TELANGANA STATE ELECTRICITY REGULATORY COMMISSION

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TSERC (STATE ELECTRICITY GRID CODE) REGULATION, 2017 FOR THE STATE OF TELANGANA

PREAMBLE

Section 86 subsection(1)clause(h) of the Electricity Act, 2003 requires, the state electricity regulatory commission to specify State Electricity Grid Code in consistent with the Grid Code specified by CERC under Section 79 sub section (1) clause (h) of the Electricity Act 2003.

The State Grid Code aims to lay down the rules, guidelines and standards to be followed by various agencies and participants in the intra-State transmission system to plan, develop, maintain and operate the intra-State transmission system, a part of Southern Region Grid System, in the most secure, efficient, reliable and economic manner, while facilitating healthy competition in the generation and supply of electricity.

To achieve above-mentioned objective, this draft Regulation is published inviting comments / suggestions from the interested persons/stakeholders. All comments/ suggestions may be submitted to the Commission Secretary, TSERC at the above mentioned address or through email to secy@tserc.gov.in on or before 25-11-2017.

Structure of TSEGC

This State Grid Code contains the following parts, namely:

Part A: General - This part largely deals with the scope and application of these regulations and with the Grid Coordination Committee;

Part B: Planning Code - This Code specifies the principles, procedures and criteria that shall be used in planning and development of intra-State transmission system;

Part C: Connection Code- Connection Conditions specify the minimum technical and design criteria that shall be complied with by a Transmission Licensee and User connected to or seeking connection to the intra-State transmission system;

Part D: System Operating Code - This Code describes the conditions under which the State Load Despatch Centre shall operate the intra-State transmission system and under which Users shall operate their facilities, in so far as necessary to maintain the security and quality of supply and safe operation of the intra-State transmission system, under both normal and abnormal operating conditions.

Part E: Scheduling and Despatch Code - This Code deals with the provisions related to development of Scheduling and Despatch Code for the State of Telangana.

Part F: Metering code -Metering code provides for development of minimum requirements and standards for installation and operation of meters for commercial and operational purposes , to be provided by user or Transmission licensee at the connection point.

Part G: Miscellaneous - This part deals with a number of miscellaneous aspects including compliance with the State Grid Code, Power to amend, power to remove difficulties and dispute resolution.

In exercise of the powers conferred by clause (zp) of section 181 read along with clause (h) of section 86 of the Electricity Act, 2003 (36 of 2003), the Telangana Electricity Regulatory Commission here by makes the following regulations, namely

1. **Short title, extent and commencement**

1.1. These Regulations may be called the Telangana Electricity Regulatory Commission (State Electricity Grid Code) Regulations, 2017, for the State of Telangana.

1.2. These Regulations shall extend to the whole of the State of Telangana.

1.3. These Regulations shall come into force with effect from the date of its publication in the Telangana Gazette and shall remain in force unless amended, varied, altered or modified by the Commission.

2. **Definitions**

2.1. In these Regulations unless the context otherwise requires:

(a) **"Act"** means the Electricity Act, 2003 (36 of 2003), including amendments there to;

(b) **"Area of Supply"** refers to area within which a Distribution Licensee is authorized by his license to distribute & supply electricity.

(c) **"Authority"** means the Central Electricity Authority referred to in sub-section (1) of Section 70 of the Act.

(d) **"Automatic Voltage Regulator"** means a continuously acting automatic excitation control system to control the voltage of a Generating Unit measured at the generator terminals;

(e) **"Available Transfer Capability (ATC)"** refers to the transfer capability of the inter- control area transmission system available for scheduling commercial transactions (through Long Term Access. Medium term and Short Term Open Access) in a specific direction, taking into account the network security. Mathematically, ATC is the Total Transfer Capability less Transmission Reliability margin.

(f) **"Black Start Procedure"** means procedure necessary to recover the grid from a partial or a total blackout;

(g) **"Bulk Consumer"** refers to any consumer who avails of supply at Voltage of 33 kV and above.

(h) **"Commission"** means the Telangana Electricity Regulatory commission for the State of Telangana.

(i) **"Connection Agreement"** means an agreement setting out the terms relating to connection to and/or for use of the intra-State transmission system;

(j) **"Connection Point"** means a point at which a User's or Transmission Licensee's Plant and/or Apparatus connects to the intra-State transmission system;

(k) **"Demand"** means the demand of Active Power in MW and Apparent power in MVA of electricity, unless otherwise stated.

(l) **"Demand Control"** refers to any of the following methods of achieving a Load reduction:

a. Consumer Load management initiated by users
b. Consumer Load reduction by disconnection initiated by users (other than following an instruction from Load Despatch Centre)
c. Consumer load reduction instructed by the Load Despatch Centre
d. Automatic Under Frequency Load Disconnection
e. Emergency manual Load Disconnection.
f. By means of Load Restrictions in terms of R&C measures imposed by statutory authorities

(m) **"df/dt Relay"** means a relay which operates when the rate of change of system frequency (over time) exceeds a specified limit and initiates load shedding;

(n) **"Distribution System"** means the system of wires and associated facilities between the delivery points on the transmission lines or the generating station connection and the point of connection to the installation of the consumers**;**

(o) **"Disturbance Recorder"** means a device provided to record the behaviour of the pre-selected digital and analogue values of the system parameters during an event.

(p) **"Data Acquisition System"** 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 ;

(q) **"Element of State Grid"** means any apparatus like EHV Power Transformer, Breaker, Isolator, EHV Line Segment, Buses etc, as the case may be, in the Intra State Transmission System (In-STs).

(r) **"Event"** means an unscheduled or unplanned occurrence on the grid including faults, incidents and breakdowns:

(s) **"Event Logger"** means a device provided to record the sequence of operation in time, of the relays/ equipment at a location during an Event;

(t) **"Fault Locator"** means a device provided at the end of a transmission line to measure/indicate the distance at which a line fault may have occurred;

(u) **"Flexible Alternating Current Transmission System (FACTS)"** 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 power transfer capability.**

(v) **"Force Majeure"** means Any event which is beyond the control of the agencies involved which they could not foresee or with a reasonable amount of diligence could not have foreseen or which could not be prevented and which substantially affect the performance by either persons such as but not limited to :-

a) Acts of God, natural phenomena, including but not limited to floods, droughts, earthquakes and epidemics;

b) Acts of any Government domestic or foreign, including but not limited to war declared or undeclared, hostilities, priorities, quarantines, embargoes;

c) Riot or Civil Commotion

d) Grid's failure not attributable to persons involved.

(w) **"High Tension or HT"** means all voltages defined as "high" or "extra high" voltage under clause (av) of sub-rule (1) of Rule 2 of the Indian Electricity Rules, 1956 and corresponding voltage classifications as may be specified in accordance with clause (c) of sub-section (2) of Section 185 of the Act;

(x) **"Intra-State Transmission System"** (In-STS) 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:

Provided that the definition of point of separation between a transmission system and distribution system and between a Generating Station and transmission system shall be guided by the provision of the Regulations notified by the Authority under clause (b) of Section 73 of the Act;

(y) **"Low Tension or LT"** means all voltages other than those defined as "high" or "extra high" voltage under clause (av) of sub-rule (1) of Rule 2 of the Indian Electricity Rules, 1956 and corresponding voltage classifications as may be specified in accordance with clause (c) of sub-section (2) of Section 185 of the Act;

(z) **"Maximum Continuous Rating"** means the maximum continuous output in MW at the Generator terminals guaranteed by the manufacturer at rated

parameters.

(aa) **"Operation"** means a scheduled or planned action relating to the operation of a System;

(bb) **"Single Line Diagram"** means diagrams which are a schematic representation of the High Voltage (HV) /Extra High Voltage (EHV) apparatus and the connections to all external circuits at a Connection Point incorporating its numbering, nomenclature and labelling;

(cc) **"Site Common Drawing"** means drawings prepared for each Connection Point, which incorporates layout drawings, electrical layout drawings, common protection/control drawings and common service drawings;

(dd) **"Spinning Reserve"** means part loaded generating capacity with some reserve margin that is synchronised to the system and is ready to provide increased generation at short notice pursuant to dispatch instruction or instantaneously in response to a frequency drop.

(ee) **"Static VAR Compensator"** means an electrical facility designed for the purpose of generating or absorbing Reactive Power;

(ff) **"Total Transfer Capability (TTC)"** is defined as the amount of electric power that can be transferred reliably over the inter-control area transmission system under a given set of operating conditions considering the effect of occurrence of the worst credible contingency.

(gg) **"Transmission Reliability Margin"** is defined as the amount of margin kept in the total transfer capability necessary to ensure that the interconnected transmission network is secure under a reasonable range of uncertainties in system conditions.

(hh) **"Under Frequency Relay"** means a relay which operates when the system frequency falls below a specified limit and initiates load shedding;

(ii) **"User"** means persons including in-State Generating Stations, transmission licensees, Distribution Licensees, Consumers of the Distribution Licensees directly connected to intra-State transmission system (including consumers connected at 33 kV bus of Distribution Substations), persons availing inter/ intra state Open Access, and Captive generating plants connected and operating in parallel with the Grid at (including those who are connected at 33 kV bus of Distribution Substations), who are connected to and/or use the intra-State transmission system:

(kk) Bilateral transaction:-a transmission for exchange of energy (Mwh) between a specified buyer and specified seller directly or through a trading licensee or discovered at power exchange through anonymous bidding from a specified point of drawl for a fixed or varying quantum of power (MW)for any time period during a month.

(ll) Capacitor:- an electrical facility provided for generation of reactive power.

(mm) Central generating Station:- Generating stations owned by the companies owned or controlled by central Government

(nn) State generating Stations:-Generating companies owned by the companies owned and controlled by the State Governments.

(oo) Captive generating station:-A power plant set up by any person to generate electricity 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 co-operative society or association.

(pp) State transmission Utility (STU):-The Board or the Govt Company specified as such by the State Govt under sub-section (1) of section 39 of the E A 2003.

(qq) Congestion:-a situation where the demand for transmission capacity exceeds the available transfer capacity.

(rr) Connectivity:- means the state of getting connected to the intra state transmission system by a generating station , including a captive generating plant and bulk consumer or an intrastate transmission licensee.

(ss) Drawl schedule:-the summation of station wise ex- power plant drawl schedules from all intra state Generating stations and drawl from /injection to State grid consequent to other long term access, Medium term and short term open access transactions.

(tt) Forced outage:-an outage of a generating unit or transmission facility due to a fault or other reasons which were being not planned.

(uu) State Grid Code:- Regulations specifying the philosophy and the responsibilities for planning and operating state power system.

(vv) Transmission licensee:- a license granted under section 14 of the of the Act to transmit electricity.

(ww) Time block:- Block of 15 minutes each for which special energy meters record values of specified electrical parameters with first time block starting 00.00 Hrs

(xx) Deviation:- In time block for a generating station or a seller means its total actual generation minus its total scheduled generation and for a beneficiary or buyer means its total actual drawl minus its total scheduled drawl.

(xx) SCADA (Supervisory Control and Data Acquisition):-Refers to the communication links and data processing systems which provide information to enable implementation of requisite supervisory and control access.

(zz) Gaming:-An intentional miss-declaration of declared capacity by any generating company or seller in order to make undue commercial gains through change for deviations.

(zz1) Pooling Station:- Means the sub-station where pooling of generation of individual wind generators or solar generators is done for interfacing with the next higher voltage level:

Provided that where there is no separate pooling station for a wind/ solar generator and the generating station is connected through common feeder and terminated at a sub-station of Distribution Company/STU , the sub-station of STU/ Distribution company shall be considered as the pooling sub-station for such wind/solar generator as the case may be.

2.2 Words or expressions used here in and defined shall have the meanings assigned to them under the act.

2.3 **Application of other Codes etc.**

1. This code shall be read along with the, *APERC* Supply Code Regulation,(until framing of TSERC supply code regulation). And other relevant provisions of the Act, along with amendments thereon, rules and regulations made there under.

2. Where any of the provisions of this Code is found to be inconsistent with those of the Act, rules or regulations made there under, not withstanding such inconsistency, the remaining provisions of this Code shall remain operative.

3. Where any dispute arises as to the application or interpretation of any provisions of this Code, it shall be referred to the Commission whose decision shall be final and binding on the parties concerned.

4. In case of any inconsistency arising between implementation of this code and any CERC regulations the regulations given by CERC along with the amendments from time to time will prevail.

PART A: GENERAL

3. **Scope of regulation and extent of application**

3.1. These regulations shall apply to-

(i) Every Transmission Licensee in the State including State Transmission Utility;

(ii) The State Load Despatch Centre (SLDC) notified under the Act;

(iii) All Users that connect with and/or utilize the In-STS are required to abide by the principles and procedures defined in this code in so far as they apply to that User.

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

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

(i) Entering into a connection agreement in accordance with Regulation 15;

(ii) Providing for protection systems in accordance with Regulation 17.2 and 17.3;

(iii) Providing for communication facilities in accordance with Regulation 18;

(iv) Providing for system recording instruments in accordance with Regulation 19;

(v) Developing Single Line Diagrams in accordance with Regulation 20.3.1, 20.3.2, 20.3.3;

(vi) Developing Site Common Drawings in accordance with regulation 20.4.2; and

(vii) Installation and Operation of meters in accordance with CEA Metering Code developed as per Regulation 14.

3.3. All provisions related to Free Governor Action/Restricted Governor action , shall be consistent with relevant provisions as provided in the IEGC specified by Central Electricity Regulatory Commission amended from time to time.

3.4 All Users who are connected to and/ or use the In-STS, shall comply with the relevant regulations and Balancing & Settlement Code notified by the Commission(TSERC) from time to time "

4. **State Grid Code**

4.1. A notified copy of the State Electricity Grid Code (SEGC) shall be put up on the Internet websites of State Load Despatch Centre (SLDC) and State Transmission Utility (STU), State Discoms, Transmission and Distribution licensees and State Generating Stations. .

5. **Grid Coordination Committee**

5.1. A Grid Coordination Committee shall be constituted by the State Load Dispatch Centre with the consent of the commission within sixty days from the date of notification of these Regulations.

5.2. The Grid Coordination Committee shall be responsible for the following matters, namely-

(i) facilitating the implementation of these Regulations and the rules and procedures developed under the provisions of these Regulations;

(ii) assessing and recommending remedial measures for issues that might arise during the course of implementation of provisions of these Regulations and the rules and procedures developed under the provisions of these Regulations;

(iii) review of the State Grid Code, in accordance with the provisions of the Act and these Regulations;

(iv) to assess and advice the commission, the necessary amendments/changes required to be brought in these regulations for smooth operation of the power sector and in the interest of overall compliance to the provisions of the Electricity Act 2003 and;

(v) Such other matters as may be directed by the Commission from time to time.

5.3. **The Grid Coordination Committee** shall comprise of the following members

& Chairman:

a) Director Grid Operation (TS Transco) shall be the Chairperson of State Grid Coordination Committee (SGCC).

b) One member from State Transmission Utility;

c) One member to represent the State generating companies

d) One member from each class of Generating companies in the State, other than State Generating Companies.

e) One member to represent the Transmission Licensees in the State, other than the State Transmission Utility;

f) One member each to represent the state-owned Distribution Licensees in the State;

g) One member to represent the privately-owned Distribution Licensees, Deemed Distribution Licensees, Distribution License exemptees etc., in the State

h) One member to represent the Electricity Traders in the State;

i) One member to represent the Southern Region Load Despatch Centre;

j) One person representing the southern Regional Power Committee.

k) One person representing the state commercial wing, DISCOM commercial wing.

l) One person representing (STPP) Singareni.

m) One member from State Load Dispatch centre (SLDC)

n) Such other persons as may be nominated by the Commission.

o) One member representing the Non-conventional generators.

Provided further that the State Transmission Utility shall, in coordination with State Load Despatch Centre, provide necessary support to facilitate smooth functioning of the Grid Coordination Committee.

5.4. The members of the Grid Coordination Committee shall be selected as follows:

(i) the member referred to in clause (m) of Regulation 5.3 above shall be the head of State Load Despatch Centre;

(ii) the concerned Director of State Transmission Utility, having the responsibility of looking after Operation & Maintenance, System Studies & System Protection activities of State Transmission Utility shall be the member referred to in clause (b) of Regulation 5.3 above;

(iii) the members referred to in clauses (c), (d), (e), (f), (g) and (h) of Regulation 5.3 above shall be nominated by their respective organizations, which organizations will be selected in rotation from among all such organizations in the State. The term of each such member, selected in rotation, shall be one (1) year.

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

6. **Grid Code Review**

6.1. Implementation aspects of State Grid Code shall be reviewed by the Grid Coordination Committee at least once in every six (12) months. The review panel may hold any number of meetings as required subject to the condition that at least one meeting shall be held once in 12 months .Such meetings may be held by the transmission licensee with the users to discuss individual requirements and with the group of users to prepare proposals for panel meeting for a decision.

6.2. Upon completion of such review, the Grid Coordination Committee shall send a report to the State Transmission Utility providing information regarding: (a) outcome of the review; and (b) any proposed revisions to be made in the State Grid Code.

6.3. The State Transmission Utility shall send the report, referred in Regulation 6.2, to the Commission.

6.4. Non compliance:--If any user fails to comply with any provision of the grid code , the user shall inform the SLDC and Grid code review panel with out any delay duly reasoning out its non compliance and remedy its non compliance promptly.SLDC may bring the non compliance to the notice of the State Commission..

6.5. Dispute settlement proceadure:- In the event of dispute regarding interpretation any part/ section of the Grid code provision between any

user and STU the matter may be referred to the commission for its decision. Commissions decision shall be final and binding,

6.6. Compatibility with Indian Electricity Grid Code:--The Grid Code is consistent / compatible with IEGC, However , in matters relating to the inter-state transmission if any provision of the state grid code is inconsistent with the provisions of IEGC , the provisions and amendments as notified by CERC from time to time will be applicable

6.7. Code responsibilities:--a) in discharging its duties under the grid code , STU has to relay on information which users shall supply regarding their requirements and intentions
(b) STU shall not be held responsible for any consequences that arise from its reasonable and prudent actions on the basis of such information.

6.8. Confidentiality:--
a) Under the terms of Grid code , STU will receive information from users relating to their intentions in respect of their Generation of supply business.
b) (b)STU, shall not other than as required by the Grid code, disclose such information to any person other than Central, State Govt and the State Commission with out the prior written consent of the provider of the information.

7. **Role & Responsibility of Various entities:**

7.1 The state transmission utility (STU) and the State Load Dispatch Centre (SLDC) shall discharge such functions, responsibility as entrusted to them and issue of such directions as may be required and comply with such directions, under the provisions of the act and any other regulations issued by the concerned authority in an independent and un biased manner.

7.2 In addition to that, the State Load Dispatch Centre (SLDC) shall also be responsible for "Operation of State UI pool account, State reactive energy account and Congestion Charge Account and state transmission deviation account etc **from the date of framing of relevant regulations by the State Commission.**

Provided that in event of a State Load Despatch Centre being operated by the State Transmission Utility, as per first proviso of sub-section (2) of Section 31 of the Act, adequate autonomy shall be provided to the State Load Despatch Centre for it to be able to discharge its functions in the above mentioned manner.

7.3 Apart from the functions specified in the Act, for SLDC, the following are contemplated and exclusive functions of SLDC under this regulations;

7.3.1 System operation & control of the state grid covering contingency analysis and operational planning on real time basis and Scheduling / Re-Scheduling of Generation & drawl by users including open access users, based on system exigencies .

7.3.2 Scheduling /Rescheduling of electricity with in the state in accordance with the contracts entered in to with the licensees or the generating companies operating in the state.

7.3.3 System restoration following grid disturbances;

7.3.4 Metered Data Collection, compilation and processing for preparation of Energy Accounts and deviation accounts.

7.3.5 Compiling, furnishing and publishing the data pertaining to system operation in a common official web-site maintained by SLDC.

7.3.6 Operation of State UI- pool account , State reactive energy account, State congestion charge account, State transmission deviation account and other functions as directed by the Commission .

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7.3.7 Keep Account of the quantity of electricity generated (including Captive) and utilized in the State

7.38 The State Load despatch Centre shall be the apex body to ensure integrated operation of the power system in the state and be responsible for optimum scheduling and despatch of electricity with in the State, in accordance with the contracts entered in to with the licensees or the generating companies operating in the State.

7.39 As Telangana State Load Despatch Centre being designated as State Agency for the State of Telangana by the Commission, following are exclusive functions of SLDC in addition to the above.

1) State Load Despatch centre shall function in accordance with the directions issued by the Commission and shall act in consistent with the procedures/rules laid by the Central Agency for discharge of its functions under the Central Electricity Regulatory Commission (Terms and conditions for recognition and issue of Renewable Energy certificate for Renewable Energy generation) Regulations 2010 as amended from time to time.

(i) State Load Despatch Centre shall accreditate the Renewable Energy Generation Projects or Distribution Licensees, (which participate in REC(Renewable Energy Certificate Mechanism) and recommend them for Registration at Central Agency i.e. NLDC under REC Mechanism, as per the procedures / rules laid by Central Agency for discharge of its functions under the Central Electricity Regulatory Commission (Terms and Conditions for recognition and issue of Renewable Energy Certificate for Renewable Energy Generation) Regulations, 2010 as amended from time to time.

(ii) State Load Despatch Centre shall submit quarterly status to the State Commission in respect of compliance of Renewable Power Purchase Obligation (RPPO) by the obligated entity(s) in the format as stipulated by the Commission and may suggest appropriate action to the Commission, if required for compliance of the Renewable Power Purchase Obligation.

(iii) State Load Despatch Centre shall accept application for self-retention of RECs and shall issue 'Certificate for purchase' of RECs to the buyers as per the procedures / rules laid by Central Agency

for discharge of its functions under the Central Electricity Regulatory Commission (Terms and Conditions for recognition and issue of Renewable Energy Certificate for Renewable Energy Generation) Regulations, 2010 as amended from time to time.

2. SLDC shall communicate the Energy Injection Reports of registered RE generators under REC Mechanism to Central Agency i.e. NLDC and concerned RE generator on monthly basis as per the procedures / rules laid by Central Agency for discharge of its functions under the Central Electricity Regulatory Commission (Terms and Conditions for recognition and issue of Renewable Energy Certificate for Renewable Energy Generation) Regulations, 2010 as amended from time to time.

7.40 Monitoring of grid operations

7.41 Exercise supervision control over the intra-state transmission system and

7.42 Be responsible for carrying the real time operations for grid control and despatch of electricity with in the state through secure and economic operation of the state grid in accordance with the grid standards and the state grid code.

7.43 In accordance with section 32 of EA 2003, the SLDC may give such directions 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 with in the State of TELANGANA. Every licensee, generating company, generating station, substation and any other person covered with the operation of the power system shall comply with the directions issued by the SLDC under section (1) of section 32 of electricity Act 2003.The State Load Despatch Centre shall comply with the directions of the Regional Load Despatch Centre.

7.44 In case of interstate bilateral and collective short term open access transactions having a state utility or an intra-state entity as a buyer or seller, SLDC shall accord concurrence or no objection or a prior standing clearance as the case may be in accordance with the central electricity regulation (CERC) (open access inter-state Transmission regulation 2008 amended from time to time).

7.45 In case of any dispute arising with reference to quality of electricity or safe secure and integrated operation of the State grid or in relation to any direction given by the SLDC, it shall be referred to the State Regulatory Commission for decision. However pending the decision of the State commission the directions of the SLDC shall be compiled by the licensee/ generating company/ OA consumer as case may be.

7.46 UNTIL A GOVERNMENT COMPANY OR ANY AUTHORITY OR CORPORATION IS NOTIFIED BY THE STATE GOVERNMENT THE STATE TRANSMISSION UTILITY SHALL OPERATE THE STATE LOAD DEAPATCH CENTRE.

PART B: PLANNING CODE

This section specifies the technical and design criteria and procedures to be adopted by STU for planning and development of the Transmission system with in its boundary.

8 Transmission System Planning

System planning specifies the technical and design criteria and procedures to be adopted by STU for the planning & development of the Transmission system. The users shall take into account for planning & development of their own system. Development of Transmission System must be planned in advance, duly allowing sufficient lead time.

8.1 In accordance with Section 39(2)(b) of Electricity Act, 2003, the State Transmission Utility (STU) shall discharge all functions of planning and coordination relating to intra-State transmission system with Central Transmission Utility, State Government, Generating Companies, Regional Power Committees, Central Electricity Authority (CEA), licensees and any other person notified by the State Government in this behalf.

8.2 In accordance with Section 39(2)(d) and section 40 of Electricity Act, 2003 , the State Transmission Utility (STU) shall inter-alia 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, on payment of the transmission charges and a surcharge thereon, as may be specified by the State Commission.

8.3 Load forecasting shall be the primary responsibility of the Distribution Licensees within their area of supply. The Distribution Licensees shall prepare Peak Demand & Energy Forecasts (duly assessing the requirements of Open Access users also) of their areas for each of the succeeding 10 years and submit the same annually, by 31st January to the State Transmission Utility. Such forecasts shall be made by considering every Operation Division of DISCOMs as a basic unit of service area, and shall be submitted to the STU.

8.4 The DISCOMs shall also 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 PPAs, for the purpose of planning the evacuation / system strengthening schemes.

8.5 The State Transmission Utility shall consolidate Load Forecasts of all distribution licensees in the State and prepare overall State Wide Load Forecast which will form the basis for Transmission Expansion Plan.

8.6 The State Transmission Utility shall publish on its Internet website the transmission system plan for the In-STS and shall also make the same available to any person upon request on payment of reasonable cost of photocopying the same.

8.7 The transmission system plan shall cover a plan period of ten (10) years commencing from the financial year immediately following the year in which it is prepared: Provided that the transmission system plan shall be updated by the State Transmission Utility in each year and published in the

manner specified above, by the 30th day of September of each year.

8.8 The executive summary of such Transmission plan should clearly indicate the location of existing and proposed EHT Substations, connecting lines, no. of bays at each voltage level with details of present occupancy and availability for future expansion. New Substations shall be planned with at least two spare bays at lower voltage levels (ex, for a 220/132/33 kV Substations at 132 kV & 33 kV sides) and one spare bay at incoming side (Higher Voltage side) for future expansion.

8.9 The transmission system plan shall describe the plan for the In-STS and shall include the proposed intra-State transmission schemes and system strengthening schemes for the benefit of all users: Provided that the transmission system plan may include information related not only to intra-State transmission lines but also additional equipment including transformers, capacitors, reactors, Static VAR Compensators and Flexible Alternating Current Transmission Systems: Provided further that the transmission system plan shall also include information on progress achieved on the identified intra-State transmission schemes and system strengthening schemes.

8.10 The State Transmission Utility may, for the purpose of preparing the transmission system plan under this Regulation, seek such information as may be required by it, including generation capacity addition, system augmentation and long-term load forecast and all applications for open access etc. Provided that the Distribution Licensees shall have the primary responsibility for developing long term load forecasts for their respective license areas. The Distribution Licensee may be guided by applicable provisions related to load forecasting as provided in the guidelines for Load Forecasting & Resource Plans by the Commission. Provided also that the State Transmission Utility shall consider, but not be bound by, the information provided under this Regulation in preparing the transmission system plan

8.11 Planning Philosophy.

a) CEA would formulate perspective transmission plan for interstate transmission system as well as intra-state transmission system. These perspective transmission plans would be continuously upgraded to take care of the revisions in load projections and generation scenarios, considering the seasonal and time of day variations. In formulating perspective transmission plan, the transmission requirement for evacuating power from renewable energy sources would also be taken care off. The transmission system required for open access would also be taken into account in accordance with National Electricity Policy so that congestion in system operation is minimised.

b)The State Transmission Utility shall also consider the following for the purpose of preparing the transmission system plan under this Regulation –
(i) Plans formulated by the Authority for the transmission system under the

(i) provisions of clause (a) of Section 73 of the Act;

(ii) Electric Power Survey of India report of the Authority;

(iii) Grid Standards specified by the Authority under clause (d) of Section 73 of the Act;

(iv) Transmission Plan formulated by Central Transmission Utility under the provisions of Grid Code specified by Central Electricity Regulatory Commission under clause (h) of Section 79 of the Act;

(v) Latest Transmission Planning Criteria and Guidelines issued by the Authority;

(vi) Recommendations/ inputs, if any, of the Southern Regional Power Committee (SRPC)

(vii) Reports on National Electricity Policy which are relevant for development of In-STS; and

(viii) Any other information/data source suggested by the Commission.

8.12 The State Transmission Utility shall, while submitting its application under subsection (1) of Section 64 of the Act, for determination tariff, to the Commission for approval, also submit there with its investment plan based on the identified intra-State transmission schemes and system strengthening schemes projected in the transmission system plan.

8.13 The cost of the transmission system planning study undertaken in accordance with this Regulation shall be allowed in the determination of the charges of the State Transmission Utility under clause (b) of sub-section (1) of Section 62 of the Act.

9 Planning Criterion

9.1 The planning criterion shall be based on the security philosophy on which the In-STS has been planned. The security philosophy may be as per the Transmission Planning Criteria and other guidelines as given by the Authority.

Provided that State Transmission Utility shall carry out appropriate system studies while developing the transmission system plan.

9.2 The general policy shall be as detailed below:
The intra-State transmission system, as a general rule, shall be capable of withstanding and be secured against the following contingency outages without necessitating load shedding or rescheduling of generation during Steady State Operation:

(i) Outage of a 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 single Interconnecting Transformer or,
(v) Outage of a one pole of HVDC Bi-pole line or,

(vi) Outage of a 765 kV S/C line.
(vii) Ground Return Mode (GRM) operation of HVDC line
(viii) Power Demand Override (PDO) operation of a HVDC link.

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.

9.3 All the Generating Units may operate within their reactive capability curves and the network voltage profile shall be maintained within voltage limits specified. STU/ SLDC shall carry out demand forecast required for furnishing transmission requirement from ISTS for the purpose of calculation of transmission charge and loss sharing as per CERC regulations.

SLDC shall declare and publish on its web site, ATC (Available transmission Capability) for In-STS corridors as stipulated in the above regulations as well as CERC regulations on measures to mitigate Congestion in ISTS and regulations on LTA/ MTOA in ISTS.SLDC shall declare ATC for STOA and for operational purposes etc.

9.4 The intra-State transmission system shall be capable of withstanding the loss of most severe single infeed without loss of stability.

9.5 Any one of the events defined in the Regulation 9.2 above shall not cause: Loss of supply; prolonged operation of the system frequency below and above specified limits; Unacceptable high or low voltage; System instability; Unacceptable overloading of In-STS elements.

9.6 In all substations (132 kV and above), except HVDC, suitable number and capacity of transformers shall be provided to have adequate redundancy required to maintain firm capacity at the substation. In HVDC substations, at least one spare converter/ inverter transformer shall be kept ready to use any time. Explanation – for the purpose of this Regulation, the term firm capacity shall mean the minimum transformation capacity available at the substation in case of outage of any one transformer in all Substations (132 kV and above), at least two Transformers shall be provided

9.7 State Transmission Utility shall carry out planning studies for Reactive Power Compensation of In-STs.

9.8 Critical loads such as-railways, metro rail, airports, refineries, underground Mines, steel plants, smelter plants etc., shall plan their inter connection With the grid, with 100% redundancy and as far as possible from two different sources of Supply in coordination with the concerned STU.

9.9 Appropriate communication system for the new-substations and generating Stations may be planned by the STU and implemented by the licensees as Well as generation developers so that the same is ready at the time of Evacuation.

9.10 Applicability:-

a) This planning criteria shall be applicable from the date the Grid Code is published.

(b) This criteria shall be used for all new transmission systems planned after the above date.

(c) The existing and already planned In-STs may be reviewed with respect to the provisions of this planning criteria.

10 Planning Data

10.1 Transmission Licensees and all Users including the distribution licensees have to supply following types of data to the State Transmission Utility for purpose of developing the transmission plan: Standard Planning Data; Detailed Planning Data.

10.2 Standard Planning Data

10.2.1 Standard Planning Data shall consist of details which are expected to be normally sufficient for the State Transmission Utility to investigate the impact on the In-STs due to User/Transmission Licensee development.

10.2.2 Transmission Licensees and Users shall provide the following data to the State Transmission Utility from time to time in the standard formats provided by State Transmission Utility:

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

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

Provided that the State Transmission Utility shall develop standard formats, for submission of above mentioned data, within one (1) month from notification of these regulations and make the same available on its Internet website:

Provided also that the State Transmission Utility shall be guided by the formats, developed for submission of above mentioned data, under the provisions of IEGC specified by Central Electricity Regulatory Commission under clause (h) of Section 79 of the Act.

10.3 Detailed Planning Data

10.3.1 Detailed Planning Data shall consist of additional, more detailed data not normally expected to be required by State Transmission Utility to assess the impact of User/Transmission Licensee development on the In-STS.

10.3.2 Detailed Planning Data shall be furnished by the Users and Transmission Licensees as and when requested by the State Transmission Utility.

10.3.3 Planning data and implementation of transmission plan shall be in accordance with the Central Electricity Regulatory Commission (grant of connectivity Long term access and Medium term open access in inter- state

Transmission and related matters) regulations 2009 along with amendments issued from time to time.

PART C: CONNECTION CODE

11 **Connection Standard**

"Users connected to or seeking connection to In-STs shall comply with CEA (Technical Standards for connectivity to grid) regulations, 2007, CEA (Grid Standards) regulations, 2007, CEA (Grid standards) regulations 2010, amended from time to time and as per the CERC regulations (Until TSERC frames regulations) regulations regarding grant of connectivity , Open Access to Intra State Transmission & Distribution Networks, notified from time to time.

In addition to CEA (Technical standards for connectivity to Grid) regulations 2007, CEA Grid Standard Regulations 2010, CERC Regulations amended from time to time and CERC order dated 05-01-2016 in respect of petition NO 420/MP/2014 and APERC RPPO/REC Regulation NO 1 of 2012,

(a) Wind and solar Generators shall provide Directional protection for better selectivity and to avoid mal-operations.

(b) Wind Generating stations shall have LVRT (Low Voltage Ride Through) feature, so that they shall remain connected to the grid, when voltage at the interconnection point on any or all phases dips up 15% of nominal system voltage for 300ms to avoid cascade tripping of wind Mills at low voltage conditions as per CEA (Technical standards for connectivity to Grid) amendment Regulations .2013 dated 15-11-2013.

(c) Solar Generating stations shall also have LVRT feature as per CERC order dated 05-01-2016 in respect of Petition No 420/MP/2014.

(d) Wind solar generating stations shall provide Telemetry/ communication system and Data acquisition system for transformation of information to SLDC.

(e) All captive power plants shall provide suitable metering for measurement of captive power consumption for compliance of RPPO (Renewable Power Purchase obligation) by them as per APERC (as adopted by TSERC)RPPO/REC regulation NO 1 of 2012.

In addition, Connection code shall **also cover the technical standards for connection of wind and solar plants** which were not covered in CEA (technical standards for connectivity of grid) regulations, 2007.

The objective of the connection code is given below;

a. To ensure the safe operation, integrity and reliability of the Grid

b. That the basic rules for connectivity are complied with in order 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 Grid, nor impose unacceptable effects on the system of any other connected user or STU.

d. Any person seeking a new connection to the State Grid is required to be aware, in advance, of the procedure for connectivity to the state grid and also the standards and conditions his system has to meet for being integrated into the grid.

e. In the absence of Grid connectivity regulations of APERC/TSERC the standard procedure for connectivity to the Grid will be prepared based on the CERC connectivity regulations.

12 Safety Standard

The applicable safety requirements for construction, operation and maintenance of electrical plants and electric lines shall be as per the Indian Electricity Rules 1956 or the standards notified by the Authority under clause (c) of Section 73 of the Act:

Harmonic Distortion:

All persons connected to the Grid or intending to connect to the State Grid shall ensure that, the total Harmonic distortion for voltage at the connection point shall not exceed 5% with no individual harmonic higher than 3% and the total harmonic distortion for current drawn from the Transmission System at the connection point shall not exceed 8%.

13 Application for connection

13.1 Application for establishing new arrangement or modifying existing arrangement of connection to and/or use of the In-STs shall be submitted by the concerned Transmission Licensee or User as per below guidelines.

Case I: For connectivity to a generator, application may be submitted to the state Transmission utility/transmission licensee or respective Discom depending on the voltage level.

Case II: for connectivity to a Transmission licensee/ distribution licensee, application may be submitted to STU.

Case III: For connectivity to a Bulk load consumer, application may be submitted to the respective Discom irrespective of voltage level.

Provided that the standard format for application mentioned in the Regulation 13.1 shall be developed by State Transmission Utility and shall be made available at its Internet website within two (2) months of notification of these Regulations.

13.2 The application mentioned in clause 13.1 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; and

(c) Confirmation that the Transmission Licensee or the User shall abide by the provisions of State Grid Code, Indian Electricity Rules and various standards including Grid Connectivity Standards made pursuant to the Act.

13.3 The State Transmission Utility shall forward a copy of the application to the Transmission Licensee in whose system the connection is being sought, to State Load Despatch Centre and to every Transmission Licensee within the State whose Transmission System is likely to be affected by such application.

13.4 The State Transmission Utility or Transmission Licensee may carry out the power system studies as considered appropriate before allowing any new connection.

13.5 The State Transmission Utility shall, within Thirty (30) days, from the receipt of an application under Regulation 13.1 and after considering all suggestions and comments received by the parties identified under Regulation 13.3 in accordance with Central Electricity Regulatory Commission (grant of connectivity , Long term access and Medium term open access in inter-state Transmission and related matters) regulations 2009, including amendments issued from time to time

(a) accept the application with such modification or such conditions as may be specified by the State Transmission Utility;

(b) reject the application for reasons to be recorded in writing if such application is not in accordance with the provisions of these Regulations.

13.6 In case of acceptance of an application as per sub-section (a) of Regulation 13.5, the State Transmission Utility shall make a formal offer to the applicant:

Provided that the State Transmission Utility shall forward a copy of the offer to the Appropriate Transmission Licensee.

13.7 The voltage level at which the applicant is offered to be connected to the In-STs shall be governed by the standards notified by the Authority and prevailing guidelines adopted by the State Transmission Utility.

13.8 The applicant and the Appropriate Transmission Licensee, in whose system the connection is being sought, shall finalise a Connection Agreement on acceptance of the offer by the applicant. Provided that the State Transmission Utility shall be provided with a copy of the Connection Agreement: Provided further the State Load Despatch Centre shall be provided with a copy of the above mentioned Connection Agreement by the State Transmission Utility.

13.9 The State Transmission Utility shall, upon compliance of the required

conditions by the concerned Transmission Licensee/ User, shall notify the concerned Transmission Licensee/User that it can be connected to the In-STs.

14 Metering Requirement:

14.1 With regard to 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, calibration and periodical testing of meters, additional meters and adoption of new technologies in respect of meters for correct accounting, billing and audit of electricity, the Regulations issued by CEA under Section 55 and section 177 of the Act shall be binding on users (including Open Access users, Licensees, Generating Companies) connecting to the Intra State Transmission System including the persons connected to 33 kV Bus at Distribution Substation.

14.2 If the existing metering is of better accuracy than the one specified in 14.1, the same may be used without alteration.

14.3 In case the existing Metering System is not complying with the CEA standards, all Licensees and Generating Companies shall comply with such standards within a period of 6 months. The Commission reserves the right to extend the above 6 month time period based on the submission made by the licensees to its satisfaction.

14.4 The associated equipment of metering shall not be inferior to the installed meters. The installation of metering and associated equipment lies with the concerned Discom licensee at the cost of users.

15 Connection Agreement

15.1 A connection agreement shall be signed by the applicant with the STU, or with the Distribution Licensee as per below mentioned guidelines.

(a) Case I: A Generator, may enter in to a connection agreement with the state Transmission utility/Transmission licensee or respective Discom depending on the voltage level.

(b) Case II: A Transmission licensee/ Distribution licensee , may enter connection agreement with the STU.

(c) Case III: A Discom consumer (Bulk load consumer) may enter in to connection agreement with the respective Discom irrespective of the voltage level in accordance with the prevailing APERC(until framing of Regulations by TSERC) Regulations.

15.2 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 In-STs: (a) a condition requiring both parties to comply with the State Grid Code, Indian Electricity Grid Code specified by CERC and all other regulations concerning Standards of Grid Connectivity, Safety and security notified by the Authority (b) details of connection, technical requirements 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) Site Responsibility Schedule; (e) General philosophy and guidelines on protection; (f) Protection systems; (g) System recording instruments; (h) Communication facilities; and (i) Any other information considered appropriate by the State Transmission Utility or the Commission.

15.3 "State Transmission Utility shall develop a model Connection Agreement within one month of notification of this regulation and submit to the Commission for approval. Upon acceptance, the same shall be signed by the users within 3 months.

SLDC shall inform the progress of new projects inter-connecting with ISTS in advance to enable CTU to coordinate installation of meters, SCADA data integration, speech and protection etc."

16 Grid Parameter Variations

16.1 Transmission Licensees and Users shall ensure that Plant and Apparatus requiring service from or providing service to the In-STs 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 In-STs.

16.2 Frequency Variation

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

16.3 Voltage Variation

16.3.1 The variations of voltage may not be more than the voltage range specified in the regulations framed by the Commission

17 Equipment at Connection Points

17.1 Sub-station Equipment

17.1.1 All Extra High Voltage (EHV) sub-station equipment shall comply with Bureau of Indian Standards/International Electro technical Commission/ prevailing Code of practice.

17.1.2 All equipment shall be designed, manufactured and 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.

17.1.3 Each connection between a User and In-STS shall be controlled by a circuit

breaker capable of interrupting, at the connection point, at least the short circuit current as advised by State Transmission Utility in the specific Connection Agreement.

17.2 **Fault Clearance Times**

17.2.1 The 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 In-STs and for a three phase fault (close to the bus-bars) on In-STs connected to Users' equipment, shall not be more than:

a. 100 mille seconds for 800 kV class & 400 kV
b. 160 mille seconds for 220 kV & 132 kV/110 kV

17.2.2 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 In-STs directly, it shall be capable of withstanding, until clearing of the fault by back-up protection on the In-STs side.

17.3 **Protection**

17.3.1 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 reliability, selectivity and sensitivity:

Provided that all Users or Transmission Licensees shall provide protection systems as specified in the Connection Agreement.

17.3.2 Relay setting coordination shall be done at State level in coordination with the State transmission utility and with Regional Power Committee (SRPC) if required.

17.3.3 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 SRPC/STU.

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

17.4 **Reactive Power Compensation**

17.4.1 "Reactive Power compensation and/or other facilities shall be provided by Users, as far as possible, in the areas prone to low or high voltages systems thereby avoiding the need for exchange of Reactive Power to/from the Intra-STS and to maintain the Intra STS voltage within the specified range at all times. Their healthiness and operation as per real time requirement shall be ensured by the user or STU."

17.4.2 Line Reactors may be provided to control temporary over voltage within the limits as set out in connection agreements.

17.4.3 The additional reactive compensation to be provided by the User shall be indicated by State Transmission Utility in the Connection Agreement for implementation.

17.4.4 Users shall endeavour to minimize the Reactive Power drawl 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 drawl points may be changed to control the Reactive Power interchange as per User's request to the State Load Despatch Centre, but only at reasonable intervals.

17.4.5 Switching in/out of all 400 kV bus and line Reactors throughout the grid shall be carried out as per instructions of State Load Despatch Centre. Tap changing on all 400/220 kV Interconnecting Transformers shall also be done as per the instructions of State Load Despatch Centre only
The person already connected to the Grid shall also provide additional reactive compensation as per the quantum and time frame decided by the SLDC.

17.4.6 The charge payment for VARs shall be at a nominal paisa /KVArh as specified by the Central Electricity Regulatory Commission (CERC) from time to time and will be between beneficiary and state pool account for VAr exchanges. The generating station shall change generator transformer taps and generate / absorb Reactive power as per the instructions of SLDC with in capability limits of the respective generating units i.e. without sacrificing the active generation required at that time. No payments shall be allowed to be paid to the generating stations for such VAr generation/ absorption at the generating stations.

17.4.7. VAr exchanges between two beneficiaries on the interconnecting lines owned by them (singly or jointly) will be as per the provisions of the Central Electricity Regulations (CERC), IEGC 2010, amended from time to time.

17.4.8. Not with standing anything the above, SLDC may direct a beneficiary to curtail its VAr drawl/ injection in case the security of the Grid or safety of any equipment is endangered.

17.4.9 All hydro stations, CCGT and **liquid fuel stations shall compulsorily have Black start facilities.** All stations at 220 kV and above shall have synchronizing facilities."

18 Communication Facilities

18.1 All Users and Transmission Licensees including the State Transmission Utility shall provide the required facilities at their respective ends as specified in the Connection Agreement: Provided that the equipment/devices for communication and data exchange shall be provided considering the guidelines of State Load Despatch Centre, the interface requirements and

other such guidelines/specifications as applicable.

18.2 Reliable and efficient speech and data communication systems shall be provided to the SLDC to facilitate necessary communication and data exchange, and supervision/control of the State Grid by the State Load Despatch Centre, under normal and abnormal conditions.

18.3 It is the responsibility of the STU & Transmission Licensees, Users including the Distribution Licensees to provide the necessary system operation parameters as specified by the SLDC on real time / online basis making use of the state of the art technology (Data Acquisition & communication) for effective operation of the state grid in coordination with the regional grid.

18.4 SLDC shall ensure reliable communication channel with RLDC.SLDC shall install and maintain voice logging systems for recording telephonic instructions and information shall be maintained for six months.

18.5 All the Generators should provide dedicated internet, land line telephone connection & Fax facility, for communication with SLDC.

18.6 Generators including Captive /Co-Generation plants shall make arrangements to provide online data to the SLDC by installing suitable RTUs/SCADA facility at their cost.

18.7 All Open Access Users should provide details of their Email id / Land Line Phone Connection, Mobile Connection, / Fax Number, of at least two authorized representatives of their entity for the purpose of communicating any direction / information from the SLDC /DISCOMs, for immediate implementation.

19 System Recording Instruments

19.1 Recording instruments such as Data Acquisition System/Disturbance Recorder/Event Logger/Fault Locator (including time synchronization equipment) shall be provided in the In-STs for recording of dynamic performance of the system

19.2 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.

20 Responsibilities for operational safety

20.1 Transmission Licensees and the Users shall be responsible for safety as indicated in Site Responsibility Schedules for each connection point.

20.2 Site Responsibility Schedule

20.2.1 Site Responsibility Schedule shall be produced by the concerned Transmission Licensee and the User detailing the ownership responsibilities of each, before execution of the project or connection, including safety responsibilities.

20.2.2 The Site Responsibility Schedule shall be developed by the concerned Transmission Licensee pursuant to the relevant Connection Agreement and shall state the following for each item of plant and apparatus installed at the Connection point:

(i) Ownership of the Plant/Apparatus;
(ii) Responsibility for control of the Plant/Apparatus;
(iii) Responsibility for operation of the Plant/Apparatus;
(iv) Responsibility for maintenance of the Plant/Apparatus; and
(v) Responsibility for all matters relating to safety of any persons at the connection point.

20.2.3 The format, principles and basic procedure to be used in the preparation of Site Responsibility Schedules shall be formulated by State Transmission Utility within three (3) months of notification of these regulations and shall be provided to each User and Transmission Licensee for compliance: Provided that the State Transmission Utility shall put up the information related to above mentioned format, principles and procedures on its Internet Website.

20.3 **Single Line Diagrams**

20.3.1 (1) Single Line Diagram form part of SCADA of SLDC under the switch yard layout of a sub-station or the Generating Station and is always required by the SLDC for switching operations .Therefore the Transmission licensee/STU has to provide the same to SLDC as and when changes are made.

(2) Single line diagrams of Renewable energy Plants (which come under REC mechanism) and captive power plants shall be routed through State Load despatch Centre before granting approval by the concerned Distribution licensee/transmission utility.

20.3.2 Single Line Diagram shall include all High Tension (HT) connected equipment and the connections to all external circuits and incorporate numbering, nomenclature and labelling.

20.3.3 In the event of a proposal to change any equipment, the concerned User or Transmission Licensee shall intimate the necessary changes to State Transmission Utility and to all concerned. Single Line Diagram shall be updated appropriately by the concerned Users or Transmission Licensee and a copy of the same shall be provided to the State Transmission Utility.

20.4 **Site Common Drawings**

20.4.1 Site Common Drawings shall be prepared for each Connection Point and will include the following information: (i) Site Layout; (ii) Electrical Layout; (iii) Details of Protection/Control; and (iv) Common Services Drawings.

20.4.2 Detailed drawings shall be prepared by Transmission Licensee and User in respect of their system/facility at each Connection Point and copies of the same shall be made available to concerned User and Transmission Licensee respectively.

20.4.3 In case of any changes in the Site Common Drawings that are found necessary by Transmission Licensee or User in respect of their system/facility at the Connection Point, the details of such changes shall be furnished to the other party as soon as possible.

21 Access at Connection Site

21.1 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, operation, maintenance, etc.

21.2 Written procedures and agreements shall be developed between 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 Transmission Licensee and User at the connection site.

PART D: SYSTEM OPERATING CODE

22 Operating conditions

22.1 State Load Despatch Centre shall supervise the overall operation of the intra-State transmission system.

22.2 State Load Despatch Centre shall develop, document and maintain detailed operating procedures for managing the State Grid. These internal operating procedures shall include the following:

(i) Black start procedures;
(ii) Load shedding procedures;
(iii) Islanding procedures; and
(iv) Any other procedures considered appropriate by the State Load Despatch Centre:

Provided that such procedures shall be developed in consultation with Regional Power Committee and Regional Load Despatch Centre:

Provided further that such procedures shall be submitted, within three (6) months, to the Commission for approval.

22.3 The control rooms of the State Load Despatch Centre including Sub-Load Despatch Centres, Power Plants, substations of 132 kV and above and any other control centres of Transmission Licensees and Users shall be manned round-the-clock by qualified and adequately trained personnel. All personnel at SLDC and Sub LDC shall under go manpower certification system as per norms set by Government of India"

23 System security aspects

23.1 All Users and Transmission Licensees shall endeavour to operate their respective power systems and power stations in synchronism with each other at all times, such that the entire system within the State operates as one synchronised system.

23.2 No part of the State Grid shall be deliberately isolated from the rest of the In-STs except

(i) under an emergency, and conditions in which such isolation will prevent a total grid collapse and/or will enable early restoration of power supply;
(ii) when serious damage to a costly equipment is imminent and such isolation will prevent it;

(iii) When such isolation is specifically instructed by the State Load Despatch Centre.
(iv) In case of opening/removal of any important element of the State Grid under an emergency situation, the same shall be communicated to State Load Despatch Centre at the earliest possible time after the event.
(v) For safety of human life.

23.3 Complete synchronism of the State Grid shall be restored as soon as the conditions again permit it. The restoration process shall be supervised by State Load Despatch Centre as per the operating procedures separately formulated.

23.4 No important element of the State Grid shall be deliberately opened or removed from service at any time, except when specifically instructed by State Load Despatch Centre or with specific and prior clearance of State Load Despatch Centre. The list of such important grid elements on which the above stipulations apply shall be prepared by the State Load Despatch Centre in consultation with the Transmission Licensees and Users and shall be available at the State Load Despatch Centre.

23.5 Any tripping, whether manual or automatic, of any of the elements of the State Grid, referred in Regulation 23.4, shall be precisely intimated by the concerned Transmission Licensee or User to the State Load Despatch Centre at the earliest say within 10 minutes. The reason, to the extent determined, and the likely time of restoration shall also be intimated. All reasonable attempts shall be made for the elements' restoration as soon as possible.

23.6 A Generating Unit shall be capable of continuously supplying its normal rated active/reactive output at the rated system frequency and voltage, subject to the design limitations specified by the manufacturer. When instructed by SLDC, the unit shall maximize the reactive power generation/ absorption as per its capability curve to the extent possible.

23.7 A Generating Unit shall be provided with an Automatic Voltage Regulator, protective devices and safety devices, as set out in Connection Agreement.

23.8 Ripple filter of +/- 0.03 Hz shall be provided so that small changes in frequency are ignored for load correction , in order to prevent Governor hunting.
Each Generating Unit shall be fitted with a turbine speed governor having an overall droop characteristic within the range of 3% to 6% and such turbine speed governor shall always be in service:

Provided that all coal /lignite based generating units of 200MW and above and all Hydro units of 25 MW and above and open cycle gas turbine

/combined cycle generating stations having gas turbines of capacity more than 50 MW each is required to be operated without its governor in normal operation, the State Load Despatch Centre shall be immediately advised about the reason and duration of such operation.

There should not be any reduction in generation in case of improvement in grid frequency below 50.00 Hz.(For example if grid frequency changes from 49.9Hz to 40.95Hz, then there shall not be any reduction in generation) whereas for any fall in grid frequency , generation from the unit should increase by 5% limited to 105%of the MCR of the unit subject to machine capability.

23.9 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. No dead bands and/or time delays shall be deliberately introduced.

23.10 Each Generating Unit shall be capable of instantaneously increasing output by 5%, when the frequency falls, subject to limit of 105% of Maximum Continuous Rating. Ramping back to the previous generation level, in case the increased output level cannot be sustained, shall not be faster than 1% per minute:

Provided that all coal /lignite based generating units of 200MW and above and all Hydro units of 25 MW and above and open cycle gas turbine /combined cycle generating stations having gas turbines of capacity more than 50 MW each is required to be operated without its governor in normal operation, the State Load Despatch Centre shall be immediately advised about the reason and duration of such operation.

23.11 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 one (1.0) per cent per minute or as per manufacturer's limits. All the generators mentioned in clause (23.10) shall be operated under Restricted Governor Mode of Operation (RGMO).For the purpose of ensuring primary response, SLDC shall not schedule the generating station or units thereof beyond ex-bus generation corresponding to 100% of the installed capacity of the generating station or units thereof. The Generators 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 a margin available for providing Governor action as primary response.

23.12 Except under an emergency, or to prevent an imminent damage to costly equipment, no User shall suddenly reduce his generating unit output by more than a limit as specified by the State Load Despatch Centre, without prior intimation to and consent of the State Load Despatch Centre, " However , if frequency falls below the limit specified by CERC from time to time. Similarly, no User shall cause a sudden increase in its load by more than a limit as specified by the State Load Despatch Centre, without prior intimation to and consent of the State Load Despatch Centre.

23.13 All generating units shall normally have their Automatic Voltage Regulators in operation, with appropriate settings.

Provided that in case a generating unit of over fifty (50) MW is required to be operated without its Automatic Voltage Regulator in service, the State Load Despatch Centre shall be immediately intimated about the reason and duration, and its permission be obtained.

23.14 Power System Stabilizers in Automatic Voltage regulator of generating units, with capacity of 50 MW wherever provided, shall be properly tuned by the respective generating unit owner as per a plan prepared for the purpose by the State Transmission Utility from time to time. State Transmission Utility will be allowed to carry out checking of Power System Stabilizer and further tuning it, wherever considered necessary.

23.15 Provision of protections and relay settings shall be coordinated periodically throughout the State grid, as per a plan to be separately finalized by the Protection committee/Regional Power Committee.

23.16 State Load Despatch Centre, in coordination with Regional Load Despatch Centre, Users and Transmission Licensees shall make all possible efforts to ensure that the grid frequency always remains within the frequency band of 49.90 to 50.5 as specified by IEGC from time to time, the frequency range within which steam turbine conforming to the IEC specifications can safely operate continuously.

23.17 Users and Transmission Licensees shall provide automatic load shedding/islanding schemes by means of installation of under-frequency and df/dt relay-settings in their respective systems, wherever applicable, to arrest frequency decline that could result in a collapse/disintegration of the State grid, as per the plan separately finalized by the Regional Power Committee and shall ensure its effective application to prevent cascade tripping of generating units in case of any contingency.

23.18 Users and Transmission Licensees shall ensure that the under-frequency and df/dt relay-based load shedding/islanding schemes, mentioned in Regulation 23.17 are always functional: Provided that the relays may be temporarily kept out of service, in extreme contingencies, with prior consent of State Load Despatch Centre.

23.19 State Transmission Utility shall carry out periodic inspection of the under frequency relays and produce the report to State Load Despatch Centre. State Load Despatch Centre shall maintain the record of under frequency relay and/or df/dt relay operation.

23.20 Users and Transmission Licensees shall facilitate identification, installation and commissioning of System Protection Schemes (including inter-tripping and run-back), as finalized by the Regional Power Committee, in the power system to protect against situations including voltage collapse and cascading: Provided that such schemes shall be prepared by State Transmission Utility after due consultations with State Load Despatch Centre, Users and other Transmission Licensees.

23.21 Each User and Transmission Licensee shall provide adequate and reliable communication facility internally and with State Load Despatch Centre, other Users and other Transmission Licensees to ensure exchange of

data/information necessary to maintain reliability and security of the grid. Wherever possible, redundancy and alternate path shall be maintained for communication along important routes, e.g., SLDC to Users.

23.22 User and Transmission Licensee shall send the requested information/data including disturbance recorder/sequential event recorder output etc. to State Load Despatch Centre within 3 days for purpose of analysis of any grid disturbance/event. No User or Transmission Licensee shall block any data/information required by the State Load Despatch Centre for maintaining reliability and security of the State or Regional Grid and for analysis of an event.
Maintenance of their respective power system elements shall be carried out by users, STUs in accordance with the provisions of Central Electricity Authority (CEA) Grid Standards 2010.

23.23 Hydro generators having capability to operate in condenser mode are required to do so under instructions from SLDC

23.24 All users, SLDC shall take all possible measures to ensure that the grid frequency remains within the frequency band specified by CERC from time to time.

23.25 Special requirement for Renewable energy:--SLDC shall make all efforts to evacuate the available power from solar, wind, mini-Hydel, co-generation power and treat the plants as must- run stations. However, SLDC may instruct such generator to back down generation in case of grid security and the generators mentioned above shall comply with the same. For, this Data Acquisition System facility shall be provided by the generator for transfer of information to the SLDC. Wind Generators during start up shall ensure that the reactive power drawl (inrush of currents in case of induction generators) shall not affect the grid performance.

23.26 Hydro generators having capability to operate in Pump mode are required to do so under instructions from SLDC

23.27 State Load Despatch Centre, Users and Transmission Licensees shall make all

Possible efforts to ensure that the grid voltage always remains within the following operating range: Voltage -

RMS Voltage (KV)

Nominal	Maximum	Minimum
765	800	728
400	420	380
220	245	198
132	145	122
66	72	60
33	36	30

24 Demand forecast

24.1 All Users / Distribution Licensees shall develop methodologies / mechanisms for daily/weekly/monthly/yearly demand estimation for current year for operational purposes. Based on this demand estimate and the estimated availability from different sources, the demand management efforts like Load Generation Balance shall be planned and shall ensure that the same is implemented by the Distribution Licensees/all users.

All Users / Distribution Licensees shall provide relevant data to SLDC from time to time. SLDC shall maintain historical database of Transmission<>Distribution (T<>D) interface points wise Grid Demand, and Generator wise injection data, power Deficit/Surplus data at grid level, for the purpose of reasonably validating the Short Term Forecasts submitted by the Users / Distribution Licensees.

24.2 The State Load Despatch Centre shall set out the responsibilities for short term (one day to 52 weeks) demand estimation of active power as well as reactive power. It shall also provide for procedures as well as time lines to be followed for exchange of information between concerned entities for arriving at these estimates/forecasts: Provided that the State Load Despatch Centre shall refer to the demand forecast considered by the State Transmission Utility while developing the transmission system Plan under Regulation 8 of these Regulations.

24.3 The demand estimation shall cover the time scales as applicable for operational purposes. The time scales should be decided after giving due considerations to the requirements under other existing regulations for furnishing demand forecast related information.

24.4 The STU shall conduct monthly system study of the network on the peak demand reached to facilitate system improvement of the network. Similar studies shall be conducted for reactive power compensation only to consider enhancing by redeployment of reactive sources on a quarterly basis.

24.5 Based on demand estimate and the estimated availability from different sources, SLDC shall plan demand management measures like Load Generation Balance and shall ensure that the same is implemented by the Distribution licensee.
While the demand estimation for operational purposes is to be done on a daily/weekly/monthly basis initially, mechanism and facilities at SLDCs shall be created within one year to facilitate on line estimation of demand for daily operational use for each 15 minutes block.

24.6 All distribution licensees shall abide by the demand management measures of the SLDC, and shall also maintain historical database for demand estimation.

25 Demand /Drawls Management:

25.1 This section is concerned with the provisions to be made by SLDC to effect a reduction of demand in the event of insufficient generating capacity, and inadequate transfers from external interconnections to meet demand, or in the event of breakdown or congestion in inter/ intra-state transmission

system (In-STs) or other operating problems (such as frequency, voltage levels beyond normal operating limit, or thermal overloads , etc.) or over-drawl of power vis-à-vis of the regional entities beyond the limits mentioned in deviation regulation of CERC

"Users shall generally endeavour to restrict their actual drawl within their respective target drawl schedules / Aggregate Contracted Demand from various sources of supply including Open Access, issued by the State Load Despatch Centre. The SLDC at any point of time, shall direct the concerned Users to effect manual load shedding to curtail over-drawl, if it feels that the grid operation and security is endangered. Frequency as per IEGC, as amended from time to time shall be maintained.

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

DISCOMs / OA Users/ Licensees shall regularly carryout the necessary exercise regarding Short-term (1 day to up to 52 Weeks) estimation of their Demand and entitled available generation, to take-up necessary steps to meet the shortage or to manage curtailment, without overdrawing from the Grid.

25.2 **Demand Management protocol.**

(i) Within one month of this regulation coming into force, all the Distribution Licensees / Deemed Licensees / Distribution License exemptees, shall set up a centre to be known as Load Monitoring & Control Centre (LMCC) at their headquarters to monitor the usage of electricity in their service area vis-à-vis their allocated generation /quota of drawl on real time basis and to coordinate and assist the State Load Despatch Centre (SLDC) in properly monitoring the State Grid and implementing the Load shedding/ power cuts, as and when necessitated, and comply with the directions of SLDC from time to time.

(ii) SLDC/Distribution licensee and bulk consumers shall initiate action to restrict the drawl from the grid, within the net drawl schedule whenever the system frequency falls **below frequency specified by CERC from time to time**

(iii) The SLDC/ Distribution licensee and bulk consumer shall ensure that requisite load shedding is carried out in its area so that there is no over drawl when frequency **is below the limit specified by CERC from time to time**

(iv) Each User/Transmission Licensee/STU/DISCOMs 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. These contingency procedures and arrangements shall regularly be / updated by User/STU/Transmission Licensee and monitored by SLDC. SLDC may direct any User/STU/Transmission Licensee/Distribution Licensee to modify the above procedures/arrangement, if required, in the interest of grid security and the concerned User/STU/Transmission Licensee/Distribution License, shall abide by these directions.

(v) The SLDC through respective LMCs of Distribution Licensees shall also formulate and implement state-of-the-art demand management schemes for automatic demand management like rotational load shedding, demand response (which may include lower tariff for interruptible loads) etc. A Report detailing the scheme and periodic reports on progress of implementation of the schemes shall be sent to the Commission by the SLDC.

(vi) In order to maintain the frequency within the stipulated band and maintaining the network security, the interruptible loads shall be arranged in four groups of loads, for scheduled power cuts/load shedding, loads for unscheduled load shedding, loads to be shed through under frequency relays/ df/dt relays and loads to be shed under any System Protection Scheme identified at the State level. These loads shall be grouped in such a manner, that there is no overlapping between different Groups of loads. In case of certain contingencies and/or threat to system security, the SLDC may direct Distribution licensee or bulk consumer connected to the In-STS to decrease drawl of its control area by a certain quantum. Such directions shall immediately be acted upon **and compliance report shall be submitted to SLDC**

(vii) SLDC shall devise standard, instantaneous, message formats in order to give directions in case of contingencies and /or threat to the system security due to deviation from schedule by all users at different over drawl/ under drawl/ over injection / under injection conditions depending upon the severity. The concerned users shall ensure immediate compliance with the directions of SLDC and send a compliance report to the SLDC.

(viii) All Users including Generating Stations, Distribution licensee or bulk consumer/Transmission Licensees shall comply with the direction of SLDC and carry out requisite load shedding or backing down of generation in case of congestion in transmission system to ensure safety and reliability of the system. The procedure for application of measures to relieve congestion in real time as well as provisions of with drawl of congestion shall be in accordance with Central Electricity Regulatory Commission (Measures to relieve congestion in real time operation) Regulations, 2009 and amendments made to it from time to time.

(ix) The measures taken by the User's, SLDC, distribution licensee or bulk consumer shall not be withdrawn as long as the frequency remains at a level lower than the limits specified in Para 25.2 (iii) or congestion continues, unless specifically permitted by the SLDC.

25.3 In case of certain contingencies and/or threat to system security, the State Load Despatch Centre may direct Users to decrease their drawls and such Users shall act upon such directions immediately:
Provided that if such contingency is caused by the intra state Open Access user, the State Load Despatch Centre may direct the concerned drawl entity of such open access transaction to decrease their drawls and such drawl entities shall act up on such directions immediately;

Provided that any non-compliance with such directions shall be dealt with as per provisions of clause 58 of this Regulation.

All operational instructions given by SLDC shall have unique codes which shall be recorded and maintained as specified in Central Electricity Authority (Grid standards) Regulations, 2010

25.4 Users shall make arrangements that will enable manual disconnection to take place as instructed by the State Load Despatch Centre.

25.5 Load crash: In the event of load crash in the system due to weather disturbances or any other reason, the situation would be controlled by SLDC duly following the system security aspects as per provisions of section 5.2 of IEGC.

26 Reports

26.1 A weekly report shall be put up by State Load Despatch Centre on its Internet website to inform about the performance of the State Grid for the previous week. The weekly report shall contain the following: (i) Frequency profile; (ii) Voltage profile of selected substations; (iii) Demand and Supply Situation; (iv) Major Generation and Transmission Outages; (v) Transmission Constraints; and (vi) Instances of persistent / significant non-compliance of State Grid Code. Provided that the weekly report shall be available on the Internet website of State Load Despatch Centre for at least twelve (12) weeks: Provided further that a copy such report shall be made available to any User or Transmission Licensee on request.

26.2 The State Load Despatch Centre 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 details of various actions taken by different Users/Transmission Licensees, and the Users/Transmission Licensees responsible for causing the constraints.

26.3 The SLDC shall give 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 measures to be taken.

27 Operational Liaison

27.1 Operations and events on the State Grid

27.1.1 State Load Despatch Centre shall, before any Operation is carried out on State grid, inform each User and Transmission Licensee, whose system may or will experience an operational effect, and give details of the operation to be carried out.

27.1.2 State Load Despatch Centre shall, immediately following an event on State grid, inform each User and Transmission Licensee, whose system may or will experience an operational effect following the event, and give details of what happened in the event but need not give the reasons for the same.

27.2 Operations and events on Users' or Transmission Licensees' System

27.2.1 Before any Operation is carried out on system of a User or a Transmission Licensee, the concerned User or Transmission Licensee shall inform the State Load Despatch Centre, in case the State Grid may or will, experience an operational effect, and shall give details of the operation to be carried out.

27.2.2 User or a Transmission Licensee shall, immediately following an event on its system, inform the State Load Despatch Centre, in case the State Grid may or will, experience an operational effect following the event, and give details of occurrence of the event. However, the Transmission Licensee (including the STU) is required to submit a detailed report within 48 hours duly mentioning the reasons for such event, to SLDC and the Commission without fail.

28 **Outage planning and coordination**

28.1 All Users and Transmission Licensees shall provide State Load Despatch Centre with their proposed outage programmes in writing for the next financial year by 15th September of each year. These shall contain identification of each Generating Unit/Transmission Line/Interconnecting Transformer for which outage is being planned, reasons for outage, the preferred date for each outage and its duration and where there is flexibility, the earliest start date and latest finishing date.

28.2 State Load Despatch Centre shall come out with a draft outage programme for the next financial year by January of each year, for the commencing financial year for the State Grid duly co-ordinating with Regional outage planning.

Provided that outage plan shall be developed after giving due considerations to 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 purpose of power generation subject to applicable constraints related to alternate use of such water. **Outage of wind Generation should be planned during lean wind season and outage of solar if required during rainy season.**

28.3 Transmission Outage Planning shall be harmonized with Generation Outage Planning and Distribution System Outage Planning shall be harmonized with Generation and Transmission Outage Planning.

28.4 The final outage plan shall be intimated to all Users and Transmission Licensee latest by January of each year:

Provided that the State Load Despatch Centre 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 State Load Despatch Centre on monthly basis in coordination with all parties concerned, and adjustments made wherever found to be necessary.

28.5 Each User or Transmission Licensee shall, at least one month prior to availing an outage 400 kV level as per the planned schedule, inform the State Load Despatch Centre about the same and obtain prior approval from State Load Despatch Centre for the same. STU shall also provide one year ahead planning for all the maintenance schedule of elements coterminous with the RLDC practices. In respect of 220 kV /132kV level, each User or transmission licensee shall at least two(2) weeks prior to availing an outage as per the planned schedule , inform the State Load despatch centre.

28.6 The State Load Despatch Centre shall have the authority to defer any planned outage in case of occurrence of following events:

(i) major grid disturbances (e.g. total black out);
(ii) system isolation;
(iii) Any other event in the system that may have an adverse impact on the system security by the proposed outage.

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

28.7 In case of emergency in the system, which may include events like loss of generation, break down of transmission line, grid disturbances and system isolation, the State Load Despatch Centre may appropriately review the situation before clearance of the planned outage. **Every user and STU shall obtain the final approval from SLDC/RLDC before availing an outage**.

29 Recovery Procedures

29.1 Detailed plans and procedures for restoration after partial/total blackout shall be finalized by State Load Despatch Centre in coordination with the Regional Load Despatch Centre, Users and Transmission Licensees.

29.2 The procedure shall be reviewed, confirmed and/or revised once every subsequent year. Training programs including workshops/MOCK TRAIL RUNS and simulation exercises of the procedure for different sub-systems shall be carried out by the State Load Despatch Centre, in coordination and consultation with Users and Transmission Licensees, at least once in every six months. Diesel generator sets for Black Start would be tested on weekly basis and test report shall be sent to SLDC on quarterly basis. The monthly report on healthiness of synchroscopes shall be intimated by the concerned sub-stations to SLDC.

29.3 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 by and be available with State Load Despatch Centre.

29.4 State Load Despatch Centre shall be authorized during the restoration process following a black out, to operate with reduced security standards for voltage and frequency as necessary in order to achieve the fastest possible recovery of the grid.

29.5 All communication channels required for restoration process shall be used for operational communication only, till grid normalcy is restored.

30 Event information

30.1 Reportable Events

30.1.1 Any of the following events shall require reporting by User/Transmission Licensee or State Load Despatch Centre as the case may be:

(i) Violation of security standards;
(ii) Grid indiscipline;
(iii) Non-compliance of State Load Despatch Centre's instructions;
(iv) System islanding/system split;
(v) Black out/partial system black out;
(vi) Protection failure on any element of intra-State transmission system;
(vii) Power system instability; and
(viii) Tripping of any element of the State Grid.
(ix) Sudden load rejection by any user.

30.2 Reporting Procedure

30.2.1 User or Transmission Licensee, after having initially reported about the event orally to the State Load Despatch Centre, shall provide a written report within two (2) weeks of the occurrence of the event to the State Load Despatch Centre in accordance with Regulation 30.1.1.

30.2.2 State Load Despatch Centre, after having initially reported about the event orally to the Users/Transmission Licensees, shall provide a written report within two (2) weeks of the occurrence of the event to the concerned Users/Transmission Licensees in accordance with Regulation30.1.1.

30.2.3 A written report shall be sent to State Load Despatch Centre or Users/Transmission Licensees, as the case may be, and shall confirm the oral notification together with the following details of the event:

(i) Time and date of event;
(ii) Location;
(iii) Plant and/or Equipment directly involved;
(iv) Description and cause of event;
(v) Antecedent conditions like line flows, bus voltage
(vi) Demand and/or Generation (in MW) interrupted and duration of interruption;
(vii) All relevant system data including copies of records of all recording instruments including Disturbance Recorder, Event Logger and Data Acquisition System;

(viii) Sequence of tripping with time;

(ix) Details of Relay Flags; and
(x) Remedial measures.
(xi) Weather condition during the incident.
(xii) Brief description of the incident.

30.2.4 Events affecting a generation capacity or a load of more than 2000 MW shall immediately be reported in writing to the Commission by the State Load Despatch Centre, Transmission Licensee or User, as the case may be: Provided that a summary document including brief detail of the event, extent and probable causes of the event shall be sent across to the Commission within 48 hours of occurrence of such event.

30.2.5 **Reporting Form.**

The standard reporting form other than for accidents shall be as agreed from time to time by the Grid code Review panel.

30.2.6 Accident Reporting.

Report of accidents shall be in accordance with the section 161 of the Electricity Act, 2003 and the rules framed there under. Report of accidents and failure of supply or Transmission of electricity shall be in the specified form to the Commission and the Electrical Inspector..

31. **State Load Despatch Centre.**

31.1 Objectives of the State Load Despatch Centre.

Operation and management of intra-State transmission system is an important, and often conflicting. The State Load Despatch Centre plays the most important role in this and which regularly requires addressing a number of complex issues.

The functions of State Load Despatch Centre have been articulated in Electricity Act 2003. However, it is important to define the underlying objectives of State Load Despatch Centre, which are sought to be achieved through these functions. These objectives of State Load Despatch Centre have been defined as under:

- To ensure reliable power supply, within available generation capacity, to all consumers located at all points of the system;
- To ensure active/ reactive power drawl from central grid as per IEGC, and other regulations of CERC
- To ensure frequency and voltage conditions within permissible limits;
- To supply power in most economic manner possible; and
- To limit the duration and extent of repercussions due to faults and restore normal functioning of the network as soon as possible

31.2 Procedures and processes developed by State Load Despatch Centre, in discharge of its functions under the provisions these Regulations, shall clearly provide for the following aspects, wherever applicable.

(i) Roles and responsibilities of Sub-load despatch centres
(ii) Communication facilities between the State Load Despatch Centre and Sub- Load Despatch Centres;
(iii) Information flow between State Load Despatch Centre and Sub-Load Despatch Centres; and

(iv) Any other aspect considered appropriate by the State Load Despatch Centre or the Commission.

32 **State Load Despatch Centre, Transmission Licensees and Users**

32.1 Procedures and processes developed by State Load Despatch Centre, in discharge of its functions under the provisions these Regulations, shall clearly provide for the following aspects, wherever applicable:

(i) Roles and Responsibilities of State Load Despatch Centre, Users and Transmission Licensees;

(ii) Information flow between State Load Despatch Centre, Users and Transmission Licensees; and

(iii) Any other aspect considered appropriate by the State Load Despatch Centre or the Commission.

PART E: SCHEDULING AND DESPATCH CODE

33 This code deals with the procedures to be adopted for scheduling of the intra –state generating stations (In-SGS) ,net drawls of Distribution Licensees and , net injection / drawls of concerned intra state open access entities on a daily basis with the modality of the flow of information between the RLDC/SLDC/Distribution Licensees & Open Access entities. The procedure for submission of capacity declaration by each In-SGS and submission of requisition / drawl schedule by the distribution licensee and open access users is intended to enable SLDC to prepare the despatch schedule for each ISGS and drawl schedule for each state entity. It also provides methodology of issuing real time dispatch/drawl instructions and rescheduling, if required, to state entities along with the commercial arrangement for the deviations from schedules. The provisions contained in this chapter are without prejudice to the powers conferred on SLDC under sections 31 and 32 of the Electricity Act, 2003.

34 To maintain harmony and consistency with the scheduling and dispatch procedure of inter -state transactions, as the power system of the state is operating in synchronism with the regional power system, for the purpose of this section, scheduling & dispatch procedure specified by the CERC in the Indian Electricity Grid Code (IEGC) issued and amended from time to time, under clause (h) of Section 79 of the Act, shall be followed.

35 The Intra State Generating Stations (In-STS), Distribution Licensees, Transmission Licensees including the STU, Intra State Open Access Users and Captive Generating Plants operating in parallel with transmission network shall have to follow the directions of the SLDC, for in the matter of scheduling and dispatch of power generation and drawl in the state. The roles and responsibilities of Intra State Generating Stations/ Distribution Licensees & Open Access users shall be similar to Inter State Generating Stations (ISGS) and beneficiaries as provided in the IEGC specified by CERC from time to time.

36 Every Generator with a total installed capacity of 10 MW and above(other than RE generators) which is connected to the State Grid at 33 kV and above, shall be required to give day- ahead generation schedules on a 15 Minute Time Block basis and generate according to such Schedules. The State Load Despatch Centre is entitled to issue any dispatch instruction in accordance with the prevailing Grid Security /stability conditions at that point of time, and the Generators are required to oblige such instructions.

Wind and Solar Generators shall provide Day ahead schedules to SLDC in a format as prescribed by the SLDC, the technical specifications at the beginning and where ever there is any change. The data relating to power system parameters and whether related data as applicable shall also be mandatorily provided by such generators to SLDC in real time.

The schedules may be revised by giving advance notice to SLDC. Such revisions shall be effective from 4^{th} block, the first being the time block in which notice was given. There may be one revision for each time block slot of one and half hours of a particular day subject to maximum of 16 revisions during the day.

37 However in case of Generators which operate on Renewable Sources (Wind, Solar, Mini-Hydel) the conditions of DSM (Deviation Settlement Mechanism) mechanism specified by Central Electricity Regulatory Commission in IEGC, as per the implementation so specified, shall be applicable in total.

38 The SLDCs/STUs shall regularly carry out the necessary exercises regarding short-term demand estimation for their respective States, to enable them to plan in advance as to how they would meet their consumers' load without overdrawing from the grid.

39 SLDC shall issue practice directions to all users in respect of manner & timing of submission of day ahead, 15 MIN drawl / Injection schedules along with such other information as may be required, for consolidating the same and issue the target Drawl / Injection schedules for the next day starting at 0.0 Hrs.

40 SLDC shall periodically review the actual deviation from dispatch & net drawl schedule being issued, to check whether any of constituents are indulging in unfair gaming or collusion. In case any such practice is detected, the matter should be reported to the Commission for further investigation / action.

41 While finalizing the drawl and dispatch schedules as above, the SLDC shall check that the resulting power flows in the Intra State Transmission System (In-STS) do not give rise to any transmission constraints. In case any impermissible constraints are foreseen, the SLDC shall moderate the schedules to the required extent under intimation to the state entities. Any changes in the scheduled quantum of power which are too fast or involve unacceptably large steps may be converted into suitable ramps by the SLDC.

42 Generation Schedules / Drawl Schedules issued /revised by the SLDC shall

become effective from designated time block (quarter hourly time period).

43 ALL users/Distribution licensee shall always restrict the net drawl of the State from the Grid within the drawl schedules keeping the deviations from the schedule within the limits specified in the Deviation settlement mechanism Regulations. The concerned distribution licensee/user, SLDC shall ensure that their automatic demand management scheme acts to ensure that there is no over drawl. If the automatic demand management has not yet been commissioned, then action shall be taken as per manual demand management scheme to restrict the net drawl from grid to within schedules and all actions for early commissioning of Automatic Demand Management Scheme (ADMS) shall be initiated.
The In-SGS is normally expected to generate power according to the daily schedules advised to them barring any inadvertent deviations. Maximum deviation allowed during a time block shall not exceed the limits specified in the Deviation Settlement Mechanism Regulations. Such deviations should not cause system parameters to deteriorate beyond permissible limits and should not lead to unacceptable line loadings. Inadvertent deviations if any from, from the ex-power plant generation schedules shall be appropriately priced in accordance with the Deviation Settlement Mechanism Regulations. In addition, deviation from schedules causing congestion, shall also be priced in accordance with the Central Electricity Regulatory Commission (Measures to relieve congestion in real time operation) regulations, 2009.

44 By 6.00 AM every day, the In-SGS shall advice the SLDC, the station wise ex-power plant MW and Mwh capabilities foreseen for the next day i.e., from 00.00 hrs to 24.00 hrs of the following day.

45 It shall be incumbent upon the In-SGS 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 In-SGS to explain the situation with necessary backup data.

46 The In-SGS shall be required to demonstrate the declared capability of its generating station as and when asked by the State Load Despatch Centre. In the event of the In-SGS failing to demonstrate the declared capability, the capacity charges due to the generator shall be reduced as a measure of penalty. 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. For the second mis-declaration the penalty shall be equivalent to fixed charges for four days and for subsequent mis-declarations, the penalty shall be multiplied in the geometrical progression over a period of a month.

47 The operating log books of the generating station shall be available for review by the SLDC. These books shall keep record of machine operation and maintenance.

48 Scheduling and Despatch procedure for long-term access, Medium – term and short-term open access shall be in accordance with IEGC amended from time to time.

49 In case of any grid disturbance, scheduled generation of all the In-SGSs supplying power under long term / medium term/short term shall be deemed to have been revised to be equal to their actual generation and the scheduled drawls of the beneficiaries/buyers shall be deemed to have been revised accordingly for all the time blocks affected by the grid disturbance. Certification of grid disturbance and its duration shall be done by the SLDC. For Bilateral short term and collective transactions, the methodology of settlement of accounts for the period of Grid disturbance shall be applicable as per the methodology formulated by National Power Committee (NPC) at regional level which is approved by the Commission.

50 Revision of declared capability by the In-SGS(s) having two part tariff with capacity charge and energy charge (except hydro stations) and requisition by beneficiary/(ies) for the remaining period of the day shall also be permitted with advance notice. 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 in the RLDC to be the first one.

51 While availability declaration by In-SGS shall have a resolution of one decimal (0.1) MW and one decimal (0.1) Mwh, all entitlements, requisitions and schedules shall be rounded off to the nearest two decimals at each control area boundary for each of the transaction, and shall have a resolution of 0.01 MW

52 In case of forced outage of a unit of a generating station (having generating capacity of 100 MW or more) and selling power under short term bilateral transaction (excluding collective transactions through power exchange), the generator or electricity trader or any other agency selling power from the unit of the generating station shall immediately intimate the outage of the unit along with the requisition for revision of schedule and estimated time of restoration of the unit, to SLDC. The schedule of beneficiaries, sellers and buyers of power from this generating unit shall be revised accordingly. The revised schedules shall become effective from the 4th time block, counting the time block in which the forced outage is declared to be the first one. 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. However, the transmission charges as per original schedule shall continue to be paid for two days. Provided that the schedule of the buyers and sellers shall be revised after forced outage of a unit, only if the source of power for a particular transaction has clearly been indicated during short-term open access application and the said unit of that generating station goes under forced outage.

Provided that the Generator or Trading Licensee or any other agency selling power from the Generating station or Unit(s) thereof may revise its

estimated time once in a day and the revision schedule shall become effective from the 4th time block counting the time block in which revision is advised by the Generator to be the first one.

53 **Commercial operation of State Generating stations and Embedded Generators**.

The procedure in accordance with the relevant provisions of Central Electricity Regulatory Commission (Indian electricity Grid Code) Regulations 2010 amended from time to time will be applicable...

54 **Technical Minimum schedule for operation of State Generating stations and Embedded Generators**.

The procedure in accordance with the relevant provisions of Central Electricity Regulatory Commission (Indian electricity Grid Code) Regulations 2010 amended from time to time will be applicable.

55 Ancillary services operation: - CERC Regulation 14 of 2015 on (Ancillary Services Operation) with amendments from time to time will be applicable.

56 **Treatment of Infirm Power:-The treatment of infirm power produced during testing period by the Generating Stations shall be treated in accordance with the Central Electricity Regulatory Commission (Grant of connectivity, Long term access and Medium –term open access in inter-state transmission and related matters) Regulations 2009, and the Central Electricity Regulatory Commission (Unscheduled inter-change charges and related matters) Regulations 2009, amended from time to time.**

PART F: MISCELLANEOUS

57. Dispute resolving mechanism

In the event of any dispute, regarding interpretation of any provision of the State Grid Code or rules and procedures notified under the provisions of the State Grid Code, the matter will be decided by the Commission in pursuant to Section 33 of the Electricity Act

58. Compliance

58.1 State Transmission Utility shall be responsible for monitoring the compliance of the Users and Transmission System Licensees with the provisions, contained in PART B, PART C and PART F of these Regulations and with the rules and procedures developed under such provisions:

Provided that the State Transmission Utility shall not unduly discriminate against or unduly prefer any User or Transmission Licensee.

58.2 State Load Despatch Centre shall be responsible for monitoring the compliance of the Users and Transmission System Licensees with the provisions contained in PART D and PART E of these Regulations and with the rules and procedures developed under such provisions:

The State Load Despatch Centre shall exercise such powers , supervision & control as conferred on it vide section 33 of the Electricity Act, required for ensuring the integrated grid operations and for achieving the maximum economy and efficiency in the operation of power system in the state,

Provided that the State Load Despatch Centre shall not unduly discriminate against or unduly prefer any User or Transmission Licensee.

58.3 In case of persistent non-compliance with the provisions of State Grid Code and/or with the rule and procedures developed under such provisions, such matter shall be reported to the Commission.

58.4 All directions issued by the Southern Region Load Despatch Centre to any Transmission Licensee or any other Licensee of the State or generating company (other than those connected to inter State transmission system) or sub-station in the State shall be issued through the State Load Despatch Centre and the State Load Despatch Centre shall ensure that such directions are duly complied with the licensee or generating company or sub-station.
State Load Despatch Centre 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.

58.5 Every Transmission Licensee and User connected with the operation of the power system shall comply with the direction issued by the State Load Despatch Centre under clause 44.5 of these Regulations.

58.6 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 clause 58.2 of these Regulations, it shall be referred to the Commission for decision:

Provided that pending the decision of the Commission, the direction of the State Load Despatch Centre shall be complied with by the transmission licensee or User.

58.7 Consistent failure to comply with the provisions of the Grid Code or with the rule and procedures developed under such provisions, by User or Transmission Licensee, may lead to disconnection of the Plant and/or Apparatus of such User or Transmission Licensee.

59. Nothing contained in Clause 58 of these Regulations shall in any manner impact the powers conferred upon the Commission to monitor and enforce compliance of the Users and Transmission System Licensees with the provisions of State Grid Code and with the rules and procedures developed under such provisions.

60. In case of non- compliance of any provisions of the State Grid Code by SLDC, Transmission licensee, STU, Distribution licensee, State Generating stations

and all other users of the Intra State Grid and any other person (s) the matter may be reported by any person to the State Commission through petition.

61. Upon noticing of any incident and which has occurred due the noncompliance of the State Grid Code, the State commission may initiate suo-motu action.

62. **Power to amend**

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

63. **Power to remove difficulties**

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.

(BY ORDER OF THE COMMISSION)

Hyderabad
08.11.2017

Sd/-
COMMISSION SECRETARY