

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

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

ELECTRICITY ACT, 2003

No. MERC/Legal/319- 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 EA, 2003.

The Maharashtra Electricity Grid Code (MEGC) 2020 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 also be known as Maharashtra Electricity Grid Code (MEGC) 2020 and shall contain the following parts, namely:

Part A: General – This part specifies the scope and application of these Regulations and with Grid Coordination Committee (GCC) 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 specifies the conditions under which the State Load Despatch Centre (SLDC) shall operate the InSTS and under which Users and Transmission Licensees 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 specifies 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 specifies the provisions related to the communication requirements of Users connected with the InSTS. It also sets out Users’ 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 specifies 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 – This 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 specifies the miscellaneous aspects such as data sharing, compliance with the MEGC, 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. Provisions of the MEGC, 2020 shall apply to all entities/users unless otherwise specified in the specific Code/Regulation.
- 1.4. 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.

Provided that, the provisions related to Deviation Settlement Mechanism framework and preparation of de-centralised merit order for buyer-wise scheduling shall come into force from the date to be separately notified by the Commission for implementation of commercial arrangement under MERC DSM Regulations.

Provided further that, until notification of such date as referred hereinabove, the provisions of Final Balancing and Settlement Mechanism (FBSM) as approved by the Commission under Order in Case 42 of 2006 (ABT Order) along with relevant amendments from time to time shall be in operation. The appropriate provisions of MEGC, 2020 shall be read with provisions of ABT Order along with relevant amendments thereof till the notification of date of commercial implementation of DSM framework.

- 1.5. The date of coming into effect of stipulated provisions under specific clauses of Regulations namely, Spinning Reserves planning (Regulation 14.4.1), Principles of Merit Order Despatch (Regulation 33.13), implementation of the provisions of Technical Minimum and compensation thereof (Regulation 34.7) and Reactive Power management framework (37.16), shall be as specified in the respective Regulation of this MEGC,2020.
- 1.6. 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 action 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:

- 1) **“Accredited Test Laboratory”** means a test laboratory accredited by National Accreditation Board for Testing and Calibration Laboratories (NABL);
- 2) **“Act”** means the Electricity Act 2003 (36 of 2003) as amended from time to time;
- 3) **“Active Energy”** means the electricity supplied or consumed during a time interval, being the integral of Active Power with respect to time, measured in the units of ‘Watt – hours’ or standard multiples thereof. One ‘kilowatt – hour’ (kWh) is one unit;
- 4) **“Active Power”** means the electrical power, being the product of root mean square (rms) voltage, root mean square (rms) current and cosine of the phase angle between the voltage and current vectors and measured in units of ‘Watt’ (W) or in standard multiples thereof;
- 5) **“Appropriate Load Dispatch Centre”** means ‘National Load Dispatch Centre’(NLDC) or ‘Regional Load Dispatch Centre’ (RLDC) or the ‘State Load Dispatch Centre’ (SLDC) which includes any ‘Area Load Dispatch Centre’ (ALDC) attached to SLDC as the case may be;
- 6) **“Appropriate Transmission Utility”** means the ‘Central Transmission Utility’ (CTU) or the ‘State Transmission Utility’ (STU), as the case may be;
- 7) **“Area Load Despatch Centre (ALDC)”** means a load despatch centre(s) established by Maharashtra State Load Despatch Centre (SLDC) or STU or Transmission Licensee for load despatch and control in a particular area of the State which reports to SLDC;
- 8) **“Authority”** means the Central Electricity Authority (CEA) as constituted under Section 70 of the Act;
- 9) **“Automated Meter Reading System (AMR)”** means the scheme to automate the task of data collection from each meter / location to Meter Data Acquisition System (MDAS) at the central location.
- 10) **“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;
- 11) **“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;
- 12) **“Availability”** in relation to a thermal generating station for any period means the average of the daily average declared capacities as certified by SLDC for all the days during that period, expressed as a percentage of the installed capacity of the Generating Station / Unit minus normative auxiliary consumption in Megawatts (MW), as specified in MERC MYT Regulations as amended from time to time , and shall be computed in accordance with the following formula:

$$\text{Availability (\%)} = 100 \times \sum_{i=1}^N \frac{DC_i}{\{N \times IC \times (100 - AUX_n)\}} \%$$

Where

N= number of time blocks in the given period

DC= Average Declared Capacity in MW for the i^{th} time block in such period

IC = Installed Capacity of the Generating Station/Unit in MW

AUX = Normative Auxiliary Consumption in MW, expressed as a percentage of gross generation.

And

“Availability” in relation to a hydro generating station for any period means the average of the daily average declared capacities as certified by SLDC for all the days during that period, expressed as a percentage of the installed capacity of the generating station /Unit minus normative auxiliary consumption in Megawatts (MW), as specified in MERC MYT Regulations as amended from time to time, and shall be computed in accordance with the following formula:

The Plant Availability Factor achieved during the Month (PAFM), in Percentage shall be computed in accordance with the following formula:

$$\text{PAFM (\%)} = 100 \times \sum_{i=1}^N \frac{DC_i}{\{N \times IC \times (100 - AUX_n)\}} \%$$

AUX = Normative auxiliary energy consumption in percentage.

DC_i = Declared Capacity (in ex-bus MW) for the i^{th} day of the month which the Station can deliver for at least three hours, as certified by SLDC after the day is over.

IC = Installed Capacity (in MW) of the complete Generating Station

N = Number of days in the month

- 13) “**Available Transfer Capability (ATC)**” means the transfer capability of the inter-control area transmission system available for scheduling commercial transactions (through Long Term Open Access (LTOA), Medium Term Open Access (MTOA) and Short Term Open Access (STOA)) in a specific direction, considering the network security. Mathematically, ATC is the Total Transfer Capability Less Transmission Reliability Margin;
- 14) “**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;
- 15) “**Black Start Procedure**” means the procedure necessary to recover the grid from partial or total blackout in the State;
- 16) “**Bulk Consumer**” means in respect of connectivity, any consumer who avails or intends to avail supply from the InSTS.

- 17) **“Buyer”** means a person, including distribution licensee, deemed distribution licensees, open access consumer, purchasing electricity through a transaction scheduled in accordance with the Regulations applicable for STOA, MTOA and LTOA;
- 18) **“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;
- 19) **“Captive Power Plant (CPP)”** means a power plant set up by any person to generate electricity primarily for his own use and includes a power plant set up by any co-operative society or association of persons for generating electricity primarily for use of members of such cooperative society or association;
- 20) **“Central Generating Station”** means generating station of the companies owned or controlled by Central Government;
- 21) **“Check Meter”** means a meter, which shall be connected to the same core of the Current Transformer (CT) and Voltage Transformer (VT) to which main meter is connected and shall be used for accounting and billing of electricity in case of failure of main meter;
- 22) **“Collective Transaction”** means a set of transactions discovered in Power Exchange through anonymous, simultaneous competitive bidding by buyers and sellers;
- 23) **“Commission”** means the Maharashtra Electricity Regulatory Commission;
- 24) **“Congestion”** means a situation where the demand for transmission capacity exceeds the ATC;
- 25) **“Connection Agreement”** means an Agreement between 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;
- 26) **“Connection Point”** means a point at which a plant and/or apparatus connects to the Transmission/Distribution System;
- 27) **“Connectivity”** means the state of getting connected to the InSTS by a generating station, including captive generating plant or User or an Intra-State Transmission Licensee;
- 28) **“Correct Meter”** means a meter, which shall at least have, features, Accuracy Class, and specifications as per the Metering Code of these Regulations;
- 29) **“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;
- 30) **“Deemed Distribution Licensee”** means, Person is authorized under Section 13 or Section 14 of the Act by virtue of Notification by the Appropriate Regulatory

- Commission to operate and maintain a power distribution system for supplying electricity to consumers in the area of supply as specified in the Notification;
- 31) **“Demand”** means the demand of Power in MVA, Active Power in MW and Reactive Power in MVAr of electricity unless otherwise stated;
 - 32) **“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;
 - 33) **“Device Language Message Specification (DLMS)”** means the objective to provide an interoperable environment for structured modelling and meter data exchange. Applications like remote meter reading, remote control, and value-added services for metering any kind of energy like electricity are supported;
 - 34) **“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;
 - 35) **“Distribution Licence”** means a Licence granted under Section 14 of the Act to distribute electricity;
 - 36) **“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;
 - 37) **“Energy Accounting Meters”** means meters used for accounting of the electricity to various segments of electrical system so as to carry out further analysis to determine the consumption and loss of energy therein over a specified time period;
 - 38) **“Event”** means an unscheduled or unplanned occurrence on a Grid including faults, incidents, and breakdowns;
 - 39) **“Event Logging Facilities”** means a device provided to record the chronological sequence of operations of the relays and other equipment;
 - 40) **“Ex-Power Plant”** means net MW/MWh output of a generating station, after deducting auxiliary consumption and transformation losses.
 - 41) **“Extra High Tension (EHT)”** means all voltages above 33 kilovolt (kV);
 - 42) **“Fault Locator”** means a device provided at the end of a transmission line to measure/indicate the distance at which fault may have occurred;
 - 43) **“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;
 - 44) **“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 STU, SLDC, Generator, User, licensee or any person and includes 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;
- 45) **“Forced Outage”** means an outage of a generating unit or a transmission facility due to fault or other reasons which has not been planned;
- 46) **“Gaming”** in relation to this Code, shall mean an intentional mis-declaration of declared capacity by any Seller or intentional mis-declaration of drawal schedule by any Buyer in order to make an undue commercial gain through Charge for Deviations;
- 47) **“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;
- 48) **“High Tension (HT)”** means all voltages above and including 650 Volt and up to and including 33 kiloVolt;
- 49) **“Independent Power Producer (IPP)”** means a generating company not owned/controlled by the Central/State Government or not a captive power plant (CPP);
- 50) **“Indian Electricity Grid Code (IEGC)”** means the grid code specified by the CERC under sub section 1(h) of Section 79 of the Act; as amended from time to time;
- 51) **“Installed Capacity”** means the summation of the name plate capacities of all the units of the generating station or the capacity of the generating station (reckoned at the generator terminals) as approved by the Commission from time to time;
- 52) **“Instrument Transformer”** means the ‘Current Transformer’(CT), ‘Voltage Transformer’ (VT) and ‘Capacitor Voltage Transformer’ (CVT);
- 53) **“Inter State Transmission System (ISTS)”** means:
- i) Any system for the conveyance of electricity by means of a main transmission line from the territory of one State to another State
 - ii) The conveyance of electricity across the territory of an intervening State as well as conveyance within the State which is incidental to such inter-State transmission of energy

- iii) The transmission of electricity within the territory of State on a system built, owned, operated, maintained, or controlled by CTU;
- 54) **“Interface Meter”** means a meter used for accounting and billing of electricity, connected at the point of interconnection between electrical systems of generating company, licensee and consumers directly connected to the Inter-State Transmission System or InSTS, and have been permitted open access by the Appropriate Commission;
- 55) **“Inter State Generating Station (ISGS)”** means a Central Sector/other generating station in which two or more than two States have a share and whose scheduling is to be coordinated by RLDC;
- 56) **“Intra State Generating Station (InSGS)”** means a generating station connected to intra-State Transmission System whose scheduling is to be coordinated by SLDC;
- 57) **“Intra State Transmission System” (InSTS)** means any system for 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 in the State excluding ISTS;
- 58) **“Licensee”** means a person who has been granted a licence or deemed licensee under Section 14 of the Act;
- 59) **“Load”** means the MW/MWh/MVAR/MVARh consumed by a utility/State Entity/installation;
- 60) **“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;
- 61) **“Maharashtra State Load Despatch Centre (MSLDC or SLDC)”** means the Centre established under sub-section (1) of Section 31 of the Act;
- 62) **“Main Meter”** means a meter, which would primarily be used for accounting and billing of electricity;
- 63) **“Maximum Continuous Rating (MCR)”** means the maximum continuous output in MW at generator terminal guaranteed by the manufacturer at rated parameters;
- 64) **“Meter Data Processing (MDP)”** means data validation, processing, and generation of customized reports of received data from AMR at SLDC;
- 65) **“MERC DSM Regulations”** refers to the Regulations MERC (Deviation Settlement Mechanism and Related Matters) Regulation, 2019 notified by the Commission for the State of Maharashtra and its amendment thereof;
- 66) **“MERC F&S Regulations”** refers to the Regulations MERC (Forecasting, Scheduling and Deviation Settlement and related matters for wind and solar)

Regulations, 2018 notified by the Commission for the State of Maharashtra and its amendment thereof;

- 67) **“Meter”** means a device suitable for measuring, indicating, and recording consumption of electricity or any other quantity related with electrical system.
- 68) **“Metering System”** means a system for measuring, indicating, and recording consumption of electricity or any other quantity related with electrical system and shall include meter, CT, VT, CVT, Lead cables etc. whichever applicable for such purpose.
- 69) **“MoD Principles”** means the principles for the operation of Merit Order Despatch (MoD) and amendments thereof, as specified by the Commission in these Regulations and Deviation Settlement Mechanism Regulations and as amended from time to time;
- 70) **“Open Access”** means the non-discriminatory provision for the use of transmission lines or distribution system or associated facilities with such lines or system by any licensees or consumer or a person engaged in generation in accordance with Regulations of the appropriate Commission;
- 71) **“Operation”** means a scheduled or planned action relating to the operation of a system;
- 72) **“Power Exchange”** means the power exchange established with the prior approval of the Central Electricity Regulatory Commission;
- 73) **“Power Factor”** means the cosine of the electrical angle between the voltage and current vectors in an AC electrical circuit;
- 74) **“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;
- 75) **“Reactive Energy”** means, the integral of Reactive Power with respect to time and measured in the units of ‘Volt-Ampere hours reactive (VARh) or in standard multiples thereof;
- 76) **“Reactive Power”** means the product of root mean square (rms) voltage, root mean square (rms) current and the sine of the electrical phase angle between the voltage complex and current complex, measured in ‘Volt – ampere reactive’ (VAr) and in standard multiples thereof;
- 77) **“Reference Frequency”** for DSM computation means the frequency as recorded by WRLDC and used by WRPC for regional Deviation Settlement Mechanism for that particular time block;

- 78) **“Regional Grid”** means the entire synchronously connected electric power network of the concerned Region, comprising of ISTS, ISGS and intra-state systems;
- 79) **“Regional Load Despatch Centre (RLDC)”** means the Centre established under sub-section (1) of Section 27 of the Act;
- 80) **“Regional Power Committee (RPC)”** means a Committee established by resolution of Central Government for a specified region for facilitating the integrated operation of the power system in that region;
- 81) **“Resource Adequacy”** means a measure of an electric system’s ability to provide adequate generation to meet all firm load obligations.
- 82) **“Scheduled Drawal”** at any time or for a time block or any period means schedule of drawal for Buyer in MW or MWh given by the concerned Load Despatch Centre;
- 83) **“Scheduled Generation”** at any time or for a time block or any period means schedule of generation in MW or MWh ex-bus given by the concerned Load Despatch Centre;
- 84) **“Seller”** means a person, including a generating station or unit of generating station, supplying electricity through a transaction scheduled in accordance with the Regulations applicable for STOA, MTOA and LTOA;
- 85) **“Share”** means percentage share of a beneficiary in an ISGS/InSGS either notified by Government of India or agreed through contracts as the case may be, and implemented through long term/medium term access;
- 86) **“Solar/Wind Power Park Developer (SPPD)”** means the entity who develops the transmission system including the pooling station within the premises of the park on behalf of solar or wind power generation developers.
- 87) **“Special Energy Meters”** means such meters, of not less than 0.2S class accuracy, as are capable of:
- i. Recording time-differentiated measurements of active energy and voltage differentiated measurement of reactive energy, at intervals of fifteen (15) minutes, and five (5) minutes;
 - ii. Onsite configuration for 15 min. or 5 min. interval whichever is applicable. Meter configuration/programming shall be carried out by authorized representative of STU only.
 - iii. storing such measurements for not less than fifteen (15) days for 5 min. interval and forty-five (45) days for 15 min. interval;
 - iv. communication of such measurements at such intervals as may be required by the SLDC for balancing and settlement of energy transactions;

- v. Shall be DLMS protocol compliant, Communicable and have the intelligence to synchronize the time with GPS (Local GPS/CDCS GPS) signal.
- 88) **“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;
- 89) **“Standards”** means Standards on Installation and Operation of meters given in these Regulations unless otherwise any other standard specifically referred;
- 90) **“Standby Meter”** means a meter connected to CT and VT or CVT, other than those used for main meter and check meter and shall be used for accounting and billing of Electricity in case of failure of both main meter and check meter;
- 91) **“State Deviation Pool Account”** means the State Account for receipts and payments on account of deviations by Buyers and Sellers including Wind and/or Solar Energy Generators;
- 92) **“State Entity”** means such person who is in the SLDC control area and whose metering and energy accounting is done at the state level;
- 93) **“State Generating Stations”** means the generating stations of state-owned generation company, i.e., Maharashtra State Power Generation Company Limited;
- 94) **“State Grid”** means synchronous grid inter-connecting generators, load centres and intra-state transmission lines in the State;
- 95) **“State Periphery”** means the periphery of electrical power system and its components thereof under operational supervision and under control area jurisdiction of SLDC covering InSTS;
- 96) **“State RE Deviation Pool Account”** means the State Account for receipts and payments on account of deviations by Wind or Solar Energy Generators;
- 97) **“Static VAR Compensator (SVR)”** means an electrical facility designed for the purpose of generating or absorbing Reactive Power;
- 98) **“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;
- 99) **“Supplier”** means any generating company or licensee from whose system electricity flows into the system of another generating company or licensee or consumer;
- 100) **“Technical Minimum”** means the operation in respect of a unit(s) of a Thermal Generating Station shall be 55% of Maximum Continuous Rating or MCR loading or installed capacity of the units on bar at the generating station after deducting the

normative Auxiliary Energy Consumption plus Auxiliary Energy Consumption compensation as per the provisions of these Regulations.

- 101) **“Time Block”** means block of 15 minutes or any such shorter duration as may be notified by Central Commission and State Commission for which specified electrical parameters and quantities are recorded by Special Energy Meters with first time block starting from 00.00 hours;
 - 102) **“Time of the Day (TOD) Meter”** means a meter suitable for recording and indicating consumption of electricity during specified time periods of the day.
 - 103) **“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;
 - 104) **“Trader”** means a person who is granted a license to undertake trading of electricity;
 - 105) **“Transmission Licence”** means a licence granted under Section 14 of the Act to transmit electricity;
 - 106) **“Transmission Open Access User”** means a person who has been allotted transmission capacity rights to access an InSTS pursuant to a Bulk Power Transmission Agreement (BPTA);
 - 107) **“Transmission Reliability Margin (TRM)”** means the amount of margin kept in the TTC necessary to ensure that the interconnected transmission network is secure under a reasonable range of uncertainties in the system conditions;
 - 108) **“Under Frequency Relay (UFR)”** means a relay which operates when the system frequency falls below a specified limit and initiates load curtailment;
 - 109) **“User” or “InSTS User”** means a person such as InSGS including, CPP, Renewable Energy Generators or Distribution Licensee or Consumers connected to the InSTS;
- 2.2. 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 MEGC,2020, 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 Regulations, encompassing all the Utilities connected to/or using InSTS and governs the relationship between various Users of InSTS, SLDC, as well as 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, irrigational 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 MEGC 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; and
- f) All Renewable Energy power projects, Solar/ wind Power Parks and park developers connected to InSTS

Provided further 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 MEGC 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 under MEGC;
- 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 30.3.

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

5. Grid Coordination Committee (GCC)

5.1. A GCC shall be re-constituted by STU within two months from the date of notification of these regulations.

Provided that, the STU in consultation with SLDC shall prepare the business rules for functioning of GCC within one month from the date of notification of these Regulations.

Provided further that, the GCC constituted under MEGC,2006 shall continue to function till a new GCC is constituted under 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 shall 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 the 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. Constitution of GCC:

5.4.1. GCC shall comprise of Core Group and Grid Co-ordination Conference.

5.4.2. The members of the core group shall be as below:

- a) Director, State Transmission Utility (STU) - Chairperson of GCC;
- b) Representative of State-Owned Generating Company - Member;
- c) Representative of State-Owned Distribution Licensees in the State – Member;
- d) Representative of State-Owned Transmission Licensees in the State – Member;
- e) Representative of Western Region Power Committee – Member;
- f) Representative of Maharashtra Energy Development Agency – Member;
- g) Executive Director/Chief Engineer, SLDC – Member Convener;

5.4.3. Following entities shall be members of Grid Co-ordination conference:

- 1) All members of Core Group of GCC
- 2) Representative of WRLDC;
- 3) Representative of each Distribution Licensee in Mumbai/MMR region;
- 4) Representative of the Indian Railways in the State;
- 5) Representative of Private Transmission Licensee including Mumbai Transmission Licensees subject to condition at Regulation 5.4.5;
- 6) Representative of Private-Owned Generating Companies Including IPPs and CPPs in the State connected to InSTS subject to condition at Regulation 5.4.5;
- 7) Representative of Deemed Distribution Licensees subject to condition at Regulation 5.4.5;

- 8) Representative of Renewable Energy (RE) generators in the State; One member each from Wind, Solar, SHP, Biomass generation and Bagasse based Co-generation, subject to condition at Regulation 5.4.5;

5.4.4. The members referred to in Regulation 5.4.2 and 5.4.3 above shall be nominated by their respective organizations and shall be part of Core Group of GCC and Grid Co-ordination Conference of GCC, respectively. Members of the core group shall be also part of grid co-ordination conference of GCC.

Provided that the members nominated by each of the organization shall be holding a senior position in their respective organization and shall be duly authorised to represent the organisation.

5.4.5. Following principle shall be followed for selection of representatives of members under (5) to (8) of Regulation 5.4.3 above:

1. Representative of Private Transmission Licensees – Two private transmission licensees having highest transmission network in Circuit-Km in the previous financial year.
2. Representative of Private-Owned Generating Companies Including IPPs and CPPs in the State – All IPPs /CPPs generators having own installed capacity 500MW and above (excluding RE installed capacity portfolio).
3. Representative of Deemed Distribution Licensees – One representative having highest non-coincident peak demand (NCPD) during last financial year.
4. Representative of RE generators in the State -
 - a. Wind generator having highest own installed capacity in the State
 - b. Solar generator having highest own installed capacity in the State
 - c. SHP generator having highest own installed capacity in the State
 - d. Biomass generator having highest own installed capacity in the State
 - e. Bagasse based Co-gen having highest own installed capacity in the State

Provided that, nomination of MSPGCL will not be considered for RE generator.

5.4.6. In addition, the core group of GCC may invite any stakeholder, expert, professional from academic or research institution as special invitee on case to case basis for the specific meeting.

5.5. Proceeding and Meetings of the GCC

- a) The core group of GCC shall meet at least once in three months and invite other members as special invitee as and when required.
- b) General body meeting of grid co-ordination conference shall be held at least once in a year and all members of Conference of GCC shall be invited for the meeting.

- c) Member Convener of GCC shall put up names and designation of all members of GCC on its website.
- d) Agenda of GCC shall be circulated in advance before the meeting.
- e) Minutes of the meeting shall be uploaded on STU's website.
- f) STU 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.
 - d) All reports, recommendations, and Minutes of the GCC shall be published by SLDC and STU **on their website.**
- 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 Users 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 and Communication Code & related issues.

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 six-monthly 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 planned outage plan of STU;
- d) Review the load curtailment mechanism;
- e) Review the installation of Disturbance Recorders, Event Loggers, Under Frequency Relays (UFR), 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;
- g) Review of Renewable Energy Curtailment and formulate means of avoiding/reducing it;
- h) Review of Transmission Constraint cases noticed by SLDC and suggest the recommendations.; and
- i) Any other function as directed by the GCC.

7.5. **Protection Coordination Committee (PCC):**

7.5.1. PCC shall meet at least 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. State Transmission Utility shall be responsible for managing and serving the Metering Code for InSTS of Maharashtra with each constituents/Users of InSTS discharging respective obligations under the Metering Code.

7.6.2. MCCC shall have following members:

- (a) A Chairman from STU, who shall be Director (Operation) MSETCL.
- (b) A Member (Secretary) from STU, who shall be Chief Engineer from MSETCL.
- (c) Executive Director/Chief Engineer, State Load Dispatch Center.
- (d) Five Representative from of Generating Companies/IPP's in State having maximum generation capacity.
- (e) One representative from each Transmission Licensee in the State.
- (f) One representative from each Distribution Licensee in the State.
- (g) Three representatives from Solar Power Producers having maximum power generation capacity.
- (h) Three representatives from Wind Power Producers having maximum power generation capacity.
- (i) Three representatives from Bagasse Co-gen Power Producers having maximum power generation capacity.
- (j) Two representatives from Hydro Power Producers having maximum power generation capacity.

7.6.3. 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.

7.6.4. MCCC shall perform the following functions:

- a) Ensure compliance of Metering Code;
- b) Review deviations in the existing 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) Review correctness and efficacy of the assessment methodology used for Metering defects, data loss etc;
- e) Deliberate and decide the issues related to communication aspects of AMR/MRI;
- f) To issue guidance on the interpretation and implementation of the Metering Code.
- g) Review and propose amendments in metering arrangement and metering code;
- h) To publish recommendations for changes to the Metering Code for InSTS together with the reason for the change and any objection if applicable
- i) Periodic review of SCADA visibility of all Drawal & injection points; and
- j) 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 Act, 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. CTU;
 - ii. State Government;
 - iii. Generating companies;
 - iv. RPC;
 - v. CEA or Authority;
 - vi. Transmission Licensees;
 - vii. Any other person notified by the State Government 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 InSGS and STU's substations etc.
- 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 Act, functions of the SLDC include:

- a) Be responsible for optimum scheduling and despatch of electricity within a State, in accordance with the provisions of these Regulations, MERC DSM Regulation, 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 Act, 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 Act. 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.

- 8.2.4. 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.
- 8.2.5. 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.
- 8.2.6. From the date to be notified separately in consultation with GCC, SLDC shall publish on its website daily report of availability of SCADA to ensure adequate data availability in real time covering interface points and highlight the deficient interface locations.
- 8.2.7. 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 Act, and these Regulations.

8.4. Role of Distribution Licensees

Distribution Licensee shall discharge the functions as stated in Section 42 of the Act, 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

User 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 wide band 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.

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.

Role of RE Generator/RE Developer: RE Generator/RE Developer connected (directly or through Pooling Station) 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 at Pooling Station level. It shall follow the relevant provisions of the MEGC, MERC F&S Regulations, MERC DSM Regulations and assist the SLDC in real time operation and control of the system and scheduling of generation. It shall also develop the transmission system including the pooling station within the premises of the park.

8.6. **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 the Act, 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 the Act, 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 the Act, 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 STU for its future demand (Short, medium, and long-term pattern under different scenarios);
- e) Adequacy of generation resources taking in to 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 and across each flow gate in a comprehensive manner by STU;
- i) Import and export capability across ISTS and STU interface.

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 from 1st April of the next year. Resource adequacy can be met using short-term, medium and long term capacities available for Round the Clock (RTC), peak and off-peak durations. Adequacy statement containing a list of such resources along with associated capacities shall be submitted to the STU by 31 December of each year and made publicly available on its website. Efforts to shift load, inter-DISCOM banking and storage should also be considered while preparing the adequacy statement. The adequacy statement should be revised every year in the five-year period and monthly reports should be submitted to the STU regarding compliance with the adequacy statement.
- 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 shall use appropriate power system modelling tools and 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 and State target as per Government of Maharashtra Policy and the RPO targets as notified by the Commission;
- 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 of each Transmission Licensee to avoid the duplication of work and optimisation of InSTS cost.

12.2. **Augmentation of transmission system:** The STU shall, while planning to augment InSTS in the form of expansion or upgradation shall consider the following:

- (a) New and emerging technologies;
 - (b) Cost-benefit analysis;
 - (c) Likely shutting down of old/ inefficient generating stations;
 - (d) RE capacity addition;
 - (e) Renewable Purchase Obligation;
 - (f) System adequacy from the perspective of black start/ start-up supply;
 - (g) Requirement of reactive power;
 - (h) Optimal utilization of resources to ensure an efficient and economical system with due consideration to power market, regional interconnection, or any other policy initiatives of Government of Maharashtra.
 - (i) Retirement of obsolete / unnecessary /idle network from the system as well as books of account.
- 12.3. STU shall provide the template to collect requisite data from stakeholders to prepare InSTS plan.
- 12.4. 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.
- 12.5. 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.
- 12.6. 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.
- 12.7. 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.

Provided further that, the STU shall publish the draft of Integrated Resource Plan (IRP) and perspective transmission plan on its website and invite the comments of stakeholders.

12.8. STU shall prepare a transmission system plan based on the data obtained from the Users and internal sources for:

- a) Short term period, i.e., up to 3 years;
- b) Medium term period, i.e., up to 5 years; and
- c) Long term period, i.e., up to 10 years.

12.9. Transmission system plan prepared by the STU shall consist of the following sections:

- a) Executive summary of Transmission plan shall clearly indicate 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 RE 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, transmission system plan shall also include schemes related augmentation of equipment such as Power Transformers, ICTs, Capacitors, Reactors, Static VAR Compensators and FACTS, substation and lines modernisation, major replacement of equipment in the substations and lines augmentation etc.

12.10. 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 October and 15 April of each financial year.

- 12.11. 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.
- 12.12. 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.
- 12.13. 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 as below,

- i) Short Term Plan – Yearly
- ii) Medium Term Plan- Biyearly (Once in Two years)
- iii) Long Term Plan – Biyearly (Once in Two years)

Provided further that, the transmission system plan shall be published in the manner as specified in Regulation 12.14 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 also that, transmission plans shall be updated to accommodate the revisions in the load projections and generation capacity additions.

- 12.14. 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.
- 12.15. 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 including but not limited to Load Flow, Transient Stability and Voltage Stability 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 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 along with 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 six 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 periodic 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. STU shall conduct short circuit studies for symmetrical and asymmetrical faults to evaluate short circuit levels at existing as well as proposed new EHV substations and voltage stability studies as required after considering the fault level.

13.3.2. STU shall take measures such as bus splitting, series reactor or any other commercially available technology to limit the short circuit levels at existing substations wherever they are likely to cross the designed limits.

13.3.3. Maximum short circuit level on any new substation bus shall not exceed 80% of the rated short circuit breaking capacity of switchgear and other equipment at different voltage levels shall be as given below:

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

Provided that rating of various substation equipment shall be such that they do not limit the loading limits of connected transmission lines.

13.3.4. While planning EHV substations, STU shall be guided by the Technical Standards and Transmission Planning Criteria specified/notified by the Authority.

13.3.5. 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.

13.3.6. 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

13.3.7. 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.

13.3.8. A stuck breaker condition shall not cause disruption of more than four feeders for 220kV 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 or Double Bus Scheme for AIS and GIS Substations respectively;
- c) Generation attached 220kV switchyard: Double Main & Transfer;
- d) 220kV Switchyard with more than eight feeders: ‘Double Main & Transfer’ scheme or ‘One and a half breaker’; and
- e) 220kV Switchyard with & up to eight feeders: ‘One Main & Transfer’ 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.

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 wind velocity specified by Authority.

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) or based on the specific technical considerations /area specific requirement after detailed study. 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 Bipole are feeding power (multi in feed), appropriate studies may be carried at the planning stage to avoid commutation failure.

13.6. Maximum permissible line loadings for different types of line configurations, employing various types of conductors, shall be thermal loading limits, as specified by the Authority.

13.7. 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.

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.

13.8. 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.

13.9. InSTS shall be capable of withstanding the loss of most severe single infeed without loss of stability.

13.10. Any of the events defined in Regulation 13.7 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.

13.11. 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 that if there are no line or source substation 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/transmission lines to avoid the idling of the assets.

Explanation: For the purpose of Regulation 13.11, the term, 'firm capacity' shall mean minimum transformation capacity available at the substation in case of outage of any one transformer/ICT.

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

13.13. **Implementation of Transmission Plan**

13.13.1. 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.

13.13.2. 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.

13.13.3. MTC and the concerned transmission licensee shall ensure simultaneous execution of substation and transmission lines, to avoid stranding of assets.

13.13.4. MTC shall submit its quarterly report of 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

14.4.1 SLDC will need to ensure maintenance of adequate Spinning Reserve Margin equivalent to 3% of the System Peak Demand or such other percentage to be stipulated by the Commission through separate Order or Practice directions 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) up to 3% of installed capacity or such other percentage to be stipulated by the Commission through separate Order or Practice directions for the management of ramp up as per the requirement of the Grid.

Provided that such requirement of spinning reserve shall be operationalised with effect from the date to be notified separately in consultation with SLDC and GCC.

14.4.2 During day ahead scheduling, SLDC shall provide target despatch schedule for such specified generator(s) after allowing for maintenance of spinning reserve margin up to 3% of installed capacity or such other percentage to be stipulated by the Commission through separate Order or Practice directions.

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.

14.4.3 The Distribution Licensees may share the spinning reserve resources on mutually agreed terms.

14.4.4 SLDC shall prepare detailed procedure to operationalise provisions related to spinning reserve margin and submit the same to the 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

Objectives 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 InSTS 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 should be aware of the procedure for connectivity to the InSTS, and the standards to be complied with by user for connectivity with the InSTS network.

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, CEA (measures relating to Safety and Electric Supply) 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.

Provided that bulk consumers shall submit application for connection to the concerned distribution licensee of its area.

- 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 a 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 and 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.

- d) Any user shall not be connected with InSTS network, prior to the compliance of the provisions of these Regulations.
- 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(a), 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 MEGC 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 MEGC;
 - 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 (including LILLO connection point) 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. SGS shall be connected to InSTS at the Voltage level, 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 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 OCC, 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 Round the Clock 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;
 - 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 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 further 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 as amended from time to time and as per the requirement of the Regulation 43 of these Regulations. 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 Licensees 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 30.3(a) 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% (coal), 105 % (OGT/CCGT) and 110% (Hydro) 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, solar-wind hybrid power and other RE considered as a must-run station as per the provisions of the MERC RE Tariff Regulations. 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. Pumped Storage Hydro generators having capability to operate in pump mode are required to operate in Pump mode as per the instructions of 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) Generating company of InSGS shall certify that:
 - i. 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. 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) 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 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 or each repeat 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. For commercial operation date (CoD) of RE generators under Section 63 of the Act, the provisions of Competitive Bidding guidelines/RFP shall be applicable and if RE generator is developed under Section 62 of the Act,, the provisions of MERC RE Tariff Regulations shall be applicable.

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

31.4.1. 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 commission the generating station and the transmission system simultaneously as far as practicable and shall ensure the same through appropriate Implementation Agreement. 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 appropriate Authority.
- 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 substations or both are implemented through TBCB, the progress of implementation shall be monitored by the appropriate authority as per the provisions of the TBCB guidelines or any other such document specified by the appropriate authority.
- 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, or downstream distribution system of distribution 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 filed under the provisions of the 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 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 conform to the relevant provisions of MEGC and other Standards specified by the Authority.

31.4.2. 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.

31.4.3. 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.

31.4.4. 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 MYT 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 for the particular time block, under the following circumstances:

32.1.1. In case the DC by generator for a particular Unit during peak hours is lower than off-peak hours;

32.1.2. In case the DC for a particular generating unit during the low demand period during the year is higher than the DC during the high demand period during the year;

32.1.3. In case the variation in minimum and maximum DC 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 the request by contracted distribution licensee;

- 32.1.5. At the discretion of the SLDC on random basis at any time which may 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 prevailing MYT Regulations shall be made applicable. For generating units whose Tariff is being determined by the Commission under Section 62 of the Act, the penalty shall be as per the prevailing MYT Regulations and for the Generating Units having PPAs entered into under Section 63 of the Act, 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 at least 10-time blocks in advance as per the detailed procedure specified in Annexure-3 of these Regulations. The costs associated with re-demonstration of DC shall be borne by such Generator.

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.

- 32.5. SLDC shall prepare the report of such instances of mis-declaration 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 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 for each month considering the principles specified in these Regulations and least cost despatch principles.

- 33.2. For preparation of MoD Stack to be operational for the monthly period, the seller whose tariff is determined by the Commission or seller whose tariff is adopted by the Commission shall consider following components while submitting the unit wise variable charge or energy charge for the next monthly period¹ for which MoD is to be prepared:

- a) variable charge/energy charge as per tariff Order / PPA including FSA billed during previous or latest month as may be applicable,
- b) impact of the claim for approved change of law,

Provided that Seller shall submit the same to the buyer with whom it has PPA by 8th day of every month (Nth month) in the Format- 5S enclosed as Annexure -8.1 to these Regulations.

Provided further that, the seller shall consider the variable charge approved/adopted by the Commission and FSA billed during previous month [i.e. (N-1)th month] or latest month in case FSA for (N-1)th month is not available, and also consider the impact of claim towards change in law already approved by the Commission.

Provided further that, seller shall consider the impact of both components on the VC/EC separately and submit to the buyer along with following supporting details:

- a) Approved variable charge as per the tariff order including fuel surcharge for previous (N-1) month or Applicable Energy Charge as per PPA for previous month (N-1) month;
- b) Landed Cost of Fuel/Bills for (N-1) month;
- c) Supplementary Bills for (N-1) month;

¹ Monthly period shall mean 16th day of Nth Month to 15th day of (N+1)th Month.

- d) All computations and supporting documents considered for computation of variable charge for the Nth month.
 - e) Other supporting documents in line with existing FAC guidelines.
- 33.3. Buyer shall scrutinize the variable charge/energy charge submitted by seller. The buyer may request for additional supporting information if required. Upon detailed scrutiny, the buyer shall submit the following details to SLDC for the purpose of MoD stack along with its consent:
- a) variable charge/energy charge as per tariff Order/ PPA including FSA billed during previous or latest month as may be applicable,
 - b) impact of claim for approved change of law,
- 33.4. Buyer shall submit the scrutinised variable charge/energy charge to the SLDC for preparation of MoD stack by 13th day of every month (Nth month) with intimation to seller with whom it has PPA in the Format- 5B enclosed as Annexure-8.1 to these regulations.
- 33.5. For central sector generating stations (CSGS), the variable charge for MOD purpose shall be landed variable charge at the state periphery for the immediately preceding month (N-1), including the injection losses, drawal losses of CTU and other such charges like electricity duty cess of exporting state.
- 33.6. For Intra-State Open Access transactions having single part tariff, total tariff shall be considered as variable charge for MOD purpose.
- 33.7. Variable charge for MOD purposes shall be provided up to three decimal places.
- 33.8. SLDC shall prepare the MoD Stack on the 15th day of every month (Nth month), which would be effective from the 16th day of the Nth month till the 15th day of the subsequent month [i.e. (N+1)th 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 (Nth month) in the Format-5B and Format-6B enclosed as Annexure-8.1 and Annexure-8.2 respectively to 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/bilateral agreement/Short term agreement in between period of MoD operation,
 - b) Revision of variable charges for preparing the MOD Stack due to Tariff Order issued by the Commission for state generating stations or by the Central Commission for central generating stations,
 - c) Impact of change in law in the PPAs as approved by the Commission.

33.10. In case of claim for un-approved change of law, the Seller/Generating Company shall file Petition before the Commission with its claim for un-approved change of law for purpose of incorporation in the merit order stack within reasonable time period not exceeding period of one month from the date of its first occurrence with intimation to the concerned Buyer/Distribution Licensee, failing which the Commission may take appropriate view, while approving the claim of Seller/Generating Company towards principal component of claim of change of law or its claim of carrying cost thereof or both.

33.11. Buyer/Distribution Licensee shall submit its say on such Petitions in timely manner but not later than 15 days from filing of the Petition to facilitate expeditious disposal of the same through due regulatory process.

Provided that upon approval (if approved) by the Commission, the Seller/Generating Company shall consider the same as part of component (b)[viz. impact of claim towards approved change of law], for the purpose of preparation of MoD stack subject to condition that the Seller/Buyer shall strive to incorporate the revision in the MoD stack preferably within seven days from the date of approval by the Commission or from next Monthly Period of MoD operation, whichever is earlier.

Provided further that, claims towards further variation in rate of already approved change in law on account of statutory taxes, duties, levies, cess shall be deemed to be approved by the Commission unless otherwise disputed by either of the party (viz. Seller/Buyer). Such deemed approved component shall be considered as part of component (b) [viz. impact of claim towards approved change of law] for the purpose of Merit Order stack preparation and payment to the Seller/Generator.

Provided also that, the Buyer/Distribution Licensee shall be vigilant and shall inform the SLDC in writing so as to ensure that such deemed approved claim is included for the purpose of Merit Order stack preparation and payment to Seller/Generator.

33.12. At the time of true-up of power purchase cost of buyers, the Commission shall consider the adherence to MoD principles followed by buyers to ensure overall efficacy of the power procurement by buyers. During truing up process, the buyer shall also submit the relevant documents to justify the deemed approval of change in law as specified in second proviso to Regulation 33.11 of MEGC,2020.

33.13. The process of merit order stack preparation specified in Regulation 33 shall also be applicable for preparation of MoD stack under FBSM framework subject to operational governing principles and commercial settlement mechanism under FBSM regime.

Provided that transitory period of at least one month from the date of notification of these Regulations shall be provided to all the stakeholders for implementation of the principles of MoD stack preparation specified in these Regulations. The Commission shall separately notify the date of operationalisation of principles for merit order stack as specified under these Regulations.

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 Maximum Continuous Rating (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.

Provided that, for computation of compensation for generator supplying power to multiple buyers, the compensation shall be calculated as per the same mechanism specified in these Regulations and its Annexures-4, and the total charges computed shall be allocated among the buyers of the generator in proportion to their implemented schedule for that period.

Provided further that, the generators shall maintain separate account for the claims submitted to buyers for operation of Unit below 85% as per the instructions of SLDC. Such information and details shall be also submitted to the Commission while submitting the FAC claims to the Commission for approval and during tariff filing process.

- 34.3. InSGS whose tariff is either determined or adopted by the Commission, will be directed by SLDC to operate below normative plant availability factor but, at or above technical minimum, such InSGS may 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 85%.

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 as % 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 (7) 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 AEC shall be admissible if the actual Heat Rate and/or actual AEC are lower than the normative Station Heat Rate and/or normative AEC 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 SHR, AEC and Secondary Oil Consumption.
 - i) No compensation for Heat Rate degradation and AEC shall be admissible if the actual Heat Rate and/or actual AEC are lower than the normative station Heat Rate and/or normative AEC 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 of the year.
- 34.6. The mechanism for compensation for SHR and AEC 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.
- 34.7. The provisions of Technical Minimum at 55% specified in the Regulation 34 shall also be applicable under FBSM framework subject to operational governing principles and commercial settlement mechanism under FBSM regime.

Provided that transitory period of at least one month from the date of notification of these Regulations shall be provided to all the stakeholders for implementation of the provisions of Technical Minimum at 55% specified in these Regulations. The Commission shall separately notify the date of operationalisation of provisions of Technical Minimum at 55% as specified under 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.

Provided that, 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 8 hours prior notice of the Zero Scheduling to the generator on bar 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 from cold start and at least 8 hours in advance for hot start and at least 24 hours in case of warm start condition.

35.8. Declared Capacity of generation unit under Zero Schedule shall be considered as higher of Average Declared Capacity for immediate one week prior to Zero Schedule instructions or Maximum Declared Capacity (for minimum 3 hours period) for last 24 hours before commencement of Zero Scheduling.

35.9. No maintenance work shall be carried out when the generating unit will be under Zero Scheduling.

Provided that, if a generating station/unit requires any maintenance under Zero Scheduling, same shall be done in due consultation with SLDC.

Provided further that, the Declared Capacity of such generating station/unit shall be reduced appropriately.

35.10. Zero scheduling shall be carried out by the distribution licensee considering its roles and obligations including capacity charges liabilities under the corresponding PPAs.

35.11. 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 triuing 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.
- Provided that, 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.
- 36.4. SLDC shall give 8 hours prior notice of RSD to the generator on bar to enable it to take steps for smooth removal of the Unit from the Grid.
- 36.5. Declared Capacity of generation unit under RSD shall be considered as higher of Average Declared Capacity for immediate one week prior to RSD instructions or Maximum Declared Capacity (for minimum 3 hours period) for last 24 hours before commencement of RSD.
- 36.6. No maintenance work shall be carried out when the generating unit will be under RSD.
- Provided that, if a generating station/unit requires any maintenance under RSD, same shall be done in due consultation with SLDC.
- Provided further that, the DC of such generating station/unit shall be reduced appropriately.
- 36.7. The proposed RSD shall be minimum for the period of 72 hours and may be extended as per the system condition. The ramping up and ramping down at the specified rates should be allowed for bringing back the unit on bar and the DC for this period shall be preserved. However, generator would make all efforts to minimize the lit-up time.
- 36.8. In case the machine is not revived as per the revival time declared by the generating station under different types of start, the machine shall be treated under outage for the duration starting from the likely revival time and the actual revival time. SLDC shall ensure that intimation is sent to the generating station sufficiently in advance keeping in view its start-up time.
- 36.9. SLDC shall prepare appropriate Guidelines for Instructing RSD of Generating Unit in line with the provisions of Regulation 36 of these Regulations within one month of notification of 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. Switchable 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 and 765 kV bus and line Reactors throughout the grid shall be carried out as per the instructions of SLDC. Tap changing on all 765/400/220 kV Interconnecting Transformers shall also be done as per the instructions of SLDC in concurrence with RLDC only. The Users already connected to the grid shall provide additional reactive compensation as per the quantum and time decided by the SLDC.
- Provided that, for the purpose of tap changing, voltage of local bus shall be considered as reference voltage.
- 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 MYT 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 at their grid inter-connection point for all dispatch scenarios by providing reactive compensation as specified by the Authority from time to time.
- 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 as specified 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 by the Authority. STU may carry out voltage stability studies for sensitive nodes having low voltages and lesser fault level and ensure that voltages at these nodes are much above knee point.

- 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 TTC / 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 98 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 drawal 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 98 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 including Monthly CPD/NCPD shall be prepared by SLDC and made available on its 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 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 Load Generation Balance Report (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 OCC.

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 1,000 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.

PART E: SCHEDULING AND DESPATCH CODE

[SLDC prepared the draft Scheduling and Despatch (S&D) Code considering the Stakeholder's comments and suggestion and submitted to the Commission for approval. The Commission approved the S&D code on 11 November 2019. The Commission while publishing draft MEGC,2020 on 1st March,2020 specified that, the approved S&D Code shall form the Part E of the final MEGC,2020 Regulations. Accordingly, the Commission has incorporated approved S&D code as Part E of these MEGC,2020 Regulations. For improving readability of consolidated MEGC,2020, the definitions of S&D code are incorporated in the definitions of MEGC,2020 and Definition and Regulation numbers are revised appropriately. The S&D code dated 11 November,2019 shall not be referred separately from the date of notification of these MEGC,2020 Regulations.]

47. Objectives

Scheduling and Despatch Code has been prepared to facilitate SLDC in discharging its responsibilities as per the provisions of MEGC,2020, IEGC and MERC DSM Regulations. The Code identifies roles and responsibilities of Users and State Entities for preparation and finalisation of the following by SLDC:

- a) A day-ahead Despatch Schedule for Sellers,
- b) A day ahead Drawal Schedule for Buyers,
- c) A load generation balance for State.

48. Scope

- 48.1. This code deals with the procedures to be adopted for scheduling of Sellers connected to InSTS and assistance in scheduling of Inter-State generating stations (ISGS) through WRLDC as per IEGC and net drawal of buyers on a day ahead basis and during intra-day operation. This code sets down the procedure for the flow of information between SLDC and WRLDC, between SLDC and sellers and between SLDC and buyers of the InSTS system.
- 48.2. This Scheduling and Despatch code shall apply to all State Entities i.e., Buyers and Sellers connected to or using InSTS under its control area as defined in Regulation 49 of these Regulations.
- 48.3. The procedure for submission of day-ahead generation schedules by each Seller and drawal schedule by each Buyer and submission of day-ahead schedule of ISGS to WRLDC is also covered under this code.
- 48.4. It also provides methodology of issuing real time Despatch/Drawal instructions and rescheduling, if required, to State Entities.

49. Applicability

This Scheduling and Despatch Code shall be applicable to

- 49.1. All Seller(s) having installed generating capacity of Unit or Combined capacity of all units in the generating station above 25 MW (or such other threshold capacity), including RE generators, open access generators, captive generators having connected to InSTS but excluding wind and solar generating stations(s). Forecasting, scheduling and deviation settlement related matters regarding wind and solar generation shall be governed as per the provisions of “Maharashtra Electricity Regulatory Commission (Forecasting, Scheduling and Deviation Settlement for Solar and Wind Generation) Regulations, 2018” and its amendments thereof.

Provided that, the provisions of the Scheduling and Despatch Code shall be also applicable to all RE generating stations (except Wind and Solar Generators) having installed capacity less than 25 MW connected to InSTS for the purpose of scheduling as specified in this Code.

- 49.2. All Buyer(s) including distribution licensee(s), deemed distribution licensee(s) located in the state and full open access consumers connected to InSTS.
- 49.3. This Scheduling and Despatch code shall be binding to all State Entities.
- 49.4. The provisions of this scheduling code shall be read with the other provisions of these MEGC, 2020 Regulations, MERC (Deviation Settlement Mechanism and related matters) Regulations, 2019, MERC (Forecasting, Scheduling and Deviation Settlement and related matters for wind and solar) Regulations, 2018 and procedure framed there under.

50. Roles and Responsibilities

50.1. Roles and Responsibilities of SLDC

- 50.1.1. In accordance with Section 33 of the Act, SLDC in the 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 power system in that State. Every licensee, generating company, generating station, substation and any other person connected with InSTS shall comply with the directions issued by the SLDC under subsection (1) of Section 33 of the Act. The SLDC shall comply with the directions of the RLDC.
- 50.1.2. In case of Inter-State bilateral and collective transactions having a State utility or an Intra-State Entity as a Buyer or Seller, SLDC shall accord concurrence or no objection certificate or a prior standing clearance, as the case may be, in accordance with the Central Electricity Regulatory Commission (Open Access for Inter-State Transmission) Regulations, & MERC (Transmission Open Access) Regulations, 2016 and MERC (Distribution Open Access) Regulations, 2016 notified from time to time.
- 50.1.3. SLDC is responsible for coordinating the scheduling of a Buyers and Sellers, within its control area. SLDC shall also be responsible for
- i. Preparation of Merit Order Stack for Day Ahead scheduling process for each month considering the MoD Principle specified in these Regulations and principles specified in the MERC DSM Regulations and as amended from time to time.
 - ii. real-time monitoring of the Seller's/Buyer's operation,
 - iii. checking that there is no gaming in its declared capacity or drawal schedule,
 - iv. revision of declared capacity and injection schedule,
 - v. revision of drawal schedule
 - vi. switching instructions,
 - vii. outage planning etc.
- 50.1.4. SLDC shall take all decisions regarding the despatch of generating stations after evaluating all the possible network parameters, constraints, congestions in the transmission network and in the eventuality of any such network condition. Instructions of SLDC relating to despatch and drawal shall be binding on all State Entities.
- 50.1.5. SLDC shall periodically review the actual deviation from despatch and net drawal schedule being issued, to check whether any of the Buyer or Seller is indulging in unfair gaming or collusion. In case any such practice is detected, the matter shall be treated in accordance with the provisions of MERC DSM Regulations,2019 and its amendments thereof.

- 50.1.6. SLDC shall be responsible for time block-wise computation of deviation for concerned State Entities, based on the actual meter readings made available by STU and the implemented schedule for the State Entities and preparation of State DSM Pool Account and State Energy Account.
- 50.1.7. SLDC shall issue procedure/guidelines to all State Entities in respect of manner & timing of submission of day ahead drawal/ injection schedules along with such other information as may be required, for consolidating the same and issue the drawal/despatch schedules for the next day starting at 00:00 Hrs.
- 50.1.8. SLDC shall also be responsible for preparation of State Periphery 'Deviation Pool Account' for Regional Pool Account Settlement.

50.2. Roles and Responsibilities of State Entities

A) Sellers:

- 50.2.1. Provisions of MERC DSM Regulations,2019 and its amendments thereof and this scheduling and despatch code shall be applicable to all Seller(s) having installed generating capacity above 25 MW (or such other threshold capacity), including RE generators but excluding wind and solar generating stations(s), open access generators, captive generators (excluding in-situ captive generators) connected to InSTS. In case of Wind and Solar generating station, provisions of MERC (F&S) Regulations and the procedure framed therein shall be applicable.
- 50.2.2. The provisions of this Scheduling and Despatch Code shall be also applicable to all RE Generating stations (except Wind and Solar Generators) having installed capacity less than 25 MW connected to InSTS for scheduling purpose as per the detailed procedure specified in this Code.
- 50.2.3. Captive generating stations or Unit connected to InSTS shall submit its Schedule separately for its own captive consumption and schedule for injection of energy into the grid as per the Scheduling Process detailed out in this code.
- 50.2.4. Captive Consumers with in-situ Captive Generating Stations having installed capacity 1MW and above shall provide Net Schedule of their consumption to Distribution Licensee(s) to facilitate Distribution Licensees plan their demand forecast and schedule of power requirement accordingly.
- 50.2.5. Sellers shall operate their generating stations in a manner that is consistent with the provisions of the IEGC and the Provisions of these Regulations as amended from time to time.
- 50.2.6. Sellers shall be responsible for power generation/power injection as per the time block wise schedules finalised by SLDC in accordance with the provisions of these Regulations, MERC DSM Regulations, 2019, MERC F&S Regulations,2018 and its amendments thereof, and procedure formulated therein as applicable.
- 50.2.7. Sellers shall inform to SLDC, the details of all contracts, they have entered into for exchange of energy.

- 50.2.8. Sellers would normally be expected to generate power according to the daily schedules advised to them. The Sellers may deviate from the given schedules within the limits specified in the MERC DSM Regulations, as amended from time to time, depending on the generating unit and system conditions. In particular, they may be allowed to generate beyond the given schedule under deficit conditions, as long as such deviations do not cause system parameters to deteriorate beyond permissible limits and/or do not lead to unacceptable line loading. Deviations, if any, from the ex-power plant generation schedules shall be appropriately priced in accordance with MERC DSM Regulations. In addition, deviations from schedules causing congestion shall also be priced in accordance with the Congestion Charge Regulations of CERC.
- 50.2.9. The Seller shall make an advance declaration of ex-power plant MW and MWh capabilities foreseen for the next day, i.e., from 0000 hrs to 2400 hrs. The seller while making Ex-power plant foreseen generation capability in MW & MWh is also required to take into account availability of fuel & water along with foreseen Day ahead capability. During fuel shortage condition, in case of thermal stations, they may specify minimum MW, maximum MW, MWh capability and declaration of fuel shortage.
- 50.2.10. The Sellers shall also declare the possible ramping up / ramping down in a block. In case of a gas turbine generating station or combined cycle generating station, the generating station shall declare the capacity for units and modules on APM gas, RLNG and liquid fuel separately, and these shall be scheduled separately.
- 50.2.11. While making or revising its declaration of capability, except in case of run-off-river (with up to three-hour pondage) hydro stations, the SGS/InSGS shall ensure that the declared capability during peak hours is not less than that during other hours. However, exception to this rule shall be allowed in case of tripping/re-synchronization of units as a result of forced outage of units. It shall be incumbent upon the generating station to declare the plant capabilities faithfully; i.e., according to their best assessment. In case, it is suspected that they have deliberately over/under declared the plant capability contemplating to deviate from the schedules given on the basis of their capability declarations (and thus make money either as undue capacity charge or as the charge for deviations from schedule), the SLDC may ask the generating station to explain the situation with necessary back-up data.

B) Buyers:

- 50.2.12. Provisions of this scheduling and despatch code and MERC DSM Regulations and its amendments thereof shall be applicable for all Buyer(s) including distribution licensee(s), deemed distribution licensee(s), located in the State, and full open access consumers connected to Intra-State transmission system.
- 50.2.13. Buyers shall operate their loads in a manner consistent with the provisions of the IEGC and the provisions of these Regulations as amended from time to time.
- 50.2.14. Buyers shall be responsible for drawal as per the time block wise schedules finalised by SLDC in accordance with the provisions of these Regulations, MERC DSM

Regulations, 2019 and its amendments thereof, and procedure formulated therein as applicable.

50.2.15. Buyers shall enter into Connection Agreement/Open Access Agreement with the concerned transmission licensee, which shall specify physical and operational requirements for reliable operation and gain physical access and connection to the InSTS, enter into Connection Agreement/Open Access Agreement with concerned Distribution Licensee for use of distribution system, as the case may be in accordance with MERC (Transmission Open Access) Regulations, 2016 and its amendments thereof and MERC(Distribution Open Access) Regulations, 2016, and its amendment thereof.

50.2.16. Buyers shall inform to SLDC, details of all contracts they have entered into for exchange of energy.

50.3. Roles and Responsibilities of STU

50.3.1. STU shall install special energy meters including Automated Meter Reading (AMR) facilities on all inter connections between the State Entities and other identified points for recording of actual MWh interchanges and MVarh drawal. Installation, operation, and maintenance of special energy meters shall be in accordance with the Metering Code specified in these Regulations.

50.3.2. STU shall make necessary arrangements for putting up suitable meters, capable of recording energy flows at 15-minute intervals or any other time interval as specified by the Commission, at the points of injection and drawal. The time synchronisation of metering system shall be through Global Positioning System with counter check from the State Energy Accounting Centre at SLDC.

50.3.3. STU shall register all the interface points and interface meters in the MDAS software and share the meter data with SLDC registry for DSM computation. No change in the interface metering infrastructure shall be carried out by STU without prior approval of the SLDC and suitable modifications in the records of the registry in the MDAS software.

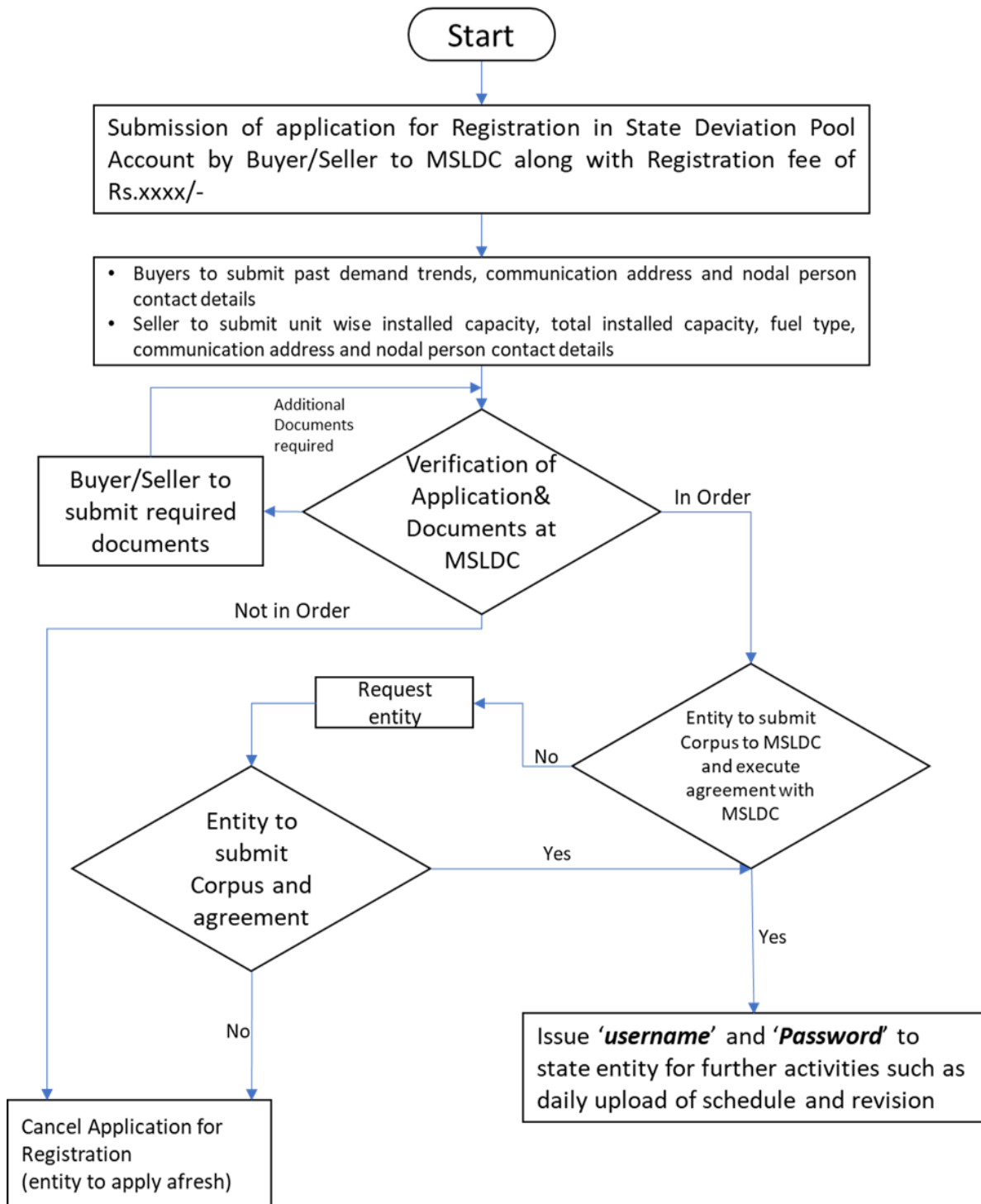
50.3.4. STU shall be responsible for installation and maintenance of the metering infrastructure, AMR facilities and Communication infrastructure.

50.4. Registration of State Entities for Scheduling

- i. The application for registration for Scheduling and Re-scheduling process should be online through SLDC's web-based software.
- ii. A Seller shall submit separate application for each of its Generating Stations or units, where the Commission is determining Unit Wise Tariff, or where Captive Generating Plant or Open Access Generating plant where there is unit wise sale or wheeling arrangement in place for scheduling.
- iii. The application of Registration shall be made as per the application format for registration (in Annexure-10) and shall contain details such as:

- Location of Generation in case of Seller
 - Total capacity of Generation and inter-connection arrangements with InSTS
 - Demand profile in case of a Buyer
 - Communication arrangements with SLDC
 - Communication details of Nodal person responsible to coordinate with SLDC
- iv. The Registration process shall be accompanied by non-refundable processing fee as approved by the Commission and as stipulated under Annexure-9.
 - v. The scanned copy of form/required document shall be uploaded.
 - vi. Once submitted online, printed copy of the documents signed and sealed by competent authority shall be sent to SLDC.
 - vii. An incomplete Application form not found in conformity with these Regulations shall not be considered by SLDC for processing.
 - viii. The verification of documents of State Entity shall be completed by SLDC within one week from the date of receipt of complete documents.
 - ix. After verification of documents the State Entity shall submit an Undertaking to SLDC that it shall undertake all operational and commercial responsibilities as mentioned in MERC DSM Regulations, 2019.
 - x. The State Entity shall deposit a corpus amount as stipulated under Annexure-9, within one week from the date of agreement with SLDC.
 - xi. Once the State Entity executes agreement with SLDC and deposit corpus amount, SLDC shall register the State entity within 1 week and issue ‘username’ and ‘password’ for accessing the website for further activities such as uploading day ahead/intraday schedule.

Procedure for State Entity Registration for Scheduling and Re-Scheduling Purpose



51. SLDC Fees and Charges

SLDC fees and charges including scheduling and rescheduling charges shall be paid by the State Entity as approved by the Commission from time to time. The other charges shall be applicable as per relevant Orders/Regulations of the Commission. The prevalent charges are provided under Annexure No. 9 with these Regulations.

52. General Principles of Scheduling and Despatch Code

52.1. General Principles:

- 52.1.1. Each State Entity including Buyers and Sellers in the State shall nominate a dedicated person/cell to coordinate and communicate with SLDC for the purpose of Scheduling and Despatch. The name, designation, contact address and contact telephone numbers of such nominated person shall be informed to SLDC and all concerned.
- 52.1.2. Following matters shall be governed by the IEGC and procedure laid down there-under
 - a. Declared capacity of ISGS
 - b. Entitlement of beneficiaries in ISGS
 - c. Drawal schedule of ISGS by beneficiary
 - d. Inter-State and inter-regional bilateral exchange
 - e. Weekly Regional Transmission Losses
 - f. ISGS Surplus
 - g. Collective transactions
 - h. Any instructions issued by WRLDC in the interest of grid operation
- 52.1.3. Inter-State Open Access injection/ drawal schedule or any other matter affecting regional power system or matter between two or more States, SLDC shall comply with procedures and instructions of WRLDC.
- 52.1.4. The generation availability of ISGS generating stations are on ex-power plant basis. The transmission loss of regional system shall be taken into account as per WRLDC procedure for working out ex-power plant generation schedule of ISGS. SLDC shall develop and maintain a dynamic web-based application for the purpose of day ahead scheduling, revision of schedules and display of real-time information.
- 52.1.5. The scheduling period shall comprise of 96-time blocks, each of 15-minute duration starting from 00:00 hours (IST) ending with 24:00 hours (IST). The first time block of scheduling period shall commence from 00:00 hours (IST) to 00:15 hours (IST), second time block of scheduling period shall commence from 00:15 hours (IST) to 00:30 hours (IST) and so on or any such other period as specified by the Commission.
- 52.1.6. The entitlements, requisitions, and schedules shall be rounded off to the nearest three decimal, to have a resolution of 0.001kW or kWh for Buyers and Sellers and reference frequency shall be rounded off to the nearest two decimal to have resolution of 0.01 Hz, further ISGS schedule will be rounded off as per WRLDC practices.
- 52.1.7. SLDC shall prepare Buyer wise Merit Order Stack for Day ahead scheduling process for each month in Form-5B and Centralised Merit Order Stack for Intra-Day operation in Form-6B considering the principles specified in the MERC DSM Regulations and MoD principles specified in these Regulations.

- 52.1.8. In case, the Sellers/Buyer fails to furnish schedule within the prescribed time limits to SLDC, the SLDC shall treat forecasted schedule of Sellers/Buyers of the previous day (d-1) as the schedule for the following day (d+1). For example, for schedule of 3rd September, if Sellers/Buyer fails to submit the schedule on 2nd September, SLDC shall consider the forecasted schedule of 2nd September submitted by Sellers/Buyer on 1st September. Such schedule as considered by SLDC in the event of non-availability of schedule from Sellers/Buyers shall be construed as the schedule of the Seller/Buyer and the concerned Seller/Buyer shall be responsible for adhering to such schedule.
- 52.1.9. In case of reduction of availability of contracted sources of Mumbai utilities /Deemed Distribution Licensee having standby power arrangement /agreement with any other utility, the requisition submitted by Mumbai Utilities /Deemed Distribution Licensee, and duly consented by concerned utility, the stand-by power shall be scheduled to the respective utilities by SLDC. SLDC shall also consider the provisions of the orders of the Commission in the matter.
- 52.2. **Principles of Day Ahead Scheduling for Sellers:**
- 52.2.1. All Sellers having generating unit/station size > 25 MW connected to InSTS, excluding solar/wind generating stations shall furnish their forecasted unit-wise availability forecasts on time block basis to SLDC. Further, if Seller is having multiple contracts for Units within Generating Station or the multiple contracts within same Unit, the Seller shall furnish their forecasted availability schedule for each contract separately to SLDC on day-ahead basis. As regards to scheduling of solar/wind generators, MERC F&S Regulations, 2018 and procedure framed therein shall be applicable.
- 52.2.2. While furnishing the availability forecasts, the Seller shall take into consideration the load requirement of their 'captive consumers' and 'open access consumers' and submit the requirement separately so as to be despatched fully up to the contracted capacity. Such generators shall not be subjected to backing down instructions (subject to system emergency and transmission constraint) up to the requirement of their OA transactions. However, generation beyond the load requirement of OA transactions shall be subjected to centralized MOD principles.
- 52.2.3. The Sellers shall forecast the availability in MW and MWh foreseen for the next day; i.e. from 00.00 hrs to 2400 hrs. on 15-minute time block basis or any other time block as may be specified by the Commission and inform to the Buyers with whom they have PPAs or any other power procurement arrangement and to the SLDC.
- 52.2.4. Qualified Co-Ordinating Agencies (QCA) for each wind and/or solar pooling substation shall prepare 15-minute time block wise schedule and revision of schedules if any as per the provisions of the MERC (Forecasting, Scheduling and Deviation settlement related matters in respect of wind and solar generation) Regulations, 2018 and the procedure framed therein and submit to SLDC.

- 52.2.5. RE generators having installed capacity more than 25 MW (excluding wind and/or solar generators) connected to the InSTS shall prepare 15-minute time block wise schedule considering their availability based on the generation sources like water, biomass, bagasse etc. and submit to the SLDC with intimation to the concerned Buyers with whom they have PPAs or OA permission as the case may be.
- 52.2.6. RE generators having installed capacity less than 25 MW (excluding wind and/or solar generators) connected to the InSTS shall prepare 15-minute time block wise schedule considering their availability based on the generation sources like water, biomass, bagasse etc. and submit to the SLDC with intimation to the concerned Buyers with whom they have PPAs or OA permission as the case may be. SLDC shall consider the same while preparing Load-generation balance, however while computing deviation of such generators, schedule data shall be replaced with actual generation data made available through AMR facilities.
- 52.2.7. While preparing Despatch schedule, SLDC shall consider the Ex-Power Plant Availability/schedule declared by the Sellers. Sellers shall consider the normative auxiliary consumption, or any specific auxiliary consumption specified by the Commission through Regulations while declaring the Availability/schedule. In absence of the above, the auxiliary consumption as mentioned by the Seller on name plate details of the generator shall be considered.

Intra-State Generating Stations (InSGS) excluding Hydro Generating Station

- 52.2.8. All the InSGS shall furnish their capability curve & droop-characteristics for each unit to SLDC. InSGS shall operate within their capability curve. SLDC may, based on system requirement, ask the concerned InSGS to regulate MVAR.
- 52.2.9. All the InSGS shall be required to demonstrate the declared capacity of its generating station as and when asked by the SLDC as specified in these Regulations and Procedure specified in Annexure – 3 of these Regulations.
- 52.2.10. The generation availability of InSGS shall be on ex-bus basis. The “Drawal Schedule” at T \leftrightarrow D interface shall be “grossed up” for InSTS losses as approved by the Commission to match with available “Ex-Bus Generation Schedule” to decide the Despatch Schedule of Generators.

Day Ahead Scheduling of Intra-State hydro Generating Stations

- 52.2.11. While declaring the availability, Intra-State hydro Generating Stations shall inform, month-wise water availability and all other parameters such as reservoir level, any other restrictions of GoMWRD, overall water quota available for generation along with unit availability to Distribution Licensee with whom it has PPA and also to SLDC, for the next month before 21st day of the current month.
- 52.2.12. Concerned Distribution Licensee shall inform day-wise generation from hydro generating stations considering water availability to SLDC for the next month before 25th day of the current month. Concerned distribution licensee shall also indicate the

water requirement for irrigation (irrigation rotation schedule) if any specified by GoMWRD for hydro power plants.

- 52.2.13. In case there is any change in planning for utilisation of water during the month, same shall be informed by Generating Station or concerned Distribution Licensee to SLDC in advance.
- 52.2.14. If day-wise monthly generation from hydro generating stations considering water availability for next month is not received from concerned Distribution Licensee to SLDC latest by 27th day of the current month, SLDC shall consider the current month's forecasted schedule of that hydro generating station for the next month.
- 52.2.15. SLDC shall be responsible for operating InSGS hydro on a daily basis considering the month-wise water availability and schedule provided by contracted Distribution Licensee of the respective Hydro Stations to SLDC as specified above.
- 52.2.16. In order to meet system contingencies, SLDC may keep hydro capacity equivalent to the capacity of largest thermal Unit as a spinning reserve.
- 52.2.17. SLDC to ensure that the hydro capacity to be kept as spinning reserve should be a mix of hydro units from different generating stations of different generating companies (in proportion to contracted capacity of such hydro generating stations) instead of hydro units from single generating station or hydro units of one generating company.
- 52.2.18. For operation of Pumped storage hydro power plants (PSHPP), concerned distribution licensee shall indicate the daily schedule of PSHPP for the week. SLDC shall operate the PSHPP as per the daily schedule indicated by concerned distribution licensee considering to the grid conditions such as frequency, voltage, reactive power requirement etc. and availability of off-peak energy.
- 52.2.19. The Intra-State hydroelectric generating stations are expected to respond to grid frequency changes and inflow fluctuations. They would, therefore, be free to deviate from the given schedule as long as they do not cause a grid constraint. While computing the deviation of intra-state hydro generating stations, the schedule of hydro generating stations shall be replaced with actual generation.

52.3. **Principles of Day Ahead Scheduling for Buyers:**

A. Procurement from Inter-State Generating Station (ISGS)

- 52.3.1. SLDC shall receive availability i.e. entitlement of ISGS for day ahead on 15- minute time block basis from the WRLDC, which SLDC shall inform to beneficiaries in the State.
- 52.3.2. Beneficiaries shall submit their requisitions from respective ISGS to SLDC. Considering drawal schedule submitted by respective Distribution Licensee & availability from all sources & decentralised load generation balance, SLDC shall advise the drawal schedule for each of the ISGS to WRLDC.

- 52.3.3. SLDC shall consider the schedule received from WRLDC while finalising schedule under decentralised MoD principles.
- 52.3.4. Transmission loss of Inter-State transmission system (ISTS) shall be taken into account as per WRLDC procedure for working out ex-power plant generation schedule of ISGS and net drawal schedule of beneficiaries at the periphery of the State.

B. Procurement from Intra-State Generating Stations (InSGS)

- 52.3.5. While preparing the Day ahead load forecast, the Buyers shall take into consideration the load requirements of the Open Access Users located within their licence area as well. While furnishing the overall Load forecast schedule to SLDC, Buyers shall consider forecasted load requirement of ‘Partial Open Access Users.’
- 52.3.6. Buyers including Distribution Licensees shall regularly carry out the necessary exercises regarding short-term Load estimation for their respective area, to enable them to plan in advance as to how they would meet their consumers’ load without overdrawing from the grid.
- 52.3.7. Buyers including Distribution licensees shall furnish details of bilateral power they have contracted on short term, medium term, and long-term basis.
- 52.3.8. Buyers shall furnish the details of their bi-lateral purchases and sources of power supply to SLDC.
- 52.3.9. Buyers shall forecast the Load requirement for day ahead on 15-minute time block basis considering the availability declared by the Sellers with whom they have contractual arrangement.
- 52.3.10. Buyers shall submit their drawal schedule to SLDC as per the timelines specified in the detailed scheduling procedure under this scheduling code.
- 52.3.11. Buyers with essential loads will separately identify non-essential components of such loads, which may be kept OFF during system contingencies. Buyers shall draw up an appropriate schedule with corresponding load blocks in each case. Buyers shall make separation and listing of “essential” and, “non-essential” loads, prepare their plan for relieving such loads and shall inform SLDC accordingly. The non-essential loads can be put ON only when system normalcy is restored, as advised by SLDC.
- 52.3.12. Wheeling transactions of captive and open access consumers shall be despatched subject to transmission constraints and system emergency conditions.
- 52.3.13. Buyers shall submit their revised drawal schedule to SLDC, if they undertake any bilateral contracts or participate in the Power Exchange Transactions.

C. Collective Transaction through Power Exchanges

- 52.3.14. SLDC shall receive details of collective transactions for the State if any from the NLDC/Power Exchanges.

- 52.3.15. SLDC shall consider the collective transactions of Buyers and Sellers for preparation of Load-Generation balance.
- 52.3.16. For scheduling of collective transactions through power exchanges, the procedure specified by the NLDC shall be followed.

D. Bilateral Short-Term Transactions

- 52.3.17. SLDC shall consider the bilateral short-term transactions/ contracts of Buyers and Sellers for preparation of Load-Generation balance.

52.4. Load Generation Balance during Day Ahead Scheduling

- 52.4.1. SLDC shall follow the de-centralised MoD principles as specified by the Commission in these Regulations and MERC DSM Regulations, for respective buyers while preparing Load Generation balance during Day Ahead Scheduling.
- 52.4.2. SLDC shall grossed up “Drawal Schedule” at T<>D interface for Intra-State Transmission losses to match with available “Ex-Bus Generation Schedule” while preparing targeted Ex-Bus Generation Schedule of InSGS.
- 52.4.3. SLDC shall prepare the separate Merit Order Stack for each Buyer considering the contracts of respective Buyer and least cost MoD principles as specified in these Regulations.
- 52.4.4. SLDC shall prepare the Load Generation balance considering the Ex-Bus generation availability of the Sellers, entitlement of ISGS and Load forecast by the Buyers, Buyer-wise MoD principle (de-centralised MoD) and RE Generation forecasted as per the procedure under MERC F&S Regulations.
- 52.4.5. While giving the Schedule to Generators as per De-Centralised MoD Principles, the SLDC shall maintain the spinning reserve margin in the Generator as specified in these Regulations for management of ramp as per the requirement of the Grid.
- 52.4.6. SLDC shall prepare target despatch schedules for all Sellers, Wind and Solar Generators (QCAs), RE generators other than wind and Solar generators connected to InSTS, and target drawal schedule of Buyers at 50.00 Hz frequency and publish the same on SLDC’s website.
- 52.4.7. While preparing target despatch and target drawal schedule for the State as a whole, SLDC shall consider all the relevant provisions of these Regulations and the IEGC such as Transmission constraints.
- 52.4.8. SLDC shall also publish information regarding the availability of surplus power or shortfall of power if any on SLDC’s website.
- 52.4.9. Based on the information furnished by SLDC, Distribution Licensee being a deemed trader may undertake any short-term contracts or Inter-State trade transactions or may participate in the power exchange transactions to meet its drawal shortfall or optimise their power procurement cost, as the case may be.

- 52.4.10. As the Sellers have contracted their generation capacity through long term/medium term contract with Buyers, such exchange of available surplus capacity shall be effected inter-se amongst Buyers without need to amend existing PPAs with their respective Sellers.
- 52.4.11. SLDC shall maintain and publish separate account of exchange of surplus power capacity if any amongst the Buyers/Distribution licensees.
- 52.4.12. Buyers shall submit their revised drawal schedule to SLDC, if they undertake any bilateral contracts or participate in the Power Exchange Transactions.
- 52.4.13. Based on the revised information received from the Buyers and Sellers, SLDC shall run revised Load–Generation balance for finalising the despatch schedules for all Sellers, Wind and Solar Generators (QCAs), RE generators connected to InSTS and drawal schedule of Buyers at frequency of 50 Hz and publish on the SLDC’s website.
- 52.4.14. SLDC shall also publish information regarding the final availability of surplus power if any on the website.

52.5. Scheduling and Despatch Procedure and timelines for Day ahead Scheduling

- a) By 0600 hrs every day, the ISGS shall advice the WRLDC, the station-wise ex-power plant MW and MWh availability for the next day, i.e. from 0000 hrs to 2400 hrs of the following day on 15-minute time block as per WRLDC Procedure.
- b) By 0800 hrs every day, WRLDC shall advice (available on WRLDC website) the station-wise ex-power plant MW and MWh availability for the next day, i.e. from 0000 hrs to 2400 hrs of the following day on 15 minute time block to SLDC for the Beneficiaries in the State as per WRLDC Procedure.
- c) By 0830 hrs every day, SLDC shall advice the station-wise ex-power plant MW and MWh availability of ISGS for the next day, i.e. from 0000 hrs to 2400 hrs of the following day on 15-minute time block to Beneficiaries in the State.
- d) By 0900 hrs every day, each Seller connected to InSTS, shall furnish to SLDC, its unit-wise generation availability in MW and MWh taking into consideration any outage of its generating unit for the next day, i.e., from 0000 hrs to 2400 hrs of the following day on 15 minute time block in **Form-1S** under Annexure-10.
- e) By 0900 hrs every day, Beneficiaries in the State shall inform their consent to the SLDC for the ISGS capabilities.
- f) By 0930 hrs every day, SLDC shall inform the consent of the Beneficiary to WRLDC for the ISGS capabilities.
- g) By 0945 hrs every day, WRLDC shall inform the consent of the Beneficiary to ISGS each day about the quantum and duration of power for next day for sale in the market.
- h) By 1000 hrs every day, Pooling Sub-Station wise QCAs, connected to InSTS, shall furnish to SLDC, their generation availability in MW and MWh taking into consideration any outage of its generating unit for the next day, i.e., from 0000 hrs to

2400 hrs of the following day on 15 minute time block as per the F&S procedure under MERC F&S Regulations.

- i) By 1000 hrs every day, Distribution Licensees/Buyers shall furnish consolidated schedule of RE generators below 25 MW connected to InSTS, to SLDC, availability in MW and MWh for the next day, i.e., from 0000 hrs to 2400 hrs of the following day on 15 minute time block in **Form- 1S** under Annexure-10.
- j) By 1000 hrs every day each Buyer shall furnish its anticipated drawal schedule for next day, on 15-minute time block basis against their bilateral power and IPP requisitions they have contracted on short term and long term basis respectively for the next day i.e. from 0000 hrs to 2400 hrs of the following day on 15 minute time block. Buyers shall furnish their drawal schedule considering expected generation from all embedded generators connected to its distribution network, for next day, to SLDC for all such generating stations in **Form- 1B** under Annexure-10.
- k) By 1000 hrs every day all Full Transmission Open Access Consumers shall furnish to SLDC their drawal schedules for next day i.e. from 0000 hrs to 2400 hrs of the following day on 15-minute time block in **Form-1B** under Annexure-10.
- l) By 1100 hrs, SLDC shall prepare the Load Generation Balance for the next day, from 0000 hrs to 2400 hrs of the following day on 15-minute time block as per De-Centralised (Buyer Wise) MoD principles specified by the Commission.
- m) By 11 hrs, SLDC shall publish Target Despatch Schedule for the next day, from 0000 hrs to 2400 hrs of the following day on 15 minute time block for Sellers, QCAs, all RE Generators connected to InSTS and Drawal Schedule for Buyers on its website in **Form-2B for Buyers and Form-2S for Sellers** under Annexure-10.
- n) By 1400 hrs, SLDC shall receive the revised ISGS drawal schedule from Buyers in MW and MWh for the next day, i.e. from 0000 hrs to 2400 hrs of the following day on 15-minute time block.
- o) By 1500 hrs, SLDC shall finalize the drawal schedule from ISGSs and inform to WRLDC, SLDC shall ensure that the step increase regarding the ISGS station-wise requisition is not more than 1% of the previous requisition.
- p) By 1800 hrs every day, WRLDC shall upload on its Website the “net drawal schedule” of the State in MW and MWh for the next day, i.e. from 0000 hrs to 2400 hrs of the following day on 15-minute time block. The summation of the station-wise ex-power plant drawal schedules for all ISGS and drawal from regional grid consequent to bilateral interchanges, after deducting the Inter-State transmission losses (estimated by WRLDC), shall constitute the State drawal schedule.
- q) By 2000 hrs every day, each Sellers connected to InSTS, shall furnish to SLDC, its unit-wise generation revised availability in MW and MWh considering any outage of its generating unit for the next day, i.e., from 0000 hrs to 2400 hrs of the following day on 15 minute time block in **Form-1S** under Annexure-10.

- r) By 2000 hrs every day, Discoms/Buyers shall furnish revised consolidated schedule of RE Generators connected to InSTS, to SLDC, availability in MW and MWh taking into consideration any outage of its generating unit for the next day, i.e., from 0000 hrs to 2400 hrs of the following day on 15 minute time block in **Form- 1S** under Annexure-10.
- s) By 2000 hrs every day each Buyer shall furnish its revised drawal schedule for next day, on 15-minute block basis against their STOA, MTOA,LTOA, Collective transactions and also considering expected generation from all embedded generators connected to its distribution network, in **Form – 2B** respectively under Annexure-10.
- t) By 2000 hrs, SLDC shall receive the revised ISGS drawal schedule from Buyers in MW and MWh for the next day, i.e. from 0000 hrs to 2400 hrs of the following day in 15-minute blocks.
- u) By 2200 hrs, SLDC shall finalize the drawal schedule from ISGSs, SLDC shall furnish to WRLDC revised drawal schedule from ISGS. SLDC shall ensure that the step increase regarding the ISGS station-wise requisition is not more than 1% of the previous requisition.
- v) By 2300 hrs, SLDC shall prepare the final time block wise Load Generation Balance for next day, i.e. from 0000hrs to 2400hrs of the following day considering Buyer wise MoD principle and publish the same on SLDC’s website.
- w) By 2300 hrs, SLDC shall release final despatch schedules on 15 minute time block basis to all Sellers, QCAs, RE Generators other than Wind and Solar generators connected to InSTS and drawal Schedules to Buyers for the next day, from 0000 hrs to 2400 hrs.

53. Principles of Intra-day operation

Sellers shall be responsible for power generation/power injection as per the time block wise schedules finalised by SLDC. Buyers shall be responsible for drawal as per the time block wise schedules finalised by SLDC. Buyer(s) or Seller(s) may request for revision of their schedule during intra-day operation in accordance with the procedure specified in subsequent paragraphs. SLDC may also revise the Schedule in accordance with the principles specified in the subsequent paragraphs.

53.1. Intra-Day Operation of hydro generating stations

- i. SLDC shall operate hydro generating stations to restore the Load generation balance at the State level, only after exhausting all the other options including ramping up of all thermal generating units up to the available capacity, however, full time generation may be scheduled for hydro stations where the reservoirs are overflowing.
- ii. Further, SLDC shall operate the hydro units kept as spinning reserve in consultation with the respective distribution licensees, who have entered into contract with respective generating company for such hydro units.

- iii. SLDC during real time operation may deviate from the daily estimated generation, however, it shall make efforts to maintain the month-wise water availability indicated by concerned Distribution Licensee.
- iv. The time block wise settlement of such power exchange account of such actions initiated by SLDC shall be settled as per the provision of the MERC DSM Regulations and this procedure or as specified by the Commission from time to time.

53.2. Revision of Schedule as per WRLDC Instructions

- 53.2.1. In case of forced outage of a unit of ISGS for those stations who have a two part tariff based on capacity charge and energy charge for long term and medium term contracts, WRLDC shall revise the schedules on the basis of revised declared capability by ISGS. The revised declared capability and the revised schedules shall become effective from the fourth time block, counting the time block in which the revision is advised by the ISGS to be the first one.
- 53.2.2. In the event of bottleneck in evacuation of power due to any constraint, outage, failure or limitation in the transmission system, associated switchyard and substations owned by the Central Transmission Utility or any other transmission licensee involved in inter-state transmission (as certified by WRLDC) necessitating reduction in generation, the WRLDC shall revise the schedules which shall become effective from the 4th time block, counting the time block in which the bottleneck in evacuation of power has taken place to be the first one. Also, during the first, second and third time blocks of such an event, the scheduled generation of the ISGS shall be deemed to have been revised to be equal to actual generation, and the scheduled drawal of the beneficiaries shall be deemed to have been revised accordingly.
- 53.2.3. WRLDC shall permit the revision of declared capability by ISGS and drawal schedule of the State for the remaining period of the day/block with advance notice of four-time blocks. Revised schedules/declared capability in such cases shall become effective from the 4th time block, counting the time block in which the request for revision has been received by WRLDC to be the first one.
- 53.2.4. WRLDC shall put all such revised schedule on its website and SLDC shall consider every revision by WRLDC and if need be, modify/revise the Despatch schedule of InSGS or revise the drawal schedule of Distribution Licensees in the State and load shedding plan, based on the circumstances at that moment.
- 53.2.5. The Generation schedules and drawal schedules issued/revised by WRLDC shall become effective from designated time block irrespective of communication successes to inform all such revisions. The SLDC will be vigilant regarding all revisions and developments in power supply position from time to time
- 53.2.6. As per the provision of these Regulations or IEGC, in case of any grid disturbance, the scheduled generation of all the generating stations and scheduled drawal of all the beneficiaries shall be deemed to have been revised to be equal to their actual generation/drawal for all the time blocks affected by the grid disturbance. The exact

duration and certification of such grid disturbance would be declared by WRLDC or SLDC as the case may be.

A notice to this effect shall be posted at RLDC/SLDC website. The issue of notice at RLDC/SLDC website shall be considered as declaration of disturbance by RLDC/SLDC. All state entity shall take note of the disturbance & take appropriate action at their end.

Provided, that, in case of partial backing down or loss of identified Unit due to operation of Special Protection Scheme (SPS), the declared capacity (D.C.) shall be deemed available for the event period as declared by SLDC.

53.3. Revision of Schedule by SLDC

53.3.1. The SLDC shall operate the system within the operating parameters specified under these Regulations or the IEGC from time to time.

53.3.2. SLDC may revise the Despatch and Drawal schedule of State Entities on account of following:

- Depletion of Generating capacity in ISGS or InSGS due to tripping of units or de-rating caused by loss of auxiliaries or due to re-start restrictions of a Thermal unit following a grid disturbance
- Constraints in interstate or intrastate transmission system
- Hydro station constraints
- Transgression of system frequency outside the band of 49.90 Hz to 50.05 Hz.
- Volume limit for Deviation as specified by the MERC DSM Regulations.

Provided that, in case of generators having multiple PPAs, such revision of schedule by SLDC shall be done in proportion to the schedules of the Beneficiaries for that particular time block subject to the maximum limit in proportion of their PPA ratio.

53.3.3. During real time operation, in case the grid parameters including frequency, voltage, transmission line loading, substation loading conditions or volume limits for the State specified under the CERC DSM Regulations deviate beyond permissible operating range, SLDC shall take suitable measures in the interest of reliable and safe grid operations or to ensure compliance of WRLDC instructions in conformity with the provisions of the CERC DSM Regulations and the amendments thereof.

53.3.4. During 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, SLDC shall take suitable measures in the interest of reliable and safe grid operations and issue necessary despatch/curtailment instructions in accordance with Centralised MoD principles for the State as a whole.

53.3.5. Accordingly, SLDC shall issue necessary despatch or curtailment instructions in accordance with Centralised MoD principles for the state as whole, considering the

technical constraints such as Ramp rate of generators so as to maintain the Load-Generation balance and comply with conditions stipulated under these Regulations and IEGC. In such cases, the revised schedules shall become effective from the 4th time block, counting the time block in which the revised schedule is issued by the SLDC to be the first one. Also, during the first, second- and third-time blocks of such an event, the schedules shall be deemed to have been revised to be equal to actual generation or actual drawal as the case may be.

- 53.3.6. For any revision of scheduled generation, including post facto deemed revision, there shall be a corresponding revision of scheduled drawal of the beneficiaries.
- 53.3.7. Collective Transaction through Power Exchange(s) would normally be curtailed subsequent to the Short-Term Bilateral Transaction(s).
- 53.3.8. The backing down of Thermal Generating Stations shall be as per MoD Principles specified by the Commission in these Regulations as amended from time to time and Orders issued by the Commission.
- 53.3.9. In the event of bottleneck in evacuation of power due to any constraint, outage, failure or limitation in the transmission system, associated switchyard and substations owned by the State Transmission Utility or any other transmission Licensee involved in Intra-State transmission (as certified by SLDC) necessitating reduction in generation, the SLDC shall revise the schedules which shall become effective from the 4th time block, counting the time block in which the bottleneck in evacuation of power has taken place to be the first one. Also, during the first, second and third time blocks of such an event, the scheduled generation of the Intra-State Generator shall be deemed to have been revised to be equal to actual generation, and the scheduled drawal of the beneficiaries shall be deemed to have been revised accordingly.
- 53.3.10. When for the reason of transmission constraints e.g. congestion or in the interest of grid security, it becomes necessary to curtail power flow on a transmission corridor, the transactions already scheduled may be curtailed by SLDC.
- 53.3.11. The short-term Open Access transactions shall be curtailed first followed by the medium term Open Access transactions, followed by the long-term Open Access transactions and amongst the consumers of a particular category, curtailment shall be carried out on pro rata basis shall be as per the MERC TOA/DOA Regulations.
- 53.3.12. For Frequency management SLDC shall,
 - i. Monitor the system frequency and ensure proper balance between the supply and Demand by due revisions in generation schedules in the frequency band between 49.90 to 50.05 Hz or as specified by IEGC from time to time.
 - ii. Monitor bilateral interchanges and net drawal from the central pool and from the regional grid and ensure their conformity to the finalised schedule especially when the frequency is below 49.90 Hz or as specified by IEGC from time to time.

- iii. In the event of frequency dropping below 49.90 Hz or as specified by IEGC from time to time, proceed to carry out requisite load shedding of respective Buyer as per the drawal schedule.
 - iv. Back down the generating units/stations as per the MoD principles specified by the Commission in case the frequency goes higher than 50.05 Hz or as specified by IEGC from time to time.
 - v. Revision of firm bilateral transaction day ahead/same day will be considered only if the request will be received with the consent of both Seller & Buyer and as per the provisions of the MERC Open Access Regulations.
- 53.3.13. SLDC shall exercise all the possible measures to maintain Volume Limits at State Periphery as specified by CERC DSM Regulations. For maintaining the Volume Limits at State Periphery, SLDC shall issue necessary instructions including curtailment instructions to Buyers or backing down instructions to Sellers. Such instructions may be irrespective of the status of Volume Limit of individual State Entity. SLDC's instructions shall be binding on all the State Entities and Users.
- 53.3.14. SLDC shall maintain and publish separate account of such actions initiated by SLDC in the interest of grid operation or in compliance of WRLDC instructions in conformity with CERC DSM Regulations. SLDC shall publish monthly report of exchange of power capacity, if any, amongst the State Entities resulting on account of such SLDC interventions.

53.4. Revision of Schedule by Sellers

- 53.4.1. Seller, as far as possible, shall generate electricity as per the day-ahead generation schedule finalized by SLDC.
- 53.4.2. In case of forced outage of an Unit of Intra-State Generator for those stations who have two part tariff based on Capacity Charge and Energy Charge for long term and medium term contracts, SLDC shall revise the schedules on the basis of revised declared capability of Intra-State Generators. The revised declared capability and the revised schedules shall become effective from the fourth time block, counting the time block in which the revision is advised by the Intra-State Generator to be the first one.
- 53.4.3. In case of forced outage of an Unit of Intra-State Generator (having generating capacity of more than 25MW) selling power under Short Term bilateral transaction (excluding collective transaction to power exchange), the generator or electricity trader or any other agency selling power from the unit of the generating station shall immediately intimate the same along with the requisition for revision of schedule and estimated time of restoration of the Unit to SLDC as the case may be. The SLDC shall revise the schedules on the basis of revised declared capability of Intra-State Generator. The revised declared capability and the revised schedules shall become effective from the fourth time block, counting the time block in which the revision is advised by the Intra-State Generator to be the first one. The corresponding schedule of the beneficiary of power from this generating unit shall be revised

accordingly. The SLDC, shall inform the revised schedule to the seller and the buyer. The original schedule shall become effective from the estimated time of restoration of the unit.

- 53.4.4. To discourage frivolous revisions, SLDC may, at its sole discretion, refuse to accept schedule/capability changes of less than two (2) percent of previous schedule/capability. The schedule of thermal generating stations indicating fuel shortage while intimating the Declared Capacity to the SLDC shall not be revised except in case of forced outage of generating unit.

Provided that, in case of gas based InSGS, for optimum utilization of gas, this shall be permitted, i.e. in case of tripping of a unit, this gas may be diverted to another unit using the same gas.

- 53.4.5. In case of Solar or Wind generating stations connected through InSTS, the QCA may revise schedule of Pooling Substation (excluding collective and inter-State bilateral transactions) by giving advance notice to SLDC. For revision of schedule by wind and solar generation the provisions of MERC F&S Regulations, 2018 and the procedure framed therein shall be applicable. Such revision shall be effective from forth (4th) time block following the time block in which notice was given. There may be one (01) revision for each time slot of one and half hours starting from 0000 hrs of a particular day, subject to a maximum of sixteen (16) revisions during the day.
- 53.4.6. SLDC shall permit the revision of generation schedule by Sellers for the remaining period of the day/block with advance notice of 4-time blocks. Revised generation schedules in such cases shall become effective from the 4th time block, counting the time block in which the request for revision has been received by SLDC to be the first one.
- 53.4.7. The provision of Must Run status of generators shall be as per the relevant Regulations and the Orders of the Commission.

53.5. Revision of Schedules by Buyers

- 53.5.1. SLDC shall permit the revision of drawal schedule of the Buyers for the remaining period of the day/block with advance notice of 4-time blocks. Revised drawal schedule in such cases shall become effective from the 4th time block, counting the time block in which the request for revision has been received by SLDC to be the first one.
- 53.5.2. In case of bilateral transactions, the revision of schedules, shall have to be confirmed by the other partner within a period of two-time blocks. The revised schedules in such event would come into effect from 4th time block.

54. Mechanism for Monitoring Compliance:

54.1. The event of breach or default of the procedure shall be as follows:

- i. Non-compliance of any of the terms/conditions/rules outlines under this Code.
- ii. Non-compliance of any of the directives as per the provisions of this Code.
- iii. Obtaining registration on the basis of false information or by suppressing material information.
- iv. State Entity fails to provide schedules continuously for 10 days.
- v. In case the State Entity has become insolvent
- vi. In case of continued default for statutory compliance leading to declaration of wilful defaulter by Competent Authority.

54.2. Consequences for event of default:

- 54.2.1. If schedule is not provided by State Entity, then the previous day's schedule (d-1) for those non-submission days shall be considered and State Entity shall adhere with it.
- 54.2.2. In case of default for acts covered under this Code without prejudice to other actions as may be taken by SLDC, the SLDC may issue a notice of period not less than 15 days for revocation of registration of State Entity and non-scheduling of State Entity and adequate opportunity shall be given to State Entity to present its case before SLDC.
- 54.2.3. In case State Entity fails to address/rectify the breach expressed by SLDC in the Notice within stipulated time, the SLDC shall approach the Commission with recommendation for revocation of registration of State Entity and disconnection from grid.

55. Grievance Redressal:

- 55.1. SLDC shall refer the Complaints regarding unfair practices, delays, discrimination, lack of information, supply of wrong information or any other matters to the Commission for redressal.
- 55.2. Any disputes between State Entity(s) and SLDC shall be resolved amicably, if not resolved shall be referred to the Commission for redressal. Pending the decision of the Commission, the directions of the SLDC shall be complied by the concerned State Entity(s).

56. General

- i. All costs/expenses/charges associated with the application, including bank charges, Affidavits etc. shall be borne by the applicant.
- ii. The State Entities shall abide by the provisions of the Act, these Regulations, MERC DSM Regulations and IEGC, and applicable CERC and MERC Regulations as amended from time to time.

- iii. This code aims at easy and pragmatic Scheduling and Despatch of Buyers and Sellers. However, some teething problems may still be experienced. The various implications would be known only after practical experience is gained by way of implementing this code. In order to resolve the same, this code shall be reviewed or revised by the SLDC with prior approval of Commission.

PART F: COMMUNICATION CODE

57. Objective

- 57.1. Communication Code provides 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.

58. Boundary of Communication System

- 58.1. 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
 - g) Captive Generators/Consumers

59. Periodic Testing of Communication System

- 59.1. All Users providing communication systems shall facilitate periodic testing of the communication system in accordance with the procedure for testing and maintenance to be prepared by STU.

59.2. STU shall prepare the procedure for testing and maintenance of communication network security system including third party system if any in accordance with provisions of the CEA (Technical Standard for Communication system in Power System Operation) Regulation 2020 within 60 days from the date of notification of these Regulations and approved by GCC.

60. Periodic Auditing of Communication System

60.1. 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 shall issue necessary instructions to all stakeholders to comply with the audit requirements within the time stipulated by the GCC.

61. Fault Reporting

61.1. 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.

61.2. 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.

62. Communication System Availability and Backup

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

62.2. The SLDC shall maintain the record of communication system availability and submit to the Commission on yearly basis.

63. Monitoring and Reporting of Communication System Performance

63.1. 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.

63.2. 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.

63.3. 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 InSTS and procedure for centralised supervision for quick fault detection and restoration. STU shall publish such report on its website from time to time.

64. Cyber Security

64.1. 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.

64.2. 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.

64.3. STU in assistance with SLDC shall prepare a standard Operating procedure for Cyber Security, 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.

64.4. 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.

64.5. 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.

64.6. 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, SLDC and STU. The frequency of such audits/mock drills shall be decided by STU in the procedure/guidelines stipulated as per Regulation 64.3 of these Regulations.

64.7. A cyber audit specifically to detect malware targeting Industrial Control Systems (ICS) shall be conducted at critical plants and substations SLDC and STU control rooms after any abnormal event.

- 64.8. 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.
- 64.9. SLDC shall scrutinize the cyber security incidences and discuss them in the MCCC and GCC and take necessary actions as deemed fit.
- 64.10. 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.

65. Guidelines or Procedures to be issued by different Entities

- 65.1. Following entities shall be responsible for preparation, consultation and finalisation of the Guidelines/Procedures required under these Regulations which shall be in line with the Central Electricity Authority (Technical Standards for Communication System in Power System Operations) Regulations, 2020 and Central Electricity Regulatory Commission (Communication System for inter-State transmission of electricity) Regulations, 2017 and amended from time to time.
- a) SLDC shall prepare Guidelines on “Interfacing Requirements” in respect of terminal equipment, RTUs, SCADA, PMUs, Automatic Generation Control (AGC), Automatic Meter Reading (AMR) Advanced Metering Infrastructure (AMI), etc. and for data communication from the User's point to the respective control center (s) based on technical standards issued by CEA ;
 - b) STU shall prepare Procedure on “Centralized supervision for quick fault detection and restoration” as per the Regulation 63.3 and “Testing and Maintenance of communication system” as per the Regulations 59.2;
 - c) STU shall prepare Guidelines on “Availability of Communication System” in consultation with SLDC and other stakeholders and submit to GCC.
- 65.2. 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

66. General

- 66.1. 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.
- 66.2. 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.
- 66.3. All Users shall co-operate 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.
- 66.4. 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 case where protection is bypassed and/or disconnected by an agreement, 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.
- 66.5. The PCC shall decide the date from which the existing protection system provided by STU and/or User is required to be changed, if it is not meeting the minimum requirement as stipulated in this code.
- 66.6. User shall update the protection system, if STU confirms that the protection system of User does not comply with the minimum requirement as stipulated in this code.
- 66.7. 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.
- 66.8. 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) CEA (Technical Standards for Communication system in Power System Operation) Regulation 2020
- f) Protection standard adopted by WRLDC/WRPC; and
- g) System Requirement and past field experience of STU.

66.9. 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.

67. Revision in the Protection Manual and Best practices Guidebook

67.1. Transmission Licensees shall share the best practices of protection system development, operation and safety provisions among the other stakeholders. PCC shall coordinate and formulate a forum of technical experts from industry and academia for continuous improvement in the knowledge of protection system, preventive measures, monitoring and reporting of best practices.

67.2. 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 shall be recorded and deliberated during PCC meetings.

67.3. 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

[STU has prepared the draft Metering Code considering the Stakeholder's comments and suggestion and submitted to the Commission for approval. The Commission approved the Metering Code on 5 December 2019. The Commission while publishing draft MEGC,2020 on 1st March,2020 specified that, the approved Metering Code shall form the Part H of the final MEGC,2020 Regulations. Accordingly, the Commission has incorporated approved Metering Code as Part H of these MEGC,2020 Regulations. For improving readability of consolidated MEGC,2020, the definitions of Metering Code are incorporated in the definitions of MEGC,2020 and regulation numbers are revised appropriately. The Metering Code dated 5 December,2019 shall not be referred separately from the date of notification of these MEGC,2020 Regulations.]

68. Introduction

68.1. These Regulations may be called Metering Code for InSTS of Maharashtra and shall come into force from the date of approval of the Commission.

68.2. Metering code prescribes a uniform policy in respect of electricity metering in the InSTS and provide the minimum requirements and standards for installation and operation of meters for commercial and operational purpose for the STU, Transmission Licensees, and Users connected to InSTS.

69. Objective

69.1. The objective of the code is to define minimum acceptable metering standards for the purpose of accounting, commercial billing, and settlement of electrical energy in InSTS and also to provide system information for operation of State power system in economical and efficient manner by SLDC.

69.2. The Metering Code provides for type, standards, ownership, location, accuracy class, installation, operation, testing and maintenance, access, sealing, safety, meter reading and recording, meter failure or discrepancies, anti-tampering features, quality assurance, error compensation, and periodical testing of meters, additional meters, and adoption of new technologies in respect of following meters for correct accounting and billing of electricity:

- (i) Interface meters for InSTS,
- (ii) Meters for Consumer directly connected to InSTS,
- (iii) Meters for Generators directly connected to InSTS.
- (iv) Meters for energy accounting in InSTS.

70. Scope and Applicability

70.1. This Metering Code for InSTS shall apply to following in the State of Maharashtra:

1. Transmission Licensees,
2. Generating Stations including Renewable Energy Generators connected to InSTS,
3. Distribution Licensees connected with InSTS including Deemed Distribution Licensees connected to the network,
4. EHV Consumers of Distribution Licensee directly connected to InSTS,
5. Transmission System Users connected to InSTS,
6. Open Access Consumers connected to InSTS,
7. Captive Generators connected to InSTS,

71. Reference Standards

71.1. All interface meters, consumer meters and energy accounting meters shall comply with the relevant standards of Bureau of Indian Standards (BIS). If BIS Standards are not available for a particular equipment or material, International Electro-technical Commission (IEC) Standards, CBIP Technical Report or any other equivalent Standard shall be followed.

71.2. Whenever an international Standard or IEC Standard is followed, necessary corrections or modifications shall be made for nominal system frequency, nominal system voltage, ambient temperature, humidity, and other conditions prevailing in India before actual Adoption of the said Standard.

71.3. The following Indian Standards (amended up to date) shall be applicable as relevant to meters and associated equipment:

Sr. No.	Standard Number	Standard Title
i.	IS - 14697:1999	Specifications for AC Static Transformer operated Watt Hour & VAR-Hour meters, class of 0.2S and 0.5S.
ii.	IS 2705	Indian Standard for Current Transformers
iii.	IS 3156	Indian Standard for Voltage Transformers
iv.	IS 9348	Indian Standard for Coupling Capacitors and Capacitor Divider
v.	IS 5547	Indian Standard for Capacitor Voltage Transformer
vi.	CBIP -304	Standardization of AC static Electrical Energy Meters.

Sr. No.	Standard Number	Standard Title
vii.	CBIP Technical Report – 111	Specification for Common Meter Reading Instrument
viii.	IS 9000	Basic Environmental Testing Procedures for Electronic & Electrical Items
ix.	IS 12063	Indian Standard for classification of degrees of protection. (IP)
x.	IS-15959:2011	Data Exchange for Electricity Meter Reading Tariff & Load Control- Companion Specification.
xi.	IEEE 830-1998	IEEE Recommended Practice for Software Requirements Specifications

71.4. The following International Standards (amended up to date) shall be applicable as relevant to meters and associated equipment not complying to Indian Standards or not manufactured in India:

Sr. No.	Standard Number	Standard Title
i.	IEC 62053-22	Electricity metering equipment (AC) – Particular requirements- Part 22: Static meters for active energy (classes 0.2 S and 0.5 S)
ii.	IEC 62053-23	Electricity metering equipment (AC) – Particular requirements- Part 23: Static meters for reactive energy (classes 2 and 3)
iii.	IEC 62052-11	Electricity metering equipment (AC) – General requirements, tests and test conditions- Part 11: Metering equipment
iv.	IEC 62053-21	Electricity metering equipment (AC) – Particular requirements – Part 21: Static meters for active energy (classes 1 and 2)
v.	IEC 62056	Standards for Electricity metering data exchange

71.5. Standards for installation and operation of meters

The meters and metering equipment shall conform to the requirements of the CEA (Installation & Operations of Meters) Regulations, 2006 dated 17 March 2007, as amended from time to time, and standards prescribed thereunder.

72. Ownership

72.1. Interface meters

72.1.1. All interface meters installed at the points of interconnection with InSTS excluding meters installed at the points of interconnection with Inter-State Transmission System (ISTS) for the purpose of electricity accounting and billing shall be owned by STU.

72.1.2. Interface Meters installed at the points of interconnection with ISTS for the purpose of electricity accounting and billing shall be owned by CTU.

72.1.3. All interface meters installed at the points of inter connection between the two licensees excluding those covered under sub-clauses (72.1.1) and (72.1.2) above for the purpose of electricity accounting and billing shall be owned by respective licensee of each end.

72.1.4. Meters of EHV Consumer directly connected to InSTS shall be owned by STU and maintained by the licensee.

73. Access to meter

73.1. The owner of the premises where, the meter is installed shall provide access to the authorized representative(s) of the other entities for installation, testing, commissioning, reading, and recording and maintenance of meters.

74. Safety of meters

74.1. The supplier or buyer in whose premises the interface meters are installed shall be responsible for their safety.

75. Location of Interface Meters

75.1. The location of interface meters, meters for energy accounting and meters of EHV Consumer directly connected to InSTS shall be as given in Table-1 below.

Interface Point	Main Meter	Check Meter	Standby Meter
Generation-Transmission (G-T)	Generating Stations- Conventional Power Plant (IPP)- Directly connected to InSTS bus		
	i) EHV Side of each Generator Transformer (GT) ii) EHV/HV Sides of each Station Auxiliary transformer (SAT)	In series with Main Meter.	All outgoing feeders of InSTS bus of generating station.
	Generating Stations- Conventional Power Plant (CPP) - connected to InSTS on dedicated transmission line.		
	1. InSTS end of transmission line. 2. i) EHV Side of each Generator Transformer (GT) ii) EHV/HV Sides of each station Auxiliary transformer (SAT)	In series with Main Meter.	Other (InSTS) end of transmission line
Generating Stations- Renewable Power (Co-Gen, Small Hydro, Solar, Wind etc.)			

Interface Point	Main Meter	Check Meter	Standby Meter
	1. Radial Connection- a) At the generator end of the line in case the line is part of InSTS. b) At InSTS end of line in case line is not part of InSTS 2. LILO Connection- a) Common Point of LILO & common injection point in case of Generator bus. b) If common injection point is not available i.e. no generator bus, EHV Side of Generator Transformer (GT).	In series with Main Meter.	1. Radial Connection- Other end of transmission line. 2. LILO Connection- Generator end of lines.
Generators connected on 11/22/33kV Bus of InSTS Substation			
	HV Side of Generator Transformer (GT)	In series with main Meter	InSTS end of feeders.
Transmission – Distribution (T-D)	1. If O/G feeders belongs to same Licensee- On each Transformer L.V. side. 2. If O/G feeders belongs to different distribution Licensee- On each O/G feeder of Distribution Licensee	In series with Main Meter	1. If O/G feeders belongs to same Licensee- On each Transformer H.V. side. 2. If O/G feeder belongs to different distribution Licensee- On L.V. side of each transformer
Between two Transmission Licensees (T – T)	On each O/G feeders at S/s. end, to whom belongs the ownership of Transmission Line. Only CTU-STU interface points to be taken.	In series with Main Meter	The meter at the other end of line
EHV Consumers directly connected to InSTS (T-D)	At the consumer premises at the connection point.	In series with Main Meter	a) The meters at the LILO Point at Consumer End

Interface Point	Main Meter	Check Meter	Standby Meter
interface at EHV level)			b) In case of redial, other end of redial line.
Open Access Customers directly connected to InSTS	Open Access Customers	In series with Main Meter	InSTS end of feeders
Additional Meters	Apart from above locations CE (STU)/ CE (SLDC) shall decide the location of IEM as per prevailing condition.		

76. Installation of meters

76.1. State Transmission Utility (STU), shall examine, test, and regulate all meters before installation for above interface locations and only correct meters shall be installed by STU.

76.2. The meter shall be installed at locations, which are easily accessible for installation, testing, commissioning, reading, recording, and maintenance. The place of installation of meter shall be such that minimum inconvenience and disruptions are caused to the site owners and the concerned organizations.

76.3. In case CTs and VTs form part of the metering system, the meter shall be installed as near the instrument transformers as possible to reduce the potential drop in the secondary leads.

77. Type of meters

77.1. All the IEM meters at interface point, meters for energy accounting and consumer's meters shall be of static type and DLMS compliant.

77.2. The meters not complying with these requirements shall be replaced by STU from the date of commencement of this Code.

77.3. The Static meters, related hardware, the communication system and the related software shall be such that progressive up-gradation to the newer technologies for improved facilities of data transfer, data security, user friendliness etc. shall be possible without undergoing major replacements.

78. Specification and Accuracy limits

78.1. Technical Specifications of Interface Energy Meters

78.1.1. Basic Features of Interface Energy Meters

- a. The energy metering system specified herein shall be used for tariff metering for bulk, inter-utility power flows, at different locations in the State of Maharashtra. Projection/flush mounted type, Static composite meter shall be installed at interface points as a self-contained device for measurement of Voltage (V), Frequency (f), Active (Wh) and Reactive (VARh) energy exchanged in each successive 15 min time block or 5 min time block as the case may be. All meters shall be compliant to IS15959 and its latest amendments.
- b. The meter shall be DLMS (Device Language Message Specification) compliant. Each meter shall have a unique identification code, which shall be marked permanently on its front, as well as in its memory. All meters supplied to as per this specification shall have their identification code starting with “IEM”, which shall not be used for any other supplies. “IEM” shall be followed by an eight-digit running serial number. The Meter serial number within the meter shall be of DLMS standards and defined by the Object Identification System (OBIS) e.g.

S. No	Information	OBIS CODES					
		A	B	C	D	E	F
1	Manufacturer name	0	0	96	1	0	255
2	Meter Serial Number	0	0	96	1	1	255

- c. The meters shall be suitable for communication with external device like modem, DCU, etc. which shall be able to communicate with Configurable Data Curation System (CDCS) for local/remote data transfer. The meter shall compulsorily have at least 1 optical port for taking reading through Hand Held Unit (HHU).
- d. Auxiliary Supply to IEM- The meters shall normally operate with the power drawn from DC auxiliary power supply (Range 110V to 220V DC) to reduce the VT burden. In addition, there shall be provision to operate the meter from the VT secondary circuit having a rated secondary line-to line voltage of 110V, and CTs having a rated secondary current of 1 A or 5A. Any further transformers/ transactions/ transducers required for their functioning shall be in-built in the meters. Necessary isolation and/or suppression shall also be built-in, for protecting the meters from surges and voltage spikes that occur in the VT and CT circuits of extra high voltage switchyards. The reference frequency shall be 50Hz. Also, the meter shall have suitable of $\pm 15\%$ tolerance for DC supply.
- e. The meters shall safely withstand the usual fluctuations arising during faults etc. In particular, VT secondary voltages 115% of Vref applied continuously and 190% of Vref for 3.0 seconds, and CT secondary current 150% of Iref applied continuously and 30 times of Iref applied for 0.5 seconds shall not cause any damage to or mal operation of the meters.
- f. The meters shall continue to function for the remaining healthy phase (s), in case one or two phases of VT supply fails. In case of a complete VT supply failure, the

computation of average frequency shall be done only for the period during which the VT supply was available in the 5-minute block. Any time block contraction or elongation for clock correction shall also be duly accounted for.

- g. The total burden imposed by a meter for measurement and operation shall be defined as per IS 14697. An automatic backup for continued operation of the meter's calendar clock, and for retaining all data stored in its memory, shall be provided through a long-life battery, which shall be capable of supplying the required power for at least 2 years. The meters shall be supplied with duly fitted batteries, which shall not require to be changed for at least 10 years, as long as total VT supply interruption does not exceed two years. The battery mounting shall be designed to facilitate easy battery replacement without affecting PCB of the meter.
- h. The meters shall fully comply with all stipulations in IS14697 except those specifically modified by this specification. The reference ambient temperature shall be 27° C.
- i. Each meter shall have a test output device (visual), as per clause 6.11 of IS 14697.1999, for checking the accuracy of active energy (Wh) measurement. The preferred pulsing rate is twenty (20) per Wh for CT sec-1A and four (4) per Wh for CT sec -5A. However, purchaser/manufacture may decide on their own. It shall be possible to couple this device to suitable testing equipment also.
- j. Exception Management- The three line-to-neutral voltage shall be continuously monitored and in case any of these falls below defined threshold (70% of Vref), meter shall have suitable indication on LED/ LCD. The meter shall also have provision for low voltage event logging in meter memory in case of any phase voltage going below a defined threshold. The time blocks in which such a voltage failure occurs/persists shall also be recorded in the meter's memory with a symbol "*" if 3 Phase RMS voltage applied to the IEM is in between 5% to 70% of Vref and if Voltage is less than 5% of Vref, meter should record Zero voltage symbol "Z". There shall also be a provision to generate an alarm/SMS (to predefined mobile numbers) in the software at CDCS in case of VT supply failure or to generate error log.
- k. Time Accuracy - Each meter shall have a built-in calendar and clock, having an accuracy of 10 seconds per month or better. The calendar and clock shall be correctly set at the manufacturer's works. The date (year-month-day) and time (hour-min.-sec.) shall be displayed on the meter front on demand. Meter shall have the intelligence to synchronize the time with GPS (Local GPS/CDCS GPS) signal and from PC using software. Limited time synchronization through meter communication port shall be possible at site. When an advance or retard command is given, twelve subsequent time blocks shall be contracted or elongated by five seconds each. Time advance and retard command should be limited to one command/week. All clock corrections shall be registered in the meter's memory and suitably shown on print out of collected data.
- l. A touch key or push button shall be provided on the meter front for switching on the display and for changing from one indication to the next. Preferably the display shall switch off automatically about one minute after the last operation of touch key/push

button. When the display is switched on, the parameter last displayed shall be displayed again, duly updated.

- m. The data of meter shall be available in text file format (file extension as per IEEE standard/.txt) exportable to Excel. Indication of time retard or advance to be provided without disturbing the proposed format. Each 5-min block data consists of Frequency (in HZ), Active energy (in Wh), Reactive energy (in VARh) and Voltage (in V). All 5-minute Wh and VARh figures in *.npc/output report shall be rounded off up to third decimal. Active and Reactive energy for High and Low voltage conditions to be in the order of 7+1 digits.
- n. The Portable Hand Held Unit (HHU)/ Common meter reading instrument (CMRI)/ Data Collecting Device (DCD) shall be having IS-15959:2011 compatibility for standardized parameters. The optical coupler for tapping data stored in the SEMs memory shall be compatible universally across different make of SEMs.

o. Constructional Features

- i. The meters shall be supplied housed in compact and sturdy, metallic or molded cases of non-rusting construction and/or finish. The cases shall be designed for simple mounting on a plane, vertical surface such as a control/relay panel front. All terminals for CT and VT connections shall be arranged in a row along the meter's lower side. Terminals shall have a suitable construction with barriers and cover, to provide a Secure and safe connection of CTs and VTs leads through stranded copper conductors of 2.5 sq. mm. size.
- ii. All meters of the same model shall be totally identical in all respects except for their unique identification codes. They shall also be properly sealed and tamper evident, with no possibility of any adjustment at site, except for transactions allowed in IS15959.
- iii. The meters shall safely withstand, without any damage or mal operation, reasonable mechanical shocks, earthquake forces, ambient temperature variations, relative humidity etc. in accordance with IS-14697. They shall have an IP54 category dust- tight construction and shall be capable of satisfactory operation in an indoor, non- air-conditioned installation & outdoor installation in a panel.
- iv. Either the meters shall have built-in facility (e.g. test links in their terminals) for onsite testing, or a separate test block shall be provided for each meter.
- v. The sealing arrangement should be suitable for application of polycarbonate seals.

78.1.2. Measurement

- a) The active energy (Wh) measurement shall be carried out on 3-phase, 4-wire principle, with an accuracy as per class 0.2S (IS 14697).
- b) The meter shall compute the net active energy (Wh) sent out from the substation bus bars during each successive 5 min /15 min block (whichever applicable), and

store it in its memory up to fourth decimal with plus sign if there is net Wh export and with a minus sign if there is net import. Further Wh data in *.npc/output report shall be rounded up to third decimal.

- c) The meter shall count the number of cycles in VT output during each successive 5min /15 min block (whichever applicable) block, and divide the same by 300 (60 sec/min x 5min) or 900 (60 sec/min x 15min) as the case may be to arrive at the average frequency. The least count of the frequency data shall be 0.01 Hz.
- d) The meter shall continuously compute the average of the RMS values of the three line to- neutral VT secondary voltages as a percentage of 63.51 V and display the same on demand. The accuracy of the voltage measurement/computation shall be at least 0.5%, a better accuracy such as 0.2% in the 97-103% range being desirable. The voltage data shall be stored in the meter's memory in volts up to third decimal. Further Wh data in *.npc/output report shall be rounded up to second decimal.
- e) The Reactive energy (VARh) measurement shall be carried out on 3-phase, 4-wire principle, with an accuracy of 0.5S as specified in IS 14697. The meter shall compute the net Reactive energy (Net VARh=(VARh Export- VARh Import)) sent out from the substation bus bars during each successive 5 min block, and store it in its memory up to fourth decimal with plus sign if there is net VARh export and with a minus sign if there is net VARh import. It shall also display on demand the net VARh sent out during the previous 5 min block. Further Wh data in *.npc/output report shall be rounded up to third decimal.
- f) The meter shall also integrate the reactive energy (VARh) algebraically into two separate registers, one for the period for which the average RMS voltage is above 103.0%, and the other for the period for which the average RMS voltage is below 97.0 %. The current reactive power (VAR), with a minus sign if negative, and cumulative reactive energy (VARh) readings of the two registers (>103% and <97%) shall be displayed on demand. The readings of the two registers at each midnight shall also be stored in the meter's memory. When reactive power is being sent out from substation bus bars, VAR display shall have a plus sign or no sign and VARh registers shall move forward. When reactive power flow is in the reverse direction, VAR display shall have negative sign and VARh registers shall move backwards. Generally, the standard PT ratios are 220 kV/110V, 400kV/110V and 765 kV/110V. However, at the time of commissioning the vendor may confirm the same from site and configure the meter accordingly to ensure correct recording of reactive energy. For Reactive High & Low recordings, PT secondary voltage shall be configured in the meter. Therefore, it is required that the same shall be confirmed from the site. Voltage high and Low parameters should also be available in load survey.
- g) The meter shall continuously integrate and display on demand the net cumulative active energy sent out from the substation bus bars up to that time. The cumulative net Wh reading at each midnight shall be stored in the meter's

memory. The register shall move backwards when active power flows back to substation busbars.

- h) Errors for different power factors shall be as defined in IS14697.
- i) For reactive power (VAR) and reactive energy (VARh) measurements, IS14697 shall be complied with. The accuracy of measurement of reactive energy shall be as per class 0.5S.
- j) The harmonics shall be filtered out while measuring Wh, V and VARh, and only fundamental frequency quantities shall be measured/computed. Total harmonic distortion (THD) measurement for currents and voltages.
- k) Data security shall be ensured as per IS 15959 (three layers of security). Four-quadrant import/export metering for active, reactive and apparent power

78.1.3. Memory/ Storage

- a. Each meter shall have a non-volatile memory in which the following shall be automatically stored:
 - i. Average frequency for each successive 5 min block, in Hertz up to third decimals.
 - ii. Net Wh transmittal during each successive 5 min block, up to fourth decimal, with plus sign if there is net Wh export and with a minus sign if there is net Wh import.
 - iii. Net VARh transmittal during each successive 5 min block, up to fourth decimal, with plus sign if there is net VARh export and with a minus sign if there is net MVARh import.
 - iv. Cumulative Wh transmittal at each midnight, in eight digits including one decimal
 - v. Cumulative VARh transmittal for voltage high condition, at each midnight in eight digits including one decimal.
 - vi. Cumulative VARh transmittal for voltage low condition, at each midnight, in eight digits including one decimal.
 - vii. Average RMS voltage for each successive 5min block
 - viii. Date and time blocks of failure of VT supply on any phase, as a star (*)/ (Z) mark.
- b. The meters shall store all the above listed data in their memories for a period of minimum forty-five (45) days for 15 min. interval and 15 days for 5 min. interval.
- c. The software provided at CDCS, i.e. SLDC/ALDC, will manage all functionalities of collection of data through DCUs, validate the data, store the data in a database, and manage the complete system. Software will also have a scheduler for

scheduling the task of collection of data periodically. The periodicity of data collection shall be user defined.

78.1.4. **Display**

Each meter shall have digital display for indication of the following (one at a time), on demand:

- i. Meter serial no. and model: IEM12345678 or IEM12345678
- ii. Date (year month day /yyyy mm dd): 20160311d
- iii. Time (hour min sec /hh mm ss): 195527t
- iv. Cumulative Wh reading: 1234567.8 C
- v. Average frequency of the previous block: 49.89F
- vi. Net Wh transmittal during the previous block: - 28.75E
- vii. Net VARh transmittal during the previous block: - 18.75R
- viii. Average % Voltage: 99.2 U
- ix. Reactive power (VAR): 106.5 r
- x. Voltage - high VARh register reading: 1234567.5 H
- xi. Voltage - low VARh register reading: 1234567.4 L
- xii. Instantaneous phase voltages
- xiii. Instantaneous line currents
- xiv. Instantaneous value of average power factor of three phases
- xv. Low battery indication
- xvi. The three line to neutral voltages shall be continuously monitored and in case any of these falls below 70 %, then preferably, the corresponding flashing LED provided on meter's front shall become steady. They all shall go off if all three voltages fall below 70 %. The LED shall automatically resume flashing when all VT secondary voltages are healthy again.
- xvii. The two VARh registers (x and xi) shall remain stay-put while VT supply is unhealthy.

Any other better or more informative mechanism to display the above shall be preferred. The above shall be mutually agreed between the meter buyer and vendor. Navigation keys to be provided at the meter front plate to navigate the display menu.

78.1.5. **Communication**

- a) Each meter must have an optical port on its front for tapping all data stored in its memory through HHU. In addition to the above each meter shall also be provided with a RS-485, RS-232, Ethernet and USB port on one of its sides as per DLMS requirement, from where all the data stored in the meter's memory can also be transferred to CDCS (through DCU), local computer and external storage using DLMS. The overall intention is to tap the data stored in the meter's memories at a

scheduled time from any of the above mentioned ports or any other means and transmit the same to a remote central computer using suitable means of communication. It shall be possible to securely download the IEM data through an USB port via external storage thereby removing the requirement of an MRI (Meter Reading Instrument). It shall be ensured that data transfer through USB shall be unidirectional only i.e. from Meter to external storage device in an authentication process. Meter data shall be tamper-proof.

- b) All meters shall be compatible with Optical port, RS-485 port, RS-232, Ethernet port and USB all together at a time and communicate using DLMS independently. It shall also be possible to obtain a printout (hard copy) of all data collected from the meters, using the local PC. Data collection from any local laptop/PC shall be possible by installing data collection software.

78.1.6. Testing

- a) Meters before dispatch from manufacturer's works, shall be duly tested to verify that it is suitable for supply to the Owner. Routine and acceptance tests shall be carried out on the meters in line with IS 14697.
- b) Any meter which fails to fully comply with the specification requirements shall be liable to be rejected by the Owner.

78.1.7. Communication ports-

All IEMs after final assembly and before dispatch from Manufacturer's works shall be duly tested to verify that they are suitable for downloading DLMS data using meter communication ports shall be subjected to the following acceptance test.

- i. Downloading Meter Data from the Meter(s) to PC via optical port.
- ii. Downloading meter data through USB port.
- iii. Downloading meter data to DCU/CDCS through Ethernet port.
- iv. Compatibility with PC Software.
- v. Functioning of Time synchronization advance and retard time commands.
- vi. Per meter downloading time verification.

78.1.8. Type Tests

Type test shall be carried out as per IS14697 and IS15959.

78.1.9. General

- a. The meter shall be supplied with DLMS latest/compatible software (shall be compatible with old & new meters data download handling). Any new software as required to be installed within warranty period are to be done by party or through remote support to client.

- b. The total arrangement shall be such that one (1) operation (click on “data download from meter” button on software) can carry out the whole operation in about five (5) minutes per meter or preferably faster.
- c. The layout of software front end/user interface shall be approved by SLDC/ALDC during technical evaluation/demonstration.
- d. The software shall be able to convert DLMS/COSEM compliant data to existing format as well as in tabular (.csv) format as applicable. Software for windows/office/antivirus to be supplied. Antivirus should not slow down processes and same will be demonstrated during technical demonstration.
- e. Above specification is indicative only, any higher standard required for the purpose intended (meter data handling) would be assessed by STU in consultation with SLDC and would be supplied accordingly. The detailed architecture shall be approved during drawing approval stage.
- f. Meters shall be accommodated in existing C&R panel of standard size in kiosk or C&R panel with door closed. Separate panel may be provided if the space is not available in the C&R Panel.
- g. Step by Step procedure (on screen shot type and desktop video capture) shall be provided by STU for
 - i. Installation/Re-installation of Database handling software into Laptop / PC
 - ii. Meter maintenance/site-testing procedure as per relevant IS/IEC standard.
 - iii. Procedure for data downloading from Meter by HHU/Laptop/Desktop PC.
- h. As on, the date of delivery supplied meters shall comply with all statutory regulation as required under MERC/CEA/IEGC as applicable and the same should be declared by the vendor during delivery along with warranty certificate.

78.1.10. **Automated Meter Data Reading (AMR) System**

This section describes the envisaged system architecture of AMR within the Region.

Intent of AMR

The intent of AMR scheme is to automate the task of data collection from each meter/location to the Central Data Collection System (CDCS) followed by validation, processing and generation of customized reports. The data shall be stored in Standard RDBMS database located at Host State Load Dispatch Centre.

AMR shall accept data from interface meters of any make complying prevalent open protocols like DLMS. AMR MDAS shall accept data either directly from the meter or from the DCU as the case may be. It shall have an intelligence to track receipt of data from each meter and also be capable of automatically polling any missed data during communication link failure.

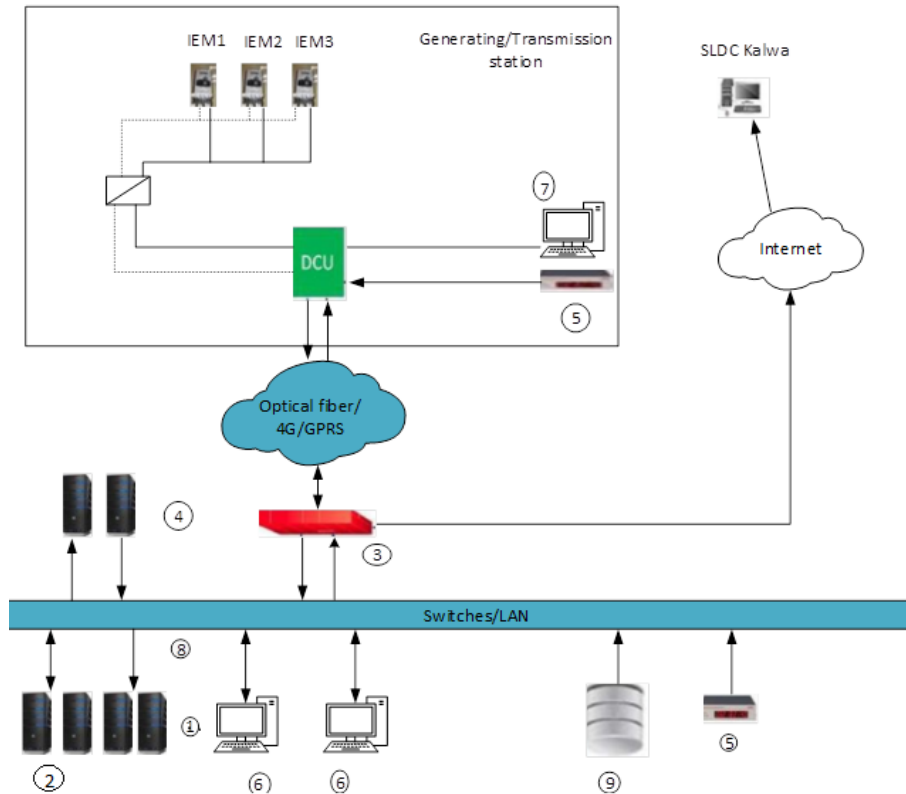


Figure: Concept diagram of the envisaged AMR system

Legends

Sr. No	Description
1	Application Server – Main & Standby
2	Database Server
3	Firewall
4	Web Servers
5	GPS clock
6	Client PCs
7	Local PC at site
8	Network Management System (NMS) (to be installed in
9	Storage

78.1.11. Accuracy Class:

The specification of the main meters and check meters for interface points, meters for energy accounting, and standby meters is given in Table-2 as below:

Table 2: Specification of Main and Check Meters for Interface Point meters

Sr.	Parameter	Standards
1	Standard Reference Voltage	As per IS

Sr.	Parameter	Standards
2	Voltage Range	The meter shall work satisfactorily on 110 Volts AC (Line-Line) with voltage variation range as per IS
3	Standard Frequency	The meter shall work satisfactorily on 50 Hz with variation range of -5% to +5%.
4	Standard Basic Current	As per IS (Current range of consumer meters shall be so chosen as to record the load current corresponding to the sanctioned load)
5	Accuracy Class*	Meters shall meet the following requirements of Accuracy Class: Interface meters - 0.2S(active) - 0.5S (reactive)
6	Starting Current and Maximum Current	As per IS
7	Power Factor Range	The meter shall work satisfactorily over a power factor range of zero lag to unity to zero lead
8	Power Frequency Withstand Voltage	As per IS
9	Impulse Voltage Withstand Test for 1.2/50 micro sec	As per IS
10	Power Consumption	As per IS

* All Interface meters should have accuracy class of 0.2S.

* The accuracy class of Current Transformers (CTs) and Voltage Transformers (VTs) shall not be inferior to that of associated meters. The existing CTs and VTs not complying with this Code shall be replaced with new CTs and VTs by STU. In case the CTs and VTs of the same Accuracy Class as that of meters cannot be accommodated in the metering cubicle or panel due to space constraints, the CTs and VTs of the next lower Accuracy Class can be installed till it is replaced with CTs and VTs of appropriate accuracy class by STU.

78.2. Data download capability of Meters

All Meters shall have downloading facilities of metered data through Common Meter Reading Instrument (CMRI). CMRI shall be capable of downloading data/information from various makes of AC static energy meters when loaded with the corresponding Meter specific downloading software(s) called Meter Reading Instrument (MRI) programs. The CMRI shall be able to extract information about energy data, load survey data, billing parameters, meter status, meter anomaly and tamper data from the memory of the meter and store for retrieval at a later stage. The meter shall be able to

store at least 100 tamper events on FIFO basis; which includes PT miss, CT reversal, Voltage unbalance, Current unbalance and power on/off.

78.3. Immunity to External Factors

The meter shall be immune to external influences like magnetic induction, vibration, electrostatic discharge, switching transients, surge voltages, oblique suspension, and harmonics and necessary tests shall be carried out in accordance with relevant standard.

78.4. Accuracy class of CTs & VTs

The accuracy class of Current transformers (CTs) and Voltage transformers (VTs) shall preferably not be inferior to that of associated meters. The existing CTs and VTs not complying with this Code shall be replaced by new CTs and VTs in a phased manner. The Voltage Transformers shall be electromagnetic VT or Capacitive Voltage Transformer (CVT).

78.5. Lead Cables

Lead Cables of CTs and PTs shall be of sufficient cross-section for reducing voltage drop to minimum between end connections (connection between cable lead end and CT/PT terminal as well as between cables lead and meter terminals). No joints shall be allowed in lead cables. The burden on metering cores of CTs and PTs including burden of lead cable and Meters connected there to shall not exceeds rated burden.

79. Meter Reading and Recording

79.1. Interface Meters

The meter reading shall be provided by STU to SLDC or data centers through online Automated Meter Reading facility and communicated with suitable medium as detailed out under Deviation Settlement Procedure approved by the Commission.

In case of non-functioning of AMR system, it shall be the responsibility of the Transmission Licensee to take down the meter reading and record the metered data, maintain database of all the information associated with the interface meters and verify the correctness of metered data and furnish the same to SLDC or other agencies as per Deviation Settlement Procedure approved by the Commission.

80. Rights of access to metering data

80.1. Authorized representatives of the following entities shall be entitled to have access to the metering data from the metering installed:

- a) STU is responsible for the metering installation;
- b) The State Load Dispatch Centre;

- c) The State Transmission Utility;
- d) The consumer of electricity or the generator of electricity at the metering installation as the case may be;
- e) Any other person who has an authorization from persons at S. No. a, b & c or from Commission; and
- f) The Commission.

81. Sealing of meters

81.1. Sealing Arrangements

All meters shall be sealed by the manufacturer at its works. In addition to the seal provided by the manufacturer at its works, the sealing of all meters shall be done as follows at various meter sealing points.

Sealing of interface meters shall also be done by both, the supplier and the buyer.

81.2. Sealing Points

Sealing shall be done at the following points (as applicable):

- (i) Meter body or cover
- (ii) Meter terminal cover
- (iii) Meter test terminal block
- (iv) Meter cabinet
- (v) The CT & VT secondary terminals terminated in the panel links
- (vi) Monitoring Seals & Sealing Records**
 - a) A tracking and recording software for all new seals shall be provided by the manufacturer of the meter so as to track total movement of seals starting from manufacturing, procurement, storage, record keeping, installation, and series of inspections, removal and disposal.
 - b) Seal shall be unique for each utility and name or logo of the utility shall be clearly visible on the seals.
 - c) Only the patented seals (seal from the manufacturer who has official right to manufacture the seal) shall be used.
 - d) Polycarbonate or acrylic seals or plastic seals or holographic seals or any other superior seals shall be used.

Lead seals shall not be used in the new meters installed at consumer premises. Old lead seals shall be replaced by new seals in a phased manner and the time frame of the same shall be submitted by the licensee to the Commission for approval.

81.3. Removal of seals from meters

81.3.1. Interface meters

Whenever seals of the interface meters have to be removed for any reason, advance notice shall be given to other party for witnessing the removal of seals and resealing of the interface meter. The breaking and re-sealing of the meters shall be recorded by the STU , who carried out the work, in the meter register mentioning the date of removal and resealing, serial numbers of the broken and new seals and the reason for removal of seals.

82. Meter failure or discrepancies

82.1. Interface meters

- a) Whenever difference between the readings of the Main Meter and the Check Meter for any month is notified more than 0.5% by SLDC, the following steps shall be taken by STU in a time bound manner:
 - (i) Checking of CT and VT connections;
 - (ii) Testing of accuracy of interface meter at site with reference standard meter of accuracy class higher than the meter under test.

If the difference exists even after such checking or testing, then the defective meter shall be replaced with a correct meter by STU in a time bound manner.

- b) In case of conspicuous failures like burning of meter and erratic display of metered parameters and when the error found in testing of meter is beyond the permissible limit of error provided in the relevant standard, the meter shall be immediately replaced with a correct meter by STU.
- c) In case where both the Main Meter and Check Meter fails, at least one of the meters shall be immediately replaced by a correct meter by STU. Also, in case of addition of new feeder in existing installation or establishment of new substations, the interface meters shall be provided and commissioned by STU, with prior approval of SLDC to the Single Line Diagram of Metering arrangement.

82.2. Billing for the failure period

- a) The billing for the failure period of the Meter shall be done as per the procedure laid down in the respective agreement such as PPA, BPTA or as specified under DSM Procedure approved by the Commission.
- b) Readings recorded by Main, Check and Standby Meters for every time slot shall be analyzed, cross checked and validated by SLDC. The discrepancies, if any, noticed in the readings shall be informed by the SLDC to the energy accounting agency for proper accounting of energy.
- c) SLDC shall also intimate the discrepancies to the STU or the concerned licensee or generating company as the case may be who shall take further necessary action

regarding testing, calibration or replacement of the faulty Meters in accordance with the provisions laid down.

- d) The defective meter shall be immediately tested and calibrated in time bound manner by STU.

83. Calibration and periodical testing of meters

83.1. Interface meter

- a) All interface Meters shall be tested at least once in Three years by the STU at site for accuracy using standard reference meter of better accuracy class than the meter under test. These Meters shall also be tested whenever the energy and other quantities recorded by the Meter are abnormal or inconsistent with electrically adjacent Meters.
- b) Whenever there is unreasonable difference between the quantity recorded by interface meter and the corresponding value monitored at the billing center via communication network, the communication system and terminal equipment shall be tested and rectified by STU.
- c) The defective Meters may be tested using NABL accredited mobile laboratory or at any accredited laboratory and recalibrated if required at manufacturer's works.
- d) Testing and calibration of defective interface meters may be carried out in the presence of the representatives of the supplier and buyer. STU shall send advance notice to the other party regarding the date of testing.

84. Mechanism for Dispute Resolution

Any disputes relating to metering amongst STU, other transmission licensees, Transmission system user of InSTS, any Generating Company, Distribution licensees in Maharashtra, any traders registered in Maharashtra, any EHV consumer connected directly to the InSTS and any disputes relating to inter-utility metering between STU and any Generating Company/Distribution Licensees/Users shall be settled in accordance with procedures given in the MEGC,2020. The dispute relating to billing and settlement among the entities shall be resolved under relevant agreements like PPA, BPTA, and Connection Agreement etc.

85. Dynamic Code

The Metering Code requires review and updation from time to time in view of continuously and fast changing metering and communication technology and for new commercial agreements and tariff, industry structure. All changes and revision in the Metering Code shall be discussed in MCCC and approved by the Commission.

STU and SLDC shall have the authority to define/decide location of Energy Accounting meters wherever necessary on case to case basis.

86. Quality Assurance of Meters

The Transmission Licensee, Generating Company, CPP/Co-generating plant, Distribution Licensee, and Consumers directly connected to the InSTS who are responsible for procurement and/or installation and commissioning of the meters covered under this Metering Code shall ensure that all type, routine and acceptance tests as per IS 14697:1999 & IS 15959:2011 are performed by the suppliers satisfactorily on these meters before they are commissioned. Subsequent to commissioning of the meters at site, the owners of the meters and the entities responsible for satisfactory functioning of the meters shall draw up a plan for routine maintenance / testing of the meters in line with Regulation 83 above and shall submit the same to the MCCC for approval.

PART I: MISCELLANEOUS

87. Objective

87.1. 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.

88. Responsibility

- 88.1. All Users are responsible for submitting up-to-date data to STU/SLDC in accordance with the provisions of the MEGC,2020.
- 88.2. All Users shall provide the name, address, and telephone number of the person responsible for sending the data to the STU and SLDC.
- 88.3. STU shall share the name, address, and telephone number of the person responsible for receiving data with the SLDC and Users.
- 88.4. STU shall provide up-to-date data to the Users as provided in the relevant formats of the MEGC,2020.
- 88.5. Responsibility for the correctness of data rests with the concerned User providing the data.

89. Data Management and Sharing

89.1. 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.

90. Data Categories and Stages in Registration

90.1. Data required to be exchanged has been listed in the appendices of these Regulations under various categories with a cross-reference to the relevant Regulations.

91. Changes to Users Data

91.1. 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.

92. Methods of Submitting Data

92.1. 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.

92.2. Where standard formats are not provided in the Regulations, same shall be developed by SLDC/STU.

92.3. 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.

92.4. 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 speed etc. if any.

93. Data Not Supplied

93.1. Users are obliged to supply data as specified in the respective Codes of MEGC. In case any data is missing and is not supplied by User, STU/SLDC may act 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 act 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.

94. Special Considerations

94.1. STU or SLDC or User may make a reasonable request for additional data, as necessary.

94.2. STU shall supply data, required/requested by SLDC for system operation, from the data repository.

95. Simulation and Analysis studies

- 95.1. STU shall carry out periodic Simulation and Analysis 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.
- 95.2. SLDC will also conduct Simulation and Analysis studies for operation planning. Such study shall cover the studies namely, steady state load flow, transient stability study, transmission outage simulation study, protection study, operation planning study. Such studies shall be based on historical as well as real-time SCADA data.
- 95.3. The STU and SLDC shall take the requisite measures for capacity building and training of their personnel engaged in planning and operation for such studies.

96. Data Acquisition

- 96.1. 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.
- 96.2. 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.
- 96.3. STU/ 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.
- 96.4. STU shall establish a suitable data transfer link between Sub-SLDC to SLDC and SLDC to WRLDC for exchange of operational data transmission.
- 96.5. 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.
- 96.6. At all the 765/400 kV lines/HVDC and important 220 kV lines, disturbance recorders shall be installed if already not installed and recorder data shall be made available at SLDC for post event analysis of the disturbances.

97. Dispute Resolution

97.1. In the event of any dispute regarding the interpretation of any provision of the MEGC,2020 or rules and procedures notified under the provisions of this MEGC,2020, same may be referred to the GCC. If the dispute is not resolved, the GCC may refer to the Commission with its suggestions/recommendations.

98. Compliance

98.1. 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 these Codes.

98.2. 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 these Codes.

98.3. In case of persistent non-compliance with the provisions of MEGC and/or the rules, procedures developed under these Codes, same shall be reported to the Commission.

98.4. 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 by the licensee or generating company or substation.

98.5. 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 intra-state grid.

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

98.6. Each Transmission Licensee and User connected with the intra-state grid shall comply with the directions issued by the SLDC or STU under these Regulations.

98.7. 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.

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

98.8. Consistent non-compliance with the provisions of the MEGC,2020 or the rules/procedures developed thereunder, by the User or Transmission Licensee, may lead to disconnection of plant and/or apparatus of such User or Transmission Licensee.

98.9. Nothing contained in Regulation 98.1 to 98.8 of these Regulations shall in any manner impact the powers conferred upon the Commission to monitor and enforce the

compliance with the provisions of the MEGC,2020 or rules/procedures formulated thereunder by Users and Transmission Licensees.

99. Procedures to be prepared for implementation of MEGC,2020

99.1. For implementation of MEGC,2020 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	12.1	STU
2	Guidebook for planning Code	13.2.6	STU
3	Integrated Resource Planning for 5 years	11 (ii)	SLDC and STU
4	Procedure for operationalising spinning reserve margin	14.4.4	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 43.2	SLDC
8	Procedure Congestion Management	44.1	STU and SLDC
9	Procedure for work to be carried out across an inter-User boundary	45.2	STU
10	Procedure for DC Demonstration of Generating Units	32.2	Provided as Annexure 3
11	Guidelines for Instructing RSD of Generating Unit	36	SLDC
12	Procedure for Accounting and Settlement of InSTS Reactive Energy Charges	37.16	Provided as Annexure 7

#	Details of Procedure / Guidelines / Codes / Plans	Ref. Regulation	Responsible Entity
13	Procedures, Formats and Timelines for Demand Estimation	38.1	SLDC
14	Contingency Procedures under Demand Curtailment	39.3.3	Licensee/user/ STU
15	Guidelines/Standard Reporting Format for Reportable Events	46.2.3	SLDC
16	Procedure for Testing and Maintenance of Communication Network Security System	59.1	STU
17	Standard Operating procedure for Cyber Security	64.3	STU
18	Procedure for Crisis Management Plan and procedure under Cyber Security.	64.3	STU
19	Guidelines/Procedure on Interfacing Requirements	65.1 a)	SLDC
20	Procedure on Centralized supervision for quick Fault Detection and Restoration	65.1 b)	STU
21	Guidelines on Availability of Communication System	65.1 c)	STU
22	Protection Manual	66.7	STU

100. Power to Amend

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

101. Power to Remove Difficulties

101.1. 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.

102. Power to Relax

102.1. 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.

103. Power to issue Practice Directions, Code, Guidelines

103.1. 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: 2 September, 2020

Abhijit Deshpande

Secretary,

Maharashtra Electricity Regulatory Commission

Annexures

Annexure-1: Minimum Acceptable Specifications of Dedicated 3 Phase HV-CT Set for Metering

(Refer Regulation 7.6.2(b))

Sr. No.	Particulars	33/132/220/400/765 kV	
	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 equipment 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 these Regulations, 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(Annexure-3)**.

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 timelines for DC demonstration activities are provided in Table 1 below:

Table 1: Timelines 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.
- 4.8. Any commercial impact due to DC Demonstration shall be borne by the respective Distribution Licensee/Buyer.
- 4.9. 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 at least 10-time blocks in advance. However, such generator shall not be allowed to request for re-demonstration of DC on the same day.
- 4.10. The SLDC shall cap the DC of generator which fails to demonstrate the DC 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. The costs associated with re-demonstration of DC shall be borne by such Generator.

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 of Annexure-3

(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.:

Format-2 of Annexure-3*(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, 2019.

2) The 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
SLDC, 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 of Annexure-3

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

**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) and 34.6)**

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 State Grid Code Regulations, 2020
 - iii. MERC DSM Procedure approved by the Commission dated 11 November 2019
 - iv. MERC MYT Regulation 2019.
 - v. CERC IEGC 2010 and subsequent amendments and provision in Fourth Amendment.
 - vi. CERC order No. L-1/219/2017-CERC dated. 05 May, 2017
 - vii. 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 above 25 MW (except captive transaction), selling power in Short Term Open Access (STOA) to an Intra-State buyer 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:

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

- b) **“Calculation Period”** means the period for which compensation calculation shall be carried out. Generally, there shall be twelve (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 Reserve Shut Down / Zero Scheduling 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 (Multi Year 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 Maharashtra State Grid Code (MEGC,2020) 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 d 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 85%.

- f) Based on the values of increased SHR and AEC arrived at Step e) above , 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:**

ECR (SE) = 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 – percentage of degradation in Aux Consumption based on unit loading corresponding to effective generation / 100).

Note: Model PPA notified by GoI provides for energy charge payment corresponding to degradation in net station heat rate and hence as such no separate compensation is allowed under this procedure.

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).

Note: Model PPA already provides for energy charge payment corresponding to degradation in net station heat rate as such no separate compensation under this procedure.

- 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:

$$ECR_n (Comp) = ECR_n (SE) - ECR_n (DC)$$

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 after due prudence by the buyer.

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

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

- 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 Orders/Regulations of the Commission 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 n^{th} 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 n^{th} 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 amounts payable to InSGS for the calculation period ending n^{th} month

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

m) Final Compensation payable by k^{th} beneficiary for the calculation period ending n^{th} month

i. No compensation shall be payable by beneficiaries if it has requisitioned at least 85% of its entitlement during the calculation period.

ii. The compensation amongst other beneficiaries shall be shared in the ratio of un-requisitioned energy below 85% of their entitlement, i.e., the compensation payable by k^{th} beneficiary for the calculation period ending n^{th} month.

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

Where UE_{kn} is un-requisitioned energy of k^{th} beneficiary below 85% of its entitlement during the calculation period ending n^{th} month (if applicable).

n) However, adjustments shall be carried out for compensation already paid for calculation period ending $(n-1)^{\text{th}}$ month.

Net compensation payable/receivable by k^{th} beneficiary for the n^{th} 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 who had requisitioned below 55% of their entitlement.
- f) Compensation (in terms of Rupees) shall be shared amongst the beneficiary (s) in the following manner.

$$\begin{aligned} & \text{Compensation payable by beneficiary } i \\ &= (N_i \times \frac{A_i}{\sum(N_i \times A_i)}) \times \text{Compensation payable to InSGS} \end{aligned}$$

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 extent 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 submit the compensation statement along with final SEA to the buyer with a copy to SLDC.
- b) In case any anomaly or discrepancy is noticed by buyer, the same may be brought to the notice of the seller within 15 days of issuance of Compensation Statement.

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	
CVPF_A(kcal/kg)	3565.6
CVSF_A(kcal/ml)	8.97873

SG	1,008,292,661
----	---------------

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. 36.3)

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 of DC 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 kV ICTs' shall be done as per the instructions of SLDC in concurrence with RLDC.

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 drawl 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 drawl/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 Drawl 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 drawl/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:

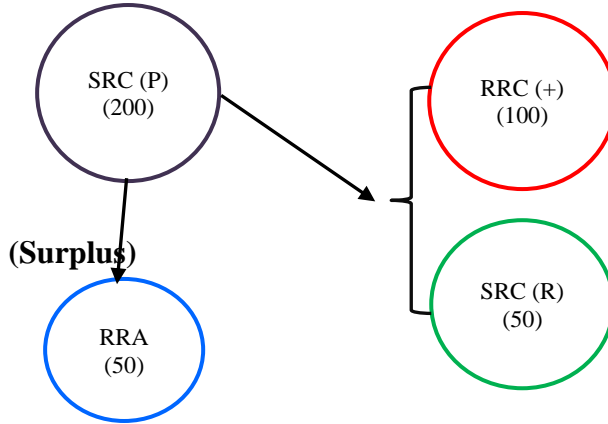
The amount available in the State DSM Pool Account may be utilized for payment to the Regional Reactive Pool purely on temporary basis. In such instances, once the balance is made in the State Reactive Pool Account, the same shall be transferred in the State DSM Pool Account.

The illustration for above cases is shown below as **Appendix-1(Annexure-7)** to this procedure.

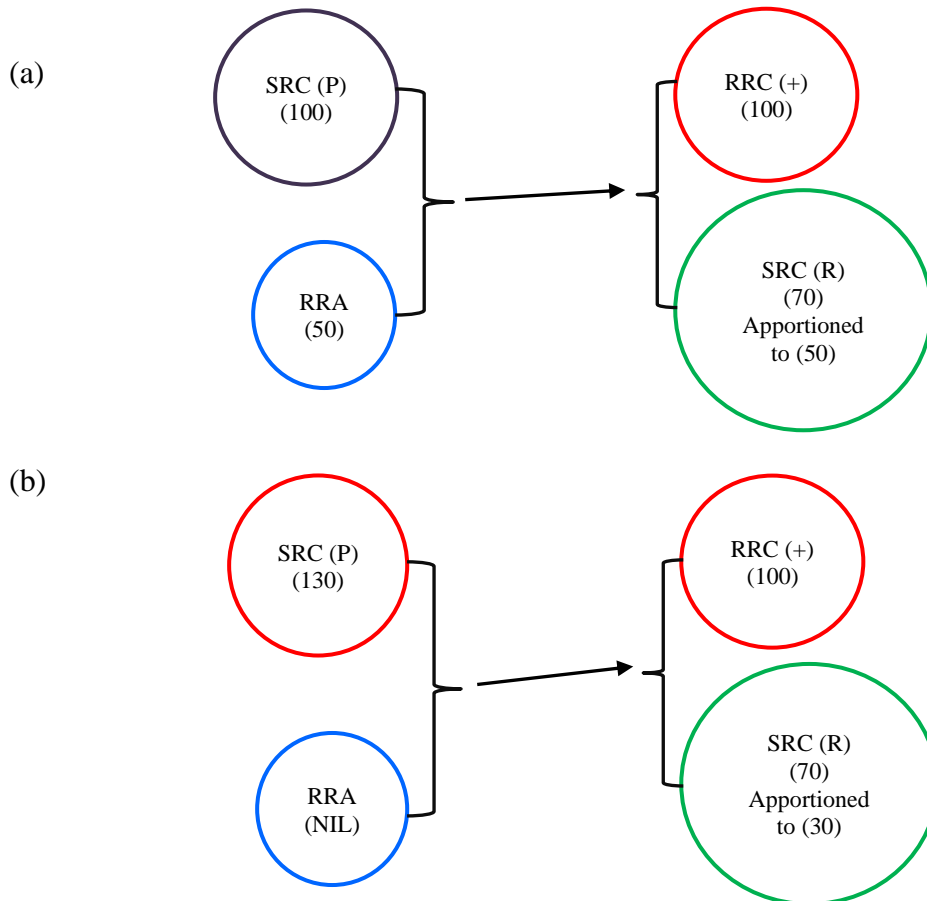
- 5.7. These payments shall be paid on priority by TSU and Generators to State Reactive Energy Pool Account within 10 days of issue of statement.
- 5.8. TSUs’ who have to receive amount on account of VAr charges would then be paid out from within one week from the receipt of payment in the Reactive Pool 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

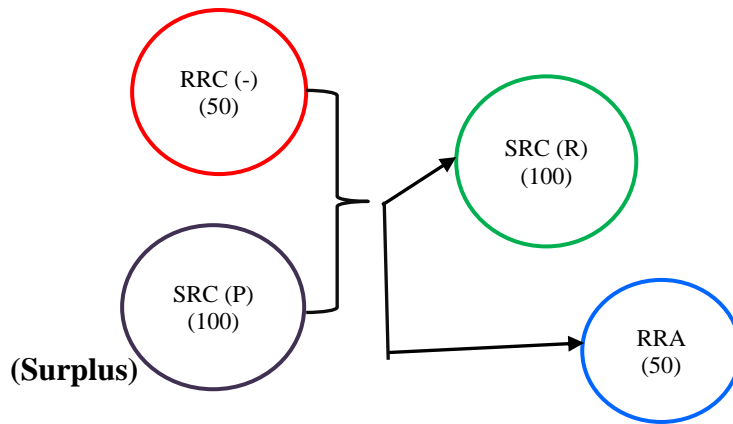
CASE – I: RRC is payable (+) by the State and $[RRC+SRC (R)] < SRC (P)$



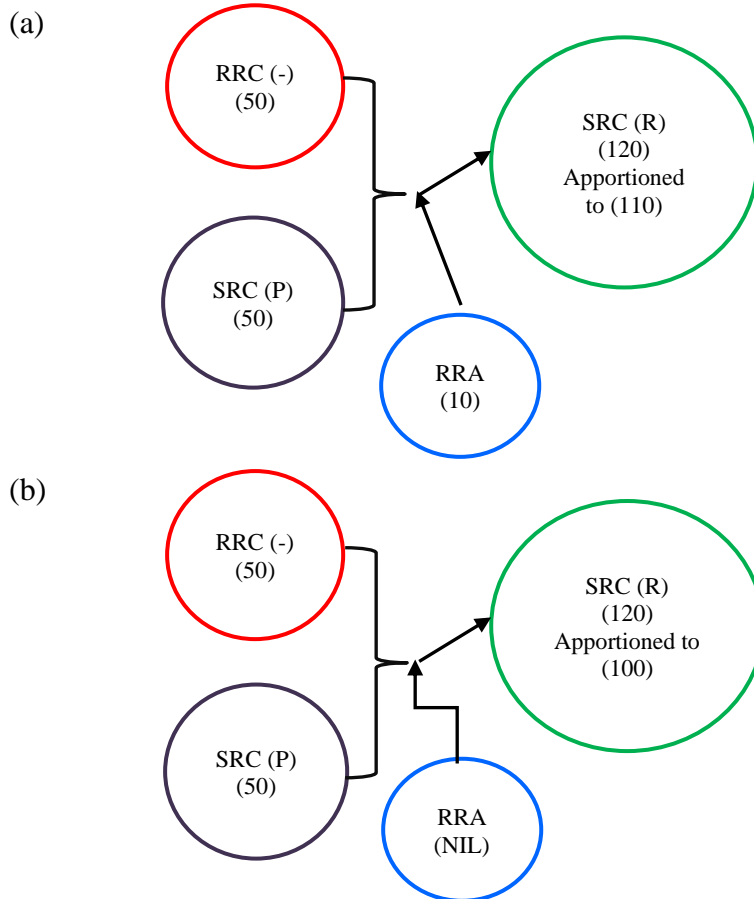
CASE – II: RRC is payable (+) by the State and $[RRC+SRC (R)] > SRC (P)$



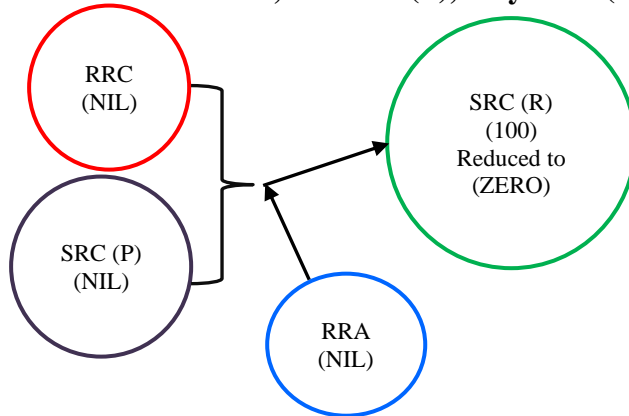
CASE – III: RRC is receivable (-) by the State and $[RRC+SRC (P)] > SRC (R)$



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

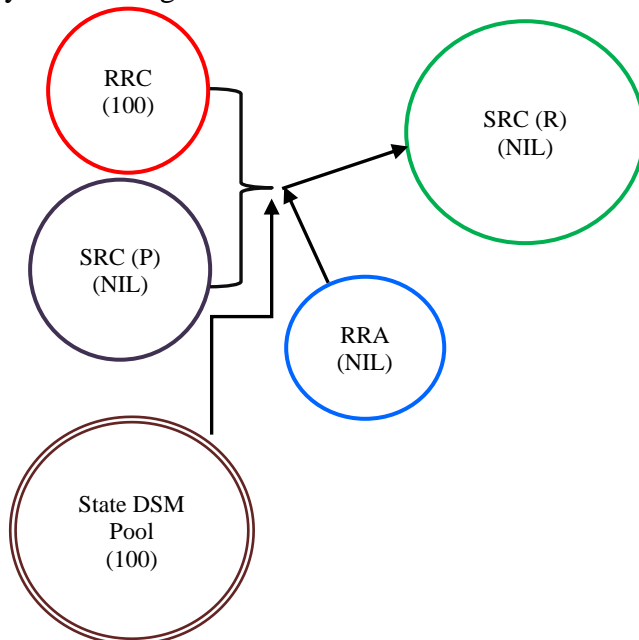


CASE – V: No RRC for the State, No SRC (P), only SRC (R) and no RRA

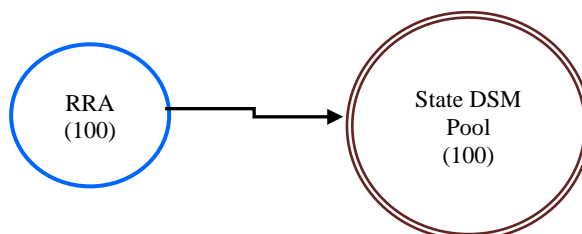


CASE – VI: RRC payable (+) for the State, No SRC (P), SRC (R) and no RRA

(a) Payment through State DSM Pool Account



(b) Transfer of Payment back to State DSM Account



Annexure-8.1 Format of Form-5S

(Ref: Regulation 33.2)

FORM -5S

Format for information to be submitted by Seller to Buyer for MoD Stack

MOD STACK OF VARIABLE CHARGES (VC) FOR (Month__) (R__) FOR BUYER –(name of Buyer) (Effective from _____ to _____)						
S. no	Generator	Installed Capacity/ Share in ISGS/InS GS (MW)	Type of Fuel	Variable Charge (Rs)/kWh in Descending Order		
				Approved Variable Charge in Rs/kWh (as per Tariff Order for S.62 Generators / as per PPA for S.63 Generator) including fuel surcharge for (N-1) month	Impact for approved Change in Law (if any) in Rs/kWh	Total Variable Charge in Rs/kWh
				(a)	(b)	(c) =(a)+(b)
1	Gen -1	xxx	Oil/Gas	xxxx	yyyy	pppp
2	Gen -2	xxx	Gas	xxxx	yyyy	pppp
3	Gen -3	xxx	Coal	xxxx	yyyy	pppp
4	Gen -n	xxx	Coal	xxxx	yyyy	pppp

Annexure-8.1 Format of Form-5B

(Ref: Regulation 33.4 and 33.8)

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, MEGC, 2020)

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

**Annexure-8.2 Revised Format of Form-6B
(Refer Regulation 33.8)**

FORM -6B (modified)

Format for State-wise MoD Stack (Centralised MoD) for Intra-Day Real time operation for SLDC interventions (this form shall be also used for MoD under FBSM framework as per ABT Order till the commercial arrangement of DSM Regulations)

(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, MEGC, 2020)

MOD STACK OF VARIABLE CHARGES (VC) FOR (Month__) (R)_)						
(Effective from _____ to _____)						
S.n o.	Generator	Installed Capacity/Share in InSGS/ISGS (MW)	Type of Fuel	Variable Charge (Rs)/kWh in Descending Order		
				Approved Variable Charge in Rs/kWh (as per Tariff Order for S.62 Generators / as per PPA for S.63 Generator) including fuel surcharge for (N-1) month	Impact of claim for approved Change in Law (if any) in Rs/kWh	Total estimated Variable Charge in Rs/kWh
				(a)	(b)	(c) =(a)+(b)
1	Gen -1	xxx	Oil/Gas	xxxx	yyyy	pppp
2	Gen -2	xxx	Gas	xxxx	yyyy	pppp
3	Gen -3	xxx	Coal	xxxx	yyyy	pppp
4	Gen -n	xxx	Coal	xxxx	yyyy	pppp

Annexures-9 Charges payable by Buyer/Seller to SLDC
(Refer Regulation 51)

Proposed Charges payable by Buyer/Seller to SLDC

Sr. No.	Type of Charges	Parameter	Amount (Rs.)	Details of Payment
1	Registration Charges	0.01 – 100 MW	20,000.00	<ul style="list-style-type: none"> • At the time of Application for Registration of Buyer/Seller • For each Buyer considering NCPD of recent Order of Commission. • For each Seller considering installed capacity of generating Station. (in case of generation station selling power Unit-wise or availing Open Access Unit-wise the Registration charges shall be paid Unit-wise)
		100.01 to 1000 MW	1,00,000.00	
		1000.01 to 10000 MW	2,00,000.00	
		>10000.01 MW	5,00,000.00	
2	Scheduling Charges	As approved by the Commission	2,250/-	For every day
3	Revision in Schedules if requested by Buyer/Seller	As approved by the Commission)	2,250/-	For every revision
4	Corpus fund for Seller		10,000/ per MW	During Registration and as and when installed capacity is added for Generating Station.
5	Corpus fund for Buyer		20,000/ per MW of NCPD	During Registration and as and when revised NCPD is approved by the Commission under InSTS Tariff Order. In case of Full OA and Captive consumers, the Capacity approved under OA shall be considered.
5	Top-up of Corpus		As required	In the event of reduction in Corpus
6	Any other charges		As required	As and when required

**Annexures-10: Tables and Formats under Scheduling and Despatch Code
(Refer Regulation 52.5)**

Table 1: Timelines for Scheduling and Despatch Procedure

Timelines	Responsibility	From	To	Form No
By 0600	Station wise ex-power plant MW and MWh Capabilities foreseen for the next Day	ISGS	WRLDC	
By 0800	Availability of ISGS Station wise ex-power plant MW and MWh capabilities foreseen for the next Day	WRLDC	SLDC	Available on WRLDCs Website
By 0830	Availability of ISGS Station wise ex-power plant MW and MWh capabilities foreseen for the next Day	SLDC	Beneficiary	Available on WRLDCs Website
By 0900	Unit-wise ex-power plant generation availability in MW and MWh taking into consideration any outage of its generating unit for the next day.	Sellers including RE Generators connected to InSTS	SLDC	Form 1S
By 0900	Consent for ISGS capacities by Beneficiaries	Beneficiary	SLDC	
By 0930	Consent for ISGS capacities by Beneficiaries to WRLDC	SLDC	WRLDC	
By 0945	Consent for Beneficiary to the ISGS for quantum and duration of power for next day for sale in the market	WRLDC	ISGS	
By 1000	QCA to upload Pooling Sub-Station wise and Buyer-wise day ahead Forecast and Available Capacity on 15-min time block basis.	QCA,	SLDC	Form 1S
By 1000	Buyers to furnish SLDC with detailed Drawal schedule on 15 minutes time block basis for next day in MW and MWh	Buyers	SLDC	Form 1B
By 1000	Full Transmission Open Access Consumers furnish detailed Drawal schedule on 15 minutes time block basis for next day in MW and MWh	Full TOA consumers	SLDC	Form 1B /Form 1S
By 1100	Preparation of Load Generation Balance and URS if any	SLDC		On web site
By 1115	Target Despatch Schedule for Seller and Target Drawal Schedule for Buyers.	SLDC	Buyers and Sellers	Form 2B and Form 2S
By 1400	ISGS drawal schedule of Beneficiaries	Beneficiaries	SLDC	
By 1500	ISGS drawal schedule of beneficiaries	SLDC	WRLDC	

Timelines	Responsibility	From	To	Form No
By 1800	“Net drawal schedule” of the State in MW and MWh for the next day	WRLDC	SLDC	Available on WRLDCs website
By 2000	Unit wise ex-bus generation revised availability in MW and MWh taking into consideration any outage of its generating unit for the next day	Sellers, QCAs connected to InSTS	SLDC	Form 1S-R
By 2000	Revised drawal schedule for next day against bilateral power and IPP requisition they have contracted in short term and long-term basis.	Buyers	SLDC	Form 1B-R
By 2000	Revised ISGS Drawal Schedule by Beneficiaries	Beneficiaries	SLDC	
By 2200	Revised ISGS Drawal Schedule by Beneficiaries	SLDC	WRLDC	
By 2300	Final Load Generation Balance and URS available if any	SLDC		SLDC Website
By 2330	Final targeted despatch schedules for Sellers and targeted drawal Schedules for Buyers.	SLDC	SLDC Website	Form No 2S

Table 2: List of Forms

Sr.	Particulars	Annexure/Format No.
1	Registration Form for Sellers for Scheduling and Re-Scheduling	Form A
2	Registration Form for Buyer for Scheduling and Re Scheduling	Form B
3	Submission of Day Ahead Drawal at T<>D Periphery by Buyer	Form 1B
4	Submission of Unit wise Ex-bus Day Ahead Availability by Seller	Form 1S
5	Day Ahead Drawal Schedule of Buyer by SLDC at T<>D periphery	Form 2B
6	Intra-day Drawal Revision at T<>D periphery by Buyer	Form 2B-R
7	Intra Day Declared Capacity of Seller unit wise (at Ex-bus periphery)	Form 2S-R
8	Final Drawal Schedule of Buyer at T<>D periphery	Form 3B-R
9	Combined Drawal Schedule of Buyers	Form - 4B
10	Day Ahead Ex-Bus Injection Schedule	Form 2S
11	Intra Day injection Schedule at G<>T periphery	Form 3S-R
12	Combined injection schedule at G<>T periphery	Form 4S
13	Buyer wise MoD Stack for Day ahead Scheduling and Revision of Schedule	Form 5B
14	Centralised MoD Stack for Intra-Day Operation by SLDC	Form 6B

FORM-A under Annexures-10

Registration form for State Entity -Seller under MERC DSM Framework

Sr. No.	Parameters	Information details
1	Type of generator	
2	Fuel Type	
3	Location of generator (Village, Tal, District)	
4	Total installed capacity of generating station	
5	Total number of units with details	
6	Name of sub-station and voltage level to which generator is connected	
7	Latitude & longitude of sub-station	
8	Schematic diagram of connectivity with the grid & metering arrangement	(Please attach)
9	Whether any PPA has been signed: (Y/N)	If yes, then please attach Notarized Affidavit indicating details
10	Metering details (G<>T interface metering details),	Meter No. 1. Main 2. Check 3. Standby
11	Contact details of the nodal person	Name: Designation: Landline number: Mobile number: E-Mail address:
12	Contact details of the alternate nodal person	Name: Designation: Landline number: Mobile number: E-Mail address:
13	Contact details of control room for communication on forecasting, scheduling, revisions, event of curtailments etc.	Landline number: Mobile number: E-Mail address:
14	Details of payment towards registration	
15	Technical data of generators (Ramp up/down rate, Technical minimum etc. Generators may enclose details as Annexure to the form.)	
16	Statement of PPAs	
17	Indemnity Bond (to submitted by Generator)	

We hereby confirms that, we shall undertake all operational and commercial responsibilities as mentioned in MERC DSM Regulations, 2019 and all the codes, procedures framed thereunder and MEGC,2020 and its amendment thereof and the abide by the directions issued by the SLDC from time to time.

Date:
Place:

Sign:
Authorized Signatory
Name:
Designation:
Name of Seller and Seal

FORM- B under Annexures-10

Registration form for State Entity -**Buyer** under MERC DSM Framework

Sr. No.	Parameters	Information details
1	Type of Buyer	
2	Address of Buyer for Communication	
3	Daily load curve data for each sample week of every quarter for last 3 years.	
4	Whether any PPA has been signed: (Y/N)	If yes, then please attach Notarized Affidavit indicating details
5	Metering details	Meter No. 1. Main 2. Check
6	Contact details of the concerned person	Name: Designation: Landline number: Mobile number: E-Mail address:
7	Contact details of the alternate concerned person	Name: Designation: Landline number: Mobile number: E-Mail address:
8	Details of payment towards registration	
9	Statement of PPAs	
10	Indemnity Bond	

We hereby confirms that, we shall undertake all operational and commercial responsibilities as mentioned in MERC DSM Regulations, 2019 and all the codes, procedures framed thereunder and MEGC,2020 and its amendment thereof and the abide by the directions issued by the SLDC from time to time.

Date:
Place:

Sign:
Authorized Signatory
Name:
Designation:
Name of Buyer:
Seal:

Form 1B under Annexures-10

Submission of Day Ahead Drawal Schedule at T<>D Periphery by Buyer to SLDC

Format 1B	Day Ahead (D-1 day) Drawal of Buyer (At T<>D Periphery)							
Name of Entity								
Buyer code:								
Delivery Date:								
Time Block	Projected Demand		Short Term OA		Medium Term OA		Bilateral Contract	
	MW	MWh	MW	MWh	MW	MWh	MW	MWh
1								
2								
3								
96								
Average								
Min								
Max								

*Day Ahead- (D-1) where *D is Delivery Date.

In addition to above the Distribution Licensee having PPAs with Hydro power plants shall submit the all the details of monthly Water Availability, Lake Level, Monthly estimated generation from the hydro power plant as per the provisions of this Procedure.

Form 1B-R under Annexures-10

Submission of Revised-Day Ahead Drawal Schedule at T<>D Periphery by Buyer to SLDC

Format 1B-R	Revised-Day Ahead (D-1 day) Drawal of Buyer (At T<>D Periphery)							
Name of Entity								
Buyer code:								
Delivery Date:								
Time Block	Projected Demand		Short Term OA		Medium Term OA		Bilateral Contract	
	MW	MWh	MW	MWh	MW	MWh	MW	MWh
1								
2								
3								
96								
Average								
Min								
Max								

*Day Ahead- (D-1) where *D is Delivery Date.

In addition to above the Distribution Licensee having PPAs with Hydro power plants shall submit the all the details of monthly Water Availability, Lake Level, Monthly estimated generation from the hydro power plant as per the provisions of this Procedure.

Format 1S under Annexures-10

Submission of Unit wise Ex-bus Day Ahead Availability by Seller

Format 1S	For Day Ahead (D-1 day) Declared Capacity at Ex-Bus wise Unit Wise (At Ex-Bus periphery)							
Name of Seller	Seller Code (Code will be generated Unit wise):							
Revision No:								
Delivery Date:								
Time Block	Day Ahead DC (MW)	LTOA (MW)		STOA (MW)		MTOA (MW)		Collective (MW)
		Intra-State		Intra-State		Intra-State		
		Buyer 1	Buyer 2	Buyer 1	Buyer 2	Buyer 1	Buyer 2	
1								
2								
3								
96								
Average								
Min								
Max								
MWh								

*Day Ahead- (D-1) where *D is Delivery Date.

Format 1S (Hydro) under Annexures-10

Submission of Unit wise Ex-bus Monthly Availability by Seller (Hydro) and Beneficiary of Hydro power plant

Format 1S (Hydro) For Day Ahead (D-1 day) Declared Capacity at Ex-Bus wise Unit Wise (At Ex-Bus periphery) to be submitted by Hydro Generators	
Name of Seller	
Seller Code (Code will be generated Unit wise):	
Revision No:	
Delivery Date:	
Month-wise Water Availability (In MCum and TMC)	
Lake Level (In Meter) as on date	
Statutory Restrictions of Tribunal/GoMWRD for water utilisation if any	
Consent of Beneficiary having PPA with Hydro plant	

Time Block	DC for days of the Month (MW)																															Remark
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
1																																
2																																
96																																
Average																																
Min																																
Max																																
MWh																																
Water utilisation (MCum /TMC)																																

- In case of Multiple Beneficiaries same form will be submitted separately for each Beneficiary by Seller.
- The Beneficiary shall provide its consent to the water utilisation and estimated generation as per the provision of this procedure.
- The SLDC during real time operation may vary the estimated generation indicated the form.

Format 1S (Pumped Hydro) under Annexures-10

Submission of Unit wise Ex-bus Monthly Availability by Seller (Pumped Hydro) and Beneficiary of Pumped Hydro power plant

Format 1S (Hydro) For Day Ahead (D-1 day) Declared Capacity at Ex-Bus wise Unit Wise (At Ex-Bus periphery) to be submitted by Pumped Hydro Generators	
Name of Seller	
Seller Code (Code will be generated Unit wise):	
Revision No:	
Delivery Date:	
Month-wise Water Availability (In MCum and TMC)	
Lake Level (In Meter) as on date	
Statutory Restrictions of Tribunal/GoMWRD for water utilisation if any	
Consent of Beneficiary having PPA with Hydro plant	

Time Block	DC for days of the Month (MW) / Pumping for the days of the Month (MW) (Pumping will be indicated negative)																															Remark			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31				
1																																			
2																																			
96																																			
Average																																			
Min																																			
Max																																			
MWh																																			
Water utilisation (MCum /TMC)																																			

- In case of Multiple Beneficiaries same form will be submitted separately for each Beneficiary by Seller.
- The Beneficiary shall provide its consent to the water utilisation and estimated generation as per the provision of this Code.

Form 2B under Annexures-10
Day Ahead Drawal Schedule declaration based on MoD by SLDC

Format-2B	Day Ahead Drawal Schedule of Buyer - ABCD (Based on De-centralised MoD at T<>D Periphery)					
Name of Buyer: _____					Buyer code:	
Delivery date:						
Time Block	Gen1	Gen2	Gen3	Gen4	Total Drawal	
1						
2						
3						
96						

**FORM 2B-R under Annexures-10
Intra-day Drawal Revision at T<>D periphery by Buyer**

Format 2B- R	Intraday (D -Day) Drawal Revision (At T<>D Periphery)					
Name of Buyers						
Revision No:						
Delivery Date:						
Time Block	Day ahead Projected Demand (MW)	Revised Demand (MW)	LTA (MW)	STOA (MW)	MTOA (MW)	Bilateral (MW)
1						
2						
3						
96						
Average						
Min						
Max						
MWh						

*D is Delivery date

Form 2S-R under Annexures-10
Intra Day Declared Capacity of Seller unit wise (at Ex-bus periphery)

Format 2S-R		For Intra Day (D-Day) Declared Capacity of Seller Unit Wise (At Ex-Bus)									
Name of Seller		Seller Code (Code will be generated Unit wise):									
Revision No:											
Delivery Date:											
Time Block	Day Ahead DC (MW)	Revised DC (MW)	STOA (MW)				MTOA (MW)				Collective Transaction
			Intra-State		Inter-State		Inter-State		Intra-State		
			Buyer 1	Buyer 2	Buyer 1	Buyer 2	Buyer 1	Buyer 2	Buyer 1	Buyer 2	
1											
2											
3											
96											
Average											
Min											
Max											
MWHR											

*D is Delivery date

Form 3B-R under Annexures-10
Final Drawal Schedule of Buyer at T<>D periphery

Format 3B-R		Final Drawal Schedule of Buyer (At T<>D Periphery)								
Name of Buyer: ABCD						Buyer code:				
Delivery Date: xxxx										
Time Block	Total Drawal in MW	InSGS Gen1 in MW	InSGS Solar in MW	InSGS Wind in MW	ISGS schedule in MW	STOA		MTOA		Power Exchange in MW
						Intra-State in MW	Inter-State in MW	Intra-State in MW	Inter-State in MW	
1										
2										
3										
96										

**Form 4B under Annexures-10
Combined Drawal Schedule of Buyers**

Format 4B		Combined Drawal Schedules of Buyers											
Time Block	Buyer 1					Buyer 2							Total Drawal
	STOA		MTOA		LTA	PXs	STOA		MTOA		LTA	PXs	
	Intra-State In MW	Inter-State In MW	Intra-State in MW	Inter-State in MW	in MW	in MW	Intra-State in MW	Inter-State in MW	Intra-State in MW	Inter-State in MW	in MW	In MW	In MW
1													
2													
3													
96													

**Form 2S under Annexures-10
For Day Ahead Ex-Bus Injection Schedule**

Format 2S	Day Ahead Injection Schedule (MW) (at G<>T Periphery)							
Seller Name:								
Time Block	Code: Unit Wise							
1	STOA in MW			MTOA in MW		LTA in MW		PXs
2	Intra State		Inter State	Intra-State		Inter-State	Intra-State	In MW
3	Buyer 1	Buyer 2	Buyer 1	Buyer 1	Buyer 2	Buyer 1		
96								

Form 3S-R under Annexures-10
Format 3S-R for Intra Day injection Schedule at G<>T periphery

Format 3S R										
Intra Day Injection Schedule (MW) (at G<>T Periphery)										
Seller Name:										
Delivery Date:										
Time Block	Code: Unit Wise									
1	STOA in MW				MTOA in MW				LTA in MW	PXs in MW
2	Intra- State		Inter-State		Intra-State		Inter-State			
3	Buyer 1	Buyer 2	Buyer 1	Buyer 2	Buyer 1	Buyer 2	Buyer 1	Buyer 2		
96										

Form 4S under Annexures-10

Combined injection schedule at G<>T periphery

Format 4S - Combined Injection Schedule (MW) (Intra Day at G<>T Periphery)																			
Delivery Date:																			
Time Block	Seller 1									Seller X									
	STOA Bilateral in MW				MTOA Bilateral in MW				LTA in MW	STOA Bilateral in MW				MTOA Bilateral in MW				LTA in MW	
2	Inter-State		Intra-State		Inter-State		Intra-State			Inter-State		Intra-State		Inter-State		Intra-State			
3	Buyer 1	Buyer 2	Buyer 1	Buyer 2	Buyer 1	Buyer 2	Buyer 1	Buyer 2		Buyer 1	Buyer 2	Buyer 1	Buyer 2	Buyer 1	Buyer 2	Buyer 1	Buyer 2		
96																			

FORM 5B under Annexures-10

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

(for revised Form – 5B Refer Annexure – 8.1 of these Regulation)

FORM -6B under Annexures-10
Form for State Wise MoD Stack (based on Centralised Principles) for Intra-Day
Operation

(for revised Form – 5B, Refer Annexure – 8.2 of these Regulation)