o) Other persons as may be nominated by the Commission.

Provided that the members referred to in clauses (j) to (o) above shall be selected as nominated by their respective organizations, where organizations will be selected in rotation among all such organizations in the State. The term of each such member, selected in rotation, shall be two years;

Provided that the members nominated by each of the organization to the above Committee shall be holding a senior position in their respective organization.

5.5. Proceeding and Meetings of the GCC

- a) GCC shall meet at least once every three months.

- b) Convener (STU) of GCC shall put up names and designation of all members of GCC on its website. Also, the minutes of the meeting shall be uploaded on SLDC's website. Agenda of GCC shall be circulated in advance before the meeting.
- c) Convener (STU) of the GCC shall submit a report of the GCC meeting to the Commission within 15 days of the meeting.

6. Grid Code Review

- 6.1. Implementation aspects of the MEGC shall be reviewed by the GCC at least once in every 12 months or as and when required.
- 6.2. State Entities/Users seeking an amendment to the MEGC shall send written requests to the convener of the GCC with a copy to the Commission. The GCC shall examine the proposed changes/modifications, along with its written comments submitted by all members of the Committee and decide on the request.
- 6.3. Upon completion of such review, the GCC shall send a report to STU providing information regarding:
 - a) Outcome of the review;
 - b) Any proposed revisions to the MEGC which GCC considers necessary for achievement of objectives; and
 - c) All written representations and objections submitted by members/Users.
- 6.4. STU shall submit review report with its recommendations for amendments if any, referred in Regulation 6.2, to the Commission within 15 days from the date of submission of report from GCC along with justification and relevant documents.
- 6.5. The Commission may issue necessary amendment directions/practice directions for implementation of the provisions considering the recommendations of GCC in such manner as may be specified in the directions and the Licensees shall comply with any such directions.

7. Functional Committees/Sub-Committees Under GCC

- 7.1. GCC, in the succeeding meeting after notification of these Regulations, shall constitute following functional committees for implementation of the MEGC under the aegis of GCC.
 - a) **Maharashtra Transmission Committee (MTC):** The Committee shall be responsible for Planning and monitoring timely execution of transmission projects in the Maharashtra State including Mumbai area. The Committee shall also address the InSTS Connectivity related issues if referred by the GCC.
 - b) **Operation Coordination Committee (OCC):** The Committee shall be responsible for the implementation of provisions of Operation Code and Scheduling and Despatch Code of MEGC.

- c) **Protection Coordination Committee (PCC):** The Committee shall be responsible for Protection Coordination of InSTS and co-ordination with WRLDC as per the requirement.
- d) **Metering and Communication Coordination Committee (MCCC):** The Committee shall be responsible for the implementation of provisions of Metering Code.

Provided that GCC may formulate any other functional Committee or sub-committees, as it deems fit for the implementation of the MEGC.

7.2. Members of functional committees shall be nominated by GCC, ensuring adequate representation of distribution licensees and generating companies including renewable energy generators in the State. The Chairperson and Convener of the functional Committees shall be from STU or SLDC as per the nature of the function.

7.3. **Maharashtra Transmission Committee (MTC)**

7.3.1. MTC shall meet at least once every six months and deliberate on all technical and operational aspects of Planning Code and Connection Code and shall provide their suggestions/recommendations to GCC. MTC shall also deliberate on timely execution of scheme and issues related thereof and monitor the execution of transmission related projects in the State and provide their suggestions/recommendations to GCC.

7.3.2. MTC shall perform the following functions:

- a) Coordinate system planning, maintenance schedule and contingency plan to ensure adequate transmission system planning;
- b) Review of existing interconnection equipment for alteration, addition, if necessary, so as to comply with the Connection Conditions provided in the MEGC/IEGC;
- c) Review the load estimate (long term) and the methodology and assumptions made by the Users;
- d) Review and finalise the proposals identified on the basis of planning studies;
- e) Prepare a report on the execution of various planning related activities and achievement of milestones on a quarterly basis and submit to GCC;
- f) Study and suggest projects to be implemented under Tariff Based Competitive Bidding (TBCB) to optimise the project cost;
- g) Study and propose the new technology in the Transmission System such as HVDC, HTLS, GIS, Monopoles etc. for the strengthening of the InSTS and any other function as directed by the GCC;
- h) Monitor the transmission related projects under execution and analyse the reasons for delay if any with propose way forward; and
- i) Any other function as directed by the GCC.

7.3.3. MTC shall also undertake scrutiny of Transmission system augmentation proposals prepared by Transmission Licensees and provide its recommendations to GCC for addition of new substation(s) or new transmission line or augmentation of capacity of existing substation or transmission line which STU shall consider for further planning.

7.4. Operation Coordination Committee (OCC):

7.4.1. OCC shall meet at least once every six months and coordinate on all technical aspects of system operation, load despatch and shall provide recommendations to the GCC.

7.4.2. OCC shall perform the following functions:

- a) Review and analyse the grid disturbances and system restoration procedure;
- b) Review the reactive compensation mechanism for InSTS;
- c) Review and finalize outage plan of STU;
- d) Review the demand disconnection mechanisms;
- e) Review the installation of Disturbance Recorders, Event Loggers, Frequency Trip Relays (FTR), df/dt relays etc. in the InSTS;
- f) Review and study the implementation of governor mode of operation for the generating stations in the State; and
- g) Any other function as directed by the GCC.

7.5. Protection Coordination Committee (PCC):

7.5.1. PCC shall meet once every six months and coordinate regarding the implementation of Protection Code to ensure that Users of InSTS discharge their obligations under the Protection Code.

7.5.2. PCC shall perform the following functions.

- a) Assist STU to prepare protection manual under Protection Code;
- b) Ensure compliance of Protection Code;
- c) Specify the minimum protection requirements for the User's system connected to the InSTS;
- d) Deliberate and decide various protection settings, testing procedure and periodicity;
- e) Review the requirement of upgradation of protection schemes and necessary switchgear equipment;
- f) Analyse the failure of protection system in case of major grid disturbance and suggest modifications and alterations;
- g) Review the suggestion of Users for revision of protection code; and
- h) any other function as directed by the GCC.

7.6. Metering and Communication Coordination Committee (MCCC):

7.6.1. MCCC shall meet at least once every six months and coordinate regarding the implementation of Metering Code to ensure that Users of the InSTS discharge their obligations under the Metering Code.

7.6.2. MCCC shall perform the following functions:

- a) Ensure compliance of Metering Code;
- b) Review deviations in the existing Current Transformers (CT) and PTs/CVTs from the minimum specifications prescribed in Annexure-1 of MEGC and upgradation/ replacement of the same within one year from the date of notification of MEGC;
- c) Deliberate and decide the issues related to metering and metering failure for DSM account and energy account;
- d) Deliberate and decide the issues related to communication aspects of AMR/MRI;
- e) Review and propose amendments in metering arrangement; and
- f) Any other function as directed by the GCC.

8. Role of Various Entities under MEGC:

8.1. Role of STU

8.1.1. The role of STU as per Section 39(2) of the EA 2003, shall be:

- a) To undertake transmission of electricity through InSTS;
- b) To discharge all functions of planning and co-ordination relating to InSTS with-
 - i. Central Transmission Utility;
 - ii. State Government;
 - iii. Generating companies;
 - iv. Regional Power Committee;
 - v. Central Electricity Authority (CEA) or Authority;
 - vi. Transmission Licensees;
 - vii. Any other person notified by the State in this behalf;
- c) To ensure development of an efficient, co-ordinated and economical InSTS for smooth flow of electricity from a generating station to the load centres;
- d) To provide non-discriminatory open access to its transmission system for use by -
 - i. Any licensee or generating company on payment of the transmission charges; or
 - ii. Any consumer as and when such open access is provided by the State Commission under sub-section (2) of section 42 of the Act, on payment of

the transmission charges and a surcharge thereon, as may be specified by the State Commission.

- e) STU shall be responsible for planning, coordination and development of reliable communication system for data communication within a State including appropriate protection path among SLDC and ALDC/Sub-LDC thereunder including main and backup as applicable along with STU substations, ISGS.
- f) STU shall also plan a redundant communication system up to the nearest ISTS wideband communication node for integration with the InSTS communication system at appropriate nodes.
- g) STU shall discharge all functions of planning related to the State backbone communication system in consultation with CTU, State Government, Generating Companies, Transmission and Distribution Licensee in the State.
- h) STU shall also provide access to its wideband Network for grid management by all the Users.
- i) STU shall extend the required support to Control Centres for the integration of communication system at respective ends.

8.1.2. Until a Government company or any authority or corporation is notified by the State Government, the STU shall operate the SLDC.

8.2. **Role of SLDC**

8.2.1. The SLDC shall be the apex body to ensure integrated operation of the power system in a State. In accordance with Section 32 of the EA 2003, functions of the SLDC include:

- a) Be responsible for optimum scheduling and despatch of electricity within a State, in accordance with the provisions of MERC DSM Regulation, Scheduling and Despatch Code and the contracts entered into with the licensees or the generating companies operating in that State;
- b) Monitor grid operations;
- c) Keep accounts of the quantity of electricity transmitted through the State grid;
- d) Exercise supervision and control over the InSTS; and
- e) Be responsible for carrying out real-time operations for grid control and despatch of electricity within the State through a secure and economic operation of State grid.

8.2.2. In accordance with Section 33 of the EA 2003, SLDC in a State may give such directions and exercise such supervision and control as may be required for ensuring the integrated grid operations and for achieving the maximum economy and efficiency in the operation of the power system in the State. Every licensee, generating company, generating station, substation and any other person connected with the operation of the power system shall comply with the directions issued by SLDC under subsection (1) of Section 33 of the EA, 2003. The SLDC shall comply with the directions of the RLDC.

- 8.2.3. In case of inter-state bilateral and collective short-term open access transactions having a state utility or an intra-state entity as a buyer or a seller, SLDC shall accord concurrence or no objection or a prior standing clearance, as the case may be, in accordance with the MERC (Transmission Open Access) Regulations, 2016, as amended from time to time.

SLDC shall issue the certificates such as availability of the sellers, as per the provision of the relevant regulations of Commission or any other certificate as may be directed by the Commission from time to time.

- 8.2.4. SLDC shall be the Nodal Agency for the integration of Communication System in the Intra-State network at SLDC end for monitoring, supervision and control of power system.
- 8.2.5. SLDC shall provide operational feedback to CTU and STU.

8.3. **Role of Transmission Licensees**

Transmission Licensees shall build, maintain and operate an efficient, coordinated and economical InSTS or ISTS, as the case may be and discharge the other functions assigned to it as per Section 40 of the EA 2003, and these Regulations.

8.4. **Role of Distribution Licensees**

Distribution Licensee shall discharge the functions as stated in Section 42 of the EA 2003. such as to develop and maintain an efficient, coordinated and economical distribution system in its area of supply; to provide non-discriminatory open access to its distribution system as specified in the MERC Open Access Regulations emended from time to time.

Provided that, distribution licensee shall be responsible to provide and maintain adequate reactive power compensation at distribution level such as 33 kV substations, 11 kV lines to maintain the voltage and power factor within the specified limit.

Provided further that, the distribution licensee shall ensure that, such reactive compensation shall remain in service.

8.5. **Role of Users**

Users including RE generators shall be responsible for the provision of compatible equipment along with an appropriate interface for uninterrupted communication with the concerned control centres at their own cost and shall be responsible for successful integration with the communication system provided by STU for data communication as per the guidelines issued by NLDC/RLDC/STU. Users may utilize the available transmission infrastructure for establishing communication up to the nearest wideband node for meeting communication requirements from their stations to concerned control centres. Users shall also be responsible for expansion/up-gradation as well as operation and maintenance of communication equipment owned by them.

8.6. Role of Generator

Generator connected to and/or using the InSTS for evacuating its generation shall inform the STU and SLDC about the contracts entered into with different parties for exporting power along with its schedule from individual generating station under the company. It shall follow the relevant provisions of the MEGC and assist the SLDC in real time operation and control of the system and scheduling of generation.

8.7. Role of Qualifying Co-ordinating Agency (QCA)

QCA shall be reckoned as State Entity and the powers, functions and role of the QCA shall be governed as per the provisions stipulated under MERC (Forecasting, Scheduling and Deviation Settlement for Solar and Wind Generation) Regulations, 2018 and its amendments thereof including F&S Procedures formulated thereunder.

PART B: PLANNING CODE

9. Introduction

- 9.1. In accordance with Section 39(2)(b) of EA 2003, the State Transmission Utility (STU) shall discharge all functions of planning and coordination relating to InSTS with CTU, State Government, Generating Company, Regional and State Power Committee, CEA, licensees and any other person notified by the State Government in this behalf.
- 9.2. In accordance with Section 39(2)(d) of EA 2003, the STU shall inter-alia provide non-discriminatory open access to its transmission system for use as per the provisions of MERC (Transmission Open Access) Regulations, 2016 and its amendments thereof.
- 9.3. In accordance with Section 40 of EA 2003, the transmission licensee shall inter-alia provide non-discriminatory open access to its transmission system for use as per the provisions of MERC (Transmission Open Access) Regulations, 2016 and its amendments thereof.
- 9.4. STU shall be responsible for planning for InSTS lines in line with CEA's National Electricity Plan and shall review its plan consistent with the revision in the National Electricity Plan from time to time.

10. Objective

- 10.1. Objectives of the Planning Code are as follows:
 - a) Specify the principles, procedures, technical and design criteria to be adopted by the STU for planning and development of InSTS and inter-state links;
 - b) Promote coordination amongst all Users, STU/SLDC and CTU/RLDC, NLDC, WRLDC, WRPC and CEA in any proposed development of the InSTS;

- c) Provide methodology and information exchange amongst Users, STU/SLDC, CTU/RLDC, RPC/SPC, NLDC and CEA in the planning and development of the InSTS;
- d) Probabilistic assessment by the designated agency of a State of its future demand pattern under different scenarios;
- e) Adequacy of generation resources taking account loss of load probability and energy not served as specified by CEA;
- f) Adequate generation reserves and demand response for maintaining grid stability;
- g) Validation of adequacy of transmission resources through system studies considering economic despatch under various demand and generation scenarios including must run generation;
- h) Validation of adequate power transfer capability to be carried out for the entire grid in a comprehensive manner by STU;
- i) Validation of adequate power transfer capability to be carried out by STU.

11. Generation resource planning

- i. Each distribution licensee shall ensure demonstrable resource adequacy as specified by the Commission for the next five (5) years starting 1st April of the next year. Adequacy statement containing a list of such resources along with associated capacities shall be submitted to the STU.
- ii. Based on the generation resource plans of distribution licensees, STU in consultation with SLDC shall develop Integrated Resource Plan for next five years for the state. While developing such Integrated Resource Plan, STU may consider the following from grid operation perspective:
 - a) Generation flexibility, ramping and minimum turndown level and start-stops
 - b) Requirement of energy storage systems and demand response measures
 - c) Generation reserve requirement
 - d) System inertia for grid stability
 - e) Fuel security
- iii. STU shall submit such Integrated Resource Plan for the state to CTU in line with requirements specified under IEGC.

12. InSTS Planning

- 12.1. STU for the purpose of preparing the transmission system plan shall be guided by the following:
 - a) Plans formulated by the Authority for the transmission system under the provisions of clause (a) of Section 73 of the Act;

- b) Electric Power Survey of India report of the Authority;
- c) CEA (Grid Standard) Regulations, 2010 as amended from time to time;
- d) Transmission Plan formulated by CTU under the provisions of Grid Code specified by CERC (IEGC);
- e) Operational feedback from NLDC/RLDC/SLDC;
- f) Transmission Planning Criteria and Guidelines issued by the Authority;
- g) Recommendations/Inputs, if any, of the Regional Power Committee;
- h) Directions/Suggestions of the Commission;
- i) CERC (Grant of Connectivity, Long-term Access and Medium-term Open Access in inter-state Transmission and related matters) Regulations;
- j) Reports on National Electricity Policy which are relevant for the development of InSTS;
- k) Renewable capacity addition plan/policy issued by Ministry of New and Renewable Energy Sources (MNRE), Government of India with State target/Government of Maharashtra;
- l) Any other information/committee study report/data source suggested by the Commission such as load estimate by the authorities such as MMRDA, BMC etc. for special upcoming projects; and
- m) If more than one transmission licensees are operating in the same area, STU shall consider a plan to avoid the duplication of work and optimisation of InSTS cost.

12.2. STU shall provide the template to collect requisite data from stakeholders to prepare InSTS plan.

12.3. Load estimation shall be the primary responsibility of the Distribution Licensees within their area of supply. Distribution Licensees shall prepare Peak Demand and Energy Forecasts (duly assessing the requirements of Open Access, captive Users, energy efficiency measures and distributed generation within its distribution area) of their areas for each of the succeeding 10 years and submit the same annually, by 31st January to the STU. Such estimates shall consider the operational division of the distribution licensee as a basic unit of the service area and shall be submitted to the STU for planning.

12.4. Distribution licensees including Indian Railways shall furnish to the STU, the details of their power procurement plans and implementation schedules of future generating plants, existing generating plants, with whom they have entered into long term/medium term/standby power purchase agreements (PPAs), for the purpose of planning the evacuation/system strengthening schemes.

- 12.5. STU shall consolidate load estimates of all distribution licensees in the State and prepare overall load estimate of the State which will form the basis for planning for expansion of InSTS.
- 12.6. STU may consult stakeholders such as Generators, SLDCs, Transmission Licensees and Distribution Licensees including Indian Railways and seek such information from InSTS User as may be required by it, including generation capacity addition, system augmentation and long-term load estimate and all applications for open access.

Provided that, while planning new substations, STU shall also consider the requirement of additional space for future expansion for incoming and outgoing bays. No extra bay shall be erected unless there is firm requirement from TSU for commissioning of such bay which shall not be more than six months from date of such request.

- 12.7. STU shall prepare a perspective transmission system plan based on the data obtained from the Users and internal sources for:
- a) Short term period, i.e., up to 5 years;
 - b) Medium term period, i.e., up to 10 years; and
 - c) Long term period, i.e., up to 15 years.
- 12.8. Transmission system plan prepared by the STU shall consist of the following sections:
- a) Executive summary of Transmission plan shall clearly indicate the location of existing and proposed EHT substations, connecting lines, no. of bays at each voltage level with details of present occupancy and availability for future expansion.
 - b) **Generation evacuation planning:** This section shall target evacuation of the upcoming generation capacity deemed to be connected to InSTS including Renewable Generators;
 - c) **Load Projection Planning:** This section shall deliberate transmission planning to meet the increasing demands from distribution licensee(s) and other Users including deemed distribution licensees;
 - d) **Interconnection Planning:** This section shall deliberate transmission planning for interconnection between the network for generation evacuation and load projection; and
 - e) **Inter-state transmission connection planning:** This section shall deliberate transmission planning for the evacuation of power by the State from neighbouring states or regions via inter-state transmission:

Provided that the STU may add any other section as it deems fit for intra-state transmission schemes and system strengthening schemes for the benefit of all Users.

Provided further that the transmission system plan shall also include information related additional equipment such as Power Transformers, ICTs, Capacitors,

Reactors, Static VAR Compensators and Flexible Alternating Current Transmission Systems (FACTS), substation and lines modernisation, major replacement of substations and lines augmentation of substations and lines etc.

- 12.9. STU in consultation with Transmission Licensees and MTC shall submit physical and financial progress reports of the actual capitalisation, reasons for deviation from planned capitalisation to the Commission on six monthly basis, i.e., on 15 September and 15 April of each financial year.
- 12.10. STU shall update the perspective transmission plan every year to take care of the revisions in load projections and generation scenarios considering the seasonal and the time of the day variations. In formulating a perspective plan, the transmission requirement for evacuating power from a renewable source, transmission system required for Open Access and recommendations/suggestions from various functional committees formed under these Regulations shall also be taken care of. The perspective plans shall be submitted to the Commission for information.
- 12.11. STU shall carry out the yearly planning process corresponding to five years forward term for the identification of major transmission system from the financial year immediately following the year in which it is published.
- 12.12. STU shall submit the investment plan for transmission system for approval of the Commission. STU/transmission licensees while submitting an application under subsection (1) of Section 64 of the Act to the Commission for approval, shall submit an investment plan based on the identified intra-state transmission schemes and system strengthening schemes projected in the transmission system plan:
- Provided that the transmission system plan shall be updated by the STU every year and published in the manner specified in Regulation 12.13 of this Regulation annually by 31st December and shall cover a plan period of five years commencing from the financial year immediately following the year in which it is published.
- Provided further that transmission plans shall be updated every year to accommodate the revisions in the load projections and generation capacity additions.
- 12.13. STU shall publish the transmission system plan for the InSTS on its website and shall also make the same available to any person upon request in hard copy as desired at a reasonable cost.
- 12.14. Cost of the transmission system planning study undertaken in accordance with these Regulations shall be allowed in the determination of the charges of STU under clause (b) of sub-section (1) of Section 62 of the Act.

13. Planning Criteria

13.1. Technical Planning Criteria:

- 13.1.1. Planning criterion shall be based on the security philosophy on which the InSTS has been planned considering past experience of STU and Users, future plan of various

State Government agencies etc. The transmission planning philosophy shall be guided by National Electricity Plan including its amendments thereof, and other guidelines as specified by the Authority and amended from time to time:

Provided that STU shall carry out appropriate system studies while developing the transmission system plan.

13.2. Financial Planning Criteria:

13.2.1. While developing transmission system plan covering addition of new transmission system element (transmission line or substation) or for augmentation of the capacity of existing transmission line or addition of transformer or bay, the STU shall provide due consideration to commercial aspects and cost implications thereof on arising on account of addition/augmentation of any transmission system element. For this purpose, STU shall be guided by but not limited to following commercial principles and parameters as outlined below:

- (a) Optimum utilisation of the existing capacity and planned capacity addition of the transmission system element
- (b) Economical and efficient development of transmission system element(s) to economise overall Return of Investment for transmission system
- (c) Equitable and fairness in recovery of the cost from the transmission system users
- (d) Coordinated development of transmission system elements, particularly with reference to inter-state/inter-regional transmission system elements vis-à-vis InSTS elements;

13.2.2. For operationalisation of the above financial criteria, STU shall develop and publish on its website zone-wise transmission capacity utilisation index as well as voltage variation index for various transmission system elements (HVDC, 765 kV, 400 kV, 220 kV, 132 kV and below)

Provided that GCC shall formulate methodology for computation of zone-wise transmission capacity utilisation index and voltage variation index, collate relevant data, and shall publish such methodology alongwith relevant data on its website within six months from date of notification of these Regulations;

Provided further that GCC shall publish such transmission capacity utilisation index and voltage variation index for HVDC, 765 kV and 400 kV transmission system elements to begin with, within three months from date of notification of these Regulations.

13.2.3. Prior to inclusion of any new transmission system element entailing capital outlay exceeding threshold limit of INR 100 Crore or such other threshold limit to be stipulated by the Commission from time to time, as part of transmission system plan, STU shall evaluate and present alternate options of meeting the User/Requester requirement (with or without transmission element, factoring optimal capacity expansion than sought for, or evaluate alternate technology options, consider

deferment or prioritisation considerations etc) and accordingly undertake scenario analysis of various cases and present it to User/Requester in order to ensure economical and efficient development of transmission system element(s) to economise overall Return of Investment for transmission system as whole.

13.2.4. Prior to inclusion of any new transmission system element or augmentation of the capacity of existing transmission system element, as part of transmission system plan, the STU shall give due consideration to equitable and fairness in recovery of costs from concerned transmission system users (subject to prevalent pricing framework) and shall highlight the incremental cost recovery burden that would be added to transmission system users due to addition/augmentation of such new transmission system element and in case the capacity utilisation of such element does not take place as planned. For this purpose, the STU through (GCC/MTC) shall expressly deliberate, highlight and record the viewpoints of transmission system users for addition/augmentation of transmission system elements, before incorporation of such transmission system element and finalisation of transmission system plan and annual rolling plan.

13.2.5. STU shall regularly assess the progress and utilisation of the inter-state and inter-regional transmission systems, their utilisation vis-à-vis InSTS planned capacity addition/augmentation to ensure coordinated development of transmission system elements. A period review of developments/progress shall facilitate STU to participate in the National/Regional Transmission Planning Committee meetings and put forth state perspective and highlight deficiencies which can avoid sub-optimal development/utilisation through timely interventions. The intra-state transmission schemes that are of strategic importance or entail inter-state/inter-regional features needs to be pursued to be covered as part of ISTS network for its cost recovery.

13.2.6. STU shall formulate Guidebook for operationalisation of the Planning Code covering detailed modalities for implementation of the financial planning criteria and technical planning criteria, information requirements from Users/Requesters, suitable forms/formats and periodic reporting/publication of zone-wise transmission utilisation index and voltage variation index, within three months from notification of these Regulations.

13.3. EHV Substation Planning Criteria

13.3.1. Maximum short circuit level on any new substation bus shall not exceed 80% of the rated short circuit capacity of the substation. The rated breaking current capability of switchgear at different voltage levels may be taken as given below:

Voltage Level	Rated Breaking Capacity
132 kV	25 kA/31.5 kA
220 kV	31.5 kA/40 kA
400 kV	40 kA/50 kA
765 kV	50 kA/63 kA

Provided that measures such as bus splitting, series reactor or any other commercially available technology may be adopted to limit the short circuit levels at existing substations wherever they are likely to cross the designed limits.

- 13.3.2. Rating of various substation equipment shall be such that they do not limit the loading limits of connected transmission lines.
- 13.3.3. While planning EHV substations, STU shall be guided by the Technical Standards and planning criteria specified/notified by the Authority.
- 13.3.4. STU while planning for addition of new substation(s) or new transmission line or augmentation of capacity of existing substation or transmission line, shall consider the recommendations/suggestions of GCC/MTC as per the provision of Regulation 7.3.3 of these Regulations.
- 13.3.5. STU should explore the possibility of planning a new substation instead of adding transformer capacity at an existing substation when the capacity of the existing substation has reached, as given in column (B) in the following table. The installed capacity of any single substation at different voltage levels shall not normally exceed, as given in column (C) in the following table:

Voltage Level	Transformer Capacity	
(A)	Existing Capacity (B)	Maximum Capacity (C)
765 kV	6,000 MVA	9,000 MVA
400 kV	1,260 MVA	2,000 MVA
220 kV	320 MVA	500 MVA
132 kV	150 MVA	250 MVA

- 13.3.6. Size and number of interconnecting transformers shall be planned in such a way that the outage of any single unit shall not overload the remaining interconnecting transformers or the underlying system.
- 13.3.7. While augmenting the transformation capacity at an existing substation or planning a new substation, the fault level of the substation shall also be reviewed:
Provided that voltage stability studies shall be carried out if the fault level is low.
- 13.3.8. A stuck breaker condition shall not cause disruption of more than four feeders for 220 kV system and two feeders for 400 kV and 765 kV system.
- 13.3.9. The following bus switching scheme may be adopted for both AIS and GIS and also for the generation switchyards:
 - a) 220 kV level – ‘One and a half breaker’ or ‘Double Main & Transfer’ scheme with a maximum of eight (8) feeders in one section
 - b) 400 kV and 765 kV level – ‘One and half breaker’ scheme.
- 13.4. **Additional Planning Criteria for Wind and Solar Projects**

- 13.4.1. Wherever available, actual data of capacity factor for wind and solar generators shall be used for planning. In the cases where data is not available the Capacity factor may be calculated using following factors specified by Authority:

Voltage Level/ Aggregation Level	132 kV/ Individual Wind or Solar	220 kV	400 kV	State (as Whole)
Capacity Factor (%)	80%	75%	70%	60%

- 13.4.2. ‘N-1’ criteria may not be applied to the immediate connectivity of wind and solar projects with InSTS, i.e., the line connecting the projects to the grid and the step-up transformers at the grid station.
- 13.4.3. As the generation of energy at a wind Project is possible only with the prevalence of wind, the thermal line loading limit of the lines connecting the wind machine(s)/farm to the nearest grid point may be assessed considering 12 km/hour wind speed.
- 13.4.4. Wind and solar projects shall maintain a power factor as mentioned in Regulation 37.10 at their grid interconnection point for all despatch scenarios by providing adequate reactive compensation and the same shall be assumed for system studies.

13.5. Additional Planning Criteria for HVDC Transmission System

- 13.5.1. Option of HVDC Bipole may be considered for transmitting bulk power (more than 2,000 MW) over a long distance (more than 700 km). HVDC transmission may also be considered in the transmission corridors that have AC lines carrying heavy power flows (total more than 5000 MW) to control and supplement the AC transmission network:

Provided that the above provision does not restrict implementation of voltage source converter (VSC) based HVDC or similar HVDC technologies wherever suitable.

- 13.5.2. Ratio of fault level in MVA at any of the convertor station (for conventional current source type), to the power flow on the HVDC Bipole, shall not be less than 3.0 under any of the load-generation scenarios and contingencies:

Provided that in areas where multiple HVDC bipoles are feeding power (multi in feed), appropriate studies may be carried at the planning stage to avoid commutation failure.

- 13.5.3. Maximum permissible thermal line loadings for different types of line configurations, employing various types of conductors, Surge Impedance Loading (SIL) shall be considered as specified by the Authority.

- 13.6. InSTS, as a general rule, shall be capable of withstanding and be secured against the following contingency outages:

- a) Without necessitating load curtailment or rescheduling of generation during Steady State Operation(s):

- i. Outage of a 100 kV /110 kV/ 132 kV D/C line, or
- ii. Outage of a 220 kV D/C line, or
- iii. Outage of a 400 kV S/C line, or
- iv. Outage of a 400 kV single circuit line with a fixed series capacitor.
- v. Outage of a single Interconnecting Transformer, or
- vi. Outage of one pole of HVDC Bipole line, or
- vii. Outage of a 765 kV S/C line.
- viii. Outage of the most severe single generating unit.
- ix. Outage of a single biggest load.
- x. Ground Return Mode (GRM) operation of the HVDC line.
- xi. Power Demand Override (PDO)/Emergency Power Control (EPC) operation of the HVDC link.

Without necessitating load curtailment but could be with rescheduling of generation during steady state operation:

- i. Outage of a 400 kV S/C line with Thyristor Controlled Series Capacitor (TCSC), or
- ii. Outage of a 400kV D/C line, or
- iii. Outage of both pole of HVDC Bipole line or both poles of HVDC back to back Station, or
- iv. Outage of a 765kV S/C line with series compensation.

Provided that the above contingencies shall be considered assuming a pre-contingency system depletion (planned outage) of another 220 kV D/C line or 400 kV S/C line in another corridor and not emanating from the same substation.

- 13.7. The planning study would assume that all the Generating Units operate within their reactive capability curves and the network voltage profile are also maintained within the voltage limits specified.
- 13.8. InSTS shall be capable of withstanding the loss of most severe single infeed without loss of stability.
- 13.9. Any of the events defined in Regulation 13.6 above shall not cause:
 - a) Loss of supply;
 - b) Prolonged operation of the system frequency below and above specified limits;
 - c) Unacceptable high or low voltage;
 - d) System instability;
 - e) Unacceptable overloading of InSTS elements.

- 13.10. In all substations of (66 kV/ 110 kV/ 132 kV and above), except HVDC, size and number of power transformers/ICTs shall be planned in such a way that the outage of any single unit would not overload the remaining transformers/ICTs to maintain the required firm capacity at the substation. In HVDC substations, at least one spare converter/inverter transformer shall be kept ready to use at any time.

Provided that in the rural areas, depending upon the feasibility, redundancy can be shared by two EHV substations through 11/22/33 kV network to optimise the project cost.

Provided further that if there are no line loading constraints of existing 220 kV /132 kV Double Circuit source line, such Double Circuit line shall be treated as N-1 contingency compliance. In such a case there is no need to construct another Single Circuit / Double Circuit Line from other source to 220 kV / 132 kV substation under the pretext of N-1 contingency compliance.

Provided further that the Transmission Licensee may propose new substation or augmentation of the existing substation in the following conditions:

- a) In urban areas, if the existing transformers are loaded with more than 70% of their installed capacity.
- b) In rural areas, if the existing transformers are loaded with more than 80 % of their installed capacity.

Each scheme for augmentation or extension of InSTS shall need a base and shall be recommended by the STU after due diligence. It will be the responsibility of concerned transmission licensee to execute the scheme efficiently, effectively and timely manner.

Provided that the installed capacity of the substation, Transmission Lines and out lets of various voltage level shall be constructed in phased manner as per the projection of load to be feed from the substation to avoid the idling of the assets.

Explanation: For the purpose of Regulation 13.10, the term, ‘firm capacity’ shall mean minimum transformation capacity available at the substation in case of outage of any one transformer/ICT.

- 13.11. STU shall carry out planning studies for Reactive Power compensation of InSTS including Reactive Power compensation by the Generator.

13.12. Implementation of Transmission Plan

- 13.12.1. STU shall endeavour to ensure that the schemes are executed in accordance with the time frame mentioned in the Transmission Plan formulated by the STU. The execution of transmission projects shall be closely monitored by the MTC constituted under the aegis of the GCC.

- 13.12.2. Implementation related issue shall be discussed in the meetings of MTC/GCC as per the requirement. MTC/GCC shall also monitor the progress of various clearances required for timely execution of projects. MTC/GCC shall also provide its recommendations for timely completion of the projects.
- 13.12.3. MTC shall ensure simultaneous execution of substation and transmission lines, to avoid stranding of assets.
- 13.12.4. MTC shall submit its quarterly report of the status of ongoing transmission projects in the State with reference to STU transmission plan to the Commission through GCC.

14. Planning Data

14.1. Transmission Licensees and Users shall supply the following types of data to the STU for the purpose of developing the transmission plan:

- a) Standard Planning Data
- b) Detailed Planning Data

14.2. Standard Planning Data

14.2.1 Standard Planning Data shall consist of details which are expected to be normally sufficient for the STU to investigate the impact on the InSTS due to User/Transmission Licensee development.

14.2.2 Transmission Licensees and Users shall provide the following data to the STU from time to time in standard formats as provided by the STU:

- a) Preliminary project planning data;
- b) Committed project planning data; and
- c) Connected planning data.

Provided that the STU shall provide a date for submission of information in the said formats, after providing reasonable time to Transmission Licensees and Users:

Provided that the STU shall develop standard formats, for submission of above-mentioned data, within one month from notification of these regulations and make the same available on its website:

Provided also that the STU shall be guided by the formats, developed for submission of abovementioned data, under the provisions of IEGC.

14.3. Detailed Planning Data

14.3.1 Detailed Planning Data shall consist of additional, more detailed data not normally expected to be required by the STU to assess the impact of User/Transmission Licensee development on the InSTS.

14.3.2 Detailed Planning Data shall be furnished by the Users and Transmission Licensees as and when requested by the STU.

14.4. Spinning Reserve Planning

14.4.3 SLDC need to ensure maintenance of adequate Spinning Reserve Margin equivalent to 3% of the System Peak Demand (or such other percentage as specified by Commission) for the purpose of day-ahead load generation balance and intra-day operations. For preparation of day ahead Schedule of Generators as per De-Centralised MoD Principles, the SLDC shall maintain the spinning reserve margin in the specified Generator(s) upto 3% of Installed Capacity or as may be specified by the Commission for the management of ramp up as per the requirement of the Grid.

14.4.4 During day ahead scheduling, SLDC shall provide target despatch schedule for such specified generator(s) after allowing for maintenance of spinning reserve margin upto 3% of Installed Capacity (or as specified by Commission).

Provided that distribution licensee having hydro generating stations (excluding small hydro power) under long term/medium term power purchase agreement/arrangement may offer to provide spinning reserve margin from such hydro generator in consultation with SLDC.

14.4.5 The distribution licensees may share the spinning reserve resources on mutually agreed terms.

14.4.6 SLDC shall prepare detailed procedure to operationalise provisions related to spinning reserve margin and submit the same to Commission upon stakeholder consultation within six months from the date of notification of applicability of MEGC.

PART C: CONNECTION CODE

15. Introduction

15.1. This code specifies the minimum technical and design criteria that shall be complied with by a Transmission Licensee and User connected to or seeking connection to the InSTS. It also set forth procedures by which STU, Transmission Licensee and User connected to or seeking connection to the InSTS shall comply. It shall comply with the CEA (Technical Standards for Connectivity to the Grid) which specifies minimum technical and design criteria and MERC (Transmission Open Access) Regulations 2016 as amended from time to time.

16. Objective

Objective of the code are as given below:

- a) To ensure safe reliable and integrated operation of the grid;
- b) To treat all Users in a non-discriminatory manner;

- c) Any new or modified connections, when established, shall neither suffer unacceptable effects due to its connectivity to the ISTS nor impose unacceptable effects on the system of any other connected User or STU;
- d) By specifying optimum design and operational criteria to assist Users in their requirement to comply with License obligations to ensure that a system of acceptable quality is maintained;
- e) Any User seeking a new connection to the grid is required to be aware, in advance, of the procedure for connectivity to the InSTS and also the standards and conditions his system has to meet for being integrated into the grid.

17. Connection Standards

- 17.1. STU, Transmission Licensees and other Users connected to, or seeking connection to InSTS shall comply with the CEA (Technical Standards for Connectivity to the Grid) Regulations 2007, CEA (Technical Standards for Construction of Electric Plants and Lines) Regulations, 2010, MERC (Transmission Open Access) Regulations, 2016 and MERC (Distribution Open Access) Regulations, 2016, as amended from time to time.

18. Safety Standards

- 18.1. The applicable safety requirements for construction, operation and maintenance of electrical plants and electric lines shall be as per the standards notified by the Authority under clause (c) of Section 73 of the Act.
- 18.2. In addition, STU and the concerned Users shall be responsible for safety in accordance with CEA (Technical Standards for connectivity to the Grid) Regulations, 2007, CEA (Safety Requirements for Construction, Operations and Maintenance of Electrical and Electric Lines) Regulations, 2011, CEA (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2010, MERC (TOA) Regulations, 2016 and MERC (DOA) Regulations, 2016 as amended from time to time.

19. Application for Connection

- 19.1. Application for establishing new arrangement or modifying the existing arrangement of connection to and/or use of InSTS shall be submitted by the concerned Transmission Licensee or User to the STU in accordance with a standard format for application as stipulated by the STU.
- 19.2. STU shall be the nodal agency for the purpose of accepting and processing the application for connectivity to InSTS.
- 19.3. Connection requirements specified in the MERC (Transmission Open Access) Regulations, 2016, as amended from time to time shall also be applicable to an User making an application for connection to InSTS in addition to these Regulations.
- 19.4. Application for connection to InSTS shall include the following details:

- a) Report stating the purpose of the proposed connection and/or modification, Transmission Licensee to whose system connection is proposed, description of apparatus to be connected or modification of the apparatus already connected and beneficiaries of the proposed connection;
 - b) Construction schedule and target completion date;
 - c) Confirmation that the Transmission Licensee or the User shall abide by the provisions of these Regulations, CEA (Technical Standards for Connectivity to the Grid) Regulations, 2007, CEA (Safety Requirements for Construction, Operation and Maintenance of Electrical Plants and Lines) Regulations, 2011, CEA (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2010 all other related standards by the Authority shall be pursuant to the Act, as amended time to time;
 - d) Any other details deemed necessary for processing of application specified by the STU.
- 19.5. STU shall forward a copy of the application to the Transmission Licensee to whose system, the connection is being sought, SLDC and all other Transmission Licensee within the State whose Transmission System is likely to be affected by such application.
- 19.6. STU or Transmission Licensee, in whose system the connection is being sought, may carry out the power system studies as considered appropriate before allowing any new connection.
- 19.7. STU shall ensure that,
- a) All Users or prospective Users are treated equitably;
 - b) Any new or modified connection, when established, shall not impose any adverse effect on InSTS nor shall a new or modified connection suffer adversely due to its connectivity to InSTS;
 - c) The ownership and responsibility for all equipment are clearly specified in a Site Responsibility Schedule for each site where a connection is made.
- 19.8. STU shall, within 30 days, from the receipt of an application and after considering all suggestions and comments received by the stakeholders identified under Regulation 19.5 above;
- a) Accept the application with such modification or such conditions as may be specified by STU;
 - b) Reject the application for reasons to be recorded in writing if such application is not in accordance with the provisions of these Regulations.
- 19.9. In case of acceptance of an application as per sub-section (a) of Regulation 19.8, the STU shall make a formal offer to the applicant:

Provided that STU shall forward a copy of the offer to the concerned Transmission Licensee.

- 19.10. STU shall be entitled to reject any application for connection to InSTS due to the following reasons apart from others as considered reasonable:
- a) If a proposed connection is likely to breach any provision of its License or any provision of the MEGC or any provision of IEGC or any criteria or covenants or deeds or Regulations by which STU is bound;
 - b) If the proposed works stated in the application do not lie within the purview of the licence or do not conform to any provision of the SGC or any criteria or covenants or deeds or Regulations by which STU is bound;
 - c) If the applicant does not undertake to be bound, in so far as applicable, by the terms of the SGC;
 - d) If the applicant fails to give confirmation and undertakings according to this section.
- 19.11. Voltage level at which the applicant is offered to be connected to InSTS shall be governed by the standards notified by the Authority and prevailing guidelines adopted by the STU as amended from time to time.
- 19.12. Applicant and the concerned Transmission Licensee, in whose system the connection is being sought, shall finalise a Connection Agreement on acceptance of the offer by the applicant. STU and SLDC shall be provided with a copy of the Connection Agreement.
- 19.13. STU shall, upon compliance of the required conditions by the concerned Transmission Licensee/User, shall inform the concerned Transmission Licensee/User that it can be connected to the InSTS.

20. Metering Arrangement

- 20.1. For Metering arrangement the provisions of Metering Code and the Regulations notified by the Authority shall be binding on Users including open access Users, licensees, generators connecting to the InSTS including the Users connected to 33 kV bus at EHV Substations and distribution substation.

21. Connection Agreement

- 21.1. STU shall revise model Connection Agreement incorporating provision of these Regulations within three months from the notification of these Regulations and upload a copy of the model Connection Agreement on its website.
- 21.2. Connection Agreement shall include, as appropriate, within its terms and conditions, the following information relating to the connection of the User or Transmission Licensee to the InSTS:

- a) A condition requiring both parties to comply with the MEGC, IEGC and all other regulations concerning standards of grid connectivity notified by the Authority;
- b) Details of connection, technical requirements, metering and commercial arrangements;
- c) Details of any capital expenditure arising from necessary reinforcement or extension of the system, data communication etc. and demarcation of the same between the concerned parties;
- d) Responsibility of sharing the charges incurred in necessary reinforcement or extension of the system.
- e) Modalities for payment of connection charges, sharing of InSTS charges and the effective date for sharing of InSTS charges.
- f) Single line diagram of the electrical system to be connected;
- g) Site Responsibility Schedule;
- h) Protection systems;
- i) System recording instruments;
- j) Data and communication facilities;
- k) Access at connection site; and
- l) Any other information considered appropriate by the STU or the Commission.

Provided that STU shall not grant connectivity/permit execution of work if any, unless the InSTS User signs the agreement as defined above.

22. Grid Parameter Variations

22.1. General

Transmission Licensees and Users shall ensure that Plant and Apparatus requiring service from or providing service to the InSTS is of such design and construction that satisfactory operation of such Plant and Apparatus will not be prevented by variation in instantaneous values of system frequency and voltage from their nominal values and that such Plant and Apparatus shall not induce any adverse effect on the InSTS.

22.2. Frequency Variation

Rated frequency of the system shall be 50.0Hz and operating frequency shall normally be controlled within the limits in strict conformity with IEGC, and any other Regulations as may be specified by the appropriate authority from time to time.

22.3. Voltage Variation

Variations of voltage may not be more than the voltage range specified in the Regulations/Standards framed by the Authority or specified by CERC and as amended from time to time.

22.4. Monitoring and Reporting of variation in Grid Parameters

Transmission Licensees shall monitor and keep record of the month-wise Voltage Variation Index at Connection Points and submit report for the past six-monthly performance during next GCC meeting. GCC shall review and deliberate on the cause of the significant variations from the normal range and guide the remedial actions for the improvements. STU in consultation with GCC shall formulate detailed procedure for measurement, monitoring and reporting of the Voltage Variation Index at Connection Points covering InSTS. STU shall publish such report on its website from time to time.

23. Equipment at Connection Points

23.1. Substation Equipment

- 23.1.1. All EHV substation equipment shall comply with the Bureau of Indian Standards/ International Electro Technical Commission/Prevailing Code of Practice.
- 23.1.2. All equipment shall be designed, manufactured, tested and certified in accordance with the quality assurance requirements as per the standards of International Electro Technical Commission or the Bureau of Indian Standards.
- 23.1.3. Each connection between a User and InSTS shall be controlled by a circuit breaker capable of interrupting, at the connection point, at least the short circuit current as advised by the STU in the specific Connection Agreement.

23.2. Fault Clearance Time

- 23.2.1. Fault clearance time for primary protection schemes, when all equipment operate correctly, for a three phase fault (close to the bus-bars) on Users' equipment directly connected to InSTS and for a three phase fault (close to the bus-bars) on InSTS connected to Users' equipment, shall not be more than:
 - a) 100 milliseconds for 800 kV class & 400 kV
 - b) 160 milliseconds for 220 kV & 132 kV/110kV
- 23.2.2. Back-up protection shall be provided for required isolation/protection in the event of failure of the primary protection systems provided to meet the above fault clearance time requirements. If a Generating Unit is connected to the InSTS directly, it shall be capable of withstanding, until clearing of the fault by back-up protection on the InSTS side.

23.3. Protection System

- 23.3.1. Protection Systems shall be provided by all Transmission Licensees and Users to isolate the faulty equipment and protect the other components against all types of

faults, internal/external to them, within specified fault clearance time with the reliability, selectivity and sensitivity:

Provided that all Users or Transmission Licensees shall provide protection systems as specified by the Authority and the provisions of the protection code and Connection Agreement.

23.3.2. Relay setting coordination shall be done at State level in coordination with the STU and with WRLDC/WRPC.

23.3.3. All 220 kV and above stations shall have bus bar protection scheme, over flux, under voltage, over voltage relays and any other protection recommended by Regional PSCC of WRPC/STU.

23.3.4. Users shall provide information to SLDC regarding installation and healthiness of protective equipment like df/dt relays etc., reactive compensation on UFR monthly basis.

23.4. State Generating Station (SGS)

23.4.1. Unless specifically agreed with STU, the inter-connection point with generating station shall be the as specified in the metering code of these regulations.

23.4.2. Voltage level at which SGS shall be connected to InSTS as agreed with STU.

23.4.3. SGS shall operate and maintain all terminals, communication, metering and protection equipment owned by it within its jurisdiction. All electrical equipment including communication equipment from outgoing feeder gantry onwards shall be owned, operated and maintained by the STU/Transmission Licensee.

23.4.4. Metering arrangement between the generating station and STU/Transmission Licensee shall be as per the Metering Code of these Regulations as amended from time to time.

23.4.5. All hydro stations more than 50MW, Combined Cycle Gas Turbine (CCGT) more than 50MW and liquid fuel stations more than 50MW shall mandatorily have black start facilities. All stations at 220 kV and above shall have synchronizing facilities.

23.5. Distribution Licensee

23.5.1. Network of distribution licensee shall be connected to the InSTS at the voltage level as agreed with the STU.

23.5.2. Unless specifically agreed with Distribution Licensee, the connection point with STU shall be the outgoing gantry of the feeder to Distribution Licensee or EHV consumer as the case may be, from Transmission Licensee's substation.

23.5.3. Metering arrangement between Distribution Licensee and STU/Transmission Licensee shall be as per Metering Code as amended from time to time.

23.6. IPPs, CPPs, Open Access Consumers and other consumers connected to InSTS

- 23.6.1. IPPs, CPPs, Open Access Consumers and other consumers shall be connected to the InSTS at the voltage level as agreed with the STU.
- 23.6.2. Unless specifically agreed with STU, the inter-connection point with generating station shall be the as specified in the metering code of these regulations.
- 23.6.3. Metering arrangement between Distribution Licensee and STU/Transmission Licensee shall be as per the Metering Code as amended from time to time.

23.7. Inter-State Transmission System.

- 23.7.1. For the connection of the InSTS with the ISTS, the connection, protection and metering arrangements shall be as per the provisions of CERC (Indian Electricity Grid Code) Regulations, 2010, as amended from time to time.

24. Data and Communication Facilities

- 24.1. All Users shall provide reliable and efficient voice and data communication systems at their own cost to facilitate necessary communication and data exchange, and supervision/control of the State Grid by the SLDC, under normal and abnormal conditions:

Provided that unless and until the communication facilities are installed, commissioned and functioning properly, the User shall not be allowed to synchronize with the Grid.

- 24.2. All Users and Transmission Licensees in coordination with the STU shall provide the required facilities at their respective ends as specified in the Connection Agreement at their own cost:

Provided that the equipment/devices for communication and data exchange shall be provided as specified by the Commission in the Communication Code of these Regulations, guidelines of SLDC for interface requirement, and other such guidelines/specifications as applicable.

- 24.3. All Users shall provide systems to telemeter power system parameters such as power flow, voltage and status of switches/transformer taps, etc. in line with interface requirements and other guidelines made available by SLDC. The associated communication system to facilitate data flow up to appropriate data collection point on InSTS shall also be established by the concerned User as specified by the STU in the Connection Agreement at their own cost.

If the Users do not comply to provide the requisite communication facilities, STU shall not grant the final connectivity.

25. System Recording Instruments

- 25.1. Recording instruments such as Data Acquisition System/Disturbance Recorder/Event Logger/Fault Locator (including time synchronization equipment)/voice recorder/any other such equipment in each generating station/substation/SLDC/ALDC shall be

provided in the InSTS for recording of dynamic performance of the system and shall be maintained in working condition:

Provided that all such locations shall be time synchronised with the Meter Data Acquisition Systems (MDAS) located at SLDC and same shall be ensured by periodic verification and validation procedure to be developed and monitored by the STU.

- 25.2. All Users and Transmission Licensees shall provide all the requisite recording instruments as specified in the Connection Agreement in accordance with the agreed time schedule.

26. Responsibilities for Operational Safety

26.1. Site Responsibility Schedule (SRS)

- 26.1.1. Transmission Licensees and the Users shall be responsible for safety as indicated in the SRS for each connection point.
- 26.1.2. SRS shall be produced by the concerned Transmission Licensee and the User detailing the ownership responsibilities of each, before the execution of the project or connection, including safety responsibilities.
- 26.1.3. An SRS shall be prepared for each connection. At the connection site where equipment of both entities, i.e., the Transmission Licensee and the User are installed, the User shall furnish required data to the Transmission Licensee and the Transmission Licensee shall prepare SRS. At a generating station, the transmission licensee shall furnish the necessary data to the generating company who shall prepare SRS. The SRS format is provided in Annexure-2.
- 26.1.4. SRS shall be developed by the concerned Transmission Licensee/Generating Company pursuant to the relevant Connection Agreement and shall state the following for each item of plant and apparatus installed at the Connection point:
- a) Ownership of the Plant/Apparatus;
 - b) Responsibility for control of the Plant/Apparatus;
 - c) Responsibility for the operation of the Plant/Apparatus;
 - d) Responsibility for maintenance of the Plant/Apparatus; and
 - e) Responsibility for all matters relating to the safety of persons at the connection point.
- 26.1.5. The format, principles and basic procedure to be used in the preparation of SRS shall be updated by the STU within two months of notification of these regulations and shall be provided to each User and Transmission Licensee for compliance:

Provided that the principles and basic procedure to be used in the preparation of SRS provided in Annexure-2 shall continue to be used till such time as the updated principles and procedures under these Regulations are issued by the STU.

Provided further that no connection shall be made unless SRS is prepared and signed by all concerned parties.

26.2. Access at Connection Site

- 26.2.1. The Transmission Licensee or User owning the Connection Site shall provide reasonable access and other required facilities to another Transmission Licensee or User whose equipment is proposed to be installed/installed at the Connection Site for installation, operations and maintenance, etc.
- 26.2.2. Written procedures and agreements shall be developed between the Transmission Licensees and Users to ensure that mandatory access is available to the concerned Transmission Licensee or User at the same time safeguarding the interests of the Transmission Licensee and User at the connection site.

PART D: OPERATING CODE

27. Operating Philosophy

- 27.1. The primary objective of the integrated operation of the InSTS is to enhance the overall operational economy and reliability of the entire network spread over the geographical area of the State. Users shall cooperate with each other and adopt good utility practice at all times for satisfactory and reliable operation of the InSTS.
- 27.2. All Users shall comply with this Operating Code, for deriving maximum benefits from the integrated operation and for equitable sharing of responsibilities.
- 27.3. All licensees, generating company and any other Users connected to the InSTS shall comply with the directions issued by the SLDC to ensure integrated grid operation and for achieving the maximum economy and efficiency in the operation of the InSTS.

28. Operating Conditions

- 28.1. SLDC shall supervise the overall operation of the InSTS.
- 28.2. SLDC, in coordination with Operation Coordination Committee, shall develop, document and maintain detailed operating procedures for managing the InSTS. These operating procedures shall include the following:
 - a) Black start procedures;
 - b) System restoration procedures for partial grid failure;
 - c) Load curtailment procedures;
 - d) Renewable energy curtailment procedures
 - e) Islanding procedures; and
 - f) Any other procedure considered appropriate by the SLDC.

Provided that such procedures shall be developed in consultation with Users, licensees, renewable energy developers and WRLDC with three months from the date of notification of these Regulations.

Provided further that such procedures, after consulting in GCC, shall be provided to all the Users. A copy of the same shall be uploaded on SLDC's website and submitted to the Commission for information.

- 28.3. The control rooms of the SLDC including Area/Sub-load Despatch Centres, Generating Stations, Substations of 132 kV and above and any other control centres of Transmission Licensees and Users shall be managed frequently by qualified and adequately trained personnel.

Provided that the control centres of distribution licensees (with recorded peak demand more than 100 MW) including Indian Railways shall carry out functions such as demand forecasting, load management, power management and real time revisions in schedule, demand curtailment etc. The control rooms shall have regular interaction with SLDC and act upon the instructions received from SLDC. The distribution licensees shall also develop online tracking and monitoring system for distributed generation including rooftop solar PV systems above 100kW within its license area for facilitating decisions of revision of drawal schedule during intra-day operation.

29. System Security Aspects

- 29.1. All Users and Transmission Licensees shall endeavour to operate their respective power systems and power stations in synchronisation with each other at all times, such that the entire system within the State operates as one synchronised system.
- 29.2. All switching operations, manually or automatic, shall be based on guidelines of the following:
- a) CERC (Indian Electricity Grid Code) Regulations, 2010, as amended from time to time;
 - b) Instructions/Guidelines issued by SLDC;
 - c) Directives of the Commission; and
 - d) Decisions/Recommendations made by GCC.
- 29.3. No part of the InSTS shall be deliberately isolated from the rest of the InSTS except -
- a) Under an emergency and conditions in which such isolation will prevent a total grid collapse and/or will enable early restoration of power supply;
 - b) When serious damage to the equipment is imminent and such isolation will prevent it;
 - c) When such isolation is specifically instructed by the SLDC;

- d) On the operation of under frequency/ islanding scheme as approved by SLDC;
and
 - e) For the safety of human and/or animal life.
- 29.4. Complete synchronisation of the InSTS shall be restored as soon as the conditions permit. The restoration process shall be supervised by SLDC, in coordination with WRLDC in accordance with the operating procedures separately formulated by WRLDC.
- 29.5. No important element of the InSTS shall be deliberately opened or removed from service at any time, except when specifically instructed by SLDC or with a specific and prior clearance of SLDC. The list of such important grid elements on which the above stipulations apply shall be prepared by the SLDC in consultation with the Transmission Licensees and Users and shall be available at SLDC's website:

Provided further that, in case of opening/removal of any important element of the InSTS under an emergency situation, the same shall be communicated to SLDC at the earliest after the event:

Provided that any emergency tripping not advised or permitted by SLDC shall be put up before the GCC for ratification, in the subsequent meeting.

- 29.6. Any tripping, whether manual or automatic, of any of the elements of the InSTS, referred in Regulation 29.3, shall be precisely intimated by the concerned Transmission Licensee or User to the SLDC within one time block. The reason, to the extent determined, and likely time of restoration shall also be intimated. All reasonable attempts shall be made for the elements' restoration as soon as possible:

Provided that the information/data from disturbance recorder, sequential event logger outputs, etc., containing the sequence of tripping and restoration or any other information as asked, shall be sent to SLDC for the purpose of analysis:

Provided further that such information/data may be directly made available at SLDC through suitable communication media for faster post fault analysis during grid disturbances.

- 29.7. All Users, STU and SLDC shall carry out maintenance of their respective power system elements in accordance with the provisions in the Grid Standards specified by the Authority. Any prolonged outage of the power system elements of any Users/STU which is causing or likely to cause danger to the grid or sub-optimal operation of the grid shall regularly be monitored by SLDC. SLDC shall report such outages to GCC. GCC shall suggest an action plan and provide instructions to restore such elements in a specified time period.

- 29.8. SLDC, in coordination with WRLDC, Users and Transmission Licensees shall make all possible efforts to ensure that frequency remains within the band of 49.90 Hz to 50.05 Hz as specified in CERC (IEGC) Regulations, 2010 amended from time to time.
- 29.9. Users and Transmission Licensees shall provide automatic under-frequency and df/dt relay-based load curtailment/islanding schemes in their respective systems, wherever applicable, to arrest frequency decline that could result in a collapse/disintegration of the InSTS, as per the directives of the GCC and shall ensure its effective application to prevent cascade tripping of generating units in case of any contingency.
- 29.10. Users and Transmission Licensees shall ensure that the under-frequency and df/dt relay-based load curtailment/islanding schemes, mentioned in Regulation 29.9 are always functional:
- Provided that the relays may be temporarily kept out of service, in extreme contingencies, with the prior consent of SLDC.
- 29.11. STU shall carry out periodic inspection of the under-frequency relays and produce the report to SLDC. SLDC shall maintain the record of under frequency relay and/or df/dt relay operation:
- Provided that SLDC shall decide and intimate the action required to the Users and Transmission Licensee to get required load relief from under frequency relay and/or df/dt relay operation:
- Provided also that SLDC shall keep comparative data of expected load relief and actual load relief obtained in real-time system operation.
- 29.12. Users and Transmission Licensees shall facilitate identification, installation and commissioning of System Protection Schemes in the power system (including inter-tripping and runback) as finalized by GCC, to operate the InSTS closer to their limits and protect against situations including voltage collapse, cascading and tripping of the important corridor:
- Provided that such schemes shall always be kept in service. If any such scheme is to be taken out of service, prior permission of SLDC shall be obtained indicating the reasons and period of the anticipated outage from service:
- Provided further that such schemes shall be prepared by STU after due consultations with OCC and PCC.
- 29.13. SLDC Procedures shall be developed to recover from partial/total collapse of the grid in accordance with CEA (Grid Standards) Regulations, 2010 and as amended from time to time as per the requirement of the Regulation 42. These procedures shall be followed by all the Users, STU and SLDC to ensure consistent, reliable and quick restoration.
- 29.14. Each User and Transmission Licensee shall provide adequate and reliable communication facility internally and to SLDC, other Users and other Transmission

Licenses to ensure the exchange of data/information necessary to maintain reliability and security of the InSTS. Wherever possible, redundancy and alternate path shall be maintained for communication along the important routes, e.g., Users to Distribution Licensee/respective entity to SLDC.

- 29.15. All Users and Transmission Licensees shall send the requested information/data including disturbance recorder/sequential event recorder output, etc. within 24 hours to SLDC for the purpose of analysis of any grid disturbance/event. No User or Transmission Licensee shall block any data/information required by the SLDC and/or WRLDC for maintaining reliability and security of the State and/or Regional Grid and for analysis of an event.

30. Operation of Generators Connected to InSTS

- 30.1. A generating unit shall be capable of continuously supplying its normal rated active and/or reactive output at the rated system frequency and voltage, subject to the design limitations specified by the manufacturer.
- 30.2. A generating unit shall be provided with an Automatic Voltage Regulator (AVR), protective devices and safety devices, as set out in Connection Agreement and/or specified by the Authority.
- 30.3. All coal/lignite based thermal generating units of 200 MW and above, open cycle gas turbine/combined cycle generating stations having gas turbines of capacity more than 50 MW each and all hydro units of capacity more than 25 MW, which are synchronised with grid, irrespective of their ownership, shall have their governors in operation at all times in accordance with the following provisions:

Governor Action

- a) Following thermal and hydro generating units shall be operated under free governor mode of operation (FGMO).
- i. Coal/Lignite based thermal generating units of 200 MW and above;
 - ii. Open Cycle Gas Turbine/Combined Cycle generating stations having gas turbines of capacity more than 50 MW each;
 - iii. Hydro units of capacity more than 25 MW.

Provided that the generators presently operating under restricted governor mode of operation (RGMO) shall be operated in FGMO within one year from the date of notification of these regulations.

Provided further that if any generating unit of over 50 MW size is required to be operated without its governor in normal operation, the SLDC shall be immediately advised about the reason and duration of such operation.

30.4. All Generating Stations connected to InSTS shall submit their frequency response characteristics (FRC) to SLDC on monthly basis to corroborate their self-certification regarding the compliance to governor mode of operation as per Regulation 30.3a)i above.

30.5. Facilities available with/in load limiters, Automatic Turbine Run-up System, Turbine Supervisory Control, Coordinated Control System, etc., shall not be used to suppress the normal governor action in any manner and no dead bands and/or time delays shall be deliberately introduced.

Provided that periodic check-ups by the third party should be conducted at regular intervals, once in two years, through independent agencies selected by SLDC. The cost of such tests shall be recovered from the generators by the SLDC. If deemed necessary by SLDC, the test may be conducted more than once in two years.

30.6. All coal/lignite based thermal generating units of 200 MW and above, open cycle gas turbine/combined cycle generating stations having gas turbines of more than 50 MW each and all hydro generating units of capacity more than 25 MW, operating at or up to 100% of their Maximum Continuous Rating(MCR), shall be capable of (shall not in any way be prevented of) instantaneously picking up to 105% and 110% of their MCR respectively when frequency falls suddenly. After an increase in the generation as above, a generating unit may ramp back to the original level, at a rate of about 1% per minute, in case the continued operation at the increased level is not sustainable. Any generating unit not complying with the above requirements shall be kept in operation (synchronized with the State Grid) only after obtaining the permission of SLDC.

30.7. For the purpose of ensuring primary response, SLDC shall schedule the generating station or unit(s) as specified in the Regulations 14.4 of these Regulations. The generating station shall not resort to Valve Wide Open (VWO) operation of units whether running on full load or part load and shall ensure that there is margin available for providing Governor action as a primary response. In case of gas/liquid fuel based units, suitable adjustment in installed capacity should be made by SLDC for scheduling in due consideration of prevailing ambient conditions of temperature and pressure vis-à-vis site ambient conditions on which installed capacity of the generating station or unit (s) thereof have been specified:

Provided that scheduling of hydro stations shall not be reduced during high inflow period in order to avoid spillage:

Provided further that, the VWO margin shall not be used by SLDC to schedule Ancillary Services as and when introduced by the Commission.

30.8. The recommended rate for changing the governor setting, i.e., supplementary control for increasing or decreasing the output (generation level) for all generating units,

irrespective of their type and size, would be 1% per minute or as per manufacturer's limits.

- 30.9. Except under an emergency, or to prevent imminent damage to the equipment, no User shall suddenly reduce his generating unit output by more than the limit as specified by the SLDC, without prior intimation to and consent of the SLDC. Similarly, no User shall cause a sudden variation in its load by more than the limit as specified by the SLDC, without prior intimation to and consent of the SLDC. All the Users shall ensure that temporary overvoltage due to sudden load rejection and the maximum permissible values of voltage unbalance shall remain within limits specified under IEGC or Authority as amended from time to time.
- 30.10. All generating units shall be provided with an AVR, protective and safety devices, as set out in Connection Agreement. All generating units shall normally have their AVR in operation, with appropriate settings:
- Provided that in case a generating unit of over 50 MW is required to be operated without its AVR in service, the SLDC shall be immediately intimated about the reason and duration, and its permission is obtained.
- 30.11. Power System Stabilizers in the AVR of generating units, wherever provided, shall be properly tuned by the respective generating unit owner as per the directions of the STU from time to time. STU will be allowed to carry out checking of the Power System Stabilizer and further tuning it, wherever considered necessary.
- 30.12. All generating stations connected to the Grid shall follow the instructions of SLDC for backing down/ramping down/shutting down the generating unit(s). SLDC shall provide a Certificate for the period of the backing down/ramping down/shutting down for the purpose of computing the deemed generation if required.
- 30.13. SLDC shall make all efforts to evacuate the available solar, wind and solar-wind hybrid power and treat as a must-run station. However, SLDC may instruct the solar/wind generator to back down generation as consideration of grid security is endangered and solar/wind generator shall comply with the same. For this, the Data Acquisition System facility shall be provided for transfer of information to the SLDC.
- a) SLDC may direct a wind farm to curtail its VAr drawal/injection in case the grid security is endangered.
 - b) During the wind generator start-up, the wind generator shall ensure that the reactive power drawl (inrush currents in case of induction generators) shall not affect the grid performance.
- 30.14. Hydro generators having the capability to operate in pump mode are required to do so under instructions from SLDC.

31. Declaration of Commercial Operation Date (COD)

31.1. The InSGS connected to InSTS and any component of InSTS shall follow the procedures specified below for declaration of COD.

31.2. Declaration of Commercial operation of InSGS.

31.2.1. Date of commercial operation in case of a unit of thermal InSGS shall mean the date declared by the generating company after demonstrating the unit capacity corresponding to its MCR or the Installed Capacity (IC) or name Plate Rating on designated fuel through a successful trial run and after getting clearance from the SLDC, and in case of the generating station as a whole, the COD of the last unit of the generating station:

Provided that:

- a) Where the beneficiaries/buyers have been tied up for purchasing power from the generating station, the trial run or each repeat of trial run shall commence after a notice of not less than seven days by the generating company to the beneficiaries/buyers and SLDC.
- b) Where the beneficiaries/buyers have not been tied up for purchasing power from the generating station, the trial run or each repeat of trial run shall commence after a notice of not less than seven days by the generating company to the SLDC.
- c) The generating company of InSGS shall certify that:
 - i. The generating station meets the relevant requirements and provisions of the technical standards of CEA (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2010 and IEGC, as applicable.
 - ii. The main plant equipment and auxiliary systems including balance of plant, such as fuel oil system, coal handling plant, DM plant, pre-treatment plant, fire-fighting system, ash disposal system and any other site specific system have been commissioned and are capable of full load operation of the units of the generating station on sustained basis.
 - iii. Permanent electric supply system including emergency supplies and all necessary instrumentation, control and protection systems and auto loops for full load operation of the unit have been put in service.
- d) The certificates as required under clause (iii) above shall be signed by the Director/Senior officer of the generating company and a copy of the certificate shall be submitted to the SLDC before the declaration of COD. The generating company shall submit approval of the board of directors to the certificates as required under clause (iii) within a period of three months of the COD.
- e) Trial run shall be carried out in accordance with Regulation 31.2.3 of these Regulations.

- f) Partial loading may be allowed with the condition that average load during the duration of the trial run shall not be less than MCR or the Installed Capacity or the Name Plate Rating excluding the period of interruption and partial loading but including the corresponding extended period.
- g) Where on the basis of the trial run, a unit of the generating station fails to demonstrate the unit capacity corresponding to MCR or installed capacity or name plate rating, the generating company has the option to de-rate the capacity or to go for repeat trial run. Where the generating company decides to de-rate the unit capacity, the demonstrated capacity in such cases shall be more or equal to 105% of de-rated capacity.
- h) SLDC, shall confirm its consent or convey its concerns and objections, if any, to the generating company for declaration of COD within seven days of receiving the generation data based on the trial run.
- i) If SLDC notices any deficiencies in the trial run, it shall be communicated to the generating company within seven days of receiving the generation data based on the trial run.
- j) Scheduling of power from the generating station or unit thereof shall commence from 00:00 hrs after the declaration of COD.

31.2.2. COD in relation to a generating unit of hydro generating station including pumped storage hydro generating station, shall mean the date declared by the generating company after demonstrating peaking capability corresponding to the Installed Capacity of the generating station through a successful trial run, and after getting clearance from the SLDC, and in relation to the generating station as a whole, the COD of the last generating unit of the generating station.

Provided that:

- a) Where beneficiaries have been tied up for purchasing power from the generating station, trial run or each repeat of trial run shall commence after a notice of not less than seven days by the generating company to the beneficiaries and SLDC;
- b) Where the beneficiaries/buyers have not been tied up for purchasing power from the generating station, the trial run shall commence after a notice of not less than seven days by the generating company to SLDC.
- c) The generating company shall certify that:
 - i. The generating station or unit thereof meets the requirement and relevant provisions of the technical standards of CEA (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2010 and Indian Electricity Grid Code, as applicable:
 - ii. The main plant equipment and auxiliary systems including drainage and dewatering system, primary and secondary cooling system, LP and HP air compressor, firefighting system, etc. have been commissioned and are capable for full load operation of units on a sustained basis.

- iii. Permanent electric supply system including emergency supplies and all necessary instrumentations, control and protection systems and auto loops for full load operation of the unit are put into service.
- d) The certificates as required under clause (iii) above shall be signed by the Director/Senior officer of the generating company and a copy of the certificate shall be submitted to the SLDC, before the declaration of COD. The generating company shall submit approval of the Board of Directors to the certificates as required under clause (iii) within a period of three months.
- e) Trial run shall be carried out in accordance with sub-Regulation 31.2.3 of this Regulation.
- f) Where on the basis of the trial run, a unit of the generating station fails to demonstrate the unit capacity corresponding to MCR or Installed Capacity or name plate rating, the generating company shall have the option to either de-rate the capacity or to go for repeat trial run. If the generating company decides to de-rate the unit capacity, the demonstrated capacity in such cases shall be more or equal to 110% of de-rated capacity.
- g) In case a hydro generating station with pondage or storage is not able to demonstrate the peaking capability corresponding to the installed capacity for the reasons of insufficient reservoir or pond level, the COD of the last unit of the generating station shall be considered as the COD of the generating station as a whole, and it will be mandatory for such hydro generating station to demonstrate peaking capability equivalent to installed capacity of the generating station or unit thereof as the case may be, as and when such reservoir/pond level is achieved:
- h) If a run-of-river hydro generating station or a unit thereof is declared under commercial operation during lean inflows period when the water inflow is insufficient for such demonstration of peaking capability, it shall be mandatory for such hydro generating station or unit thereof to demonstrate peaking capability equivalent to the installed capacity as and when sufficient water inflow is available. In case of failure to demonstrate the peaking capacity, the unit capacity shall be de-rated to the capacity demonstrated with effect from the COD.
- i) If SLDC, notices any deficiency in the trial run, it shall be communicated to the generating company within seven days of receiving the generation data based on the trial run.
- j) Scheduling shall commence from 00:00 hrs after the declaration of COD.

31.2.3. Trial Run or Trial Operation in relation to a thermal generating station or a unit thereof shall mean successful running of the generating station or unit thereof on designated fuel at MCR or installed capacity or name plate rating for a continuous period of 72 hours and in case of a hydro generating station or a unit thereof at maximum rating or installed capacity or nameplate rating for a continuous period of 12 hours:

Provided that:

- a) Short interruptions, for a cumulative duration of four hours, shall be permissible, with a corresponding increase in the duration of the test. cumulative interruptions of more than four hours shall call for a repeat of trial operation or trial run.
- b) Partial loading may be allowed with the condition that average load during the duration of the trial run shall not be less than maximum continuous rating, or the installed capacity or the name plate rating excluding the period of interruption and partial loading but including the corresponding extended period.
- c) Where beneficiaries have been tied up for purchasing power from the generating station, the trial run or each repeat of trial run shall commence after a notice of not less than seven days by the generating company to the beneficiaries and SLDC.
- d) Units of thermal and hydro generating stations shall also demonstrate the capability to raise load up to 105% or 110% of this MCR or installed capacity or the name plate rating as the case may be.

31.3. **Declaration of date of Commercial operation of InSTS.**

31.3.1. COD in relation to an InSTS or an element thereof shall mean the date declared by the transmission licensee from 00:00 hours of which an element of the transmission system is in regular service after successful trial operation for transmitting electricity and communication signal from the sending end to the receiving end:

Provided that:

- a) In case of InSTS executed through TBCB, the transmission licensee shall declare COD of the InSTS in accordance with the provisions of the Transmission Service Agreement (TSA).
- b) Where the transmission line or substation is dedicated for evacuation of power from a particular generating station and the dedicated transmission line is being implemented other than through TBCB, the concerned generating company and Transmission Licensee shall endeavour to the Commission, the generating station and the transmission system simultaneously as far as practicable and shall ensure the same through appropriate Implementation Agreement in accordance with relevant provisions of MERC (Terms and Conditions of Tariff) Regulations, 2019 or any subsequent amendment or re-enactment thereof. In case the transmission line or substation dedicated to a generator is being implemented through TBCB, then matching of commissioning of the transmission line/substation and generating station shall be monitored by the CEA.
- c) Where the transmission system executed by a transmission licensee is required to be connected to the transmission system executed by any other

Transmission Licensee and both transmission systems are executed in a manner other than through TBCB, the Transmission Licensee shall endeavour to match the commissioning of its transmission system with the transmission system of the other licensee as far as practicable and shall ensure the same through an appropriate implementation agreement. Where either of the transmission systems or both are implemented through TBCB, the progress of implementation of the transmission systems in a matching time schedule shall be monitored by the CEA.

- d) In case a transmission system or an element thereof is prevented from regular service on or before the Scheduled COD for reasons not attributable to the transmission licensee or its supplier or its contractors but is on account of the delay in commissioning of the concerned generating station or in commissioning of the upstream or downstream transmission system of other Transmission Licensee, the Transmission Licensee shall approach the Commission through an appropriate application for approval of the COD of such transmission system or an element thereof.

Provided that, the Transmission Licensee while executing the Transmission, System shall endeavour to match the construction schedule of the generator or downstream network as the case may be to avoid the idling of the assets.

Provided further that, in case of an existing Transmission Licensee, such request may be included as part of its Multi Year Tariff (MYT) Petition or Mid-Term Review Petition or True-up Petition to be filed under MYT Regulations;

- e) An element shall be declared to have achieved COD only after all the elements which are pre-required to achieve COD as per the TSA are commissioned. In case any element is required to be commissioned prior to the commissioning of the pre-required element, the same can be done if CEA/STU confirms that such commissioning is in the interest of the power system.
- f) Transmission Licensee shall submit a certificate from the Director/Senior officer of the company that the transmission line, substation and communication system conforms to the relevant provisions of MEGC and other Standards specified by the Authority.

31.3.2. Trial run and Trial operation in relation to a transmission system or an element thereof shall mean successful charging of the transmission system or an element thereof for 24 hours at the continuous flow of power, and communication signal from the sending end to the receiving end and with the requisite metering system, telemetry and protection system in service enclosing certificate to that effect from the SLDC.

31.3.3. COD in relation to a communication system or an element thereof shall mean the date declared by the Transmission Licensee from 00:00 hour of which a communication system or element thereof shall be put into

service after the completion of site acceptance test, including the transfer of voice and data to the respective control centre as certified by the SLDC.

- 31.3.4. In the event of any dispute regarding the CoD declaration, the SLDC's certification shall prevail.

Provided that, in the event of inconsistency between the provisions relating to the trial operation and commercial operation as specified in these regulations and the provisions of MERC (Terms and Conditions of Tariff) Regulations, 2019 or any subsequent enactment thereof, the provisions of these regulations shall prevail.

32. Demonstration of DC of the Generating Units in the State:

- 32.1. SLDC may ask the generating station/Units connected to InSTS (excluding renewable energy generators) to demonstrate the maximum DC of generating Unit for the day or generation schedule for the particular time block, particularly under the following circumstances:

- 32.1.1. In case the schedule by generator for a particular Unit during peak hours is lower than off-peak hours;
- 32.1.2. In case the schedule for a particular generating unit during the low demand period during the year is higher than the generation schedule during the high demand period during the year;
- 32.1.3. In case the variation in minimum and maximum generation schedule by any generator for a particular generating unit during various time-blocks of the day is more than 30% of contracted capacity;
- 32.1.4. In case of the request by contracted distribution licensee;
- 32.1.5. At the discretion of the SLDC on random basis at any time which shall not be more than once every quarter.

(Explanation – For the purpose of these Regulations, the number of hours of “peak” and “off-peak” periods during a day shall be four and twenty respectively. The hours of peak and off-peak periods during a day shall be declared by the SLDC at least a week in advance. The high demand season (period of three months, consecutive or otherwise) and low demand season (period of remaining nine months, consecutive or otherwise) in the State shall be declared by the SLDC, at least six months in advance.

Provided that the SLDC, after duly considering the comments of the concerned stakeholders, shall declare peak hours and high demand season in such a way as to coincide with the peak hours and high demand season of the State).

- 32.2. Detailed Procedure for Demonstration of DC of generating units is enclosed as Annexure-3 with these Regulations.
- 32.3. If generator unit is unable to ramp up the under circumstances specified above, such instance will be considered as misdeclaration by the generator and the penalty as per the provisions of MYT Regulations shall be made applicable. For generating units

whose Tariff is being determined by the Commission under Section 62 of the EA 2003, the penalty shall be as per the MYT Regulations and for the Generating Units having PPAs entered into under Section 63, the penalty shall be as per the provisions of PPA or as per following conditions, whichever is higher :

- (a) In the event of the Generating Company failing to demonstrate the declared capacity, the Annual Fixed Charges due to Generating Company shall be reduced as measure of penalty
- (b) The quantum of penalty for the first mis-declaration for any duration/block in a day shall be the charges corresponding to two days fixed charges
- (c) For the second mis-declaration, the penalty shall be equivalent to fixed charges for four days and for subsequent mis-declarations in the year, the penalty shall be multiplied in the geometrical progression.

- 32.4. The generator which fails to demonstrate the DC shall require to re-demonstrate the DC for which it had failed to demonstrate with prior request to SLDC and concerned beneficiary as per the detailed procedure.

Provided that, such generator shall not be allowed to request for re-demonstration of DC on the same day.

Provided further that the SLDC shall cap the DC of such generator to the actual generation demonstrated during test for the remaining time-blocks of that day or till such time the generator re-demonstrate the higher DC than the actual generation demonstrated during testing.

Provided further that the costs associated with re-demonstration of DC shall be borne by such Generator

- 32.5. SLDC shall prepare the report of such instances of misdeclaration in the format enclosed as Annexure-6 and publish the report on its website. SLDC shall send the report to the concerned Distribution Licensee having PPA with the Generating Unit on a monthly basis, by 5th of every month.

33. Principles of Merit Order Despatch for Operation of InSGS Connected to InSTS

- 33.1. SLDC is responsible for coordinating the scheduling of Buyers and Sellers within its control area. SLDC shall also be responsible for Preparation of Merit Order (MOD) Stack for Day Ahead scheduling process for each month considering the principles specified in the MERC DSM Regulations and the Principle specified in this MEGC as amended from time to time.
- 33.2. SLDC shall prepare Buyer wise MOD Stack for day-ahead scheduling process and centralised MOD Stack for intra-day operation considering the principles specified in the MERC DSM Regulations and Scheduling and Despatch Code under the SGC by the Commission.
- 33.3. SLDC shall prepare separate MOD Stack for each Buyer considering the contracts of respective Buyer and least cost principles as specified in the MOD Principles of SGC.

- 33.4. SLDC shall also prepare Centralised MOD Stack of the generators for real-time operation, in case the grid parameters including frequency, voltage, transmission line loading, substation loading conditions or State volume limits (presently +/-250 MW) deviate beyond permissible operating range as specified in the Scheduling and Despatch Code.
- 33.5. For preparation of MoD Stack, seller whose tariff is determined by the Commission or seller whose tariff is adopted by the Commission shall project the unit wise variable charge for the next month for which MoD is to be prepared considering all the possible charges including impact of change in law and submit to the buyer by 11th day of every month in the Format- 5B enclosed as Annexure -8 with these Regulations.
- 33.6. The seller shall also submit to the buyer, all the computations and supporting documents considered for projection of variable charge for the next month.
- Provided that, the seller shall consider the variable charge approved/adopted by the Commission and FSA billed during latest month and impact of all the change in laws already approved by the Commission and projected impact on the variable charge on account of change in law by various authorities.
- 33.7. The buyer shall verify the variable charge submitted by seller and submit to the SLDC for preparation of MoD stack by 14th day of every month with intimation to seller with whom it has PPA in the Format- 5B enclosed as Annexure-8 with these Regulations.
- 33.8. SLDC shall prepare the MoD Stack on the 15th day of every month, which would be effective from the 16th day of the month till the 15th day of the subsequent month unless revised by SLDC. SLDC shall upload the monthly MoD Stack on its website by 15:00 hours on the 15th day of every month in the Format- 5B and Format-6B enclosed as Annexure -8.1 and Annexure-8.2 with these Regulations.
- 33.9. MoD Stack uploaded on the 15th of the month may be subsequently revised by SLDC in the following circumstances:
- a) Commencement of supply of power by a Generating Unit under a new arrangement/agreement,
 - b) Revision of Variable Charges for preparing the MOD Stack due to Tariff Order issued by this Commission for State Generating Stations or the CERC for Central Generating Stations,
 - c) Impact of Change in Law in the PPAs as notified by the Distribution Licensee.
- 33.10. The Commission shall scrutinise and ascertain the variations, if any, from the basis of projection of variable charge during prudence check at the time of truing up of Generating Stations whose tariff is determined by the Commission and in case of claims for revision in Variable Charge on account change in law in case of generating stations whose tariff is adopted by the Commission.

Provided that, during prudence check if the Commission observes that, the seller has not considered the impact of change in law in existence at the time of projection of variable charge for MoD purpose, the Commission shall disallow the same.

Provided further that at the time of true-up of power purchase cost of Buyers, the Commission shall consider the adherence to MoD principles followed by Buyers and due diligence exercised by the Buyers on claims of projected variable charges as estimated by Sellers to ensure overall efficacy of the power procurement by Buyers.

- 33.11. For Central Section Generating Stations (CSGS), the Variable Charge for MOD purposes shall be the landed variable cost at the State periphery for the immediately preceding month, including the injection losses, drawal losses of CTU and other such charges like Electricity Duty Cess of exporting State.
- 33.12. The Seller shall consider impact of Change in Law in the Variable Charge that it intimates to Buyer and Buyer to SLDC for preparation of the MOD Stack. However, the payments for such Change in Law claims will be made by the Buyer to Seller after the approval of the Commission in accordance with the provisions of the MYT Regulations or provisions of PPA.
- 33.13. For Intra-State Open Access transactions having single part tariff, total tariff shall be considered as Variable Charge for MOD purpose.
- 33.14. The Variable Charges for MOD purposes shall be provided up to four decimal places.

34. Technical Minimum Schedule for Operation of InSGS Connected to InSTS

- 34.1. Technical minimum for operation in respect of a unit or units of InSGS shall be 55% of MCR loading or installed capacity of the unit of generating station.

Provided that, deviation from the above provision may be considered by the Commission on case to case basis subject to certification from the Original Equipment Manufacturer (OEM) of generating plant with supporting document.

- 34.2. InSGS may be directed by SLDC to operate its unit(s) at or above the technical minimum but below the normative plant availability factor on account of grid security or due to the fewer schedules given by the buyer.
- 34.3. InSGS, who will be directed by SLDC to operate below normative plant availability factor but at or above technical minimum, shall be compensated depending on the Average Unit Loading (AUL) duly taking into account the forced outages, planned outages, PLF, generation at generator terminal, energy sent out ex-bus, number of start-stop, secondary fuel oil consumption and auxiliary energy consumption, in due consideration of actual and normative operating parameters of station heat rate, auxiliary energy consumption and secondary fuel oil consumption etc. on monthly basis duly supported by relevant data verified by SLDC.

Provided that no compensation for SHR degradation or increase in AEC shall be payable if the AUL for the generating station for the computation period works out to be more than or equal to 70%.

Provided further that:

- a) In case of coal/lignite based generating stations, following station heat rate degradation or actual heat rate, whichever is lower, shall be considered for the purpose of compensation:

Sr. No.	Unit loading of Installed Capacity of the Unit (%)	Increase in SHR (for supercritical units) (%)	Increase in SHR (for sub-critical units) (%)
1	85 - 100	Nil	Nil
2	75 - 84.99	1.25	2.25
3	65 - 74.99	2	4
4	55 - 64.99	3	6

- b) In case of coal/lignite based generating stations, the following Auxiliary Energy Consumption degradation or actual, whichever is lower, shall be considered for the purpose of compensation:

Sr. No	Unit Loading (% of MCR)	Degradation in AEC admissible (%)
1.	85 – 100	NIL
2.	75 - 84.99	0.35
3.	65 - 74.99	0.65
4.	55 - 64.99	1.00

- c) Where the scheduled generation falls below the technical minimum schedule, the concerned InSGS shall have the option to go for Reserve Shut Down (RSD) and in such cases, start-up fuel cost over and above seven start/stop in a year shall be considered as additional compensation based on the following norms or actual, whichever is lower:

Unit Size (MW)	Oil Consumption per start-up (Kl)		
	Hot	Warm	Cold
200/210/250 MW	20	30	50
500 MW	30	50	90
660 MW	40	60	110

- d) In case of gas-based InSGS, compensation shall be decided based on the characteristic curve provided by the manufacturer and after prudence check of actual operating parameters of Station Heat Rate, Auxiliary Energy Consumption, etc.
- e) Compensation for the Station Heat Rate and Auxiliary Energy Consumption shall be worked out in terms of energy charges.
- f) The compensation so computed shall be borne by the entity who has caused the plant to be operated at schedule lower than corresponding to the

normative plant. Availability Factor up to technical minimum based on the compensation mechanism specified by the Commission as Annexure-4 with these Regulations.

- g) No compensation for Heat Rate degradation and Auxiliary Energy Consumption shall be admissible if the actual Heat Rate and/or actual Auxiliary Energy Consumption are lower than the normative Station Heat Rate and/or normative Auxiliary Energy Consumption applicable to the unit or the generating station.
- h) There shall be a reconciliation of the compensation at the end of the financial year in due consideration of actual weighted average operational parameters of Station Heat Rate, Auxiliary Energy Consumption and Secondary Oil Consumption.
- i) No compensation for Heat Rate degradation and Auxiliary Energy Consumption shall be admissible if the actual Heat Rate and/or actual Auxiliary Energy Consumption are lower than the normative station Heat Rate and/or normative Auxiliary Energy Consumption applicable to the unit or the generating station in a month or after annual reconciliation at the end of the year.

34.4. In case of a generating station whose tariff is neither determined nor adopted by the Commission, the concerned generating company shall have to factor the above provisions in the PPAs entered for sale of power to claim the compensation for operating at the technical minimum schedule.

34.5. The generating company shall keep a record of the emission levels from the plant due to part load operation and submit a report for each year to the Commission by 31st May.

34.6. The mechanism for compensation for station heat rate and auxiliary energy consumption for low unit loading on monthly basis in terms of energy charges and compensation for secondary fuel oil consumption over and above the norm of 0.5 ml/kWh for additional start-ups in excess of seven start-ups, is enclosed as Annexure-4 with these Regulations.

35. Guidelines for 'Zero Schedule' for InSGS Connected to InSTS

35.1. In case of anticipated generation availability in surplus of anticipated demand, the Distribution Licensees need to optimise their cost of power procurement considering the contracted sources for the period of anticipated surplus.

35.2. The distribution licensee shall ensure that, there shall not be any adverse impact on its power procurement cost on account of zero scheduling of contracted generator.

Provided that, the Commission shall verify the decisions of zero scheduling of unit vis-à-vis power procurement cost from alternate sources during trueing up of ARR of distribution licensee.

- 35.3. If the anticipated generation availability is more than the anticipated demand, the Distribution Licensee in consultation with SLDC may consider giving Zero Schedule (ZS) to some of its contracted sources for the period during which the demand is expected to be lower than the total contracted sources availability put together.
- 35.4. SLDC shall provide its concurrence to the proposed “Zero Schedule” by Distribution Licensee considering the demand-supply position and transmission constraints.
- 35.5. If grid constraints prevent the Zero Scheduling of the Unit with the highest Variable Charge in the MOD Stack, the Unit with the next highest Variable Charge needs to be considered. However, SLDC shall publish the details of such grid constraints on its website, along with the period for which it is likely to persist.
- 35.6. The distribution licensee shall give the generator 24 hours prior notice of the Zero Scheduling to enable it to take steps for smooth removal of the Unit from the Grid.
- 35.7. In case a particular Unit is, in fact, required to be scheduled during the pre-declared Zero scheduling period, the distribution licensee shall intimate the generator at least 72 hours in advance for the Unit(s) to come on a bar in cold start.
- 35.8. Zero scheduling shall be carried out by the distribution licensee considering its roles and obligations under the corresponding PPAs.
- 35.9. Any additional cost implication in Variable Charges (by means of inferior norms of operation or minimum fuel off-take conditions) that arises on account of Zero Scheduling shall be borne entirely by such distribution licensee and shall be dealt as per provisions under PPA with generators. Pass through on this count will not be allowed while truing up the power procurement cost.

36. Guidelines for Instructing RSD of Generating Unit by SLDC

- 36.1. A Reserve margin equivalent to the contracted capacity of the largest Unit of the Power Station, contracted by the Distribution Licensee needs to be maintained.
- 36.2. RSD should be implemented for the capacity available in excess of the largest Unit contracted by the Distribution Licensee.
- 36.3. RSD should be applied to Units with higher Variable Charges in the MOD Stack, subject to grid conditions permitting the same.
- 36.4. SLDC shall upload the details of RSD of the previous month on its website by the 3rd of every month in the format provided as Annexure-5 with these Regulations.

37. Voltage Control and Reactive Power Management

- 37.1. Reactive power compensation and/or other facilities shall be provided by the STU/Users, as far as possible, in the areas prone to low or high voltage systems close to the load points thereby avoiding the need for exchange of Reactive Power to/from the InSTS and to maintain the InSTS voltage within the specified range at all the times. Their healthiness and operation as per real time requirement shall be ensured by the User/STU.

- 37.2. Line Reactors may be provided to control temporary overvoltage within the limits set out in connection agreements.
- 37.3. The additional reactive compensation to be provided by the User shall be indicated by the STU in the Connection Agreement for implementation.
- 37.4. Users shall endeavor to minimize the Reactive Power drawal at an interchange point when the voltage at that point is below 97% of rated voltage and shall not inject Reactive Power when the voltage is above 103% of rated voltage. Interconnecting Transformer taps at the respective drawal points may be changed to control the Reactive Power interchange as per a User's request to the SLDC, but only at reasonable intervals.
- 37.5. Switching in/out of all 400 kV bus and line Reactors throughout the grid shall be carried out as per the instructions of SLDC. Tap changing on all 400/220 kV Interconnecting Transformers shall also be done as per the instructions of SLDC only. The Users already connected to the grid shall provide additional reactive compensation as per the quantum and time decided by the SLDC.
- 37.6. Notwithstanding anything above, SLDC may direct the User to curtail its VAR drawal/injection in case the security of the Grid or safety of any equipment is endangered.
- 37.7. As per Regulation 70 of the MERC (Multi-Year Tariff) Regulations, 2019, the Generating Station shall inject/absorb the reactive energy into the grid on the basis of machine capability as per the directions of SLDC.
- 37.8. Reactive energy exchange, only if made as per the directions of SLDC, for the applicable duration (injection or absorption) shall be compensated/levied by the SLDC to the generating station as specified in these Regulations.
- 37.9. The generating station shall change generator transformer taps and generate/absorb Reactive power as per the instructions of SLDC within the capability limits of the respective generating units, i.e., without sacrificing the active generation required at that time. Payments shall be allowed to be paid to the generating stations for such VAR generation/absorption at the generating stations as per the detailed procedure enclosed as Annexure-7 of these Regulations.
- 37.10. Wind generating stations connected to InSTS shall be capable of supplying dynamically varying reactive power support, so as to maintain power factor of 0.98 (absorbing) at their grid inter-connection point for all dispatch scenarios by providing adequate reactive compensation or as specified by the Authority and the same shall be assumed for system studies.
- 37.11. Wind generating stations and solar generating stations shall have fault ride through the capability of not less than 300 milliseconds so that the grid is not destabilized due to sudden outage of generation in the event of grid disturbance. The provisions of the CEA's Regulations for Low Voltage Ride Through (LVRT) and High Voltage Ride

Through (HVRT) shall be applicable to the Wind and Solar Generators as amended from time to time.

- 37.12. Wind and Solar generators shall control the harmonics level, at all connection points of a User on the transmission system, in accordance with that prescribed by the IEEE STD 519-1992, namely “IEEE recommended practices and requirements for harmonic control in the electrical power systems”
- 37.13. All Users shall attempt to ensure that grid voltages always remain within the limits specified in CEA (Grid Standards) Regulations, 2010 as amended from time to time and as mentioned below:

Voltage - (kV rms)		
Nominal	Maximum	Minimum
765	800	728
400	420	380
220	245	198
132	145	122
110	121	99
100	110	90
66	72	60
33	36	30
22	24	20
11	12	10

- 37.14. STU and/or SLDC shall carry out load flow studies to predict where voltage problems may be encountered based on the operational data and identify appropriate measures to ensure that voltages remain within the defined limits. On the basis of these studies, SLDC may issue specific instructions to Users to maintain voltage level at interconnecting points within permissible limits.
- 37.15. SLDC shall take appropriate measures to control InSTS voltages, which may include but not limited to power transformer tap changing, capacitor/reactor switching including capacitor switching by the distribution licensees at 66 kV and 33 kV substations, operation of hydro unit as synchronous condenser and use of MVAR reserves with generating stations within the technical limits agreed to between the STU and generators:

Provided that generators shall inform SLDC of their reactive reserve capability promptly on request.

Provided further that the generating station shall inject/absorb the reactive energy into/from the InSTS on the basis of their Unit capability as per the directions of SLDC.

- 37.16. Reactive energy exchange, only if made as per the directions of SLDC, for the applicable duration (injection or absorption) shall be compensated/levied as per the detailed procedure for accounting and settlement of intra-state reactive energy charges specified as Annexure-7 with these Regulations:

Provided that the applicability of the procedure for accounting and settlement of Intra-State reactive energy charges shall come into effect from the date to be notified by the Commission separately.

- 37.17. Generating Stations (except CPPs) shall provide up to date capability curves for all Generating Units to the SLDC indicating any restrictions to allow accurate system studies and effective operation of the InSTS:

Provided that CPPs shall similarly furnish the net reactive capability that will be available for Export/Import to/from InSTS.

- 37.18. All Users and STUs shall provide adequate voltage control measures through voltage relay as finalized by GCC or operational committee thereunder, to prevent voltage collapse and shall ensure its effective application to prevent voltage collapse/cascade tripping. Voltage fluctuation limits and voltage wave-form quality shall be maintained as specified in Authority.

- 37.19. All Users except generating stations shall provide local VAr compensation/generation to maintain the voltage within the specified limits:

Provided that there shall not be any drawal of VARs from the EHV grid under low-voltage condition.

- 37.20. Notwithstanding the above, SLDC may direct all Users except Generating Stations to curtail its VAr drawal/injection in case the security of InSTS is endangered.

- 37.21. Reactive power facilities connected to InSTS shall be in operation at all times and shall not be taken out without the permission of SLDC.

- 37.22. Periodic/seasonal tap changing of inter-connecting transformers and generator transformers shall be carried out to optimize the voltages and if required other options such as tap staggering may be carried out in the network.

- 37.23. Generating stations connected to InSTS shall generate/absorb reactive power as per the instructions of SLDC, within the capability limits of the respective generating units, without sacrificing the active generation required at that time.

- 37.24. Wind Generators, during the start-up, shall ensure that reactive power drawal shall not affect the grid performance:

Provided that SLDC may direct the wind generator to curtail VAr drawal/injection for the security of the grid.

38. Demand Estimation

38.1. The SLDC shall set out the responsibilities for short term (one day to 52 weeks) demand estimation of active as well as reactive power (MW, MVAR and MWh) for operational purpose. It shall also provide procedures, formats as well as timelines to be followed for exchange of information between the concerned entities for arriving at these estimates.

38.2. All Buyers shall be responsible for the estimation of their own demand. Buyers shall submit their demand estimation to SLDC for demand estimate of the State. All Buyers shall also maintain historical data for demand estimate.

Provided that SLDC shall refer to the demand estimate considered by the STU while developing the transmission system plan under Regulation 12.1 of these Regulations.

38.3. Each Buyer shall develop methodology for daily/weekly/monthly/yearly demand estimation in MW and MWh for operational analysis purposes as well resource adequacy. All Buyers shall also maintain historical database for demand estimation.

38.4. Each Buyer shall utilize state of the art tools, weather data, historical data and any other data for getting effective demand estimate for operational use. Each Buyer shall compare the actual demand with forecast demand and compare the forecasting error for improvement. The Buyers shall maintain the data of forecast error for daily/day-ahead/weekly/monthly and yearly basis on their website.

38.5. The demand estimation shall cover the different time periods such as short term, medium term and long term as applicable for operational purposes. The time period shall be decided after considering the requirements under other existing Regulations for furnishing demand estimate related information.

38.6. Each Buyer shall submit node-wise morning peak, evening peak, day shoulder and night off-peak estimated demand in MW and MVAR on monthly and quarterly basis at all nodes including and above 132 kV for preparation of scenarios for computation of ATC/TTC by SLDC.

38.7. To facilitate estimation of Total Transfer Capability/Available Transfer Capability (ATC) on three-month ahead basis, all Transmission Licensees through STU shall furnish monthly estimated demand and availability data to SLDC for better operational planning for InSTS Network. Similar information shall be furnished by SLDC to RLDC/RPC for better operational planning for ISTS network as per the provision of IEGC.

39. Demand Management

39.1. SLDC shall be responsible for reduction of demand in the event of insufficient generating capacity, inadequate transfers from external interconnections to meet demand, or in the event of breakdown or congestion in InSTS or ISTS or other operating problems (such as frequency, voltage levels beyond normal operating limit,

or thermal overloads of the equipment and lines, etc.) or overdrawal of power vis-à-vis that of intra-state entities beyond the Volume limits specified in MERC DSM Regulations 2019.

- 39.2. SLDC for the safety of InSTS may direct the Users to curtail their drawal from the InSTS. Such directions shall include the time period or the system conditions until which the issued directions shall be applicable:

Provided that any non-compliance of such direction shall be dealt with as per the provisions of Regulation 70 of these Regulations.

39.3. Demand Curtailment

- 39.3.1. Buyers including distribution licensees and Users shall endeavour to restrict their actual drawal, from InSTS, of its control area within their respective drawal schedules:

Provided that if automatic demand management scheme is not available, the manual load curtailment shall occur to ensure that there is no overdrawal.

- 39.3.2. The measures taken by the buyers including distribution licensee or User shall not be withdrawn as long as the frequency remains at a level lower than the limits specified or congestion continues unless specifically permitted by the SLDC.

- 39.3.3. Each buyer including distribution licensee or user or STU shall formulate contingency procedures and make arrangements that will enable demand disconnection to take place, as instructed by the SLDC, under normal and/or contingent conditions:

Provided that SLDC may direct to modify such procedures or arrangement, if required, in the interest of grid security and concerned Users shall abide by these directions.

- 39.3.4. SLDC through respective distribution licensees or Users may formulate and implement state-of-the-art demand management schemes for automatic or manual demand management like under frequency relays, rotational load curtailment, demand response within six months from the notification of these Regulations:

Provided that such schemes shall be duly prepared in coordination with OCC and approved by the GCC.

- 39.3.5. The interruptible loads for demand management shall be arranged in four groups of loads such as:

- a) Scheduled load curtailment;
- b) Unscheduled/Emergency load curtailment;
- c) Loads to be shed under frequency relays or df/dt relays; and
- d) Loads to be shed under any System Protection Scheme such as islanding, to maintain the frequency within the permissible limits and network security:

Provided that such loads shall be grouped in such a manner that it does not overlap between different groups of loads.

- 39.3.6. Particulars of feeders or group of feeders at Transmission Licensee, distribution licensee and User substation which shall be tripped under under-frequency load curtailment scheme whether manually or automatic on a rotational basis or otherwise shall be displayed on their website for information of the consumer(s).
- 39.3.7. SLDC shall devise standard, instantaneous, message formats to give directions in case of contingencies and/or threat to the system security to reduce overdrawal by any User/distribution licensee at different overdrawal conditions depending upon the severity of the overdrawal:

Provided that the concerned User or distribution licensee shall ensure immediate compliance with these directions of SLDC.

- 39.4. In case of certain contingencies and/or threat to system security, the SLDC may direct Users to decrease their drawals and such Users shall act upon such directions immediately:

Provided that such directions shall include the time period or the system conditions until which the issued directions shall be applicable:

Provided further that SLDC and Transmission Licensees shall ensure that requisite load curtailment is carried out by buyers including distribution licensees/Users in its control area so that there shall not be any overdrawal:

Provided further that any non-compliance with such directions shall be dealt with as per the provisions of Regulation 70 of these Regulations.

39.5. Load Crash:

- 39.5.1. In the event of load crash due to weather disturbance or any other reasons, SLDC shall control the situation by getting the following methods implemented from Distribution Licensee(s) and other Users in descending priorities:

- a) Lifting of the load restrictions, if any;
- b) Exporting the power to neighbouring regions/states;
- c) Closing/Backing down of hydropower units (subject to non-spilling of water and effect on irrigation) keeping in view the inflow of water into canals and safety of canals/hydel channels.
- d) Backing down of thermal stations with a time lag of 5-10 minutes for a short period in merit order;

Provided that any other instruction issued by WRLDC shall assume priority over such methods:

Provided further that such methods shall be reviewed from time to time by GCC.

40. Periodic Reports

- 40.1. A daily report covering the performance of the InSTS shall be prepared by SLDC based on the inputs from Users and shall be put on its website. This report shall also cover the wind and solar power generation and injection into the Grid.
- 40.2. A weekly report covering the performance of the InSTS shall be prepared by SLDC. Such weekly report shall be available on the SLDC website for at least 12 weeks. The weekly report shall contain the following:
- a) Frequency profile;
 - b) Voltage profile of selected substations normally having low/high voltages;
 - c) Demand and Supply situation;
 - d) Major Generation and Transmission Outages;
 - e) Transmission constraints;
 - f) Instances of persistent/significant non-compliance of the MEGC;
 - g) Instances of congestion in InSTS;
 - h) Instances of inordinate delays in restoration of transmission elements and generating units;
 - i) Non-compliance of instructions of SLDC by Users resulting in non-compliance of these Regulations;
 - j) Total scheduled and actual generation/drawal of the State Entities;
 - k) Lines/Substations operating near thermal rating or rated capacity; and
 - l) Lines/Substations drawing excessive reactive power.

Provided that the weekly report may categorize the grid incidents (GI) as GI-1 to GI-2 and grid disturbance (GD) as GD-1 to GD-5 based on the severity of tripping as per the provisions of CEA (Grid Standards) Regulations, 2010, as amended from time to time.

- 40.3. A monthly report covering the performance of the InSTS shall be prepared by SLDC and shall be made available on the website.
- 40.4. SLDC shall prepare a quarterly report which shall bring out the system constraints, reasons for not meeting the requirements, if any, of security standards and quality of service, along with the details of various actions taken by different Users/Transmission Licensees, and the Users/Transmission Licensees responsible for causing the constraints.
- 40.5. The SLDC shall also provide information/report to the WRLDC as per the provisions of IEGC in the interest of smooth operation of ISTS.

40.6. The SLDC shall provide the operational feedback to the STU with a copy to the Commission, once in every three months with regard to overloading of various transmission elements and may suggest suitable remedial measures to be taken.

41. Procedure for Operational Liaison

41.1. Operations and Events on User/ STU/Transmission Licensees' System

- 41.1.1. In case the State Grid may or will, experience an operational effect while carrying out any operation on the Transmission system, the concerned User or a Transmission Licensee, shall inform to the SLDC before carrying out such operation with details of the operation to be carried out.
- 41.1.2. The User or a Transmission Licensee shall, immediately following an event on its system, inform the SLDC, in case the State Grid may or will, experience an operational effect following the event, and give details of what happened in the event.
- 41.1.3. Forced outages of important network elements in the State Grid shall be closely monitored by the concerned Licensee/User. Licensee/User shall send a monthly report of prolonged outage of generators or transmission facilities to the STU and SLDC.
- 41.1.4. All operational instructions given by SLDC shall have unique codes which shall be recorded and maintained as specified by the Authority.
- 41.1.5. Forced outages of important network elements in the State Grid shall be closely monitored at SLDC level and necessary actions/restorations instructions will be issued by SLDC to Users/Transmission Licensees.
- 41.1.6. Any operation in a State having an impact on other state(s)/region(s) shall be intimated by the SLDC to WRLDC.

42. Outage Planning

42.1. Objective

- 42.1.1. Produce a coordinated generation and transmission outage programme for the State Grid, considering all the available resources and considering transmission constraints, as well as, irrigation requirements.
- 42.1.2. Minimise surplus or deficits, if any, in the system requirement and operate the system within Security Standards.
- 42.1.3. Optimize the transmission outages of the elements of the State Grid without adversely affecting the grid operation but considering the Generation Outage Schedule, outages of User/STU systems and maintaining system security standards.

42.2. Outage Planning Process

- 42.2.1. All Users including buyers and sellers and Transmission Licensees shall provide SLDC with their proposed planned outage programmes in writing for the next financial year by 31st October of each year. These shall contain identification of each Generating Unit/Transmission Line/Interconnecting Transformer for which outage is

being planned, reasons for the outage, the preferred date for each outage and its duration and where there is flexibility, the earliest start date and latest end date.

- 42.2.2. SLDC shall prepare the draft outage programme for the next financial year by 30th November of each year for the InSTS:

Provided that outage plan shall be developed after considering system security and reliability and shall be developed such that the extent of unmet system demand on account of such a plan is kept to a minimum:

Provided further that in case of hydro generating stations such a plan shall also endeavour to maximize the utilization of water for the purpose of power generation subject to applicable constraints related to alternate use of such water:

Provided further that outage of wind generator may be planned during lean wind season, outage of solar, if required during the rainy season and outage of run-of-the-river hydropower plant in the lean water season.

- 42.2.3. All Users and STU shall follow annual outage plans published by SLDC. If any deviation is required, the same shall be obtained with the prior permission of SLDC. The outage planning of run-of-the-river hydro plant, wind and solar power plant and its associated evacuation network shall be planned to extract maximum power from these renewable sources of energy.
- 42.2.4. Transmission Outage Planning shall be harmonized with Generation Outage Planning and Distribution System Outage Planning shall be harmonized with Generation and Transmission Outage Planning.
- 42.2.5. The final outage plan for next year shall be intimated to all Users and Transmission Licensee latest by 31st December of each year:

Provided that SLDC shall finalise the outage plan in consultation with the Users and Transmission Licensee:

Provided further that the above annual outage plan shall be reviewed by SLDC on monthly basis in coordination with all concerned parties, and adjustments made wherever found necessary.

- 42.2.6. Each User or Transmission Licensee shall, at least two weeks prior to availing an outage as per the planned schedule, inform SLDC about the outage and obtain prior approval from it to avail outage.
- 42.2.7. SLDC shall have the authority to defer any planned outage in case of occurrence of following events:
- a) Major grid disturbances (e.g., partial/total blackout);
 - b) System isolation; and

- c) Any other event in the system that may have an adverse impact on the system security by the proposed outage.

Provided that SLDC shall inform about the revised outage plan, with appropriate reasons for revisions in the outage plan, as soon as possible.

- 42.2.8. In case of emergency in the system, which may include events like loss of generation, breakdown of the transmission line, grid disturbances and system isolation, SLDC may appropriately review the situation before clearance of the planned outage:

Provided that scheduled outage of power stations of 10 MW capacity and above as notified by SLDC from time to time, will be subject to annual planning:

- 42.2.9. SLDC shall prepare and submit to WRPC its outage plan in writing for the next financial year by 30th November for each year. These shall contain identification of each Generating Unit/Transmission Line/Interconnecting Transformer for which outage is being planned, reasons for the outage, the preferred date for each outage and its duration and where there is flexibility, the earliest start date and latest finishing date. SLDC shall submit Load Generation Balance Report for peak as well as off-peak scenario by 31st October for the next financial year to WRPC. The annual plans for managing deficits/surpluses shall be clearly indicated in the LGBR.
- 42.2.10. Scheduled outage of power stations and EHV transmission lines affecting regional power system shall be affected only with the approval of WRLDC in coordination with SLDC.
- 42.2.11. SLDC shall upload quarterly, half-yearly, yearly outage reports on its website.
- 42.2.12. In respect of scheduled outage referred in this Regulation, a calendar shall be formulated in respect of Annual Outage Planning for the ensuing financial year. Such outage plan shall be deliberated and finalised in the meeting of the Operation Coordination Committee.

43. Restoration/Recovery Procedures

- 43.1. Detailed plans and procedures for restoration after partial/total blackout of each User/Transmission Licensee shall be finalized by the concerned Users and Transmission Licensees in coordination with SLDC. The procedure should be reviewed, confirmed and/or revised once every subsequent year. Mock trial runs of the procedure or different sub system shall be carried out by the User/Transmission Licensee at least once every six months under intimation to SLDC.

Provided that Users shall agree to such plans and procedure and promptly inform SLDC in advance wherever they have difficulty in complying the same.

- 43.2. Detailed procedure for restoration of InSTS shall include the following contingencies and shall be in conformity with system restoration procedure of WRLDC:
 - a) Total system blackout;

- b) Partial system blackout; and
- c) Synchronization of islands of splits of system.

Provided that such procedure shall consider the generation capabilities and operational constraints of ISTS and InSTS.

- 43.3. List of generating stations with black start facility, inter-state/inter-regional ties, synchronizing points and essential loads to be restored on priority, shall be prepared and will be available with SLDC. The list shall be reviewed and confirmed by GCC.
- 43.4. SLDC shall be authorized during the restoration process following a blackout, to operate with reduced security standards for voltage and frequency as necessary to achieve the fastest possible recovery of the grid.
- 43.5. All communication channels required for restoration process shall be used for operational communication only, till grid normalcy is restored.
- 43.6. Distribution Licensees or Users with essential loads shall separately identify non-essential components of such loads, which may be kept off during system contingencies. Distribution Licensees shall draw up an appropriate schedule with corresponding load blocks in each case and assign relative priority in the restoration of essential loads. The non-essential loads shall be put on only when system normalcy is restored, as advised by SLDC.
- 43.7. All Users shall pay special attention to carry out the procedures so that secondary collapse due to undue haste or inappropriate loading is avoided. Despite the urgency of the situation, careful, prompt and complete logging of all operations and operational messages shall be ensured by all the Users to facilitate subsequent investigation into the incident and the efficiency of the restoration process. Such investigation shall be conducted promptly after the incident.
- 43.8. SLDC shall carry out the post-disturbance analysis of all major grid disturbances resulting into total or partial system blackout or system split and desynchronism of any part of the State Grid. All Users shall coordinate and furnish the data pertaining to the system disturbance to enable SLDC to analyse the system disturbance and furnish a report to WRLDC in accordance with the provisions of IEGC, as amended from time to time.
- 43.9. PCC under GCC shall also review the data collected and analyse the failure of protection system either of InSTS or any User and recommend modification and/or improvement in the protection system or relay setting schemes and, if necessary, of the islanding and restoration scheme of InSTS and Western Region, to be carried out by the Grid Users.

44. Congestion Management

- 44.1. STU in consultation with SLDC shall develop a procedure for relieving congestion in the InSTS within a period of six months from the notification of these Regulations:

Provided that till the time such procedures are developed, Congestion Management in real-time system shall be dealt with as per the Central Commission's relevant Regulations as amended from time to time:

Provided further that such procedure shall be reviewed by GCC and shall be provided to all the Users and shall be kept on the website of SLDC as well as STU.

Provided also that congestion charges shall be applicable if determined by the Commission from time to time.

45. Inter User Boundary Safety

- 45.1. STU shall maintain an updated list of designated officers (names, designations and telephone numbers) to all Users who have a direct inter User boundary with STU or other Users on its website. Similarly, all Users with a direct inter User boundary with STU or other User system shall maintain a similar updated list of their designated officers on their website.
- 45.2. STU in coordination with OCC shall prepare a detailed procedure for any work to be carried out across an inter-User boundary within three months from the notification of these Regulations and submit to the GCC for approval. The procedure approved by GCC shall be available on the STU's website. STU shall review the procedure for inter-User boundary work at least once in 12 months and submit to GCC for approval.
- 45.3. For the inter-User boundary between STU and other User's circuits, all Users shall comply with the agreed safety rules, which must be in accordance with CEA Safety Regulations or any other rules and regulations framed under the Act.

46. Event Information

46.1. Reportable Events

- 46.1.1. Any of the following events shall require reporting by the User/Transmission Licensee or SLDC or STU as the case may be:
- a) Blackout/partial system blackout;
 - b) System islanding/system split;
 - c) Grid indiscipline;
 - d) Loss of major generating unit;
 - e) Violation of security standards;

- f) Severe equipment problem relating to major circuit breaker, transformer, bus bar or EHV Transmission Line tower collapsing;
- g) Non-compliance of SLDC's instructions;
- h) Protection failure on any element of InSTS;
- i) Power system instability;
- j) Tripping of any element of the State Grid;
- k) Major fire incidents;
- l) Force majeure conditions;
- m) Fatal or non-fatal accident of human;
- n) Sudden load rejection by any User;
- o) Exceptionally high or low system voltage; and
- p) Any other event as stipulated by the Commission from time to time.

46.2. Reporting Procedure

- 46.2.1. User or Transmission Licensee, after having initially reported about the event orally to the SLDC, shall provide a written report within two days of the occurrence of the event to the SLDC in accordance with Regulation 46.1.1.
- 46.2.2. SLDC, after having initially reported about the event orally to the Users/Transmission Licensees, shall provide a written report within two weeks of the occurrence of the event to the concerned Users/Transmission Licensees.
- 46.2.3. A written report shall be sent to SLDC or Users/Transmission Licensees, as the case may be, and shall confirm the oral notification together with the following details of the event:
 - a) Time and date of the event;
 - b) Location;
 - c) Plant and/or Equipment directly involved;
 - d) Description and cause of event;
 - e) Antecedent conditions;
 - f) Demand and/or Generation (in MW) interrupted and duration of interruption;
 - g) All relevant system data including copies of records of all recording Instruments including Disturbance Recorder, Event Logger and Data Acquisition System;
 - h) Sequence of tripping with time;
 - i) Details of Relay Flags;
 - j) Remedial measures; and

- k) Any other related information.

Provided that SLDC shall develop standard reporting format considering information mentioned in 46.1.1 and as agreed by the GCC. Such formats shall be made available on the SLDC website.

- 46.2.4. Events affecting a generation capacity or a load of more than 1,00 MW shall immediately be reported in writing to the Commission by the SLDC/Transmission Licensee/User, as the case may be:

Provided that the summary including brief detail of the event, extent and probable causes of the event shall be submitted to the Commission within 24 hours from the occurrence of such event.

- 46.2.5. Reporting of accidents shall be in accordance with Section 161 of the Act and rules framed thereunder. Notice of accident and failure of supplies or transmission of electricity shall be in the specified form to the Electrical Inspector.

47. Cyber Security

- 47.1. All Users shall identify critical and vulnerable cyber assets and take maximum possible efforts to protect them from potential cyber attacks so as to support reliable and secure operation of the grid.

- 47.2. The details of the requirement of Cyber Security shall be as specified in Regulation 55 of these Regulations.

PART E: SCHEDULING AND DESPATCH CODE

The Schedule and Despatch Code¹

{The Commission has notified MERC (Deviation Settlement Mechanism and related matters) Regulations, 2019 on 1 March 2019. As per the provisions of the MERC DSM Regulations, the SLDC prepared the draft Scheduling and Despatch (S&D) Code and draft Deviation Settlement and Energy Accounting Procedure and published for stakeholder's comments on its website on 9 May 2019. SLDC received the comments/suggestions from the stakeholders on the draft S&D code and DSM procedure. Considering the Stakeholder's comments and suggestion, SLDC revised the Draft S&D Code and DSM Procedure appropriately and submitted to the Commission for approval on 20 August 2019.

The Commission reviewed the draft S&D code and DSM procedure submitted by the SLDC and approved the draft S&D code and DSM procedure on 11 November 2019 and directed to

¹ <https://mahaslde.in/wp-content/uploads/2019/11/Approved-SD-Code.pdf>

publish the approved copies SLDC's website. This approved S&D code shall form Part E of these Regulations and shall be read with other sections of MEGC as necessary.}

PART F: COMMUNICATION CODE

48. Objective

- 48.1. These regulations provide for planning, implementation, operation and maintenance and up-gradation of the reliable communication system for all communication requirements including the exchange of data for integrated operation of State Grid.
- a) To ensure seamless integration, reliable, redundant and secure communication;
 - b) To ensure that any network change shall not cause any adverse effect on the functioning of the existing Communication System. The Communication System shall continue to perform an intended function with specified reliability, security and quality;
 - c) A Data Provider or an intervening Communication System Provider is required to be aware, in advance, of the latest standards and conditions to be met by its system for being connected into the Communication System.

49. Boundary of Communication System

- 49.1. Intra-State Communication System shall cover:
- a) SLDC control rooms
 - b) STU (InSTS network)
 - c) Distribution Companies and Buyers within the State
 - d) State Generating Stations, IPPs including RE generators connected to InSTS
 - e) Substations of STU and State Transmission licensees
 - f) Nodes of ISTS with InSTS

50. Periodic Testing of Communication System

- 50.1. All Users providing communication systems shall facilitate periodic testing of the communication system in accordance with the procedure for maintenance and testing to be prepared by STU within 60 days of notification of Regulations and approved by GCC.
- 50.2. STU shall prepare the procedure for testing and maintenance of communication network security system including third party system if any and approved by GCC.

51. Periodic Auditing of Communication System

- 51.1. The MCCC under GCC shall conduct a performance audit of the communication system annually as per the procedure specified by CERC/RPC/RLDC/Authority. Based on the audit report, GCC Secretariat shall issue necessary instructions to all stakeholders to comply with the audit requirements within the time stipulated by the GCC.

52. Fault Reporting

- 52.1. SLDC in case of outage of telemeter data or communication failure shall inform the respective User so that the User shall ensure the healthiness of its communication system. In case outage pertains to a fault in the communication system of other User, the User shall lodge complaints about the failure of the communication to the communication system owner for quick restoration.
- 52.2. The communication provider shall explore the possibility for route diversion on the existing facility in close coordination with a concerned provider in case the fault restoration is prolonged. No separate charges shall be paid for such route diversion or channel re-allocation. However, such re-routing shall be discontinued once the original channel is restored.

53. Communication System Availability and Backup

- 53.1. All Users of InSTS shall maintain the communication channel availability at 99.9% annually and with a backup communication system, the availability of the communication system shall be 100%.

54. Monitoring and Reporting of Communication System Performance

- 54.1. All Users/Transmission Licensees shall monitor and keep record of the month-wise Communication System (SCADA RTU) Availability Index and Average Duration of Downtime per month (in Minutes) for AMR System at each Connection Point and submit report for the past six-monthly performance during next MCCC meeting.
- 54.2. MCCC shall review and deliberate on the cause of the significant variations in indices from the normal range (below 99.9% for Communication System (SCADA/RTU) Availability Index and more than 60 minutes/month in case of Average duration of Downtime for AMR system) and guide the remedial actions for the improvements.
- 54.3. STU in consultation with MCCC shall formulate detailed procedure for measurement, monitoring and reporting of the Communication System Index (for SCADA/RTU) and Average duration of Downtime (for AMR System) at Connection Point covering intra-state transmission network. STU shall publish such report on its website from time to time.

55. Cyber Security

- 55.1. Communication infrastructure shall be planned, designed and executed to address the network security needs as per the standards specified by CEA and shall be in conformity with the Cyber Security Policy of the Government of India, issued from time to time.
- 55.2. STU in assistance with SLDC shall prepare a Crisis Management Plan and/or procedure in line with Information Technology (IT) Act 2002, as amended from time to time and any other rules or policy or guidelines relevant to the subject, within six months from the date of notification of these Regulations, to ensure that adequate Cyber Security mechanism is available with all Users to prevent any potential cyber attack on the systems and submit for approval of the GCC.
- 55.3. An appropriate communication or IT network may be built up preferably using Multi-Protocol Label Switching, which is simple, cost-effective and reliable. In the remote places where connectivity is a problem, the stations can use dedicated fibre cable from the nearest node. Such communication or IT network may be built using dedicated fibres to avoid any cyber attack on the power system.
- 55.4. The existing communication or IT network shall be maintained properly. Remote Terminal Units and communication equipment shall have an uninterrupted power supply with proper battery backup so that in case of total power failure, supervisory commands and control channels do not fail.
- 55.5. Regular cyber vulnerability test/mock drills/cyber audit/and other measures as per the crisis management plan of the Indian Computer Emergency Response Team (ICERT) shall be carried out regularly by all Users. The frequency of such audits/mock drills shall be decided by STU in the procedure/guidelines stipulated as per Regulation 55.2.
- 55.6. A cyber audit specifically to detect malware targeting Industrial Control Systems (ICS) shall be conducted at critical plants and substations after any abnormal event.
- 55.7. A dedicated team of IT Personnel for cyber security of substations shall be developed and proper training for the team members shall also be conducted regularly by the respective organizations to upgrade their skills.
- 55.8. SLDC shall monitor the case of cyber security incidences and discuss them at State level and take necessary action as deemed fit.
- 55.9. GCC shall ensure that third party cyber security audits shall be conducted periodically (period to be decided at GCC) and appropriate measures shall be implemented to comply with the findings of the audits. The audits shall be conducted by CERT-In certified third party auditors.

56. Guidelines or Procedures to be issued by different Entities

- 56.1. Following entities shall be responsible for preparation, consultation and finalisation of the Guidelines/Procedures required under these Regulations:
- a) SLDC shall prepare Guidelines on “Interfacing Requirements” in terms of Regulation **Error! Reference source not found.**;
 - b) STU shall prepare Procedure on “Centralized supervision for quick fault detection and restoration” in terms of Regulation **Error! Reference source not found.** and on “Maintenance and testing of communication system” in terms of Regulation 50 of these Regulations;
 - c) GCC shall prepare Guidelines on “Availability of Communication System” in terms of Regulation 53.
- 56.2. All the entities shall post the draft guidelines/procedure on its website and invite comments from the stakeholders and finalise the guidelines after considering the comments received from them. The entities, while submitting the final procedures/guidelines to the Commission, shall submit a statement indicating its views on the comments received from the general public and stakeholders.

PART G: PROTECTION CODE

57. General

- 57.1. STU shall be the nodal agency to ensure implementation of protection schemes in accordance with the provisions of the Regulations specified by the Authority and in co-ordination with WRPC.
- 57.2. Electrical equipment or part of electrical equipment shall be allowed to remain connected to the InSTS only if it shall be provided by minimum specified protection aimed at reliability, selectivity, speed, stability and sensitivity.
- 57.3. All Users shall cooperate with STU to ensure correct and appropriate settings of the protection system to achieve effective, discriminatory removal of faulty equipment within the time for target clearance specified in these Regulations and as amended from time to time.
- 57.4. Protection system settings shall not be altered, or protection relays bypassed and/or disconnected without consultation and agreement between all affected Users and Nodal agency. In a case where protection is bypassed and/or disconnected by an agreement, then the cause shall be rectified and the protection is restored to normal condition as quickly as possible. If agreement has not been reached, the electrical equipment shall be removed from service forthwith.

- 57.5. PCC shall decide the date from which the existing protection provided in STU and/or User systems not meeting the minimum requirement as stipulated in this code is required to be changed.
- 57.6. User shall receive the protection system, checked/tested/inspected by STU if STU confirmed that the protection system of User does not comply with the norms.
- 57.7. STU in consultation with PCC shall prepare Protection Manual within three months from the notification of these Regulations. STU also shall consult with the stakeholders and GCC and also consider the on-field experience and operational best practices followed in other states while developing the Protection Manual.
- 57.8. STU shall ensure that the provisions of the Protection Manual shall be consistent with the following and as amended from time to time:
- a) Protection Philosophy;
 - b) CEA (Technical Standards for Connectivity to the Grid) Regulations,2007 and as amended time to time;
 - c) CEA (Technical Standards for Construction of Electrical Plants and Electric Lines) 2010 and as amended time to time;
 - d) CEA (Grid Standards) Regulations, 2010 as amended from time to time;
 - e) Protection standard adopted by WRLDC/WRPC; and
 - f) System Requirement and past field experience of STU.
- 57.9. The Protection Manual prepared by the STU shall contain provisions for the following:
- a) Role and responsibility of STU/SLDC and Users;
 - b) Protection System for Generators;
 - c) Protection System for Transmission Lines including HVDC;
 - d) Protection System for substations and Transmission to Distribution interface;
 - e) Compliance monitoring of the protection code by the Users;
 - f) Calibration and testing of the equipment and Relays used in the protection system;
 - g) Type of communication required for protection system;
 - h) Protection Audit; and
 - i) Any other provisions that STU deem fit as required for the system.

58. Revision in the Protection Manual and Best practices Guidebook

- 58.1. Transmission Licensees shall prepare share the best practices of protection system development, operations and safety practices. PCC shall coordinate and formulate a

forum of technical experts from industry and academia for continuous improvement in the knowledge of protection systems, preventive measures, monitoring and reporting of best practices.

- 58.2. The events of protection system/switchgear/relay/device failure as well as the events leading to successful operation of the protection system/switchgear/ relay/device should be recorded and deliberated during PCC meetings.
- 58.3. Review of the Protection Manual for upgradation/modification shall be undertaken at least once in a year. Such review would cover the important developments/events at national/regional level, need for periodic review due to upgradation of technical standards for switchgear/devices, technological innovations, use of IT tools/practices, training and capacity building requirements. Based on the review, the PCC shall recommend suitable modifications/amendments to Protection Manual which shall be duly incorporated in timebound manner upon following due stakeholder consultation process.

PART H: METERING CODE

The Metering Code²

{The Commission has notified MERC (Deviation Settlement Mechanism and related matters) Regulations, 2019 on 1 March 2019. As per the provisions of MERC DSM Regulations and Statement of Reasons (SoR) to DSM Regulations, the Commission directed the STU to undertake the review of the Metering Code under MERC State Grid Code,2006. Accordingly, STU constituted the Metering Code Committee under the convenorship of CE, STU.

The Metering Code Committee reviewed the existing metering code and prepared the revised draft Metering Code in line with provisions of the CEA Metering Regulation, IEGC provisions and other relevant Regulations. The STU published the draft metering code on its website for stakeholder's comments. The STU received the comments/suggestions from the stakeholders on the draft metering code. The comments/suggestions of the stakeholders were discussed in the meetings of the metering committee. Considering the Stakeholder's comments and suggestion, Metering Committee revised the Draft Metering Code and submitted to the Commission for approval on 3 September 2019.

The Commission reviewed the draft Metering Code submitted by the STU and approved the draft Metering code on 5 December 2019 and directed STU to publish the approved copies on STU's website. This approved Metering Code shall form Part H of these Regulations and shall be read with other sections of MEGC, as necessary.

² www.mahatransco.in/uploads/docs/Metering%20Code-2019%20for%20Intra-State%20Transmission%20System%20Maharashtra_13_12_2019.pdf

PART I: MISCELLANEOUS

59. Objective

- 59.1. The objective of this Code is to list out all the data required to be provided by the Users to the STU and the data required to be provided by the STU and SLDC to the Users, in accordance with the provisions of these Regulations.

60. Responsibility

- 60.1. All Users are responsible for submitting up-to-date data to STU/SLDC in accordance with the provisions of the Grid Code.
- 60.2. All Users shall provide the name, address and telephone number of the person responsible for sending the data to the STU and SLDC.
- 60.3. STU shall share the name, address and telephone number of the person responsible for receiving data with the SLDC and Users.
- 60.4. STU shall provide up-to-date data to the Users as provided in the relevant schedule of the Grid Code.
- 60.5. Responsibility for the correctness of data rests with the concerned User providing the data.

61. Data Management and Sharing

- 61.1. All the data required by STU and SLDC shall be provided by the Users and the data required by the Users shall be provided by STU and SLDC as specified in these Regulations.

62. Data Categories and Stages in Registration

- 62.1. Data required to be exchanged has been listed in the appendices of this section under various categories with a cross-reference to the concerned sections.

63. Changes to Users Data

- 63.1. Whenever any User becomes aware of a change to any items of data that are registered with STU, the User must promptly notify STU of the changes. STU on receipt of intimation of the changes shall promptly update the database. This shall also apply to any data compiled by the STU regarding its own system.

64. Methods of Submitting Data

- 64.1. The data shall be furnished in the standard formats for data submission and such format must be used for written submission of data to SLDC/STU.

- 64.2. Where standard formats are not enclosed these would be developed by SLDC/STU in consultation with the Users.
- 64.3. The User must submit all the data under the Schedule(s) periodically to the SLDC/STU or to such other department and/or address as notified by the STU. The name of the person who is submitting each schedule of data must be indicated.
- 64.4. Where a computer data link exists between a User and SLDC/STU, data may be submitted via this link. The data shall be in the same format as specified for paper transmission except for electronic encoding for which some other format may be more suited. The User shall specify the method to be used in consultation with the SLDC/STU and resolve issues such as protocols, transmission speeds etc. at the time of transmission.

65. Data Not Supplied

- 65.1. Users are obliged to supply data as referred to in the individual Code of MEGC. In case any data is missing and is not supplied by any User, STU or SLDC may acting reasonably, if and when necessary, estimate such data depending upon the urgency of the situation. Similarly, in case any data is missing and is not supplied by the STU, the concerned User may acting reasonably, if and when necessary, estimate such data depending upon the urgency of the situation. Such estimates will in each case, be based upon the corresponding data for similar plant or apparatus or upon such other information, the User or STU or SLDC, as the case may be, deemed appropriate.

66. Special Considerations

- 66.1. STU and SLDC and any other User may at any time make a reasonable request for additional data as necessary.
- 66.2. STU shall supply data, required/requested by SLDC for system operation, from the data bank.

67. Load-Flow Studies

- 67.1. STU shall carry out periodic load-flow studies of the network to facilitate future expansion and augmentation of the network. The study shall encompass both transient as well as steady state studies. The transmission licensees shall mandatorily use the latest load flow data while proposing any additional infrastructure.
- 67.2. SLDC will also conduct load-flow studies for operation planning. Such studies shall be based on historical as well as real-time data.

The STU and SLDC shall take the requisite measures to enhance the capacity building measures for such studies so that the personnel engaged in planning and operation are adequately trained.

68. Data Acquisition

- 68.1. The following real-time data is required by SLDC for effective control of the power system:
- a) MW and MVAR generated or absorbed in each generating station;
 - b) MVAR imported or exported from the external connections;
 - c) Voltages in all the system busbars;
 - d) Frequency in the system;
 - e) MW & MVAR flow in each Transmission element;
 - f) Weather Data Viz. Temperature, Wind Speed & Direction, Humidity etc.; and
 - g) Tap position of Transformer, Breaker/ Isolator status points.
- 68.2. The generating companies shall provide necessary RTU or interface point for the transmission of the above data from their generating stations to Sub-SLDC/SLDC.
- 68.3. STU/CTU/Transmission Licensee shall similarly provide necessary RTU or interface point from SCADA for the transmission of the above data from their receiving stations and substations to Sub-SLDC/SLDC.
- 68.4. STU shall establish a suitable data transfer link between Sub-SLDC to SLDC and SLDC to WRLDC for exchange of operational data transmission.
- 68.5. The RTU/SCADA facility should have Geographical Positioning Systems (GPS) time synchronization and time stamping facility on all data communicated to Sub-SLDC. GPS may be used for time stamping of the trip information at the respective stations.
- 68.6. At all the 765/400 kV lines/HVDC and important 220 kV lines, disturbance recorders shall be installed and recorder data shall be made available at SLDC for post event analysis of the disturbances.

69. Dispute

- 69.1. In the event of any dispute regarding the interpretation of any provision of the MEGC or rules and procedures notified under the provisions of the MEGC, the matter may be referred to the GCC constituted under these Regulations for its decision. If the dispute is not resolved, the GCC may refer to the Commission with its suggestions/recommendations.

70. Compliance

- 70.1. STU shall be responsible for monitoring the compliance of the Users and Transmission System Licensees with the provisions specified in Part-B, Part-C, Part-F, Part-G and Part-H in these Regulations and procedures developed under such provisions.

- 70.2. SLDC shall be responsible for monitoring the compliance of the Users and Transmission System Licensees with the provisions contained in Part-D and Part-E of these Regulations and with the rules and procedures developed under such provisions.
- 70.3. In case of persistent non-compliance with the provisions of MEGC and/or with the rules and procedures developed under such provisions, such matter shall be reported to the Commission.
- 70.4. All directions issued by the WRLDC to any Transmission Licensee or any other Licensee of the State or generating company (other than those connected to ISTS) or substation in the State shall be issued through the SLDC and the SLDC shall ensure that such directions are duly complied with the licensee or generating company or substation.
- 70.5. SLDC may provide directions and exercise supervision and control as may be required for ensuring integrated grid operations and for achieving the maximum economy and efficiency in the operation of the power system.

Provided that any non-compliance of such directions shall attract the penalty as specified in Section 33(5) of the Act.

- 70.6. Every Transmission Licensee and User connected with the operation of the power system shall comply with the direction issued by the SLDC under these Regulations.
- 70.7. If any dispute arises with reference to the quality of electricity or safe, secure and integrated operation of the State grid or in relation to any direction given under these Regulations, it shall be referred to the Commission for decision:

Provided that pending the decision of the Commission, the direction of the SLDC shall be complied by the Transmission Licensee or User.

- 70.8. Consistent failure to comply with the provisions of the MEGC or with the rules and procedures developed under such provisions, by the User or Transmission Licensee, may lead to disconnection of plant and/or apparatus of such User or Transmission Licensee.
- 70.9. Nothing contained in Regulation 72 to 78 of these Regulations shall in any manner impact the powers conferred upon the Commission to monitor and enforce compliance of the Users and Transmission System Licensees with the provisions of the MEGC and with the rules and procedures developed under such provision.

71. Procedures to be Prepared for implementation of MEGC

- 71.1. For implementation of MEGC, following procedures shall be prepared by STU and/or SLDC

#	Details of Procedure / Guidelines / Codes / Plans	Ref. Regulation	Responsible Entity
1	Transmission System Plan for 5 years	12	STU

#	Details of Procedure / Guidelines / Codes / Plans	Ref. Regulation	Responsible Entity
2	Guidebook for planning Code	13.2.6	STU
3	Integrated Resource Planning for 5 years	11	SLDC and STU
4	Procedure for operationalising spinning reserve margin	14.4.6	SLDC
5	Model Connection Agreement	21.1	STU
6	Procedure for preparation of SRS	26.1.5	STU
7	Procedures for a) Black start; b) System restoration for partial grid failure; c) Load curtailment; d) Renewable Energy curtailment; e) Islanding; and f) Any other procedure as required	28.2 and 43	SLDC
8	Procedure Congestion Management	44	STU and SLDC
9	Procedure for work to be carried out across an inter-User boundary	45.2	STU
10	Standard reporting format for event reporting	46.2.3	SLDC
11	Procedure for DC Demonstration of Generating Units	32.4	Provided as Annexure 3
12	Guidelines for Instructing RSD of Generating Unit	36	SLDC
13	Procedure for Accounting and Settlement of InSTS Reactive Energy Charges	37.16	Provided as Annexure 7
14	Procedures, Formats and Timelines for Demand Estimation	38.1	SLDC
15	Contingency Procedures under Demand Curtailment	39.3.3	Licensee/user/STU
16	Guidelines/Standard Reporting Format for Reportable Events	46.2.3	SLDC/Licensee/user
17	Procedure for Testing and Maintenance of Communication Network Security System	50.1	STU
18	Procedure for Crisis Management Plan and procedure under Cyber Security.	55.2	STU
19	Guidelines/Procedure on Interfacing Requirements	56.1a)	SLDC
20	Procedure on Centralized supervision for quick Fault Detection and Restoration	56.1b)	STU
21	Procedure on Maintenance and testing of Communication System	56.1b)	STU
22	Guidelines on Availability of Communication System	56.1c)	STU
23	Protection Manual	57.7	STU

72. Power to Amend

72.1. The Commission may, at any time, vary, alter, modify or amend any provisions of these Regulations.

73. Power to Remove Difficulties

73.1. If any difficulty arises in giving effect to the provisions of these Regulations, the Commission may, by general or specific order, make such provisions not inconsistent with the provisions of the Act, as may appear to be necessary for removing the difficulty.

74. Power to Relax

74.1. The Commission may by general or special order, for reasons to be recorded in writing, and after giving an opportunity of hearing to the parties likely to be affected by grant of relaxation, may relax any of the provisions of these Regulations on its own motion or on an application made before it by an interested person.

75. Power to issue Practice Directions, Code, Guidelines

75.1. Subject to the provisions of the Act, the Commission may, from time to time, issue Practice Directions or Code(s) or Guidelines with regard to implementation of these Regulations.

Place: Mumbai

Dated: 1 March,2020

Secretary,
Maharashtra Electricity Regulatory Commission

Annexures

Annexure-1: Minimum Acceptable Specifications of Dedicated Three-Phase HV-CT Set for Metering (Refer Regulation 7.6.2(b))

Sr. No.	Particulars	33/132/220/400/765 kV	
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	Specification of CT (for CT-PT Set)		
1	Nominal System Voltage (kV rms)		The CT-PT combined metering unit is not used in transmission system
2	Highest System Voltage (kV rms)		
3	Reference Standard		
4	Standard CT Ratio (Amps/Amp)		
5	Rated continuous thermal current		
6	Rated short time thermal primary current for 1 second (in kA)		
7	CT Characteristic:		
(a)	Rated Primary Current (Amps)		
(b)	Rated Secondary Current (Amps)		
(c)	Accuracy Class		
(d)	Maximum Instrument Security Factor (ISF)		
(e)	Rated Secondary Burden (VA)		
8	Reference Standard for insulating oil		
	Specification of PT (for CT-PT Set)		
1	Nominal System Voltage (kV rms)		
2	Highest System Voltage (kV rms)		
3	Reference Standard		
4	No. of Secondary Windings for potential measurement devices		
5	Standard Voltage Ratio		
6	Rated Secondary Burden (VA) per Winding		
7	Accuracy Class (At 10% to 100% of rated VA burden)		
8	Rated Voltage Factor and duration		

**Annexure-2: Site Responsibility Schedule
(Refer Regulation 26.1.3)**

Name of Power Station:

Tel. Number:

Fax Number:

Permanent Address:

Site Manager:

Item of Plant / Apparatus	Plant Owner	Responsibility for				Remarks
		Safety	Control	Operation	Maintenance	
..... kV Switchyard						
All equipments Including Busbars						
Feeders						
Generating Units						

Annexure-3: Detailed Procedure for Demonstration of DC of InSGS

(Refer Regulation 32.2)

1. Nodal Officer for DC Demonstration

- 1.1. Executive Engineer Shift In-Charge of SLDC shall be the Nodal Officer in consultation with the Chief Engineer (SLDC).
- 1.2. All the Distribution Licensees and Generating Stations in the State shall designate a Nodal Officer, for the purpose of DC demonstration and intimate to the SLDC.

2. Request for DC Demonstration From Distribution Licensees

- 2.1. The Nodal Officer of Distribution Licensee shall submit the request for DC Demonstration to SLDC in the prescribed format attached as **Format-1 (Annexure-3)**.
- 2.2. Distribution Licensee shall request a demonstration of DC of their contracted Generating Units only under Long Term and Medium Term Contracts.
- 2.3. The reason for requesting DC demonstration shall be specified in the application.

3. DC Demonstration on SLDC's Observation

- 3.1. SLDC, as per the provisions in the State Grid Code, shall request any Generating Unit in the State to demonstrate the DC.
- 3.2. Superintending Engineer (Operation), SLDC, on daily basis, for the previous day, shall certify the DC tracking of Generating Stations in accordance with the provision of this procedure. Format for the same is attached as **Appendix-A**.

4. Procedure for Implementation of DC Demonstration

- 4.1. Request for demonstration shall be submitted to SLDC Nodal Officer at least six-time blocks before, including the time block in which physical implementation of ramping-up of generation is to be initiated.
- 4.2. SLDC, in two-time blocks, shall verify the details and based on the current load generation balance and sign reversal scenario as per the MERC DSM Regulations and shall take appropriate decision for effecting the demonstration implementation.
- 4.3. Instructions for ramping-up of the Generation for demonstration shall be issued by SLDC to the concerned Generating Unit in the 4th time block which will be effective from 6th time block.
- 4.4. Concerned Generating unit shall not revise DC once an application for demonstration of DC has been received by the SLDC Nodal Officer till demonstration process is completed.
- 4.5. 5th time block shall be reserved for Generator to take necessary actions for ramping-up of the Generation.
- 4.6. Actual increase of generation shall commence from 6th time block and the maximum period for attaining DC shall be as per the ramping rate. During the demonstration period, the Generating unit shall maintain average generation at per the declared DC and shall maintain the same during the demonstration period which shall be maximum

12-time blocks. The line lines for DC demonstration activities are provided in Table 1 below:

Table 1: Time lines for DC Demonstration Activities

Time Block	Time	Particulars
1st Block	12:00 to 12:15	<ul style="list-style-type: none"> Application for DC Demonstration from the Nodal Officer of Distribution Licensee to the Nodal Officer of SLDC. No request of Generator for change of DC shall be entertained till DC Demonstration procedure is completed.
2nd and 3rd time block	12:15 to 12:45	<ul style="list-style-type: none"> Verification and appropriate action such as alternate Generation Peaking, maintaining Grid stability, etc will be carried out.
4th time block	12:45 to 13:00	<ul style="list-style-type: none"> Convey instructions and required injection based on the application of the Distribution Licensee/SLDC to the concerned Generator for demonstration by SLDC.
5th time block	13:00 to 13:15	<ul style="list-style-type: none"> Reserved for the Generator for taking necessary actions for ramping-up of the Generation.
6th to nth Time block	13:15 onwards	<ul style="list-style-type: none"> Commencement of the physical ramping-up of generation for attaining DC. From 6th time block, actual increase in the generation shall commence. nth time block shall be as per ramping rate.
nth to n + 12th time block	---	<ul style="list-style-type: none"> DC demonstration period will be 12-time blocks; however, it may vary depending on the system condition.
Concerned Generator shall maintain an operational logbook with the details of activities to be carried out during DC demonstration.		

4.7. During the demonstration period, the earlier Schedule of the Generating Unit under demonstration shall be replaced by the actual generation. The generator will submit the revised DC for remaining time blocks of the day after completing the DC demonstration.

4.8. Any commercial impact due to DC Demonstration shall be borne by the respective Distribution Licensee/Buyer.

5. Procedure for Data Recording and Certification

5.1. Injection data of the generating unit under demonstration shall be maintained from 4th time block, i.e., the time block in which instructions have been issued by the SLDC till 'n + 12th time block'.

5.2. Nodal Officer of the generating station shall submit the meter data (MWh) and SCADA data recorded at Generating Station to SLDC within 24 hours from the date of demonstration in the prescribed format attached as **Format-2 (Annexure-3)**. The copy

of Operating Logbook maintained during DC demonstration period shall be submitted to SLDC.

- 5.3. STU shall also submit meter data (MWh) at interface point (Ex-bus point) to SLDC within two working days from the date of the demonstration.
- 5.4. SLDC shall verify the data and issue Certification of DC Declaration in attached **Format-3 (Annexure-3)** within four working days from the date of the demonstration to the Nodal Officer of Distribution Licensee and Generating Company.
- 5.5. The details of DC demonstration shall be uploaded on the website in the prescribed format on a monthly basis on 5th of every month for the preceding month.

Format-1

(To be submitted by Distribution Licensee/SLDC)

Sr.	Particulars	Details
1	Date of DC Demonstration	
2	Block No. and Time of Application	
3	Block No. and Time of commencement of DC Demonstration	
4	Name of the Distribution Licensee	
5	Details of the Generating Unit under Demonstration	
a	Name of Generating Station	
b	Generating Unit No. under Demonstration	
c	Capacity of Unit under Demonstration	
d	Schedule (MW)	
e	DC issued by the Generating Company (MW)	
6	Capacity up to which Generation is to be ramped up for Demonstration	
7	Details of earlier Demonstration carried out on same Generating Unit	
8	Reason for requesting Demonstration (periodic or specific reason)	

Sign of Nodal Officer:

Name of Nodal Officer:

Name of Distribution Licensee/SLDC:

Mobile No.:

(To be submitted by Generating Company)

Generation Data for DC Demonstration of Generating Unit

Sr. No.	Particulars	Details
1	Date of DC Demonstration	
2	Block No. and Time of commencement of DC Demonstration	
3	Details of the Generating Unit under Demonstration	
a	Name of Generating Station	
b	Generating Unit No. under Demonstration	
c	Capacity of Unit under Demonstration	
d	Schedule (MW)	
e	DC issued by Generating Company (MW)	
4	Capacity up to which Generation is to be ramped up for Demonstration	
5	Block-wise Generation Data starting from 4th time block in which instructions to Generating Unit is issued by SLDC	Block-4: Block-5: Block-6: Block-7: Block-8: Block-n: Block-n + 1: Block-n + 12:
6	Whether Demonstration has been carried out successfully or not	Yes/NO
a	If 'No' reason for the same	

Sign of Nodal Officer:

Name of Nodal Officer:

Name of Generating Company:

Mobile No.:

(On the letter head of SLDC)

Certification for DC Demonstration of the Generating Unit

To,

Name of Distribution Licensee:

Name of Generating Company:

Address:

Address:

Sub: Certification towards Demonstration of DC of the Generating Unit No. ____ at _____
Generating Station.

Ref: 1) The MERC (MYT) Regulations, 2015.

2) MERC State Grid Code Regulations, 2020 dated _____.

3) DC Demonstration conducted on _____.

With reference to the above subject, the Demonstration of DC of the ____ Generating Unit located in the
____ Generating Station of ____ (Name of Generating Company) ____ having Installed Capacity ____
MW was conducted on __ (Date) __.

During the demonstration, it is observed that the Generating unit under demonstration attained ____ MW
Generation (Average Generation for the entire Block) against the DC of ____ MW in the ____ Time Block.

In view of above, it is to certify that the Generating Unit No. ____ of the ____ Generating Station (With
% error of ____ %) has successfully demonstrated the DC Demonstration as declared.

OR

In view of the above, it is to certify that the Generating Unit No. ____ of the ____ Generating Station
has failed to demonstrate the DC Demonstration as declared.

The relevant data is enclosed as Appendix-A herewith for ready reference.

Submitted for information and needful, please.

Thanking you.

Yours Faithfully,

Encl: As above.

(Name)
Chief Engineer
MSLDC, Airoli.

Copy s.w.r.s. to:

The Director (Operations), MSETCL, Mumbai.

Copy to:

The Superintending Engineer (Operation), SLDC, Airoli.

It is requested to update and upload the details in the prescribed format on SLDC's website on a
monthly basis.

Appendix-A

Declared Capacity Violation Report														
Generating Stations connected to InSTS under Section 62 & 63 of EA Act-2003														
Sr. No.	Name of Generating Unit	Name of Generating Utility	Peak Hour DC for the Day<Off-Peak Hour DC for the Day			% Variation of DC between various time blocks in a day is more than 30% of the Contracted capacity			DC during low demand periods for the year > DC during high demand periods for the year			Verification by SLDC		Whether Mis-Declaration by Generator? (Yes/No)
			Peak Hour DC for the Day/Time block	Off-Peak Hour DC for the Day/Time Block	Whether Peak Hour DC for the Day < Off-Peak Hour DC for the Day (Yes/No)	DC for Time Block 1/TB1	DC for Time Block 2/TB2	% Variation of DC Between TB1 and TB2 in Respect to the Contracted Capacity	DC During Low Demand Periods for the Year/Date/Time Block	DC During High Demand Periods for the Year/Date/Time Block	Whether DC During Low Demand Periods Is Higher Than High Demand Periods of the Year (Yes/No)	Any Forced Plant/Auxiliary Maintenance Activity Carried Out on the Unit During Violation (Yes/No)	Any Tripping of the Unit During Violation (Yes/No)	
A	B	C	D	E	F	G	H	$I = [(G-H) * 100] / \text{Contracted Capacity of the unit}$	J	K	L	M	N	O
1														
"peak hours" and "off-peak hours" shall be considered as specified in the MERC MYT Regulations,2019 as amended from time to time.														
Daily Report to be generated on (D + 1) basis.														

**Annexure-4: Mechanism for Compensation for Degradation of Heat Rate, Auxiliary Consumption and Secondary Fuel Oil Consumption Due to Part Load Operation and Multiple Start/Stop of Units of Intra-State Generators Connected to InSTS in Maharashtra State
(Refer Regulation No. 34.3(f))**

1. Introduction

- a) The detailed operating procedure of Compensation Mechanism is based on following code/regulation and guidelines;
 - i. MERC DSM Regulations, 2019.
 - ii. MERC Scheduling and Despatch Code and MERC DSM Procedure approved by MERC dated 11 November 2019 State Grid Code, 2006.
 - iii. MERC MYT Regulation 2019.
 - iv. CERC IEGC 2010 and subsequent amendments and provision in Fourth Amendment.
 - v. CERC order No. L-1/219/2017-CERC dated. 05 May,2017
 - vi. CERC Tariff Regulations 2019.

2. Applicability

This Compensation Mechanism is applicable to Coal/Gas based InSTS connected Generating Stations:

- a) Whose tariff is determined by the Commission.
- b) Whose tariff is adopted by the Commission.
- c) In case of generating stations, whose tariff is neither determined nor adopted by the Commission but which is a State Entity, selling power in Short Term Open Access (STOA) to an Intra-State buyer above 25 MW (Except captive transaction) they shall be required to make appropriate provisions in their PPAs or any other supplementary agreement in light of the proposed Compensation Mechanism.
- d) The effective date of implementation of this procedure shall be notified separately by the Commission.

3. Definitions and Abbreviations

3.1 In this Compensation Mechanism, unless the context otherwise requires:

- a) "**AUL of the Station**" (in %) means loading of the station during the Calculation Period determined as follows:

$\text{Average Unit Loading (AUL) in\%} = \frac{\text{Effective Generation of Station (in MWhr)}}{\text{Effective capacity(in MWhr)} \times (1 - \text{Normative Auxiliary Consumption})} \times 100$

- b) **“Calculation Period”** means the period for which compensation calculation shall be carried out. Generally, there shall be 12 calculations during the financial year. The calculation month will start from 16th day of the month to 15th of the subsequent month. The second calculation shall be done by considering cumulative of two months and so on. (The calculation period is considered to match with monthly MOD period.);
- c) **“Comp (F)”** – Final Compensation means reconciled compensation in rupees to be received by a generator during the calculation period based on the actual and normative parameters including degraded SHR and AEC based on AUL;
- d) **“Comp (P)”** Compensation payable means compensation in rupees computed for the calculation period based on the normative parameters and actual degraded SHR and AEC based on the AUL;
- e) **“EC (A)”** means total energy charges in rupees computed for a designated generating station during the calculation period on actual parameters of SHR and AEC;
- f) **“EC (N)”** means total energy charges in rupees computed for a designated generating station during the calculation period on normative parameters considering degraded SHR and AEC based on the AUL;
- g) **“Effective Capacity”** in MWhr means maximum possible generation from a station during calculation period and shall be calculated as:
 Total Installed Capacity of the designated generating station (in MWhr) - Installed Capacity (MW) of the Unit(s) of the said station under outage (planned or forced outage) and under RSD / ZS during the calculation period X outage time.
- h) **“ECR (Comp)”** means an increase in normative Energy Charge Rate in rupees/kWh for the calculation period considering degraded SHR and AEC based on the AUL;
- i) **“ECR (DC)”** means Energy Charge Rate in rupees/kWh based on degraded SHR and AEC considering average DC as AUL during the calculation period;
- j) **“ECR (SE)”** means Energy Charge Rate in rupees/kWh based on degraded SHR and AEC considering the AUL of generating station during the calculation period;
- k) **“Effective Generation of the Station”** in MWhr means the actual generation (ex-bus) of the designated station or the Schedule generation excluding bilateral sale/collective sale under open access during the calculation period whichever is higher;
- l) **“Tariff Regulations”** means Maharashtra Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations,2019 as amended from time to time or any subsequent enactment thereof;

4. Mechanism for Working Out Compensation

4.1 Compensation for Degradation of Heat Rate (SHR) and AEC

- a) The mechanism is based on relevant provisions of State Grid Code and Tariff Regulations of the Commission, as notified from time to time.
- b) The Compensation shall be worked out for a month on a cumulative basis considering degradation in SHR and AEC based on AUL, subject to reconciliation at the end of the year.
- c) The Normative Auxiliary Consumption of competitively bid projects shall be considered based on the normative AEC of similar units as per the Tariff Regulation of the Commission or the difference between the Installed Capacity and the ex-bus Contracted Capacity as a percentage of installed capacity of the generating station, whichever is less.
- d) For Gas based generating stations, degraded SHR and AEC shall be decided based on the characteristic curve provided by the manufacturer. In case if the characteristic curve is not provided for the entire range of operating, i.e., up to 55% of module rating, the curve provided by OEM shall be extrapolated up to 55% of module loading.
- e) AUL shall be used to increase SHR and AEC in accordance with the Regulations and for gas based generating station as per Step 4 above:

Provided that no compensation for SHR degradation or increase in AEC shall be payable if the AUL for the generating station for the computation period works out to be more than or equal to 70%.

- f) Based on the values of increased SHR and AEC arrived at Step 5, Energy Charge Rate (ECR) for AUL, i.e., ECR (SE) for the station whose tariff has been determined by the Commission under **Section 62** of the Act shall be calculated using the formula specified in Tariff Regulations of the Commission:

Provided that for generating stations, whose tariff has been adopted by the Commission under **Section 63** of the Act, the ECR (SE) shall be worked out as per the following formula:

i. Where ECR is quoted without specifying SHR and AEC:

$$\text{ECR (SE)} = \text{quoted ECR or quoted Variable Charge} \times (1 + \text{percentage of degradation in heat rate based on unit loading corresponding to Effective Generation} / 100) / (1 - \text{percentage of degradation in Aux Consumption based on unit loading corresponding to Scheduled Energy} / 100).$$

ii. Where ECR is computed based on the normative net Heat Rate and PPA already provided for energy charge payment corresponding to the degradation in net station heat rate:

$$\text{ECR (SE)} = \text{ECR worked out based on net station heat rate (without the percentage of degradation in heat rate based on unit loading) corresponding to effective generation} / (1 - \text{percentage of degradation in Aux Consumption based on unit loading corresponding to effective generation} / 100).$$

iii. Where ECR is computed based on the normative net Heat Rate and PPA does not provide energy charge payment corresponding to the degradation in net station heat rate:

ECR (SE) = ECR worked out based on the net station heat rate x (1 + percentage of degradation in heat rate based on unit loading corresponding to effective generation / 100) / (1 – percentage of degradation in Aux Consumption based on unit loading corresponding to effective generation / 100).

- g) ECR corresponding to average DC, i.e., ECR (DC) for the calculation period shall also be calculated using the formula specified in Tariff Regulations of the Commission and used as a reference for calculating compensation. This is because, the effect of less declaration (with respect to normative ex-bus Installed capacity), if any, on the SHR and AEC should be to the account of InSGS:

Provided that for generating stations whose tariff has been adopted by the Commission under Section 63 of the Act, the ECR (DC) shall be worked out as per the following formula:

i. Where ECR is quoted without specifying Heat Rate or Aux Consumption:

ECR (DC) = ECR quoted or variable Charge quoted x (1 + percentage of degradation in heat rate based on unit loading corresponding to DC/100) / (1 – percentage of degradation in Aux Consumption based on unit loading corresponding to DC / 100).

ii. Where ECR is computed based on the net Heat Rate and PPA already provided for energy charge payment corresponding to the degradation in net station heat rate:

ECR (DC) = ECR worked out based on net station heat rate (without the percentage of degradation in heat rate based on unit loading) corresponding to DC / (1 – percentage of degradation in Aux Consumption based on unit loading corresponding to DC / 100).

iii. Where ECR is computed based on the normative net Heat Rate and PPA does not provide for energy charge payment corresponding to degradation in net station heat rate:

ECR (DC) = ECR worked out based on net station heat rate X (1 + percentage of degradation in heat rate based on unit loading corresponding to DC / 100) / (1 – percentage of degradation in Aux Consumption based on unit loading corresponding to DC / 100).

- h) The compensation to be paid to InSGS for the calculation period ending nth month shall be the difference in ECR (SE) and ECR (DC) for that period. ECR (Comp) for the calculation period ending nth month shall be calculated as:**

$$ECR_n(\text{Comp}) = ECR_n(\text{SE}) - ECR_n(\text{DC})$$

Provided that the ECR (Comp) shall be worked out separately for each PPA of the station by the Generator but annual reconciliation shall be on the overall consideration of PPAs.

- i) The compensation $Comp_n(P)$ payable to InSGS for the calculation period ending nth month shall be calculated as below:

$Comp_n(P) = (\text{Total Generation Schedule (Energy) to its original beneficiaries excluding bilateral sale / collective sale under open access}) * ECR_n(\text{Comp})$

- j) $ECR_n(A)$ for the calculation period shall be calculated using actual values of SHR and Aux Consumption furnished by InSGS at the end of the calculation period and normative secondary fuel oil consumption as per the prevailing Commission order for which the requisite information shall be submitted by the generating station to beneficiaries.

Similarly, $ECR_n(N)$ shall be calculated using normative values of SHR and Aux Consumption and normative secondary fuel oil consumption as per provisions of the Tariff Regulations of the Commission furnished by InSGS.

Provided that in case of generating stations whose tariff has been adopted by the Commission under **Section 63** of the Act, $ECR_n(N)$ shall be calculated using normative net SHR or the ECR quoted for the relevant month as the case may be.

- k) The following values shall be calculated:

- i. Total Energy Charges payable to InSGS based on actual parameters:

$EC_n(A) = ECR_n(A) \times (\text{Total Generation Schedule (Energy) to its beneficiary excluding bilateral sale / collective sale under open access during the calculation period ending nth month})$

- ii. Total Energy Charges payable to InSGS based on Normative parameters:

$EC_n(N) = ECR_n(N) \times (\text{Total Generation Schedule (Energy) to its beneficiary excluding bilateral sale / collective sale under open access during the calculation period ending nth month})$

- l) **Compensation payable** for the calculation period ending nth month to InSGS would be decided based on the following criteria:

- i. If $EC_n(A)$ is less than or equal to $EC_n(N)$:

No compensation shall be payable to InSGS

- ii. If $EC_n(A)$ is more than $EC_n(N)$:

(b1) If $Comp_n(P)$ is less than or equal to $EC_n(A)$ minus $EC_n(N)$ then final compensation amount payable to InSGS for the calculation period ending nth month:

$Comp_n(F) = Comp_n(P)$

(b2) If $Comp_n (P)$ is more than $EC_n (A)$ minus $EC_n (N)$, then final compensation amount payable to InSGS for the calculation period ending nth month

$$Comp_n (F) = ECR_n (A) - ECR_n (N)$$

- m) Final Compensation payable by kth beneficiary for the calculation period ending nth month
- i. No compensation shall be payable by beneficiaries if it has requisitioned at least 70% of its entitlement during the calculation period.
 - ii. The compensation amongst other beneficiaries shall be shared in the ratio of un-requisitioned energy below 70% of their entitlement, i.e., the compensation payable by kth beneficiary for the calculation period ending nth month.

$$FCB_{kn} = Comp_n (F) \times \frac{UE_{kn}}{\sum_k UE_{kn}}$$

Where UE_{kn} is un-requisitioned energy of kt^h beneficiary below 70% of its entitlement during the calculation period ending nth month (if applicable).

- n) However, adjustments shall be carried out for compensation already paid for calculation period ending (n-1) th month.

Net compensation payable/receivable by kth beneficiary for the nth month

$$NCB_{kn} = FCB_{kn} - FCB_{k(n-1)}$$

If NCB_{kn} is negative, this is the amount payable by InSGS to the beneficiary and vice versa. This way reconciliation would automatically take place at the end of the Financial Year.

5. Calculation for Secondary Fuel Oil Consumption

- a) No compensation for degradation of SHR for secondary fuel oil consumption is payable for the year if total number of start-ups is equal to or less than 7 X No of units in the generating station or the actual Secondary Fuel Oil consumption is less than normative fuel oil consumption.
- b) Compensation (in terms of KL of Secondary Oil) shall be payable to InSGS for the year due to degradation of secondary fuel oil consumption shall be calculated by multiplying no of start-ups exceeding 7 per unit and solely attributable to reserve shut-downs with the appropriate value of additional secondary oil consumption specified in the Regulation.
- c) Compensation payable to InSGS shall be restricted such that Oil consumption based on the norms plus compensation calculated does not exceed actual secondary fuel oil consumption for the year.

- d) Compensation in terms of Rupees shall be calculated by multiplying compensation in terms of KL as calculated and average landed price of Secondary fuel oil for the year.
- e) Each start-up due to reserve shutdown shall be attributed to the concerned beneficiary of the seller.
- f) Compensation (in terms of Rupees) shall be shared amongst the beneficiary (s) in the following manner.

Compensation payable by beneficiary i

$$= (N_i \times \frac{A_i}{\sum(N_i \times A_i)}) \times \text{Compensation payable to CGS/ISGS}$$

Where

N_i = Number of start-ups attributable to the beneficiary i.

A_i = Weightage Average Percentage share of the beneficiary in the generating station

- g) The InSGS shall take all due care to keep the check on secondary oil use during part operation and during start ups to the extend possible.

6. Generating Station Running Below Technical Minimum

In case generating station runs below the technical minimum schedule, it shall be entitled for compensation corresponding to technical minimum schedule.

7. Calculation of Compensation, Billing and Submission of Data by the Generator

- a) Generating station shall calculate the compensation as specified in these procedures and bill the same to beneficiaries along with its monthly bill which shall be subject to the adjustment based on the implemented schedule issued by SLDC.
- b) Generating station shall submit the requisite data along with compensation calculation to beneficiaries as prescribed in **Schedule-1** for a month by 30th day of the month for the previous calculation month (16th to 15th) and so on. Payment terms to be decided by the buyer and seller.
- c) SLDC shall provide necessary implemented schedule for the period of calculation by 22nd day of the month to Generating company as well as to concerned Distribution Licensee.

8. Issuance of Compensation Statement

- a) The generating company will issue the compensation statement to the beneficiary with a copy to SLDC.
- b) In case any anomaly or discrepancy is noticed by any buyer, the same may be brought to the notice of the seller within 15 days of issuance of Compensation Statement.

9. Review of the Procedure

The Procedure shall be reviewed by the Commission after six months of its notification based on the feedback from buyer, seller and SLDC.

Schedule-1 of Annexure-4

Information to be submitted to the beneficiary by Intra-State Generators at the time of issuing bill.

Sr. No (a)	(b)	Unit No 1 (c)	Unit No 2 (d)	Unit No 3 (e)	Unit No 4 (f)	Total (g)
1	Installed capacity/MCR					
2	Planned outage/Tripped (Hrs)					
3	On bar hrs					
4	Normative SHR or Net SHR as the case may be					
5	Normative SFC					
6	CVSF					
7	LPPF					
8	LPSFi					
9	Normative LC					
10	LPL					
11	Normative Aux. Cons					
12	Actual GHR/SHR					
13	Actual SFC					
14	Actual LC					
15	Actual Aux. Cons					
16	RSD start /stop in the month					
17	RSD start/stop cumulative					
18	Total no. of Start /stop during year					
19	CVPF					

Schedule-2 of Annexure-4

Computation of Average Unit Loading (AUL)			
	Data Source	Formula	
Actual generation MWhr	AG(MU)	AG(MU)*1000	
Total IC in MWhr			
Total DC MWhr	DC On Bar(MU)	DC On Bar(MU)*1000	
Norm AEC	Norm APC	-	
IC Units under outage MW			
Units under RSD MW			
Outage Time			
On bar ic mwh	On Bar IC (MU)	On Bar IC *1000	
Effective Generation(SDL) MWhr	SG Excl. Bilateral (Mus)	Total SG(Mus)*1000	
Effective Capacity MWhr	On Bar IC (MU), Norm APC	On Bar IC (MU)*(1-Norm APC/100)	
AUL w.r.t SDL in %	Effective Generation(SDL) MWhr, Effective Capacity MWhr	100*Effective Generation(SDL) MWhr/Effective Capacity MWhr	Higher one to be taken
AUL w.r.t AG in %	Actual generation MWhr, Effective Capacity MWhr	100*Actual generation MWhr/Effective Capacity MWhr	
AUL w.r.t DC in %	Total DC MWhr, Effective Capacity MWhr	100*Total DC MWhr/Effective Capacity MWhr	

Schedule-3 of Annexure-4

Calculation of Compensation			
		Data Source	Formula
I	Degraded GHR	GHR	GHR*Compensation factor as applicable
II	Degraded AEC	APC, %APC dr(AUL SG)	APC + %APC dr(AUL SG)
III	GHR for ECR SE	GHR_Act_Cum, Degraded GHR	MIN(GHR_Act_Cum, Degraded GHR)
IV	AEC for ECR SE	APC_Act_Cum, Degraded AEC	MIN(APC_Act_Cum, Degraded AEC)
V	ECR(SE)	GHR for ECR SE, SFC, CVSF_Cum, LPPF_Cum, CVPF_Cum, AEC for ECR SE	ECR (SE)= {(GHR FOR ECR SE - SFC*CVSF)*LPPF/CVPF+SFC*LPSFi+LC*LPL}*100/(100-AEC for ECR SE)
VI	GHR for ECR DC	GHR, GHR_Act_Cum	MIN(GHR*(%Degradation as applicable), GHR_Act_Cum)
VII	AEC for ECR DC	APC_Act_Cum, APC dr(AUL DC)	MIN(APC_Act_Cum, APC dr(AUL DC))
VIII	ECR(DC)	GHR for ECR DC, SFC, CVSF, LPPF, CVPF, LPSF, AEC for ECR DC	((GHR for ECR DC - SFC)*CVSF*LPPF/CVPF)+(SFC*LPSF)*100/(100-AEC for ECR DC)
IX	ECRn(COMP)	ECR(SE), ECR(DC)	ECR(SE)-ECR(DC)
X	Comp(P)	Effective Generation(SDL) MWhr, ECRn(COMP)	Effective Generation(SDL) MWhr*ECRn(COMP)
XI	ECR(A)	GHR_Act_Cum, SFC, CVSF, LPPF, CVPF, LPSF, APC_Act_Cum	((GHR_Act_Cum - SFC)*CVSF*LPPF/CVPF)+(SFC*LPSF)*100/(100-APC_Act_Cum)
XII	ECR(N)	GHR, SFC, CVSF, LPPF, CVPF, LPSF, APC	((GHR - SFC)*CVSF*LPPF/CVPF)+(SFC*LPSF)*100/(100-APC)
XIII	EC(A)	Effective Generation(SDL) MWhr, ECR(A)	Effective Generation(SDL) MWhr*1000*ECR(A)
XIV	EC(N)	Effective Generation(SDL) MWhr, ECR(N)	Effective Generation(SDL) MWhr*1000*ECR(N)
XV	EC(A)-EC(N)	EC(A), EC(N)	EC(A)-EC(N)
XVI	Comp(F)	Comp(P), EC(A)-EC(N)	MIN(Comp(P), EC(A)-EC(N))

Schedule-4 of Annexure-4

Sample Calculation Sheet

AUL	
Actual generation	1063651.233
Total IC in MWhr	
Total DC MWhr	1393977.335
Norm AEC	5.75
On bar IC MWhr	1889672.4
Effective Generation (SDL) MWhr	1008292.661
Effective Capacity MWhr	1781016.237
AUL w.r.t SDL in %	56.61
AUL w.r.t AG in %	59.72
AUL w.r.t DC in %	78.27

Higher
one to
be
taken

GHR (kcal/kwh)	2247.97
GHR_Actual	2375.05
APC	5.75
APC_Actual	8.54
SFC	0.5
SFC_Actual	
LPPF_A(Rs/kg)	4.88936
LPSF_A(Rs/ml)	0.03349988
CVPF_A(kcal/kg)	3565.6
CVSF_A(kcal/ml)	8.97873

SG	1,008,292,661
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Degraded GHR	2,315.4091
Degraded AEC	6.75
GHR for ECR SE	2,315.4091
AEC for ECR SE	6.75
ECR(SE)	3.416
GHR for ECR DC	2,276.07
AEC for ECR DC	6.1
ECR(DC)	3.335
ECRn (COMP)	0.081
Comp(P)	81,671,705.541
ECR(A)	3.572
ECR(N)	3.282
EC(A)	3,601,621,385
EC(N)	3,309,216,513
EC(A)-EC(N)	292,404,872
Comp(F) Rs.	81,671,705.541

Note

- 1.All the values are taken from the Generator
- 2.Sample calculation is based on CERC Regulation

Annexure-5: Report on Reserve Shut Down for the Month of _____

(Refer Regulation No. 36.4)

Sr. No.	Generating Station	No. of Units	Unit Size (MW)	Total Capacity under Reserve Shut Down (Unit No and Capacity)	RSD Period (Date)		Reasons for RSD	Rank in MOD	Generating Station(s) with higher Variable Charge than the Station/Unit which was given MOD	Reasons for not selecting the Generating Station with higher Variable Charge for RSD
					From	To				
1										
....										

Notes:

Annexure-6: Report on Mis-Declaration for the Month

(Refer Regulation No. 32.5)

Sr. No.	Generating Station	Generating Unit	Unit Size (MW)	Details of Mis-Declaration Incidence and the penalty that would be applicable
1				
....				

Notes:

**Annexure-7: Mechanism for Accounting and Settlement of Reactive Energy Charges for
Intra-State Entities
(Refer Regulation 37.9)**

1. Preamble

- 1.1. As per Regulation 70 of MERC (Multi-Year Tariff) Regulations, 2019, generating station shall inject/absorb reactive energy into the grid on the basis of machine capability as per the directions of SLDC. Reactive energy exchange, only if made as per the directions of SLDC, for applicable duration (injection or absorption) shall be compensated/levied by SLDC to the generating station, as specified in the MEGC.

2. Applicability of the Mechanism

- 2.1. Mechanism shall be applicable to all the TSUs' and all generator(s) (including wind and solar generating stations) connected to InSTS directly or through common pooling substation in the State.
- 2.2. Mechanism shall be implemented in the State after the installation of Special Energy Meters (SEMs) at all interface points in the State and from the date to be separately notified by the Commission.

3. General Principle

- 3.1. Reactive Power compensation and/or other facilities shall be provided by the Users, as far as possible, in the low voltage systems close to the load points thereby avoiding the need for exchange of Reactive Power to/from the InSTS and to maintain the InSTS voltage within the specified range.
- 3.2. Suitable Line Reactors shall be provided to control temporary overvoltage within the limits as per the system study carried out by the STU.
- 3.3. Additional reactive compensation shall be provided by the TSUs as indicated by the STU.
- 3.4. Switching in/out of 765/400 kV bus and line Reactors throughout the InSTS shall be carried out as per the instructions of SLDC. Tap changing of all 765/400/220 kV ICTs' shall also be done as per the instructions of SLDC.

4. Methodology for Accounting and Settlement

- 4.1. To discourage VAR drawl/injection by the TSUs and Generating Unit, VAR exchanges with InSTS shall be priced as follows:
- The TSUs and Generating Unit shall **pay into the Pool for any VAR drawl** when the voltage at interface metering point is **below 97% of the bus voltage at which the TSU and Generating Unit is connected.**
 - The TSUs and Generating Unit shall **get paid from the Pool for any VAR injection** when the voltage at metering point is **below 97% of the bus voltage at which the TSU and Generating Unit is connected.**

- The TSUs and Generating Unit shall **get paid from the Pool for any VAr draw** when the voltage at metering point is **above 103% of the bus voltage at which the TSU and Generating Unit is connected.**
- The TSUs' and Generating Unit shall **pay into the Pool for any VAr injection** when the voltage at metering point is **above 103% of the bus voltage at which the TSU and Generating Unit is connected.**

Provided that there shall be no charge/payment for VAr draw/return by a TSU except Generating Unit on its own line emanating from a Generating Station.

Provided further that reactive energy exchange, only if made as per the directions of SLDC, for applicable duration (injection or absorption) shall be compensated/levied by SLDC to the generating station, as per following conditions:

Voltage/Condition of TSU and Generating Unit	VAr Draw from InSTS	VAr Injection into InSTS
$V_{\text{meter}} < 97\% \text{ of } V_{\text{bus}}$	Pay into the Pool	Get paid from the Pool
$97\% < V_{\text{meter}} < 103\%$	No payment	No payment
$V_{\text{meter}} > 103\% \text{ of } V_{\text{bus}}$	Get paid from the Pool	Pay into the Pool

- 4.2. The charge for kVArh (injection / drawal) to be levied shall be 13.00 paise/kVArh or such other rate as may be stipulated by Commission from the date of applicability of implementation of reactive power compensation mechanism in the state and the same shall be escalated by 0.50 paise/kVArh annually in subsequent years unless otherwise revised by the Commission.
- 4.3. Notwithstanding the above, SLDC may direct TSUs' and Generating Station to curtail its VAr draw/injection in case the security of the grid safety of any equipment is endangered.
- 4.4. The Generating Stations connected to InSTS shall generate/absorb reactive power as per the system conditions without any specific instructions of SLDC, **within the Capability Curve limits of the respecting Generating Units**, that is without sacrificing Active Generation required at that time.

SLDC shall monitor the Injection/Absorption of Reactive Energy by Generators during Real time and issue instructions during Voltages beyond 97% and 103% only to specific default Generators.

The operation of any hydro generation under condenser mode is a specific requirement depending up on system requirements. Hence, the operation of any hydro generation under condenser mode shall be with the instructions of SLDC only. SLDC shall maintain records for such operations.

- 4.5. During major grid disturbances, the bus voltages may deviate beyond set points. In such case, SLDC shall declare details of such incidence along with period, which may be

excluded from accounting, however, it shall be the responsibility of the TSUs' and the Generating Stations located in the affected area, to provide necessary active and reactive support as per the instructions of SLDC. SLDC shall maintain records of such instances and instructions.

- 4.6. In case TSUs' and/or Generators have been levied penalty for four consecutive weeks then an additional charge of 20 % of total weekly Reactive Charges arrived at 4th week, shall be levied to the concerned TSU or Generator.

5. Accounting and Settlement of Reactive Energy

- 5.1. It shall be the responsibility of STU to install SEMs' at all the G<>T and T<>D interface points in the InSTS along with AMR facility.
- 5.2. It shall be the responsibility of STU/Transmission Licensees to provide meter data of the Reactive Energy recorded for a week to SLDC for accounting and computation within 10 days of the successive next week.
- 5.3. It is the responsibility of SLDC to maintain State Reactive Energy Pool Account.
- 5.4. SLDC shall prepare and issue provisional weekly Statement of VAr charges for all the TSUs and Generating Stations in the State who have net reactive energy drawl/injection under low/high voltage conditions within ten (10) days from the receipt of AMR from all the TSUs'.
- 5.5. The Reactive Statement shall broadly contain following information:
- Details of day-wise net Reactive Energy Injection/Drawl during low Voltage (<97%) and high Voltage (>103%) for each TSU;
 - Summary of weekly total net Reactive Energy Injection/Drawl during low Voltage (<97%) and high Voltage (>103%) for each TSU;
 - Summary of Reactive Charges payable/receivable by the TSU;
 - Any other details which SLDC feels necessary to complete the Statement.
- 5.6. The Reactive Energy Settlement shall be carried out as per following procedure:

Nomenclature:

- **Regional Reactive Charges (RRC):** RRC Payable (+) / Receivable (-) by the State to Regional Reactive Pool Account.
- **State Reactive Charges Payable (SRC) (P):** (+) by TSUs'.
- **SRC Receivable (R): SRC (R) (-)** by TSUs'.
- **Reactive Reserve Amount (RRA):** RRA available in State Reactive Energy Pool Account (i.e., surplus balance amount after settlement of all earlier Reactive transactions)

(a) CASE – I:

RRC is payable (+) by the State and [RRC+SRC (R)] <SRC (P):

Balance amount shall be kept as reserve (RRA) after paying out RRC and SRC (P).

(b) CASE – II:

RRC is payable (+) by the State and $[RRC+SRC (R)] > SRC (P)$:

Surplus amount available in reserve (RRA), if any, shall be withdrawn to match $[RRC+SRC (R)]$ and SRC (P).

If there is no reserve or if it is inadequate to meet the gap, SRC (P) and SRC (R) shall be apportioned to match the total payables and total receivables.

(c) CASE – III:

RRC is receivable (-) by the State and $[RRC+SRC (P)] > SRC (R)$:

Balance amount shall be kept as reserve (RRA) after paying out SRC (R).

(d) CASE – IV:

RRC is receivable (-) by the State and $[RRC+SRC (P)] < SRC (R)$:

Surplus amount available in reserve (RRA), if any, shall be withdrawn to match $[RRC+SRC (P)]$ and SRC (R).

If there is no reserve or if it is inadequate to meet the gap, SRC (P) and SRC (R) shall be apportioned to match the total payables and total receivables.

(e) CASE – V:

No RRC for the State, No SRC (P), only SRC (R) and no RRA:

No Reactive Charges shall be paid to TSUs’.

(f) CASE – VI:

RRC is payable (+) by the State, No SRC (P), SRC (R) and no RRA:

The amount available in the State DSM Pool Account may be utilized for payment to the Regional Reactive Pool purely on temporary basis. In such instances, once the balance is made in the State Reactive Pool Account, the same shall be transferred in the State DSM Pool Account.

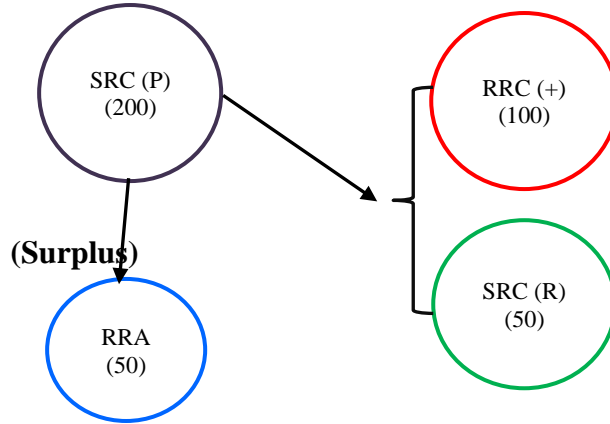
The illustration for above cases is shown below as **Appendix-1** to this procedure.

- 5.7. These payments shall be paid on priority by TSU and Generators to State Reactive Energy Pool Account within 10 days of issue of statement.
- 5.8. TSUs’ who have to receive amount on account of VAr charges would then be paid out from within one week from the receipt of payment in the Reactive Pool Account.
- 5.9. If payments against the VAr charges is delayed by more than two days, i.e., beyond 12 days, from the issue of Statement, the defaulting TSU shall pay simple interest @ 0.04 % for each day of delay. Persistent payment defaults, if any, shall be reported by SLDC to the Commission for initiating remedial action.

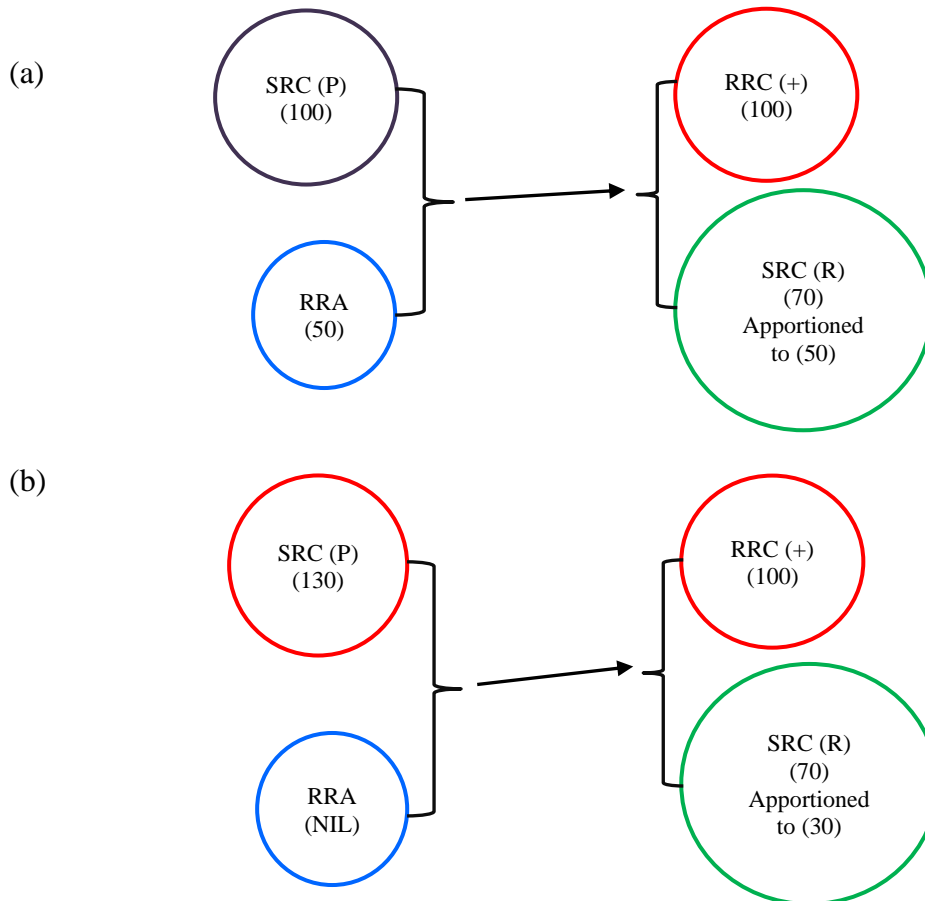
- 5.10. The amount remaining in the Reactive Pool Account after pay-out of all the VAR charges up to 31st March of every year shall be utilized as decided by the Commission from time to time.
- 5.11. SLDC shall place a complete statement of State Reactive Energy Pool Account before the GCC meeting on quarterly basis.

Illustration for State Reactive Energy Account Settlement

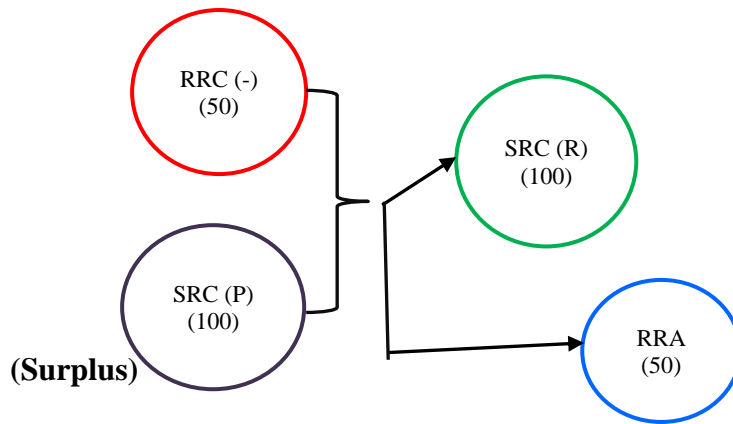
CASE – I: RRC is payable (+) by the State and $[RRC+SRC (R)] < SRC (P)$



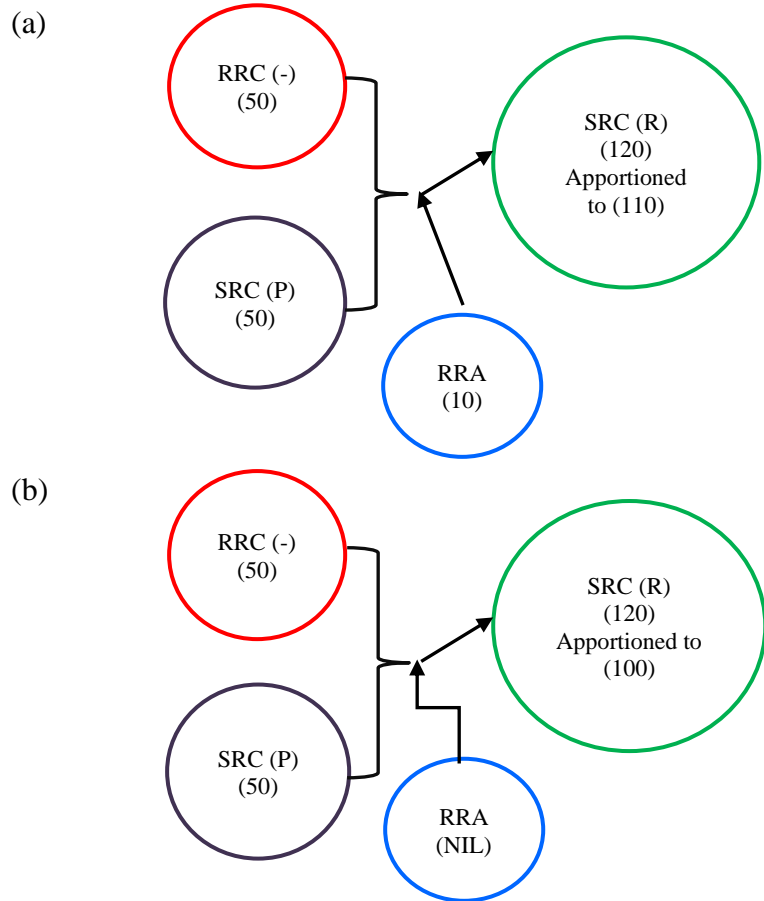
CASE – II: RRC is payable (+) by the State and $[RRC+SRC (R)] > SRC (P)$



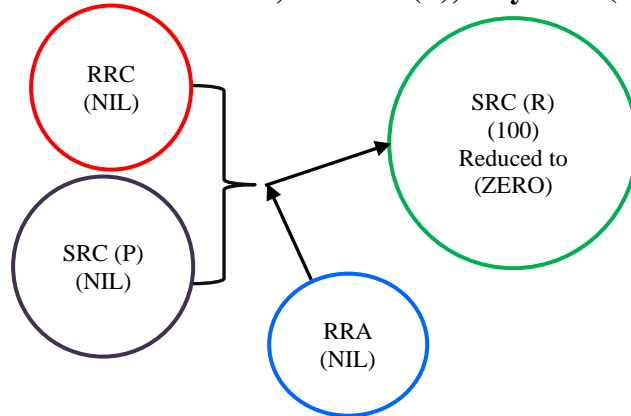
CASE – III: RRC is receivable (-) by the State and $[RRC+SRC (P)]>SRC (R)$



CASE – IV: RRC is receivable (-) by the State and $[RRC+SRC (P)]<SRC (R)$

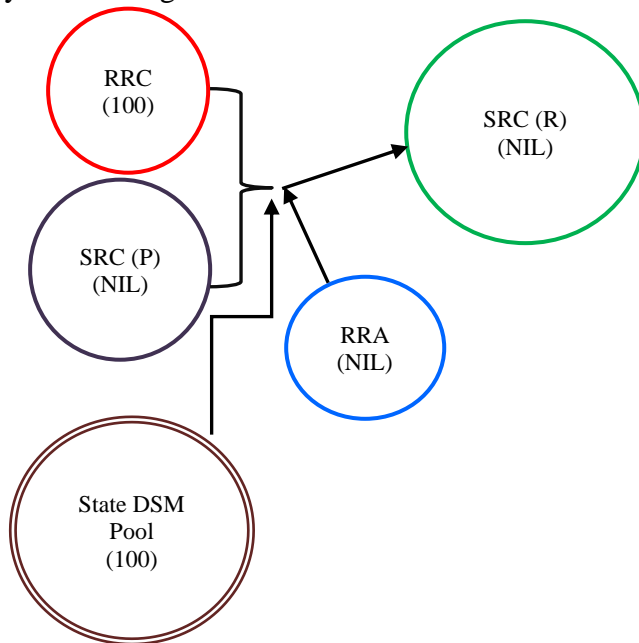


CASE – V: No RRC for the State, No SRC (P), only SRC (R) and no RRA

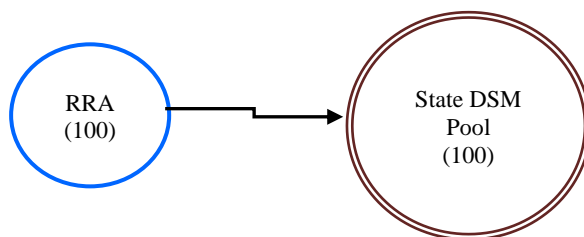


CASE – VI: RRC payable (+) for the State, No SRC (P), SRC (R) and no RRA

(a) Payment through State DSM Pool Account



(b) Transfer of Payment back to State DSM Account



**Annexure – 8.1 Revised Format of Form-5B of Scheduling and Despatch Code
(Ref: Regulation 33)**

FORM -5B (modified)

**Format for Buyer wise MoD Stack (De-Centralised MoD) for Day ahead Scheduling and
Revision of Schedule**

(This MoD Stack shall also be used during Intra-Day Operation subject to the Provisions of the
MERC DSM Regulations, MoD Principles specified by the Commission and provisions of this
Procedure)

MOD STACK OF VARIABLE CHARGES (VC) FOR (Month__) (R_) FOR BUYER							
(Effective from _____ to _____)							
S.no.	Generator	Installed Capacity/ Share in ISGS (MW)	Type of Fuel	Projected Variable Charge (Rs)/kWh in Descending Order			
				Variable Charge in Rs/kWh (as per Tariff Order for S.62 Generators / as per PPA for S.63 Generator)	Projected Fuel Adjustme nt Charge in Rs/kWh if any	Projected Impact of Change in Law if any in Rs/kWh	Total Projected Variable Charge in Rs/kWh
				(a)	(b)	(c)	(d) =(a)+(b)+(c)
1	Gen -1	xxx	Oil/Gas	xxxx	yyyy	zzzz	pppp
2	Gen -2	xxx	Gas	xxxx	yyyy	zzzz	pppp
3	Gen -3	xxx	Coal	xxxx	yyyy	zzzz	pppp
4	Gen -n	xxx	Coal	xxxx	yyyy	zzzz	pppp

**Annexure – 8.2 Revised Format of Form-6B of Scheduling and Despatch Code
(Ref: Regulation 33)**

FORM -6B (modified)

**Format for State-wise MoD Stack (Centralised MoD) for Intra-Day Real time operation for
SLDC interventions**

**(This MoD Stack shall also be used during Intra-Day Real time Operation due to SLDC
interventions subject to the Provisions of the MERC DSM Regulations, MoD Principles
specified by the Commission and provisions of this Procedure)**

MOD STACK OF VARIABLE CHARGES (VC) FOR (Month__) (R)_)							
(Effective from _____ to _____)							
S.n o.	Gener ator	Installed Capacity/ Share in ISGS (MW)	Type of Fuel	Projected Variable Charge (Rs)/kWh in Descending Order			
				Variable Charge in Rs/kWh (as per Tariff Order for S.62 Generators / as per PPA for S.63 Generator)	Projected Fuel Adjustme nt Charge in Rs/kWh (if any)	Projected Impact of Change in Law (if any) in Rs/kWh	Total Projected Variable Charge in Rs/kWh
				(a)	(b)	(c)	(d) =(a)+(b)+(c)
1	Gen -1	xxx	Oil/Gas	Xxxx	Yyyy	zzzz	pppp
2	Gen -2	xxx	Gas	Xxxx	Yyyy	zzzz	pppp
3	Gen -3	xxx	Coal	Xxxx	Yyyy	zzzz	pppp
4	Gen -n	xxx	Coal	Xxxx	Yyyy	zzzz	pppp