

**PUBLIC WORKS NOTIFICATIONS
TELANGANA STATE ELECTRICITY REGULATORY COMMISSION
HYDERABAD**

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Smart Grid Regulations, 2016

The Electricity Sector comprising of generation, transmission and distribution has to keep pace with other technologies arising out of information technology and scientific development taking place in I.T. enabling services. The Commission has to endeavour to bring the new technologies in the operation of the grid. Therefore, the Commission in exercise of powers conferred under section 181 of the Electricity Act, 2003 and all other powers enabling it under the said Act makes the following regulation.

CHAPTER - 1: GENERAL

1. Short Title, Extent and Commencement:

- (1) These Regulations may be called the Telangana State Electricity Regulatory Commission (Smart Grid) Regulations, 2016.
- (2) These Regulations shall be applicable to all Generating) Companies, Transmission and Distribution Licensees and consumers in the State of Telangana and connected to the state grid.
- (3) These Regulations shall come into force on the date of their publication in the Official Gazette.
- (4) It extends to the entire State of Telangana.

2. Definitions

- (1) Unless the context otherwise requires, for the purpose of these Regulations:-
 - (a) "Act" means the Electricity Act, 2003 and amendments thereof;
 - (b) "Advanced Metering Infrastructure (AMI)" including smart meters means the infrastructure required to enable the Distribution Licensee to accurately collect, monitor and analyse real-time consumption data from consumers, communicate price signals to consumers and where permitted loads controlled;
 - (c) "Aggregator" is an entity registered with the Distribution Licensee to provide aggregation of one or more of the services like demand response services under the

demand response mechanism, Distributed Generation, Energy Storage etc. within a control area;

(d) "Commission" means Telangana State Electricity Regulatory Commission;

(e) "Cyber Security" means protecting information, equipment, devices, computer, computer resource, network, programmes, data, communication device and information stored therein from unauthorised or unintended access, use, disclosure, disruption, modification or destruction;

(f) "Electric Energy Storage" means a set of technologies capable of storing previously generated energy and releasing energy at a later time to feed electricity into grid. Electric storage technologies may store energy as potential, kinetic, chemical, or thermal energy, and include various types of batteries, flywheels, electrochemical, capacitors, compressed air storage, thermal storage devices and pumped hydroelectric power and able to generate electricity;

(g) "Interoperability" means the measure of ease of integration between two systems or software components to achieve a functional goal;

(h) "Key Performance Indicator (KPI)" is a type of performance measurement to evaluate its success, or to evaluate the outcome of a particular activity in which it is engaged;

(i) "Microgrid" is an intelligent electricity distribution system that interconnects loads, distributed energy resources and storage within clearly defined electrical boundaries to act as a single controllable entity with respect to the main grid. A microgrid uses information, communications and control technologies to operate the systems distributed supply and demand resources in a controlled and coordinated way either while connected to the main grid or while islanded. A microgrid can connect and disconnect from the grid to enable it to operate in both grid-connected or island-mode.

(j) "Smart Grid" is an electricity network that can cost-efficiently integrate the behaviour and actions of all users connected to it - generators, consumers and those that do both - in order to ensure economically efficient, sustainable power systems with low losses and high levels of quality and security of supply and safety.

(k) "Wide Area Measurement Systems (WAMS)" is advanced measurement technology, information tools, and operational infrastructure that facilitate the understanding and management of the increasingly complex behaviour exhibited by large power systems to enhance the system operator's "situational awareness" for safe and reliable grid operation;

(2) The words and expressions used and not defined in these Regulations but defined in the Act, Rules and Regulations framed thereunder shall have the meaning assigned to them in the Act, Rules and Regulations.

CHAPTER 11: SMART GRID OBJECTIVES AND GUIDELINES

3. Smart Grid Objectives.

(1) The objectives of these regulations are to enable integration of various smart grid technologies and measures to bring about economy, efficiency improvement in generation, transmission and distribution licensee operations, manage the transmission and distribution networks effectively, enhance network security, integrate renewable and clean energy into the grid and micro grids.

(2) The objectives also include enhancing network visibility and access, promoting optimal asset utilization, improving consumer service levels thereby allowing for participation in operations of transmission, distribution licensees through greater technology adoption across the value chain in the electricity sector and particularly in the transmission and distribution segments.

4. Guidelines on Smart Grid process.

(1) The Commission may from time to time issue guidelines for the generating company, transmission and distribution licensees in execution of the activities including but not limited to,

- a. Formulation of Smart Grid programmes.
- b. Implementation of Smart Grid programmes.
- c. Cost Effectiveness Assessment of Smart Grid programmes.
- d. Monitoring and Reporting of Smart Grid Plans and programmes.
- e. Essential requisites for Smart Grid programmes.
- f. Customer engagement and participation.
- g. Customer data protection.
- h. Training and capacity building.
- i. Methodology for setting Smart Grid plans and funding levels.
- J. Database development framework and information system requirements.

(2) Issuance of such guidelines shall not be a pre-requisite for preparation and submission of the Smart Grid plan by the generating company, transmission licensee, and distribution licensee.

CHAPTER III: SMART GRID CELL

5. Constitution of Smart Grid Cell, its roles & responsibilities

(1) Every transmission and distribution licensees shall, constitute Smart Grid Cell within three months of notification of these regulations.

(2) The Smart Grid Cell so constituted shall have the authority and necessary resources so as to execute the functions assigned to it under these Regulations.

(3) The Smart Grid Cell shall be responsible for:

- a. Baseline study and development of data.
- b. Formulation of Smart Grid Plans, Programmes and Projects.
- c. Design and development of Smart Grid projects including cost benefit analysis, plans for implementation, monitoring & reporting and for measurement & verification.
- d. Seeking necessary approvals to Smart Grid Plans, Programmes and Projects.
- e. Implementation of Smart Grid programmes.
- f. Any other additional function that may be assigned by the Commission from time to time.

(4) The transmission and distribution licensees may combine activities related to energy efficiency, demand side management and Smart Grid implementation within the same cell.

CHAPTER IV: SMART GRID PROCESS

6. Baseline study and development of data

(1) Transmission and distribution licensees shall undertake baseline study to identify the targets and final outcomes for Smart Grid project programmes. The transmission and distribution licensees shall also build the necessary database.

(2) Transmission and distribution licensees shall undertake study to estimate potential for employment of specific efficiency technologies and applications, establish key performance indicators, and determine existing baseline technical conditions.

(3) On the basis of the results of baseline study, the transmission and distribution licensee shall develop smart grid programme for its area of supply.

7. Formulation of Smart Grid Plan, Programmes, Projects.

(1) The transmission and distribution licensees shall submit an integrated Multi-Year Smart Grid Plan for their respective Licence areas along-with Multi-Year Tariff Petition or ARR Petition, for the approval of Commission.

(2) All Smart Grid projects requiring investments of more than Rupees 10 Crores (or such sum as specified by the Commission) shall be submitted to the Commission for prior approval of investments:

Provided that investments of less than Rupees 10 Crores (or such sum as specified by the Commission) shall not require prior approval of the Commission if it is part of Multi-Year Smart Grid Plan of the utility approved by the Commission.

(3) The proposal for Smart Grid Projects shall include.

(i) Detailed Project Report.

(ii) Customer engagement and participation plan as applicable.

(iii) Training and capacity building plan and

(iv) any other information that may be stipulated by the Commission from time to time:

Provided that the detailed project report would include inter alia description of the project, objective and rationale for the project, technical feasibility study, projected financial implications, target stakeholders, detailed cost benefit analysis detailing all costs qualitative and quantitative in nature, assessment of the project, in line with the cost effectiveness guidelines issued by the Commission, proposed mechanism for recovery of costs, delivery strategy, implementation mechanism, implementation schedule, performance incentives if any, monitoring and evaluation plan, plan for increasing awareness among the stakeholders.

(4) The Commission shall allow creation of provision for R&D activities in the field of Smart Grid projects in the Aggregate Revenue Requirement of the Distribution Licensee up to a limit equivalent to 1 paisa per unit of sales of the Distribution Licensee. The Distribution Licensee shall be required to maintain a separate account for this fund and utilization of this fund shall require prior approval of the Commission.

(5) The Commission shall also allow creation of provision for R&D activities in the field of Smart Grid projects in the Aggregate Revenue Requirement of the Transmission

Licensee and Load Dispatch Centre, up to a limit equivalent to 0.50 percent of the Aggregate Revenue Requirement of the respective year of Transmission Licensee and Load Dispatch Centre. The Transmission Licensee and Load Dispatch Centre shall be required to maintain a separate account for this fund and utilization of this fund shall require prior approval of the Commission.

(6) A list of indicative components of Smart Grid Projects is appended as Schedule.

8. Approval of Smart Grid Plan, Programme, Project Document

(1) The Commission shall approve a Smart Grid Programme, Project if it is in line with the Objectives set out in Clause 3 of the Regulations.

(2) The Commission may take assistance and advice of such experts as it deems necessary for examining the proposal submitted by the transmission licensee, distribution licensee.

(3) The Commission while according approval to the proposals, may identify costs, if any, relating to the programme, project, and decide the methodology, procedure, process for recovery of such costs.

Provided that the Commission may provide the incentive/dis-Incentive mechanism for the transmission and distribution licensees linked to the execution, implementation and performance during the life of the project. The Commission may also specify financial incentives / dis-incentives to participating consumers to encourage active and effective participation in the Smart Grid programs.

Provided that the Commission may modify the proposal as deemed fit in order to ensure its consistency with overall objectives.

9. Execution of Smart Grid programmes, projects

(1) The transmission and distribution licensees shall undertake execution of the project, programme in line with the approval given by the Commission and other directions issued by the Commission from time to time.

(2) The transmission and distribution licensees shall normally adopt the system standards as per Regulations notified by the CEA. In such case where no standards or regulations are notified by the CEA the appropriate standards, regulations notified by the appropriate Commission shall be applicable. In respect of network, communication, products, interoperability and cyber security, the standards as provided by BIS or such appropriate authority shall be adopted. Where these

standards are not yet in place, relevant IEC / IEEE / ANSI Standards shall be followed in that order.

(3) The Regulations relating to standards of performance as notified by the Commission shall apply. Assessment of performance of the Smart Grid projects shall be carried out for incentivizing / penalizing performance of transmission and distribution licensees. The Commission may specify and require implementation of additional standards of performance to maximize the benefits and ensure compliance of the Smart Grid performance standards proposed.

(4) Transmission and distribution licensees and other agencies responsible for implementation of the Smart Grid programmes, projects shall ensure that protection of consumer data and consumer privacy is accorded the highest levels of priority.

10. Mechanism for Cost Recovery

(1) Transmission and distribution licensees shall identify the net incremental costs, if any, associated with planning, design and implementation of programmes.

(2) Transmission and distribution licensees may propose methodology for recovery of net incremental costs through tariff or any other mechanism.

(3) In order to qualify for cost recovery, each program must be;

i. Approved prior to implementation and

ii. Implemented in accordance with the approved program plan.

(4) The Commission shall allow the recovery of such expenditure in the Annual Revenue Requirement (ARR) subject to prudence check.

CHAPTER V: SMART GRID PROJECT EVALUATION

11. Smart Grid Programme, Project Completion Report.

(1) The transmission and distribution licensees will prepare and submit a detailed programme, project completion report and submit the same to the Commission within one month of completion of such programme.

(2) The Report shall cover the programme, project expenses, physical achievements, constraints and difficulties faced, and deviations, if any.

(3) Transmission and distribution licensees shall place the completion report in public domain through its website.

12. Monitoring, Evaluation, Measurement and Verification of execution and performance of the Smart Grid Programme, Project.

(1) The Smart Grid programme, project shall be monitored and evaluated based on appropriate methodology including Key Performance Indicators as decided by the Commission using suitable measurement and verification protocols identified for each of the individual programmes, projects by the Commission.

(2) Transmission licensee, distribution licensee shall also submit an evaluation report to the Commission, which inter alia will include outcomes, benefits, lessons learnt and way forward.

CHAPTER VI

CUSTOMER ENGAGEMENT AND SMART GRID

13. Awareness and Capacity Building.

(1) In the development phase of Smart Grid programs, there would be significant needs for customer / prosumer education and outreach. Licensees shall earmark 1 % of the project cost for each Smart Grid project towards consumer awareness and capacity building.

(2) As part of the detailed project reports, Licensees shall define a clear internal and external communication strategy that identifies the critical communication needs and linking the same to the key project components. The Commission may reject project proposals or may require revisions to the communication strategy if required.

CHAPTER VII

MISCELLANEOUS

14. Power to amend: -

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

15. Removal of difficulties: -

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

16. Powers to give directions: -

The Commission may, from time to time, issue orders and directions in regard to the implementation of the Regulations and procedures to be followed.

17. Powers 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, may relax any of the provisions of these Regulations.

18. Dispute resolution: -

All disputes arising under these Regulations shall be decided by the Commission based on an application made by the person aggrieved in accordance with the Telangana State Electricity Regulatory Commission (Conduct of Business) Regulations, 2015 as amended from time to time.

(BY ORDER OF THE COMMISSION)

**Dr. K. SRINIVAS REDDY
COMMISSION SECRETARY
TELANGANA STATE ELECTRICITY
REGULATORY COMMISSION**

**HYDERABAD
Dt: -11-2016.**

SCHEDULE

A LIST OF INDICATIVE COMPONENTS OF SMART GRID PROJECTS

1. Automated Metering Infrastructure (AMI).
2. Demand Response.
3. Micro-Grids.
4. Distribution SCADA/Distribution Management.
5. Distributed Generation.
6. Peak Load Management.
7. Outage Management.
8. Asset Management.
9. Wide Area Measurement Systems.
10. Energy Storage Projects.
11. Grid Integration of Renewables.
12. Electric Vehicle including Grid to Vehicle (G2V) and Vehicle to Grid (V2G) Interactions.
13. Smart Grid Data collection and analysis.
14. Tariff Mechanism including interruptible and dynamic tariffs, time of use, critical peak pricing, real time pricing etc.