DISTRIBUTION (PLANNING AND OPERATION) CODE
REVISIONS

REVISION NUMBER	ISSUING DATE	CLAUSE (S) REVISED
1	20.8.03	Clause No.-1.4.4, 1.4.2 (3)
2	10.10.05	Clause Nos.-, 1.2.1, 1.3.1, 1.4.2(4), 4.3.1
3		Clause Nos -1.1.1,1.1.2,1.1.3, 1.3.1,1.2.1,1.3.1,1.4.2,1.4.6,1.5,1.6,1.6.1, 2.1(a), 2.1(p), 2.1(q), 2.1(r),2.1(s),2.1(t),2.1(w)2.1(x),2.1(y),2.2,3.2(f),3.3.8,3.4.5.1, 3.5,4.1.1,4.2.1,4.2.3,4.3.1,4.3.3,4.3.4,4.4.1,4.4.2.1,4.4.2.3, 4.4.4.1,4.7.2,4.7.4,4.7.5,4.8.2.1,4.8.3,4.9.1,4.9.2,4.10.3,4.10.4, 4.10.5, 4.11.1(iii), 4.11.3,4.11.4,4.12.4
4		Clause Nos.- 1.4.2(3) ,2.1, 3.6 (added)
5.		Clause Nos – 1.4.2(7) (added),2.1(w) ,4.2.1 amended

ORISSA DISTRIBUTION (PLANNING & OPERATION) CODE 1998

I N D E X

CHAPTER - 1

INTRODUCTION

1.1.1 (a) GENERAL

All Distribution Licensees operating in the state of Orissa, as per Condition 17 of their licenses issued under OER Act, 1995 are required to prepare, review and at all times have in force a Distribution (Planning and Operation) Code (hereinafter called, the Planning and Operation Code). This Code can be amended from time to time by its Review Panel with due approval of the Commission. Accordingly revisions have been carried out since the 1st version came into force on 10th November 1998.

Meanwhile, the Electricity Act, 2003 (hereinafter called, the Act) has come into force since 10thJune 2003. As per Sec.14 of the Act, the existing Distribution Licensees have been declared as Deemed Licensees. In compliance to the provisions of the Act, the Commission has framed various Regulations including the OERC (Conduct of Business) Regulations, 2004 which among other things, contains the General Conditions applicable to Distribution Licensees. As required under Sec.50 and other provisions of the Act, an Electricity Supply Code Regulation namely, the OERC Distribution (Conditions of Supply) Code, 2004 (hereinafter called, the Supply Code) has been gazetted on 28th May 2004, which has repealed the earlier OERC Distribution (Conditions of Supply) Code, 1998

1.1.2 The Supply Code, amongst others, provides for recovery of electricity charges intervals for billing of electricity charges, disconnection of supply of electricity for non-payment thereof, restoration of supply of electricity, tampering, distress or damage to electrical plant, electric lines or meters, entry of Distribution Licensee or any person acting on his behalf for disconnecting supply of electricity and removing the meter, entry for replacing, altering or maintaining electric lines or electric plant or meter. This also contains the classification of consumers, security deposits, connected load/contract demand etc. The Planning and Operation Code covers other conditions applicable for distribution and supply of electricity and includes the following:

(a) A distribution planning and connection condition containing;

(i) Connection conditions specifying the technical, design and operational criteria to be complied with by any person connected or seeking connection with the Licensee's Distribution System, and

---

(ii) Planning conditions specifying the technical and design criteria and procedures to be applied by the Licensee in the planning and development of the Licensee's Distribution System, and

(b) A Distribution operating code specifying the conditions under which the Licensee shall operate the Licensee's Distribution System and under which persons shall operate their plant and/or Distribution System in relation to the Licensee's Distribution System, in so far as necessary to protect the security and quality of supply and safe operation of the Licensee's Distribution System under both normal and abnormal operating conditions; and

(c) Where there is an electrical interface between two Distribution Licenses, each Licensee must conform to the Planning and Operation Code for efficient operation of the interface.

1.1.2 The Distribution (Planning & Operation) Code has been designed so as to permit development. Maintenance and operation of an efficient,co-ordinated and economical Distribution system

1.2 SCOPE

1.2.1 The provisions of this Code shall be applicable to the Distribution Licensee and to all specific Users of the Licensee's Distribution System as detailed herein below except where an exemption is granted in writing by the Commission. Further the Licensee and the consumers connected or seeking connection with the Distribution System shall comply with the Orissa Electricity Regulatory Commission (Conditions of Supply) Code, 2004.

Category	**Relevant Chapter of this Code as applicable**
1. Consumers having	
(a) Contract Demand below 500KVA	Nil
(b)Contract Demand of 500 KVA and above	3.5.4
(c)Contract Demand of 1 MW and above	3.5.6(III), 4.5.3, 4.8.1.2,4.8.4.1, 4.9.1 plus as per (b)

Category	Relevant Chapter of this Code as applicable
(d)Contract Demand of 5 MW and above	All Chapters as applicable
(e) Independent and dedicated feeders as per their contract demand.	4.5.2 and relevant Chapters
2. Small Generating Units	All Chapters including but not limited to1.4.2(4), 4.6
3. Other Licensee's including Transmission Licensee and persons exempted from license	Chapters as per applicable

1.3 Overriding Effect

1.3.1 Nothing contained in this Code shall have effect, in so far as it is inconsistent with the provisions of the Electricity Act, 2003 the Indian Electricity Rules, 1956 till same is replaced by CEA Regulations U/S 53 of the Act , the Orissa Electricity Reform Act, 1995 and Rules, Regulations framed thereunder. The provisions of the OGC shall be complied with by the Licensee and Users including generating units of capacity above 5MW wherever applicable.

1.4 Implementation and Review of this Distribution Code

1.4.1 This Code and its implementation shall be periodically reviewed by the Licensees, including upon the request of the Commission. For this purpose there shall be established a Distribution (Planning and Operation) Code, Review panel. Herein after this will be referred to as the Panel.

1.4.2 The Panel shall consist of the following members:

(1) A Chairman on rotation basis from each of the Distribution Licensee.

(2) Two members from each of the Distribution Licensee.

(3) [1] [One member from the Transmission Licensee and one member from the Electricity Trader excluding Gridco]

(4) At least One member from each Distribution Company having captive power plant connected to the Distribution System to represent all the generating stations.

(5) One member for the area of supply of each Licensee from persons with connected load of 5 MW and above to represent all such persons.

(6) One representative from OERC may attend the meeting as an observer

(7) One member from the State Load Despatch Centre.

1.4.3 The Panel shall frame with the approval of the Commission, its own rules and procedures to conduct its business, including appointment and tenure of Chairman and Convenor Secretary, a standing secretariat and appropriate funding arrangement for the Panel..

1.4.4 The Panel shall meet at least once in a year.

1.4.5 The Panel shall carry out following functions referred to below:

(i) Periodically review this Code and its implementation;

(ii) Review of all suggestions for amendments to this Code which any of the Licensees or any other member may wish to be made including that of the Commission;

(iii) Issue guidance in relation to this Code and its implementation, interpretation of any provision thereunder when requested by any person connected to the Licensee's Distribution System;

(iv) Consider changes necessary in this Code arising out of any unforeseen circumstances.

---

1. " one member from the Transmission Licensee " has been replaced by "one member from the Transmission Licensee and one member from the Electricity Trader excluding Gridco"

2. One member from the State Load Despatch Center

.

1.4.6] Following any review, the Convenor Secretary of the Panel shall send to the Commission,

(i) a report on the outcome of such review;

(ii) any proposed revision or revisions to this Code the Panel reasonably thinks fit for achievement of the objectives of this Code.

(iii) all written representations or objections from any member of the Panel whose views were not accepted by the Panel.

1.5 Unforeseen Circumstance:

1.5.1 If circumstances not envisaged by the provisions of this Code should arise, the Licensee shall, to the extent reasonably practicable, consult promptly in good faith with all affected Users in an effort to reach agreement as to the further course of action. If agreement between the Licensee and affected Users cannot be reached in the time available, the Licensee shall follow a prudent course of action, keeping the nature of unforeseen circumstance and the technical parameters of the affected User's system. Under such event, the affected Users shall comply with the instructions given by the Licensee. All such cases shall however be referred to the Panel by the concerned Licensee for consideration in its next meeting.

1.6 Non-Compliance

1.6.1 The Distribution Licensee requires the Licensee to comply with the provisions of this Code in accordance with the implementation plan approved by the Commission. Users are required to comply with the provisions of this Code pertaining to them. Any User or Licensee to whom the provisions of this Code apply, finding himself, for any reason unable to comply with the same shall promptly refer the matter to the Licensee or the Commission as the case may be justifying his actions. The Commission may grant exemption depending upon merit of each such matter. Non-compliance of provision of this Code without justifiable reasons meriting exemption shall constitute an offence under the Act.

CHAPTER - 2
DEFINITIONS

2.1 In this Code unless the context otherwise requires;

(a) ***The* Act** means the Electricity Act, 2003;
Orissa Act means the Orissa Electricity Reform Act, 1995 (Act 2 of 1996)

(b) **Agreement** with its grammatical variations and cognate expressions means an agreement entered into by the licensee and the User;

(c) **Apparatus** means electrical apparatus and includes all machines, fittings, accessories and appliances in which conductors are used;

(d) **Area of Supply** means the area within which a licensee is for the time being authorised by his license to supply energy;

(e) **Bare** means not covered with insulating material;

(f) **Break-down** means an occurrence relating to equipment of supply system or other electrical line, which prevents its normal functioning;

(g) **Cable** means a length of insulated single conductor (solid or stranded) or of two or more such conductors each provided with its own insulation, which are laid up together. Such insulated conductor or conductors may or may not be provided with an overall mechanical protective covering;

(h) **Commission** means Orissa Electricity Regulatory Commission;

(i) **Circuit** means an arrangement of conductor or conductors for the purpose of conveying energy and forming a system or a branch of a system;

(j) **Coincidence Factor** means ratio of combined peak of a group of connected loads to the sum of peaks of individual connected loads in the group;

(k) **Conductor** means any wire, cable, bar, tube, rail or plate used for conducting energy and so arranged as to be electrically connected to a system;

(l) **Connected Load** means aggregate of manufacturer's rating of all connected apparatus including portable apparatus in the consumer's premises and apparatus in respect of which declaration has been made by the consumer for taking supply or any other method of assessing connected load as may be approved by the Commission. This shall be expressed in KW or KVA. If the ratings are in KVA, the same may be converted to KW by multiplying the KVA with a power factor of 0.9. If the same or any apparatus is rated by the manufacturer in HP, the HP rating shall be converted into KW by multiplying it by 0.746;

(m) **Connection Point/"interconnection** " means a point at which a User's electrical system is connected to licensee's distribution system;

(n) **Contract Demand** means maximum KW or KVA agreed to be supplied by the licensee and reflected in the agreement executed between the parties. Where the agreement stipulates supply in KVA, the quantum in terms of KW may be determined by multiplying the KVA with 0.9;

(o) **Control Person** means the person designated by the licensee and any user having common electrical interface with the licensee's distribution system who shall be responsible for safety co-ordination;

(p) **Diversity Factor** means ratio of sum of peaks of a group of connected loads to the combined peak of the group;

(p)(1) [1] [**Extra High Tension supply (EHT**) refers to system or supply energized at a voltage more than 33000Volts under normal conditions subject , however to the percentage variation stated in the Indian Electricity Rules ,1956 or in Rules/Regulations specified under the Act.]

(p)(2) [2] [**High Tension (HT)** refers to system of supply energized at a voltage more than 650volts and not exceeding 33000volts under normal condition subject , however to the percentage variation stated in the Indian Electricity Rules,1956 or in Rules /Regulations specified under the Act.]

(q) **Licensee** means a person authorized to distribute electricity under section 14 of the Act

(r) **Load Factor** means the ratio of average load over a designated period to the peak load in that period;

(s) **Low Tension (L.T.)** refers to system or supply energised at 230 volt or 400 volt;

(t) **Orissa Grid Code or OGC** means the State Grid Code of Orissa specified by the Commission under Section 86(h) of the Electricity Act, 2003.

(t)(1) [3] [**Person** shall include any company or body corporate or association or body of individuals, whether incorporated or not or artificial juridical person.]

(u) **Power Factor** means the ratio of kilowatt to kilovolt-ampere;

---

1. Definition of 1- EHT , 2- HT and 3- Person have been inserted in (p)(1), (p)(2) & (t)(1) respectively.

(v) **Regional Transmission System** means the combination of EHT electric lines and electrical equipment owned or operated by Power Grid Corporation of India;

(w) **SLDC** refers to the definition as per the OGC.

(x) **Standard of Performance** refers to those standards of performance as per regulation made by the Commission pursuant to Section *57 & 58* of the Act;

(y) [1] [**Transmission System** means the system consisting mainly of extra high voltage electric lines having design voltage of 33KV and higher , owned or controlled by the Transmission Licensee, and used for the purposes of the conveyance of electricity between the switchyards of two generating sets or from the Switchyard of Generating Set to a substation, or between substations, or to or from any external interconnection and includes all bays /equipment upto the interconnection with the Distribution System , and any plant, apparatus and meters owned or used in connection with the transmission of electricity, but shall not include any part of a Distribution System."]

---

1. Transmission System" has been redefined as per regulation 2(ii) of OERC Distribution (Conduct of Supply) Code, 2004
   2.1(w). SLDC refers to the definition as per the OGC.

(z) **User** means persons having electrical interface with or using the distribution system of the Licensee to whom this Code is applicable and includes any other distribution and retail supply licensee and generating units as more particularly identified at 1.2.1 and relevant *Chapter* s of this code

2.2 The words or expressions occurring in this Code but not defined herein above shall bear the same meaning as in the Electricity Act, 2003 or in rules and regulations framed under the said Acts or in absence thereof, the meaning commonly understood in the electricity industry.

CHAPTER – 3

DISTRIBUTION PLANNING CODE

3.1 Introduction

3.1.1 The Distribution Planning Code (DPC) specifies the technical and design criteria and the procedures to be applied by the **Licensee** in planning and development of its **Distribution System** . D.P.C. also applies to **Users** of the **Distribution System** in the planning and development of their systems in so far as they affect the **Distribution System.**

3.1.2 The **User's** requirement may necessitate the reinforcement of or the extension to the **Distribution System** and in some cases may require the **licensee** to seek the reinforcement or extension to the capacity of the relevant point of **interconnection** between the **Licensee's Distribution System** and the **Transmission System** . This may arise for a number of reasons including but not limited to:

i) A development on a **User's** system already connected to the **Licensee** system as a User Development,

ii) Introduction of a new **connection point** between the **User's** system and the Licensee systems.

iii) To increase the system capacity, remove operating constraints and maintain standards of security to accommodate a general increase in Electricity Demand.

---

3. 1.3 Accordingly the reinforcement or extension of the **Licensee's Distribution System** may involve work at the following points.

(i) At a **connection point** between **User's** system and the **Licensee's Distribution System** ,

(ii) On the **Distribution System** or other facilities which join a **connection point** to the remainder of the **Licensee's System** ,

(iii) At or between points on the **Licensee's Distribution System** remote from **connection points** ,

3.1.4 Development of Licensee's Distribution System must be planned with sufficient lead time to allow any necessary statutory consents or way leaves to be obtained and detailed Engineering design and construction work to be completed.

3.2 **Objectives**

Objectives of the DPC are:

(a) To enable the **Distribution System** to be planned, designed and constructed to operate economically, reliably and safely conforming to the relevant electricity Acts, Rules, Bureau of Indian Standard specifications and other relevant manuals and construction standards to operate economically, reliably and safely.

(b) To facilitate the use of the **Distribution System** by any **User** connected or seeking connection to it.

(c) to establish technical conditions which enable the respective **Licensees** and **Users** to meet set standards for efficient operation of the common electrical interface.

(d) To define the procedure for the exchange of system planning data, between **Licensee** and **Users** .

(e) To provide sufficient information for a **User** to assess opportunities for connection and to plan and develop its System so as to be compatible with the **Distribution System.**

(f) To enable the **Licensee** to co-operate with the *STU and the SLDC* in furnishing data as detailed in OGCunder the *Chapter* "System Planning ".

3.3 **Technical and Design Criteria**

The **Licensee** shall plan and develop its **Distribution System** observing the technical and design criteria stated below.

3.3.1 The **Distribution System** shall be planned and developed to meet the load demand of all existing Users connected to it and all **Users** seeking connection. To this end all the **Apparatus** and Circuits of the **Distribution System** shall have adequate capacity to carry electricity safely, economically and reliably.

3.3.2 The **Licensee** shall appropriately assess the load demand of various categories of consumers and forecast the demand of power on an annual basis or more frequently as required by the **Commission.**

3.3.3 The **Licensee** shall prudently utilise the modern forecasting tools in forecasting load demand and in addition shall apply its knowledge of electricity consumers and an understanding of the way they use electricity and other alternative sources of energy. The load forecasting shall also take into account the various conservation programmes under demand side management or off-peak usage programmes, which the Licensee might be sponsoring, resulting in reduction of energy and peak demand of the consumers over the years.

3.3.4 The **Licensee** shall use load research facilities to identify components of the System and customer load profiles to forecast changes in the load. Customer load pattern data shall be collected and stored for further analysis.

3.3.5 The optimum circuit loading and minimum number of circuits at any electrical interface between the **Distribution System** and **Transmission System** shall conform to **Distribution System** Planning and Security Standards as referred to under the **License.**

3.3.6 As far as practicable the **Licensee** shall provide separate circuits for Urban Supply (Non Industrial), Urban Supply (industrial) and Rural Supply and shall so arrange the loads as to create discrete load blocks to facilitate load management during emergency operations.

3.3.7 Location of 33/11 KV, sub-stations, capacitor installations and Distribution Transformer Sub-stations shall be determined with the objective of containing the Voltage variation and Transmission and Distribution Losses within permissible and reasonable levels by carrying out load flow studies.

3.3.8 The **Distribution System** shall be designed so as to maintain the voltage at the commencement of supply to a consumer within limits specified in the I.E. Rules 1956 *till same is replaced by CEA Regulations u/s 53 of the Act* . The design shall be so as to reduce the distribution losses to a reasonable level as projected in the long-term load forecast of the **Licensee**

3.3.9 The capacity of step down transformers used in the **Distribution System** and lay out of the Bus Bar, Switchgear, Transformers, Capacitors, Earthing, Lightning Arrestors, Control Panels, Station Battery, Fire Extinguishers and other accessories required for the safe operation of the sub-station shall be standardised by the **Licensee** . This shall conform to guidelines and principles contained in the "**Distribution System** Planning And Security Standards" as referred to in the **Licensee.**

3.3.10 While planning the **Distribution System** the **License** e shall examine the cost effectiveness of Loss reduction measures without compromising the Security Standards referred to in paragraph 3.4.9.

3.3.11 The **Licensee** shall adopt measures including the following for reduction of lengths of Low Tension Bare Conductor overhead lines to the extent it is cost effective.

a) L.T. Less Distribution.

b) Aerial Bunched Cables.

c) Underground Cables.

d) Increasing number of Distribution Transformers.

3.4 **Planning Procedure**

3.4.1 The Licensee is required to forecast the demand for power within the Area of Supply annually or more frequently, if required by the Commission, in each of the succeeding 5 years. The Licensee shall, accordingly, prepare a demand forecast and generally follow the procedures laid herein.

3.4.2 The Licensee shall create a database of loads for each Consumer category and for each Distribution Sub-station connected to its Distribution System and update it on an annual basis.

3.4.3 **Load Research**

The Licensee may develop a load research programme with the objective of obtaining customer data and load profile data that shows the usage characteristics of specific appliances of different categories of consumers. The load research will facilitate obtaining data such as:

i) Demand according to end use at the hour of system peak, daily, monthly, seasonal or annual.

ii.) Hourly end use demand for the day of the system peak, monthly, seasonal or annual.

iii.) Hourly end use demand for the average day of the system peak, monthly, seasonal or annual.

iv) Category wise Diversity Factor or Coincidence Factors and Load Factors.

v) Total energy consumption for each category by day, month, season or year.

vi) Category wise non-coincident peak demands.

vii) Hourly demand for end use appliances

The Licensee shall work out details of its Load Research implementation programme and file its proposal with the Commission for its consideration.

3.4.4 **Energy Audit**

The Licensee shall promote the carrying out of energy audit by consumers having contract demand of 500 KVA and above for in-plant load management and energy conservation. On its part the Licensee shall provide such consumers with appropriate information relating to energy auditors and financial incentives offered by recognised financial institutions, Banks and other Government Organisations in this matter.

3.4.5 **Load Data**

3.4.5.1 From the metering data at each connection point with the Transmission System, the Licensee shall develop load curves for the area fed by the concerned Sub-station of the Transmission Licensee. By compiling data from each Sub-station feeding its Distribution System, the Licensee shall develop a system load curve for its Area of Supply. By reconciling actual energy sales figures with the drawl from metering data losses in the System may be computed for any period. These data shall be furnished to the STU and Commission on an annual basis.

3.4.5.2 All users with demands of 5 MW and above seeking connection shall furnish their Load Data to the Licensee, as detailed in Annexure-l. The Licensee shall exercise special care in monitoring the actual development of loads in respect of consumers desiring to contract for loads of 5 MW and above at any single point. The Licensee on its part shall furnish relevant System Data as detailed in Annexure-2 if requested by the User seeking connection on payment basis.

The Licensee shall update its System Data at least once a year.

3.4.6 **Forecast Methodology**

i). The Licensee shall formulate its long term demand forecast taking the previous financial year ending on 31st March as Base Year and projecting the demand in the succeeding 5 years. While making the demand forecast, the Licensee shall review the status of loads materialising as per the previous load forecast.

ii) Energy Sales in each tariff class shall be projected in the forecast period over the corresponding figures relating to the Base Year by adopting a suitable methodology.

iii) The projections shall take into account assumed normal growth for non-specific loads, specific and identified loads of 1 MW and above, and effects, if any, due to Demand Side Management and energy conservation, if any.

iv) The Licensee shall forecast the aggregate energy requirement and peak load at each of the Connection Points for each of the years in the forecast period accounting for losses.

3.4.6.1 The Licensee shall forward its long term Demand Forecast for each of the Connection Points with the Transmission System and the aggregate Demand Forecast for its Area of Supply on an annual basis to the Transmission Licensee and Commission along with following details on the basis of which forecasts are made:

I. Data

ii. Methodology

iii. Assumptions

3.5 Obligation of Licensee in preparation of demand forecasts for the State of Orissa

The Licensee shall cooperate with the STU in the preparation of the demand forecasts for the State of Orissa.

3.6 [1] [Distribution Licensee shall establish (DSOCC) Distribution System Operation & Control Center , as per provisions in the Orissa Grid Code under chapter 2.5(2) of OGC .]

---

1. 3.6 Distribution Licensee shall establish (DSOCC) Distribution System Operation & Control Center , as per provisions in the Orissa Grid Code under chapter 2.5(2) of OGC .

Annexure-l

LOAD DATA FOR DEMANDS OF 5 MW AND ABOVE

(With reference to "Distribution Planning Code" Para 3.4.5.2)

1. Type of Load (State whether: - steel melting furnace loads, rolling and rolling, mills, traction loads, other, industrial loads, pumping loads, etc.)

2. Maximum demand (KVA)

3. Year/Years by which full /part supply is required (furnish phasing of loads year-wise if necessary)

4. Location of Load (Furnish location map to scale)

5. Rated voltage, Frequency and number of phases at which supply is required.

6. Description of Equipment installations, voltage and KW rating, method of starting, starting current

(i) Motors: State purpose and number of and duration, type of motors, types of drives and control arrangements.

(ii) Heating: Type and KW rating.
(iii)Furnace: Type, Furnace Transformer capacity and voltage ratio.
(iv)Electrolysis: Purpose, KVA capacity.

(v) Lighting: KW Demand.
(vi) Any other load with particulars

---

7. Sensitivity of demand to fluctuations
in voltage and frequency of supply at time
of Peak Demand. (Give Details)

(i) Voltage sensitivity

MW/KV
MVAR/KV

(ii) Frequency sensitivity

MW/Hz
MVAR/Hz

8. Phase unbalance imposed on system

Maximum (%)
Average (%)

9. Maximum harmonic
content imposed on system (Furnish details of devices for suppression of Harmonics)

10. Details of any loads, which may cause
Demand fluctuations of greater than 10 MW
at the point of connection including Voltage
Dips (percentage) lasting for 5 seconds and more.

Annexure-2

SYSTEM DATA

(With reference to *Chapter* - 3 "Distribution Planning Code" Para [1] [3.4.5.2])

1 Topographical Map of Orissa marking boundaries of Area of Supply of Licensee.	
2 Distribution Map of Licensee	Showing existing 11KV and 33KV lines and sub-stations within the Area of Supply of the Licensee. Lines and Sub-stations under construction or planned for next 5 years to be shown as dotted.
3 Single line diagram of Distribution System	Line length and conductor sizes, sub-station capacity, capacitor sizes, with locations, auto reclosures if any to be included.
4 General Relaying and Metering arrangements at 33/1 1KV sub-stations 10 MVA and above.	
5 Details of Grid sub-stations at point of **Interconnection** with **Distribution System**.	Furnish following : (i) MVA capacity, voltage (ii) Transformers sizes, Voltage Ratio, Tap Range. (iii) Fault MVA at sub-station Bus. (iv) Bus Impedance (v) Diagram of sub-station Layout.
6.Drawl from **Interconnection (s)**	Furnish following : Maximum & minimum MW drawl from each **Interconnection** with **Transmission System** or with any other Distribution **Licensee** during last six months.

CHAPTER **- 4**

DISTRIBUTION OPERATION CODE

4.1 Introduction

4.1.1 This Chapter describes procedures and codifies practices to be followed by the Licensee and Users whose electric lines and electrical plant are connected to the Licensee's Distribution System for safe and efficient operation of their respective systems. This shall also apply to any electrical interface between two Distribution Licensees for safe and efficient operation of the interface.

4.1.2 The following aspects of operation are covered in this *Chapter* .

i. Demand Estimation
ii. Outage Planning
iii. Contingency Planning
iv. Demand Management / Load Shedding
v. Interface with Small Generators
vi. Protection Co-ordination
vii. Metering and Telecommunication
viii. Voltage/Frequency/Power Factor Monitoring and Control.
ix. Safety Co-ordination
x. Major Incident and Accident Reporting
xi. Maintenance and Testing
xii. Tools and Spares
xiii. Training

4.2 Demand Estimation

4.2.1 The Licensee shall provide to the SLDC/STU, its estimation of Demand at each Interconnection on a year ahead, month ahead and week ahead and a day ahead basis as required. The Time - scales for such solution as set in the OGC shall be adhered to by the Licensee.

---

1. The Licensee shall provide to the SLDC/STU, its estimation of Demand at each Interconnection on a year ahead, month ahead and week ahead and a day ahead basis as required. The Time - scales for such solution as set in the OGC shall be adhered to by the Licensee.

4.2.2 Data shall be furnished by the concerned User for this purpose as required by the Licensee.

4.2.3 The Licensee shall estimate its Blockwise (15 minutes duration) and daily Demand at each Interconnection on the basis of relevant Load Curves drawn on a day ahead basis subject to modification depending upon communication received from any specific User or caused by any contingency.

4.3 **Outage Planning**

4.3.1 The licensee shall furnish its proposed Outage programmes to SLDC/STU on a year ahead basis April to March by 1st August each year.

4.3.2 Outage programme shall contain identification of electric lines and equipment of the Distribution System that will be taken out of service, outage start date, duration of Outage and Quantum of load not to be drawn at any Interconnection during Outage.

4.3.3 Outage plan of the Licensee may come into effect only after SLDC releases the finally agreed transmission Outage plan by 1st March each year

4.3.4 Notwithstanding any approved Outage plan, the Licensee may not take any Circuit or Equipment out of service at any Interconnection without specific release from Transmission Licensee. In case of a Circuit or equipment of 66 KV and higher voltage specific release of SLDC shall be obtained in addition. This shall however, not apply under the following circumstances.

If the total drawl at any Interconnections as per estimation of Demand is not affected

If removal of any Circuit from service becomes necessary under emergent conditions or disconnection for violation of Agreement, SLDC shall be kept informed wherever effected load is 5 MW or larger.

4.4 Contingency Planning

4.4.1 A contingency in the Distribution System may arise in the event of total or partial blackouts in Transmission System or Regional Transmission Sys tem. A contingency may also affect a part of the Distribution System due to local breakdowns in the Distribution System itself and in the Apparatus of the Transmission Licensee at the Interconnection. This sub-section lays down procedures, which the Licensee shall follow under such contingencies to restore and maintain power supply to its consumers quickly and efficiently. These are classified as under:

a). Transmission System or Regional Transmission System failure.

b). Distribution System Failure.

c). Failure of Apparatus of Transmission Licensee at Interconnection.

4.4.2 Transmission System or Regional System Failure.

4.4.2.1 In case of total black out at any point of Interconnection the Licensee shall abide by the Black Start procedures framed by STU and incorporated in OGC

4.4.2.2 The Licensee shall be responsible for sectionalizing the Distribution System into discrete, unconnected blocks of demand. It shall advise SLDC of the amount of MW likely to be picked up on switching on each demand block.

4.4.2.3 The Licensee shall prepare a schedule of essential and non essential loads in order of priority at each Interconnection to be picked up during restoration process with the approval of the Commission and forward the same to the SLDC. Such schedule shall be updated continually. The scheduling shall conform to provision in OGC in this regard.

4.4.2.4 The Licensee shall take care to ensure that load generation balance is maintained at all time under SLDC's direction.

4.4.2.5 The Licensee shall maintain direct communications links with SLDC through out the restoration process until normalcy is restored.

4.4.2.6 Licensee shall furnish to SLDC, Name and designation of person/persons with their telephone number and stations, authorized to deal with contingency operations.

4.4.3 Distribution System Failure

4.4.3.1 Interruption to power supply in any part of the Distribution System lasting more than one hour due to breakdown of any part of the Distribution System may be termed as a Distribution System Failure.

4.4.3.2 Licensee shall evolve a restoration process for such Distribution System Failure under intimation to the Commission.

4.4.4 Failure of Apparatus of Transmission Licensee

4.4.4.1 Licensee shall immediately contact the person authorised for such purpose at the substation of the Transmission Licensee and assess probable period for restoration and/or probable restriction on load drawl from the affected sub-station.

4.4.4.2 Licensee may affect demand management plan accordingly as necessary.

4.5 Demand Management/Load Shedding

4.5.1 Temporary load shedding may be resorted to maintain load generation balance as instructed by SLDC. This may also be necessary due to loss of any circuit or equipment or any other operational contingency.

4.5.2 The Licensee shall estimate loads that may be shed in discrete blocks at each Interconnection in consultation with Users supplied through independent circuits as required and submit the same to SLDC. Such Users shall cooperate with the Licensee in this regard. Modus Operandi of load shedding may be worked out by the Licensee and detail procedure shall be furnished to SLDC and also persons in charge of downstream sub-stations of the Licensee where such load shedding has to be carried out. In case of automatic load shedding through Under Frequency Relays, circuits and amount of load to be interrupted with corresponding relay settings shall be intimated to SLDC and persons in charge of downstream substations of the Licensee as necessary.

4.5.3 If due to any load shedding exceeding thirty minutes is to be resorted to in any part of the Distribution system, public shall be notified promptly through the media. Consumers with Contract Demand 1 MW and above and essential services such as Hospital, Public Water Works etc. shall be intimated over telephone wherever applicable.

4.6 Interface with Small Generating Units

If the Licensee has an interface with any such generating unit and an Agreement for this purpose exists, the Licensee and the concerned owner of the generating unit shall abide by the provisions set of this paragraph in addition to provisions contained in this Code as applicable to all Users.

4.6.1 Generating Units up to 5MW

(i) The owner shall provide suitable protection at the interface to protect its system from any damage due to normal and abnormal conditions of the Distribution System.

(ii) If the generator is an induction generator, the owner shall install in addition to operational metering provided under paragraph 4.8.1.2, metering for reactive load drawal.

4.6.2 **Generating Units above 5 MW**

In addition to above provision as applicable the generator shall comply with the OGC also.

4.7 **Protection Coordination**

4.7.1 Protection of Distribution System, Transmission System and User's System shall be well co-coordinated. Individual protection schemes shall be capable of speedily, selectively and reliably disconnecting the faulty section from the rest of the system.

4.7.2 Provision in Chapter 'Protection' of the OGC ,specifying minimum protection requirement of the Distribution System shall be followed by the Licensee, as well as by the Users of the Distribution System, as applicable.

4.7.3 No item of apparatus shall be allowed to remain connected to the Distribution System unless it is covered by appropriate protection.

4.7.4 All Users within the Area of Supply of the Licensee availing Supply at 66 KV and above and all other Users within the Area of Supply of the Licensee with a contract demand of 5 MW and above shall furnish details of their protection schemes to the Licensee before connection is effected, termed as Protection Data as listed in Data Registration Chapters of OGC Similar Protection Data relating to Distribution System of the Licensee shall be supplied to any User seeking connections, by the Licensee upon request on payment of nominal charges.

4.7.5 The Licensee and Users of the Distribution System (as required) shall attend the protection co-ordination meetings as and when called for by STU to discuss all related issues and take remedial measures as discussed and agreed to in such meetings.

4.8 Metering and Telecommunication

4.8.1 Metering (Operational)

4.8.1.1 The minimum requirement of operational metering at Distribution System sub-stations shall be as follows:

(i) At 33/11 KV sub-stations (10 MVA and above)
For measurement of

a) Station 33 KV voltage

b) Station 11 KV voltage

c) 33KV incoming and outgoing current in each Circuit

d) Transformer primary and secondary current

e) 11 KV outgoing current in each Circuit

f) Power Factor in each 11 KV circuit

g) Energy received and sent out.

(ii) At 33/11 kV sub-stations (below 10 MVA and above 3 MVA)
for measurement of Station 11 kV voltage current and energy sent out.

(iii) At 11/0 4 kV substation (250 KVA and above)
For measurement of Energy sent out on L.T. side

4.8.1.2 **User's** Systems (with demand of one MW and above) shall have operational metering to furnish following minimum data to the Licensee whenever required:

(a) Voltage (b) Load drawal (c) Power Factor

4.8. **Metering (Tariff / Commercial)**

4.8.2.1 Tariff metering shall be provided at each point of Interconnection between Distribution System and Transmission System in accordance with OGC and Connection Agreement

4.8.2.2 Tariff metering at connection point between Users System and Distribution System shall be governed by provision in the Connection Agreement.

4.8.3 **Specification/Rules**

All meters their installations and testing shall conform to relevant Bureau of Indian Standard Specifications and the Indian Electricity Rules, 1956 till same is replaced by CEA Regulations u/s 53 of the Act .

4.8.4 **Communication**

4.8.4.1 Reliable communication links shall be established for exchange of data, information and operating instructions between Licensee, Users with demand of 1 MW and above and the **SLDC.**

4.9 **Voltage/Frequency/Power Factor Monitoring and Control**

4.9.1 The Licensee shall monitor the Voltage/Frequency/Power Factor in the Distribution System at different points at peak and off peak hours and take reasonable measures for improvement of the same in coordination with the Users with demand of 1 MW and above and Transmission Licensee.

4.9.2 **Voltage**

The voltage in the Distribution System may vary depending upon available generation, system demand and configuration of Transmission System and Distribution System at any time. Under normal operating conditions the Licensee shall exercise proper voltage management in its Distribution System beyond point of Interconnection to maintain voltage at all levels according to the l. E. Rules, 1956 till same is replaced by CEA Regulations u/s 53 of the Act.

4.9.3 **Frequency**

The Licensee shall abide by the instruction issued from SLDC from time to time on load management for maintaining Frequency of Supply within statutory limits.

4.9.4 **Power Factor**

4.9.4.1 The Licensee shall take power factor improvement measures at strategic points in the Distribution System by carrying out system studies and installing required reactive equipments

4.9.4.2 **Users** having loads with high harmonic content, low Power Factor and fluctuations, may be required to install appropriate equipment for correction.

4.10 **Safety Co-ordination**

4.10.1 The Licensee and the Users of the Distribution System shall observe safety rules and precautions when work is to be carried out on any Apparatus, Switchgear or Circuits in any part of the Distribution System or in any part of the Users system.

4.10.2 The objective of safety coordination is to enforce principles of safety as prescribed in Indian Electricity Rules, 1956 and to devise codes and practices to implement the same.

4.10.3 There shall be co-ordination between persons of the Licensee and its Users, between persons of two Distribution Licensees having common electrical interfaces, for carrying out work on any Apparatus, Switchgear, or Circuits belonging to either party at the Interconnection.

4.10.4 The Licensee shall follow the provision of Grid Code for operations at Interconnection points in coordination with the Transmission Licensee.

4.10.5 The Licensee and all Users and any other Distribution Licensee having common electrical interface with the Licensee shall designate suitable persons to be responsible for safety co-ordination. These persons shall be referred to as Control Persons. The list of Control persons, their designation and telephone number shall be exchanged between all concerned persons. Any change in the list shall be notified promptly to all concerned.

4.10.6 The disconnecting device/or devices at each electrical interface, which shall be capable of effectively disconnecting the System of the Licensee and the other Users and grounding the respective System at the control boundary shall be identified and marked by the Licensee and respective User and shall be maintained in good order at all times. Such disconnecting devices shall be provided with interlocks to prevent inadvertent switching operations by unauthorized persons

4.10.7 Permission in writing shall be issued by the appropriate Control Person at the electrical interface to his counterpart for carrying out work on any Apparatus Switchgear or Circuits beyond the electrical interface. Such permissions shall be termed as Line Clear Permits (LCP). The format of LCP shall be standardized by the Licensee and shall be used by all concerned.

4.10.8 Check list of operations to be carried out before issue and return of LCP's and procedures for safety co-ordination for each electrical interface shall be framed by the Licensee in consultation with the concerned User. Such procedures and check list shall be issued to all concerned by the Licensee for implementation.

4.10.9 The Licensee shall prepare a safety manual incorporating all Safety Rules and Safety Precautions applicable to its Distribution System and the User's System and circulate the same among all Users for compliance.

4.11 Major Incident and Accident Reporting

4.11.1 Typical examples of reportable incidents that would affect the Distribution System are as follows:

i) High/Low System Voltage or Frequency.

ii) Major breakdowns in Distribution System.

iii) Major deviations of load drawl from any Interconnection relative to the day ahead estimation of Demand furnished by the Licensee to the Transmission Licensee or to the SLDC.

iv) Any other incident which the Licensee or l user may consider worth reporting in view of its repercussions on safe and reliable operation of the Distribution System.

v) Major breakdowns of equipment to the User's system.

The Licensee and the Users shall establish a hierarchy for reporting incidents and a procedure for exchange of information. The Users shall furnish information to the Licensee regarding any major incident occurring in their System promptly, if requested, by the licensee.

Explanation: Major Break down: What shall construe major breakdowns may be listed by the concerned Licensee/user and reported to the Commission/Licensee respectively.

4.11.2 The Licensee shall report to the Commission major incidents according to time schedule as follows:

i. High/Low System Voltage or Frequency- Monthly

ii. Major deviation of load drawal- Monthly

iii. Major Breakdowns (including loss of capacity of 5 MVA and above)

a) Preliminary report - Within 24Hours

b) Comprehensive report - Status, nature of break down, total break down period/anticipated restoration period, estimate of losses, estimate of repairs, loss to persons/property - Within two months

iv. Any other incident referred to in Para 4.11.1(iv) -Monthly

4.11.3 The Licensee shall follow provisions of the Grid Code in reporting incidents to Transmission Licensee.

4.11.4 Reporting of electrical accidents shall be in accordance with the I.E. Rules 1956 till same is replaced by CEA Regulations u/s 53 of the Act.

4.12 **Maintenance and Testing**

4.12.1 The Licensee shall prepare maintenance schedules for Lines and equipment and ensure its compliance at all levels.

4.12.2 Level of maintenance shall be appropriate to meet Performance Standards of the Licensee.

4.12.3. Testing of transformers, switchgear, and protective equipment in the Distribution System shall be carried out by the Licensee as recommended by the manufacturers/relevant code of practice at prescribed intervals for ensuring their serviceability, safety and efficiency.

4.12.4 The Users shall be obliged to maintain their Apparatus, Switchgear and electric lines at all times conforming to the I.E. Rules 1956 till same is replaced by CEA Regulations u/s 53 of the Act and suitable for being connected to the Distribution System in a safe and reliable manner.

4.13 **Tools and Spares**

4.13.1 The Licensee shall ensure availability of proper tools and tackles at all work places for carrying out maintenance. Serviceability of tools and tackles must be checked from to time and ensured.

4.13.2 The Licensee shall maintain minimum inventory of spares required for maintenance and replacement purposes at suitable locations according to a clear policy to be laid down by the Licensee and submitted to the Commission.

4.14 **Training**

The Licensee shall make appropriate arrangements for imparting training to its workmen and supervising staff in modern and state of an Distribution Practice and maintenance techniques and shall adopt a Syllabus suitable for the intended purpose.
