

UP ELECTRICITY GRID CODE

(Approved By : UPERC's Order Dated 8 August 2000)

UTTAR PRADESH POWER CORPORATION LIMITED

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(The State Transmission Utility)

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GRID CODE REVISION (S)

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CHAPTER-I

GENERAL

1.1 INTRODUCTION

The Uttar Pradesh Government has declared UP Power Corporation Limited (UPPCL) as State Transmission Utility (STU) under section 27-B of Indian Electricity Act, 1910. As per the Indian Electricity Act, 1910 following are the functions of State Transmission Utility to

- a. Undertake transmission of energy through intra-State transmission system;
- b. Discharge all functions of planning and coordination relating to intra-State transmission system with –
 - i. Central Transmission Utility;
 - ii. State Governments;
 - iii. Generating companies;
 - iv. Regional Electricity Boards;
 - v. Authority;
 - vi. Licensees;
 - vii. Transmission licensees;
 - viii. Any other person notified by the State Government in this behalf.
- c. The State Transmission utility shall exercise supervision and control over the intra-State transmission system.
- d. The State Transmission Utility shall comply with and ensure compliance by others in that State of the directions which the Central Transmission Utility may give from time to time in connection with the integrated grid operations and operation of the power system or otherwise in regard to matters which affect the operation of the inter-State transmission system.

In order to perform above task in a transparent manner the UPPCL has formulated this Grid Code. This code will be applicable for intra state transmission system only. In case of inter state transmission system (ISTS) the provisions of the Indian Electricity Grid Code (IEGC) will prevail over this code.

1.1.2 SYSTEM PLANNING

Specifying the technical and design criteria and procedures to be applied by the STU for the planning and development of **Transmission System** and by other **Users** connected or seeking connection to the **Transmission System**.

1.1.3. CONNECTIVITY CONDITIONS

Specifying the technical criteria and standards to be complied with by the **Licensee** and other **Users** connected or seeking connection to the **Transmission System**.

1.1.4 SECURITY ASPECT

Specifying condition under which to operate different power system and generating stations in synchronism with each other at all times with a view to operate it as an

integral part of Northern Regional Grid, ensuring security of the power system and safety of power equipment employed in the system.

1.1.5 **OPERATIONAL PLANNING**

Specifying the conditions under which the **Licensee** shall operate the **Transmission System** and other **Users** of the **Transmission System** shall operate their plant and/or system for the generation and distribution of electricity under abnormal operating outage conditions and under normal conditions.

1.1.6 **SCHEDULING AND DISPATCH**

Specifying the procedures to be followed by the SLDC, **Licensee** and **Users** relating to the scheduling and dispatch of Generating Units to meet system demand and allocations.

1.1.7 **FREQUENCY AND VOLTAGE MANAGEMENT**

Specifying the procedures by which all the **Users** of the **Transmission System** shall endeavor to cooperate with the SLDC/ for effective control of system frequency and managing voltage levels of the **Transmission System**.

1.1.8 **MONITORING OF GENERATION AND DRAWLS**

Specifying the procedures to ensure monitoring of drawl schedule for improving performance and stability of the grid.

1.1.9 **CONTINGENCY PLANNING**

Specifying the strategy for restoration of the system in the event of total or partial shutdown.

1.1.10 **CROSS BOUNDARY SAFETY**

Specifying the requirement in maintaining safe working practices with cross boundary operations between various **Users** of the **Transmission System**

1.1.11 **OPERATIONAL EVENT/INCIDENT REPORTING**

Specifying the requirement for exchange of information relating to Operation and/or Events on the total system including that of the regional grid.

1.1.12 **PROTECTION**

Specifying coordination, responsibility and minimum standards and protection that are required to be installed by **Users** of the **Transmission System**

1.1.13 **METERING, COMMUNICATION AND DATA ACQUISITION**

The Grid Code is a document for governing the boundary between the **Licensee** and **Users** and it establishes procedures for operation of facilities, which will use the

Transmission System It lays down both the information requirement and the procedures governing the relationship between the **Licensee** and **Users**.

U.P. Electricity Grid Code (UPGC) briefly indicates the activity which will required to be carried out by the various agencies and participants in UP Power System viz. Generators, Non tariff consumers, for providing quality and reliable electricity to the consumers.

The Grid code shall neither discriminate against any nor unduly prefer any one or a group of **Users**. The Grid Code shall cover all the material and technical aspects relating to connectivity and operation and use of **Transmission System**. It shall be so designed as to permit the development, maintenance and operation of **Transmission System** in the State in an efficient, coordinated and economical manner.

1.2 SCOPE

The Grid Code shall be complied with by the **UPPCL** in its capacity as **STU** and by **SSGs/Supply licensees** and Bulk Power Consumers in their capacity as holder of **Licence** in the respective areas.

1.3 IMPLEMENTATION AND OPERATION OF THE GRID CODE

The **STU** has the duty to implement the Grid Code. All **Users** are required to comply with the Grid Code, which will be enforced by the **STU**. **Users** must provide the **STU** reasonable rights of access, service and facilities necessary to discharge its responsibilities in the **Users** premises and to comply with instructions issued by the **Licensee**, reasonably required to implement and enforce the Grid Code.

If any **User** fails to comply with any provision of the Grid Code, it shall inform the **STU** without delay of the reason for its non-compliance and shall remedy its non-compliance promptly. Consistent failure to comply with the Grid Code may lead to Disconnection of the **Users** plant and/or facilities.

The operation of the Grid Code will be reviewed regularly by the Grid Code Review Panel in accordance with the provisions of the relevant Section of the Grid Code.

1.4 GENERAL REQUIREMENTS

The Grid Code contains procedures to permit equitable management of day-to-day technical situations in the Electricity Supply System, taking into account a wide range of operational conditions likely to be encountered under both normal and abnormal circumstances. It is nevertheless necessary to recognize that the Grid Code cannot predict and address all possible operational conditions.

Users must therefore understand and accept that the **Licensee** in such unforeseen circumstances may be required to act decisively to discharge its obligations under its **Licence**. **Users** shall provide such reasonable cooperation and assistance as the **Licensee** may request in such circumstances.

1.5 CODE RESPONSIBILITIES

In discharging its duties under the Grid Code, the **Licensee** has to rely on information,

which **Users** supply regarding their requirements and intentions. The **Licensee** shall not be held responsible for any consequences that arise from its reasonable and prudent actions on the basis of such information.

1.6 **CONFIDENTIALITY**

Under the terms of the Grid Code, the **Licensee** will receive information from **Users** relating to their intentions in respect of their Generation or Supply businesses. The **Licensee** shall not, other than as required by the Grid Code, disclose such information to any other person without the prior written consent of the provider of the information.

1.7 **PROCEDURES TO SETTLE DISPUTE**

In the event of any dispute regarding interpretation of any part of the Grid Code provision between any **User** and the **Licensee**, the matter may be referred to the **UPERC** for its decision. The **Commission's** decision shall be final and binding.

In the event of any conflict between any provision of the Grid Code and any contract or agreement between the **Licensee** and a **User**, the provision of the Grid Code will prevail.

1.8 **COMMUNICATION BETWEEN THE LICENSEE AND USERS**

All communication between the **Licensee** and **Users** shall be in accordance with the provisions of the relevant Section of the Grid Code.

Unless otherwise specifically required by the Grid Code, all communications shall be in writing, save that where operation time scales require oral communication, these communications shall be confirmed in writing as soon as practicable.

1.9 **PARTIAL INVALIDITY**

If any provision or part of a provision of the Grid Code should become or be declared unlawful for any reason, the validity of all remaining provisions, or parts of provisions, of the Grid Code shall not be affected.

CHAPTER-2

DEFINITIONS

<u>Defined Term</u>	<u>Definitions</u>
Act	The U.P. STATE ELECTRICITY REFORM ACT, 1999
Agency	A term in the various sections of U.P.E.G.C. to refer to utilities that utilize the Intra State Transmission System .
Apparatus	All equipment, in which electrical conductors are used, supported or of which they may form part.
Appendix	An appendix to any section or chapter of The Grid Code .
Area of supply	Area designated in the licence for carrying out the licenced activity.
Automatic Voltage Regulator or AVR	A continuously acting automatic excitation system to control the voltage of a Generating Unit as measured at the Generator Terminals.
Availability	<p>In respect of any Settlement Period shall mean for any Generating Unit the figure, expressed in MW, which is the Capability of the Generating Unit. The terms “Available” and “Unavailable” shall be construed accordingly and “fully Available” shall mean that the SSG is Available to its Contracted Capacity.</p> <p>In relation to a Transmission System, shall mean the time in hours Transmission System is capable to transmit Electricity at its rated voltage from the supply point to the delivery point and shall be expressed in percentage of Annual Availability.</p>
Backing down	Reduction of Generation on instructions from SLDC/ NRLDC by a Generating Unit under abnormal conditions such as high frequency, low system demand or network constraints.

Black Start	The procedure necessary for recovery from a Total blackout or Partial blackout.
Bulk Power Supply Agreement	The agreement between the Licensee and a power consumer in which subject to certain conditions the consumers agree to purchase bulk power from the Licensee .
Capability	The capability of a Generating Unit expressed in MW to generate electricity determined at the Interconnection Point (after deducting consumption of Auxiliaries)
Captive Power Plant (CPP)	Power Plant holding valid consent under section 44 of Electricity (Supply) Act, 1948 and permitted for sale of surplus power.
CEA	The Central Electricity Authority
Central Dispatch	The process of Scheduling and issuing Dispatch Instructions in relation to S.S.G.
Central Transmission Utility (CTU)	Any Government Company notified by the Central Government under sub-Section (1) of Section 27(A) of the Indian Electricity Act 1910 as amended in 1998.
CERC	Central Electricity Regulatory Commission
Commission	The U P State Electricity Regulatory Commission
Connection Point	A point at which agency's Plant and/or Apparatus connects to the Transmission System .
Contingency Reserve	The margin of generation over forecast demand required in the period from 24 hours ahead down to real time to cover against uncertainties in generation, plant availability, import from external connections and against demand forecast variations. It is provided by generating plant which is not required to be Synchronised but must be held available to Synchronise within 10 to 15 minutes.
Control Person	A person identified as having responsibility for cross boundary safety under chapter '12' Cross Boundary Safety of the Grid Code.

Customer Demand Control	Means reducing the level of supply of energy to a customer, disconnection of a customer or directing the timing of supply to a customer in a manner agreed for commercial purposes between supplier and customer.
De Loaded	The condition in which a Generation Unit has reduced or is not delivering electric power to the System to which it is Synchronised and the terms” De-Loading” and “De Load” shall be construed accordingly.
Demand	The demand of Active Power and Reactive Power unless otherwise stated.
Demand Control	The term is used to describe one or all of the methods controlling demand.
De-synchronised	The act of taking a Generating Unit off the Licensee System to which it has been Synchronised, and like terms shall be construed accordingly.
Disconnect	The act of physically separating a User’s (or Customer’s) equipment from the Licensee System.
Dispatch Instruction	An instruction by Licensee to SSG to operate Generator as per instructions issued in accordance with the Chapter of Scheduling & Dispatch.
Distribution Company	An Organization which is licensed or exempt from the requirement to be licensed to own and/or operate all or part of the distribution system.
Distribution System	The distribution system comprising electric lines and apparatus at voltage levels of 0.4KV, 11KV, 33KV, 37.5 KV and 66KV including part of Transmission System which is used for distribution of electricity to a Single consumer or group of consumers.
DPD	Detailed Planning Data specified in System Planning.
Drawl	The import from or export to Northern Regional Grid of Electrical Energy.

e	DRC	Data Registration Code
	Electricity Board	U P State Electricity Board
	Electricity Supply Act	The Indian Electricity Supply Act, 1948 as amended up to date.
	Emergency Disconnection/ Rostering	Load Shedding carried out by disconnecting at short notice or no notice for safety of personnel and equipment or when a Regulating Margin cannot otherwise be achieved.
	External Interconnection	Apparatus for the Transmission of electricity to or from the Licensee System into or out of a Transmission System located outside U P State.
	Extra High Voltage or EHV	A voltage exceeding 33000/37500 volts under normal conditions subject, however, to the percentage variation allowed by the Indian Electricity Rules, 1956 as amended up to date.
	Forced Outage	An Outage of a SSG or any of Power Station Equipment, generally due to sudden failure of one or more parts of equipment at a generating station, of which no notice can be given by the Generator to Licensee .
	Frequency Transient	An abrupt decrease/increase of 0.5 HZ or more in the Frequency of the Licensee System.
	Generating Company	A company registered under the Companies Act, 1956(1 of 1956) and which has among its objects the establishment, operation and maintenance of generating stations.
	Generating Unit	An electrical Generating Unit coupled to a turbine within a Power Station together with all Plant and Apparatus at that Power Station (up to the Connection Point) which relates exclusively to the operation of that turbo-generator.
	Generator	A person or Agency/Generating Company who generates electricity and who is subject to the Grid Code either pursuant to any agreement with Licensee or otherwise.

IE Rules	Indian Electricity Rules 1956
Independent Power Producer (IPP)	Independent Power Producer owning power station which is not part of U.P. Rajya Vidyut Utpadan Nigam Limited and U.P. Jal Vidyut Nigam Limited and not classified as CPP.
Inter Connecting Transformer (ICT)	Transformer connecting EHV lines of different voltage levels.
InterState Generating Station (ISGS)	A Central /MPP /other generating station in which two or more than two states have a share and whose scheduling is to be coordinated by the RLDC .
Isolating Device	Denotes Switches, Circuit Breakers, Cutouts & other apparatus for Operation, Regulation and Control of Electrical Circuits.
L.C.P.	Line Clear Permit
Licence	A Licence granted under the Act for the purpose specified.
Licensee	A Person Licensed for engaging in business of transmission of electricity under section 15 of Uttar Pradesh Electricity Reforms Act, 1999 by /Uttar Pradesh Electricity Regulatory Commission or by Government of Uttar Pradesh under Indian Electricity Act, 1910. It will include STU.
Low/Under Frequency Relay	An Electrical measuring relay intended to operate when its characteristic quantity (Frequency) reaches the relay setting by decrease in Frequency.
Maximum Continuous Rating (MCR)	The normal rated full load MW output capacity of a Generating Unit, which can be sustained on a continuous basis at specified conditions.
NAPP:	Narora Atomic Power Plant.
NHPC:	National Hydro Power Corporation.
Northern Region/Regional Grid:	Regional Grid comprising the areas of operation of State Electy. Boards, utilities &

CPPs/IPPs of Uttar Pradesh, Haryana, Punjab, Chandigarh (UT), Rajasthan, Himanchal Pradesh, Delhi, J&K, NTPC, NHPC, NPC, BBMB, PGCIL for the integrated operation of electricity system.

NPC :	Nuclear Power Corporation
NREB:	Northern Regional Electricity Board.
NRLDC:	Northern Regional Load Dispatch Center.
NTPC:	National Thermal Power Corporation.
Operating Co-ordination Committee: (OCC)	The Committee constituted by NREB , which co-ordinates the operation of the Regional Transmission System and Central Sector Generation
Operating Reserve	The additional out put from Generating Plant or a reduction in Demand or both which must be reliable in real time operation to respond for contribution in containing and correcting System Frequency deviation to an acceptable level in the event of mismatch between Generation including Import from external connections and demand.
Outage:	In relation to a SSG/Transmission / Distribution facility, a total or partial regulation in Availability in connection with the repair or maintenance of the SSG/Transmission facility or resulting from a breakdown or failure of the Transmission /Distribution facility/SSG unit or defect in its Auxiliary system. In relation to Licensee System, the removal for repair or maintenance, or as a result of failure or breakdown of, any part of the Licensee System.
Planned Outage:	An Outage in relation to a SSG unit for Power Station Equipment or Transmission facility which has been planned and agreed with SLDC , in advance in respect of the year in which it is to be taken.
Power Grid or PGCIL:	The Power Grid Corporation of India Limited.
Power Purchase Agreement or PPA:	The agreement entered into between a Generator and the Licensee pursuant to

whom the **Licensee** amongst other matters agrees to purchase from the Generator the generating capacity of the Generator's Generating Units.

Power Station Equipment:

Items of plant in a Power Station which are integral to the operation of a SSG, but which are not used exclusively in the operation of such SSG unit, the Outage of which will, or is likely to (when for example, taken together with other Power Station Equipment Outages) reduce the level of availability of a SSG.

Protection:

Equipment for detecting abnormal conditions on a System and initiating fault clearance and activating alarms and indications.

Rotational Load Shedding:

Planned Disconnection of Customers on a Rotational basis during periods when there is a significant short fall of power required to meet the total Demand.

Safety Co-coordinator

A person authorized by the concerned licensee or user for ensuring safety while taking/granting/returning shut down of electrical equipment/system.

Safety Precaution:

For the purpose of the co-ordination of safety relating to HV apparatus the term "Safety Precaution" means isolation and/or earthing.

Shut Down:

The condition of a Generating Unit where it is at rest or on barring gear isolated from grid or Transmission facility, which is at rest or isolated from Grid.

Spinning Reserve:

Unloaded generating capacity, which is synchronised to the System and is ready to provide increased generation at short notice pursuant to dispatch Instruction or instantaneously in response to Frequency drop.

Standing Instruction:

An instruction of the dispatch notified to a Generator in advance by **SLDC** whereby when the specified circumstances arise (which will be capable of being known by the Generator), the Generator would take the specified action as though a valid dispatch instruction had been issued by **SLDC**.

State Sector Generator (SSG)	A State Generating Station which includes U.P.Rajya Vidyut Utpadan Nigam Limited, U.P. Jal Vidyut Nigam Limited, IPPs and CPPs.
State Transmission Utility (STU)	The utility notified by the Government of U.P. under Sub-Section (1) of section 27B of the Indian Electricity Act, 1910, as amended in 1998, and whose functions have been outlined under section 55 of Amendments to the Electricity Supply Act 1948 issued in 1998. UPPCL has been declared as STU vide U.P. Govt. Gazette No.151/P-1/2000-74 dated 14.1.2000.
SPD:	Standard Planning Data.
Start date:	The date on which a Planned Outage is to begin.
Start time:	The time at which a Planned Outage is to begin.
Start up:	The action of bringing a Generating Unit from Shut Down to the speed required by the Generating Unit to enable it to be Synchronised to the Licensee System.
State Government:	Government of Uttar Pradesh.
State:	Uttar Pradesh.
State Load Dispatch Center (SLDC):	State Load Dispatch Center where the operation of the Power System in the state and integration of such state power system with other power systems are coordinated round the clock on real time basis.
Supervisory Control and Data Acquisition or SCADA:	The communication links and data processing systems which provide information to the SLDC on the State of the Grid and also enable implementation of requisite supervisory and control actions.
Supply Licensee:	Any person/company authorized by the Commission or Uttar Pradesh Government for engaging in the business of supply of electricity.
Synchronised:	The condition where an incoming Generating Unit or System is connected to

another System so that the voltage, frequencies and phase relationships of that Generating Unit or System, as the case may be, and the System to which it is connected are identical and the terms “Synchronise” and “Synchronisation” shall be construed accordingly.

Tariff Customer/Retail Consumer:	A person who requires supply of electricity and is supplied by a supplier otherwise than on the terms specified in a special agreement.
Testing:	Testing carried out by Licensee in respect of SSG and User's Equipment and the term ‘Test’ shall be construed accordingly.
Transmission Licensee	Any person/company authorized by the Commission or Uttar Pradesh Government for engaging in the business of transmission of electricity other than STU.
Transmission Service Agreement:	The agreement between the Licensee and a User in which, subject to certain conditions, the Licensee agrees to transmit/wheel electrical power over its network for User .
Transmission System / Intra State Transmission System:	Means one Line with associated Substation or a group of Lines interconnected together along with associated Substations in UP.
Unscheduled Generation:	Any generation that is in violation of SLDC/NRLDC instructions based on parameters described in relevant Sections of the Grid Code.
U.P. Electricity Grid Code (UPEGC)	The set of the principles and guidelines prepared by Licensee in accordance with the terms of the Transmission Licence and approved by UPERC and as amended time to time by discretion of the Commission , relating to the planning, design and operation of Licensee system.
User:	A term utilised in various sections of the Grid Code to refer to the persons using the Licensee System, as more particularly identified in each section of the Grid Code concerned.
User System:	Any system owned or operated by a User comprising Generating Units together with Plant and/or Apparatus connecting Generating Units and/or Customer’s equipment to the Licensee System.
Utility:	Any person or entity engaged in the generation, transmission, sale, distribution or supply, as the case

may be, of energy.

Warning Notice:

A notice issued by **Licensee** to Generator informing the Generator that it has failed to comply with dispatch instructions.

The terms, which are used in this Code and are not defined above, will have the same meaning as defined in IEGC.

CHAPTER-3
MANAGEMENT OF GRID CODE

3.1 Introduction

3.1.1 The State transmission Utility (STU)(UP Power Corporation Limited) is required to implement and comply with the U.P. Electricity Grid Code (**UPEGC**) and facilitate periodic review and amendments of the same with the approval of **UPERC**. An important feature of **UPEGC** is the establishment of a **UPEGC Review Panel**, Comprising Representatives of all **Users** of the **Transmission System**

3.1.2 Except under conditions as described in the next paragraph, it is specially required that no change, however small or large in the **UPEGC** be made without being deliberated and agreed by the **UPEGC Review Panel** and approved by **Uttar Pradesh Electricity Regulatory Commission (UPERC)**. It is specifically required that no change in **UPEGC**, however small or large, may be made without being deliberated and agreed by the **UPEGC Review Panel** and submitted for approval by **UPERC**.

3.2 OBJECTIVE:

3.2.1 The objective is to define the method of management of **UPEGC** documents, pursuing of any changes/modifications required and the responsibilities of the constituents (all **Users**) to effect that change.

3.3 SCOPE:

(a) The STU will be responsible for managing and serving the **UPEGC** for discharging its obligation with the users. However, the STU will not be required to incur any expenditure on account of travel etc. of any other member of the panel for servicing of this document. The review Panel will be chaired by STU and shall consist of representatives as indicated here under.

(b) The STU shall constitute the **UPERC** Review Panel in accordance with the Provisions of the code.

3.4 UPEGC REVIEW

3.4.1 The functioning of the Panel shall be coordinated by STU who shall also be the convener. The Panel shall be chaired by STU and shall have members comprising one representative from each of the following organisation on the recommendation of the respective head of the organisation.

3.4.2 The Chairman to be nominated by the STU not below the rank of General Manager. Member Secretary also to be nominated by the STU.

One Representative of senior executive level from Uttar Pradesh Jal Vidyut Nigam Limited (UPJVNL).

One Representative of senior executive level from Uttar Pradesh Rajya Vidhyut Utpadan Nigam Limited (UPRVUNL).

One Representative of senior executive level from National Thermal Power Corporation Limited (NTPC)

One Representative of senior executive level from Power Grid Corporation of India Limited (PGCIL).

One Representative of senior executive level from Northern Regional Electricity Board (NREB) secretariat.

One Representative of senior executive level from each supply licensee

One Representative of senior executive level of CPPs of capacity not less than 10MW to be nominated by STU.

One Representative of senior executive level of IPPs. of capacity not less than 50MW to be nominated by STU.

One Representative of senior executive level from Utter Pradesh Electricity Regulatory **Commission (UPERC)** as an observer.

3.4.3 **STU** will inform all **Users** the names and address of the Panel Chairman and Member Secretary at least 7 days before the first Panel Meeting and shall inform **User** in writing of any subsequent changes. Each **User** shall inform the Panel Member Secretary of the names and designations of their Panel Representative not less than 3 days before the first Panel Meeting and shall inform the Panel Member Secretary in writing of any subsequent changes.

3.5 **Function of Review Panel:**

3.5.1 The function of the Panel are as follows:

- a) To keep the **UPEGC** and it's working under continuous scrutiny and review.
- b) To consider all requests for amendments to the **UPEGC** which any **User** makes and to publish recommendations for changes to the **UPEGC** together with the reasons for changes.
- c) To issue guidance on the interpretation and implementation of **UPEGC**.
- d) To examine problems raised by the **Users**.
- e) To ensure that changes/modifications proposed in **UPEGC** are consistent/compatible with IEGC.

Sub meeting may be held by **Licensee** with the **User** to discuss individual requirements and with groups of **Users** to prepare proposals for the Panel meeting/decision.

3.6 **Review and Revisions:**

3.6.1 Written request for review / modification of **UPEGC** shall be sent by the **Users** who is seeking the amendment, to the Grid Code. If the request is sent to **UPERC**, the same shall be forwarded to the STU

- 3.6.2 The STU shall, in consultation with supply Licensee, Generating Cos. **CTU REB and such other persons as the Commission directs every year or earlier if required, review the UPEGC quoted provisions.**
- 3.6.3 The Member Secretary shall present all proposed revisions of the **UPEGC** to the Panel for its consideration. STU shall send the following reports to the **Commission** at the conclusion of each review meeting of the Panel:-
1. A report on the outcome of such review.
 2. Any proposed revisions to the **UPEGC** as the **Licensee** reasonably thinks necessary for achievement of the objectives referred to in the relevant paragraphs of the Transmission licence
 3. All written representations or objections from **Users** rose during the review.
- 3.6.4 All revisions to the **UPEGC** shall require approval of the **Commission**.
- STU** shall publish revisions to the **UPEGC** once approved by the **UPERC**. STU shall present proposals to the **UPERC** to allow relaxation, where **Users** have difficulties in meeting the **UPEGC**.
- 3.6.5 Every change from the previous version shall be clearly marked in the margin. In addition, a revision sheet shall be placed at the front of the Revised Version noting the number of every changed Sub-section, together with a brief statement of change.
- 3.6.6 **STU** shall keep an up to date list of the recipients and locations of all serviced copies of the **UPEGC**.
- 3.6.7 **STU** shall make available a copy of Grid Code in force to any person requesting it at a price not exceeding the reasonable cost.

CHAPTER-4 SYSTEM PLANNING

4.1 **Introduction**

The System Planning (hereinafter referred to as the SP) specifies the technical and design criteria and procedures to be applied to **Licensee** in the planning and development of the **Transmission System**. Users of the Transmission System when planning and developing of their own systems shall take the System Planning into account.

4.1.1. A requirement for reinforcement or extension of the **Licensee** system may arise for a number of reasons including, but not limited to:

1. A development on a **User's** System already connected to the **Transmission System** as a **User** Development.
2. The introduction of a new Connection Point between a **User's** System and the **Transmission System**.
3. The need to increase system capacity, to remove operating constraints and to maintain standards of security to accommodate a general increase in any **Licensee** Demand.
4. Transient or steady state stability considerations;
5. The cumulative effects of any combination of 1 to 5 above.

4.1.2 Accordingly, the reinforcement or extension of the **Transmission System** may involve work at a connecting point (entry or exit point) of a generator or supply licensee to the **Transmission System**

4.1.3 The development of the **Transmission System** must be planned with sufficient lead-time to allow time for any necessary statutory consents or right-of-way permission to be obtained and detailed engineering design/construction work to be completed. This System Planning therefore imposes time scales for the exchange of information between STU and **Users**, subject to all parties having regard, where appropriate to the confidentiality of such information.

4.2 **Objective**

4.2.1 The Standards and procedures within the SP are intended to enable STU in consultation with **Users**, to provide an efficient, co-coordinated, secure and economical **Transmission System** throughout its authorised area in order to satisfy requirements imposed by future levels and dispositions of Demand and Generation.

4.3 **Perspective Plan**

4.3.1 The STU is charged with the responsibility to prepare and submit a long-term plan in

conformity with the national perspective generation and transmission plan prepared by CEA to the **Commission** for generation expansion and for **Transmission System** expansion to meet the future demand.

4.3.2 For fulfillment of the above requirement the **Licensee** shall:

1. Forecast the demand for power within the Area of Supply in each of the succeeding 10-15 years and provide to the STU details of the demand forecasts, data, methodology and assumptions on which the forecasts are based. These forecasts may be periodically reviewed and updated.
2. Prepare a long-term plan for the **Transmission System** compatible with the above load forecast and national perspective generation and transmission plan prepared by CEA. This will include provision for VAR compensation needed in the **Transmission System**

4.4 **Planning Standards and Procedures:**

4.4.1 The **Transmission System** shall be planned in accordance with the **Transmission System** Planning and Security Standards.

4.5 **Planning responsibility**

4.5.1 The Primary responsibility of load forecasting within its area rests with each of the supply licensee Supply licensees. The supply licensee Supply licensees shall determine, peak load and energy forecasts of their areas, for each category of loads for each of the succeeding 10-15 years and submit the same annually by 31st March to the **Licensee** along with details of the demand forecasts, data methodology and assumptions on which the forecasts are based. The load forecasts shall be made for each of the interconnection points, between the **Licensee** and **Users** and shall include annual peak load and energy projections and daily load curve. The demand forecasts shall be updated annually or whenever major changes are made in the existing system. While indicating requirements of single consumers with large demands (one MW or higher) the supply licensee shall satisfy it, regarding materialisation of the demand.

4.5.2 The **Licensee** is responsible for integrating the load forecasts submitted by each of the Supply licensees and determining the long-term (10-15 years) load forecasts for the State. In doing so the **Licensee** may apply appropriate diversity factor, and satisfy itself regarding probability of materialisation of bulk loads of consumers with demands above 1MW in consultation with the supply licensee concerned.

4.5.3 The **Licensee** may also review the methodology and assumptions used by the supply licensee in making the load forecast, in consultation with the supply licensee. The resulting overall load forecast will form the basis of planning for expansion of **Transmission System** which will be carried out by STU. To maintain the reliability of interconnected regional power systems, all the participants must comply with the CEA's planning criteria/guidelines as updated from time to time.

4.6 **PLANNING DATA REQUIREMENT:**

4.6.1 To enable the **Licensee** to discharge its responsibilities under the **License**, to conduct System studies and prepare perspective plans for electricity demand, generation and

transmission as detailed in paragraph 4.3 of this Section, the **Users** shall furnish data to the **Licensee** from time to time as detailed under Data Registration Section and categorized as Planning Data (PD).

- 4.6.2 To enable **Users** to co-ordinate planning, design and operation of their plant and system with the **Transmission System** they may seek certain salient data of **Transmission System** as applicable to them, which the **Licensee** shall supply from time to time as detailed under Data Registration Section and categorized as Detailed System Data Transmission.
- 4.7 Notwithstanding the above provisions the planning code of IEGC will also apply to the generating **Companies, CPPs, IPPs & STU**, Utilities and **Supply licensees** regarding generation /or transmission of energy /or from the **ISTS /STU**.
- 4.8 The one time data shall be submitted within 6 months from the date the Grid Code takes effect, by the different **Supply licensees, Generation Companies, CPPs, IPPs**, to the **Licensee/STU**. The data other than the one time data may be similarly is made available to the **Licensee/STU** on first of April and first of October every year.

APPENDIX-A-1
PLANNING DATA REQUIREMENTS

PART-I

A-1 Standard Planning Data (Generation)

A-1.1. Thermal (Coal based)

I- GENERAL

- | | | |
|----|------------------------------------|--|
| 1. | Site | Give location map to scale showing roads, railway lines, transmission lines, rivers and reservoirs, if any. |
| 2. | Site map (To scale) | Showing area required for power station coal linkage, coal yard, water pipe line, ash disposal area, colony etc. |
| 3. | Approximate period of construction | |

II Connection

- | | | |
|----|---------------------|--|
| 1. | Point of connection | Give single line diagram of the proposed connection with the system. |
|----|---------------------|--|

III Station Capacity

- | | | |
|----|-----------------------------|--|
| 1. | Total Station capacity (MW) | MW |
| 2. | No of Units & Unit size | State whether development will be carried out in phase and if so, furnish details. |

IV Generating Unit Data

- | | | |
|----|-----------------|--|
| 1. | Steam generator | State type, capacity, steam pressure, steam temperature etc. |
| 2. | Steam turbine | State type and capacity. |

3. Generator

- (a) Type
- (b) Rating (MVA)
- (c) Terminal voltage (KV)

- (d) Rated Power Factor
- (e) Reactive power Capacity (MVA_r) at lower voltage terminal of the G.T for Maximum Generation at normal full load in the range of 0.95 pf leading and 0.85 lagging.
- (f) Short Circuit Ratio
- (g) Direct axis transient reactance (% On MVA rating)
- (h) Direct axis sub-transient reactance (% on MVA rating)
- (i) Auxiliary Power Requirement (MVA)

4. **Generator Transformer**
 - (a) Type
 - (b) Rated capacity (MVA)
 - (c) Voltage Ratio (HV/LV)
 - (d) Tap Change Range (+% to-%)
 - (e) Percentage Impedance (positive Sequence at Full load)

A-1.2 Hydro Electrical

I General

1. Site Give location map to scale showing roads, railway lines, and transmission lines.
2. Site map (To scale) Showing proposed dam, reservoir area, water conductor system, fore bay, power house etc.
- 3.
4. Approximate period of construction

II Connection

1. Point of connection Give Single line diagram of the proposed connection with the Trans. system
2. Step up voltage for connection

III Station Capacity

1. Total Station capacity (MW)
2. No of units & unit size in (MW)

IV Generating Unit Data

1. Operating Head (in Mt.)
 - Maximum
 - Minimum
 - Average
2. Turbine State type and capacity
3. **Generator**
 - (a) Type
 - (b) Rating (MVA)
 - (c) Terminal voltage (MV)
 - (d) Rated Power Factor
 - (e) Reactive power capability (MVA_r) at lower voltage terminal of G.T. for Maximum Generation at normal full load Normal Minimum load in the range 0.95 pf leading and 0.85 pf lagging
 - (f) Short Circuit Ratio
 - (g) Direct axis transient reactance (% on rated MVA)
 - (h) Direct axis sub-transient reactance (% on rated MVA)
 - (i) Auxiliary Power Requirement (MW)

4. **Generator-Transformer**
- (a) Type
 - (b) Rated Capacity (MVA)
 - (c) Voltage Ratio LV/HV
 - (d) Tap Change Range (+% to-%)
 - (e) Percentage Impedance (Positive Sequence at Full load)

A-2 Standard Planning Data (Transmission)

Note:- The compilation of the data is the internal matter of **Licensee**, and as such **Licensee** shall make arrangements for getting the required data from different Departments of **Licensee** to update its Standard Planning Data in the format given below:

1. Name of line (Indicating Stations and substations to be connected)
2. Voltage of Line (KV)
3. No. of Circuits
4. Route length (CKM)
5. Conductor sizes (Dog, Moose etc.)
6. Line parameters (PU and ohmic values)
 - (a) Resistance/Km
 - (b) Inductance/Km
 - (c) Susceptance/Km
7. Approximate power flow expected (MW)/MVAR
8. Terrain of route Give information regarding nature of terrain i.e. forest land, shallow land, agricultural and river basin, hill, slope etc.
9. Route map (To Scale) Furnish topographical map showing the proposed route showing existing power lines and Telecommunication lines
10. Purpose of connection Reference to scheme, wheeling to other state etc.
11. Approximate period of construction

A-3 Standard Planning Data (Distribution)

I. General

1. Area map (To scale) Marking the area in the map of U.P. for which Distribution licence is applied.
2. Consumer Data Furnish categories of consumers. Their nos. connected loads.
3. Reference to Circle/Divisions presently in charge of the Distribution

II. Connection

1. Points of connection Furnish single line diagram showing points of connection.
2. Voltage of supply at points of connection
3. Names of Grid Sub-Station feeding the points of connection

III. Lines and Substations

1. Line Data Furnish lengths of line and voltages within the Area.
2. Sub-Station Data Furnish details of 33/11KV Sub-Station, 11/0.4KV Sub-stations and capacitor installations.

IV. Loads

1. Loads drawl at points of connection
2. Details of loads fed at EHV (if any) Give name of consumer voltage of supply contract demand and name of Grid Substation from which line is drawn, length of EHV line from Grid S/s to consumer's premises.

V. Demand Data

Note: These information are required from Non Tariff consumers requiring connection.

1. Type of load State whether furnace loads, rolling mills, traction loads, other industrial loads, pumping loads etc.
2. Rated Voltage
3. Electrical loading of equipment State number and size of motors, types of drive and control arrangement.
4. Sensitivity of load to voltage and frequency of supply
5. Nearest sub-station from which load is to be fed.
6. Location map to scale Showing location of load with reference to lines and sub-station in the vicinity.

VI. Load Forecast Data

1. Peak load and energy forecast for each category of loads for each of the succeeding 10 year.

2. Details of methodology and assumptions on which forecasts are based.
3. If supply is received from more than one Sub-Station, the sub-station wise break up of peak load and energy projections for each category of loads for the succeeding 10 years along with estimated daily load curve.
4. Details of loads of 5MW and above
 - (a) Name of prospective consumer
 - (b) Location and nature of load/complex
 - (c) Substation from which is to be fed
 - (d) Voltage of supply
 - (e) Phasing of load

Detailed Planning Data (Generation)
Part-I
For Thermal Power Station (Coal Based)

I. General

1. Name of Power Station
2. No and Capacity of units (MVA)
3. Ratings of all major equipments
 - (a) Boiler (Steam temperature/Pressure)
 - (b) Coal Mill (KW)
 - (c) Feed Water Pumps (KW)
 - (d) I.D. Fans (KW)
 - (e) Turbines (KW)
 - (f) Alternators (MVA)
 - (g) Generator Transformer (MVA)
 - (h) Auxiliary Transformers (MVA)
4. Single line Diagram of power Station and Switchyard
5. Relaying and metering diagram
6. Neutral Grounding of Generators
7. Excitation control (state type used, e.g. Thyristor, Fast Brushless)
8. Earthing arrangements with earth resistance values

II Protection and Metering

1. Full description including settings for all relays and protection systems installed on the Generating unit, Generator Transformer, Auxiliary Transformer and electrical motor of major equipment listed.
2. Full description including settings for all relays installed on all outgoing feeders from power station switchyard, Tie Breakers, incoming Breakers.
3. Full descriptions of inter tripping of Breakers at the point or points of connection with the Trans. System.
4. Most probable fault clearance time for electrical faults on the **User's** System.

III Switchyard

1. In relation to interconnecting transformers between Transmission High Voltage System and the Generator Transformer High Voltage System.
 - (a) Rated MVA
 - (b) Voltage Ratio
 - (c) Vector Group
 - (d) Positive sequence reactance (maximum, minimum, normal Tap)(% on MVA)

- (e) Positive sequence resistance (maximum, minimum, normal Tap) (%)
on MVA)
 - (f) Zero sequence reactance (% on MVA)
 - (g) Tap Changer Range (+% to -%) and steps.
 - (h) Type of Tap Changer (OFF/ON)
2. In relation to switchgear including circuit breakers, Isolators on all circuits connected to the points of connection
 - (a) Rated Voltage (KV)
 - (b) Type of Breaker (MOCB/ABCB/SF6)
 - (c) Rated short circuit breaking current (KA) 3 phase
 - (d) Rated short circuit breaking current (KA) 1 phase
 - (e) Rated short circuit making current (KA) 3 phase
 - (f) Rated short circuit making current (KA) 1 phase
 - (g) Provisions of auto reclosing with details
 3. Lightning Arrester, Technical data
 4. Details of PLCC equipment installed at points of connections
 5. Basic Insulation Level (KV)
 - (a) Bus bar
 - (b) Switchgear
 - (c) Transformer
 - (d) Transformer windings

IV Generating Units

A Parameters of Generating Units

1. Rated terminal Voltage (KV)
2. Rated MVA
3. Rated MW
4. Inertia constant (MW sec/MVA)
5. Short circuit ratio
6. Direct axis synchronous reactance (% on MVA) X_d'
7. Direct axis transient reactance (% on MVA) X_d''
8. Direct axis sub-transient reactance (% on MVA) X_d'''
9. Quadrature axis synchronous reactance (% on MVA) X_q'
10. Quadrature axis transient reactance (% on MVA) X_q''
11. Quadrature axis sub-transient reactance (% on MVA) X_q'''
12. Direct axis transient open circuit time constant (Sec) T'_{do}
13. Direct axis sub-transient open circuit time constant (Sec) T''_{do}
14. Direct axis transient open circuit time constant (Sec) T'_{qo}
15. Quadrature axis sub-transient open circuit time constant (Sec) T''_{qo}
16. Stator Resistance (Ohm) R_a
17. Stator leakage reactance (Ohm) X_l
18. Stator time constant (Sec)
19. Rated Field current (A)
20. Open circuit saturation characteristic for various voltages giving the compounding current to achieve the same.

B Parameters of Excitation Control System

1. Exciter Voltage
2. Gain Factor
3. Self Regulator Factor
4. Feed Back Strength
5. Time Constant of Control Amplifier
6. Time Constant of Exciter
7. Time Constant of Feed Back
8. Output Voltage of control amplifier
9. Minimum output voltage of control amplifier
10. Maximum output voltage of control amplifier
11. Details of excitation loop in Block Diagrams showing transfer functions of individual elements.
12. Dynamic characteristics of over-excitation limiter
13. Dynamic characteristics of under excitation limiter

Note: Using IEEE Committee Report symbols the following parameters shall be furnished $D, A, B, S_x, K_a, K_e, K_f, T_a, T_f, V_r(\min), V_r(\max), S_a, S_b$.

C. Parameters of Governor

1. Governor average gain (MW/HZ)
2. Speeder motor setting range
3. Time constant of steam or fuel Governor valve
4. Governor valve opening limits
5. Governor valve rate limits
6. Time constant of Turbine
7. Governor Block Diagram showing transfer of individual elements

Note: 1) For Reheat Type Turbines, Parameters of HP and LP Governors may be furnished.
2) Using IEEE Committee Report Symbols the following Parameters shall be furnished phase Thp, Tip, Tlp, Fhp, Fip, Flp, R, Ts, g(min), g(max).

V Plant Performance

A Station

1. Daily Demand Profile (Peak and Average, in time marked 30 minutes throughout the day)
(Last year)
2. Daily Demand profile In time marked 30 minutes throughout the day.
(Forecast)
3. Units Generated (MU)
4. Units consumed in auxiliary (MU)
5. Units supplied from system to auxiliary Load (MU)
6. Seasonal generation (MU)

Planning Data Generation
Part-II
(For Submission on request by Licensee)
For Thermal Stations (Coal Based)

I General

1. Detailed Project Report
2. Status Report
 - (a) Land
 - (b) Coal
 - (c) Water
 - (d) Environmental Clearance
 - (e) Rehabilitation of displaced persons
3. Techno-economic approval by Central Electricity Authority
4. Approval of State Government/Government of India
5. Financial Tie-up

II Connection

1. Reports of studies for parallel operation with **Transmission System**
 - (a) Short Circuit studies
 - (b) Stability studies
 - (c) Load Flow studies
2. Proposed Connection with **Transmission System**
 - (a) Voltage
 - (b) No. of Circuits
 - (c) Point of connection

Hydroelectric Power Stations

I. General

1. Detailed Project Report
2. Status Report
 - (a) Topographical survey
 - (b) Geological survey
 - (c) Land
 - (d) Environmental Clearance
 - (e) Rehabilitation of dispatched persons
3. Techno economic approval by Central Electricity Authority
4. Approval of State Government/Government of India
Financial Tie-up

II Connection

1. Report of studies for parallel operation with **Transmission System**
 - (a) Short Circuit studies
 - (b) Stability studies
 - (c) Load Flow studies

2. Proposed Connection with **Transmission System**

- (a) Voltage
- (b) No. of circuits
- (c) Point of connection

Detailed Planning Data (Transmission)

Part-I

Note: The compilation of the data is the internal matter of **Licensee**, and as such **Licensee** shall make arrangements for getting the required data from different departments of **Licensee** to update its Standard Planning data in the format given below:

I General

1. Single Line Diagram of the system Indicating Furnish the single line diagram of the System of UP Power Sector up to 33 KV Bus at Grid Substation.
 - a. Name of substation
 - b. Power Stations connected
 - c. Number and length of circuits
 - d. Interconnecting Transformers
 - e. Substation Bus layout
 - f. Power Transformers
 - g. Reactive Compensation equipments
 - i) The details of Capacitors installed
 - ii) Additional Capacitors to be commissioned along with Additional Loads.

Substation lay out diagrams

- a. Bus bar layouts
- b. Electrical circuitry (lines, cables, transformer, switchgear etc)
- c. Phasing arrangement
- d. Earthing Arrangement
- e. Switching facilities and interlocking arrangements
- f. Operating Voltages
- g. Numbering and nomenclature.
 - i) Transformers
 - ii) Feeders
 - iii) Breakers
 - iv) Isolating Switches

II Line Parameters (for all circuits)

1. Name of line
2. Length of line (KM)
3. Number of circuits
4. Per circuit values
 - (a) Operating Voltage (KV)
 - (b) Positive Phase sequence reactance (pu on 100 MVA) XI
 - (c) Positive Phase sequence resistance (pu on 100 MVA) RI
 - (d) Positive Phase sequence Susceptance (pu on 100 MVA) BI
 - (e) Zero Phase sequence reactance (pu on 100 MVA) XO
 - (f) Zero Phase sequence resistance (pu on 100 MVA) XO
 - (g) Zero Phase sequence Susceptance (pu on 100 MVA) XO

- III Transformers Parameters (for all transformers)**
- A**
- (a) Rated MVA
 - (b) Voltage Ratio
 - (c) Vector Group
 - (d) Positive sequence reactance (pu on 100MVA max, min & normal)XI
 - (e) Positive sequence resistance (pu on 100 MVA max, min & normal) RI
 - (f) Zero sequence reactance (pu on 100 MVA) XO
 - (g) Tap change range (+ % to - %)and steps
 - (h) Details of Tap changer (Off / On)
- IV Equipment Details (For all substations)**
1. Circuit Breakers
 2. Isolating Switches
 3. Current Transformers
 4. Potential Transformers
- V Relaying and metering**
1. Relay installed for all transformers and feeders along with their settings and protection levels of coordination with other **Users**.
 2. Metering Details
- VI System studies**
1. Load flow studies (Peak, Medium and Lean load) for maximum Hydro and maximum Thermal Generation
 2. Transient stability studies for 3 phase fault in critical lines
 3. Dynamic Stability studies
 4. Short circuits studies (3 phase & single phase to earth)
 5. Losses in **Transmission System** (Transmission as well as Distribution)
- VII Demand Data (For all substations)**
- Demand Profile (Peak and lean load)
- (a) Current
 - (b) Forecast for the next 5 years.
- VIII Reactive Compensation Equipment**
- a. Type of equipment (fixed or variable)
 - b. Capacities and/or Inductive rating or its operating range in MVAR
 - c. Details of Control
 - d. Points of connection to the System

Detailed Planning Data (Transmission)
Part-II (For Submission on request by Licensee)
(In addition to information contained in Part-I)

I. General

1. Detailed Project Report (For new and system improvement schemes)
2. Status Report

Line:

- (a) Route Survey
- (b) Forest Clearance

Sub-Stations:

- a. Land
- b. Environmental Clearance
3. Techno-economic approval by Central Electricity Authority
4. Financial Tie-up

II Connection

1. Single line Diagram (Showing proposed connection)
2. Sub-station layout diagram
 - (a) New
 - (b) Additions & Alteration
3. Revised system studies with changed parameters
4. Points of connection
 - a. Voltage
 - b. Length of circuit
 - c. Circuit parameters
 - d. PLCC facilities
 - e. Relaying with inter tripping arrangements to inter trip system breaker at point of connection to isolate on fault
 - f. Metering at points of connection.

Detailed Planning Data (Distribution)

Part-I

I. General

1. Distribution map to scale (Showing all lines up to 11 KV and substations belonging to Supplier)
2. Single line diagram of distribution system (Showing distribution lines from points of connection with **Transmission System**, 33/11KV substation, 11/0.4 KV Substation, consumer bus if fed directly from **Transmission System**.)
3. Numbering and nomenclature of lines and substations (Identified with feeding Grid Substation of **Licensee** and concerned 33/11KV Substation of Supplier).
4. Monitoring of Transmission and distribution losses (State methods adopted for reduction of losses).

II Connection

1. Points of connection (furnish details of existing arrangements of connection).
2. Details of metering at points of connection.

III Loads

1. Connected load (category wise) | Furnish consumer details, Number of consumers category-wise, details of load 1MW and above.
2. Information on diversity of load and coincidence factor.
3. Daily Demand Profile (current and forecast) on each 33/11KV substation.
4. Cumulative Demand Profile of Distribution (current & Forecast)

Detailed Planning Data (Distribution)
Part-II
(For Submission on request by Licensee)
(In addition to information contained in Section-I)

I. General

1. Detailed Project Report (For new and system improvement scheme)
2. Status Report
 - a. Load Survey
 - b. Load Forecast for next 5 years.
3. Single line diagram (Showing proposed new lines & Substations)
4. Techno Economic approval by Central Electricity Authority

II. Connection

1. Points of connection (As applied for)
 - a. New
 - b. Upgrading existing connection
2. Changes in metering at points of connection

III. Loads

1. Details of loads as per load forecast in the next 5 years.
2. Distribution of loads 33/11KV substation wise projected in the next 5 years.
3. Details of major loads 1MW and above to be contracted in the next 5 years.

IV. Improvement Schemes for reduction of Transmission and Distribution loss

1. Statement of estimated T&D loss in the next 5 years.
2. Brief indication of improvement scheme for reduction of losses (Excerpts from Detailed Project Report).
 - a. New lines
 - b. Upgrading of lines
 - c. New Substation/Upgrading of Substations
 - d. Rearrangement of loads
 - e. Installation of capacitors

CHAPTER-5
CONNECTIVITY CONDITIONS

5.1 Introduction

5.1.1 Connectivity Conditions specify the technical design and Operational Criteria which must be complied with by any **User** Connected to the **Transmission System**.

5.2 Objective

5.2.1 The Objective of this Section is to ensure the following:

- i. All **Users** or prospective **Users** are treated equitably.
- ii. Any new connection shall not impose any adverse effects on existing **Users**, nor shall a new Connection suffer adversely due to existing **Users**.
- iii. By specifying minimum design and operational criteria, to assist **Users** in their requirement to comply with **Licensee** obligations and hence ensure that a system of acceptable quality is maintained.
- iv. The ownership and responsibility for all items of equipments is clearly specified in a schedule (Site Responsibility Schedule) for every site where a Connection is made.

5.3 Procedures for Applications for connection to use Licensee System

5.3.1 Offer of Terms

- a) Within 2 months of receipt of an application containing all such information as may reasonably be required, **Licensee** shall make a formal offer. It should include the break-up of cost of works to be undertaken, duly classified under the sub-heads like materials, labour and, supervision. The estimated time schedule for completion of such works should also be indicated.
- b) The offer shall specify, and take account of, any works required for the extension or reinforcement of the Trans. **Licensee** System necessitated by the applicant's proposal and for obtaining any consent necessary for such purpose.
- c) Where the offer is in respect of a modified connection, the terms shall take into account, the existing Connection Agreement.
- d) I) If the nature of complexity of the proposed Development is such that the prescribed time limit for making the offer is not considered adequate, **Licensee** shall make a preliminary offer within the prescribed time limit indicating the extent of further time required for more detailed analysis of the issues.

II) On receipt of the preliminary offer the **User** shall indicate whether **Licensee** should precede further to make a final offer within the extended

time limit.

III) **Licensee** may require the **User** to furnish some or all of the Detailed Planning Data at this stage (in advance of the normal time limit).

- e) In the event of an offer becoming invalid or rejected by an applicant, **Licensee** shall not be required to consider any further application from the same **User** within twelve months of original application unless the new application is substantially different from the original application with regard to system changes.
- f) A **User** shall furnish the relevant Detailed Planning Data to **Licensee** within 30 days (or any longer period as **Licensee** may agree in a particular case) of its acceptance of an offer.
- g) Wherever the **STU/Licensee Transmission System** is connected with ISTS the provisions of Connection Conditions (Chapter-4) of IEGC will prevail.

5.4 **Right to Reject An Application:**

5.4.1 **Licensee** shall be entitled to reject any application for connection to /or use of **Licensee** System on the following conditions.

- a) If such proposed connection is likely to cause breach of any provision of its License or any provision of the Grid Code or any provision of the Indian Electricity Rules or any provision of planning criteria or any covenants, deeds or regulations by which the **Licensee** is bound, or
- b) If the applicant does not undertake to be bound, in so far as applicable, by the terms of Grid Code.
- c) If the proposed works stated in the application do not lie within the purview of the **Licensee** or do not conform to the provision of Grid Code.
- d) If the applicant fails to give confirmation and undertakings according to section 5.3.1.

5.5 **Connection Agreements**

5.5.1 A connection Agreement (or the offer for a connection Agreement) will include, as appropriate within its terms and conditions the following:

- a) A condition requiring both parties to comply with the Grid Code.
- b) Details of connection and/or use of system.
- c) Details of any capital related payments arising from necessary reinforcement or extension of the system.
- e) A Site Responsibility Schedule, detailing the division of responsibility at Connection Sites in relation to ownership, control, operation and maintenance of plant and Apparatus and to safety of persons;

5.6 **Offer's Conditions on Consents and Statutory Obligations**

- a) An offer made by **Licensee** on an application by an **User** for connection to or use of the **Licensee** system shall be, as appropriately as possible, subject to obtaining or compliance with necessary consents, approvals, permissions right of way or other external requirements (Whether of a statutory, contractual nature or

otherwise)

- b) A **User** whose Development requires **Licensee** to obtain any of the consents, approvals, permissions and right of ways or to comply with any other requirements mentioned in U.P.E.G.C. shall:
 - i) Provide necessary assistance, supporting information or evidence;
and
 - iii) Ensure attendance by such witness as **Licensee** may reasonably request.
- c) If any offer was originally made upon an application for a Development by a **User** which is subject to changes in design parameters, **Licensee** shall make a revised offer to the **User** including revised terms and extended time limit for submission of data. This revised offer shall form the basis of any Connection Agreement.

5.7 **Site Responsibility Schedule**

5.7.1 For connections to the **Licensee** System for which a Connection Agreement is required, a schedule will be prepared by **Licensee** pursuant to the relevant Connection Agreement which shall state for each item of Plant and Apparatus at the Connection Site: -

- a) Ownership of the Plant/apparatus;
- b) Responsibility for control of the Plant/Apparatus
- c) Responsibility for operation of the Plant/Apparatus;
- d) Responsibility for maintenance of the Plant/Apparatus; and
- e) Responsibility for all matters relating to the safety of any person at the connectivity Site.

5.7.2 Each Site Responsibility Schedule shall, in addition to the information specified in paragraph 5.7.1 contains the information set out in the **UPEGC** elsewhere. The **User** owning the connection site shall provide reasonable access and the required facilities to another **User** whose equipment is installed at the connection site for installation, operation and maintenance etc.

5.8 **Protection Performance**

The action required to be taken by **Licensee** and the **Users** have been outlined in Chapter-14 of Grid Code.

APPENDIX
Site Responsibility Schedules

All HV Apparatus on any Connection Site shall be shown on one diagram which shall include details of the following

1. Busbars
2. Circuit Breakers
3. Isolator
4. Bypass facilities
5. Earthing switches,
6. Maintenance Earths
7. Overhead line entries
8. Overhead line traps
9. Cable and Cable sealing ends
10. Generating Unit
11. Generating Unit Transformers
12. Generating Unit Auxiliary Transformers including lower voltage circuit breakers
13. Station Service Transformers including lower voltage circuit breakers
14. Capacitors including Synchronous compensators
15. Series or Shunt Reactors
16. Grid Transformers (Inter connecting transformers)
17. Tertiary windings
18. Earthing and auxiliary transformers
19. Three phase voltage transformers
20. Single phase voltage transformers and phase identity
21. Surge arresters
22. Neutral earthing arrangements on HV plant
23. Current Transformer

CHAPTER-6
SYSTEM SECURITY ASPECTS

- 6.1 All **Users** shall endeavor to operate their respective power system and generating stations in synchronism with each other at all times, such that the whole **Licensee** system operates as synchronised system and integrated part of Northern Regional Grid. **Licensee** will endeavor to operate the inter zonal links so that inter zonal transfer of power can be achieved smoothly and when required. Security of the power system and safety of power equipment shall enjoy priority over economically optimal operations.
- 6.1.1 **STU** shall provide automatic under frequency load shedding scheme in their System to arrest frequency decline and the collapse/disintegration of the grid as per plan finalised by **NREB**.
- 6.2 No part of the **Licensee** System shall be deliberately isolated from the integrated Grid, except
- (i) Under an emergency and conditions in which such isolation would prevent a total Grid collapse and /or enable early restoration of power supply.
 - (ii) When serious damage to a costly equipment is imminent and such isolation would prevent it
 - (iii) When such isolation is specifically advised by **SLDC** and
 - (iv) On operation of under-frequency / Islanding scheme as approved by **NREB**. All such isolations shall be either as per standing guidelines approved by **NREB/UPERC** or shall be put up in the review Panel for ratification. Complete synchronization of integrated Grid shall be restored, as soon as the conditions again permit it. The restoration process shall be supervised by **SLDC** as per relevant procedures separately finalised.
- 6.3 The 66 KV and above transmission lines and inter-connecting transformers (except radial lines which do not affect the operation of the Grid) shall not be deliberately opened or removed from service at any time except when advised by **SLDC** or with specific and prior clearance of **SLDC**. Where prior clearance from **SLDC** is not possible it should be intimated to **SLDC** at the earliest possible time after the incident. If **SLDC** feels that reasons for not taking prior permission are not justified it may refer the matter to the Review panel.
- 6.4 Any tripping, whether manual or automatic, of any of the elements mentioned above, shall be precisely reported by the concerned Zonal LDC/Sub-station operator to **SLDC** at the earliest. The reason (to the extent determined) and the likely time of

restoration shall also be intimated. All reasonable attempts shall be made for the elementary restoration at the earliest. The constituent/ substation operator/ Zonal LDC shall send the information/ data including Disturbance Recorder, Sequential Event Recorder outputs etc. containing the sequence of tripping and restoration to **SLDC** for the purpose of analysis.

- 6.5 All Generating Units (except run of the river Hydro stations without any pondage) and gas stations which are synchronised with the Grid, irrespective of their ownership, type and size, shall have their governors in free operation (Natural governing) at all times except in case of Combined Cycle gas based Power Stations where steam turbines do not have facilities for free governor operation. If any Generating Unit of over fifty (50) MW size is required to be operated without its governor in free operation, the **SLDC** shall be immediately intimated about the reason and duration of such operation, which has ultimately to be ratified by the Review Panel.
- 6.6 Facilities available within Load Limiters, Automatic Turbine Run-up System (ATRS), Turbine Supervisory Coordinated Control system etc. shall not be used to suppress the normal governor action in any manner. No dead bands and time delays shall be deliberately introduced
- 6.7 All Generating Units operating at up to 100 % of their Maximum Continuous Rating (MCR) shall normally be capable of (and shall not normally be prevented from) instantaneously picking up at least five percent (5%) extra load (Valve Wide Open) for at least five (5) minutes or with in technical limits as provided by the manufactures when frequency falls due to a system contingency subject to the ambient conditions and operating margins provided by the manufacturers. The Generating Units operating at above 100 % of their MCR shall be capable of (and shall not be prevented from) going at least to 105% of their MCR when frequency falls suddenly subject to the aforesaid condition. In case any Generating Unit of fifty (50) MW size and above does not comply with the above requirement, **SLDC** shall be kept apprised of such limitations. The concerned constituents shall make efforts to compensate for this shortfall in spinning reserve by maintaining an extra spinning reserve on the other Generating Units of the constituent. The gas station loading will be subject to ambient temperature & frequency.
- 6.8 In case frequency falls below 49.5 Hz, all partly loaded Generating Units shall pick up additional load at a faster rate, according to their capability. **SLDC** in consultation with NRLDC. Supply Licensees shall prepare a plan for automatic load relief during the low frequency conditions. In case frequency rises to 50.5 Hz or higher, neither any generating unit shall be synchronized with the Grid nor MW generation at any

generating station (irrespective of type of ownership) shall be increased.

- 6.9 Except under an emergency, or to prevent an imminent damage to a costly equipment, no **User** shall suddenly decrease / increase its generation without prior intimation to the **SLDC**. Similarly, no **User** shall cause a sudden decrease/ increase in its load due to imposition/lifting of power cuts etc. without prior intimation to and consent of the **SLDC**, particularly when frequency is less than 49.5 Hz or above 50.5 Hz.
- 6.10 All Generating Units shall normally have their Automatic Voltage Regulators (AVRS) in operation, with appropriate settings. In particular, if a Generating Unit of over fifty (50) MW size is required to be operated without its AVRS in service, the **SLDC** shall be immediately intimated about the reason and duration, and its concurrence obtained.
- 6.11 Provision of protections and relay settings shall be coordinated in the system of U.P State, as per plan to be separately finalised by the Protection Committee to be constituted by Review Panel/ **Licensee** in consultation with the existing Protection Committee of **NREB**.
- 6.12 Various steps shall be taken for frequency management (refer para 9.3) and voltage management (refer para 9.5) so as to ensure system security.
- 6.13 All 220 KV Grid stations Disturbance Recorders (DRs) and Event Loggers (ELs) with the time synchronization facilities using Geo Physical Satellite (GPS) for recording of dynamic performance of the system shall be provided.
- 6.14 **Users** shall comply with the provisions outlined in the Transmission and Distribution Operating, Security and Planning Standards of the **Licensee**.
- 6.15 The **Users** shall comply with the provisions out lined in respect of frequency variation limits and voltage limits as specified in IEGC clause 6.2.
- 6.16 **LCP (Line Clear Permit)**
 - 6.16.1 This operating code sets out the procedure for the Record of line clear permit.
 - 6.16.2 The format of LCP forms set out in Appendices A,B and C shall be used. The form set out in Appendix A and designated as ‘Requisition for Line Clear Permit’ shall be used by requesting Safety Coordinator (An Authorised Person). The form set out in Appendix B and designated, as “Line Clear Return” shall be used for the return of the Line Clear Permit after the work for which LCP was taken is completed. The form set out in Appendix C and designated as ‘Check List for Line clear Permit’ shall be used

at the time of issuing LCP.

- 6.16.3 **Users** may either adopt the format referred to in 6.16.2 or use forms or other tangible written records in equivalent formats provided that they include sections for containing the same information and has the same numbering of Sections as LCP-A, LCP-B and LCP-C. Whichever method **Users** choose, they shall provide Performa or other means of recording in writing for use by their staff.
- 6.16.4 **SLDC** should provide information/data including Disturbance Recorder/Event logger output etc to **NRLDC** for the purpose of any grid disturbance/event analysis.

APPEDIX-A

REQUISITION FOR LINE CLEAR PERMIT

LCP-A Number

Dated.....

1. HV Apparatus Identification:

Safety: Precautions have been established by the Implementing Safety Coordinator to achieve safety from the system on the Following HV apparatus on the requesting Safety Coordinator system from the Implementing safety coordinator's side of the System (state identity-names) and where Applicable, identification of the HV circuits up to the correction points.

2. Safety Precaution Established

- a. Isolation (State location(s) at which Isolation has been established. For each location identify each point of Isolation and means by which Isolation has been achieved and whether immobilized and locked, caution Notice affixed on other safety procedure applied, as appropriate).

- b. Earthing (State the location(s) at which Earthing has been established. For each location identify each point of Earthing has been achieved and whether immobilized and locked or other safety procedures applied, as appropriate)

Name and Signature of
(Requisitioning Safety Coordinator)	(Incharge of the crew)
Designation.....
Date.....

LCP-A(Continued)

**(FOR USE IN SUBSTATION FROM WHERE LINE CLEAR PERMIT WILL BE
ISSUED)**

1. Line Clear permit issued : Yes/No
2. Number and date of issue (Code No.):
3. Time of issue:
4. Time of Return:
5. Remarks: See Check List LCP-C

Issue

I have received confirmation from(name of implementing safety co-coordinator) at.....(Location) that the safety precautions identified in para 2 above have been established and the instructions will not be issued at his location for their removal until his LCP-A is cancelled.

Name and Signature of
(Requesting Safety Coordinator)

Incharge of the crew at(Time) on.....(date)

Cancellation

I have confirm to(name of Implementing safety co-coordinator) at(location) that the safety precautions set out in para 2 are no longer required and accordingly this LCP-A is cancelled.

Name and Signature of
(Incharge of the crew) (Requesting safety coordinator)

Incharge of the crew at(Time) on.....(date)
(On Duplicate copy)

Issue

I have confirmed to(name of Requesting safety co-dinator)
at.....(location) that the safety precautions identified in para 2 have
been established and that instruction will not be issued at my location for them to be
removed until this LCP-A is cancelled.

Note: See Check List LPC-A

Name and Signature of.....
(Incharge of the crew) (Implementing Safety coordinator)

Incharge of the crew at.....(Time) on.....(date)

Cancellation

I have received confirmation from.....(name of the safety co-
ordinator) at(location) that the safety precautions set
out in para 2 are no longer required and accordingly this LCP-A is cancelled.

Name and Signature of.....
(Incharge of the crew) (Implementing Safety coordinator)

Incharge of the crew at(Time) on.....(date)

APPENDIX-B

LCP-B Number.....
Dated.....

LINE CLEAR RETURN

LCP-A No.....Dated.....issued
From.....

(Location is hereby returned by the persons undersigned. The undersigned declare that the all men as mentioned below who were sent on work have been withdrawn, temporary earth removed, all repair tools and materials checked and the Feeders/Equipments mentioned below are safe to be energised.

- 1. **HV Apparatus Identification:** State identified name(s) and where applicable identification of the HV circuit up to the connection point.
- 2. **Safety Precaution no longer required:**
 - a. Isolation (State locations and each point of isolation indicating means by which isolation was achieved).
 - b. Earthing (State location at which earthing was established and identify each point of earthing indicating means by which earthing has been achieved).

CHECK LIST TO BE TICKED –OFF

- 1. Whether all men withdrawn: Yes
- 2. Whether all temporary earth removed: Yes
- 3. Whether materials, Tools and Plant used in work have been checked: Yes
- 4. Code Number (If used when Line Clear is returned over Telephone)

Name and Signature of.....
(Requesting safety coordinator)

Designation.....

Incharge of the crew at.....(Time) on.....(date)

Name and Signature of.....
(Incharge of the crew) (Implementing Safety coordinator)

Designation.....

Incharge of the crew at(Time)on.....(date)

APPENDIX-C

LCP-C Number
Dated.....

Check list of the line clear permit

1. Name of location for which line clear is issued .
2. Reference and Authority requisitioning line clear : (indicate original LCP-A number including suffix and prefix).
3. Identity of HV Apparatus.
4. Sources from which the Line equipment are charged.
5. No./name of OCB/Isolating switch open at each of above sources.
6. Whether confirmed that Line is disconnected from both ends.
7. Whether line is earthed at both ends.
8. Whether OCB Truck removed in case of indoor Switchgear controlling the feeder /equipment on which line clear is given.
9. Whether Fuses of control supply voltage of the OCB/Isolating switches controlling the Feeder/Equipment for which line clear is given are removed and kept in safe custody.
10. Time of issue of line clear permit and LCP-A No.
11. Name of requesting safety coordinator on whose request LCP-A is issued.
12. Approximate Time for returning LCP-A as ascertained from Requesting Coordinator.

Name and Signature.....
(Implementing safety co-coordinator)

Designation.....

Incharge of the crew at(Time)(date)

LINE CLEAR PERMIT

No.....

Permission is hereby accorded to(Requesting safety co-ordinator) For carrying out works as per requisition No.....date.....

The HV equipment herein described are declared safe. The permission is subject to the conditions overleaf.

Name and Signature
(Person issuing line clear permit)

Designation

Incharge of the crew at(Time)on.....(date)

(Implementing safety coordinator)

(To be printed on reverse of LCP-C: Check list of line clear permit)

CONDITIONS

1. This permit is valid only for working in the Feeder/Equipment mentioned herein and not in any other Feeder/Equipment.
2. Only authorised persons are allowed to work in the Feeders/Equipments for which the permit has been issued.
3. Works as per requisition only should be carried out.
4. Before touching any part of the Feeder/Equipment the same should be earthed at two points on either side through standard discharge rods connected with good earths. Temporary earths may only be removed after completion of all works and after men come down from the Feeder/Equipment.
5. Work should be so planned that the Line Clear is returned before or at the time indicated. If any unavoidable delay is anticipated advance intimation should be given to the location from where Line Clear is issued.
6. Before return of Line Clear it should be ensured that all men on line have returned and reported and all temporary earths removed. There should also be check on material, tools and plant issued for the work to ensure that nothing is left behind on the line or equipment.
7. Only authorised persons should return line clear.
8. In case Line Clear cannot be returned in person the same may be returned to the Line Clear Issuing Authority over Telephone by naming the CODE WORDS assigned. In case two or more different CODE WORDS are issued to the two or more persons in whose favour the permit is given, those persons must jointly return the Line Clear by naming their own CODE WORDS. The Line Clear Return will not be deemed to be accepted unless returned by all these persons.
9. The line Clear issuing authority should go over the checklist of Line Clear Return before accepting it.
10. If Line Clear is returned over Telephone the Line Clear Return Form duly filled and signed should be sent to the Line clear Issuing Authority by post immediately for record.

CHAPTER-7
OPERATIONAL PLANNING

7.1 Introduction

7.1.1 Operational planning -planning for years 1 and 2 ahead

STU shall plan System Outages required in year 1 and 2 ahead as a result of construction works taking due account of known requirements. In addition in years 0 and 1 ahead the outages required as a result of maintenance shall be taken into account.

Licensee system outages and SSG outages shall during year 2 but not in year 1 or year 0 be co-coordinated so that in general SSG outages shall take precedence over **Licensee** System outages. However in any particular case **SLDC**'s discretion to determine otherwise, based on reasons relating to the proper operation of the **Licensee** System shall prevail.

In each Calendar year by the end of September, STU shall draw up a draft **Licensee** system Outage Plan covering years 1 and 2 for use of **SLDC** and **SLDC** will notify each SSG and Supply licensee in writing these aspects of the draft plan which may operationally affect such SSG and/or Supply licensee giving proposed start and end date of relevant system outages, **SLDC** will indicate to a SSG where a need may exist to use intertripping or other measures including restrictions on the Dispatch to allow security of the System to be maintained within the Standards. The final annual outages Plan shall be intimated to all intra-state constituents for implementation latest by 28/29 February of each year.

Supply licensees must inform the Consumers connected to its System of the aspects of the plan, which may affect the Consumers, by publication in the local newspapers.

The time frame and procedure in the outage planning will be in-line with these as mentioned in Clause 6.7.4 of IEGC.

7.2 Short Term Operational planning

Planning in year 0 Down to programming phase.

The Licensee system's draft outage plans for year 1 shall become the final **Licensee** system Outage Plan for year 0 when by affliction of time year 1 becomes year 0.

(i) Programming phase

- a) During the programming phase
Each SSG and Supply licensee will inform **SLDC** immediately if there is any unavoidable requirement to depart from the outages and actions determined and notified under (b) below.
- b) By 11.00 hours each Thursday

SLDC shall update the **Licensee** System Outage Plan for the following one-week

period beginning on the Friday.

SLDC will notify each SSG and Supply licensee in writing of these aspects of the plan which may operationally affect them including proposed start dates and end date of relevant **Licensee** System outages. **SLDC** will also indicate where intertripping, Emergency Switching, Emergency Load Management or other measures including restriction on the Dispatch of CSG have to be applied to allow the security of the **Licensee** System to be maintained within the **Licensee** Standards. However planned outages be preferably undertaken on selective days so as to cause minimum inconvenience to the consumers.

7.3 **Data Requirements**

7.3.1 When requested initially under the PPA and thereafter in June in each Calendar Year, each Generator shall, in respect of each of its unit submit to **SLDC** in writing the Generation Planning parameters and the Generator Performance Chart to be applied from the beginning of July onwards, as per details indicated in Data Registration Code for these charts and as set out below for the Generation planning parameters.

7.3.2 The **Generator performance Chart** must be on a Generating unit specific basis and must include details of the Generator Transformer Parameters and demonstrate the limitation on reactive capability of the **Licensee** System voltage at 10% above normal as and when required by **SLDC**.

7.4 **Operating Margin**

7.4.1 **Introduction**

Operating Margin sets out different types of reserve, which make up the Operating Margin that **SLDC** may use to control the various parameters of the grid.

7.4.2 **Objective**

To set out the types of reserve, which may be utilised by, **SLDC** taking into account any reserve, which may be available from External Connections.

7.4.3 **Criterion**

Operation Margin comprising Contingency Reserve and Operating Reserve is required in a System to cover uncertainties in Plant Availability, variation in Demand forecast, loss of External Connections, loss of Generation, Weakness of **Licensee** System and other factors so that the System is Operated within the specifications of the **Licensee** Standard. **SLDC** will issue Instructions to **Users** to hold the required reserves from time to time with this in view.

7.4.4 **Constituents of operating Margin**

The operating margin comprises Contingency Reserve and Operating Reserve.

(a) **Contingency Reserve**

Contingency reserve is the margin of generation over forecast Demand required

in the period from 24 hours ahead down to real time to cover against uncertainties in Generating plant Availability, imports from External Connections and against Demand Forecast variations. It is provided by Generating Plant which is not required to be Synchronised but must be held available to Synchronise within 10 to 15 minutes.

(b) Operating Reserve

Operating Reserve is additional output from Generating Plant or a reduction in Demand or both which must be reliable in real time operation to respond for contribution in containing and correcting System Frequency deviation to an acceptable level in the event of mismatch between generation including import from External connections and Demand.

7.4.5 Contingency Reserve

The amount of Contingency Reserve required will be decided by **SLDC** on the basis of historical trends in the reduction in Availability of SSG, Imports through inter-state tie lines and increase in forecast Demand up to real time operation.

Where Contingency Reserve is to be held on Thermal SSG, **SLDC** will include in the Indicative Running notification and/or subsequent Dispatch Instruction by which the Generator is notified of and/or instructed, that the SSG shall be taken to Operate in the Contingency Reserve role.

7.5 Demand Control

7.5.1 Introduction

Demand Control: sets out to the provisions made by **SLDC** and procedures to be followed by **Licensee** and **Users** to permit reduction in Demand for any reason as set out in clause 7.5.4.

7.5.2 Objective

The detailed provision is required to enable **SLDC** to achieve a reduction in demand to avoid Operating problems on all or part of the **Licensee** System. **SLDC** will utilise Demand Control in a manner which does not unduly discriminate against any one or group of customers.

7.5.3 Criterion:

Demand Control is to be exercised by **Licensee** and the Suppliers to ensure that there is a balance between the Available Generation plus Imports from External Connections plus purchases from Independent Generating plants and the Customer Demand plus losses plus the required Reserve. Another reason for exercising Demand Control is the weakness of Transmission or Distribution System.

This code specifies the quantum of Load to be shed ensuring no undue discrimination between Customers.

7.5.4 **Types of Demand Control**

7.5.5 **Planned Control**

- (i) Customer Demand Management initiated by Supplier
- (ii) Customer Demand Management initiated by **SLDC**
- (iii) Planned Manual Disconnection such as Rotational load shedding and /or Emergency Manual Disconnection initiated by **SLDC** and/or the Suppliers.

7.6 **Automatic Control**

- (i) Protection of Supply to any part of **Licensee** System where System security is weak such as a heavily loaded Transformer or a heavily loaded Transmission or distribution line which can be tripped off by the Protection to prevent damage by overloading.
- (ii) Disconnection of Load blocks by operation of Automatic Under Frequency load Shedding devices to preserve overall **Licensee** System security.

7.6.1 **Definitions**

- (a) The term “Demand Control” is used to describe an or all of the methods controlling demand.
- (b) The type of Demand Control utilized by **SLDC** in any particular case will depend upon the amount of time between the awareness of the problem by **SLDC** and the time of implementation. Sudden and unexpected loss of generation or problem on the **Licensee** System will call for automatic Under Frequency Load Shedding and occasional additional emergency Manual Disconnection. In all cases **SLDC** will use demand disconnection as the last option.
- (c) Customer Demand Control: means reducing the level of supply of energy to a Customer, disconnecting a customer or directing the timing of supply to a Customer in a manner agreed for commercial purposes between Supplier and Customer.

7.7 **Planned and/or Emergency Manual Disconnection**

- a) Planned Manual Disconnection is the procedure adopted when Generation short fall, Transmission Constraint or reduction of Imports through External Connection requiring Demand Control is forecastable for a prolonged period in which disconnection under a Rotational Load Shedding Scheme may be required to ensure equitable treatment for all Customers as far as practicable.
- b) Emergency Manual Disconnection is utilised when loss of Generation /mismatch of Generation output and Demand or Transmission Line Constraint is such that there is a problem requiring shedding of Load at short notice or no notice to maintain a Regulating Margin to deal with unacceptable Voltage levels, Thermal overloads etc.

- c) Load Blocks shed under Planned Manual Disconnection and/or Emergency Manual Disconnection will be separate in addition to load blocks covered for shedding under Automatic load Shedding Scheme
- d) **SLDC** will implement planned Manual Disconnection and/or Emergency Manual Disconnection when it considers it necessary.

7.7.1 **Automatic Load Shedding**

- a) To prevent collapse of Frequency on the **Licensee** System and restore balance between Generation output plus Imports from External Connections plus purchase from Independent Generators and Demand a Frequency graded Automatic Load Shedding Scheme is utilised by **SLDC**.
- b) The number, location, size and the associated Low Frequency setting of discrete blocks subject to Automatic Load Shedding shall be determined on a Rotational basis in consultation with the suppliers. Frequency settings of the relays, in this connection, will be coordinated at **NREB** level.
- c) In case restoration of a large portion of the total Demand disconnected by Automatic Load Shedding (and recovery of frequency on the **Licensee** System), is not possible within a reasonable period of time **SLDC** may implement additional disconnection manually to restore an equivalent amount of demand disconnected automatically. The Suppliers shall help in identifying such Load Blocks.
- d) No Demand shed by operation of Automatic Load shedding devices shall be restored without specific direction of **SLDC**.

CHAPTER-8
SCHEDULING AND DISPATCH

8.1 Introduction

Scheduling and Dispatch is connected with the procedure to be adopted for the scheduling and dispatch of Generating Units to meet demand and allocation requirements and maintain voltage and frequency within acceptable range, and defines the contributions by **Users** to help achieve this goal.

8.1.2 Objective

The objective of this code is to detail the actions and responsibilities of **SLDC** in preparing and issuing a daily schedule of generation and the responsibilities of **Users** to supply the necessary data and to comply with this schedule. It also specifies the responsibilities of **SLDC** and **Users** in voltage and frequency management.

8.2 Generation Scheduling

8.2.1 All SSGs shall provide the hourly MW/MVAr availability (00.00-24.00 hours) of all Generating Units to **SLDC** on the day ahead basis by 10.00 hours.

CPPs shall provide the hourly import/ figures also on the day ahead basis by 10.00 hours.

8.2.2 In working out the MW/MVAr availability, Hydro Power Stations shall take into account their respective levels and any other restrictions and shall report the same to **SLDC**.

8.2.3 **SLDC** shall obtain from **NRLDC** the hourly MW entitlement from Central Generating Stations, on a day ahead basis. **SLDC** shall produce a day ahead hourly Generation schedule after consolidation of data provided by the Generators and **NRLDC**. In preparation of the schedule, **SLDC** shall take into account of the relative commercial costs to the **Licensee** of the operation of Generation units. Full generation at all Hydel stations will also be included during flooding when reservoirs are full.

SLDC shall intimate the generation schedule/import schedule for the following day to all Generators/CPPs (including any Generating Units not required to run) by 18.00 hours.

8.2.4 SSG shall promptly report to **SLDC**, changes of Generating Units availability or capability, or any unexpected situation, which could affect its operation.

8.2.5 **SLDC** shall advise **Users** as soon as possible of any necessary rescheduling.

8.2.6 **SLDC** shall prepare the day ahead generation schedule keeping in view the followings:

- i) **Transmission System** constraints from time to time.
- ii) Hourly load requirements as estimated by **SLDC**.
- iii) The need to provide operating margins and reserves required to be maintained.

- iv) The availability of generation from SSG and, Central Sector Generators together with any constraint in each case.
- v) Overall economy to the **Licensee** as well as Customers.

8.2.7 **SLDC** shall instruct Generators to hold capacity reserves (spinning and/or standby) as per the agreed **NREB** guidelines or as determined for local conditions.

SLDC may also require the SSGs to generate MVAR within their respective capability limits to hold station bus bar voltages at specified levels.

8.2.8 The estimation of load demand will be done in general by supply **Licensees** keeping in view the following aspects.

1. Outage planning/scheduled rostering.
2. Historical data of load for same month/day/time.
3. Previous day's demand.
4. Present weather conditions and meteorological reports.
5. Requirements for meeting important loads of Festivals etc.
6. Force Majeure Conditions such as floods, riots etc.
7. Vacations, Sundays, Holidays.
8. Number & frequency of Breakdowns and their recovery period.

8.3 **Generation Dispatch**

8.3.1 All SSGs shall regulate generation and their export according to the daily generation schedule.

8.3.2 **SLDC** will dispatch by instruction to all SSGs according to the hourly day ahead generation schedule, unless rescheduling is required due to unforeseen circumstances. In absence of any dispatch instructions by **SLDC**, SSG shall generate/export according to the day ahead generation schedule.

If the drawl schedule of the **SLDC** is revised during the day of operation on account of any contingency then revised schedule of generation will be communicated to the SSGs within one hour after the receipt of revised drawl schedule from RLDC.

8.4 **Communication with Generators**

Dispatch instructions shall be issued by E-Mail /Fax/ telephone, confirmed by exchange of name of operators sending and receiving the same and logging the same at each end. All such oral instructions shall be complied with forthwith and written confirmation shall be issued promptly by FAX, teleprinter or otherwise.

8.5 **Action Required by Generators**

8.5.1 All SSGs shall comply promptly with a dispatch instruction issued by **SLDC** unless this action would compromise the safety of plant or personnel.

8.5.2 The SSG shall promptly inform **SLDC** in the event of any unforeseen difficulties in carrying out an instruction.

8.5.3 All Generating Units shall have Automatic Voltage Regulator (AVR) in service.

- 8.5.4 All Generating units shall have the governor available and in service and must be capable of automatic increase or decrease in output within the normal declared frequency range and within their respective capability limit.
- 8.5.5 SSG shall immediately inform **SLDC** by telephone of any loss or change (temporary or otherwise) in the operational capability of any Generating Unit which is synchronised to the system or which is being used to maintain system reserve. Generators shall inform **SLDC** any removal of AVR and/or governor from service with reasons.
- 8.5.6 SSG shall similarly inform any change in status affecting their ability in complying with dispatch instructions. SSG shall not de-synchronise Generating Units, without instruction from **SLDC** except on the grounds of safety to plant or personnel, which shall be promptly reported to **SLDC**.

APPENDIX-A

Format for Availability Notice

To,
Director Grid Operation
State Load Dispatch Center
Lucknow

Date:
Time of Communitan:

From,
(Name of Generator/ CPP/IPP)
Notification of Availability/Revised Availability

UNIT NO	VALUE/REVISED VALUE	PERIOF FROM-TO

Control Engineer

APPENDIX-B

B-1.0 Form of Dispatch Instruction

B-1.1 All the loading/De-loading rate will be in accordance with Scheduling & Dispatch code. Each Dispatch instruction will be kept simple.

B-1.2 The Dispatch Instruction given by TELEPHONE or FAX MESSAGE will follow the form :

- (i) Specific SSG to which the instruction applies.
- (ii) The output to which the instruction applies.
- (iii) If the Start Time is different from the time the instruction is issued the Start Time will be included.
- (iv) Where specific Loading/De- loading Rates are concerned a specific target time.
- (v) The issue time of the instruction.
- (vi) Name of Sender of Dispatch Instruction.
- (vii) Spinning Reserve MW.

CHAPTER-9

FREQUENCY AND VOLTAGE MANAGEMENT

9.1 **Introduction:**

9.1.1 This Section describes the method by which all **Users** of the **Transmission System** shall co-operate with the **Licensee** in contributing towards effective control of the system frequency and managing the EHV voltage of the **Transmission System**

9.1.2 The **Licensee**'s System normally operates in synchronism with the Northern Region Grid and **NRLDC** has the overall responsibility of enforcing Grid discipline and managing the frequency in the Region. The constituents of the Region are required to follow the instructions of **NRLDC** for the backing down/shutting down generation, regulating load etc. to meet the objective. **SLDC** shall accordingly instruct SSGs to regulate Generation/Export and hold reserves of active and reactive power within their respective declared parameters.

9.1.3 **SLDC** shall also regulate load as may be necessary to meet this objective. **Transmission System** voltage levels can be affected by Regional operation. The **Licensee** shall optimize voltage management by adjusting transformer taps to the extent available and switching of Capacitors/Reactors and other operational steps. **SLDC** will instruct SSGs to regulate MVAR generation within their declared parameters. **SLDC** shall also instruct Supply licensees to regulate demand, if necessary.

9.2 **Objective**

9.2.1 The objectives of this section are as follows:

- (a) To define the responsibilities of all **Users** in contributing to frequency and voltage management.
- (b) To define the actions required to enable the **Licensee** to maintain **Transmission System** voltages and frequency within acceptable levels in accordance with CEA/CERC guidelines, and Planning and Security Standards for **Transmission System**.

9.2.2 **SLDC** shall monitor the system frequency and take action to ensure that they are within acceptable limits, as per Indian Electricity Rules and in the operating range as set forth in IEGC.

9.2.3 **SLDC** shall monitor actual drawl against scheduled drawl and regulate internal generation/demand to maintain this schedule.

9.3 **Falling frequency:**

9.3.1 Under falling frequency conditions, **SLDC** shall take appropriate action to issue instructions, in co-ordination with **NRLDC** to arrest the falling frequency and restore it to be within permissible range. Such instructions may include dispatch instruction

to SSGs and/or instruction to **Supply licensees** to reduce load demand by appropriate manual and/or automatic load shedding.

- 9.3.2 SSGs shall follow the dispatch instructions issued by **SLDC**. **Supply licensees** shall cooperate with **SLDC** in managing load, especially for maintaining the frequency during contingencies such as unexpected generation outage, by reducing the drawl from the **Transmission System** on instruction from **SLDC**.

9.4 **Rising Frequency**

- 9.4.1 Under rising frequency conditions, **SLDC** shall take appropriate action to issue instructions to SSG in co-ordination with **NRLDC**, to arrest the rising frequency and restore frequency within permissible range. **SLDC** shall also issue instructions to **Supply licensees** in coordination with **NRLDC** to lift Load shedding (if exists) in order to take additional load.

9.5 **Voltage Management**

- 9.5.1 The variation in voltage may not be more than the voltage range specified in I.E. rule 1956 as amended from time to time and also as provided in Clause 6.2(q) of IEGC. **SLDC** shall carry out load flow studies from time to time to predict where voltage problems may be encountered and to identify appropriate measures such as changing transformer tap settings or switching in compensatory equipment to ensure that voltage remain within the defined limits. On the basis of these studies **SLDC** may instruct Generators and CPPs to maintain specified voltage levels at interconnecting points and determine voltage levels at the interconnection points with Supply licensees. **SLDC** shall continuously monitor 400/220/132KV voltage levels at grid sub-stations. The **SLDC** shall take appropriate measures to control **Transmission System** voltage, which may include but not be limited to transformer tap changing and use of MVar resource with generating units including CPPs/IPPs.
- 9.5.1.1 The **Licensee** will ensure installation of shunt capacitors and other reactive compensation devices in their own System and the Systems of their **Users** in line with the total requirements for the State determined by **NREB** from time to time.
- 9.5.2 SSGs shall make available to **SLDC** the up-to-date capability curves for all Generating Units, as detailed in the connectivity conditions, indicating any restrictions, to allow accurate system studies and effective operation of the **Transmission System**. CPPs/IPPs shall similarly furnish the net reactive capability that will be available for export to/import from **Transmission System**. SSGs shall inform **SLDC** of their reactive reserve capability promptly on request. **SLDC** may instruct SSG to regulate MVar generation within their declared parameters.
- 9.5.3 **Supply licensees** shall participate in voltage management by regulating their drawl and by installing compensatory equipment as may be required.
- 9.5.4 If acceptable voltage level still cannot be maintained by these measures, **Licensee** shall take steps to augment the voltage level such as strengthening of **Transmission System** and/or installation of requisite shunt capacitors adding compensatory equipment, building new lines etc. to meet the voltage criteria.
- 9.5.5 Procedure will be established by STU with all SSGs for pattern of generation

reduction at different stations.

9.6 **Reactive Power Requirement**

Supply licensees will ensure standard power factor of 0.85 by installing appropriate capacity of Capacitors at load points. They shall also make available to **SLDC** any data required to ascertain the Reactive power flow to **Supply licensees** System. **SLDC** may instruct **Supply licensees** to maintain specified power factor at interconnection points. In case of failure of **Supply licensees** to maintain appropriate power factor, **SLDC** shall take measures to control the excess reactive power flow.

9.7 **General**

9.7.1 Close co-ordination between **Users** and the **Licensee** shall exist at all times for the purpose of effective frequency and voltage management.

9.7.2 Schedule & Dispatch procedure shall be suitably modified to cater the tariff agreements as soon as such agreements are reached with SSG.

CHAPTER –10
MONITORING OF GENERATION AND DRAWL

10.1 Introduction:

10.1.1 The monitoring by **SLDC** of **SSG's** Unit output, active and reactive reserve capacity is important to evaluate the performance of plant.

The monitoring of **Scheduled Drawl** is important to ensure that the **Licensee** contributes towards improving **Regional Performance** , and observes **Grid Discipline**.

10.2 Objective:

10.2.1 The objective of this Section is to define the responsibilities of all **Users** in the monitoring of Generating Unit reliability and performance, and the **Licensee's** compliance with the scheduled Drawl.

10.3 Monitoring Procedure

10.3.1 For effective operation of the **Transmission System** it is important that a Generator's declared availability is realistic and that any departures are continuously fed back to the **SLDC** to help effective improvement.

10.3.2 The **Licensee** shall regularly monitor Generating Unit outputs and Bus voltages. A More stringent monitoring may be performed at any time when there is reason to believe that a Generator's declared availability may not match the actual availability or declared output does not match the actual output.

10.3.3 The **Licensee** shall inform a **SSG**, in writing, if the regular monitoring demonstrated an apparent persistent or material mismatch between the dispatch instructions and the Generating Unit output or Breach of the Connectivity Conditions. Continued discrepancies shall be resolved in the review panel with a view to either improve performance in future, providing more realistic declarations or initiate appropriate actions for any breach of Connectivity Conditions.

10.3.4 **SSGs** shall provide to **SLDC** hourly generation summation outputs where no automatically transmitted metering or SCADA equipment exists. Captive Power Plants shall provide to **SLDC** hourly export/ import MW and MVA.

SSGs shall provide any other logged readings, that **SLDC** may reasonably require for monitoring purposes where SCADA data are not available.

10.4 Generating Unit Tripping

10.4.1 **SSGs** shall promptly inform the tripping of a Generating Unit, with reasons, to **SLDC**

in accordance with the operational Event/Incidents Reporting Section. **SLDC** shall keep a written log of all such tripping, including the reasons with a view to demonstrating the effect on system performance and identifying the need for remedial measures.

SSG shall submit a more detailed report of Generating Unit tripping to **SLDC** monthly.

10.5 **Monitoring of Drawl**

- 10.5.1. **SLDC** shall continuously monitor actual MW Drawl against that scheduled by use of SCADA equipment where available, or otherwise using available metering. STU shall request **NRLDC** and adjacent State as thought appropriate to provide any additional data required to enable the monitoring to be carried out.

SLDC shall continuously monitor the actual MVA_r Drawl to the extent possible. This will be used to assist in **Transmission System** voltage mangement

10.6 **Data Requirement**

SSGs shall submit data to **SLDC** as listed in Data Registration Section, termed as Monitoring of Generation.

CHAPTER-11 CONTINGENCY PLANNING

11.1 Introduction:

Contingency Planning covers: Implementation of recovery process to be followed by all **Users** in the event of a Total or partial shutdown /blackout.

11.2 Objective:

- a) To achieve restoration of the Total system and associated Demand in the shortest possible time, taking into account Power Station capabilities, transfers across External connections and operational constraints of the Total System.
- b) To achieve Re-synchronization of parts of Total System which have ceased to be in Synchronism.
- c) To ensure that communication arrangements for use in circumstances of serious disruption to the system, are available to enable senior management representatives of **SLDC, Licensee** and **Users** who are authorised to make binding decision on behalf of **Licensee** or the **User**.
- d) To ensure that the **Licensee** System can continue to operate in the event State Load Dispatch Center is incapacitated for any reason.

11.3 Strategy:

The situation prevailing prior to the occurrence of the contingency i.e. availability of specific Generating Units(s), transmission circuits and load demands, will largely determine the restoration process to be adopted in the event of a total black out. **NRLDC** and **SLDC** shall coordinate to determine the extent of the problem. **SLDC** shall advise all **Users** of the situation and follow the strategy as outlined below for restoration.

User's persons authorised for operation and control shall be available at **User's** end for communication and acceptance of all operational Communication throughout the contingency. Communication channel shall be restricted to operation communication only till normalcy is restored.

11.4 Total Regional Blackout

It means total black out in the northern region

SLDC shall instruct all relevant SSGs having Power Stations with Black Start capability to commence their pre-planned Black Start procedure. **SLDC** may require IPPs and CPPs to extend start-up Power Supply to Generators as may be feasible.

SLDC shall prepare the **Transmission System** for restoration by creating power islands with no interconnection. Close coordination with concerned **Supply licensees** shall be maintained during the restoration process to arrange for discrete demand blocks becoming available to stabilize Generating Units, as these become available in individual islands/sections. SSGs to whom startup power supply is made available shall

sequence their start up to match their auxiliary power demand with supply available.

SSGs shall inform **SLDC** as Generation Units become available to take load, in order that the **Licensee** may assess the MW demand, which the Generating Unit is likely to pick up on circuit breaker closure.

SLDC shall co-ordinate with Generators and Supply licensees to:

- (i) Form discrete power islands with one Generating Unit feeding some local demand.
- (ii) Extend islands by adding more Generating Units and more demand in a coordinated manner maintaining load generation balance.
- (iii) Synchronize islands to form a larger, more stable island.

SLDC shall, taking into account sites where system synchronisers are available, gradually extend the synchronization, until all demand is restored.

SLDC shall utilize any Regional or interstate assistance available, if thought appropriate, at any time to assist in the above process.

The activities under this clause will be coordinated as per the instructions from **NRLDC**.

11.5 **Total Transmission System Blackout**

It indicates total black out in whole state of Uttar Pradesh.

11.5.1 **SLDC** shall plan the strategy for recovery procedure following total blackout in consultation with **NRLDC** & **SLDC** shall carry out simultaneous action to utilize radial feeders from Northern Region and neighboring States.

11.5.2 List of Generating stations with black out control availability, Inter-State/Inter-Radial Tie-lines , synchronizing points and essential loads to be restricted on priority will be prepared and be made available to **NRLDC**.

11.5.3 The procedure for restoration of the Grid under partial/total black out shall be reviewed/up dated annually in coordination with **NRLDC**.

11.6 **Partial Transmission System Blackout**

It indicates black out in part of the area of state of Uttar Pradesh.

11.6.1 **SLDC** shall ensure with **Users** that security of the healthy part of the **Transmission System** is maintained.

11.6.2 **SLDC** shall gradually extend the healthy system to provide start-up power to appropriate Generating Units.

11.6.3 **SLDC** in close co-ordination with Supply licensees and SSG, shall gradually restore demand to match generation as it becomes available

11.6.4 All **Users** shall take care to ensure that load generation balance is maintained at all times under **SLDC**'s direction.

11.7 **Responsibilities**

11.7.1 **During any black outs all users will follow the instructions/black start procedure of SLDC for restoration of the system.**

SLDC shall maintain a record of Power Station Black Start capability and associated Power Station Black Start plans.

The STU shall prepare, distribute and maintain up to date Black Start procedures covering the restoration of the **Transmission System** following total or partial blackout. SSG/Transmission licensee can obtain the guidelines of black start procedure from the STU.

11.7.2 **Users** shall agree regarding Black Start procedures with the **Licensee** and promptly inform **SLDC** when unable to follow the procedure.

11.7.3 **SLDC** shall be responsible for directing the overall **Transmission System** restoration process by co-ordination with all **Users** and **NRLDC**.

11.7.4 Supply licensees shall be responsible for sectionalizing the Distribution System into discrete, unconnected blocks of demand. They shall advise **SLDC** of the amount of MW likely to be picked up by the synchronizing Generator.

11.7.5 SSG shall be responsible for commencing their planned Black Start procedure on the instruction of **SLDC** and steadily increasing their generation according to the demand, which **SLDC** is able to make available.

11.8 **Special Considerations:**

11.8.1 During restoration process of **Transmission System** or Regional system blackout conditions, normal standards of voltage and frequency shall not apply.

11.8.2 Supply licensees with essential loads will separately identify non-essential components of such loads, which may be kept off during system contingencies. Supply licensees shall draw up an appropriate schedule with corresponding load blocks in each case. The non-essential loads can be put on only when system normalcy is restored, as advised by **SLDC**.

11.8.3 All **Users** shall pay special attention in carrying out the procedures so that secondary collapse due to undue haste or inappropriate loading is avoided.

CHAPTER-12

CROSS BOUNDARY SAFETY

12.1 **Introduction**

ALL Section sets down the requirements for maintaining safe-working practices associated with cross boundary operations. It lays down the procedure to be followed when work is required to be carried out on electrical equipment that is connected to another **User's** system.

12.2 **Objective**

The objective of this Section is to achieve agreement and consistency on the principles of safety as prescribed in the Indian Electricity Rules, 1956 when working across a control boundary between the **Licensee** and another **User**.

12.3 **Control Persons**

ALL **Licensee** and all **Users** shall nominate suitably authorized persons to be responsible for the co-ordination of safety across their company boundary. These persons shall be referred to as Control Persons.

12.4 **Procedure**

12.4.1 The **Licensee** shall issue a list of Control Persons (names, designations and telephone numbers) to all **Users** who have a direct control on the boundary with the **Licensee**. This list shall be updated promptly whenever there is change of name, designation or telephone number.

12.4.2 All **Users** with a direct control boundary with the **Licensee** shall issue a similar list of their Control Persons to the **Licensee**, which shall be updated promptly whenever there is a change to the Control Persons list.

12.4.3 Whenever work across a control boundary is to be carried out, the Control Person, of the **User** (which may be the **Licensee**), wishing to carry out work shall directly contact the other relevant Control Person. Code words will be agreed at the time of work to ensure correct identification of both parties.

12.4.4 Contact between the Control Persons shall normally be by direct telephone. Should the work extend over more than one shift the Control Person shall ensure that the relieving Control Person is fully briefed on the nature of the work and the code words in operation.

12.4.5 The Control Persons shall co-operate to establish and maintain the precautions necessary for the required work to be carried out in a safe manner. Both the established isolation and the established earth shall be locked in position, where such facilities

exist, and shall be clearly identified.

- 12.4.6 Work shall not commence until the Control Person, of the **User** (who may be even **Licensee**), wishing to carry out the work, is satisfied that all the safety precautions have been established. This Control Person shall issue agreed safety documentation to the working party to allow work to commence.
- 12.4.7 When work is completed and safety precautions are no longer required, the Control Persons who have been responsible for the work being carried out shall make direct contact with the other Control Persons to request removal of those safety precautions.
- 12.4.8 The equipment shall only be considered as suitable for return to service when all safety precautions are confirmed as removed, by direct communication using code word contact between the two Control Persons, and return of agreed safety documentation from the working party has taken place.
- 12.4.9 The **Licensee** shall develop an agreed written procedure for cross boundary safety and continually update it.
- 12.4.10 Any dispute concerning Cross Boundary Safety shall be resolved at the level of STU if STU is not the party, . in case where STU is one of the party, the dispute shall be referred to the Commission.
- 12.5 **Special Consideration:**
 - 12.5.1 For cross boundary circuits, all **Users** shall comply with the agreed safety rules, which must be in accordance with Indian Electricity Rules 1956 as amended from time to time.
 - 12.5.2 All equipment on cross boundary circuits which may be used for the purpose of safety co-ordination and establishment of isolation and earthing, shall be permanently and clearly marked with an identification number or name, that number or name being unique in that sub-station. This equipment shall be regularly inspected and maintained in accordance with manufacturer's specification.
 - 12.5.3 Each Control Person shall maintain a legibly written safety log, in chronological order, of all operations and messages relating to safety co-ordination sent and received by them. All safety logs shall be retained for a period of not less than 10 years.

CHAPTER -13
OPERATIONAL EVENT/INCIDENT REPORTING

13.1 Introduction

13.1.1 Operational Liaison: details the requirement for exchange of information relating to Operations and/or Events on the total System including the Northern Regional Systems which have or may have an operational effect on:

- a) The **Licensee** System in the case of an Operation and/or Event occurring on a **User** System.
- b) A **User** System in the case of an operation and/or Event occurring in the **Licensee** System.

13.1.2 The procedure for issue of warnings in the event of a risk of serious and widespread disturbance on the whole or part of the **Licensee** System is set out in the code.

13.2 Objective

To specify the information to be exchanged between **Users** to identify the potential impact of an operation and/or Event and to assess the possible risk arising from it, so that appropriate action is taken by the relevant party to maintain the integrity of the **Licensee** System. It does not deal with any action arising from the exchange of information, but merely with that exchange.

13.3 Notifiable

- 13.3.1
- a) **Licensee**: An Event on the **Licensee** System, which has an operational effect on a User System, will be notified by **Licensee** to **SLDC** and the **Users**, whose systems have been affected.
 - b) **User**: An Event on a **User** System which has an Operational Effect on the **Licensee** System shall be notified by the **User** to the **Licensee** and **SLDC** who will in turn notify the other **Users** on whose system the event may have an operational effect.
 - c) The following are typical examples of situations where notification will be required that could have an Operational Effect: -
 - i) Exceptionally high/low system voltage or frequency.
 - ii) Serious equipment Problem i.e. major problem in circuit breaker, Transformer or bus bar.
 - iii) Major problem in Generating unit
 - iv) Tripping of ICT, Transmission Line or Capacitor Bank
 - v) Major fire incident
 - vi) Major protection failure
 - vii) Where Plant and/or Apparatus is being operated in excess of its capability or may present a hazard to personnel.

- viii) Activation of any alarm or indication of any abnormal operating condition.
- ix) Adverse weather conditions being experienced or forecast.
- x) Break down or faults or temporary changes in the capabilities of Plant and/or Apparatus.
- xi) Break down of, or faults on control, communication or metering equipment.
- xii) Increased risks of Protection Operation.
- xiii) Load crash/loss of load
- xiv) Excessive drawl deviations
- xv) Accidents

13.3.2 The examples under clause 13.3.1 are illustrative only and in no way limit the general requirements to be notified.

13.4 Notification procedure

- a) The notification shall be of sufficient detail to describe the Event so as to enable the recipient to assess the implications and risks arising. The cause need not be included in the notification but the recipient may ask questions to clarify and sender shall provide the necessary information using its reasonable efforts.
- b) The notification may indicate that there has been an incident on the total or part of the System, the general nature of the incident and if power supply has been affected, the estimated time of return to service.
- c) Recording: Notification shall be given orally and if either party requests it shall be written down by the sender and dictated by way of a telephonic message – through Fax/E-mail to the recipient.. In the case of an emergency the notification shall only be given orally which shall be followed by written Confirmation.
- f) Timing: Notification shall be given as soon as possible after the occurrence of the event and in any case within 15 minutes of such event.

13.5 Significant Events

- a) Where a **User** notifies an event which **SLDC** or **Licensee** considers to have had a significant effect on the **Licensee** or **SLDC** system, **Licensee** may require the **User** to report that event in writing within one day
- b) Where **Licensee** notifies **SLDC** and a **User** of an event which the **User** of **SLDC** considers to have had a significant effect on the **User's** system, that **User** may require **Licensee** to report that event in writing within one day
- c) Events mentioned at (a) and (b) are known as significant events.
- d) Significant Incident will include Events having an operational effect e.g.
 1. Tripping of Plant and/or Apparatus manually or automatically.
 2. Voltage outside statutory limits
 3. System frequency outside statutory limits.
 4. System instability or
 5. System overloads

13.6 **Warnings:**

- a) An oral warning will be issued by **SLDC** and confirmed in writing as well to **Licensee** and **Users**, who may be affected when **SLDC** knows there is a risk of widespread and serious disturbance to the whole, or part of, the total system.
- b) Provided, sufficient time is available, the warning will contain such information, as **SLDC** considers reasonable, to explain the nature, extent of the anticipated disturbance, to the **User** and **Licensee** provided that such information is available to **SLDC**.
- c) Each **User** and **Licensee** on receipt of the warning shall take steps to warn its operational staff and maintain its plant and Apparatus in the condition in which it is best able to withstand the anticipated disturbance for the duration of the warning.
- d) Scheduling and Dispatch may be affected during the period covered by a warning.

13.7 **Loss of Licensee Control Center**

If the Event referred is the loss of State Load Dispatch Center the provision made shall not apply but instead the following provision shall apply.

Each Generator shall continue to operate in accordance with the last Dispatch Instruction issued by **SLDC** but shall use all reasonable endeavors to maintain **Licensee System Frequency** at the target frequency of 50 Hz , plus or minus 0.5Hz by monitoring frequency until such time as new Dispatch Instructions are received from **SLDC**.

13.8 **Form of Report**

- 13.8.1
- a) A report will be in writing addressed to **SLDC** and endorsed to **Licensee** or Generator.
 - b) In either case the report will contain a written confirmation of oral notification given, together with such further information which has become known relating to the Significant Incident since the oral notification. The report shall as a minimum contain the matter specified below, which is not intended to be exhaustive.
 - 1. Time and date of Significant Incident.
 - 2. Location.
 - 3. Plant and/or Apparatus involved.
 - 4. Brief description of Significant Incident.
 - 5. Estimated time and date of return to service.
 - 6. Supplies/generation interrupted and duration of interruption.
 - 7. Generating Unit-Frequency response achieved.
 - 8. Generating Unit-MVAr performance achieved.
 - 9. Any other information which the Generator or **Licensee** considers that **SLDC** might require in relation to the Significant Incident.

- c) While the the report need not state the cause of the significant incident, if not known, it shall contain an indication as to whether the cause has been ascertained, whether it is thought likely that the matter which caused the Significant Incident will recur.

13.8.2 The standard reporting form other than for accidents (which will be reported in accordance with Ind. Elect Rules 1956), shall be as decided by **Licensee**.

CHAPTER-14

PROTECTION

14.1 Introduction

In order to safeguard a **User's** system from faults, which may occur on another **User's** system, it is essential that certain minimum standards of protection be adopted. This Section describes these minimum standards.

14.2 Objective

The objective of this Section is to define the minimum protection requirements for any equipment connected to the **Transmission System** and thereby minimise disruption due to faults.

14.3 General Principles:

- 14.3.1 No item of electrical equipment shall be allowed to remain connected to the **Transmission System** unless it is covered by appropriate protection aimed at reliability, selectivity, speed and sensitivity. Guidelines mentioned in protection manuals of Central Board Of Irrigation & Power (CBI&P) may be kept in view
- 14.3.2 All **Users** shall co-operate with the STU to ensure correct and appropriate settings of protection to achieve effective, discriminatory removal of faulty equipment within the time for target clearance specified in this Section.
- 14.3.3 Protection settings shall not be altered, or protection by passed and/or disconnected without consultation and agreement of all affected **Users**. In the case where protection is by passed and/or disconnected, by agreement, then the cause must be rectified and the protection restored to normal condition as quickly as possible. If agreement has not been reached the electrical equipment will be removed from service forthwith.

14.4. Protection Coordination:

- 14.4.1 The setting of protective relays starting from the Generating Unit up to the remote end of 37.5KV/33KV and 11KV lines shall be such that a fault in any section does not effect the section between the Generation Unit and the faulty section under both high and low generation conditions. STU shall notify **Users** of the initial settings and any subsequent changes from time to time. Routine checks on the performance of the protective relays shall be conducted and any malfunction shall be noted and corrected as soon as possible. Short circuit studies required for deciding the relay setting shall be conducted by STU with the data collected from the **Users**. Representatives of, SSG, **Licensee** and Supply Licensee shall meet periodically to discuss such malfunction, changes in **Licensee** System configuration, if any, and possible revised setting of relays.

The STU shall be responsible for arranging periodical meetings between all **Users** to discuss co-ordination of protection. The STU shall investigate any malfunction of protection or other unsatisfactory protection issues. **Users** shall take prompt action to

correct any protection malfunction or issue as discussed and agreed to in these periodical meetings.

- 14.4.2 Generator including CPPs shall report any abnormal voltage and frequency related operation of Generating Units/feeders promptly to **SLDC**.
- 14.4.3 SSG shall not synchronise Generating Units, , without instruction from **SLDC**. In emergency situations, the SSG may synchronise Units with the **Grid** without prior intimation in the interest of the operation of the **Grid**, following standing instructions developed for such purpose under “Contingency Planning”.
- 14.4.4 Should a SSG fail to comply with any of the above provisions, it shall inform **SLDC** promptly of this failure.
- 14.4.5 While the grid frequency is higher than 50.2 HZ, the MW generation at no generating station (irrespective of type and ownership) shall be increased. Provided that when the frequency has risen from a previous lower level to 50.2HZ or a higher level, and due to normal governor action, the MW output of a generating unit has fallen to a level requiring oil support, which results in unstable operation of the Unit, then the MW output may be increased to the level:-

-At which oil support is not required, and

-At which the unit can operate in a stable and safe manner.

Similarly, no generating unit shall be synchronized with the grid while the grid frequency is above 50.2 HZ or higher, except with the specific concurrence of the **RLDC/SLDC**.

- 14.4.6 The power generated during high frequency conditions by any Generator, against **NRLDC** instructions conveyed through **SLDC** shall be treated as unscheduled generation and may not be considered for energy accounting purposes in addition to any other penalty imposed.
- 14.4.7 In case of low system demand from **Users** during normal system conditions, the generating unit(s) can be backed down/shut down, in order of merit,(as desired by **SLDC**) if so required, for optimum utilization of available entitlements.
- 14.4.8 Enhancement of Schedule and Dispatch Procedure Schedule and dispatch procedures shall be suitably enhanced to cater to tariff agreements as soon as any such agreement is reached with. SSG

14.5 **Fault Clearance time:**

- 14.5.1 From a stability consideration the maximum fault clearance time for faults on any **User's** system directly connected to the **Transmission System**, or any faults on the **Transmission System** itself, are as follows:

Target clearance times:

- a. 400KV – 100 msec.
- b. 220 KV – 120 msec.

- c. 132KV – 120 msec.
- d. 66KV/33KV/11KV – 300 msec.

14.5.2 Slower fault clearance time for faults on a **Users** system may be agreed to but only if, in the STU opinion, system conditions allow this. At generating stations, line faults should be cleared at the generation station end, within the critical clearing time, for the generators to remain in synchronism.

14.6 **Generator Requirements**

All Generating Units and all associated electrical equipment of the Generator connected to the **Transmission System** shall be protected by adequate protection so that the **Transmission System** does not suffer due to any disturbances originating from the Generating Unit.

14.7 **Transmission Line Requirements:**

Every EHT line taking off from a Power Station or a sub-station shall have distance protection and back up protection as mentioned below. The **Licensee** shall notify **Users** of any changes in its policy on protection from time to time.

14.8 **General**

14.8.1 For short transmission lines alternative appropriate protection schemes may be adopted.

14.8.2 Relay Panels for the protection of lines of the **Licensee** taking off from a Power Station, shall be owned and maintained by SSG All transmission line related relay settings or any change in relay settings will be carried out by SSG in close coordination and consultation and with the STU approval. Carrier cabinets/equipment, line-matching units including wave traps and communication cable shall be owned and maintained by the **Licensee**. All SSG shall provide space, Connection facility, and access to the **Licensee** for such purpose.

14.9 **Distribution Line Requirements:**

All 33 KV and 11 KV lines at Connection points shall be provided with a minimum of over current and earth fault protection with or without directional features along with high set element. Co-ordination with the originating EHV sub-station should be ensured to avoid major sub-station equipment/ EHV transmission lines from tripping on through faults due to delayed fault clearance in the distribution feeders.

14.10 **Transformer Requirements:**

The protection of Auto, Power & Distribution transformers shall be as per revised manual on Transformers published by Central Board Of Irrigation And Power (Publication No 275).

14.11 **Distribution System:**

For smaller transformers of HV class on the Distribution System differential protection shall be provided for 10 MVA and above along with back up time lag over current and earth fault protection (with directional feature/inter-tripping of HT and LT

breakers for parallel operations). Transformers 1.6 MVA and above and less than 10 MVA shall be protected by time lag over current, earth fault and instantaneous R.E.F. relays. In addition, all transformers 1.6 MVA and above shall be provided with gas-operated relays, temperature protection and winding temperature protection and oil temperature protection.

14.12 Sub-Station Bus Bar Protection and Fire Protection:

14.12.1 All **Users** shall provide adequate Bus zone protection for substation Bus Bars in all 220 KV class grid substations.

14.12.2 Adequate precautions shall be taken and protection shall be provided against fire hazards to all apparatus of the **Users** conforming to relevant Indian Standard Specification and /or provisions in IE Rules 1956 as amended from time to time and Tariff Advisory Committee recommendations.

14.13 Data Requirements:

14.13.1 **Users** shall provide the **Licensee** with data for this Section as stated in the Data Registration Section.

14.13.2 Protection schemes should be tested thoroughly before the onset of the summer season.

14.13.3 Protection Testing should be carried out periodically every year or immediately after any major fault, whichever is earlier.

14.14 Protection Performance

14.14.1 Every EHV line taking off from a power station or a Substation shall have Distance Protection and back up protection provided. STU shall notify **Users** of any changes to its policy on protection from time to time. Initially the following protection shall be provided.

- a) 400KV Lines will generally have two main distance protections called Main-I & Main-II will permissive inter trip for remote end fault. However, 220KV short lines may have directional comparison of phase comparison carrier protection as Main II. In addition to above single pole tripping and auto reclosing is to be provided for stability of power system.

All 400KV circuits will have local breaker back up protection (LBB), which will isolate the faulty bus in case of breaker failure.

In case of bus fault bus-bar protection shall be provided for each bus-bar section to isolate the faulty bus from the system.

400KV/220KV transformer will be provided with one differential protection, restricted earth fault protection, Bucholz and winding temperature protection and back up Directional HV & LV IDMT over current protection.

- b) 220KV lines have three zone switched/non switched distance protection on with permissive inter trip for end zone fault as a main protection. Directional earth

fault protection relay as a back up protection.

220KV buses will have bus bar protection, which are near to the generating stations.

220KV/132KV transformer have differential protection, restricted earth fault protection. Buchholz, winding/oil temperature protection. It will also have directional over current as a back up protection.

- c) 132KV will have static switched three zone protection. It will also have directional earth fault protection as back up protection.
- d) 66/37.5/33/11KV lines have two over current and one earth fault non-directional IDMT protection. It will also have instantaneous over current element.

CHAPTER-15

METERING, COMMUNICATION AND DATA ACQUISITION

15.1 **Introduction:**

This Section specifies the minimum operational and commercial metering, communication and Data Acquisition requirements to be provided by each **User** at the interconnection points and also at the cross boundary circuits.

15.2 **Objective:**

15.2.1 The objective of this Section is to define the minimum acceptable metering and communication and data acquisition requirements to enable the **Licensee** to manage the **Transmission System** in a safe and economic manner consistent with **License** requirements.

15.3 **Generation Operational Metering:**

15.3.1 This sub-section Specify the facilities that shall be provided, certain practices that shall be employed for monitoring output and response of Power Stations and Generating Units. It shall not apply to Power Stations with a capacity below 5 MW.

15.3.2 The Generator shall install operational metering to the **Licensee's** specification so as to provide operational information for both real time and recording purposes in relation to each Generating Unit at each Power Station in respect of:

- i. Bus Voltage
- ii. Frequency
- iii. MW
- iv. MVA_r

And any other additional data as agreed between the **Licensee** and Generator.

15.3.3 All current transformers and voltage transformers used in conjunction with the operational metering shall conform to relevant Bureau of Indian Standards or the relevant IEC, of accuracy class minimum 0.5 and of suitable rating to cater to the meters and the lead wire burden.

15.3.4 Metering shall be jointly calibrated, once a year so as to achieve overall accuracy of operational metering in the limits as agreed between the **Licensee** and Generator. Records of calibration shall be maintained for reference and shall be made available to the **Licensee** upon request joint site testing of meters shall be carried out once a year.

15.3.5 Generators shall furnish recorded data of all electrical measurements and events recorded by the operational metering to the **Licensee** at least once in a week or more often if required.

15.4 **Transmission System Operational Metering:**

15.4.1 This sub-section specifies the facilities that shall be provided and certain practices that shall be employed for monitoring electrical supply and load characteristic at each sub-station.

15.4.2 The **Licensee** shall install operational metering so as to provide operational information for both real time and recording purposes in relation to each feeder, transformer and compensation device at each sub-station in respect of:

- i. Bus Voltage
- ii. Frequency
- iii. MW
- iv. MVA_r
- v. Power Factor
- vi. Current

15.5 **Supervisory Control and Data Acquisition (SCADA)**

15.5.1 As early as possible the **Licensee** shall install and make operative an operational metering data collection system under SCADA for storage, display and processing of operational metering data. All **Users** shall make available outputs of their respective operational meters to the SCADA interface equipment.

15.5.2 The data collection, storage and display center of the **Licensee** /STU shall be the State Load Dispatch Center.

15.6 **Generation/Draw Commercial (Tariff) Metering:**

15.6.1 This sub-section specifies provision of Commercial (Tariff) metering at Connection points between Generating Stations and **Transmission System** and between External Interconnection points and **Transmission System**. It also specifies metering facilities that shall be provided for the measurement of electricity consumed at Power Stations.

15.6.2 Metering shall be done to measure the following:

- i. Active Energy for Export
- ii. Active Energy for Import
- iii. Reactive Energy for Import
- iv. Reactive Energy for Export
- v. Frequency
- vi. Voltage

Each metering point associated with determination of energy exported or imported shall be provided with both main and a check meter

15.6.3 Minimum standard of accuracy of meters shall be of class 0.2 or as agreed between the Generator and the **Licensee**, PGCIL and **Licensee** and shall conform to relevant Bureau of Indian Standards or relevant IEC.

15.6.4 All current transformers and voltage transformer used in conjunction with

Commercial (Tariff) metering shall conform to relevant Bureau of Indian Standards or relevant IEC. These shall be of accuracy class 0.2 and of suitable rating to cater to the meter burden and lead wire burden.

- 15.6.5 Data Collection shall be used to integrate impulses from meters over each integration period as per agreement, store values and transmit values to the data collection system of the **Licensee**. Data shall be collected from both main and check metering schemes.
- 15.6.6 Voltage supply to the metering shall be assured with necessary voltage selection schemes. Voltage Failure Relays shall be provided which will initiate alarm on loss of one or more phases of the voltage supply to any meter.
- 15.6.7 Meters shall be tested and calibrated at least once in every year or such period as mutually agreed between users involved according to guidelines provided in relevant Bureau of Indian Standards or relevant IEC as applicable or **NREB**. Records of meter calibration test shall be maintained for future reference.
- 15.6.8 A procedure shall be drawn up between the **Licensee** and Generators and between the **Licensee** and covering summation, collection, processing of tariff meter readings, at various Connection sites. This may be revised from time to time as necessary.
- 15.6.9 The ownership and responsibility of maintenance and testing of meters shall be as mutually agreed between the **Users** and the **Licensee**.
- 15.6.10 A comprehensive Metering Code covering the foregoing provisions shall be developed by the STU and will be approved by UPERC, which shall form a part of the Grid Code.
- 15.7 **Distribution System Commercial (Tariff) Metering:**
 - 15.7.1 This sub-section specifies provision of Commercial (Tariff) metering at Connection points between the Distribution System and the **Transmission System**
 - 15.7.2 Metering shall be done to measure the following and the meters shall conform to the requirements of Comprehensive Metering Code mentioned in clause 15.6.10.
 - i. Active Energy for Export
 - ii. Reactive Energy for Export
 - iii. Active Energy for Import
 - iv. Reactive Energy for Import
 - 15.7.3 Each metering point associated with determination of energy exported or imported shall be provided with both main and check meters.
 - 15.7.4 Minimum standard of accuracy of meters shall be of class 0.2 or as agreed between the **Licensee** and Supply Licensee shall conform to relevant Bureau of Indian Standard or relevant IEC.
All current transformers and voltage transformers used in conjunction with Commercial (Tariff) metering shall conform to relevant Bureau of Indian Standard or

relevant IEC. These shall be of class 0.2 and of suitable ratings to cater to the meter burden and lead wire burden.

- 15.7.5 Voltage supply to the metering shall be assured with necessary voltage selector schemes. Voltage failure relays should be provided which will initiate alarm on loss of one or more phases of voltage supply to any meter.
- 15.7.6 Meters shall be tested and calibrated at least once in a year by the users involved according to guidelines provided in relevant Bureau of Indian Standards or relevant IEC if applicable. Records of meter calibration tests shall be maintained for future reference.
- 15.7.7 A procedure shall be drawn between the **Licensee** and **supply licensee** covering summation, collection, processing of tariff meter readings at various connection sites. This may be revised from time to time as necessary
- 15.7.8 The Comprehensive metering code specified in clause 15.6.10 shall also cover the Distribution System Commercial (Tariff) metering.

15.8 **Communication:**

- 15.8.1 Independent dedicated communication links for voice communication, for written communication and for data acquisition shall be installed by the **Licensee** between all Power Station, **Transmission System** sub-stations and **SLDC**. In addition, similar links between various **Transmission System** Sub-stations shall be established. Communication shall be available by dialing discrete numbers and also through Hot Line. The **Licensee** shall establish Hot Line links between Power Station/important sub-station and **SLDC**.

15.9 **Data Acquisition:**

- 15.9.1 For effective control of the **Transmission System** the **SLDC** would need real time data as follows:
 - a. MW Generated in each Power Station
 - b. MW drawl from External Interconnection
 - c. MVAR Generated or absorbed in each Power Station.
 - d. MVAR. Imported or exported from External Interconnection.
 - e. Voltage in all system buses.
 - f. Frequency in **Transmission System**
 - g. MW & MVAR flow in each Transmission line.
- 15.9.2 SSG, licensee, and supply licensee. Shall provide necessary Transducers for the transmission of the above data to **SLDC**. /**RLDC**
- 15.9.3 The **Licensee** shall establish a suitable data transfer link between **SLDC** and **NRLDC** for the exchange of operational data.

15.10 **Agreed Procedure for Communication and Data Transmission:**

Mutually agreed procedures shall be drawn up between the **Licensee** and other **Users** outlining inter responsibility, accountability and recording of day-to-day communication and data transmission for operational matters.

CHAPTER 16
GRANT OF TRANSMISSION LICENCE IN U.P.

16.1 INTRODUCTION:

16.1.1 As per Section 27 A(2) of amended Indian Electricity Act 1910 (No. 22 of 1998) Central Transmission Utility has to undertake transmission of energy through Inter State **Transmission System**. Similarly, as per section 27 B(2) of the above Act the State Transmission Utility has to undertake transmission of energy through Intra State **Transmission System**. Since these are statutory provisions, therefore neither CTU nor **STU** require any further authorisation (**Licence**) for undertaking the transmission activity. It has also been stipulated that **CTU/STU** will be a Government Company, therefore, it is implied that the Inter State **Transmission System** would be by and large owned by CTU whereas the **Intra State Transmission System** would be by an large owned by **STU**. However, in future, the Commission may decide to grant a transmission licence under section 27 D of Indian Electricity Act, 1910 to any one for constructing, maintaining and operating any part of intra state transmission system under the direction control and supervision of the **STU**.

16.2 PROCEDURE:

16.2.1 Once the **STU** has identified one or more element of the Intra State **Transmission System** for the assistance of private Sector, it shall issue an advertisement requesting the interested parties to apply for short listing.

16.2.2 The **STU** shall parallelly get a preliminary survey done and prepare a feasibility report. **STU** shall also apply for forest clearance etc. as necessary. All details available through the preliminary survey shall be issued, to the short listed parties along with the Tender documents, which shall include the draft of implementation agreement, transmission services agreement and the license. The bidders shall be asked to quote transmission charges which shall be payable to them at a certain level of availability. The **STU** shall then select the qualified bidders on sound techno-economical basis for undertaking construction of the specified element(s) on ownership basis.

16.2.3 The successful bidder would then be required to submit an application for issuance of a license in accordance with UP Electricity Reform Act, 1999 and UPERC's Business Regulations 2000. This application shall be forwarded by **STU** along with its recommendations to the **UPERC**.

Tender Documents, terms and conditions, evaluation proposal as also the draft of implementation agreement, transmission service agreement and transmission **Licencee** (which are to be subsequently enclosed in the tender documents) shall be developed by **STU** and submitted to **UPERC** for prior approval. However, no application for **Licencee** shall be entertained unless applicant has obtained approval of the State Transmission Utility.

16.3 **REVOCAION OF LICENSEE:**

- a) **UPERC** may enquire into the conduct or functioning of any transmission **Licensee** in carrying out the obligation set out in the Transmission **Licence**, Rules & Regulation framed there under and the Terms and Conditions of the **Licence** in the following circumstances:
 - i) Upon receiving a complaint from any user
 - ii) Upon reference made to it by State Government, the CTU, the Central Government or CEA: or STU
 - iii) Upon it's own knowledge or information received from any source.
- (b) Upon making such inquiry, **UPERC** may if in it's opinion in the public interest it so requires, revoke a **Licensee** in any of the following cases ;
 - i) Where the **Licensee**, in the opinion of **UPERC/STU** has committed willful and unreasonable default in doing any thing required of him under Indian Electricity Act 1910, Electricity (Supply) Act 1948, Indian Electricity Rules, 1956 and/or UP Electricity Reform Act, 1999 the rules or regulations made there under or under the **UPEGC or any other directives issued by the UPERC/STU**.
 - ii) Where the **Licensee** commits a breach of any of the terms and conditions of **Licence**
 - iii) Wherein the opinion of the **UPERC** the financial position of the Licensor is such that it is unable to fully and efficiently discharge the duties and obligations imposed by the **Licensee**.
- c) Notwithstanding the position of Subsections (a) & (b) above the **UPERC** may, where in it's opinion in the public interest so requires, on the application or with the consent of the **Licensee** revoke a transmission **Licence** as to the whole or any part of the area of transmission or supply upon such terms and conditions as it thinks fit.
- d) Licence shall be revoked under subsection (b) & (c) above, unless **UPERC** has given to the **Licensee** not less than 3 months notice in writing, stating the ground on which it is proposes to revoke the **Licence** and has considered any cause shown by the **Licensee** within the period of that notice against the proposed revocation.
- e) **UPERC** may instead of revoking a **Licensee**, permit it, to remain in force subject to such terms and conditions as it thinks fit to impose. These terms and conditions shall be binding upon and be observed by the **Licensee** and it would be of like force and effect as if, they were contained in the License.
- f) Before a license is revoked/suspended **UPERC** and **STU** shall ensure that alternative arrangements have been/are being made so that the operation of **Intra- State Transmission System** is not adversely effected.

CHAPTER-17

DATA REGISTRATION CODE (DRC)

17.1 **Introduction:**

17.1.1 The Data Registration Code (DRC) presents a list of all data required by **Licensee** from **Users** and by **Users** from **Licensee**, from time to time under the Grid Code.

17.1.2 The code under which any item of data is required specifies procedures and timings for the supply of that data, for routine up dating and for recording temporary or permanent changes to that data. All timetables for the provision of data are indicated in the DRC. Various sections of the Grid Code also specify information which the **Users** will receive from STU /**SLDC** accordingly.

17.2 **Objective**

The objective of the DRC is to:-

- a) List all the data to be provided by each category of **User** to **Licensee** under the Grid Code; and
- b) List all the data to be provided by **Licensee** to each category of **User** under the Grid Code.

17.3 **Responsibility:**

1. All **Users** are responsible for submitting up to date data to the **Licensee** in accordance with the provisions of the Grid Code.
2. All **Users** shall provide the **Licensee** with the name address and telephone Number of the person responsible for sending the data.
3. The **Licensee** shall inform all the **Users**, the name, address and telephone Number of the person responsible for receiving data.
4. The **Licensee** shall provide up to date data to **Users** as provided in relevant schedule of the Grid code Responsibility of correctness of data rest with the concerned **Users** providing the data.

17.4 **Data categories and stages in registration**

17.4.1 Within the DRC each data item is allocated to one of the following three categories:

- (a) Standard Planning Data (SPD)
- (b) Detailed Planning Data (DPD)
- (c) Operational Data

17.4.2 Standard Planning Data will be provided to STU in accordance with Planning Code.

17.4.3 Detailed Planning Data (DPD)
The Detailed Planning Data listed in this DRC is that data listed in the Planning Code and shall be provided to STU in accordance with the planning Code.

17.4.4 **Operational Data**

17.4.4.1 Operational Data is data, which are required in the DRC. Operating Data is sub-categorised according to the Code under which it is required.

17.4.4.2 Operational Data is to be supplied in accordance with time tables set down in the relevant Operating Codes and Scheduling and Dispatch and indicated in tabular form in the schedules to this DRC.

17.5 **Procedures and Responsibilities**

17.5.1 **Responsibility for Submission and Updating of Data**

In accordance with the provisions of the various sections of the Grid Code, each **User** must submit the data accordingly.

17.5.2 **Methods of Submitting Data**

17.5.2.1 The data schedules to the DRC are structured to serve as standard formats for data submission and such format must be used for the written submission of data to STU
Where standard format are not enclosed in DRC, these would be developed by **SLDC / Licensee** in consultation with **Users** .

17.5.2.2 All data to be submitted under the Schedule(s) must be submitted to STU or to such other department and/or address as STU may from time to time notify to **Users** . The name of the Person who is submitting each schedule of data must be indicated.

17.5.2.3 Where a computer data link exists between a **User** and **SLDC/ STU**, data may be submitted via this link. The data shall be in the same format as specified for paper transmission except for electronic encoding for which some other format may be more suited. The **User** shall specify the method to be used in consultation with the **SLDC/ STU** and resolve issues such as Protocols, transmission speeds etc. at the time of transmission.

17.5.2.4 Other modes of data transfer, such as magnetic tape may be utilised if **SLDC/ STU** gives its prior written consent.

17.5.3 **Changes to User's Data**

17.5.3.1 Whenever a **User** becomes aware of a change to an item of data, which is registered with **SLDC/ STU**, the **User** must notify **SLDC/ STU** in accordance with the relevant section of the Grid Code. The method and timing of the notification to **SLDC** is set out in the relevant section of the Grid Code.

17.6 **Data not supplied**

17.6.2 **STU** will advise a **User** in writing of any estimated data it intend to use in the event of data not being supplied.

17.7 **Special Consideration:**

The **Licensee** and any **User** may at any time make reasonable request for extra data as necessary.

