

# WEST BENGAL ELECTRICITY REGULATORY COMMISSION

## (DRAFT STATE GRID CODE)

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### **LIST OF ABBREVIATIONS**

ALDC	Area Load Despatch Centre
AVR	Automatic Voltage Regulator
BIS	Bureau of Indian Standards.
BSP	Black Start Procedure
CEA	Central Electricity Authority
CERC	Central Electricity Regulatory Commission
CPP	Captive Power Plant
CTU	Central Transmission Utility
DAS	Data Acquisition System
DR	Disturbance Recorder
DS	Deviation Settlement
EL	Event Logger
FACTS	Flexible Alternating Current Transmission Systems
FL	Fault Locator
IEC	The International Electro Technical Commission
IEGC	Indian Electricity Grid Code
IPP	Independent Power Producers
ISGS	Inter State Generating Station
ISTS	Inter State Transmission System
InSTS	Intra State Transmission System
NCES	Non Conventional Energy Source
MCR	Maximum Continuous Rating
RPC	Regional Power Committee
RGMO	Restricted Governor Mode of Operation
RLDC	Regional Load Despatch Centre
SLD	Single Line Diagram
SLDC	State Load Despatch Centre
SPC	State Power Committee
SPS	State Power System
SSGS	State Sector Generating Station
STS	State Transmission System
STU	State Transmission Utility
SVC	Static VAR Compensator
WBERC	West Bengal Electricity Regulatory Commission
WBEGC	West Bengal Electricity Grid Code
WBREDA	West Bengal Renewable Energy Development Agency

# WEST BENGAL ELECTRICITY REGULATORY COMMISSION

## (DRAFT STATE GRID CODE)

### Notification

No. xx/WBERC

Date:xx.xx.2017

In exercise of the power conferred by clause (Zp) of sub-section (2) of section 181 read with clause (h) of sub-section (1) of section 86 of the Electricity Act 2003 (36 of 2003) and powers enabling it on that behalf the West Bengal Electricity Regulatory Commission (WBERC) hereby makes the following Regulations, namely:

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

- (1) These Regulations may be called the West Bengal Electricity Regulatory Commission (State Electricity Grid Code) Regulations, 2017 or in short WBEGC or State Grid Code.
- (2) These Regulations shall extend to the whole of the State of West Bengal.
- (3) These Regulations shall come into force with effect from the date of their publication in the official gazette and superseding the existing West Bengal Electricity Regulatory Commission (State Electricity Grid Code) Regulations, 2007 along with all amendments.

### **2. Definitions**

- 2.1. In these Regulations, the following words and expressions shall, unless context otherwise requires, bear the following meaning:
- (i) “Act” means The Electricity Act, 2003 (36 of 2003);
  - (ii) “Agency / Entity” in relation to various sections of WBEGC refers to SSGS/Licensee/ Open access customers/ IPP/ CPP that utilize the InSTS;
  - (iii) “Area Load Despatch Centre (ALDC)” means a Load Despatch Centre establish by the distribution Licensees operating in the State to carry out

the operating directives of SLDC and assist SLDC for safe and integrated operation of the concerned distribution network. SLDC will declare the ALDC with approval of the Commission;

- (iv) “Authority” means Central Electricity Authority referred to in sub-section (1) of Section 70 of the Act;
- (v) “Automatic Voltage Regulator (AVR)” means a continuously acting automatic excitation control system to control the voltage of a Generating Unit measured at the generator terminals;
- (vi) “Availability” in relation to a thermal generating station for any period shall mean the average of the daily average declared capacities (DCs) for all the days during that period expressed as a percentage of the installed capacity of the generating station minus normative auxiliary consumption in MW.

Availability in case of generating stations shall be computed in accordance with the formula specified Tariff Regulations as amended from time to time.

- (vii) “Backing down” means reduction of Generation by a Generating Unit on instructions from SLDC under abnormal conditions such as high frequency, low system demand or network constraints;
- (viii) “Black Start Procedure” means the procedure necessary to recover from a partial or a total blackout;
- (ix) “Beneficiary” means a person who has a share in an ISGS/SSGS or bilateral exchanges including open access users;
- (x) “Bilateral Transaction” means a transaction for exchange of energy (MWh) between a specified buyer and a specified seller, directly or through a trading licensee or discovered at Power Exchange through anonymous bidding, from a specified point of injection to a specified point of drawal for a fixed or varying quantum of power (MW) for any time period during a specified period;
- (xi) “Captive Generating Plant (CGP)” or “Captive Power Plant (CPP)” means a power plant as defined in sub-section 8 of Section 2 of the Act read with Rule 3 of Electricity Rules, 2005, notified by the Ministry of Power;
- (xii) “Capacitor” means an electrical gadget provided for generation of

reactive power;

- (xiii) “Collective transactions” means a set of transactions discovered in power exchange through anonymous, simultaneous competitive bidding by buyers and sellers;
- (xiv) “Congestion” means a situation where the demand for transmission capacity exceeds the Available Transfer Capacity;
- (xv) “Connection Agreement” means an Agreement between the STU and a user setting out the terms relating to a connection to and/or use of the Intra State Transmission System;
- (xvi) “Connection point” means a point at which any user’s plant and/or apparatus connects to the Intra-state Transmission System/Inter-state Transmission System;
- (xvii) “Demand” means the demand of Active Power in MW and Reactive Power in MVAR of electricity, unless provided otherwise;
- (xviii) “Despatch Schedule” means the ex-power plant net MW and MWH output of a generating station, scheduled to be exported/ despatched to the Grid from time to time;
- (xix) “Disturbance Recorder” or “DR” means a device provided to record the behavior of the pre-selected digital and analog values of the system parameters during an Event;
- (xx) “Data Acquisition System” or “DAS” means a device provided to record the sequence of operations in time, of the relays/equipments/system parameters at a location;
- (xxi) “Drawal Schedule” means the, ex-power plant, MW that a beneficiary is scheduled to receive from a SSGS/ISGS, including bilateral exchanges from time to time;
- (xxii) “Entitlement” means share of a beneficiary (in MW or MVA) in the installed capacity/output capability/ capacity of an SSGS/ISGS;
- (xxiii) “Event” means an unscheduled or unplanned occurrence in the Grid including faults, incidents, breakdowns and forced outages;
- (xxiv) “Event Logger (EL)” means a device provided to record the sequence of operation in time, of the relays/equipments at a location during occurrence of an Event;

- (xxv) "Ex-Power Plant MW/MWH" means net MW/MWH output of a generating station, after deducting auxiliary consumption and transformation losses;
- (xxvi) "Extra High Voltage" or "EHV" means where the voltage exceeds 33,000 volts under normal conditions, subject, however, to the percentage variation allowed by the Authority;
- (xxvii) "Fault Locator (FL)" means a device provided at the end of a transmission line to measure/indicate the distance at which a line fault may have occurred;
- (xxviii) "Flexible Alternating Current Transmission Systems" or "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;
- (xxix) "Forced Outage" means an outage of a Generating Unit or a transmission facility due to a fault or other reasons that has not been planned;
- (xxx) "Forced Majeure" means any event or circumstance which is beyond the control of the persons 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 affects the performance by person such being the following including but not limited to:
- (a) Act of God including natural phenomena, fire and explosion, earthquake, volcanic eruption, landslide, flood, geological surprises or epidemics;
  - (b) Act of any Government, domestic or foreign, war declared or undeclared, hostilities, priorities, quarantines, embargoes, terrorist or military action; or
  - (c) Riot or civil commission;
  - (d) Grid's failure not attributable to the person;
- (xxxi) "Generating Company" means any company or body corporate or association or body of individuals, whether incorporated or not, or artificial juridical person, which owns or operates or maintains a generating station;
- (xxxii) "Generating Unit" means an electrical Generating Unit coupled to a turbine within a Power Station together with all Plant and Apparatus at



that Power Station (up to the Connection Point) which relates exclusively to the operation of that turbo- generator;

- (xxxiii) “Good Utility Practices” means any of the practices, methods and acts engaged in or approved by a significant portion of the electric utility industry during the relevant time period which could have been expected to accomplish the desired results at a reasonable cost consistent with good business practices, reliably, safely and with expedition;
- (xxxiv) “Governor Droop” in relation to the operation of the governor of a Generating Unit means the percentage drop in system frequency which would cause the Generating Unit under free governor action to change its output from zero to full load;
- (xxxv) “Grid Standards” means the Grid Standards specified by the Authority under clause (d) of the Section 73 of the Act;
- (xxxvi) “High Voltage” or “HV” means where the voltage exceeds 650 volts but does not exceeding 33,000 volts under normal conditions, subject, however, to the percentage variation allowed under these Regulations or as specified in the Regulations made by the authority as the case may be.
- (xxxvii) “Independent Power Producers” or “IPP” means a generating company not owned/controlled by the Central/State Government;
- (xxxviii) “Indian Electricity Grid Code” or “IEGC” refers the document describing the philosophy and the responsibilities for planning and operation of Indian power system specified by CERC in accordance with sub section 1(h) of Section 79 of the Act;
- (xxxix) “Inter State Generating Station” or “ISGS” means a Central/other generating station in which two or more states have shares and whose scheduling is to be coordinated by the RLDC;
- (xl) “Inter State Transmission System” or “ISTS” means
  - (a) any system for the conveyance of electricity by means of a main transmission line from the territory of one State to another State;
  - (b) The conveyance of electricity across the territory of an intervening State as well as conveyance within the State which is incidental to such Inter-State transmission of energy;

- (c) The transmission of electricity within the territory of State on a system built, owned, operated, maintained or controlled by CTU.
- (xli) “Intra State Transmission System (InSTS)” includes the entire Transmission network within the State excluding the Inter-State Transmission System. Intra-State Transmission System for the purposes of this Grid Code has been abbreviated as InSTS.
  - (xlii) “Licensee” means a person who has been granted a licence under Section 14 of the Electricity Act, 2003;
  - (xliii) “Long-term access” means the right to use the transmission and distribution system for such period and in such manner as defined under Open Access Regulations;
  - (xliv) “Low voltage” or “LV” means where the voltage does not exceeds 250 volts under normal conditions, subject, however, to the percentage variation allowed under these Regulations;
  - (xlv) “Maximum Continuous Rating” or “MCR” means the normal rated full load MW output capacity of a Generating Unit which can be sustained on a continuous basis under specified conditions;
  - (xlvi) “Medium-term open access” means the right to use the transmission and distribution system for such period and in such manner as defined under Open Access Regulations;
  - (xlvii) “Medium voltage” or “MV” means where the voltage exceeds 250 volts but not exceeding 650 volts under normal conditions, subject, however, to the percentage variation allowed under these Regulations
  - (xlviii) “National Grid” means the entire inter-connected electric power network of the country;
  - (xlix) “Non-Conventional Energy Sources” or “NCES” means generating plants based on non-conventional energy sources e.g. solar, wind, bio-mass, bio-gas, industrial waste, municipal waste and small hydro generating Stations;
  - (l) “Net Drawal Schedule” means the drawal schedule of a beneficiary after deducting the apportioned transmission losses (estimated);
  - (li) “Open Access Customers” means the persons allowed Open Access under the Open Access Regulations;

- (lii) “Open Access Regulations” means WBERC (Open Access) Regulations 2007 or its subsequent Amendments;
- (liii) “Operation” means a scheduled or planned action relating to the operation of a System;
- (liv) “Operating range” means the operating range of frequency and voltage as specified under the operating code;
- (lv) “Person” means any company or body corporate or association of body of individuals, whether incorporated or not, or artificial juridical person;
- (lvi) “Pool Account” means Regional / State account for payments regarding Deviation Settlement or reactive energy exchanges, as the case may be;
- (lvii) “Power System” means all aspects of generation, transmission, distribution and supply of electricity and includes one or more of the following, namely:
  - (a) generating stations;
  - (b) transmission or main transmission lines;
  - (c) sub-stations;
  - (d) tie-lines;
  - (e) load despatch activities;
  - (f) mains or distribution mains;
  - (g) electric supply lines;
  - (h) overhead lines;
  - (i) service lines;
  - (j) works;
- (lviii) “Reactor” means an electrical plant specifically designed to absorb Reactive Power;
- (lix) “Regional Power Committee” or “RPC” means a Committee established by resolution by the Central Government for a specific region for facilitating the integrated operation of the power systems in that region;
- (lx) “Regional Energy Account” or “REA” means a regional energy account prepared on monthly basis by the RPC for the billing and settlement of ‘Capacity Charge’, ‘Energy Charge’ and transmission charges’;
- (lxi) “Regional Grid” means the entire synchronously connected electric power network of the concerned Region;

- (lxii) “Share” means percentage share of a beneficiary in an SSGS/ISGS notified by Government of India/ Government of W.B. or as agreed to in the agreement between SSGS/ISGS and its beneficiaries;
- (lxiii) “Short Term Open Access” means the right to use the transmission and distribution system for such period and in such manner as defined under Open Access Regulations;
- (lxiv) “Single Line Diagram” or “SLD” means the diagrams which are a schematic representation of the HV/EHV apparatus and the connections to all external circuits at a Connection Point incorporating its numbering nomenclature and labeling;
- (lxv) “Site Common Drawing” means the drawings prepared for each Connection Point, which incorporates layout drawings, electrical layout drawings, common protection/control drawings and common service drawings;
- (lxvi) “Spinning Reserve Generating Stations” means part loaded generating capacity with some reserve margin that is synchronized to the system and is ready to provide increased generation at short notice pursuant to despatch instruction or instantaneously in response to a frequency drop;
- (lxvii) “State Load Despatch Centre” or “SLDC” means a Centre established by the State Government under subsection (1) of Section 31 of the Act;
- (lxviii) “State Transmission Utility” or “STU” means the Government Company specified as such by the State Government under sub-section (1) of Section 39 of the Act;
- (lxix) “State Sector Generating Stations” or “SSGS” shall mean Generating Stations connected with the State Transmission System including generating station of any generating company or any licensee, IPP, Captive Generating Plant, Co-Gen and NCES;
- (lxx) “State Power Committee” or “SPC” means a Committee constituted under the provisions of regulation 19 of this State Grid Code;
- (lxxi) “State Power Grid” means the high voltage backbone system of interconnected transmission lines, sub- stations and generating plants within the State;

- (lxxii) “State Power System” includes the entire distribution system within the State in addition to high voltage backbone system covered in the State Power Grid;
- (lxxiii) “Static VAR Compensator” or “SVC” means an electrical facility designed for the purpose of generating or absorbing Reactive Power;
- (lxxiv) “Time Block” means block of 15 minutes each for which special energy Meters record specified electrical parameters and quantities with first time block starting from 00.00 Hrs;
- (lxxv) “Transmission License” means a Licence granted under Section 14 of the Act to transmit electricity;
- (lxxvi) “Transmission Planning Criteria” means the policy, standards and guidelines issued by the CEA for the planning and design of the Transmission system;
- (lxxvii) “User” in relation to various sections of the WBEGC refers to the persons/agencies, including Generating Stations, Distribution Licensees, persons availing open access who are connected to and/or using the InSTS, as more particularly identified in each section of WBEGC

2.2. Words and expressions used and not defined in this Code but defined in the Act shall have the meanings assigned to them in the said Act. Expressions used herein but not specifically defined in this Code or in the said Act but defined under any law passed by a competent legislature and applicable to the electricity industry in the state shall have the meaning assigned to them in such law. Subject to the above, expressions used herein but not specifically defined in this Code or in the Acts or any law passed by a competent legislature shall have the meaning as is generally assigned in the electricity industry

## **CHAPTER- 1 GENERAL**

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### **3. Introduction**

Generating Station, Transmission Lines and Distribution System form the main components of any electric power system. For efficient, reliable, economical and secure operation of power system, the three components should function in a coordinated and synchronized manner. The West Bengal Electricity Grid Code (WBEGC) accordingly lays down the rules, procedures and standards to be followed by the various Users and participants in the system to jointly plan, develop, maintain and operate the power system, in the most efficient, reliable, economic and secure manner.

### **4. Objective**

The State Grid Code is designed to facilitate the development, operation and maintenance of an efficient, coordinated, secure and economical State Power Grid. It accordingly provides the following:

- a) Relationship between the various Users of the Intra-State Transmission System (InSTS).
- b) Technical Standards, Rules and Procedures (technical, operational, and for information sharing) to be adopted by SLDC, STU and Users connected to the State Power Grid.
- c) Facilitation of the operation, maintenance, development and planning of economic and reliable State Power Grid.
- d) Common basis of operation of the Power System to facilitate Open Access and trading of electricity.

### **5. Scope**

- a.) This code shall apply to STU, SLDC and all Users connected with and/or utilizing the Intra-State Transmission System.
- b.) STU, SLDC and all Users shall abide by this code to the extent it applies to them.

- c.) This State Grid Code shall apply for the Intra-State transmission of electricity.
- d.) This State Grid Code shall not affect the obligations of the STU, SLDC and Users as laid down under the Indian Electricity Grid Code notified by CERC, and/or the Electricity Act, 2003 and rules and regulations made there under.
- e) In case of any inconsistency between Grid Standards and WBEGC, the provision of Grid Standards shall prevail.

## 6. Structure of the WBEGC

The provisions of WBEGC relating to planning, operational and procedural matters are contained in Chapter 3 to Chapter 8. The broad contents of different chapters are however, as follows:

### **Chapter-1: General**

**Chapter-2: Role of various Organizations and their linkages** This chapter defines the functions of the various organizations as are relevant to WBEGC.

### **Chapter-3: System Planning Code**

This chapter provides the policy and procedures to be adopted in the planning and development of bulk power transfer and associated InSTS. The Planning Code lays down the detailed information exchange required between the STU, SLDC, Users and the various participants of the power system for load forecasting, generation availability, and overall power system planning etc. The Planning Code stipulates the various criteria to be adopted during the planning process.

### **Chapter-4: Connectivity Conditions Code**

This chapter specifies minimum technical and design criteria to be complied with by various Users connected to or seeking connection to the InSTS, to maintain uniformity and quality across the system. This includes:

- a) Procedure for connection to the InSTS
- b) Site responsibility schedule

### **Chapter-5: Operation Planning and System Security Code**

This Chapter describes the operational philosophy to maintain efficient, secure, economic and reliable grid operation. This chapter covers the requirement for the exchange of information in relation to security aspects, demand estimation, demand management, outage planning, operational liasioning, and events occurring in the State Power System and the National Grid, which have had or may have an effect on the Regional Grid and/or on the State Power Grid and/or on a Users' System connected to State Power Grid. This Chapter also formulates the recovery and normalization of power supply process to be followed by all the Users connected to the State Power Grid in the event of partial / total failure of State Power Grid and/or the Regional Grid (total or partial collapse)causingblackouts.

### **Chapter-6: Scheduling & Despatch Code**

This chapter deals with the procedure to be adopted for scheduling and despatch of generation of the Generating Stations including complementary commercial mechanisms, on a daily basis with the modality of the flow of information interalia between the Generating Stations, State Load Despatch Centre (SLDC), Area Load Despatch Centres (ALDCs), all Users connected to State PowerGrid.

### **Chapter-7: Management ofWBEGC**

This Chapter specifies the procedure for management of the WBEGC and also its modification/amendment.

## **7. Non-compliance**

In case of a persistent non-compliance of any of the stipulations of the WBEGC by any user, the matter shall be reported by any user/SLDC to the Member Secretary, SPC. The Member Secretary, SPC, shall verify and take up the matter with the defaulting agency for expeditious termination of the noncompliance. In case of inadequate response to the efforts made by the Member Secretary, SPC, the non-compliance shall be reported to WBERC. WBERC, in turn after due process, may order the defaulting user for compliance, failing which; the WBERC may take appropriate action. SPC shall maintain appropriate records of such violations. In case of a non-compliance of any of the stipulations of the WBEGC by SLDC or SPC, the matter shall be reported to the WBERC.



## **8. Charge/Payment for Reactive Energy Exchanges**

The rate for charge/payment of reactive energy exchanges (according to the scheme specified in regulation 6.6 shall be specified by the Commission through a separate order, which will be effective from 1<sup>st</sup> April of the respective year

## **9. Exemptions**

Any exemption from the provisions of WBEGC shall be allowed by the Commission only on receipt of a petition from the concerned user giving reasons/ justification for exemption sought therein. The Commission may invite comments from various stakeholders before allowing any such exemption.

## **10. Interpretations**

In the interpretation of this Code, unless the context otherwise requires:

- i) words in the singular or plural term, as the case may be, shall also be deemed to include the plural or the singular term, respectively;
- ii) the headings are inserted for convenience and may not be taken into account for the purpose of interpretation of this Grid Code;
- iii) references to the statutes, regulations or guidelines shall be construed as including all statutory provisions consolidating, amending or replacing such statutes, regulations or guidelines, as the case may be.

## ***CHAPTER-2: ROLE OF VARIOUS ORGANIZATIONS & THEIR LINKAGES***

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### **11.Introduction**

This chapter defines the functions of the various organizations connected with the functioning and operations of the State Power Grid and their organizational linkages so as to facilitate development and smooth operation of State Power Grid in harmony with Regional and National Grid, as envisaged in the Electricity Act, 2003 and rules and regulations made thereunder.

### **12.State Load Despatch Centre (SLDC)**

12.1. The State Government shall establish a centre to be known as the State Load Despatch Centre for the purpose of exercising the powers and discharging the function under sub section (1) of section 32 of the Act. This State Load Despatch Centre shall be operated by a Government company or any authority or Corporation established or constituted by or under any State Act, as may be notified by the State Government. Until such company or authority or corporation is notified by the State Government, the State Transmission Utility shall operate the State Load Despatch Centre. SLDC shall be the apex body to ensure integrated operation of the power system in the State. SLDC shall be responsible for:

- a. Optimum scheduling and despatch of electricity within the State, in accordance with the contracts entered into with the licensees or the generating companies operating in the State.
- b. Monitoring of Grid Operations.
- c. Keeping accounts of electricity transmitted through the State PowerGrid.
- d. Supervision and control over the intra State transmission system.
- e. Carrying out real time operations for the Grid control and despatch of electricity within the State through secure and economic operation of the State Power Grid in accordance with the Grid Standards and the State Grid Code.

12.2 In addition to above functions under the Act SLDC shall also discharge the following functions as per the provisions of this State Grid Code:

- a. System operation and control of the State Grid covering contingency analysis and operational planning on real time basis;
- b. Scheduling / re-scheduling of despatch and drawal schedules as per system conditions and request of Generating Stations and Distribution Licensees;
- c. System restoration following grid disturbances;
- d. Specifying metering points and data collection;
- e. Compiling and furnishing data pertaining to system operation;
- f. Operation of State pool account;
- g. SLDC shall be the nodal agency for the short-term open access in case Intra-state Transmission is used. The procedure and modalities in regard to short-term Open Access shall be as per the Open Access Regulations;.

Providing that, notwithstanding anything contrary to the above SLDC shall also discharge any other functions specifically mentioned in any other regulations or orders of the Commission.

12.3 SLDC may give such direction and exercise such supervision and control as may be required for ensuring the integrated grid operation and for achieving the maximum economy and efficiency in the operation of the State Power System. All Users shall comply with the directions issued by the SLDC.

12.4 The SLDC shall ensure compliance of the directions of the Regional Load Despatch Centre by issuing suitable directions to the Users.

12.5 If any dispute arises with reference to the quality of electricity or, safe, secure and integrated operation of the State Power Grid or in relation to any direction given by the SLDC, it shall be referred to the Commission for decision. Pending the decision of the Commission, the Licensee or Generating Company shall comply with the directions of the SLDC.

12.6 If any licensee, generating company or any other person fails to comply with the directions issued by SLDC, he shall be liable to a penalty, as per the provisions of the Act.

### **13. Area Load Despatch Centre (ALDC)**

- 13.1 All distribution Licensees operating in the State shall establish an Area Load Despatch Centre (ALDC) to carry out the operating directives of SLDC and assist SLDC for safe and integrated operation of the concerned distribution network. ALDC must have a 24 x 7 control room with adequate numbers of qualified manpower.
- 13.2 ALDC shall be responsible for:
- a) Data acquisition and transfer to SLDC;
  - b) Supervisory control of load in their respective area;
  - c) Assist SLDC to ensure safe and integrated operation of the power system of the State;
  - d) Assist SLDC for monitoring grid operations;
  - e) Carry out the real-time instructions of SLDC for safe and integrated operation of the State grid;
  - f) Maintain the drawal and/ or injection schedule as finalized by SLDC;
- 13.3 ALDC shall comply all the directives given by SLDC and provide all relevant information as and when required by the SLDC.
- 13.4 After getting request from the Distribution Licensee, SLDC shall the ALDC with the approval of the Commission.

### **14.State Transmission Utility (STU)**

- 14.1 "State Transmission Utility" means the Government Company notified by the State Government under sub-section (1) of section 39 of the Electricity Act, 2003. WBSETCL, which was declared as STU with effect from 01.04.2007, vide W.B. Government Gazette No. 89-PO/O/III/3R-5/2007 dated 26.03.2007, is also a deemed transmission licensee under section 14 of the Electricity Act, 2003.
- 14.2 As per the ACT, STU shall be responsible for -

- (a) Transmission of electricity through intra State Transmission system; and
- (b) Discharging all functions of planning and coordination relating to Intra-State Transmission system with
  - i. Central Transmission utility,
  - ii. State Government,
  - iii. Generating Companies,
  - iv. Regional Power Committee,
  - v. Central Electricity Authority,
  - vi. All Licensees,
  - vii. Any other person notified by the State Government in this behalf.
- (c) Ensuring development of an efficient, coordinated and economical system of intra State Transmission Lines for smooth flow of electricity from a generating station to the load centres.
- (d) Providing 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 customer, as and when open access is provided by the Commission under subsection (2) of section 42 of the Act, on payment of the transmission charges and a surcharges thereon, as may be specified by the Commission.

14.3 STU, in discharge of its functions under the Act and this Code, shall take into consideration recommendations, if any, of the State Co- ordination Forum and State Power Committee.

14.4 STU shall act as nodal agency for all long-term access and medium-term open access if STU system is used. The procedure and modalities in regard to long-term and medium-term open access shall be as per the Open Access Regulations.

## **15. Transmission Licensee**

- 15.1 Every Transmission licensee shall comply with technical standards of construction of Electrical plants, Electric lines and connectivity with the grid and safety requirements as specified by the CEA, and follow the principles and procedures as specified in this code and/or Indian Electricity Grid Code as applicable to the intra State Transmission system.
- 15.2 It shall be the duty of the Transmission licensee to:
- a.) build, maintain and operate an efficient, co-ordinated and economical intra State transmission system and comply with the direction of RLDC and SLDC as the case may be.
  - b.) 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 Commission under subsection (2) of section 42 of the Act, on payment of the transmission charges and a surcharges thereon, as may be specified by the Commission.

## **16. Generating Company**

- 16.1 Any generating company may establish, operate and maintain a generating station without obtaining a licence under the Act if it complies with the technical standards relating to connectivity with the grid referred to in clause (b) of section 73 of the Act.
- 16.2 As per the provisions of Section 10 of the Act, the duties of a generating company shall be:
- i. to establish, operate and maintain generating stations, tie-lines, sub-stations and dedicated transmission lines connected therewith in accordance with the provisions of the Act or the rules or regulations made thereunder;
  - ii. may supply electricity to any licensee in accordance with the Act and the rules and regulations made thereunder and may, subject to the regulations made under sub-section (2) of section 42, supply electricity to any consumer;

- iii. to submit technical details regarding its generating stations to the Appropriate Commission and the Authority;
- iv. to co-ordinate with the Central Transmission Utility or the State Transmission Utility, as the case may be, for transmission of the electricity generated by it.

## **17. Distribution Licensee**

17.1 Any person granted licence under section 14 of Act for distribution of Electricity in a particular area should develop and maintain an efficient, co-ordinated and economical distribution system for supplying electricity to the consumers in his area of supply in accordance with the provisions the Act.

17.2 It shall also be the duty of the distribution licensee:

- a.) to provide non-discriminatory open access to the consumers in its area of supply in such phases as may be specified by the Commission on payment of wheeling charge, surcharge and additional surcharge as may be determined by the Commission.
- b.) to give supply of electricity, on an application by the owner or occupier of any premises, within a period of one month after receipt of the application requiring such supply:

Provided that where such supply requires extension of distribution mains, or commissioning of new sub-stations, the distribution licensee shall supply the electricity to such premises immediately after such extension or commissioning or within such period as may be specified by the Commission.

## **18. State Co-ordination Forum**

As per section 166 (4) of the Act, Government of West Bengal has constituted a State Co-ordination Forum vide notification no 110-PO/O/C/III/3R-08/2003 dated 12<sup>th</sup> April, 2007 for smooth and coordinated development of the power system in the State. State Co-ordination Forum may give its recommendations on matters related to overall planning and development of the Power System in West Bengal.

## **19. State Power Committee (SPC)**

19.1 Head of SLDC shall be the Chairman of the State Power Committee and it shall comprise of the following other members:

- (a) One member from State Transmission Utility;
- (b) One member representing State-owned Generating Stations;
- (c) One member from WBREDA;
- (d) One member from each IPP having installed capacity of 300MW and more;
- (e) One member from each Transmission Licensee in the State other than the State Transmission Utility;
- (f) One member from each Distribution Licensee in the State;
- (g) One member from each Electricity Trader in the State;
- (h) Member Secretary, senior officer from State Load Dispatch Centre as may be nominated by the Chairman, State Power Committee -Convener
- (i) Such other persons as may be nominated by the Commission.

19.2 The Committee shall have a secretariat of its own which will be headed by the Member Secretary of the Committee. Other staff for the secretariat shall be provided by the SLDC.

19.3 The Headquarters of the Committee will be located at the Office of Chief Engineer SLDC.

19.4 Operationalisation of the Committee

- i) The Chairman, State Power Committee, shall invite nominations from various organizations and shall ensure that the nominations referred to in clauses (b) to (i) of Regulation 19.1 are received within thirty (30) days of notification of these Regulations and that the Committee becomes functional within sixty (60) days from the date of notification of these Regulations.
- ii) The Committee will frame its own rules of business for the conduct of its meeting and other related matters.
- iii) The tenure of the members shall be co-terminus with their association with the respective organization. However, any organization/group may suitably re-nominate some other person for representation in the State Power Committee. In such a case



earlier nominated person shall cease to be a member of the State Power Committee. All organizations shall nominate alternative member to represent at the State Power Committee in absence of the member.

- iv) Members nominated by each of the organization shall be persons holding senior position in their respective organization not below the rank of Chief Engineer or equivalent.

19.5 The Committee shall discharge following functions:

- i) To undertake State Level operation analysis for improving grid performance.
- ii) To facilitate intra-State transfer of power.
- iii) To facilitate all functions of planning relating to intra-state transmission system with STU and review of progress of crucial transmission projects.
- iv) To coordinate planning of maintenance of generating machines of various generating companies of the State on annual basis and also to undertake review of maintenance programme on monthly basis.
- v) To undertake planning and monitoring of outage of transmission system on monthly basis.
- vi) To undertake operational planning studies including protection studies for stable operation of the grid.
- vii) To undertake planning for maintaining proper voltages through review of reactive power compensation requirement and monitoring of installed capacitors.
- viii) To evolve consensus on all issues relating to economy and efficiency in the operation of power system in the state.

19.6 The Committee may constitute its Sub-committees, Task Forces, Ad hoc Committees and Standing Committees, as envisaged under the State Grid Code or otherwise considered necessary for efficient functioning. It may also set up, if required, Groups / Committees of eminent experts to advise it on issues of specific nature. The level of the representative to the Sub Committees etc would depend on the nature of the issue concerned.

19.7 A metering Committee will be constructed under SPC consisting of members from all Users, STU, SLDC and Transmission Licensees to resolve all meter

related issues. Chairman of SPC shall nominate one senior officer of SLDC as the chairman of the Metering Committee and one officer of SLDC will act as the convener of the Metering Committee. Metering Committee shall quarterly review the metering issues and submit report to the SPC

19.8 The decisions of Committee arrived at by consensus regarding operation of the state power grid and scheduling and dispatch of electricity will be followed by SLDC subject to directions of the - Commission, if any. The Committee shall meet at least once in a quarter and at such other time as may be considered necessary.

19.9 All complaints regarding unfair practices, delays, discrimination, lack of information, supply of wrong information or any other matter related to open access in intra-state transmission shall be directed to the Member Secretary, State Power Committee. The Member Secretary, SPC shall investigate and endeavour to resolve the grievance as an arbitrator appointed by the Commission. The Member Secretary, SPC shall forward a copy of its final order to the Commission for issuance of a formal order by the Commission. In case the Member Secretary, SPC is unable to resolve the matter, it shall be reported to the Commission for a decision.

**NOTE:**

The role & functions of different Users/Organizations as described above shall be read with the provisions of the Act and different regulations of the Central and the State Electricity Regulatory Commission notified under the Act.

## ***CHAPTER- 3: PLANNING FOR INTRA STATE POWER SYSTEM***

This chapter comprises various aspects of planning and development relating to State Power System including Intra State Transmission Systems.

### **20. Introduction**

- 20.1 In accordance with Section 39(2)(b) of Electricity Act, 2003, the State Transmission Utility (STU) shall discharge all functions of planning and co-ordination relating to Intra-State transmission system in coordination with CTU, State Governments, Generating Companies, Regional Power Committees, State Power Committee, CEA, licensees and any other person notified by the State Government in this behalf.
- 20.2 In accordance with Section 3(4) of Electricity Act, 2003, CEA shall prepare a National Electricity Plan in accordance with the National Electricity Policy and notify such plan once in five (5) years. As per Section 3(5) of Electricity Act, 2003, CEA may review or revise the National Electricity Plan in accordance with the National Electricity Policy. The Generating Companies and the licensees shall consider the National Electricity Plan prepared by CEA in developing their system.
- 20.3 Requirement for reinforcement / extension / new transmission line may arise for a number of reasons including, but not limited to:
- i) Development on the system of any user already connected to the State Transmission System;
  - ii) Introduction of a new Connection point between a user's system and the State Transmission System;
  - iii) Need to increase system capacity, to remove operational constraints and to maintain standards of security to accommodate a general increase in the demand;
  - iv) For evacuation of power from generating stations within and outside the State;
  - v) Reactive power compensation;
  - vi) In order to accommodate long-term access requirements;
  - vii) Transient and steady state stability considerations;
  - viii) Provide reliable and quality power;
  - ix) The cumulative effects of combination of any of (i) to (viii) above.

- 20.4 Accordingly, the reinforcement or extension of the State Transmission System may involve work at the interconnection points of a generator or entry point of other licensees to the State Transmission system.
- 20.5 The development of the State Transmission System must therefore be planned with sufficient lead-time to allow time for any necessary statutory consents/ right-of-way permission to be obtained and detailed engineering design/construction work to be completed. This System Planning Code therefore imposes timelines for the exchange of information between SLDC, STU and Users connected to and/or utilizing the State Power Grid, subject to all parties having regard, where appropriate, to the confidentiality of such information.

## **21. Objective**

The standards and procedures within the System Planning Code are intended to enable STU, SLDC and other users to jointly evolve an efficient, co-coordinated, secure and economical Intra- State Transmission System satisfying the requirements of evacuation of power from Generating Stations to load centres, to meet the future demand with sufficient redundancies, to tackle the contingencies. The objective of System Planning Code therefore is:

- a) To specify the principles, procedures and criteria to be applied in the planning and development of the InSTS.
- b) To promote co-ordination amongst all users in any proposed development of the InSTS.
- c) To provide methodology and information exchange requirement amongst SLDC, STU and Users in the planning and development of the InSTS.

## **22. Scope**

This Planning Code shall apply to SLDC, STU, other licensees, State Sector Generating Stations (SSGS), connected to and/or using and/or involved in developing the InSTS.

## **23. Planning Policy**

- 23.1 The STU shall prepare and submit to the Commission a long-term

Transmission System Plan (time span 5 years) for the expansion of State Power Grid to meet the future demand within three months from the date of notification of this state grid code. In preparing the above plan STU should take into consideration the following:

- Perspective plan for development of the electricity system as prepared by CEA under section 73 (a) of the EA-2003;
- Latest Electric Power Survey of India published by CEA;
- Transmission Planning Criteria and guidelines issued by CEA;
- National Electricity Policy issued by the Government of India to the extent applicable to the development of Intra-State Transmission System;
- Load forecast reports submitted by the Distribution Licensees in the State
- Any other authentic report carried out by agencies like Advisory Board of Energy (ABE), Government of West Bengal;;
- Requirement of evacuation system for upcoming generating stations and evacuation of power from Renewable sources;
- Plans prepared by CTU in order to evacuation of power as required for State Power System

23.2 The STU shall submit to the Commission an updated long-term Transmission System Plan by 28<sup>th</sup> February every year taking care of the revisions in the electricity load projection and additions in the generation capacity.

## **24. Load Forecasting**

24.1 The primary responsibility of load forecasting of a particular supply area shall be that of respective Distribution Licensee. Distribution Licensee shall forecast the peak load and energy requirement of their areas for each category of loads for the succeeding 5 years and submit the same annually by 31st December to STU along with forecast methodology, assumptions and daily load curve on which the forecasts are based. STU may ask for any additional information from the Distribution Licensees regarding load and energy details. These forecasts shall be reviewed annually or whenever major changes are made in the existing system and updated accordingly. While indicating requirements of single consumer with large demand (one

MW or higher) the Distribution licensee shall satisfy itself, as to the degree of certainty of the demand materializing. STU shall apply appropriate diversity factor, and satisfy itself regarding probability of materialization of bulk loads of consumers with demands above 1MW in consultation with concerned Distribution Licensee. Distribution licensees shall also submit the data regarding voltage wise distribution losses to the STU.

24.2 STU in consultation with SLDC and the concerned Distribution Licensee, may review the methodology and assumptions, used in making the load forecast and shall further re-work:

- (a) Projected loads and losses of the system, the net energy requirement and peak load requirement at generation end. The installed capacity, peak availability, surplus and deficit both in generation and demand shall also be worked out by STU.
- (b) Additional generating capacity required after taking into account, the existing capacity, projects under construction, proposed projects, and availability from captive power plants, co- generators, NCES, long-term access and also share of the State from Central sector Power Projects both within and outside the State. STU shall also examine the economic technical and environmental aspects of all the available alternatives.

24.3 Besides addition to the Intra-State transmission system, the STU shall plan, from time to time, system-strengthening schemes, need of which may arise to overcome the constraints in power transfer and to improve the overall performance of the grid. The Intra-State transmission proposals including system strengthening scheme identified on the basis of the planning studies would be finalised by STU based on inputs received from various stakeholders i.e. Generating companies and Distribution licensees, SLDC and any committee created for the transmission planning purposes by the Commission.

24.4 In case system strengthening is required for long-term access as per Open Access Regulations, STU shall carry out system studies to identify system strengthening requirements in harmony with the long-term system planning. In case of Long Term Access applications requiring any strengthening in the Inter-State transmission system to absorb/evacuate power beyond InSTS, the applicant shall also co- ordinate with CTU for integrated planning.

- 24.5 All the users shall supply the desired planning data to STU by 31st December every year to enable STU to review and revise the Long Term Transmission System Plan.
- 24.6 The Long Term Transmission System Plan prepared by STU shall contain a chapter on additional transmission requirement, which may include not only Intra State Transmission Lines, but also additional equipment requirement such as Transformers, Capacitors, and Reactor etc.
- 24.7 The Long Term Transmission System Plan shall also indicate the action taken to fulfill the additional requirement and actual progress made on new schemes. The planning report and power map shall be made available to any party interested in making investments decision/connection decisions to the InSTS.
- 24.8 As voltage management plays an important role in intra-state transmission of energy, special attention shall be accorded to planning of capacitors, reactors, SVC and Flexible Alternating Current Transmission Systems (FACTS), etc.
- 24.9 Based on Plan prepared by the STU, other Transmission Licensees/Distribution licensees shall plan their systems to further evacuate power from the InSTS.
- 24.10 The Inter-State Transmission System and associated Intra-State transmission system are complementary and inter-dependent therefore planning of one affects the planning and performance of the other. The STU shall accordingly plan the development of associated Intra-State transmission system in line with the development of Inter-State Transmission System.
- 24.11 STU should maintain a historical database based on operational data supplied by SLDC and use advance software tools for validation of the demand forecasting submitted by the distribution licensees.
- 24.12 STU's planning department shall use load flow, short circuit, transient stability study, relay coordination study and other techniques for Transmission System Planning.
- 24.13 STU's planning department shall simulate the contingency and system

constraint conditions for the State Transmission System and incorporate the results in the Long Term Transmission System Plan.

- 24.14 STU shall extend full support to CTU in the regional transmission system planning. The STU shall help the CTU in identification of Inter- State Transmission projects including inter-regional schemes, which shall fit in the long-term plan developed by CEA.
- 24.15 STU shall furnish the requisite planning data to CTU as required by it from time to time.

## **25.Planning Criterion**

- 25.1 The planning criteria are based on the security philosophy on which the InSTS has been planned. The security philosophy shall be as per the Transmission Planning Criteria and other guidelines as given by CEA. The general criteria shall be as detailed below:

- a.) As a general rule, the State Transmission System 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:

- Outage of a 132 kV D/C line (except for radial lines) or,
- Outage of a 220 kV D/C line (except for radial lines) or,
- Outage of a 400 kV S/C line (except for radial lines) or,
- Outage of single Interconnecting Transformer.

- b.) 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. All the Generating Units may operate within their reactive capability curves and the network voltage profile shall also be maintained within voltage limits specified.

- 25.2 The State Transmission System shall be capable of withstanding the loss of most severe single system in feed without loss of stability.

- 25.3 Any one of these events defined above shall not cause:

- i) Loss of supply



- ii) Prolonged operation of the system frequency below and above specified limits.
- iii) Unacceptable high or low voltage
- iv) System instability
- v) Unacceptable overloading of InSTS elements.

25.4 In all substations (66kV and above), at least two transformers shall be provided and the transmission capacity of any single sub-station for meeting loads at different voltage levels shall not exceeds the MVA capacity mentioned under CEA (Technical Standards for Construction of Electrical Plants and Electrical Lines) Regulations,2010, as amended from time to time.

25.5 The Transmission System should therefore have sufficient additional capacities and redundancies to cater to above needs.

25.6 STU shall carry out planning studies for Reactive Power compensation of InSTS including reactive power compensation requirement at the SSGS's Switchyard.

## **26.Distribution planning:**

26.1 The distribution system shall be developed to meet the load demand of all existing consumers and intending consumers seeking connection for supply including programme of intensification and green field area electrification. The distribution system is to be planned based on load forecast and its spatial distribution. Power flow studies shall be carried out wherever necessary. The perspective plan as per Tariff Regulations shall be evolved for achieving target levels in aspects like reduction of losses by proper choice of the length and size of Low Tension (LT) lines, improvement of power factor, voltage control, etc.

26.2 Separate High Tension (HT) overhead / underground lines are to be planned to cater to discrete load blocks to facilitate load management during emergency operations. Use of sectionalizes or other devices to reduce interruption is to be progressively introduced. Use of modern technology shall be judiciously introduced with an aim to improve the performance of the network as well as reduce the system loss.

- 26.3 The distribution system shall have alternative feeding arrangements for high load density areas and for essential services wherever possible.
- 26.4 In addition to catering to the active power demand, reactive power components of power requirement should be studied and adequate VAR compensation are to be installed at different voltage levels to improve power factor and reduction of losses. The distribution company in their supply conditions shall include installation of reactive compensation at load end depending on the type of load used.
- 26.5 Voltage in the distribution system shall be controlled and maintained at statutory levels. Voltages at the consumer terminals shall be maintained as specified below:
- a) For LT / LV the percentage variation by not more than 6%;
  - b) For MT / MV the percentage variation by not more than 6%;
  - c) For HT / HV the percentage variation by not more than 6% on the higher side or not more than 9% on the lower side.
- 26.6 The level of harmonics generated by consumer's equipment is to be controlled as per the limits specified in the grid connectivity standards specified by CEA.
- 26.7 Voltage flickers caused by consumers' loads shall have to be controlled within the permissible limits as per Grid Standards.
- 26.8 Appropriate metering facilities shall be installed with all lines, transformers and consumers as per CEA (Installation and Operations of Meters) Regulations 2006, as amended from time to time.

## **27.Planning Data**

- 27.1 To enable the STU to discharge its responsibilities to conduct system studies and prepare long term transmission system plan, Users shall furnish the necessary data related to the electricity demand, transmission capacity and generation availability to the STU. All users shall provide the required

planning data/information in the formats as may be devised by STU.

- 27.2 The one time data shall be submitted by all the Users to STU within 6 months from the date of notification of this State Grid Code. Users shall thereafter submit yearly data to STU latest by 31st December for the ensuing year.
- 27.3 STU shall supply the data as may be required by the Users for the co-ordinated planning, design and operation of their plants and systems with the transmission system.

## **28. Implementation of Transmission Plan**

The actual program of implementation of transmission lines, Inter-connecting Transformers, reactors/capacitors and other transmission elements will be determined by STU in consultation with the concerned User. The completion of these works, in the required time frame, shall be ensured by STU.

## **CHAPTER-4: CONNECTION CONDITIONS**

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### **29.Introduction**

The Connectivity Conditions Code specify the minimum technical and design criteria that shall be complied with by STU/Transmission Licensee and all Users connected to or seeking connection to the State Transmission System. This chapter also sets out the procedures by which STU shall ensure compliance by all Users with the above criteria as a pre-requisite for the establishment of an agreed connection.

### **30.Objective**

The Connection Conditions are designed to ensure that:

- a) To the safe operation, integrity and reliability of the grid;
- b) The basic rules and regulations for connections are complied with and all Users are treated in a non-discriminatory manner;
- c) Any new or modified connections, when established, shall neither impose any adverse effect on existing Users nor shall new connection suffer adversely due to existing Users;
- d) The ownership and responsibility for all the equipments are clearly specified in a schedule (Site Responsibility Schedule) for every site, where a connection is made.

### **31.Scope**

This Connectivity Conditions Code shall apply to STU / SLDC and all Users connected to and/or involved in developing the State Power Grid and includes Generating Companies/Transmission Licensee/Distribution Licensee which are engaged in or are intending to engage in generation/transmission/distribution of power through the State Power System.

### **32.Connection Standard**

The applicable technical standards for construction of electrical plants, electric lines and connectivity to the InSTS shall be as per CEA (Technical Standards for Construction of Electrical Plants & Electric Lines) Regulations, 2010, CEA (Technical standards for Connectivity to the Grid) Regulations, 2007 and CEA (Grid Standards) Regulations, 2010 amended from time to time.

### **33.Safety Standard**

The applicable safety requirements for construction, operation and maintenance of electric plants and electric lines shall be as per CEA (Safety Requirements for construction, operation and maintenance of electrical plants and electric lines) Regulations 2011 and CEA (Measures Relating to Safety and Electric supply) Regulations, 2010 and amendments from time to time shall also be applicable.

### **34.Procedure for connection**

34.1 Prior to a being connected to the InSTS, User shall ensure that all the necessary conditions outlined in the WBEGC in addition to mutually agreed requirements, have been complied by it. Any User seeking to establish new or modified arrangements of connection to or use of assets of the Intra-State transmission system shall submit an application on standard format to the State Transmission Utility (STU) along with the following details:

- (i) Report stating the purpose of the proposed connection and/or modification, transmission licensee in whose network the connection is proposed, connection site, description of apparatus to be connected or modification to the apparatus already connected and beneficiaries of the proposed connection.
- (ii) Undertaking that the prospective installation shall comply with the provisions of this State Grid Code, with regulations specified by CEA under section-53 of the Act, and various standards such as Grid Standards and Technical Standards for Construction of Electrical Plants and Electrical Lines and Connectivity to the Grid specified by the CEA.
- (iii) Construction Schedule and target completion date.
- (iv) For special loads like arc furnaces, rolling mills etc., Real and Reactive Power values of the Load with time and harmonic level.
- (v) All prospective users shall be required to pay to the STU all charges as specified in connectivity procedure prepared by STU and subsequently approved by WBERC for the purpose of conducting the initial interconnection studies, additional study as well as for processing the application.

34.2 On receipt of an application for new connection/ modification of existing connection, complete in all respect, the Transmission Licensee shall forward a copy of the application to the SLDC and STU (in case user is intending to be connected to the network of any transmission licensee other than STU).

- 34.3 The Transmission Licensee / STU shall, within 30 days, from the receipt of an application under regulation 34.1 and after considering all suggestions and comments received by the parties identified under regulation 34.2 of these Regulations shall make a formal offer to the user.

Provided that Transmission Licensee / STU shall mandatorily carry out power system study as considered appropriate before allowing any new connection or modification of existing connection.

- 34.4 The formal offer by the STU / Transmission Licensee shall specify the voltage level at which the applicant is offered to be connected, contain all details of the requirement and procedure for connection to the InSTS and a draft Connection Agreement along with all such information as may be necessary. In the event of User requesting for any specific information / study / data from STU / Transmission Licensee for the purposes of Grid Connectivity, the STU / Transmission Licensee shall make the same available to the User. The offer made shall be subject to obtaining the required consents, approvals, and permissions for right of way or any other requirements as per the provisions of this State Grid Code, Electricity Act 2003 and rules and regulations made thereunder.

- 34.5 A User whose development/connection requires the STU/Transmission Licensee to obtain any consents, approvals, permissions, and right of ways or compliance with any other requirements mentioned in this State Grid Code shall:

- Provide necessary assistance, supporting information or evidence; and
- Ensure attendance by such witnesses as the STU/Transmission Licensee may reasonably request

- 34.6 The offer shall specify, and take in to account, any works required for the extension or reinforcement of existing Transmission System and/or Supply System as necessitated by the applicant's proposal.

- 34.7 The estimated time schedule for completion of works should also be specified in the offer, taking into account the time required to obtain statutory clearances etc., wherever necessary. In respect of offers for modifications to the existing Connections, the offers shall also take into account the terms of the existing Connection Agreement, if any.

- 34.8 If the nature of complexity of the proposed development is such that the prescribed time limit for making the offer is not considered adequate, the STU/Transmission Licensee shall make a preliminary offer within the prescribed time limit indicating the extent of further time required for more detailed analysis of the issues.
- a.) On receipt of the preliminary offer, the User shall indicate whether Licensee should proceed further to make a final offer within the extended time limit.
  - b.) STU/Transmission Licensee may require the User to furnish some or all of the Planning Data at this stage i.e. in advance of the normal time limit.
- 34.9 All offers (other than the preliminary offers) including revised offers shall remain valid for 120 (one hundred and twenty) days from the date of issue of the offer. The Transmission Licensee shall make a revised offer, upon request by a User, if necessitated by changes in data furnished earlier by the User.
- 34.10 The User shall furnish the relevant Planning Data to the STU/ Transmission Licensee within thirty days of acceptances of an offer or such longer period as the STU/Transmission Licensee may agree in a particular case.
- 34.11 Upon compliance of required conditions, STU shall notify the concerned user that it can be connected to the STS.
- 34.12 The user and the STU / Transmission Licensee in whose system the connection is being sought shall finalize a Connection Agreement on acceptance of the offer by the user. STU/Transmission Licensee shall forward a copy of the connection agreement entered into with the User to the STU and SLDC.
- 34.13 In the event of an offer becoming invalid or rejected by an applicant, STU/Transmission Licensee shall not be required to consider any further application from the same User within twelve months from the date of the offer letter unless the new application is substantially different from the original application with regard to system changes.
- 34.14 STU/Transmission Licensee may reject an application for connection to /or use of Transmission System on the following conditions.

- a) If such proposed connection is likely to cause breach of any of the provisions of Transmission Licence/WBEGC/ IEGC/Grid Standards and Technical Standards setout by CEA/Electricity Act, 2003, or any provision of planning criteria/ any covenants/deeds/regulations by which the STU/Transmission licensee is bound, or
- b) If the applicant fails to give the undertakings as per clause 34.1(ii) above.

34.15 In the event of any dispute with regard to rejection of application by the STU/Transmission Licensee, the User/Transmission Licensee may approach the Commission.

34.16 STU shall prepare a detailed connectivity procedure including of all Forms, rates and charges, etc within 45 days of notification of these regulations and submit before the Commission for approval. The approved procedure shall be available in the website of STU.

### **35.Connection Agreements**

35.1 All Users connected to or seeking connection to the InSTS shall enter into a connection agreement with the STU/Transmission Licensee. However, in respect of existing connections a relaxation of one year is allowed so that present arrangement may continue in the interim. The process of re-negotiation of the connection conditions shall be completed within this period of one year. In case it is determined that the compliance of connection conditions would be delayed further, the Commission may consider further User relaxation for which a petition will have to be filed by the concerned User along with STU's recommendation/comments. The cost of modification, if any, shall be borne by the concerned user.

35.2 A connection Agreement shall include (but not limited to), as appropriate within its terms and conditions, the following:

- i) A condition requiring both parties to comply with the provisions of the WBEGC;
- ii) Details of connection, technical requirements;
- iii) Details of any capital expenditure arising from necessary reinforcement of extension of the system, data communication, RTU etc. and demarcation of the same between the concerned parties;
- iv) the details of commercial arrangements regarding payment of transmission charges, payment of charges towards construction of



- bays at STU sub-stations, payment of O&M charges for dedicated transmission line, if any, and arrangement of capital expenditure;
- v) The metering arrangement;
  - vi) Details of equipment and plant to be connected;
  - vii) General philosophy, guidelines etc, on protection and telemetry;
  - viii) A 'Site Responsibility Schedule' detailing the division of responsibility at Connection Sites in relation to ownership, control, operation and maintenance of plant & apparatus and to safety of persons;
  - ix) STU shall prepare a model connection agreement and submit it to the Commission for approval within 45 days from the date of notification of these regulations and make it available in the website. Such submission shall also include a gist of the model agreement for publication in newspaper. Commission shall approve the gist within seven days of submission along with modification, if any, in the draft agreement. Commission shall approve the model agreement after taking into consideration of different provisions of the Act and different regulations and also the stakeholders' comments on this agreement through previous publications in at least four widely circulated news papers (one of which will be in English and one of which will be vernacular language) and the website of STU. The Commission will make approval within one month from the last day of receipt of comments as per gist publication.

### **36.Connection Point**

36.1 Different requirement of connection point of the InSTS with different constituents are as follows:

- (i) For Generating Station, the switchyard voltage of connection point may be 400 / 220 / 132 KV or as agreed with the Licensee with whose network the connection is to be effected. Unless specifically agreed with the Licensee with whose network the connection to be effected, the connection point shall be the outgoing feeder gantry of generating station switchyard. All the terminals, communication, protection and metering equipment owned by the generating company within the perimeter of its site shall be maintained by it. From the outgoing feeder gantry onwards, all electrical equipment shall be maintained by the Licensee or the owner of the dedicated transmission lines with whose network the connection is to be effected.

- (ii) For Distribution Licensee, the voltage of connection point may be as agreed with Generating Station or the Licensee with whose network the connection is to be effected but the same cannot be below 6 KV. The connection point shall be the outgoing feeder gantry of Generating Station switchyard or the sub-station in case of the Licensee. However, in case of connection with dedicated transmission lines, it may be the point as agreed by the Distribution Licensee and the owner of the dedicated transmission line. All the terminal, communication, protection and metering equipment within the premises of the sub-station shall be maintained by owner of the substation. From the outgoing feeder gantry onwards, all electrical equipment shall be maintained by the respective distribution entity.
- (iii) For the InSTS of the Regional Grid, the connection point, protection scheme, metering scheme, metering point and the voltage shall be in accordance with the mutual agreement between owners of two connecting systems, until and unless they are specified by CEA in its Regulations under the Act.
- (iv) For CPPs and EHT/HT Consumers, voltage may be 220/132/66/33 KV or as agreed with Licensee with whose network the connection is to be effected. Sub-stations, owned by CPPs and EHT / HT Consumers, shall be maintained by them or as mentioned in the connection agreement. The connection point shall be the feeder gantry on their premises in case of EHT / HT consumers and at Licensee's gantry in case of CPPs.

### **37. InSTS Parameter Variations**

#### **37.1 General:**

Within the power system, instantaneous values of system frequency and voltage are subject to variation from their nominal value. All users shall ensure that Plant and Apparatus requiring service from/to the InSTS is of such design and construction that satisfactory operation is not hampered by such variation.

#### **37.2 Frequency Variations:**

Rated frequency of the system shall be 50.0 Hz and shall normally be

controlled within the limits as per regulations/standards framed by the Authority.

### 37.3 Voltage Variations:

- i) The variation of voltage in EHV may not be more than the voltage range specified in regulations/standards framed by the Authority.
- ii) The variation of voltage in HV, MV & LV may not be more than the voltage range specified in regulation 26.5 of these Regulations.
- iii) The agencies engaged in sub-transmission and distribution shall not depend upon the InSTS for reactive energy compensation when connected. The agencies shall estimate and provide the required reactive energy compensation in its transmission and distribution network to meet its full Reactive Power requirement.

## **38. Equipment at Connection Points**

### 38.1 Sub-station Equipment

- i) All EHV sub-station equipments shall comply with Bureau of Indian Standards (BIS) /IEC/ prevailing Code of practice.
- ii) All equipment shall be designed, manufactured and tested and certified in accordance with the quality requirements as per IEC/BIS standards.
- iii) Each connection between the User and the InSTS shall conform to Connection Standard mentioned under regulations 32 and 33 of these Regulations. .

### 38.2 Fault Clearance Times

- i) The primary protection system shall be such that the fault clearance time of all equipments/lines connected to the InSTS whether of Users or of STU / Transmission Licensee, shall not be more than:
  - (a) 100 milli seconds (ms) for 800 kV & 400 kV
  - (b) 160 milli seconds (ms) for 220 kV & 132 kV
  - (c) 400 milli seconds (/2<sup>nd</sup> Zone) for 132kV and above.
  - (d) 200 milli seconds for 33 kV.

- ii) Back-up protection shall be provided for system at 132 kV and above required isolation/protection in the event of failure of the primary protection systems to isolate the faulty element within the above fault clearance time requirements. The protection system shall comply with the provisions mentioned under CEA (technical Standards for connectivity to the Grid) Regulations, 2007.

### 38.3 Protection Planning

- i) Protection systems are required to be provided by all Users in coordination with STU.
- ii) In case of installation of any device, which necessitates modification/ replacement of existing protection relays/ scheme in the network, owner of respective part of network shall carry out such modification/ replacement.
- ii) Protection systems are required to isolate the faulty equipments and protect the other components of the system against all types of faults, internal/ external to them, within the specified fault clearance time with reliability, selectivity and sensitivity.
- iii) All users connected to the InSTS shall provide protection systems as specified in the connection agreement.
- iv) Relay setting co-ordination at the state level shall be done by STU in consultation with SPC.
- v) Relay setting coordination shall be done at regional level by RPC. The RPCs would also identify critical locations where bus bar protection needs to be provided, if not available.

### 38.4 Generating Units and Power Stations:

- i) A Generating Unit shall be capable of continuously supplying its normal rated active/reactive output within the system frequency and voltage variation range specified in the Grid Standards, subject to the design limitations specified by the manufacturer.
- ii) All Generating Units and associated electrical equipments connected to the State Grid shall be provided with adequate protection and safety in line with Connection and Safety Standards specified in Regulations 32 and 33 of these Regulations so that the State Grid does not suffer due to any disturbance originating from the generating unit.

**38.5 Transmission Line Requirements:**

Every EHT line taking off from a generating station or a sub-station shall have suitable protection schemes in line with Connection and Safety Standards specified in Regulations 32 and 33 of these Regulations. STU shall in the connection agreement specify the details and also notify the users of any changes in its policy on protection from time to time.

**38.6 Distribution Line Requirements:**

All 33KV and 11/6 kV lines at connection points shall be provided with a minimum of over current and earth fault protection with or without directional features as given below:

- (a) Single Radial Feeders: Non-directional time lag over current and earth fault relay with suitable settings to obtain discrimination between adjacent stations;
- (b) Parallel Feeders/ Ring Feeders: Directional time lag over current and earth fault relays;
- (c) Long Feeders / Transformer Feeders: For long feeders or transformer feeders, the relays should incorporate a high set instantaneous element.

**38.7** The consumers connected to distribution or transmission system shall comply with the connection and safety standards and shall not energise transmission or distribution system by injecting supply from his generators or any other source either by controls or manually unless specifically requested / permitted by the Transmission or Distribution Licensee.

**39. Metering:**

**39.1** The agency who has to provide, operate and maintain the metering arrangements at various locations shall be specified by the STU in the connection agreement in accordance with the Central Electricity Authority (Installation and Operations of meters) Regulations, 2006 and subsequent amendments made by Central Electricity Authority under sub-section 1 of section 55 of the Electricity Act, 2003.

**39.2** Each interconnection shall have one main meter and one Standby/check meters so that correct computation of net interchange at all connection points

/ interface points is possible even when a Main meter, a CT or a VT has a problem. The main meter and the check meter shall be connected to same core of CTs and VTs. The standby meter, should be connected to CT and VT, other than those used for main and check meter.

- 39.3 Special energy meters termed as “Interface meters” shall be provided at all the point of interconnection between electrical systems of generating company, distribution licensee, STU and consumers directly connected to the Intra-state Transmission System who have to be covered under ABT and/or have been permitted open access under relevant regulations of the Appropriate Commission.
- 39.4 Commercial meters are to be used for accounting and billing of electricity supplied to the consumers / beneficiaries of generating stations but excluding those consumers/ beneficiaries covered under Interface Meters.
- 39.5 Energy Accounting and Audit Meters are to be installed at power stations and at sub-stations for accounting of the electricity to various segments of electrical system so as to carry out further analysis to determine the consumption and loss of energy therein over a specified time period.
- (a) Records of calibration shall be maintained for reference and shall be made available to the STU/ SLDC on request;
- (b) Generating companies shall furnish recorded data of all electric measurements and events recorded by the energy accounting and audit metering to the STU/SLDC as and when requested by them.
- 39.6 All meters shall comply with the technical specifications mentioned under Central Electricity Authority (Installation and Operations of meters) Regulations, 2006 and subsequent amendments.
- 39.7 Wherever a meter becomes defective, consumption recorded by the check meter shall be referred for a mutually agreed period. And wherever both main and check meters become defective the reading of standby meters are to be considered.
- 39.8 If the main as well as the check metering systems become defective and there is

no standby meter, the assessment of energy consumption for the outage period shall be done by the concerned parties on mutually agreed basis.

39.9 If the main as well as the check metering systems become defective and there is no standby meter, the assessment of energy consumption for the outage period shall be done by the concerned parties on mutually agreed basis.

- i. A procedure shall be drawn up between the STU and the entities covering summation, collection, processing meter readings at various connection sites. This may be revised from time to time as needed.
- ii. Any disputes relating to inter-entity metering between the STU / Transmission Licensee and Generating Company / Distributing Licensee / Open Access Users / Transmission Licensee shall be settled in accordance with the procedures stipulated under relevant Power Purchase Agreement / Connection Agreement as the case may be. In case of unresolved dispute, the matter may be referred to WBERC for adjudication and reference for arbitrations.

39.10 Notwithstanding anything contrary to any regulation of the Commission, STU / SLDC shall not permit any synchronization of any new unit of any generating station unless ABT compliant meters are installed and commissioned for recording the gross generation and ex-bus generation amount along with proper online real time display of such information at SLDC as specified in the regulations framed under section 61 of the Electricity Act, 2003

#### **40. Reactive Power Compensation**

40.1 Reactive Power compensation and/or other facilities should be provided by Transmission Licensee/Distribution licensees as far as possible close to the load points thereby avoiding the need for exchange of Reactive Power to/from InSTS and to maintain InSTS voltage within the specified range.

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

40.3 The additional reactive compensation to be provided by a User shall be indicated by STU in the Connection Agreement for implementation.

40.4 Users shall endeavour to minimize the lagging Reactive Power drawal at an

interchange point when the voltage at that point is below 97% of rated voltage, and shall not inject lagging Reactive Power when the voltage is above 103% of rated voltage. Interconnecting Transformer taps at the respective drawal points may be changed to control the Reactive Power interchange as per a User's request to the State Load Despatch Centre, but only at reasonable intervals.

#### **41.Data and Communication Facilities**

Reliable and efficient speech and data communication systems shall be provided to facilitate necessary communication and data exchange, and supervision/control of the grid by the SLDC, under normal and abnormal conditions. All Users shall provide systems to telemeter power system parameter such as power flow, voltage and status of switches/ transformer taps etc. in line with interface requirements and other guideline made available to SLDC/RLDC. The associated communication system to facilitate data flow up to SLDC/RLDC, as the case may be shall also be established by the concerned user as specified by STU in connection agreement. All users in coordination with STU shall provide the required facilities at their respective ends and SLDC as specified in the connection agreement.

#### **42.System Recording Instruments**

Recording instruments such as Data Acquisition Systems/Disturbance Recorder/Event Logger/Fault Locator (including time synchronization equipment) shall be provided in the InSTS for recording of dynamic performance of the system. Users shall provide all the requisite recording instruments as specified in the connection agreement according to the agreed time schedule.

#### **43.Responsibilities for operational safety**

STU/Transmission licensee and the concerned User shall be responsible for safety as indicated in Site Responsibility Schedules for each connection point.

##### **43.1 Site Responsibility Schedule**

- i) A Site Responsibility Schedule shall be produced by the STU/ transmission license and User detailing the ownership, and responsibilities of each, before execution of the project or connection including safety responsibilities.



For connection to the InSTS, a schedule shall be prepared by STU/transmission licensee pursuant to the relevant Connection Agreement, which shall state for each item of plant and apparatus at the connection point including the followings:

- Ownership of the Plant/apparatus;
  - Responsibility for control of the Plant/Apparatus
  - Responsibility for operation of the Plant/Apparatus;
  - Responsibility for maintenance of the Plant/Apparatus;  
and
  - Responsibility for all matters relating to the safety of any person at the connection Point.
- ii) The formats, principles and basic procedure to be used in the preparation of the Site Responsibility Schedules shall be formulated by STU and shall be provided to each User seeking connection or modification of existing connection to the InSTS.
- iii) All users connected to or planning to connect to InSTS would ensure providing of RTU and other communication equipment, as specified by SLDC, for sending real-time data to SLDC at least before the date of commercial operation of the generating stations or sub-stations or lines being connected to InSTS.
- iv) STU/Transmission Licensee and Users should be responsible for safety as indicated in the site responsibility schedule for each connection point.

#### 43.2 Single Line Diagrams

- i) Single Line Diagram shall be furnished for each Connection Point by the connected Users or Transmission Licensee to the SLDC and /or the STU. These diagrams shall include all EHV/ HV connected equipment and the connections to all external circuits and incorporate numbering, nomenclature and labeling, etc. The diagram is intended to provide an accurate record of the layout and circuit connections, rating, numbering and nomenclature of EHV/HV apparatus and related plant.
- ii) Whenever any equipment is proposed to be changed, then concerned user shall intimate the necessary changes to STU and to

SLDC. When the changes are implemented, revised Single Line Diagram shall be circulated by the user to SLDC/STU.

#### **43.3 Site Common Drawings**

- i) Site Common Drawing shall be prepared for each Connection Point and will include the following information:
  - a) Site Layout;
  - b) Electrical Layout;
  - c) Details of protection/ control; and
  - d) common services drawings;
- ii) The detailed drawings for the portion of the User and STU/ transmission licensee at each Connection Point shall be prepared individually and copies shall be handed over to other party.
- iii) If any change in the drawing is found necessary, the details will be furnished to other party as soon as possible.

#### **44. Procedure for Site Access, Site operational activities and Maintenance Standards**

The Connection Agreement will also indicate any procedure necessary for Site access, Site operational activities and maintenance standards for equipment of the STU/ transmission licensee at STU/User's premises and vice versa

#### **45. Schedule of assets of State Power Grid**

STU shall submit annually to WBERC by 30th September each year a schedule of transmission assets, which constitute the State Power Grid as on 31st March of that year indicating ownership on which SLDC has operational control and responsibility.

#### **46. Conditionality of Connectivity**

Notwithstanding anything contained contrary elsewhere in any other regulation of the Commission, no licensee can deny connectivity to any generating station and/or no transmission licensee can deny connectivity to any distribution licensee intends to have connectivity for injection/ drawal of power on the ground of non-availability of power purchase agreement, if the applicant of the

connectivity is ready to bear the cost of connectivity. However, power cannot be injected into the transmission or distribution system as the case may be or power cannot be drawn from the system until there is a PPA on the basis of which open access has been duly accorded through wheeling or transmission agreement as per Open Access Regulations.

## ***CHAPTER -5: OPERATING CODE FOR STATE GRID***

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### **47. Operating Policy**

- 47.1 The primary objective of integrated operation of the State Power Grid is to enhance the overall operational economy and reliability of the entire electric power network spread over the geographical area of the State. Participant utilities shall therefore co-operate with each other and adopt Good Utility Practice at all times for satisfactory and beneficial operation of the State PowerGrid.
- 47.2 Overall operation of the State Power Grid shall be supervised by the State Load Despatch Centre (SLDC). All Users and Transmission Licensees are accordingly required to comply with the directions given by the SLDC.
- 47.3 Distribution Licensee shall establish at least one ALDC to monitor grid operation of its distribution system and to coordinate with the SLDC
- 47.4 All Users and Transmission Licensees shall comply with this operation planning and system security code, for deriving maximum benefits from the integrated operation and for equitable sharing of obligations.
- 47.5 SLDC shall prepare a draft operational manual within 45 days from notification of this regulation in accordance with WBEGC, IEGC and Grid Standards which shall be followed by staff of SLDC, all Users and Transmission Licensees. SLDC shall also review and coordinate the maintenance plan of Generating Stations, STU, Transmission Licensees and all other users connected with the InSTS.
- 47.6 For efficient and secure operation of the State Power Grid the control rooms of the SLDC, ALDC, power generating plants, substation of 132 kV & above, and any other control centers established by the Transmission Licensee/Users shall be automated or manned round the clock by qualified and adequately trained personnel.

### **48. System Security Aspects**

- 48.1 All Users and Transmission Licensee shall endeavor to operate their respective power systems and power generating stations in synchronism with each other at all times, such that the entire power system within the

State operates as one synchronized system.

- 48.2 No part of the State Power Grid shall be deliberately isolated from the rest of the State Power Grid, except
- i. under an emergency, and conditions in which such isolation would prevent a total grid collapse and/or would enable early restoration of power supply,
  - ii. for safety of human life,
  - iii. when serious damage to a costly equipment is imminent and such isolation would prevent it,
  - iv. when such isolation is specifically instructed by SLDC.

Complete synchronization of grid shall be restored as soon as the conditions again permit it. The restoration process shall be supervised by SLDC, as per operating procedures separately formulated by it.

- 48.3 No important element of the State Power Grid shall be deliberately opened or removed from service at any time, except when specifically instructed by SLDC or with specific and prior clearance of SLDC. The list of such important grid elements on which the above stipulations apply shall be prepared by the SLDC in consultation with the Transmission Licensees, STU and Users, and shall be available at the website of SLDC,. In case of opening/removal of any important element of the State Power Grid under an emergency situation, the same shall be communicated to SLDC at the earliest possible time after the event.
- 48.4 Any tripping, whether manual or automatic, of any of the above elements of State Power Grid shall be precisely intimated by the concerned agency to SLDC immediately explaining the reasons (to the extent determined). The reasons in detail and the expected time of restoration shall also be intimated to the SLDC at the earliest. All reasonable attempts shall be made for the elements' restoration as soon as possible. All logs, data, records, etc are to be preserved for future analysis.
- 48.5 All thermal generating units of 200 MW and above and all hydro units of 10 MW and above (except those with upto 3 hours pondage), which are

synchronized with the grid, irrespective of their ownership, shall have their governor under Restricted Governor Mode of Operations (RGM) at all times. The restricted governor mode of operation shall have the same features as detailed in IEGC.

- 48.6 If any thermal generator of 200 MW and above rating and any hydro units of 10 MW and above rating (except those with upto 3 hours pondage) is required to be operated without its governor in normal operation, SLDC shall be immediately informed about the reason and duration of such operation.

Provided also that if any generator seeks an exemption from the above requirement, it shall file a petition justifying the same in advance to the Commission, which may, at its sole discretion, allow the same.

Provided further that the hydro units having pondage upto 3 hours, gas turbines / CCGT, wind and solar generators and nuclear power stations shall be exempted from the above requirement till the Commission reviews the situation.

- 48.7 All governors shall have a droop setting of between 3% and 6%.
- 48.8 Facilities available with/in load limiters, Automatic Turbine Run-up System (ATRS), Turbine supervisory control, coordinated control system, etc., shall not be used to suppress the normal governor action in any manner and no dead bands and/or time delays shall be deliberately introduced except as required under IEGC for restricted governor mode of operations.
- 48.9 All thermal generating units of 100 MW and above and all hydro units of 10 MW and above, operating at or up to 100% at their MCR shall normally be capable of (and shall not in any way be prevented from) instantaneously picking up to 105% and 110% of their MCR respectively, when frequency falls suddenly. After an increase in generation as above, a generating unit may slide back to the original level at a rate of about 1% per minute, in case continued operation at the increased level is not sustainable. Any generating unit (synchronized with the State grid), not complying with the above requirement, shall be kept in operation only after obtaining the permission of the SLDC.
- 48.10 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..

- 48.11 Except under an emergency, or to prevent an imminent damage to costly equipment, no SSGS shall suddenly reduce his generating unit output by more than one hundred (100) MW without prior intimation to and consent of the SLDC. Similarly, no Users shall cause a sudden increase in its load by more than one hundred MW(100 MW) without prior intimation to and consent of the SLDC.
- 48.12 All generating units shall normally have their automatic voltage regulators (AVRs) in operation, with appropriate settings. In particular, if a generating unit of over fifty (50) MW size is required to be operated without its AVR in service, the SLDC shall be immediately intimated about the reason and duration, and its permission obtained. Power System Stabilizers (PSS) in AVRs of generating units (wherever provided), shall be got properly tuned by the respective generating unit owner as per a plan prepared for the purpose by the STU from time to time. STU will be allowed to carry out checking of PSS and further tuning it, wherever considered necessary.
- 48.13 Provision of protections and relay settings shall be coordinated periodically throughout the State Power grid, as per a plan to be separately finalized by SPC. All Users and Transmission Licensee shall ensure that installation and operation of protection system shall comply with the provisions of CEA (Grid Standard) Regulations, 2010 amended from time to time. Protective relay settings shall not be altered or protection bypassed and/or disconnected, without consultation and agreement of SLDC and STU and/or affected User. STU either suo-motu or on instruction of SPC secretariat shall investigate into any malfunctioning of protection or other unsatisfactory protection issues. The concerned Users / Transmission Licensee shall take prompt action to correct any protection malfunction or issues as identified by the STU. Proper documentation of settings provided change of settings, bypass/ disconnection of protective arrangement, if any, with date and time punching shall be responsibility of the STU. Any shortcoming due to shutdown or outage shall be reported by all constituent to SLDC and STU on time to time basis.
- 48.14 All Users shall make all possible efforts to ensure that the grid frequency always remains within the 49.90 – 50.05 Hz band,.

- 48.15 Distribution licensees and bulk consumers shall provide automatic under-frequency and  $df/dt$  load shedding in their respective systems, to arrest frequency decline that could result in a collapse/disintegration of the grid, as per the plan separately finalized by the SPC/ STU, and shall ensure its effective application to prevent cascade tripping of generating units in case of any contingency. All Users shall ensure that the above under-frequency and  $df/dt$  load shedding/islanding schemes are always functional. However, in case of extreme contingencies, these relays may be temporarily kept out of service with prior consent of SLDC.
- 48.16 SLDC shall inform SPC Secretariat about instances when the desired load relief is not obtained through these relays in real time operation. STU shall carry out periodic inspection of the under frequency and  $df/dt$  relays and maintain proper records of the inspection.
- 48.17 All Users and Transmission Licensee shall also facilitate identification, installation and commissioning of System Protection Schemes (including inter-tripping and run-back) in the power system to protect against situations such as voltage collapse and cascade tripping. Such schemes would be finalized by SPC, and shall be kept in service. SLDC shall be promptly informed in case any of these are taken out of service.
- 48.18 Procedures shall be developed by SLDC in consultation with all Users and Transmission Licensees to recover from partial/total collapse of the grid and periodically updated in accordance with CEA (grid Standards) Regulations, 2010 and with the requirements given under regulation 53 of these Regulations. These procedures shall be followed by all Users to ensure consistent, reliable and quick restoration.
- 48.19 Each Users and Transmission Licensee shall provide & maintain adequate and reliable communication facility internally and also with SLDC/other Users 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 generating stations and/or ALDC to SLDC.
- 48.20 All Users and Transmission Licensee shall send information/data including disturbance recorder/sequential event recorder output etc., to SLDC within 2 hours after achieving steady state conditions for purpose of analysis of any grid disturbance/event. No Users and Transmission Licensee shall block any



data/information required by the SLDC for maintaining reliability and security of the grid and for analysis of an event.

48.21 All Users and Transmission Licensee shall make all possible efforts to ensure that the grid voltage always remains within the voltage range as specified in the Grid Standards.

48.22 **Special requirements for Solar / wind generators:**

SLDC and ALDC shall make all efforts to evacuate the available solar and wind power and treat them as a must-run station. However, system operator may instruct the solar/ wind generator to back down generation on consideration of grid stability, security or safety of any equipment or personnel is endangered and Solar/ wind generator shall comply with the same. For this, Data acquisition System facility shall be provided for transfer of information to concerned ALDC and/or SLDC, as the case may be.

- a) SLDC may direct a wind firm to curtail its VAr drawal / injection in case the security of grid or safety of any equipment or personnel is endangered.
- b) During the wind generator start-up, the wind generator shall ensure that the reactive power drawal (inrush currents incase of induction generators) shall not affect the grid performance.

## **49.Demand Estimation for Operational Purposes**

### **49.1 Introduction**

- (a) This section describes the procedures/responsibilities of the SLDC, STU and other users for demand estimation for both Active Power and ReactivePower.
- (b) The demand estimation is to be done on daily/weekly/monthly basis for current year.
- (c) Each distribution licensee shall carry out its own demand estimation from the historical data and weather forecast data from time to time.
- (d) While the demand estimation for operational purposes is to be done on a daily/weekly/monthly basis initially, mechanisms and facilities at SLDC shall be created at the earliest to facilitate on-line estimation of

demand for daily operational use.

## **49.2 Objective**

- (a) The objective of this procedure is to enable the SLDC to estimate the demand over a particular period.
- (b) The demand estimates are to enable the SLDC to conduct system studies for operational planning purposes.

## **49.3 Procedure**

- 49.3.1 Each Distribution Licensee shall develop methodologies/mechanisms for daily/ weekly/monthly/yearly demand estimation (MW, MVAR and MWh) for operational purposes. The data for the estimation shall also include load shedding, power cuts, etc. Licensees shall also maintain historical database for demand estimation. Each Distribution Licensee have to submit this demand estimation data to SLDC on regular basis.
- 49.3.2 The Distribution Licensee shall also submit the updated long-term energy and demand forecast on annual basis based on the actual data to SLDC latest by 30<sup>th</sup> November every year.
- 49.3.3 The distribution licensee shall at regular interval review the status of loads materialized as per the previous load forecast. Distribution licensee shall further take the base data (i.e. actual energy and demand requirement of the previous financial year) and relate it to past trend.
- 49.3.4 SLDC based on the data received from distribution licensees and all other users carry out the state-wise demand estimation on daily/weekly/monthly/yearly basis for current year for load-generation balance planning and operational planning. Mechanism and facilities at SLDC shall be created at the earliest to facilitate on-line estimation of demand for daily operational use for each 15 minutes time block.
- 49.3.5 Distribution Licensees and SLDC shall take into account forecasting of the Solar and Wind energy, if any, to meet the active and reactive power requirement.

# **50.Demand Management**

## **50.1 Introduction**

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 energy transfers from external interconnections to meet demand, or in the event of breakdown or operating problems (such as frequency, voltage levels or thermal overloads) on any part of the grid or overdrawal of power by the licensee / open access customers beyond the limits mentioned under Deviation Settlement Mechanism in the Balancing and Settlement Code.

## **50.2 Demand Management Process**

- (a) All the Users / SLDC shall endeavour to restrict their net electricity drawal from the grid to within their respective net drawal schedules. Users / SLDC shall ensure that requisite load shedding is carried out in its control area so that there is no overdrawal.
- (b) For effective and automatic demand control under-frequency relays shall be installed at the Substations of the STU/Transmission Licensee. The number and size of the discrete blocks, which shall get isolated at a particular frequency, shall be determined by SLDC on rotational basis in consultation with every Distribution Licensee and finalized in the SPC.
- (c) SLDC shall issue instructions for manual disconnection of loads whenever demand control for effective grid management, is not possible through under-frequency relays, within a reasonable time and there is danger of grid collapse. The Distribution Licensees shall immediately disconnect the quantum of load as instructed by SLDC.
- (d) Further, in case of certain contingencies and/or threat to system security, SLDC shall issue necessary directions to all users to decrease their drawal by a certain quantum. Such direction shall immediately be acted upon.
- (e) All users shall make such arrangements that enable manual demand disconnection to take place, as instructed by the SLDC, under normal and/or contingent conditions. SLDC shall devise standard instantaneous message format in order to give directions in case of contingencies and / or threat to the system security to reduce deviation from schedule by the Users or demand disconnections, as the case may be.

- (f) The Distribution Licensees shall provide in advance to SLDC, estimates of loads that may be shed on the instructions of SLDC, when required, in discrete blocks, with details of arrangements of such load shedding. The interruptible loads shall be arranged in four groups of loads:
- (i) For scheduled power cuts/ load shedding;
  - (ii) Loads for unscheduled load shedding;
  - (iii) Loads to be shed through under frequency relays /  $df/dt$  relays;
  - (iv) Loads to be shed under any system protection scheme identified at SPC or RPC level;

The aforesaid loads shall be grouped in such a manner, that there shall be no overlapping between different groups of loads.

The loads under (iii) and (iv) shall not be shed under normal conditions.

- (g) Planned manual Disconnection shall be implemented by the SLDC whenever there is a shortfall in generation, or constraints in Transmission System, or reduction of imports through external connection or any other reason, requiring demand control over prolonged period. However, in such cases SLDC shall adopt a rotational load-shedding scheme to ensure equitable treatment to all consumers as far as practicable. (In the case of shortage of power availability with respect to demand, the ALDC shall resort to shedding the load of different feeders on economic principle till the Commission specifies any policy in this matter through notification.)
- (h) Emergency Manual Disconnection to deal with unacceptable voltage and frequency levels etc may be implemented by the SLDC only when there is major loss of generation resulting into mismatch of generation and drawal or there are constraints in the Transmission System. SLDC may also direct manual disconnection in cases of persistent over-drawal from the grid in excess of respective drawal schedule.
- (i) The measures taken to reduce the users' drawal from the grid shall not be withdrawn as long as the frequency/voltage remains at a low level, unless specifically permitted by the SLDC.

- (j) Within a time frame of two years, SLDC through the Distribution Licensee shall formulate and implement state-of-art demand management schemes for automatic demand management like rotational load shedding, demand response (which may include lower tariff for interruptible load) etc to reduce over drawal in order to comply with clause (a) of regulation 50.2 of these Regulations. SPC shall monitor the progress of the scheme and a report detailing the scheme shall be sent to the Commission by the SLDC.

### **50.3 Periodic Reports**

A monthly report shall be issued by SLDC to all the Users and SPC Secretariat, which shall cover the performance of the State Power Grid for the previous month. Such monthly report shall also be available on the website of the SLDC for at least 3 months. The monthly report shall essentially contain the following:-

- (a) Frequency profile
- (b) Voltage profile of selected substations
- (c) Major Generation and Transmission Outages
- (d) Transmission Constraints
- (e) Instances of persistent/significant non-compliance of WBEGC.
- (f) Instances of incorrect operations of protection system.
- (g) Instances of congestion in transmission system
- (h) Instances of inordinate delays in restoration of transmission elements and generating units.
- (i) Monthly load-duration curve with date
- (j) Daily demand profile consisting of:
  - i. Daily maximum demand (MW) with corresponding frequency (HZ) and energy (MU) with corresponding average frequency;
  - ii. Daily load shedding at peak hours (MW);
  - iii. Daily load shedding in MU;
  - iv. Daily technical interruption losses in MW at peak hours;
  - v. Daily technical interruption losses in MU
- (k) Daily Generation Performance Status:

Generating station wise daily schedule for availability declared, actual

generation, non-drawal by the system (if any), reason for non-drawal, reason for less generation;

- (l) Daily wind and solar power generation and injection into the state grid
- (m) Instances of persistent / significant non-compliance of WBEGC

#### **50.4 Other Reports**

- (a) The SLDC shall prepare a quarterly report, which shall bring out the system constraints, reasons for not meeting the requirements, if any, of security standards and quality of service, along with details of various actions taken by different Users, and the User(s) responsible for causing the constraints.
- (b) The SLDC shall also provide information/report, as desired by SPC in the interest of smooth operation of State Power Grid.

### **51.Operation Liaison**

#### **51.1 Introduction**

- (a) This section covers the requirement for the exchange of information in relation to operations and/or events on the State Power Grid which have had or may have an effect on:
  - 1. The Regional Grid,
  - 2. The State Power Grid,
  - 3. A User System,
- (b) The Operational liaison function is a mandatory built-in hierarchical function of the SLDC and State users, to facilitate quick transfer of information to operational staff. It will correlate the required inputs for optimization of decision making and actions.
- (c) All operational instructions given by SLDC through telephone, fax, e-mail, etc shall have a unique operating code number and SLDC shall maintain a voice recorder for recording and reproduction of conversation with time tag or stamp. Such record of instructions shall be kept for at least six months.

#### **51.2 Procedure for Operational Liaison**

- (a) Operations and events in the State Power Grid:
- Before any Operation is carried out on State Power Grid, the SLDC will inform all Users, whose system may, or will, experience an operational effect, and give details of the operation to be carried out. The SLDC shall also inform the RLDC in case such an operation impacts the Regional Grid.
  - Immediately following an event on State Power Grid, the SLDC will inform all Users, whose system may, or will, experience an operational effect following the event, and give details of what has happened in the event but not the reasons why. The SLDC shall also inform the RLDC in case such an event impacts the Regional Grid.
- (b) Operations and events on a User system.
- Before any operation is carried out on a User's system, the User shall inform the SLDC, in case the State Power Grid may, or will, experience an Operational effect. User shall also give details of the operation to be carried out. The SLDC shall further inform the RLDC in case such an operation impacts the Regional Grid.
  - Immediately following an event on a User's system, the User will inform the SLDC, in case the State Power Grid may, or will, experience an operational effect following the event, and give details of what has happened in the event. The SLDC shall further inform the RLDC in case such an event impacts the Regional Grid.

## **52. Outage Planning**

### **52.1 Introduction**

- (a) This section sets out the procedure for preparation of outage schedules for the elements of the State Power Grid in a coordinated and optimal manner keeping in view the State power system operating conditions and the balance of generation and demand. (A List of elements of the state grid covered under these stipulations shall be prepared by SLDC in consultation with the STU and all other users).
- (b) The generation capacity and transmission system should be

adequate after taking into account the outages to achieve the security standards.

- (c) The State's annual outage plan shall be prepared in advance for the financial year by the SPC and reviewed during the year on quarterly and monthly basis.

## **52.2 Objective**

- (a) To produce a coordinated generation outage programme for the State Power Grid, considering all the available resources and taking into account transmission constraints, as well as, irrigational requirements.
- (b) To minimize surplus or deficits, if any, in the system requirement of electricity demand and energy and help operate system within Security Standards.
- (c) For optimum management of transmission outages without adversely affecting the grid operation but taking into account the generation outage schedules, planned outages of distribution system and transmission systems and maintaining system security standards.

## **52.3 Scope**

This section is applicable to all users including SLDC, STU, SSGS and all other users connected to the state power grid.

## **52.4 Outage Planning Process**

- (a) The SPC shall be responsible for analyzing the outage schedule given by all the users, preparing a draft annual outage schedule and finalization of the annual outage plan, which shall be in line with the Regional annual outage plan finalized by RPC for the following financial year.
- (b) All Generating Companies and Licensees including STU shall furnish their proposed scheduled outage program indicating the Units/Lines/Sub-stations/ICTs etc, date of start of outage and duration of outage in writing to the SPC Secretariat for the ensuing financial year by 15<sup>th</sup> of September each year. Distribution Licensees are however not required to intimate outages, which might induce load loss of less than 20 MW demand in their area of



supply.

- (c) The SPC shall prepare an optimum draft outage plan minimizing interruption to the consumers on the basis of data submitted by the Generating Companies and the Licensees. SPC shall make available the draft Scheduled Outage Plan to RPC by 31<sup>st</sup> October each year.
- (d) Based on refinement by the RPC secretariat in the draft inter- State outage Plan, the SPC shall also review and revise the State's Scheduled Outage Plan and intimate all Users and SLDC, the final Scheduled Outage Plan for implementation latest by 31<sup>st</sup> January each year.
- (e) The above annual outage plan shall be reviewed by SPC on quarterly in coordination with all parties and considering updated Regional outage plan and adjustments made wherever found to be necessary.
- (f) In case of emergency in the system viz., loss of generation, break down of transmission line affecting the system, grid disturbance, system isolation, the SLDC, may conduct studies again before clearance of the planned outage.
- (g) The SLDC is authorized to defer the planned outage in case of any of the following, taking into account the statutory requirements:
  - i. Major grid disturbances (Total black out in the State/Region).
  - ii. System isolation
  - iii. Partial Black out in the State
  - iv. Any other event in the system that may have an adverse impact on the system security by the proposed outage.
- (d) Generating Companies and Licensees shall plan their activities as per the latest annual scheduled outage plan finalized by the SPC (with all adjustments made to date).
- (e) All Users shall obtain the prior approval from SLDC for availing an outage.
- (f) User's requests for additional outages will be considered by SLDC to

accommodate to the extent possible.

### **53.Recovery Procedures**

- 53.1 Detailed plans and procedures for restoration of the state power grid under partial/total blackout shall be developed by SLDC in consultation with all users/SPC Secretariat and shall be reviewed / updated annually.
- 53.2 Detailed plans and procedures for restoration after partial/ total blackout of each Users' system within the state, will be finalized by the concerned user in coordination with the SLDC. The procedure will be reviewed, confirmed and/or revised once every subsequent year. Mock trial runs of the procedure for different sub-systems shall be carried out by the users at least once every six months to be coordinated by SLDC. Diesel Generator sets for black start would be tested on weekly basis and test report shall be sent to SLDC on quarterly basis.
- 53.3 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 SLDCs and shall remain always available with it.
- 53.4 The SLDC is 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.
- 53.5 All communication channels required for restoration process shall be used for operational communication only, till grid normalcy is restored.

### **54.Event Information**

#### **54.1 Introduction**

This section deals with reporting procedures in writing of reportable events in the system to all Users, STU, SLDC / ALDCs and SPC Secretariat.

#### **54.2 Objective**

The objective of this section is to define the incidents to be reported, the reporting route to be followed and information to be supplied to ensure

consistent approach to the reporting of incidents/events.

### **54.3 Scope**

This section covers all users STU, SLDC /ALDCs and SPC Secretariat.

### **54.4 Responsibility**

- a) The SLDC shall be responsible for reporting events to the State users/RLDC/SPC/RPC Secretariat.
- b) All State users, ALDCs and STU shall be responsible for collection and reporting of all necessary data to SLDC and SPC Secretariat for monitoring, reporting and event analysis.

### **54.5 Reportable Events**

Any of the following events require reporting by SLDC/ALDCs/STU/User:

- Violation of security standards.
- Grid indiscipline.
- Non-compliance of SLDC's instructions.
- System islanding/system split
- State black out/partial system black out
- Protection failure on any element of InSTS.
- Power system instability
- Tripping of any element of the State Power Grid.
- Major fire incidents
- Sudden load rejection by any User
- Loss of major generating unit
- Excessive Drawal deviations

### **54.6 Reporting Procedure**

- (a) All reportable incidents occurring in the systems of Users shall be intimated orally to the SLDC, immediately. A report in writing shall also be submitted to SLDC within one hour of the oral communication. If the reporting incident is of major nature, the initial written report may be submitted within two hours duly followed by a comprehensive report after achieving steady state conditions. In other cases, the reporting User shall submit a report within five working days to SLDC.
- (b) If the event is likely to impact the operation of the regional grid the

SLDC shall report the event orally and as soon as possible in writing to the RLDC. Wherever it is required to bring the matter to the knowledge of the RPC, SLDC may while making a written report to RLDC request RLDC for the same.

- (c) Following detail for example shall form part of the written report :
- Time and date of event
  - Location
  - Plant and/or Equipment directly involved
  - Description and cause of event
  - Antecedent conditions of load and generation, including frequency, voltage and flows in the affected area at the time of tripping including weather condition prior to the event
  - Demand and/or Generation (in MW) interrupted and duration of interruption
  - All Relevant system data including copies of records of all recording instruments including Disturbance Recorder, Event Logger, DAS etc.
  - Sequence of trippings with time.
  - Details of Relay Flags.
  - Remedial measures.
  - Estimated time of return to service,
  - Any other relevant information,
  - Name and designation of reporting officer.

## ***CHAPTER-6: SCHEDULING AND DESPATCH CODE***

### **55.Introduction**

This Chapter sets out

- (a) Demarcation of responsibilities between various Users and SLDC in scheduling and despatch.
- (b) The procedure for scheduling and despatch.
- (c) The reactive power and voltage control mechanism
- (d) Complementary commercial mechanisms (in the Annexure– 1).

### **56.Objective**

The objective of this Code is to specify the procedures to be adopted for scheduling of injections from the SSGS, imports from Inter- State Generating Stations, all inter-state & intra-state bilateral transactions and net drawals by the concerned beneficiaries on day-ahead basis and also the modality of the flow of information between SLDC, RLDC, SSGS and the beneficiaries. The procedure for submission of capacity declaration by each SSGS and submission of drawal schedule by each beneficiary is intended to enable SLDC to prepare the injection schedule for each SSGS and drawal schedule for each beneficiary in accordance with the contracts entered into between the parties. It also provides methodology of issuing real time injection / drawal instructions and rescheduling, if required, to Intra-State generating Stations and beneficiaries along with the commercial arrangement for the deviations from schedules, as well as, mechanism for reactive power pricing. The provisions contained in this chapter are without prejudice to the powers conferred on SLDC under section 33 of the Electricity Act, 2003.

### **57.Scope**

This Code shall be applicable to SLDC/ ALDCs, STU and all Users of the State Power Grid.

### **58.Demarcation of responsibilities**

58.1 SLDC shall have the total responsibility for:

- a.) Scheduling/ despatching the generation of all SSGS connected to the State Power Grid, Central Sector Generating Stations where full

share is allotted to the State and generating stations connected to both ISTS and InSTS where State has more than 50% of share

- b.) Scheduling drawals by beneficiaries from the SSGS and Central Generating Stations (within their share in the respective plant's expected capability)
- c.) Regulating the demand of the Distribution licensees and other beneficiaries in the state,
- d.) Scheduling bilateral transactions,
- e.) Rescheduling of injection / drawal schedules as per intimation received from RLDC and on the request of SSGS and or beneficiaries as well as those resulting from Transmission system failure/constraints.
- f.) Implementation of ABT procedures and restricted governor operation at power stations wherever specified under these Regulations.

58.2 The State Grid shall be operated as power pool, where system of each beneficiary shall be treated and operated as a notional control area. The algebraic summation of scheduled drawal from SSGS / ISGS and from contracts through long-term access, medium-term and short-term open access arrangements adjusted to the transmission losses shall provide the net drawal schedule of each beneficiary and this shall be determined in advance on day-ahead basis. Beneficiaries shall always endeavor to restrict their net drawal within their respective drawal schedules under the guidelines of ABT. Deviations from net drawal schedule shall be appropriately priced through the Deviation Settlement (DS) Mechanism as specified in Annexure-1.

Provided that such deviation do not cause any system parameter to deteriorate or do not lead to overloading of the transmission system.

58.3 Provided that SLDC, shall always exercise control to restrict the net drawal / injection of the users from the State Power Grid within their respective drawal / injection schedules keeping the overall deviation of the State from the Regional Grid within the limits specified by RLDC or CERC regulations, as the case may be. SLDC shall direct the beneficiaries to carry out the requisite load shedding for restricting over drawal, if any. However it shall be obligatory

on the part of the beneficiaries to act on their own and to curtail their demand in the event of frequency falling below 49.5 Hz.

- 58.4 The SLDC in consultation with STU, SSGS and beneficiaries shall regularly carry out the necessary exercises regarding short-term and long-term demand estimation for the State, to enable it to plan in advance as to how it would meet the total demand without overdrawing from the grid.
- 58.5 The SSGS shall be responsible for power generation generally according to the daily injection schedules advised to them by the SLDC, on the basis of the contracts/ requisitions received from the Distribution Licensees and/or Open Access Customers, and for proper operation and maintenance of their generating stations, such that these stations achieve the best possible long-term availability and economy.
- 58.6 The State Generating Stations shall always endeavor to restrict their injection to the State Grid within their respective ex-power plant injection schedules advised to them by the SLDC. Deviations from the ex-power plant generation schedules shall be appropriately priced through the Deviation Settlement Mechanism as specified in Annexure-1.

Provided that such deviation do not cause any system parameter to deteriorate or do not lead to overloading of the transmission system.

- 58.7 ALDC of the respective distribution licensee shall prepare the injection schedule of the Generating stations owned by the Licensee. While scheduling the injection schedule on the basis of declared capacity of the generating stations of the licensee, ALDC shall also consider the firm allocation of capacity or power provided by the other suppliers (henceforth called as firm supplier) to the licensee with same weightage along with the generating stations of the licensee following the principle of merit order dispatch/supply based on landed / summated amount of energy charge at the distribution boundary and social cost charge, if available, against each unit of injection for preparation of the injection schedule for the generating stations of the licensee and drawal schedule from its firm suppliers. In absence of separate energy charges the single part tariff will itself be considered as energy charge till two part tariff is introduced.
- 58.8 On submission of such injection schedule of generating station of the licensee and drawal schedule of the licensee prepared as per regulation 58.7 of these regulations by ALDC to SLDC, the SLDC shall check those schedules to ensure that there is no deviation from the principles of merit order dispatch/supply as

specified in the regulations 58.7 of these regulations and in case of any deviation, SLDC shall make appropriate modifications before releasing of injection and drawal schedule in pursuance to State Grid Code.

58.9 For the purpose of merit order despatch from the generating stations on N<sup>th</sup> month, SLDC/ALDC shall consider the energy charge rate of (N-2)<sup>th</sup> month. For this purpose the Generating Company or the ALDC shall submit within 25<sup>th</sup> of (N-1)<sup>th</sup> month, the energy charge rate of the generating stations for (N-2)<sup>th</sup> month before the SLDC with required adjustment for recent changes, if any, along with justification.

58.10 Notwithstanding the above, the SLDC may direct the generating stations / beneficiaries/ ALDCs/ other Users to increase /decrease their generation / drawals in case of contingencies e.g. overloading of lines / transformers, abnormal voltages, threat to system security. Such directions shall be immediately acted upon. In case the situation does not call for urgent action, and SLDC has some time for analysis, it shall check whether the situation has arisen due to deviations from schedules.

These deviations shall be got terminated first, through appropriate measure like opening of feeders, if considered necessary by SLDC, before an action, which would affect the scheduled supplies to the short-term or medium-term or long-term customers. In case of curtailment of open access transactions, guide lines as specified in the Open Access Regulations shall be followed.

In case Short-term / Medium-term open access or Long-term access are curtailed, SLDC shall submit a report to the SPC regarding the reasons to which it was not able to curtail deviations from schedule and agencies which had not taken necessary actions.

58.11 For all outages of generation and transmission system, which may have an effect on the State Power Grid, all Users shall co-operate with each other and co-ordinate their actions as per the procedures laid down by SLDC or as per the advice of SLDC in absence of such procedure. In particular, outages, which may cause restriction of generation that a beneficiary could receive (and which may have a commercial implication), shall be planned carefully to achieve the best optimization.

58.12 The beneficiaries of the SSGSs shall enter into separate joint/bilateral agreement(s) to identify their shares in SSGS projects, scheduled drawal



pattern, tariffs, payment terms etc. A copy of such agreements shall be submitted to the SLDC for being considered in scheduling and state energy accounting. Any bilateral agreements between beneficiaries for scheduled interchanges on long-term/medium-term/short-term basis shall also specify the interchange schedule, which shall be submitted in advance to SLDC.

58.13 All Users covered under ABT scheme are required to abide by the concept of frequency linked load despatch and pricing of deviations from schedule under Deviation Settlement Mechanism as per the Balancing and Settlement Code of the Commission to the extent applicable.

58.14 The SSGS shall make an advance declaration of ex-power plant MW capacities foreseen for the next day, i.e., from 0000hrs to 2400 hrs. During fuel shortage conditions the coal fired thermal generating stations shall in line with Tariff Regulation, declare the capacity for both the situations as mentioned below:

Actual Declared Capacity taking into consideration existing actual shortage in coal supply and this is to be known as declared capacity.

Notional Declared Capacity considering no shortage notionally in coal supply.

SLDC shall verify the claim of shortage of coal. The generating stations will submit such data and information as may be required by SLDC to verify the claim.

58.15 While making or revising its declaration of capacity, except in case of Run of the River (with up to three hours pondage) hydro stations and RE generators, the SSGS shall ensure that the declared capacity during peak hours is not less than that during other hours. However, exception to this rule shall be allowed in case of tripping/ re-synchronization of units as a result of forced outage of units.

58.16 It shall be incumbent upon the SSGS to declare the plant capacity faithfully, i.e., according to their best assessment. In case, it is suspected that they have deliberately over/under declared the plant capacity contemplating to deviate from the schedules given on the basis of their capacity declarations (and thus make money either as undue capacity charge or as the charge for deviations from schedule), the SLDC may ask the SSGS to explain the situation with necessary backup data.

58.17 The SSGS may be required to demonstrate the declared capacity of its generating station as and when asked by the SLDC. For coal fired thermal

generating station such demonstration shall be applicable for both actual declared capacity (normally called as declared capacity) and Notional Declared Capacity as explained in regulation 58.14 of these regulations. On a day when there is difference between Actual Declared Capacity and Notional Declared Capacity, SLDC, on the basis of request from any beneficiary or suo-moto shall mandatorily ask for at least one demonstration at a stretch of a duration of 15 minutes time block against Notional Declared Capacity where such demonstration period excludes the ramp-up and ramp down time. In the event the generating station fails to demonstrate any of such declared capacity, the capacity charges due to the generating station shall be reduced as a measure of penalty.

- 58.18 If the captive generating plant / generating station sell a portion of its power to the licensee, then the coal shortage against total installed capacity is required and the respective proportion for Notional Declared Capacity under sale to licensee will be determined as per ratio of allocation in PPA to the licensee. For such captive generating plant the demonstration is to be given for Notional Declared Capacity against total installed capacity and for that period if there is any surplus generation the licensee will consume such surplus generation. Moreover, for such declaration in such demonstration penalty will be imposed and other measures will be taken proportionately to the extent of its installed capacity which is agreed for allocation for sale to the licensee under PPA.
- 58.19 No separate cost of demonstration, will be allowed for either type of the declared capacity for a unit which is kept idle for want of demand or shortage in coal-supply. This means that, for such demonstration, corresponding capacity charge and fuel cost as determined under normative parameter as provided in tariff order will be applicable.
- 58.20 While giving notice for demonstration of Declared Capacity, to a coal fired thermal generating station SLDC shall clearly mention whether such demonstration is to demonstrate the Actual Declared Capacity or Notional Declared Capacity. In case of demonstration of Notional Declared Capacity, same demonstration will also be treated as the demonstration for Actual Declared Capacity. For generating stations other than coal fired thermal generating stations, demonstration of declared capacity means Actual Declared Capacity only.
- 58.21 During demonstration of Actual Declared Capacity or Notional Declared Capacity the actual injection will be treated as the revised schedule of injection for those

15 minutes time block and the period of ramp-up and ramp-down under which such demonstration takes place in accordance with prior intimation to all entities by SLDC about undertaking of such demonstration. The impact of such additional injection due to such demonstration will be distributed as additional drawal schedule among the purchaser of electricity of that generating station in proportion to their original drawal schedule or as per direction of SLDC where such additional generation can be scheduled for any licensee who has shortage of power or to the licensee (s) who has asked for such demonstration.

- 58.22 ABT complaint interface meters are to be installed at all interconnection points of the users who are connected to the InSTS and/or allowed access on InSTS. The responsibility of installation and maintenance of interface meters will be in line with the connection agreement specified in Regulation 39.1 of these Regulations. It shall be the responsibility of the STU to ensure installation of interface meters on all the connection points. The type of meters to be installed, metering scheme, metering capacity, testing and calibration requirements, etc. shall be as per CEA (Installation and Operations of meters) Regulations, 2006, as amended from time to time. All concerned entities (in whose premises the interface meters are installed) shall fully cooperate with the SLDC and extend the necessary assistance by taking weekly meter readings and transmitting them to the SLDC.

STU in consultation with SLDC shall, within 30 days from notification of these Regulations, develop a detail procedure for collecting and sending the weekly meter reading to the SLDC and submit it before the Commission for approval. The procedure shall specifically mention the role and responsibility of various users including STU.

- 58.23 The SLDC shall be responsible for computation of actual net MWh injection by SSGS and through bilateral trade and actual net drawal of each beneficiary, 15-minute time block wise, based on the above meter readings. The SLDC shall further be responsible for preparing Intra- State Energy Accounts as per the provisions of Balancing and Settlement Code..
- 58.24 SLDC shall periodically review the actual deviation from the despatch and net drawal schedules being issued, to check whether any of the beneficiaries/SSGS are indulging in unfair gaming or collusion. In case any such practice is detected, then matter shall be reported to the Commission.

## **59. Scheduling and Despatch procedure**

- 59.1 Each day, starting from 00.00 hours to 24.00 hours, shall be divided into 96 time blocks of 15 minutes intervals for the purposes of scheduling and despatch and energy accounting.
- 59.2 For all SSGS the station capacities and allocated / contracted shares of different beneficiaries shall be duly listed with SLDC and any changes in this regard shall be immediately informed to SLDC. Each beneficiary shall be entitled to a MW dispatch upto (foreseen ex-power plant MW capability of the block) x (beneficiary's share in the station capacity).
- 59.3 By 9.00 a.m. every day all SSGS shall advise the SLDC, the station wise ex-power plant MW capacity as foreseen for each time block of the next day i.e. from 00.00 hours to 24.00 hours of the following day. For Hydro generating station, the declaration shall be made for a period of time not less than 3 hours within a 24 hours period for pondage and storage type of stations and for the entire day for purely run-of-river type stations. For hydro-generating stations, the declaration should also include limitation on generation during specific time periods, if any, on account of restriction on water use due to irrigation, drinking water, industrial, environmental considerations, etc.
- 59.4 The SLDC shall also receive information from RLDC regarding the MW and MWh entitlements for the State beneficiaries from ISGSs for each 15 minute time blocks for the next day by 10.00 AM.
- 59.5 SLDC shall compile the above information, taking into account bilateral transactions, if any, and apportion it for the next day based on the entitlements of the beneficiaries in the State Sector Generating Stations, Inter-State Generating Stations and bilateral transactions and communicate the same to all the beneficiaries / ALDCs by 11.00 AM.
- 59.6 The beneficiaries/ ALDCs shall prepare the drawal schedule according to their foreseen load pattern and their own generating capacity for the next day (if any, from generating plants such as that owned by the beneficiary itself, Captive Plants and NCES based plants connected to their distribution system), and advise the SLDC by 1.00 PM. their drawal schedule from SSGS and ISGS and long term, short term bilateral trades in which they have shares.

Provided that where distribution licensee has its own generating stations ALDC

shall follow the principles laid down under regulation 58.7 while preparing the dispatch schedule for own generating stations and submit the same to SLDC along with its drawal schedule.

Provided further that the beneficiary / ALDC shall also show block wise projected demand under normal conditions along with reasons of restriction in drawal, if any, and its quantum.

- 59.7 SLDC shall compile the drawal schedules received from beneficiaries and determine the requirement from ISGS and injection schedule for SSGS considering the merit order despatch, ramp-up & ramp-down rate of generating stations and network conditions. SLDC shall convey by 3.00 PM. the requirement from each of ISGS to RLDC.
- 59.8 After considering the net drawal/injection schedule for the State for each 15 minute time block along with the entitlements from ISGS and all inter-state transactions, as intimated by RLDC by 6 PM each day, the SLDC shall convey by 7 PM
- a) the ex-power plant "injection schedule" to each of the SSGS in MW for each 15 minutes time block for the next day. The summation of the ex-power plant drawal schedules advised by all beneficiaries shall constitute the ex-power plant station-wise / stage-wise injection schedule for SSGS.
  - b) the "net drawal schedule" to each beneficiary, in MW for each 15 minutes time block, for the next day. The summation of the station-wise ex-power plant drawal schedules from all the SSGS/ ISGS along with any drawal from / injection to State Grid corresponding to bilateral transactions and after deducting the transmission losses (estimated), shall constitute the beneficiary-wise net drawal schedule. The 15 minute time-block wise injection schedule for the generating stations of the licensee shall be mentioned separately.
- 59.9 While finalizing the drawal and despatch schedules as above, the SLDC shall ensure that the same are operationally reasonable, particularly in terms of ramping up and ramping down rates and ratio between minimum and maximum generation. SLDC shall also check that the resulting power flows do not give rise to any transmission constraints. In case of any foreseen generation/transmission constraints, the SLDC shall moderate the schedules to the required extent, under intimation to the concerned beneficiaries/SSGS.

- 59.10 The Beneficiaries, shall inform SLDC about any modification / changes to be made in the drawal schedule or bilateral transactions or injection schedule of its own generating station, if any, to SLDC by 9.00 PM. Similarly, State Sector Generating Companies, may inform SLDC about any modification / changes in the foreseen despatch capabilities, if any, to SLDC by 9.00 PM.
- 59.11 The SLDC accordingly shall inform any modification / changes to be made in the station wise drawal schedule of ISGS and bilateral transactions, if any, to RLDC by 10.00 PM.
- 59.12 The SLDC shall finally receive from RLDC the modified 'drawal schedule' against Central allocation along with bilateral transactions, if any, by 11.00 PM.
- 59.13 The SLDC shall review and revise the despatch schedules of the SSGS and drawal schedules of the beneficiaries in the light of the modified drawal schedule received from RLDC and convey by 11.30 PM:
- i. The upto dated ex-power plant "injection schedule" to each SSGS in MW for each 15-minute time block, for the next day.
  - ii. The upto dated "net drawal schedule" to each of the beneficiary in MW for each 15-minute time block, for the next day along with the injection schedule of its embedded generating stations, if any.
- 59.14 In case of forced outage of a SSGS unit, SLDC shall revise the schedules on the basis of revised declared capacity by the SSGS. The revised declared capacity and revised schedules shall become effective from the 4th time block, counting the time block in which the revision is advised by the SSGS to be the first one.
- 59.15 In case of forced outage of an ISGS unit, SLDC shall receive revised schedule from RLDC drawn on the basis of revised declared capacity by the ISGS. The revised declared capacity and revised schedules shall become effective from the 4th time block, counting the time block in which the revision is advised by the ISGS to be the first one.
- 59.16 In the event of bottleneck in evacuation of power due to any constraint, outage, failure or limitation in the intra- State Transmission System, associated switchyard and sub- stations owned by the State Transmission Utility or any other transmission licensee involved in intrastate transmission

(as certified by the SLDC) necessitating reduction in generation, the SLDC shall revise the schedules which shall become effective from the 4th time block, counting the time block in which the bottleneck in evacuation of power has taken place to be the first one. During the first, second and third time blocks of such an event, the scheduled generation of the SSGS shall be deemed to have been revised to be equal to actual generation, and the scheduled drawals of the beneficiaries shall be deemed to have been revised to be equal to their actual drawals.

- 59.17 In the event of bottleneck in evacuation of power due to any constraint, outage, failure or limitation in the Inter- State Transmission System, necessitating reduction in generation of ISGS, the SLDC shall receive revised schedules from RLDC which shall become effective from the 4th time block, counting the time block in which the bottleneck in evacuation of power has taken place to be the first one.
- 59.18 In case of any grid disturbance, scheduled generation of all the SSGS and scheduled drawal of all the beneficiaries shall be deemed to have been revised to be equal to their actual generation/drawal for all the time blocks affected by the grid disturbance. Certification of grid disturbance and its duration shall be done by the RLDC/SLDC.
- 59.19 If any running unit(s) of Bandel Thermal Power Station's first four units go out of operation from running condition at any block of time, then from the next block of time, the generation of such generating plant shall be considered as scheduled generation upto 6<sup>th</sup> block or till revised schedule is obtained, whichever is earlier, and the injection schedule of the generating station shall be modified by SLDC accordingly.
- 59.20 Revision of declared capacity by the SSGS and drawal requisition by beneficiary (ies) during any time block shall also be permitted based on advance notice. Revised schedules/declared capacity in such cases shall become effective from the 6th time block, counting the time block in which the request for revision has been received in the SLDC to be the first one. The generating stations and the beneficiaries have to provide the reasons for revision request.

Provided that if there is load-shedding in the area of the distribution licensee, then SLDC may revise the schedule from 4<sup>th</sup> time block counting the time block in which the request for revision has been received in the SLDC to be the firstone with the consent of generator.

- 59.21 In case of revision of declared capacity by the ISGS and requisition by beneficiary (ies) during any time block shall also be permitted on intimation from RLDC. Revised schedules/declared capacity in such cases shall become effective from the 6th time block, counting the time block in which the request for revision has been received in the RLDC to be the first one. SLDC shall intimate all the State beneficiaries about such modifications in the drawal/despatch schedules and advise them to effect corresponding change in their drawal schedules.
- 59.22 If, at any point of time, the SLDC observes that there is need for revision of the schedules in the interest of better system operation, it may do so on its own, and in such cases, the revised schedules shall become effective from the 4th time block, counting the time block in which the revised schedule is issued by the SLDC to be the first one.
- 59.23 If, at any point of time, the RLDC observes that there is need for revision of the schedules in the interest of better system operation, it may do so on its own. On intimation of such revision by RLDC, SLDC shall intimate all the State beneficiaries about such modifications in the drawal/despatch schedules and advise them to effect corresponding change in their drawal schedules.
- 59.24 To discourage frivolous revisions, the SLDC may, at its sole discretion, refuse to accept schedule/capacity changes of less than two (2) percent of the previous schedule/capacity.
- 59.25 Since variation of generation in purely run-of-river hydro generating stations may lead to spillage, these shall be treated as must run stations. The maximum available capacity in each time block, duly taking into account the over load capability, shall be equal to or greater than that required to make full use of the available water of that time block.

The run-of-river hydro-generating station with pondage, storage type hydro-generating stations and pumped storage hydro-generating stations are designed to operate during peak hours to meet system peak demand. The maximum available capacity of a station declared for the day shall be equal to the installed capacity including overload capability, minus auxiliary consumption and transformation losses, corrected for the reservoir level. The ALDC/ SLDC shall ensure that generation schedules of such type of stations are prepared and the



stations dispatched for optimum utilization of available hydro energy except in the event of specific system requirements/constraints.

#### 59.26 Wind and Solar generators

- a) Wind and solar generators connected to STS shall mandatorily provide to the SLDC, in a format as prescribed by SLDC, the technical specifications at the beginning and wherever 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. In case of wind and solar generators (including rooftop PV solar plants) connected to distribution licensee and sales its power to the distribution licensee they shall submit their above mentioned information to respective ALDC.
- b) Forecasting shall be done by wind and solar generator as well as the SLDC / ALDC as the case may be. The SLDC / ALDC may engage forecasting agency (ies) and prepare a schedule for such generating stations. The forecast by the SLDC / ALDC shall be with the objective of ensuring secure grid operation. The forecast by the wind and solar generator shall be generator centric. The wind and solar generation which are connected with STS will have the option of accepting SLDC's forecast for preparing its schedule or provide the SLDC with a schedule based on its own forecast. Any commercial impact on account of deviation from schedule based on the forecast chosen by the wind and solar generator shall be borne by it.
- c) The schedule by wind and solar generators who are connected with STS (excluding collective transactions) may be revised by giving advance notice to the SLDC, as the case may be. Such revisions shall be effective from 4<sup>th</sup> time block, the first being the time-block in which the notice was given. There may be one revision for each time slot of one and half hours starting from 00:00 hours of a particular day subject to maximum of 16 revisions during the day.
- d) The schedule of wind and solar generators who are connected to any distribution licensee network and whose power is purchased by the same distribution licensee shall be prepared by the ALDC based on availability forecasted by the generators or ALDC as per the PPA entered between them. ALDC shall revise the schedule suo-motu or on advance notice from the generators based on revised availability, if any. ALDC may, if required, ask SLDC to revise its net drawal schedule from the Grid. However, in all cases ALDC shall restrict its net drawal / injection from the State Grid within

its net drawal schedule. Commercial settlement between distribution Licensee and wind and solar generation in case of any mismatch will be dealt as per PPA entered between them.

- e) The schedule of solar generators shall be based on availability of the generator, weather forecasting, solar insolation/ irradiance, season and normal solar generation curve, etc.

59.27 For infirm power the generating stations shall give a 15 minute time-block wise tentative schedule of injection to beneficiary which shall be adjusted to its actual injection during the day while preparing the final net drawal schedule of the beneficiary.

59.28 Generation schedules and drawal schedules issued / revised by the SLDC shall become effective from designated time block irrespective of communication success.

59.29 For any revision of scheduled generation, including post facto deemed revision; there shall be a corresponding revision of scheduled drawals of the beneficiaries.

59.30 A procedure for recording the communication regarding changes to schedules duly taking into account the time factor shall be evolved by SLDC in consultation with STU and Users.

59.31 When for reason of transmission constraints e.g. congestion or in the interest of grid security, it become necessary to curtail power flow on a transmission corridor, the exchanges already scheduled may be curtailed by the SLDC. In the process the Short-term customers shall be curtailed first followed by the medium-term customers, which shall be followed by the long-term customers and among the customers of a particular category, curtailment shall be carried out on pro-rata basis.

59.32 After the operating day is over at 2400 hours, the provisional final schedule for the day (taking into account all before-the-fact changes in despatch schedule of generating stations and drawal schedule of the Users/ beneficiaries) shall be issued by SLDC by 6:00 A.M. of the next day.

59.33 SLDC shall properly document all above information i.e. station-wise foreseen ex-power plant capabilities advised by the generating stations, the drawal schedules advised by beneficiaries, all schedules issued by the SLDC,

and all revisions/updating of the above.

59.34 The provisional final schedules issued by SLDC, shall be open to all users for any checking/verification, for a period of 3 days. In case any mistake/omission is detected, SLDC shall forthwith make a complete check and rectify the same and issue the Final Schedule by the fifth day. These final schedules shall be the datum for commercial accounting.

59.35 SLDC shall assign suitable functions to the ALDCs (established across the State) to help it in discharge of its different functions under section-32 of the Electricity Act-2003 including scheduling and despatch.

59.36 SLDC shall develop the formats for scheduling and modify the same as and when required in consultation with SPC and put before the Commission for approval. Such approved forms will be used for all Scheduling and Despatching purpose.

59.37 While availability declaration by SSGS may 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, to have a resolution of 0.01 MW.

Note: Any change in the schedule by SLDC shall be intimated to all the Beneficiaries, SSGS and RLDC as may be necessary.

## **60. Reactive Power and Voltage Control**

60.1 Reactive power compensation should ideally be provided locally, by generating reactive power as close to the reactive power consumption as possible. The beneficiaries are therefore expected to provide local reactive power compensation/generation such that they do not draw reactive power from the EHV grid, particularly under low-voltage condition. However, considering the present limitations, this is not being insisted upon. Instead, to discourage reactive power drawals by Beneficiaries connected to the State Power Grid, reactive power exchanges among beneficiaries shall be priced as follows:

- The Beneficiary pays for reactive power drawal when voltage at the metering point is below 97%
- The Beneficiary gets paid for reactive power return when voltage

is below 97%

- The Beneficiary gets paid for reactive power drawal when voltage is above 103%
- The Beneficiary pays for reactive power return when voltage is above 103%.

Provided that there shall be no charge/payment for reactive power drawal / return by a Beneficiary on its own line emanating directly from a generating station.

- 60.2 The charge/payment for reactive power, shall be at a nominal paise/kVARh rate as may be specified by the Commission from time to time, and will be between the Beneficiary and the State Reactive Pool Account operated by SLDC for reactive power interchanges.
- 60.3 Notwithstanding the above, SLDC may direct a beneficiary to curtail its reactive power drawal/injection in case the security of grid or safety of any equipment is endangered.
- 60.4 In general, the Beneficiaries shall endeavour to minimize the reactive power drawal at an interchange point when the voltage at that point is below 95% of rated, and shall not inject reactive power when the voltage is above 105%. ICT taps at the respective drawal points may be changed to control the reactive power interchange as per a Beneficiary's request to the SLDC or suo-motu by the SLDC, but only at reasonable intervals as may be decided by the SLDC.
- 60.5 Switching in/out of all reactive compensatory devices throughout the State Power Grid shall be carried out in accordance with SLDC. Tap changing on all ICTS at 400 KV/ 220 kV/ 132 kV/ 66kV buses shall also be done as per SLDC's instructions only.
- 60.6 The SSGS shall generate/absorb reactive power as per instructions of SLDC, within capability limits of the respective generating units, that is without sacrificing on the active generation required at that time. No payments shall be made to the generating companies for such reactive power generation/absorption.
- 60.7 Reactive power exchange directly between two Beneficiaries on the interconnecting lines owned by them (singly or jointly) generally address or cause a local voltage problem, and generally do not have an impact on the

voltage profile of the State grid. Accordingly, the management/control and commercial handling of the reactive power exchanges on such lines shall be as per following provisions, on case- by-case basis:

- i) The two concerned Beneficiaries may mutually agree not to have any charge/payment for VAr exchanges between them on an interconnecting line.
- ii) The two concerned Beneficiaries may mutually agree to adopt a payment rate/scheme for VAr exchanges between them identical to or at variance from that specified by WBERC for VAr exchanges on Intra State Transmission System. If the agreed scheme requires any additional metering, the same shall be arranged by the concerned Beneficiaries.
- iii) In case of a disagreement between the concerned Beneficiaries (e.g. one party wanting to have the charge/payment for VAr exchanges, and the other party refusing to have the scheme), the scheme as specified in Annexure-2 shall be applied. Per kVArh rate shall be as specified by WBERC for VAr exchanges on Intra State Transmission System.
- iv) The computation and payments for such VAr exchanges shall be effected as mutually agreed between the two Beneficiaries.

## **CHAPTER -7: MISCELLANEOUS**

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### **61. Determination of Transmission Loss**

The summation of all inflows at any 15 minute time block recorded in special energy meter (also termed as interface meter) at the connection points of the STS with generating stations, distribution licensees and interconnection point with CTU and other entities gives the total inflow into the STS for that time block. Similarly, the summation of all outflow at any 15 minute time block recorded in special energy meter (also termed as interface meter) at the connection points of the STS with generating stations, distribution licensees and interconnection point with CTU and other entities gives the total outflow into the STS for that time block. The difference between the total inflow and outflow of any particular time block is the transmission loss for that particular time block. SLDC shall based on the interface meter data determine the transmission loss for each 15 minute time block and derive the average transmission loss percentage (%) for the week. Such average transmission loss percentage shall be published by SLDC along with weekly Deviation Settlement Account and this percentage transmission loss shall be considered while determining the drawal schedule for the beneficiaries / distribution licensees for the coming week. Till all the interconnection points are metered and data are available with SLDC, several load flow studies representing different load conditions covering at least three seasons and three hours of the day may be carried out to determine the transmission loss for scheduling purpose.

### **62. Review of performance of State Grid**

The State Power Committee shall be review the performance of the State Grid in line with various provisions of the WBEGC at least once in every twelve (12) months or as may be directed by the Commission and upon completion of the review SPC shall send a report to the Commission.

### **63. Power to Amend**

The Commission may, at any point of time, at its sole discretion, vary, alter, modify, add or amend any provisions of these Regulations.

### **64. Power to remove difficulties**

If any difficulty arises in giving effect to any of the provisions of these Regulations, the Commission may, with reasons to be recorded in writing, by

general or special order, make such provisions not inconsistent with the provisions of the Act, as may appear to be necessary for removing the difficulty.

#### **65.Power to dispense with Regulations**

Nothing in these Regulations shall be deemed to limit or otherwise affect the inherent powers of the Commission to make such orders as may be necessary for meeting ends of justice or to prevent the abuse of the process of the Commission

#### **66.Repeal and Savings**

The West Bengal Electricity Regulatory Commission (West Bengal Electricity Grid Code) Regulations, 2007 issued under Notification No. 34/WBERC dated 4<sup>th</sup> April 2007 and published in the Kolkata Gazette, Extraordinary on 4<sup>th</sup> April 2007, with all its amendments is hereby repealed. Notwithstanding such repeal, anything done or any action already taken under the repealed Regulations, shall in so far as it is not inconsistent with the West Bengal Electricity Regulatory Commission (State Electricity Grid Code) Regulations, 2017, be deemed to have been done or taken under the corresponding provisions of the West Bengal Electricity Regulatory Commission (State Electricity Grid Code) Regulations, 2017.

Place: Kolkata  
Date: XX. XX. 2017

By order of the Commission

Secretary of the Commission

## ***Annexure-1 COMPLEMENTARY COMMERCIAL MECHANISMS***

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**(Refer Regulation 55)**

1. The beneficiaries shall pay to the respective SSGS, Capacity charges corresponding to plant availability and Energy charges for the scheduled despatch, as per the relevant notifications and orders of WBERC. The respective Generating Stations shall issue the bills for these charges to each beneficiary on monthly basis based on State Energy Accounts prepared by SLDC following the procedure mentioned in Balancing and Settlement Code.
2. The sum of the above two charges from all beneficiaries shall fully reimburse the SSGS for generation according to the given despatch schedule. In case of a deviation from the despatch schedule, the concerned SSGS shall be additionally paid for excess generation through the Deviation Settlement (DS) Mechanism. In case of actual generation being below the given despatch schedule, the concerned SSGS shall pay back through the Deviation Settlement (DS) Mechanism for the shortfall in generation.
3. The summation of station-wise ex-power plant despatch schedules from each generating station and any bilaterally agreed interchanges of each beneficiary shall be adjusted for transmission losses, and the net drawal schedule so calculated shall be compared with the actual net drawal of the beneficiary. In case of excess drawal, the beneficiary shall be required to pay through the Deviation Settlement (DS) Mechanism for the excess drawal of energy. In case of underdrawal, the beneficiary shall be paid back through the Deviation Settlement (DS) Mechanism, for the energy not drawn.
4. The summation of all inflows at any 15 minute time block recorded in special energy meter (also termed as interface meter) at the connection points of the STS with generating stations, distribution licensees and interconnection point with CTU and other entities gives the total inflow into the STS for that time block. Similarly, the summation of all outflow at any 15 minute time block recorded in special energy meter (also termed as interface meter) at the connection points of the STS with generating stations, distribution licensees and interconnection point with CTU and



other entities gives the total outflow into the STS for that time block. The difference between the total inflow and outflow of any particular time block is the transmission loss for that particular time block. SLDC shall based on the interface meter data determine the transmission loss for each 15 minute time block and derive the average transmission loss percentage (%) for the week. Such average transmission loss percentage shall be published by SLDC along with weekly Deviation Settlement Account and this percentage transmission loss shall be considered while determining the drawal schedule for the beneficiaries / distribution licensees for the coming week. Till all the interconnection points are metered and data are available with SLDC, several load flow studies representing different load conditions covering at least three seasons and three hours of the day may be carried out to determine the transmission loss for scheduling purpose.

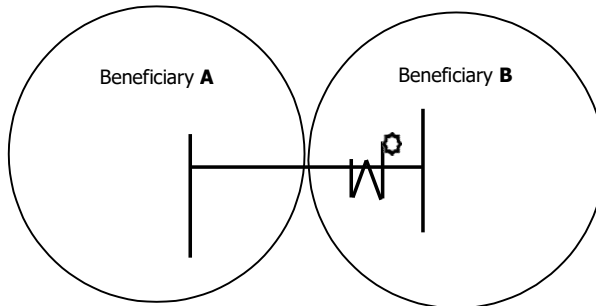
5. State Energy Accounts shall be prepared on monthly basis and the statement of Deviation Settlement charges shall be prepared by the SLDC on a weekly basis considering the detailed provisions under Balancing and Settlement Code.
6. The SLDC shall also issue the weekly statement for VAr charges as per the procedures detailed in Balancing and Settlement Code, to all Beneficiaries who have a net drawal/injection of reactive energy under low/high voltage conditions from such date as specified by the Commission through notifications/ order.
7. The SLDC shall table the complete statement of State Deviation Settlement account and the State Reactive Energy account before the SPC along with a reconciliation statement, on a quarterly basis.
8. All 15-minute energy figures (net scheduled, actually metered and DS) shall be rounded off to the nearest 0.01 MWh.

## ***Annexure-2 : PAYMENT FOR REACTIVE ENERGY EXCHANGES***

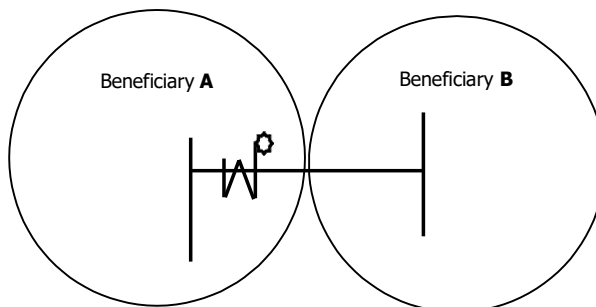
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### **PAYMENT FOR REACTIVE ENERGY EXCHANGES ON LINES OWNED BY BENEFICIARIES (refer section 6.6.7(iii))**

**Case – 1:** Interconnecting line owned by Beneficiary-A  
Metering Point : Substation of Beneficiary -B



**Case – 2:** Interconnecting line owned by Beneficiary -B  
Metering point : Substation of Beneficiary -A



Beneficiary -B pays to Beneficiary -A for

- (i) Net VARh received from Beneficiary -A while voltage is below 97%, and
- (ii) Net VARh supplied to Beneficiary -A while voltage is above 103%

Note: Net VARh and net payment may be positive or negative

**Case – 3:** Interconnecting line is jointly owned by Beneficiary -A and -B.  
Metering points : Substations of Beneficiary -A and Beneficiary -B

Net VARh exported from S/S-A, while voltage < 97% = X1

Net VARh exported from S/S-A, while voltage > 103% = X2

Net VARh imported at S/S-B, while voltage < 97% = X3

Net VARh imported at S/S-B, while voltage > 103% = X4

- (i) Beneficiary -B pays to Beneficiary -A for X1 or X3, whichever is smaller in magnitude, and
- (ii) Beneficiary -A pays to Beneficiary -B for X2 or X4, whichever is smaller in magnitude.

Note:

- i. Net VARh and net payment may be positive or negative.
- ii. In case X1 is positive and X3 is negative, or vice-versa, there would be no payment under (i) above.
- iii. In case X2 is positive and X4 is negative, or vice-versa, there would be no payment under (ii) above.

