Jharkhand State Electricity Regulatory Commission

DRAFT JHARKHAND ELECTRICITY REGULATORY COMMISSION

(STATE GRID CODE) REGULATIONS 2006

No. [ ]- In exercise of the powers conferred by clause (zp) of section 181 read along with clause (h) of section 86 of the Electricity Act, 2003 (36 of 2003), and all other powers enabling on that behalf the Jharkhand State Electricity Regulatory Commission hereby makes the following regulations, namely:-

1 Short title, extent and commencement

1.1 These Regulations may be called the Jharkhand State Electricity Regulatory Commission (State Grid Code) Regulations, 2006. : (JSGC-2006 in short).

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

1.3 These Regulations shall come into force from the date of their publication in the Official Gazette.

1. Introduction

1.1 The State Grid Code lays down the rules, guidelines and standards to be followed by various agencies and participants in the Jharkhand State Electricity Grid to plan, develop, maintain and operate the state grid system, in the most efficient, reliable, and economic manner, while facilitating a healthy competition in the generation and supply of electricity.

1.2 This State Grid Code contains the following parts, namely:

Part A: General- This part deals with the scope and application of these regulations and constitutions, powers and functions of Grid Coordination Committee.

Part B: Planning Code - This Code specifies the principles, procedures and criteria that shall be used in planning and development of Jharkhand State Grid System.

Part C: Connection Code- Connection Code specify the minimum technical and design criteria that shall be complied with by a Transmission Licensee and User connected to or seeking connection to the State Grid including conditions, principles and procedures for same.

Part D: Operating Code - This Code describe the conditions under which the State Load Despatch Centre shall operate the State Grid System and under which Users shall operate their facilities, to maintain the security and reliability and economy of Grid operation of the State Grid System, under both normal and abnormal operating conditions and operating principles, procedures and practices for the same.

Part E: Scheduling and Despatch Code – Scheduling and Despatch Code deals with the principles and procedures to be adopted for Scheduling and Despatch Code for generation and supply of electricity in the State of Jharkhand on daily basis and flow of information between State Generators, Users, Licensees, SLDC and RLDC.

Part F: Commercial Code- This part deals with the commercial mechanism complimentary to Scheduling and Despatch for settlement of account between the concerned parties.

Part G: Miscellaneous Code - This part deals with miscellaneous aspects including compliance requirement with the State Grid Code and dispute resolution etc.

2 Definitions

2.1 In these Regulations unless the context otherwise requires:

(a) "**ABT**" means Availability Based Tariff.

(b) "**Act**" means the Electricity Act, 2003 (36 of 2003), including amendments thereto.

(c) "**Agency**" A term used in various section of Jharkhand State Electricity Grid Code (JSGC).

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

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

(f) **"Captive generating plant"** means a power plant set up by any person to generate electricity primarily for his own use and includes a power plant set up by any co-operative society or association of persons for generating electricity primarily for use of members of such cooperative society or association.

(g) "**Commission**" means the Jharkhand State Electricity Regulatory Commission.

(h) **"Connection Point"**: means a point at which a User's generation/supply or Transmission Licensee's Plant and/or Apparatus connects to the State Grid system.

(i) "**Constituent**":: All Licensee of the State including deemed licensee, all the State generating stations including captive generating stations, IPPs and Non Conventional Energy Sources: STU, and open access consumers.

(j) "**Continuous rating": means** the normal rated full Load out put capacity of Generating Unit which can be sustain on continuous basis at a specified conditions.

(k) **"df/dt Relay": means** a relay which operates when the rate of change of system frequency (over time) goes higher than a specified limit and provides command for load management.

(l) **"Disturbance Recorder": means** a device provided to record the behavior of the pre-selected digital and analog values of the system parameters.

(m) **"Data Acquisition System"**: means a device provided to record the sequence of operation in time, of the relays/equipments/system parameters at a location.

(n) **"DVC": means** – Damodar Valley Corporation – a deemed licensee as provided in the section 14 proviso 4 of the

Electricity Act 2003.

(o) **"Event":** means an unscheduled or unplanned occurrence in the State Grid System including faults, incidents and breakdowns.

(p) **"Event Logger":** means a device provided to record the sequence of operation in time, of the relays/ equipments at a location during an Event.

(q) **"Fault Locator":** means a device provided in transmission line to measure/indicate the distance at which a line fault may have occurred.

(r) "**Forced Outage":** means an outage of Generating Unit or Transmission Facility due to a fault or other reasons which has not been planned.

(s) **"Flexible Alternating Current Transmission (FACT)"**: means facilities that enable power flows on A.C. lines to be regulated, to control loop flows, line loading etc.

(t) **"Grid":** means the high voltage backbone system of interconnected Transmission lines Sub-stations and Generating Plants.

(u) **"Generating Company":** means any company or body corporate of association of body individuals, whether incorporated or not or artificial judicial person, which owns or operates or maintains a Generating Station.

(v) **"Generating Unit"**: means an electrical Generating Unit coupled to a turbine within a power station together with all plant and apparatus within a power station (Up to the connection point) which relates exclusively to that turbo-Generator.

(w) **"Governor Droop":** In relation to the operation of the Governor of Generating Unit means the percentage droop in system frequency which would cause the Generating Unit under free Governor action to change its output from Zero to full load.

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

(y) "**Inter –State Transmission system**": includes-

(i) any system for the conveyance of electricity by means of main transmission line from the territory of one State to another State

(ii) the conveyance of electricity across the territory of an intervening State as well as conveyance within the State which is incidental to such inter-State transmission of electricity.

(iii) The transmission of electricity within the territory of a State on a system built, owned, operated, maintained or controlled by Central Transmission Utility. "Intra-State Transmission system"- copy from Act.

(z) **"Intra-State Transmission System"**: means any system for transmission of electricity by other than an inter-State Transmission system.

(aa) **"JSEB"**- Jharkhand State Electricity Board or its unbundled organizations as provided in section 172 of the Act.

(ab) "**Load Control Centre**" means the facilities of Generating company/Licensee/Users set up to supply and control of load.

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

(ad) **"Licensee"** means a person who has been granted Licensee under section 14.

(ae) "**Single Line Diagram**" means diagrams which are a schematic representation of the LT/HV/EHV apparatus and the connections to all external circuits at a Connection Point incorporating its numbering nomenclature and labeling.

(af) "**Site Common Drawing**" means drawings prepared for each Connection Point, which incorporates layout drawings, electrical layout drawings, single line diagram common protection/control drawings and common service drawings.

(ag) "**Spinning Reserve**" means generating capacity with some reserve margin, at standard rated frequency of 50 Hz, that is synchronized to the system and is ready to provide increased generation at short notice pursuant to dispatch instruction or instantaneously in response to a frequency drop.

(ah) **"State Generating Station"** All generating Station in the state of Jharkhand connected to State Grid.

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

(aj) "**STU**" mean State Transmission utility – "State Transmission Utility" means the Government company/entity specified as such by the State Government under sub-section (1) of section 39.

(ak) "**Under Frequency Relay"** means a relay which operates when the system frequency falls below a specified limit and initiates commands for system operation to achieve stability.

(al) "**User**" means persons, including State Generating Stations, Distribution Licensees Consumers of the Distribution Licensees directly connected to intra-State Transmission System and persons availing of Open Access, who are connected to and/or use the intra-State Transmission System. Words or expressions used herein and not defined shall have the meanings assigned to them under the Act.

3. PART A: GENERAL

3.1 Scope of regulation and extent of application

These regulations shall apply to-

(1) The State Load Despatch Centre;

(2) State Transmission Utility;

(3) Intra-State Transmission Licensee;

(4) Generating Stations in the State;

(5) User who is connected to and/or uses the State Electricity Grid;

Provided that the Commission may issue directions relieving any Transmission Licensee or User, either suo-motu or based on

an application submitted by such Transmission Licensee or User, of their obligations to implement or comply with the State Grid Code to the extent as may be stipulated in the directions:

3.2 Transmission Licensee and User having connections to the State Grid system as on date of notification of these Regulations shall be given a maximum period of one year to comply with the following requirements under these Regulations:

(i) Entering into a connection agreement in accordance with Section 14;

(ii) Developing Site Responsibility Schedules in accordance with Section 19.2.2;

(iii) Developing Single Line Diagrams in accordance with Section 19.3.1; and

(iv) Developing Site Common Drawings in accordance with Section 19.4.2.

3.3 The date of applicability of provisions related to Free Governor Action, as provided in Section 22.9, Section 22.10, Section 22.11 and Section 22.12 of these Regulations, shall be consistent with relevant provisions as provided in the Grid Code specified by Central Electricity Regulatory Commission under clause (h) of Section 79 of the Act.

4 State Grid Code

4.1 The Commission shall put up a copy of the State Grid Code on its Internet website and make available, through State Load Despatch Centre and State Transmission Utility, a copy of State Grid Code to any person requesting it, at a price not exceeding the reasonable cost of reproducing it.

4.2 The Commission shall make available a copy of the notified State Grid Code to the State Load Despatch Centre and State Transmission Utility for it to be put up on the Internet websites of State Load Despatch Centre and State Transmission Utility respectively.

5 Grid Coordination Committee

5.1 A Grid Coordination Committee shall be constituted by the Commission within sixty (60) days from the date of notification of these Regulations.

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

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

(ii) facilitating operational coordination including coordination of relay planned outage and maintenance among members i.e. SLDC, STU, State Generating Station ,Licensee and Users.

(iii) facilitating all functions of planning of Intra-State Transmission system including planning for maintaining proper voltage by re-active compensation.

(iv) evolving consensus on all issues relating to secure, reliable and economic operation of the State Grid.

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

(vi) facilitating commercial coordination among members including State level Energy Accounting with the

consent of all the members.

(vii) such other matters as may be directed by the Commission from time to time.

5.3 The decision of the Grid Coordination Committee arrived by consensus regarding operation of State Grid and Scheduling and Despatch of electricity will be followed by SLDC subject to direction of JSERC, if any.

5.4 The Grid Coordination Committee shall comprise of the following members:

(a) One member from State Transmission Utility;
(b) One member of the State Load Despatch Centre;
(c) One member to represent each generating company in the State;
(d) One member to represent each Transmission Licensee in the State, other than the State Transmission Utility;
(e) One member to represent each Distribution Licensee in the State;
(f) One member to represent each Intra-State Trading Licensee;
(g) Such other persons as may be nominated by the Commission.

Provided that the member from State Transmission Utility shall be the Chairperson of the Committee:

Provided that the representative of State Load Despatch Centre shall be Convener of the Grid Coordination Committee:

Provided further that the State Transmission Utility shall, in coordination with State Load Despatch Centre, facilitate and manage the functioning of the Grid Coordination Committee.

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

(i) the concerned Chairperson or Director of State Transmission Utility, having the responsibility of looking after technical activities of State Transmission Utility shall be the member referred to in clause (a) of Section 5.3 above;

(ii) the member referred to in clause (b) of Section 5.3 above shall be the head of State Load Despatch Centre;

(iii) the members referred to in clauses (c), (d), (e), (f) and (g) of Section 5.3 above shall be nominated by their respective organizations.

Provided that the members nominated by each of the organization to the above Committee shall be holding very senior position in their respective organization and would be from Engineering discipline. Members can co-opt another eligible person from same group to support/ substitute during his absence.

6. Meeting of the Grid Coordination Committee.

6.1 Grid Coordination Committee shall meet at least once every month with pre-notified Agenda.

6.2 Grid Coordination Committee shall send a Grid Code review report to the Commission at least once every six months for initial three years providing information regarding:

(a) Difficulty/inconsistency discovered in implementation of the provisions of this Regulation.

(b) Any proposed revisions to the State Grid Code.

7. State Load Despatch Centre shall discharge the functions assigned to it under the provisions of the Act and these Regulations in an independent and unbiased manner:

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

PART B: PLANNING CODE

8. Transmission System Planning

8.1 The nodal agency for planning of State Transmission System shall be STU.

8.2 The State Transmission Utility shall publish on its Internet website the transmission system plan for the Intra-State Transmission system and shall also make the same available to any person upon request for making investment/connection decision. STU shall also co-ordinate development of inter-state transmission system passing through or related to state of Jharkhand through CTU.

8.3 The transmission system plan shall cover a plan period of five (5) years commencing from the financial year immediately following the year in which this regulation is published:

Provided that the transmission system plan shall be updated by the State Transmission Utility each year and published in the manner specified in Regulation 8.1 by the 30th day of September each year and shall cover a plan period of five (5) years commencing from the financial year immediately following the year in which it is published.

Provided that inter-state transmission system and intra-state transmission system shall be developed to complement and supplement each other with reference to the State Grid.

8.4 As per JSERC Regulations for providing Open Access in Intra-State Transmission System, the nodal agency providing long term Transmission Access shall be STU and for short term Transmission Access the nodal agency shall be SLDC.

8.5 The transmission system plan shall describe the plan for the Intra-State Transmission System and shall include the proposed Intra-State transmission schemes and system strengthening schemes for the benefit of all Users, grid stability and grid efficiency.

Provided that the transmission system plan should include information related not only to intra-State Transmission lines but also additional equipment including transformers, capacitors, reactors, Static VAR Compensators and Flexible Alternating Current Transmission Systems: Provided further that the transmission system plan shall also include information on progress achieved on the identified intra-State transmission schemes and system strengthening schemes.

8.6 The State Transmission Utility may, for the purpose of preparing the transmission system plan under these Regulations, seek such information as may be required by it, including generation capacity addition, inter-state transmission system plan covering State of Jharkhand and neighboring States, system augmentation and long-term load forecast and all applications for long term Open Access in State Transmission networks:

Provided that the State Transmission Utility shall consider, but not be bound by, the information provided under this Regulation in preparing the transmission system plan.

8.7 The State Transmission Utility shall also consider the following for the purpose of preparing the transmission system plan under these Regulations –

(i) Plans formulated by the Authority for the transmission system under the provisions of clause (a), (b),(c) of Section 73 of the Act;

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

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

(iv) Transmission Plan formulated by Central Transmission Utility.

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

(vi) Recommendations/ inputs, if any, of the Regional Power Committee and Grid Coordination Committee.

(vii) Reports on National Electricity Policy which are relevant for development of intra-State Transmission System; and

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

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

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

9 Planning Criterion

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

Provided that State Transmission Utility shall carry out appropriate system studies while developing the transmission system plan in consultation with CTU/Authority.

9.2 The State Grid System, as a general rule, shall be capable of withstanding and be secured against the following contingency outages without necessitating load shedding or rescheduling of generation during Steady State Operation:

(i) Outage of a 110kV/132kV D/C line or,

(ii) Outage of a 220kV D/C line or,

(iii) Outage of a 400kV S/C line or,

(iv) Outage of a single Interconnecting Transformer.

Provided that the above contingencies shall be considered assuming a pre-contingency system depletion (planned outage) of another 132 Kv D/C line or 220kV D/C line or 400kV S/C line in another corridor and not emanating from the same substation.

9.3 All the Generating stations may operate within their reactive capability curves and the network voltage profile shall be maintained within voltage limits specified.

9.4 The Intra-State Transmission System shall be capable of withstanding the loss of most severe single infeed without loss of stability.

9.5 Any one of the events defined in the Section 9.2 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 intra-State Transmission System elements.

9.6 In all substations (110kV/132kV and above), at least two transformers shall be provided.

9.7 State Transmission Utility shall carry out planning studies for Reactive Power compensation of State Grid System including reactive power compensation at the State Generating Station's switchyard.

10 Planning Data

10.1 Transmission Licensees and Users are to supply following types of data to the State Transmission Utility for purpose of developing the transmission plan:

(i) Standard Planning Data;

(ii) Detailed Planning Data

10.2 Standard Planning Data

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

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

(a) Preliminary project planning data;

(b) Committed project planning data; and

(c) Connected planning data.

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

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

10.3 Detailed Planning Data

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

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

10.3 Schedule of Assets.

STU shall submit annually to JSERC by 30th September each year a schedule of Assets of State Grid giving details of transmission lines, State Generating Stations, their ownership with basic capacity & production/utilization details and list of distribution licensee & bulk consumers giving details of annual power, active & reactive energy drawl.

10.4 **Implementation of Transmission Plan** The actual programme of implementation of Transmission lines, interconnecting Transformers, substations, Reactors/capacitors and other Transmission elements will be determined by STU in consultation with concerned agencies. The completion of these works/Projects in the time frame, shall be ensured by STU through proactive actions through concerned agencies.

PART C: CONNECTION CODE.

11 The applicable technical standards for construction of electrical plants and electric lines connected to the State Grid system shall be as per the standards notified by the Authority under clause (b) of Section 73 of the Act.

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

12.0 Objective and Scope

12.1 Objective

The connection codes are designed to ensure that

(a) The basic rules for connection are complied with to treat all agencies in a non-discriminatory manner.

(b) Any new or modified connection when established shall neither suffer unacceptable effects due to its connections to State Transmission Grid nor impose unacceptable effects on any other agency. Harmonisation of State Grid with connected agency for efficient grid operation would be the aim to be achieved.

(c) Responsibility and ownership of equipment shall be clearly specified in a schedule (standard life responsibility schedule) for every connection point. Minimum deviations would be permitted from standards so that clarity of scope remains near the set standards. Deviations, if any, from standards shall be clearly brought out in the site responsibility schedule by STU.

12.2 Scope

The connection condition shall apply to all constituents, STU, CTU, State Generating Stations and any other agency/licensee connected to or involved in developing the State Grid and SLDC. This connection Code also applies to all agencies, which are planning to generate/Transmit and/or are generating/Transmitting energy to/from State Transmission Grid.

13 Application for connection

13.1 Application for establishing new arrangement or modifying existing arrangement of connection to and/or use of the State Grid System shall be submitted by the concerned Transmission Licensee, State Generating Stations or User to the State Transmission Utility:

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

Provided further that the prospective users shall be required to pay to the Steam/Transmission Licensees the charges as approved by the Commission, for the purpose of conducting initial inter connection studies, any additional studies as well as processing the application.

13.2 The application mentioned in Section 13.1 shall include the following details:

(a) Report stating the purpose of the proposed connection and/or modification, transmission licensee to whose system connection is proposed, description of apparatus to be connected or modification of the apparatus already connected and beneficiaries of the proposed connection;

(b) Construction schedule and target completion date; and

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

Provided that the applicant shall supply any further details/information as required by State Transmission Utility.

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

13.4 The State Transmission Utility shall, within Thirty (30) days, from the receipt of an application under Regulation 13.1 and after considering all suggestions and comments received by the parties identified under Regulation 13.3: make a formal offer the applicant setting out the requirements, procedures, terms and conditions including connection agreement to be entered into.

13.5 Upon compliance of the required terms and conditions of offer by the concerned Transmission Licensee/ User, State Transmission Utility shall notify the concerned Transmission Licensee/User that it can be connected to the State Grid System.

14. Connection Agreement

14.1 Connection Agreement shall include (but not limited to), as appropriate, within its terms and conditions, the following information relating to the connection of the User or Transmission Licensee to the State Grid system:

(a) A condition requiring both parties to comply with the State Grid Code;

(b) Details of connection, technical requirements and commercial arrangements;

(c) Details of any capital expenditure arising from necessary reinforcement or extension of the system and demarcation of the same between the concerned parties;

(d) Site Responsibility Schedule;

(e) General philosophy and guidelines on protection;

(f) Protection systems;

(g) System recording instruments;

(h) Communication facilities; and

(i) Any other details considered appropriate by the State Transmission Utility or the Commission.

15 Grid Parameter Variations

15.1 General

15.1.1 Transmission Licensees and Users shall ensure that Plant and Apparatus requiring service from or providing service to the State Grid System is of such design and construction that satisfactory operation of such Plant and Apparatus will not be prevented by normal instantaneous variation in Grid operational parameters.

15.2 Frequency Variation

15.2.1 Rated frequency of the system shall be 50.0 Hz and shall normally be controlled within the limits as per regulations /standards specified by Authority.

15.3 Voltage Variation

15.3.1 The variations of voltage may not be more than the voltage range specified in the regulations/Standards framed by Authority.

16 Equipment at Connection Points

16.1 Sub-station Equipment

16.1.1 All EHV/High/LT tension sub-station equipments shall comply with Bureau of Indian Standards/International Electro Technical Commission.

16.1.2 All equipment shall be designed, manufactured and tested and certified in accordance with the quality assurance requirements as per the standards of International Electro Technical Commission / Bureau of Indian Standards.

16.1.3 Each connection between a User and intra-State Transmission System shall be controlled by a circuit breaker appropriate of short circuit with stand capability and interrupting capacity, at the connection point, as advised by State Transmission Utility in the specific Connection Agreement.

16.2 Fault Clearance Times

16.2.1 The fault clearance time for primary protection schemes, for a three phase fault (close to the bus-bars) on Users' equipment directly connected to intra-State Transmission System and for a three phase fault (close to the bus-bars) on intra-State Transmission System connected to Users' equipment, shall not be more than:

(a) 100 milli seconds for 800 kV class & 400 kV

(b) 160 milli seconds for 220 kV & 132 kV/110kV

16.2.2 Back-up protection shall be provided for required isolation/protection in the event of failure of the primary protection systems provided to meet the above fault clearance time requirements. If a Generating Unit is connected to the State Grid System directly, it shall be capable of withstanding, until clearing of the fault by back-up protection on the State Grid System.

16.3 Protection

16.3.1 Protection Systems shall be provided by all Transmission Licensees and Users to isolate the faulty equipments and protect the other components against all types of faults, internal/external to them, within specified fault clearance time with reliability, selectivity and sensitivity:

Provided that all Users or Transmission Licensees connected to the State Grid System shall provide protection systems as specified in the Connection Agreement.

16.3.2 Relay setting coordination shall be done at State level by Grid Coordination Committee. The Grid Coordination Committee would also identify critical locations where a particular type of protection needs to be provided if not available already.

16.4 Reactive Power Compensation

16.4.1 Reactive Power compensation and/or other facilities shall be provided by

Users, as far as possible, in the low voltage systems close to the load points thereby reducing the need for exchange of Reactive Power to/from the State Grid System and to maintain the State Grid System voltage within the specified range.

16.4.2 Line Reactors may be provided by licensee to control temporary over voltage within the limits as set out in grid standard / connection agreement.

16.4.3 The additional reactive compensation to be provided by the User shall be indicated by State Transmission Utility in the Connection Agreement for implementation. Further additional reactive compensation equipment based on actual performance may have to be provided as required by STU by Distribution Licensee/Users.

16.4.4 Users shall endeavour to minimize the Reactive Power drawal at an interchange point when the voltage at that point is below 95% of rated voltage, and shall not inject Reactive Power when the voltage is above 105% 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.

16.4.5 Switching in/out of all 400/220/132 kV bus and line Reactors throughout the grid shall be carried out as per instructions of State Load Despatch Centre. Tap changing on Interconnecting Transformers shall also be done as per the instructions of State Load Despatch Centre only.

16.4.6 The State Generating Station shall generate/absorb reactive power as per instructions of SLDC, within the capability limit of respective Generating Units.

16.4.7 Notwithstanding above SLDC may direct a User/Licensee to curtain its VAR drawal /injection in case the security of the Grid or safety of any equipment is endangered.

16.5 Communication Facilities

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

16.5.2 All Users and Transmission Licensees shall provide the required facilities at their respective ends as specified in the Connection Agreement.

16.5.3 All agencies shall provide system to telemeter power system operational parameters such as flow, voltage, status of switches./Transformer taps etc in line with interface requirement and other guidelines made available by SLDC/RLDC through SLDC. Associated communication system to facilitate data flow upto SLDC shall also be established by concerned agency as required by STU.

16.5.4 All agencies in co-ordination with STU shall provide required facilities at their respective ends and at SLDC.

17. Generating units and Power stations.

17.1 Generating units and Power Stations

(a) A Generating Unit shall be capable of continuously supplying its normal rated active/reactive output within the system frequency and voltage variation range, above subject to design imitations specified by the manufacturer.

(b) A generating unit shall be provided with an AVR, protective and safety devices, as set out in connection agreements.

(c) Subject to size of generating unit required for auto governor operation made. Each Generating Unit shall be fitted with a turbine speed governor having an overall droop characteristic within the range of 3% to 6% which shall always be in service.

(d) Each Generating Unit shall be capable of instantaneously increasing output by 5% when the frequency falls limited to 105% MCR. Ramping back to previous MW level (in case the increased output level can not be sustained) shall not be faster than 1% per minute.

18 System Recording Instruments

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

18.2 All Users and Transmission Licensees shall provide all the requisite recording/indicating/integrating instruments as specified in the connection agreement in accordance with the agreed time schedule.

19 Responsibilities for operational safety

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

19.2 Site Responsibility Schedule

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

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

(i) Ownership of the Plant/Apparatus;

(ii) Responsibility for control of the Plant/Apparatus;

(iii) Responsibility for operation of the Plant/Apparatus;

(iv) Responsibility for maintenance of the Plant/Apparatus; and

(v) Responsibility for all matters relating to safety of any persons at the connection point.

19.2.3 The format, principles and basic procedure to be used in the preparation of Site

Responsibility Schedules shall be formulated by State Transmission Utility within three (3) months of notification of these regulations and shall be provided to each User and Transmission Licensee for compliance:

Provided that the State Transmission Licensee shall also put up the information related to above mentioned format, principles and procedures on its Internet Website.

19.3 Single Line Diagrams

19.3.1 Single Line Diagram shall be furnished for each connection point by the connected User or Transmission Licensee to the State Load Despatch Centre.

19.3.2 Single Line Diagram shall include all High Voltage (HV) connected equipment and the connections to all external circuits and incorporate numbering, nomenclature, rating and labeling.

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

19.4 Site Common Drawings

19.4.1 Site Common Drawings shall be prepared for each Connection Point and will include the following information:

(i) Site Layout;

(ii) Electrical Layout;

(iii) Details of Protection; and

(iv) Common Services Drawings.

(v) Division/boundary between user and Transmission Licensee.

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

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

20 Access at Connection Site

20.1 The Transmission Licensee or User owning the Connection Site shall provide reasonable access and other required facilities to another Transmission Licensee or User whose equipment is proposed to be installed / installed at the Connection Site for installation, operation, maintenance, etc.

20.2 Written procedures and agreements shall be developed between STU, Transmission Licensees and Users to ensure that mandatory access is available to the concerned Transmission Licensee or STU or User for installation, inspection, maintenance and recording as and when needed.

PART D: OPERATING CODE

21 Operating code

21.1 State Load Despatch Centre shall supervise the overall operation of the State Grid System including import to and export from State of active and reactive power. Export from and import to shall be supervised in close co-ordination with RLDC. RLDC shall supervise and control inter-state transmission lines as per Section 28(2) (d) of the Act as well as be responsible for overall scheduling and dispatch on the regional basis is concerned.

21.2 State Load Despatch Centre shall develop, document and maintain detailed internal operating procedures for managing the State Grid.

Provided that such procedures shall be developed in consultation with RLDC, STU, Transmission Licensees and Grid Coordination Committee.

Provided further that such procedures shall be consistent with State Grid code and IEGC.

21.3 The control rooms of the State Load Despatch Centre including load control centres of Licensee/State generating stations Power Plants, substations of 132 kV and above and any other control Centres of Transmission Licensees and Users shall be manned round-the-clock by qualified and adequately trained personnel.

22 System security aspects

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

22.2 No part of the State Grid shall be deliberately isolated from the rest of the intra-State Transmission System except

(i) Under an emergency, and conditions in which such isolation will prevent a total grid collapse and/or will enable early restoration of power supply;

(ii) When serious damage to a costly equipment is imminent and such isolation will prevent it;

(iii) When such isolation is specifically instructed by the State Load Despatch Centre.

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

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

22.5 Any tripping, whether manual or automatic, of any of the elements of the State Grid, referred in Section 22.4, shall be precisely intimated by the concerned Transmission Licensee or User to the State Load

Despatch Centre as soon as possible. The reason, to the extent determined, and the likely time of restoration shall also be intimated. All reasonable attempts shall be made for the elements' restoration as soon as possible.

22.6 An in-State Generating Unit shall be capable of continuously supplying its normal rated active/reactive output at the rated system frequency and voltage, subject to the design limitations specified by the manufacturer.

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

22.8 Each In-State Generating Unit shall be fitted with a turbine speed governor having an overall droop characteristic within the range of 3% to 6% and such turbine speed governor shall always be in service: Provided that if any in-State generating unit of over fifty (50) MW size is required to be operated without its governor in normal operation, the State Load Despatch Centre shall be immediately advised about the reason and duration of such operation.

22.9 Facilities available with/in load limiters, Automatic Turbine Run-up System, Turbine supervisory control, coordinated control system, etc., shall not be used to suppress the normal governor action in any manner. No dead bands and/or time delays shall be deliberately introduced.

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

Provided that any in-State generating unit of over Fifty (50) MW size not complying with the above requirements, shall be kept in operation (synchronized with the State Grid) only after obtaining the permission of State Load Despatch Centre:

Provided also that User can make up the corresponding short fall in spinning reserve by maintaining an extra spinning reserve on the other generating units of the User

22.11 The recommended rate for changing the governor setting, i.e., supplementary control for increasing or decreasing the output (generation level) for all generating units, irrespective of their type and size, would be one (1.0) per cent per minute or as per manufacturer's limits. However, if frequency falls below 49.5 Hz, all partly loaded generating units shall pick up additional load at a faster rate, according to their capability.

22.12 Except under an emergency, or to prevent an imminent damage to costly equipment, no User shall suddenly reduce his generating unit output by more than one hundred (100) MW without prior intimation to and consent of the State Load Despatch Centre, particularly when frequency is falling or is below 49.0Hz. Similarly, no User shall cause a sudden increase in its load by more than one hundred (100 MW) without prior intimation to and consent of the State Load Despatch Centre.

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

Provided that in case a generating unit of over fifty (50) MW is required to be operated without its Automatic Voltage Regulator in service, the State Load Despatch Centre shall be immediately intimated about the reason and duration, and its permission be obtained and written confirmation 3obtained from SLDC.

22.14 Power System Stabilizers in Automatic Voltage Regulators of generating units, wherever provided, shall

be properly tuned by the respective generating unit owner as per a plan prepared for the purpose by the State Transmission Utility from time to time. State Transmission Utility will be allowed to carry out checking of Power System Stabilizer and further tuning it, wherever considered necessary.

22.15 Provision of protections and relay settings shall be coordinated periodically throughout the State grid, as per a plan to be separately finalized by Grid Coordination Committee and RLDC.

22.16 State Load Despatch Centre, in coordination with Regional Load Despatch Centre, Users and Transmission Licensees shall make all possible efforts to ensure that the grid frequency always remains within the 49.0 – 50.5 Hz band, the frequency range within which steam turbines conforming to the IEC specifications can safely operate continuously.

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

22.18 Users and Transmission System Licensees shall ensure that the under-frequency and df/dt relay-based load shedding/islanding schemes, mentioned in Section 22.18 are always functional:

Provided that the relays may be temporarily kept out of service, in extreme contingencies, with prior consent of State Load Despatch Centre.

22.19 Sub-Committee constituted by Grid Coordination Committee for this purpose shall carry out periodic inspection of the under frequency and df/dt relays and Grid Coordination Committee shall maintain proper record of these inspection.

22.20 Users and Transmission Licensees shall facilitate identification, installation and commissioning of System Protection Schemes, as finalized by Grid Coordination Committee, in the power system to protect against situations such as voltage collapse and cascading:

Provided that such schemes shall always be kept in service and in case any of these are taken out of service, SLDC shall be promptly informed.

22.21 Each User and Transmission Licensee shall provide adequate and reliable communication facility internally and with State Load Despatch Centre, other Users and other Transmission Licensees to ensure exchange of data/information necessary to maintain reliability and security of the grid. Wherever possible, redundancy and alternate path shall be maintained for communication along important routes, e.g., SLDC to Users.

22.22 User and Transmission Licensee shall send the requested information/data including disturbance recorder/sequential event recorder output etc to State Load Despatch Centre for purpose of analysis of any grid disturbance/event. No User or Transmission Licensee shall block any data/information required by the State Load Despatch Centre Data required may also cover data for maintaining reliability and security of the State or Regional Grid and for analysis of an event.

22.23 State Load Despatch Centre, State Generating Stations Users and Transmission Licensees shall make all possible efforts to ensure that the grid voltage always remains within the following operating range:

Voltage (kV rms)		
Nominal	Maximum	Minimum
400	420	360

220	245	200
132	145	120

23 Demand forecast

23.1 Each distribution Licensee and User shall develop methodology/mechanism for daily/weekly/monthly/early demand estimation of active power as well as reactive power. STU shall provide for procedures as well as time guidelines to be followed for exchange of information between concerned entities for arriving at these estimates/forecasts.

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

24 Manual Demand Disconnection

24.1 Users shall endevour to restrict their actual drawal within their respective drawal schedules whenever the system frequency is below 49.5 Hz
Provided that, in case of frequency falling below 49.0 Hz. requisite manual load shedding to curtail overdrawal shall be carried out by respective Distribution Licensee and Users.

24.2 In case of certain contingencies and/or threat to system security, the State Load Despatch Centre may direct Distribution Licensees and Users to decrease their drawals by certain quantum and such Users shall act upon such directions immediately.

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

24.4 The measures taken to reduce Users drawal from the State Grid shall not be withdrawn so long as frequency/voltage remains at low level unless specifically permitted by SLDC.

25 Reports

25.1 A weekly report shall be issued by State Load Despatch Centre to STU, Transmission Licensees, users and Grid-coordination Committee to inform about the performance of the State Grid for the previous week. The weekly report shall contain the following:

(i) Frequency profile;

(ii) Voltage profile of selected substations;

(iii) Major Generation and Transmission Outages;

(iv) Transmission constraints; and

(i) Instances of persistent / significant non-compliance of State Grid Code.

Provided that the weekly report shall also be available in copying mode on the Internet website of State Load Despatch Centre for at least twelve (12) weeks:

25.2 The State Load Despatch Centre shall prepare a quarterly report which shall bring out the system constraints, reasons for not meeting the requirements, if any, of security standards and quality of service, along with details of various actions taken by different Users/Transmission Licensees, and the

Users/Transmission Licensees responsible for causing the constraints.

25.3 SLDC shall also provide information/report which can be called by Grid Coordination Committee in the interest of smooth operation of State Grid.

26 Operational Liaison

26.1 Operations and events on the State Grid:

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

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

26.2 Operations and events on Users' or Transmission Licensees' System:

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

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

27 Outage planning and coordination

27.1 Introduction

(a) This section sets out the procedure for preparation of outage schedules for State Grid as well as planning for the elements of State Grid in a co-ordinated and optimum manner keeping in view the condition of State Grid, State Generation and status of export import and load demand.

(b) Transmission system and State Generation including export/import should be adequate after taking into account the outages to achieve security standards.

(c) Annual outage plan should be prepared in advance for the financial year by Grid Coordination Committee for the State Grid and reviewed on quarterly and monthly basis.

27.2 Objective

(a) To develop a co-ordinated Generation/Transmission line outage programme for State Grid taking into account State Generation, Transmission line constraints and load demand.

(b) To minimize demand supply gap for power demand, active energy demand and reactive energy demand to achieve proper security standards.

(c) To optimize Transmission line outage of State transmission line and other transmission networks to achieve proper security standards.

27.3 Outage Planning Process

27.3.1 All Users and Transmission Licensees shall provide Grid Coordination Committee with their proposed

outage programmes in writing for the next financial year by 30th November of each year. These shall contain identification of each Generating Unit/Transmission Line/Interconnecting Transformer for which outage is being planned, reasons for outage, the preferred date for each outage and its duration and where there is flexibility, the earliest start date and latest finishing date.

27.3.2 Grid Coordination Committee shall come out with a draft outage programme for the next financial year by 31st December of each year for the State Grid:
Provided that outage plan shall be developed after giving due considerations to system security and reliability and shall be developed such that the extent of unmet system demand on account of such a plan is kept to a minimum: Provided further that in case of hydro generating stations such a plan shall also endeavor to maximize the utilization of water for purpose of power generation subject to applicable constraints related to alternate use of such water.

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

27.3.4 The final outage plan shall be intimated to all Users and Transmission Licensee latest by 31st January each year:
Provided that the above annual outage plan shall be reviewed by Grid Coordination Committee on monthly basis in coordination with all parties concerned, and adjustments made wherever found to be necessary.

27.3.5 Each User or Transmission Licensee shall, at least two (2) weeks prior to availing an outage as per the planned schedule, inform the State Load Despatch Centre about the same and obtain prior approval from State Load Despatch Centre for the availing the schedule plan. Without prior approval from SLDC, scheduled plan should not be availed.

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

(i) Major grid disturbances (total black out);

(ii) System isolation;

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

(iv) Black out in User area.

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

28 Recovery Procedures

28.1 Detailed plans and procedures for restoration after partial/total blackout shall be developed by State Load Dispatch Center in coordination with the Users and Transmission Licensees and Grid Coordination Committee.

28.2 The procedure shall 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 State Load Dispatch Center, in coordination and consultation with Users and Transmission Licensees, at least once every six months under intimation to the Regional Load Despatch Centre.

28.3 List of State Generating Stations with black start facility, inter-State ties, synchronizing points and essential loads to be restored on priority, shall be prepared by SLDC and be available with State Load Despatch Centre.

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

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

29 Event information

(a) This section deals with reporting procedure in writing of all reportable events in State Grd.
(b) The objective of this section is to define the events to be reported along with reporting route and details of information to be reported to achieve consistency of approach.
(c) This Section cover all Users, Transmission Licensees, HTU, SLDC and RLDC.

29.2 Reportable Events.

29.1.2 Any of the following events shall require reporting by User, Transmission Licensee, STU or State Load Despatch Centre as the case may be.

(i) Violation of security standards;

(ii) Grid indiscipline;

(iii) Non-compliance of State Load Despatch Centre's instructions;

(iv) System islanding/system split;

(v) Black out/partial system black out;

(vi) Protection failure on any element of intra-State Transmission System;

(vii) Power system instability; and

(viii) Tripping of any element of the State Grid.

29.3 Reporting Procedure

29.3.1 User or Transmission Licensee, after having initially reported about the event orally to the State Load Despatch Centre, shall provide a written report within72 hours of the occurrence of the event to the State Load Despatch Centre.

29.3.2 State Load Despatch Centre, after having initially reported about the event orally to the Users/Transmission Licensees, shall provide a written report within 72 hours of the occurrence of the event to the concerned Users/Transmission Licensees.

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

(i) Time and date of event;

(ii) Location;

(iii) Plant and/or Equipment directly involved;

(iv) Description and cause of event;

(v) Antecedent conditions;

(vi) Demand and/or Generation (in MW) interrupted and duration of interruption;

(vii) All relevant system data including copies of records of all recording instruments including Disturbance Recorder, Event Logger and Data Acquisition System;

(viii) Sequence of trippings with time;

(ix) Details of Relay Flags; and

(x) Remedial measures.

Provided that a copy of the report shall be forwarded to the Commission

30 State Load Despatch Centre and Sub-Load Despatch Centres

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

(i) Roles and Responsibilities of Load Control Centres;

(ii) Communication facilities between the State Load Despatch Centre and Load Control Centres;

(iii) Information flow between State Load Despatch Centre and Load Control Centres; and

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

31 State Load Despatch Centre, Transmission Licensees and Users.

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

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

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

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

PART E: SCHEDULING AND DESPATCH CODE

32 SLDC has the exclusive responsibility for optimum scheduling and dispatch of electricity within the state in accordance with the contracts entered into between Licensees, Users and State Generating Stations including captives and non-conventional energy sources.

33 The following specific points would be taken into consideration while preparing and finalizing the schedules:

(a) SLDC will issue despatch instruction for all State Generating Stations and imports from ISGS, IPPs, CPPs and NCES as hourly day a head generation schedule, unless rescheduling is required due to unforeseen circumstances.

(b) SLDC shall despatch the overall State generation in such a manner that generation from following types of power stations where energy potential, if unutilized, goes, as a waste shall not be curtailed

- Run of river or canal based hydro stations.
- Hydro-station where water level is at peak reservoir level or expected to touch peak reservoir level (as per inflows).
- Renewable Energy Sources.

(c) Despatch instructions shall be in Annexure format D1. These instructions will recognize declared availability and other parameters that have been made 53 available by the generators to SLDC. These instructions shall include time, power station, generating units, (total export in case of CPP) and name of operators sending and receiving the same.

(d) Standard despatch instructions may include:

- To switch a generator into or out of service.
- Details of reserve to be carried on a unit.
- To increase or decrease MVAr generation to assist with voltage profile as per unit capability at that time.
- To begin pre-planned Black Start procedures.

- To hold spinning reserve.
- To hold generating units on standby.
- To control MW/MVAr drawal by Users / Distribution Licensees.

34 Demarcation of responsibilities

34.1 The SLDC shall have the total responsibility for:

(i) Scheduling / despatching the generation of all agencies including the Utilities, IPPs, NCES *(excluding windmills)*., Co-Generators, etc. connected to the Grid.

(ii) Regulating the demand of the Users / Distribution Licensee in the State.

(iii) Regulating the drawal from the central generating stations and regulating the bilateral interchanges, if there is any.

(iv) Adopting merit order despatch, ABT procedures and free governor operation at power stations wherever possible.

34.2 SLDC shall always endeavor to restrict its net drawal from central generating stations and other generating stations within their respective drawal schedules and the guidelines of ABT.

34.3 The generating stations shall be responsible for power generation generally according to the daily schedule provided to them by the SLDC on the basis of the drawal schedules received from the Users /Distribution Licensee and also in accordance with Merit Order Despatch and Connectivity Agreements. However, the generating stations may 54 deviate from the given schedules depending on the plant and system conditions with the prior approval from SLDC. Provided that when, the frequency is higher than 50.5 Hz, the actual net injection shall not exceed the scheduled despatch for that hour. Also while the frequency is above 50.5 Hz, the generating stations may (at their discretion) back down without waiting for the advice from SLDC. When the frequency falls below 49.5 Hz, the generation at all stations (except those on peaking duty) shall be maximized, at least up to the level, which can be sustained, without waiting for the advice from SLDC. Notwithstanding the above, the SLDC may direct the generating stations / beneficiaries to increase / decrease their generation / drawal in case of contingencies e.g. overloading of lines / transformers, abnormal voltages, threat to system security. Such directions shall immediately be acted upon.

34.4 For all outages of generation and transmission system, which may have an effect on the State Grid, all entities shall co-operate with each other and co-ordinate their actions as per the approved procedures prepared separately. In particular, outages requiring restriction of generation which a Users / Distribution Licensee can receive (and which may have a commercial implication) shall be planned carefully to achieve the best optimization. The entities shall furnish to the SLDC all requisite information for billing purposes.

34.5 All entities shall abide by the concept of frequency linked load dispatch and pricing of deviations from schedule i.e. unscheduled interchanges. All generating units of the entities and the licensees shall normally be operated according to the standing frequency linked load dispatch guidelines issued by the SLDC to the extent possible, unless otherwise advised by the SLDC.

34.6 The STU shall opt to install special energy meters on all inter connections between the State entities and other identified points for recording of actual net MWh interchanges and MVArh drawals. The SLDC shall be responsible for computation of actual net MWh injection of each generating stations and actual

net drawal of each beneficiary, 15 minutewise, based on the above meter readings**.** The SLDC shall be responsible 55 for Intra-State Energy Accounting as per the scheme approved by Grid Coordination Committee, and all entities shall extend the necessary assistance to the SLDC personnel in timely collection of metered data. The generators shall furnish the data as per Annexure D-2.

34.7 The STU will undertake necessary Energy Audits in the Grid.

35 Scheduling and Despatch procedure

35.1 The generation scheduling and despatch data shall be as per format in Annexure D-1.The procedure has been devised taking into account the ABT (Available Based Tariff) regime.

35.2 Each day starting from 00.00 hours will be divided into 96 time blocks of 15 minutes intervals.

35.3 By 10.00 a.m. every day all the generating stations in the States shall furnish to the SLDC, the station wise ex-power plant MW and MWh capability foreseen for each time block of the next day i.e. from 00.00 hours to 24.00 hours of the following day.

35.4 Control Centre of Users/Distribution Licensees shall inform the SLDC the MW and MWh requirements for different hours for the next day by 11.00 AM. The SLDC shall receive information from RLDC regarding the MW and MWh entitlements from Central Generating stations for different hours and blocks for the next day by 11.00 AM.

35.5 The above information of the foreseen capabilities of the State generating stations and entitlements from ISGS given by RLDC shall be compiled by the SLDC everyday for the next day, and advised to all Control Centre of Users /Distribution Licensees by 12 AM.

35.6 The Control Centre of Users/Distribution Licensees shall review it vis-à-vis their foreseen load pattern and shall advise the SLDC by 1.00 PM, the sub station wise MW and MWh requirements foreseen for different hours for the next day i.e., from 00.00 hours to 2400 hours of following day to the SLDC.

35.7 The SLDC shall review the foreseen load pattern and the generation capacity available including bilateral exchanges if any, and advise the RLDC by 3.00 PM. their drawal schedule for the next day for each of the generating 56 stations in which they have shares and the other generating companies in the State, their despatch schedule.

35.8 By 5 PM each day, the RLDC shall convey the ex-power plant “dispatch schedule” to each of the Inter State Generating Stations, and “net drawal schedule” to each SLDC / Regional Grid beneficiary in MW for different hours, for the next day.

35.9 By 6 PM each day, the SLDC shall convey the ex-power plant “dispatch schedule” to each of the State generating stations and “net drawal schedule” to each of the State Users / Distribution Licensees through Control Centres in MW for different hours, for the next day.

35.10 The summation of the station-wise ex-power plant generation schedules for all generating stations after deducting the apportioned transmission losses (estimated), shall constitute the State Users / Distribution Licensees drawal schedule.

35.11 While finalizing the above daily generation schedules for the generating stations, the SLDC shall ensure that the same are operationally reasonable, particularly in terms of ramping-up /ramping-down rates and the ratio between minimum and maximum generation levels. Additional charges payable to the generating companies on account of such plant operations requiring oil support and / or unit shut-down / start-up shall also be considered by SLDC.

35.12 The generating companies in the State may inform through Control Centres any modification / changes to be made in station wise drawal, schedule / foreseen capabilities, if any, to SLDC by 9.00 PM.

35.13 Based on the surplus, if any, the SLDC may arrange for bi-lateral exchanges. Such arrangement shall be intimated to RLDC by the SLDC by 10.00 PM.

35.14 The SLDC shall receive the final 'drawal schedule' against Central allocation along with bilateral exchange of power, if any by 11.00 PM.

35.15 The SLDC shall inform the final drawal schedule for the next day to Control Centers of Users/Distribution Licensees by 11.15 PM

35.16 In the event of any contingency, SLDC will revise the schedules on the basis of revised declared capability by the generators. The revised schedules 57 will become effective from the 4th time block, counting the time block in which the revision is advised by the generator to be the first one. The revised declared capability will also become effective from the 4th time block.

35.17 In the event of bottleneck in evacuation of power due to any constraint, outage, failure or limitation in the transmission system, associated switchyard and substations owned by STU (as certified by SLDC) necessitating reduction in generation, SLDC will revise the schedules which will become effective from the 4th time block, counting the time block in which the bottleneck in evacuation of power has taken place to be the first one. Also, during the first, second and third time blocks of such an event, the scheduled generation of the station will be deemed to have been revised to be equal to actual generation and also the scheduled drawals of the Users / Distribution Licensees will be deemed to have been revised to be equal to their actual drawals.

35.18 In case of any grid disturbance, scheduled generation of all the generating stations and scheduled drawal of all the Users / Distribution Licensees 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 SLDC.

35.19 Revision of declared capability by generator(s) and requisition by Users / Distribution Licensees for the remaining period of the day will also be permitted with advance notice. Revised schedules/declared capability 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 SLDC to be the first one.

35.20 If, at any point of time, 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 SLDC to be the first one. *To discourage frivolous revisions, SLDC may, at its sole discretion, refuse to accept schedule/capability changes of less than 50 MW* 58

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

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

35.23 While finalizing the drawal and despatch schedules as above, the SLDC shall also check that the resulting power flows do not give rise to any transmission constraint. In case any impermissible constraints are foreseen, the SLDC shall moderate the schedules to the required extent, under intimation to the concerned Users. Any changes in the scheduled quantum of power which are too fast or involve unacceptably large steps, may be converted into suitable ramps by the SLDC.

35.24 On completion of the operating day, by 24.00 hours, the schedule finally implemented during the day (taking into account all before-the-fact changes) in despatch schedule of generating stations and drawal schedule of the Users shall be issued by SLDC. This schedule shall be the datum for commercial accounting. The average ex-bus capability for each of the generating stations shall also be worked out based on all before-the-fact advice to SLDC.

35.25 The SLDC shall properly document all the above information i.e. station-wise foreseen ex-power plant capabilities advised by the generating stations, the drawal schedule indented by the Users / Distribution Licensees, all schedules issued by the SLDC and all revisions / updating of the above.

35.26 The procedure for scheduling carried out by SLDC, shall be open to all entities for any checking / verification. In case any mistake / omission is detected, the SLDC shall forthwith make a complete check and rectify the same.

35.27 A procedure for recording the communication regarding changes to schedules duly taking into account the time factor shall be evolved by Grid Coordination Committee.

PART F : COMMERCIAL CODE

36 Commercial Issues

36.1 In regard to central sector allocation of power, the CERC has full jurisdiction to determine the tariff and other commercial issues.

36.2 Subject to any scheme of tariff, as may be approved by the JSERC, the bulk power supply agreements between the constituents shall duly specify the relationship between capacity charges to be paid and plant availability, and energy charge rates (in rupees per MWh) for each station, in ex-power plants. Regarding the other commercial issues, the following are applicable:

36.2.1 The transmission charges and other open access charges shall be paid to the respective constituents as per the JSERC regulations issued time to time.

36.2.2 The summation of the station-wise ex-power plant drawal schedules for all generating stations after deducting the apportioned transmission losses (estimated), shall constitute the State beneficiaries / distribution licensees drawal schedule which in turn shall be used for billing.

36.2.3 In case of a deviation from the generation schedule, the frequency linked Unscheduled Interchanges Charges (UI charges) shall be applicable for such deviations as may be approved by the CERC/JSERC from time to time and dependent on average frequency for the concerned 15-minute block.

36.2.4 Energy Accounts shall be prepared by the SLDC on a monthly basis. The Users / Distribution Licensees as per provision in the respective PPAs shall pay these bills.

36.2.5 The SLDC shall in parallel issue the weekly bills for UI charges and Reactive Energy Charges to all constituents by Tuesday for the seven day period ending on the penultimate Sunday mid night. These bills shall have a higher priority, and the generating stations and Users / Distribution Licensees shall pay the billed amounts within 10 days of billing date.

36.2.6 If payments against the above bills are delayed beyond 10 days, the defaulting entities shall have to pay *a simple interest rate of 0.04 percent* for each day of delay. The interest so collected shall be paid to the entities who have to receive the payment which got delayed.

36.2.7 SLDC shall periodically review the actual deviation from the generation and net drawal schedules to check whether any of the entities is indulging in unfair gaming. In case any such practice is detected the matter shall be reported to the Grid Coordination Committee for further investigation /action and if so needed the Grid Coordination Committee shall refer the matter to the Commission with their recommendation for appropriate action.

36.2.8 All energy accounting calculation carried out by SLDC shall be open to all the users of the State Grid for any checking / verification. In case any mistake is detected, the SLDC shall forthwith make a complete check and rectify the mistake.

36.2.9 Energy accounting (including billing of UI charges and reactive energy charges) is one of the most important and critical function of SLDC. Any flaw in the energy accounting will lead to serious financial consequences. Hence, a Sub-committee to be designated by the Grid Coordination Committee will conduct annual audit on the accounting and technical performance of SLDC and present a report to the Commission before the end of May every year for the previous financial year.

36.2.10 Regarding VAR drawal / absorption from Inter State Grid, the SLDC has to follow IEGC. The charge/payment for VARs, shall be at a nominal paise / kVARh rate as may be approved by CERC / JSERC from time to time, and will be between the beneficiary and the Pool Account and between two beneficiaries. The generating stations shall generate / absorb reactive power as per instructions of SLDC, within the capability limits of the respective generating units. No payments shall be made to the erating companies for such VAR generation / absorption.

36.2.11 The basic rules for absorption / generation of VAR are:

- The Beneficiary pays for VAR drawal when voltage at the metering point is below 97%.
- The Beneficiary gets paid for VAR return when voltage is below 97%.
- The Beneficiary gets paid for VAR drawal when voltage is above 103%.
- The Beneficiary pays for VAR return when voltage is above 103%

PART G: MISCELLANEOUS CODE

37 Dispute

37.1 In the event of any dispute, regarding interpretation of any provision of the State Grid Code or rules and procedures notified under the provisions of the State Grid Code, the matter may be referred to the Commission for its decision:

Provided that the dispute may be referred to a forum as specified by the Commission

38 Compliance

38.1 As stipulated under Section 33 (2), (4) and (5) of the Act, every licensee, user, generating company, generating station, substation and any other person connected with the operation of the power system shall comply with the directions issued by SLDC. If any dispute arises with reference to the quality of electricity or safe, secure and integrated operation of the State Grid or in relation to any direction given by SLDC, it shall be referred to the Commission for decision. Pending decision of the Commission the licensee or the user or the generating company shall comply with the directions of the SLDC. JSERC, in turn, after due process, may order the defaulting entity for compliance, failing which it may take penal action and other regulatory measures, which includes termination of connectivity agreement/ de-linking

from the Grid etc., through STU/SLDC.

39 Non-payment of dues

39.1 In case of non-payment of capacity and energy charges, unscheduled interchange charges, transmission/SLDC charges, etc. by any beneficiary of the State Grid, the affected beneficiary shall report the matter to the Grid Coordination Committee. The latter shall verify and take up the defaulting entity for paying up the dues. In case of inadequate response, the Grid Coordination Committee shall report the same to JSERC. JSERC in turn, after due process, may order the defaulting entity to pay the dues within a certain period, failing which the JSERC may initiate necessary regulatory measures.

40 Power to amend

40.1 The Commission may, at anytime, vary, alter, modify or amend any provisions of these Regulations

41 Power to remove difficulties

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

Annexure D-1

GENERATION SCHEDULING DATA

(Refer clause 35.1)

To be furnished to the SLDC :

Schedule and Despatch	Submitted by
1. Day ahead hourly MW/MVAr availability (0.00 - 24.00 Hrs) of all Generator Units	10.00 Hrs. (every day)
2. Day ahead hourly MW import/export from CPP's	---------do-------
3. Status of Generating unit Excitation AVR in service (Yes/No)	---------do-------
4. Status of Generating Unit Speed Control System Governor	---------do-------
5. Spinning Reserve Capability (MW)	---------do-------
6. Backing down Capability with / without Oil Support (MW)	---------do-------
7. Hydro Reservoir Levels and restrictions	---------do-------
8. Generating Units hourly Summation outputs (MW)	---------do-------

9. Sub station wise MW and MWh requirements from 00.00 hrs to 24.00 hours of following day	11.00 hrs
10. MW and MWh entitlements from ISGS for different hours for the next day	11.00 hrs (every day)
11. Tentative Drawal schedule for the next day by SLDC to RLDC and despatch schedules for all generating stations in the State.	15.00 hrs
12. Net Drawal schedules communicated to all Regional Grid beneficiaries and SLDCs, and ex power plant despatch schedule to each ISGS by RLDC.	17.00 hrs
13. State generating companies request for modification if any to SLDC	21.00 hrs
14. SLDC to inform RLDC for any revisions/ bilateral exchanges	22.00 hrs
15. Final drawal schedule against CGS allocation to be informed to SLDC by RLDC	23.00 hrs
16. SLDC to inform the Users/Licensees the final drawal schedule	23.15 hrs

Annexure D-2

MONITORING OF GENERATION

(Refer clause 34.6)

Item	Description	submitted by
1.	Generating stations shall provide generation Summation to SLDC in 15 minutes block	Real time basis
2.	CPP's shall provide hourly export/ import MW to SLDC in 15 minutes block	Real Time
3.	Logged readings of Generators to SLDC	As required
4.	Detailed report of Generating Unit trippings on Monthly basis.	First week of the succeeding month