

**CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI**

PREAMBLE

File No. L-1/210/2016/CERC

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The Central Commission has been assigned the function to regulate inter-State transmission of electricity and to specify the Grid Code having regard to Grid standard under clause (c) and (h) of sub-section (1) of Section 79 of the Electricity Act, 2003. Communication system forms the backbone of the inter-State transmission of electricity and smooth operation of the power system. Keeping in view the importance of the communication system in a vast meshed network at the National, Regional and State level in India, a need has been felt to specify the regulations regarding Communication System for inter-State transmission of electricity. The purpose of the regulations is to lay down the rules, guidelines and standards to be followed by various persons and participants in the system for continuous availability of data for system operation and control including market operations. Further, the regulations deal with the planning, implementation, operation and maintenance and up-gradation of reliable communication system for all communication requirements including exchange of data for integrated operation of National Grid.

NOTIFICATION

In exercise of the powers conferred under Section 178 of the Electricity Act, 2003 (36 of 2003), read with clause (c) and (h) of sub-section (1) of Section 79 and all other powers enabling it in this behalf, the Central Electricity Regulatory Commission makes the following regulations, namely:

1. SHORT TITLE AND COMMENCEMENT:

- (i) These regulations may be called the Central Electricity Regulatory Commission (Communication System for inter-State transmission of electricity) Regulations, 2017.
- (ii) These regulations shall come into force w.e.f. 1.7.2017.

2. DEFINITIONS AND INTERPRETATIONS:

- (i) In these regulations, unless the context otherwise requires, -
 - a) "Act" means the Electricity Act, 2003 (36 of 2003) as amended from time to time;
 - b) "Ancillary Services" means in relation to power system (or grid) operation, the services necessary to support the power system (or grid) operation in maintaining power quality, reliability and security of the grid e.g. active power support for load following, reactive power support, black start, etc.;

- c) "Associated communication system" means a communication system associated with a project set up for exchange of voice/video data with load despatch centre as per Grid Code.
- d) "Commission" means the Central Electricity Regulatory Commission referred to in sub-section (1) of Section 76 of the Act;
- e) "Central Transmission Utility" means any Government Company which the Central Government may notify under sub-section (1) of Section 38 of the Act;
- f) "Communication Channel" means a dedicated virtual path configured from one users' node to another user's node, either directly or through intermediary node(s) to facilitate voice, video and data communication and tele-protection system.
- g) "Communication network" means an interconnection of communication nodes through a combination of media, either directly or through intermediary node(s);
- h) "Communication system" is a collection of individual communication networks, communication media, relaying stations, tributary stations, terminal equipment usually capable of inter-connection and inter-operation to form an integrated communication backbone for power sector. It also includes existing communication system of Inter State Transmission System, Satellite and Radio Communication System and their auxiliary power supply system, etc. used for regulation of inter-State and intra-State transmission of electricity;
- i) "Control Centre" means NLDC or RLDC or REMC or SLDC or Area LDC or Sub-LDC or DISCOM LDC including main and backup as applicable.
- j) "data" means a set of values of analogue or digital signal including a text, voice, video, tele -protection, alarm, control signal , phasor, weather parameter, parameter of a machine or the power system.
- k) "Forecasting Service Provider (FSP)" means a service provider who provides forecast related to weather/Renewable Energy Resources and Demand for use of Users.
- l) "Generating station" means a generating station as defined in Section 2 (30) of the Act.
- m) "Grid Code" means the Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2010 as amended from time to time or subsequent re-enactment thereof.
- n) "Inter-State transmission system" means the ISTS as defined in Section 2 (36) of the Act.
- o) "Meter" means a device suitable for measuring, indicating and recording consumption of electricity or any other quantity related with electrical system and shall include, wherever applicable, other equipments such as Current Transformers

(CT), Voltage Transformer (VT) or Capacitor Voltage Transformer (CVT) with necessary wiring and accessories.

p) "National Load Despatch Centre" means the centre established under sub-section (1) of Section 26 of the Act;

q) "PMU (Phasor Measurement Unit)" means a device which provides phasor information (both magnitude and phase angle) for one or more phases of AC voltage or current waveforms in real time.

r) "Real time operation" means action to be taken at a given time at which information about the electricity system is made available to the concerned Load Despatch Centre;

s) "Real time data" denotes information relating to current operating state of power system in accordance with system operation and control requirements.

t) "Regional Load Despatch Centre" means the Centre established under sub-section (1) of Section 27 of the Act;

u) "Remote Terminal Units" (RTU) means a device suitable for measuring, recording and storing the consumption of electricity or any other quantity related with electrical system and status of the equipment in real time basis and exchanging such information with the data acquisition system for display and control and shall include, wherever applicable, other equipments such as transducers, relays with necessary wiring and accessories.

v) "Renewable Energy Management Centres" means the centres being established in India to enable forecasting, scheduling and monitoring of renewable energy generation.

w) "State Load Despatch Centre (SLDC)" means the centre established under sub-section (1) of Section 31 of the Act;

x) "State Transmission Utility" means the board or the Government Company as specified by the State Government under sub-section (1) of Section 39 of the Act;

y) "Supervisory/system control and data acquisition (SCADA)" means a system of remote control and telemetry used to monitor and control the transmission system;

z) "system operation function" includes monitoring of grid operations, supervision and control over the Inter-State Transmission System, real time operations for grid control and dispatch, system restoration following grid disturbances, compiling and furnishing data pertaining to system operation, congestion management, black start coordination and any other function(s) assigned to the RLDC under the Act or any regulations and orders of the Commission;

aa) "User" means a person such as a Generating Company including Captive Generating Plant, RE Generator, Transmission Licensee [other than the Central Transmission Utility (CTU) and State Transmission Utility (STU)] , Distribution Licensee, a Bulk Consumer, whose electrical system is connected to the ISTS or the intra-State transmission system.

ab) "Wide band Node" means wide bandwidth data transmission data with an ability to simultaneously transport multiple signals and traffic types.

3. Save as aforesaid and unless repugnant to the context or the subject-matter otherwise requires, words and expressions used in these regulations and not defined, but defined in the Act, or the Grid Code or any other regulations of this Commission shall have the meanings assigned to them respectively in the Act or the Grid Code or any other regulations.

GENERAL

INTRODUCTION

4. OBJECTIVE:

These regulations provide for planning, implementation, operation and maintenance and up-gradation of reliable communication system for all communication requirements including exchange of data for integrated operation of National Grid.

5. SCOPE and APPLICABILITY:

(i) These regulations shall apply to the communication infrastructure to be used for data communication and tele-protection for the power system at National, Regional and inter-State level and shall also include the power system at the State level till appropriate regulation on Communication is framed by the respective State Electricity Regulatory Commissions.

(ii) All Users, SLDCs, RLDCs, NLDC, CEA, CTU, STUs, RPCs, REMC, FSP and Power Exchanges shall abide by the principles and procedure as applicable to them in accordance with these regulations.

6. NODAL AGENCY:

(i) The nodal agency for planning, and coordination for development of communication system for inter-State transmission system user shall be the Central Transmission Utility.

(ii) The nodal agency for planning, and coordination for development of communication system for intra - State transmission system user shall be the State Transmission Utility.

(iii) The nodal agency for ensuring integration of communication system at regional level with SCADA, WAMS, Video Conferencing Systems(VCS), Automatic Meter Reading(AMR), EPABX, Tele-protection system shall be respective RLDC for ISGS,

ISTS and SLDCs; and respective SLDC for State Generating Stations, distribution companies, Intra-State entities, intra-State transmission system, etc.

7. ROLE AND RESPONSIBILITIES OF VARIOUS ORGANIZATIONS AND THEIR LINKAGES:

7.1 Role of Central Electricity Authority (CEA)

(i) CEA shall formulate communication planning criterion and guidelines for development of reliable communication system for power system of India duly considering requisite route redundancy ,capacity, as well as requirements of smart grid and cyber security.

(ii) CEA shall formulate and notify technical standards, cyber security requirements in accordance with the Cyber security Policy of the Govt of India from time to time, protocol for the communication system for Power Sector within the country including the grid integration with the grid of the neighbouring countries.

(iii) CEA shall constitute and notify a Standing Committee for Communication System in Power Sector. The Standing Committee shall be responsible to:

- a. prepare perspective plan for communication duly considering optimal utilization of transmission assets for communication purposes having regards to the transmission planning carried out by CEA through Standing Committee on Power System Planning.
- b. carry out periodic review of the perspective plan.
- c. monitor and facilitate timely completion of schemes and projects for improving and augmenting the associated communication system along with transmission system in the power sector.

7.2 Role of CTU

(i) The CTU shall in due consideration of the planning criteria and guidelines formulated by CEA, be responsible for planning and coordination for development of reliable National communication backbone Communication System among National Load despatch Centre, Regional Load Despatch Centre(s) and State Load Despatch Centre(s) and REMCs along with Central Generating Stations, ISTS Sub -Stations, UMPPs, inter-State generating stations, IPPs, renewable energy sources connected to the ISTS, Intra-State entities, STU, State distribution companies, Centralised Coordination or Control Centres for generation and transmission. While carrying out planning process from time to time, CTU shall in addition to the data collected from and in consultation with the users consider operational feedback from NLDC, RLDCs and SLDCs.

(ii) The CTU shall plan the communication system comprehensively and prospectively for users considering the requirement of the expected nodes in consultation with Standing Committee to be constituted by CEA.

(iii) The CTU shall also plan communication system for the cross border transmission system for cross border exchange of power.

(iv) The CTU shall integrate communication planning with transmission and generation project planning in a comprehensive manner.

(v) The CTU shall discharge the above function in consultation with the CEA, State Transmission Utilities, ISGS, Regional Power Committees, NLDC and RLDCs and SLDCs.

(vi) The CTU shall provide access to its communication node to interface the wideband network being implemented by State Transmission Utilities to have a single interconnected network and shall coordinate with State Utility for the interface requirement.

(vii) CTU shall be the Nodal Agency for supervision of communication system in respect of inter-State communication system and will implement centralized supervision for quick fault detection and restoration. CTU shall prepare Procedure for same and submit to Commission for approval within 60 days of notification of these Regulations.

(viii) The CTU in consultation with STUs shall carry out the integrated planning for development of backbone communication systems providing interfaces to wideband communication network of STUs at interface nodes.

(ix) The CTU shall provide access to its wideband network for grid management and asset management by all users.

(x) The CTU shall extend the required support to Control Centres for integration of communication system at respective ends.

7.3 Role of National Power Committee (NPC) and Regional Power Committee (RPC):

(i) NPC shall be responsible for issuance of the guidelines with the approval of the Commission on "Availability of Communication System" in consultation with RPCs, RLDCs, CTU, CEA and other stakeholders within a period of two months from the date of notification of these regulations.

(ii) The RPC Secretariat shall certify the availability of communication equipment for CTU, ISGS, RLDCs, NLDC, SLDCs based on the data furnished by RLDC.

(iii) The RPC Secretariat shall monitor instances of non-compliance of these regulations as amended from time to time and make endeavour to sort out the issues in the respective region in such a way that cases of non-compliance are prevented in future.

Unresolved issues and non-compliance of any of the provisions of these regulations shall be reported by the Member Secretary of respective RPC to the Commission.

(iv) The RPC Secretariat shall be responsible for outage planning for communication system in its region. RPC Secretariat shall process outage planning such that uninterrupted communication system is ensured.

7.4 Role of NLDC:

(i) The National Load Despatch Centre (NLDC) shall be responsible for preparation and issuance guidelines with the approval of the Commission on the "Interfacing Requirements" in respect of terminal equipment, RTUs, SCADA, PMUs, Automatic Generation Control (AGC), Automatic Meter Reading (AMR) Advanced Metering Infrastructure (AMI), etc. and for data communication from the User's point to the respective control centre(s) based on technical standards issued by CEA within 60 days of issuance of technical standards.

(ii) NLDC shall be responsible for integration of the Communication system at NLDC end for monitoring, supervision and control of Power System and adequate data availability in real-time within 60 days of the issue of the guidelines.

7.5 Role of RLDCs:

(i) The Regional Load Despatch Centre shall be nodal agency for integration and supervision of Communication System of the ISTS, ISGS, SLDCs and IPPs at RLDC end for monitoring, supervision and control of Power System and adequate data availability in real time.

(ii) The Regional Load Despatch Centre (RLDC) shall collect and furnish data related to Communication System of various users, CTU, RLDC, STU and SLDC to RPCs.

(iii) RLDCs shall provide operational feedback to CTU.

7.6 Role of SLDCs:

(i) The State Load Despatch Centres shall be nodal agency for integration of Communication System in the intra-State network, distribution system and generating stations at SLDC end for monitoring, supervision and control of Power System and adequate data availability in real time.

(ii) SLDC shall provide operational feedback to CTU and STU.

7.7 Role of STUs

(i) The STU shall be responsible for planning, coordination and development of reliable communication system for data communication within a State including appropriate protection path among State Load Despatch Centre, Area LDC, Sub-LDC and DISCOM LDC including Main and backup as applicable along with STU Sub-Stations, intra-State Generating Stations.

(ii) The STU shall also plan redundant communication system up to the nearest Inter-State Transmission System wideband communication node for integration with the inter-State communication system at appropriate nodes.

(iii) The STU shall discharge all functions of planning related to the State backbone communication system in consultation with Central Transmission Utility, State Government, generating companies and distribution companies in the State.

(iv) The STU shall also provide access to its wideband Network for grid management by all users.

(v) The STU shall extend the required support to Control Centres for integration of communication system at respective ends.

7.8 Role of Users:

(i) The Users including renewable energy generators shall be responsible for provision of compatible equipment along with appropriate interface for uninterrupted communication with the concerned control centres and shall be responsible for successful integration with the communication system provided by CTU or STU for data communication as per guidelines issued by NLDC.

(ii) Users may utilize the available transmission infrastructure for establishing communication up to nearest wideband node for meeting communication requirements from their stations to concerned control centres.

(iii) The Users shall also be responsible for expansion /up-gradation as well as operation and maintenance of communication equipment owned by them.

8. BOUNDARY OF THE COMMUNICATION SYSTEM

8.1 ISTS Communication system

(i) NLDC

(ii) RLDCs

(iii) SLDCs (ISTS interconnection)

(iv) ISTS sub-stations of transmission licensee

(v) ISGS, Central Generating Stations, Solar generation plants/ solar parks and wind generation pooling stations connected to ISTS as required.

8.2 Intra-State Communication System:

(i) SLDC (State Inter-connection)

(ii) STU

(iii) Distribution Companies

(iv) State Generating Stations including renewable generators connected to State network.

(v) Sub-stations of STU and State Transmission licensees

9. PERIODIC TESTING OF THE COMMUNICATION SYSTEM:

(i) All users that have provided the communication systems shall facilitate for periodic testing of the communication system in accordance with procedure for maintenance and testing to be prepared by CTU within 60 days of notification of Regulations and approved by Commission.

(ii) Testing process for communication network security should also be included even for third party system if exists in accordance with procedure for maintenance and testing to be prepared by CTU and approved by Commission.

10. Periodic Auditing of Communication System:

The RPC Secretariat shall conduct performance audit of communication system annually as per the procedure finalised in the forum of the concerned RPC. Based on the audit report. RPC Secretariat shall issue necessary instructions to all stakeholders to comply with the audit requirements within the time stipulated by the RPC Secretariat. An Annual Report on the audit carried out by respective RPCs shall be submitted to the Commission within one month of closing of the financial year.

11. FAULT REPORTING:

(i) RLDC and SLDC in case of outage of telemeter data, or communication failure shall inform the respective user so that the user shall ensure healthiness of its communication system. In case outage pertains to fault in communication system of other user, the user shall lodge complaints for failure of the communication to the communication system owner for quick restoration.

(ii) The communication provider shall explore the possibility for route diversion on the existing facility in close co-ordination with concerned provider in case the fault restoration is prolonged. No separate charges shall be paid for such route diversion or channel re-allocation. However, such rerouting shall be discontinued once the original channel is restored.

12. COMMUNICATION SYSTEM AVAILABILITY:

All users of CTU, NLDC, RLDCs, SLDCs, STUs shall maintain the communication channel availability at 99.9% annually:

Provided that with back up communication system, the availability of communication system should be 100%.

13. Cyber Security:

(i) Communication infrastructure shall be planned, designed and executed to address the network security needs as per standard specified by CEA and shall be in conformity with the Cyber Security Policy of the Govt. of India, issued from time to time.

(ii) NLDC, shall monitor case of cyber security incidences and discuss them at RPC level and take necessary action as deemed fit.

(iii) RPC shall ensure that third party cyber security audits shall be conducted periodically (period to be decided at RPC) and appropriate measures shall be implemented to comply with the findings of the audits. The audits shall be conducted by CERT-In certified third party auditors.

14. Guidelines or Procedures to be issued by different entities under these Regulations

14.1 The following entities shall be responsible for preparation, consultation and finalisation of the Guidelines / Procedure required under these Regulations:

(i) NLDC shall prepare Guidelines on "Interfacing Requirements" in terms of Regulation 7.4(i) of these Regulations.

(ii) CTU shall prepare Procedure on "Centralized supervision for quick fault detection and restoration" in terms of Regulation 7.2 and on "Maintenance and testing of communication system" in terms of Regulation 9 of these Regulations.

(iii) NPC shall prepare Guidelines on "Availability of Communication system" in terms of Regulation 7.3 of these Regulations.

14.2 All the entities shall post the draft Guidelines/ Procedure on its website and invite comments from the general public and stakeholders and finalise the guidelines after considering the comments received from them. The entities, while seeking approval of the Commission, shall submit a statement indicating its views on the comments received from the general public and stakeholders.

15. Dispute resolution:

In case of any dispute in giving effect to these regulations, the affected party may approach the Commission with a proper application in accordance with Central Electricity Regulatory Commission (Conduct of Business) Regulations, 1999 as amended from time to time.

16. Power to Relax:

The Commission may by general or special order, for reasons to be recorded in writing, and after giving an opportunity of hearing to the parties likely to be

affected by grant of relaxation, may relax any of the provisions of these regulations on its own motion or on an application made before it by an interested person.

17. Power to Remove Difficulty:

If any difficulty arises in giving effect to the provisions of these regulations, the Commission may, by order, make such provision not inconsistent with the provisions of the Act or provisions of other regulations specified by the Commission, as may appear to be necessary for removing the difficulty in giving effect to the objectives of these regulations.

sd/-
(Sanoj Kumar Jha)
Secretary