TELANGANA STATE ELECTRICITY REGULATORY COMMISSION

5th Floor, Singareni Bhavan, Red Hills, Lakdi-ka-pul, Hyderabad 500004

Dated: 30.06.2021

Present

Sri T.Sriranga Rao, Chairman
Sri M.D.Manohar Raju, Member (Technical)
Sri Bandaru Krishnaiah, Member (Finance)

In the matter of Telangana State Electricity Regulatory Commission (Smart Grid) Regulation, 2021 – Statement of Reasons thereof

STATEMENT OF REASONS

Preamble:

The Electricity Sector comprising of generation, transmission and distribution has to keep pace with other technologies arising out of scientific development, information technology (IT) and engineered services. A Smart Grid is an electrical grid with automation, communication and IT systems that can monitor power flows from points of generation to points of consumption (even down to the appliances level) and control the power flow or curtail the load to match generation in real time or near real time. The increased visibility, predictability, and even control of generation and demand bring flexibility to both generation and consumption and enable the utility to better integrate intermittent renewable generation and also reduce costs of peak power. A Smart Grid is cost-effective, nimble, responsive, and better engineered for reliability and self-healing operations.

The Government of India (GoI) has notified a Smart Grid vision and roadmap that clearly articulates the goals and timelines for deployment with respect to the Smart Grid objectives. Further, the National Smart Grid Mission has been established by Ministry of Power (MoP), GoI to accelerate Smart Grid deployment in the country.

The Commission, in order to promote the development of Smart Grid in the State has identified on several key priorities to address existing and emerging challenges to the operation of the transmission and distribution systems. These challenges include cyber security issues, large-scale changes in generation mix and capabilities, and large potential new load from electric vehicles. The fact that a Smart Grid would permit two-way communication between the traditionally regulated components of the electric system and a large number of smart grid devices expected to be located beyond the conventional boundaries of regulated entities suggests that cyber security standards require special attention.

Smart Grid is essentially a “system of systems” and standardized communication across the interfaces of these systems is a critical enabler of Smart Grid functionality and interoperability. Smart Meter is one of the most essentially required key features

in present scenario for implementation of Advanced Metering Infrastructure (AMI) and Smart Grid across the country to ensure interoperability of energy meters. The implementation of wide-area situational awareness could help mitigate the effect of reliability events by giving reliability entities an improved and manageable high-level view of system conditions and parameters.

The Commission is of the view that Smart Grid technologies have considerable potential to promote demand response, which can reduce wholesale prices and wholesale price volatility. Smart Grid capability can enhance the application of demand response to accommodate the integration of variable generation. If electricity storage technologies could be more widely deployed, they would present an important means of addressing some of the difficult issues being faced by the electric industry, including helping to address large-scale changes in generation mix.

The Commission has also observed the rising trend of Electric Vehicles in the transportation industry. Implementation of the abovementioned measures may provide the technical capability to deal with any electric vehicle-related load growth that we may see in the future.

The Commission to endeavour to bring the new technologies in the operation of the grid had earlier issued the Draft Telangana State Electricity Regulatory Commission (Smart Grid) Regulations, 2016 on 15.11.2016 and invited the suggestions/ comments from interested persons/stakeholders. In response to the same, the Commission had received suggestions/comments from two (2) stakeholders.

In consonance to the roadmap and aiming to propagate the expansion of Smart Grid and allied technologies the Commission before finalising the Regulation intended to issue again the Draft Regulations for stakeholder consultation.

Accordingly, the Commission in exercise of powers conferred under the Electricity Act, 2003 made and posted the draft Smart Grid Regulation on the website of the Commission on 24.11.2020 inviting suggestions/comments from all the interested persons/stakeholders before 5 pm on or before 16.12.2020 in compliance with the provisions of Electricity (Previous Publication) Rules, 2005. In response, the Commission has received written suggestions/comments/objections from four (4) stakeholders. The list of stakeholders who have submitted the written suggestions/ comments on earlier draft regulation and on present draft regulation is attached as Annexure.

The suggestions/comments/objections given by all the stakeholders have been considered and the Commission has attempted to summarise all the relevant suggestions/comments/objections as well as the Commission's view thereon as detailed hereunder.

1. With regard to the sub-clause (1) (j) of Clause 2, Definition of Electric Energy Storage

Commission's proposal

1.1 *2.(1)(j)* "***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;"

Stakeholders' submission

1.2 The Centre for Energy Regulation (CER) suggested to replace with the following definition –

2.(1)(j) "***Electric Energy Storage*** *means Hybrid 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 and pumped hydroelectric power and able to generate electricity*;"

Commission's view

1.3 The Commission has taken note of the stakeholder submission and decided to retain the definition of Electric Energy Storage as proposed.

2. With regard to the Clause 4. of draft Regulation

Commission's proposal

2.1 **"*4. Smart Grid process***

(1) The Smart Grid process shall constitute the activities including but not limited to the following:

(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;"

Stakeholders' submission

2.2 M/s Customized Energy Solutions suggested that –

- to include the process of Smart Meter rollout and the tariff design process under the list of Smart Grid processes in line with Tariff Policy, 2016 which highlights the need to link tariffs to the cost of service and provides a mandate for rollout of smart meters between 2017 and 2019.
- Tariff design process shall be significant considering increasing grid interaction of prosumers who are installing distributed energy generation like solar rooftop projects and a few State Electricity Regulatory Commission (SERCs) are reviewing proposals to include Time of Use tariff, peak and real time pricing for all consumers.

Commission's view

2.3 The Smart meter is an integral part of Automated Metering Infrastructure (AMI) which is included in the list of indicative components under sub-clause (6) of Clause 7 of Regulation. Time of Day (ToD) tariff is in vogue for High Tension

(HT) consumers connected at 11 kV and above and implementation of ToD tariff for Low Tension (LT) consumers shall be decided by the Commission at appropriate time through public consultation process. **The Commission decided to retain the clause (4) as proposed.**

3. With regard to the Clause 5. of draft Regulation

Commission's proposal

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

(1) Every transmission licensee, distribution licensee shall, constitute Smart Grid Cell within three (3) months of notification of this Regulation.

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

(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 licensee, distribution licensee may combine activities related to energy efficiency, demand side management and Smart Grid implementation within the same cell."

Stakeholders' submission

3.2 The National Smart Grid Mission Project Management Unit (NPMU) commented that the following sub-clause may be added after sub-clause 4 of Clause 5:

"(1) Smart Grid Readiness-Self Assessment Tool (SGR-SAT) and Investment Analysis Tools may be used by Smart Grid Cell to self-assess and identify the requirements for Smart Grid deployments:

(a) SGR-SAT assessments by Smart Grid Cell at-least two time a year.

For example, through use of SGR-SAT, assessment of Network Planning [domain]/Distribution System Modernization [sub-domain] can be done for self-analysis and approach for future requirement and deployment:

- Level 1: Manual breakers and no specific automation components in field (default);
- Level 2: Identify critical points, considering the automation components (auto-reclosures, sectionalizers, FPIs, RMUs, etc.) right sizing and deployment, installing upto 5% footprint;
- Level 3: Increasing deployment to 10% and integration

with SCADA/DMS;
- Level 4: Increasing deployment to 50% and integration;
- Level 5: Increasing deployment to 90-100% and future requirement anticipation;

(b) Investment Analysis Tool for Utility Modernization Project (CBA tool) for identifying cost assessments for new Smart Grid projects. The tool integrates following seven (7) asset types with their functionalities:
- Distributed Generation (Rooftop PV);
- Demand Forecasting System;
- Electric Vehicle Charging Infrastructure (Utility led);
- Transformer Management Unit (TMC);
- Advanced Metering Infrastructure (AMI);
- Peak Load Management (PLM);
- Outage Management System (OMS);

(2) SLPMU can be leveraged for comprehensive Smart Grid initiative."

Commission's view

3.3 The Government of Telangana State (GoTS) vide G.O.Rt.No.2 dated 06.01.2017 constituted a State Level Project Monitoring Unit (SLPMU) to monitor the implementation of Smart Grid projects in the State under National Smart Grid Mission (NSGM). The transmission licensees and distribution licensees are already the members of SLPMU, which function under NSGM Project Monitoring Unit (NPMU) and therefore, the Commission is of the view that the proposed additions as suggested by the stakeholder are not required. **The Commission decided to retain the clause 5 as proposed.**

4. With regard to the Clause 6. of draft Regulation

Commission's proposal

4.1 ***"6. Baseline study and development of data***

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

(2) The transmission licensee, distribution licensee shall undertake study to estimate potential for employment of specific efficiency technologies and applications, establish key performance indicators, and determine existing base line technical conditions.

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

Stakeholders' submission

4.2 CER commented that –
- For sub-clause (1) of Clause 6- a broad set of parameters be identified for "the base line study".
- For sub-clause (3) of Clause 6 – it should be clarified whether the license will provide the service to the captive consumers under its area of supply.

Commission's view

4.3 The Commission perused the comments of the stakeholder and opines that the stakeholder's comments do not fall under the ambit of the Draft Regulation and **decided to retain the Clause 6 as proposed.**

5. With regard to the Clause 7. of draft Regulation

Commission's proposal

5.1 ***"7. Formulation of Smart Grid Plan, Programmes, Projects***

(1) The transmission licensee, distribution licensee 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 Rs.20 crore (Rupees Twenty Crore) shall be submitted to the Commission for prior approval of investments:

Provided that investments of less than Rs.20 crore (Rupees Twenty Crore) 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:

(a) Detailed Project Report;
(b) Customer engagement and participation plan as applicable;
(c) Training and capacity building plan; and
(d) 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 Research & Development activities in the field of Smart Grid projects in the Aggregate Revenue Requirement of the distribution licensee up to a limit equivalent to Rs.0.01 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 Research & Development (R&D) activities in the field of Smart Grid projects in the Aggregate Revenue Requirement of the transmission licensee and State Load Despatch Centre, up to a limit equivalent to 0.50 percent (0.50%) of the Aggregate Revenue Requirement of the respective year of transmission licensee and State Load Dispatch Centre. The transmission licensee and State 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 are as under:

(a) Advanced Metering Infrastructure (AMI);
(b) Demand Response;
(c) Micro-Grids;
(d) Distribution SCADA/Distribution Management;
(e) Distributed Generation;
(f) Peak Load Management;
(g) Outage Management;
(h) Asset Management;
(i) Wide Area Measurement Systems;
(j) Energy Storage Projects;
(k) Grid Integration of Renewables;
(l) Electric Vehicle including Grid to Vehicle (G2V) and Vehicle to Grid (V2G) Interactions;
(m) Smart Grid data collection and analysis;
(n) Tariff Mechanism including interruptible and dynamic tariffs, time of use, critical peak pricing, real time pricing, etc.;"

Stakeholders' submission

5.2 TSSPDCL commented that –

- The cost of network strengthening in area covered under the Smart Grid project shall also be included in the project cost of Smart Grid.
- The Commission shall incentivise the distribution licensee by providing an additional return of 2% more than the Weighted Average Cost of Capital (WACC).
- The fund specified in sub-clause (4) of Clause 7 may be allowed to be utilised for equity investment in Smart Grid projects.
- The following new clause may be added after sub-clause (3) of Clause 7:
  "*The Commission shall allow additional operational expenditure arising from changed energy data management and new required services*."

5.3 Sri M.Venugopala Rao, submitted that –

- Sub-clause (1) of Clause 7 depicts hasty approach and may cause irreparable damage on long-term basis.
- With regard to proviso to sub-clause (3) of Clause 7, stakeholder commented that when the transmission and distribution licensees are already engulfed with complicated and onerous tasks, the generalised nature of the proviso may not result effective implementation of Smart Grid as the entire onus is placed on the licensees. Such an approach of placing the onus on the licensees without clear apprehension of the implications on larger consumer interest and the utilities was experienced to be counterproductive.
- Electric Energy Storage has not been implemented, availability of latest technology and benefits remain uncertain. The viable and economical battery storage system will be beneficial and deployment of the same is unrelated to Smart Grid scheme.

5.4 NPSM commented that the following may be added as applicable to sub-clause 3 (b) of Clause 7:
"*Necessary inputs from Consumer Engagement Framework and Draft Guidelines for National Rollout of Smart Prepaid Metering in India & Electricity (Right of Consumers) Rules, 2020 are under finalization and soon to be released by MoP*."

NPSM commented following with regard to sub-clause (3) (c) of Clause 7.
"*For training and capacity building, NSGM training course material on 'Basic Smart Grid Training Program for Utility professionals' may be followed (available at https://www.nsgm.gov.in/sites/default/files/Smart-Grid-Training-Coure-July-2016.pdf). Further, Smart Grid Knowledge Centre (SGKC) developed by POWERGRID for NSGM under MoP may be leveraged."*

5.5 M/s Customised Energy Solutions requested to mandate the formulation of smart meter rollout as part of the programme. Also, requested to include smart meters in the list of indicative components of Smart Grid projects as the smart meters will play a significant part in the operation of Smart Grid.

5.6 CER commented that –

- With regard to sub-clause (3) of Clause 7 – CER suggested that DPR should be available for each individual project. Interoperability should be mandatory for the projects undertaken by the technology suppliers. It is advised that the technology supplier should provide service support for a period of 5-7 years. Once protocol should be adopted by the technology supplier rather than proprietary protocols. It is also advised that the Smart Grid cell should set up portal for Data Hosting, Data Visualization and DPR.
- With regard to sub-clause (4) of Clause 7 – CER suggested that the creation of provision for Research and Development (R&D) activities should be in the field of "Smart Grid" instead of Smart Grid projects".
- With regard to sub-clause (6) of Clause 7 – CER suggested to incorporate following components in the Smart Grid projects.
  (a) Behavioural analysis /Impact on consumers;
  (b) Study on consumer acceptance;
  (c) EV charging infrastructure.

Commission's view

5.7 The Smart Grid project cost shall be approved upon prudence check on the proposals of the respective licensee. The prudence check of additional operational expenditure shall be carried out while approving the ARR proposals of the licensees. The fund specified in sub-clause (4) is for undertaking Research & Development (R&D) activities alone. The Commission is of view that the additional return as suggested by TSSPDCL is not required. The submissions of Sri M.Venugopala Rao are prejudiced apprehensions without any justification and hence devoid of any merit. The transmission licensees and distribution licensees are already the members of SLPMU, which was constituted by GoTS and which functions under NPMU and therefore the NPSM suggestions for additions to sub-clauses 3(b) and 3(c) are not required. The list of indicative components of Smart Grid includes Automated Metering Infrastructure (AMI) to which smart meter is an integral part, likewise Electric

Vehicle including G2V and V2G to which EV charging infrastructure is an integral part. **The Commission decided to retain the Clause 7 as proposed.**

6. With regard to the Clause 8. of Draft Regulation

Commission's proposal

6.1 ***"8. Approval of Smart Grid Plan, Programme, Project Document***

(1) The Commission shall approve a Smart Grid plan, programme, project if it is in line with the objectives set out in Clause 3 of this Regulation.

(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 licensee, distribution licensee 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."

Stakeholders' submission

6.2 Sri M.Venugopala Rao commented that the sub-clause (2) of Clause 8 indicates that the Commission's understanding and expertise are not thorough on Smart Grid scheme.

6.3 CER with regard to sub-clause (3) of Clause 8 suggested that –

- in place of 'identify costs' it should be 'approve costs' and
- to clarify whether it is identifying a part of the cost or overall cost of the project.
- Incentives to be provided by the Commission to the transmission licensee and distribution licensee only to the projects which are implemented below the original cost, completed on time and demonstrate benefits to the utility and the consumers.

Commission's view

6.4 The Electricity Act, 2003 empowers the Commission to take assistance and advice of experts in matters as deemed necessary in discharge of its functions. The stakeholder apprehensions are misplaced and unwarranted. The Commission has taken note of the suggestion of the stakeholder with regard to incentives to be provided to the transmission/distribution licensee. **The Commission decided to retain the Clause 8 as proposed.**

7. With regard to the Clause 9. of draft Regulation

Commission's proposal

7.1 **"*9. Execution of Smart Grid programmes, projects***

(1) The transmission licensee, distribution licensee 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 licensee, distribution licensee 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 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 (SoP) 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 licensee, distribution licensee. 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) The transmission licensee, distribution licensee 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."

Stakeholders' submission

7.2 TSSPDCL suggested that the sub-clause (2) of Clause 9 may be modified as under:

"The transmission and distribution licensees shall normally adopt the system standards as per Regulations notified by the Commission. In such case where no standards or regulations are notified by the on, the appropriate standards, regulation notified by the CEA shall be applicable."

TSSPDCL also submitted that it undertaken the following smart meter projects:

- Automated Meter Reading (AMR) for HT services:
- Meter Data Acquisition System (MDAS)-AMR of CT meters at Distribution Transformers (DTRs) (module under Restructured Accelerated Power Development & Reforms Programme [R-APDRP]);
- Smart Grid project at Jeedimetla (8800 Nos. single phase meters) under NSGM with 50% grant;
- Prepaid meters for High value Government services (14000 Nos);

In the above applications, GPRS data communication was provided by different service providers; however, the major challenge was the reliability of the communication network. Hence, the SoP be applied after strengthening of optical fibre communication system for Smart Grid projects. The SoP (if any) to

be additionally adhered to by the Smart Grid service provider to be defined in SoP regulation after due process. The guidelines for incentives/penalties may be finalized in consultation with the licensee.

7.3 CER with regard to sub-clause (4) of Clause 9, suggested that a provision of data sharing to the Research Institutes through proper channel should be inserted.

Commission's view

7.4 The Commission does not find merit in the stakeholder's proposed modification to sub-clause (2) and (4). Further, the Commission has taken note of the suggestion of the stakeholders regarding the amendment to SoP Regulation. **The Commission decided to retain the Clause 9 as proposed**.

8. With regard to the Clause 10. of draft Regulation

Commission's proposal

8.1 **"*10. Mechanism for Cost Recovery***

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

(2) The transmission licensee, distribution licensee 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:

(a) Approved prior to implementation; and

(b) *Implemented in accordance with the approved program plan;"*

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

Stakeholders' submission

8.2 M/s Customised Energy Solutions commented that –

- The net incremental costs associated with Smart Grid plan will be an additional fixed cost to the licensee.
- The tariff Policy, 2016 proposes implementation of two-part tariff featuring separate fixed and variable charges and time differentiated tariff for all large consumer (> 1 MW demand) within One (1) year and subsequently for all consumers within five (5) years.
- Any proposed mechanism for cost recovery for Smart Grid plan will impact the current structure of tariff recovery particularly by the distribution licensees who are also impacted by the increase in distributed generation like solar rooftops by the consumers.
- Hence, to consider the inclusion of tariff design in Regulation considering the anticipated increase of distributed generation by prosumers and the rollout of smart meters.

8.3 Sri M.Venugopala Rao commented that when the Smart Grid is supposed to be cost effective with low losses, the recovery of incremental cost through tariff does not arise.

8.4 TSSPDCL suggested that the financial assistance may be provided in the form of grants by MoP for implementation of Smart Grid projects as the investment is high.

8.5 CER with regard to sub-clause (2) of Clause 10, proposed that the methodology for recovery of net incremental cost should be based on Discounted Cost-Benefit ratio exceeding 1.5 over the life of project, in such case, bank rate plus MCLR, average MCLR of past one-year whichever is lower, should be considered.

Commission's view

8.6 The tariff design process shall be decided by the Commission while approving the Retail Supply Tariffs and the Commission does not find it prudent to include the same in this Regulation. There are adequate checks and balances in the Regulation for approving the Smart Grid programmes formulated by the licensees. The licensees may approach competent authority for securing grants/finances for their Smart Grid projects. **The Commission decided to retain the Clause 10 as proposed.**

9. With regard to the Clause 11. of Draft Regulation

Commission's proposal

9.1 **"*11. Smart Grid Programme, Project Completion Report.***

(1) The transmission licensee, distribution licensee will prepare and submit a detailed programme, project completion report and submit the same to the Commission within one (1) 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) *The transmission licensee, distribution licensee shall place the completion report in public domain through its website*."

Stakeholders' submission

9.2 TSSPDCL commented that main constraints for effective implementation of a Smart Grid project are: (a) reliable communication network, (b) cost of the project, and (c) consumer awareness.

Commission's view

9.3 The Commission has taken note of the stakeholder submissions and **decided to retain the Clause 11 as proposed**.

10. With regard to the Clause *12. of Draft Regulation*

Commission's proposal

10.1 **"*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 (KPI) as decided by the Commission using suitable measurement and verification protocols identified for each of the individual programmes, projects by the Commission.

(2) *The 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."*

Stakeholders' submission

10.2 NPSM with regard to sub-clause (1) of Clause 12, commented that Key Performance Indicators (KPI) should include measures like improvements in reliability and system efficiency.

10.3 CER with regard to sub-clause (1) of Clause 12, suggested that basic KPI such as cost reduction, consumer safety, demand response should be also decided by the Commission right up front.

Commission's view

10.4 The Commission has taken note of the stakeholders submissions and **decided to retain the Clause 12 as proposed.**

11. With regard to the Clause 13. *of Draft Regulation*

Commission's proposal

11.1 ***"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. The transmission licensee and distribution licensee 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, transmission licensee, distribution licensee 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."

Stakeholders' submission

11.2 TSSPDCL suggested that sub-clause (1) of Clause 13 may be modified as under:
"In the development phase of Smart Grid programs, there would be significant needs for customer/prosumer education and outreach. The transmission licensee and distribution licensee shall allocate upto 1% of the project cost for each Smart Grid project towards consumer awareness and capacity building."

11.3 CER with regard to sub-clause (1) of Clause 13, suggested that –

- Special emphasis should be given for promoting awareness through educational programs as it will directly benefit the project.
- Special emphasis should be given for promoting Smart Grid/Automation and demonstration of projects, which can demonstrate benefits to the consumers.

Commission's view

11.4 The Commission does not find any merit in stakeholders proposed modification to sub-clause (1) of Clause 13 of the Regulation and **decided to retain the Clause 13 as proposed.**

12. With regard to Clause 14. of Draft Regulation

Commission's proposal

12.1 ***"14. Safety and standards related to Smart Grid***

(1) ***System standards****: The transmission licensee, distribution licensee shall normally adopt the system standards as per Regulations notified by the CEA. Where CEA or BIS standards are not yet in place, relevant IEC/IEEE/ANSI Standards should be followed in that order. 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.*

(2) ***Network and communication standards****: In respect of network, communication, products, the standards provided by BIS or such appropriate authority shall be adopted. Where these standards are not yet in place, relevant IEC/IEEE/ANSI Standards should be followed in that order.*

(3) ***Product standards****: Where available BIS standards shall be complied with for all equipment and technology related to Smart Grid. Where BIS standards are not yet in place, relevant IEC/IEEE/ANSI Standards should be followed in that order.*

(4) ***Performance standards****: To the extent applicable, the Standards of Performance Regulation shall apply for assessing the performance of Smart Grid projects. The Commission may specify and require implementation of additional Standards of Performance to maximize the benefits and ensure compliance of the Smart Grid investments proposed. All Standards of Performance to be met in the Smart Grid project implementation area shall be measurable through the measurement, visualization and analytics facilities that are required to be integral part of the Smart Grid project design. The Commission, through Order, may require specific reporting arrangements to be implemented and periodic reports to be furnished to the Commission on actual performance against the required standards.*

(5) ***Consumer data protection standards****: The transmission licensee, distribution licensee and other implementers of the Smart Grid projects/ programs shall ensure that protection of consumer privacy is accorded the highest levels of priority in the design of the Smart Grid projects and the corresponding investment plans. Consumer data shall be protected through appropriate levels of encryption and access controls and shall ordinarily not be shared with external agencies without explicit authorization of the Commission or unless required by statutory authorities or by courts of law.*

(6) ***Testing and certification****: The Commission may require the licensee to provide certificate of compliance to specific standards from the designated nodal authority at the national level for the Smart Grid equipment installed."*

Stakeholders' submission

12.2 TSSPDCL commented that the Regulation may stipulate the standards of cyber security measures to be adopted by transmission licensee and distribution licensee; or the CEA guidelines can be used as reference. The recovery of cost of cyber security audits related to the Smart Grid system (IT and OT) and the necessary rectification cost forms the part of the recovery mechanism of the overall cost of the Smart Grid. The Commission may also specify the rules for customer privacy and data protection that the transmission licensee, distribution licensee should adhere to.

If any additional expenditure is incurred towards testing and certification as per the Commission's requirement, the same shall be allowed over and above the approved expenditure of the Smart Grid project.

Commission's view

12.3 Safety and standards related to Smart Grid projects to be adopted by the licensees are clearly outlined in the Regulation. The expenditure incurred by the licensees for the implementation of the Smart Grid project within the ambit of this Regulation shall be allowed after prudence check. **The Commission decided to retain the Clause 14 as proposed.**

13. Others

Stakeholders' submission

13.1 CER commented that overall regulation provide a broad framework for Smart Grid rollout in the State of Telangana to accelerate the Smart Grid deployment in the State as a follow up to the GoI's Smart Grid Vision and Roadmap, and MoP's National Smart Grid Mission.

13.2 Sri M.Venugopala Rao submitted that the information on implementation of National Smart Grid Mission issued by MoP, GoI and the results thereof and the cost benefit analysis is not available. This appears to have been issued based on the proposals of MoP, GoI and does not clarify on various presumptions and technical aspects mentioned therein. It appears that the transmission and distribution licensees have not requested the Commission for framing of Regulation and approval for preparation and implementation of Smart Grid plan, programme and project document. It is difficult to comprehend as to how the proposed scheme of Smart Grid benefits the electricity consumers.

Sri M.Venugopala Rao, also submitted that one of the objectives of Smart Grid is to integrate renewal and clean energy into the grid and micro grids which implies that the integration of renewable energy into the grid have problems. Some of the States are saddled with high-cost long-term power purchase agreements for renewable energy which is leading to power surplus situation and backing down of thermal generation with payment of fixed charges, the situation which may be prevalent in Telangana State also, this issue is not

addressed. The Smart Grid scheme appears to pass on the cost of grid integration of renewable power onto the electricity consumers. He, further requested to consider the following points:

- The transmission and distribution licensees may be directed to make their submissions on the Draft Regulation and place the same on the Commission's website for the interested persons to submit their responses on the same.
- The Commission may issue a working paper on the Smart Grid scheme detailing its mechanism, implementation and desired results before issuing the Regulation.
- The transmission and distribution licensees may be allowed to implement Smart Grid scheme on experimental basis at micro level and after study of the effectiveness of the same, the Regulation may be issued.
- The clarifications may be sought from MoP, GoI on various objectives and logistics of Smart Grid scheme to the desired results from the same.

Commission's view

13.3 The Electricity Act, 2003 empowers the Commission to make Regulations consistent with the Act, whereas proposal from the utilities is not a pre-requisite for the same. The submissions of the stakeholder are prejudiced apprehensions without any justification and hence, devoid of any merit.

13.4 Further, the Commission has conducted a field visit on 27.01.2021 to Smart Grid pilot project of TSSPDCL for better understanding of implementation of the Project. The salient features of the TSSPDCL's pilot project are as follows:

TSSPDCL's Smart Grid pilot project covers Jeedimetla and Shapurnagar sections in Jeedimetla Industrial Area (IDA) of Rangareddy North Operation circle. Ministry of Power (GoI) has sanctioned the scheme for Rs.41.82 Crore with 50% grant on 20.08.2013 & the implementing agency is ECIL under the guidance of CPRI (Project Management Consultant (PMC)). An agreement was concluded with ECIL on 17.03.2016 for an amount of Rs.34.93 Crore.

(a) The objective of the project is to measure the functionalities viz., (a) Advanced Metering Infrastructure (AMI) for residential/industrial consumers (b) Outage Management System (OMS) (c) Power Quality Management (PQM) and (d) Peak Load Management (PLM).

(b) Under the scheme, 8882 Nos. Single Phase Whole Current RF (Radio Frequency – 865 MHz license free Bandwidth) Smart Meters are installed, commissioned & integrated for domestic and industrial in Shapurnagar & Jeedimetla sections and 49 Nos. 11 kV Feeders are automated by deploying/erecting Auto-reclosers, Sectionalizers, Fault Passage Indicators, and 3-Way and 5-Way Ring Main Units (RMUs).

(c) The Control Centre comprises the Data Servers, Application Servers, Network Management Servers, Distribution Management Servers (DMS), Front end Servers, UPS, Video Projection Systems (VPS), GPS and Routers, Firewalls, etc. The communication link between DCU & Control Centre is GSM/GPRS with MPLS.

(d) Working principle of Smart Meters: The meters data will be collected by local Data Concentrator Unit (DCU) by applying RF Zigbee technology with a range of 100 m range. The collected data/received data which are available in the DCU will be sent to HES (Head End Server) Smart Grid control centre at Erragadda by using GSM/GPRS. The Smart Meters will send the data every 15 minutes to HES to measure, monitor and controlling from remote end i.e., it is an online system and can measure the load profile of individual consumer, outage management and quality of power and to supply 24x7 power continuously.

(e) Working principle of Automation Devices: Each 11 kV feeder is equipped with one (1) No. Auto-recloser and three (3) Nos. Sectionalisers, FPIs and RMUs. The 11 kV network will be ring connected but radially operated. The Automation equipment are pole mounted devices whereas RMUs are ground mounted. All automation devices are being communicated with DMS by Internet Service Provider (ISP).

(f) 71 Nos. Auto-reclosure, 89 Nos. Sectionalisers, 176 sets FPIs, 22 Nos. 3-Way RMUs and 40 Nos. 5-Way RMUs.

(g) Whenever the fault occurs in 11 kV Feeder whether it is momentary or permanent fault, ground fault or phase fault, the faulty section is isolated by the Sectionaliser and supply will be restored to the balance healthy section by Auto-reclosure within 5 seconds. Thus, the breakdown time is reduced drastically, and sales will be improved.

(h) The Smart Grid pilot project at Jeedimetla was achieved GO LIVE on 30.03.2019.

(i) The following benefits are envisaged through this Smart Grid pilot project.

- Automatic meter reading;
- Prevention of suppression of wrong readings/billing exceptionals;
- Improvement of billing efficiency;
- Reduction of AT&C losses;
- Remote disconnection & reconnection of services;
- Power quality measurement such as voltage sag/swell, poor power factor, frequency;
- To maintain reliable & quality power (24x7) to all consumers;
- To detect theft of energy;
- To measure the power on/off of individual consumers;
- To measure the reactive power & voltage;
- To measure performance indices such as SAIDI/SAIFI feeder wise & DTR wise;

The Commission is of the view that the Smart Grid pilot project is significant because it shows how modern Smart Grid solutions can be utilised to solve grid challenges and later enable proliferation.

After the field visit the Chairman of the Commission commented that "***De-carbonising electricity grid will introduce new localised challenges and need to fuse the latest Smart Grid technology with the right market incentives to unlock a clean grid. These solutions can do more than we give them credit for. This pilot study shows how they can be better suited to our increasingly dynamic grid than what is in our conventional toolkit.***

***Exploring how we can enable these capabilities at scale will accelerate our transition to a clean grid**."*

The Chairman also said *"**Innovative projects like this shall produce mutual benefits for utility operators and consumers and also provide the foundation that can revolutionise the efficiency, reliability, resiliency, quality, and overall performance of the electric system, helping move us closer to achieving nation-leading climate and clean energy goals**."*

Utilities and consumers have reiterated the importance of smart meters and Smart Grid. **The Commission is of the view that it is appropriate to issue the Regulation to accomplish the objectives of this Regulation**.

Sd/-	**Sd/-**	**Sd/-**
(BANDARU KRISHNAIAH)	**(M.D.MANOHAR RAJU)**	**(T.SRIRANGA RAO)**
MEMBER	**MEMBER**	**CHAIRMAN**

ANNEXURE – LIST OF STAKEHOLDERS WHO SUBMITTED WRITTEN SUGGESTIONS AND COMMENTS

Sl. No.	Name and address of the stakeholder
A	**Received on earlier draft Regulation**
1)	M/s Customised Energy Solutions.
2)	Southern Power Distribution Company of Telangana Limited, (TSSPDCL) #6-1-50, Corporate Office, Mint Compound, Hyderabad – 500 063.
B	**Received on current draft Regulation**
1)	Sri M.Venugopala Rao, Senior Journalist & Convener, Centre for Power Studies, H.No.1-100/MP/101, Monarch Prestige, Journalists' Colony, Gopanpally, Serilingampally Mandal, Hyderabad – 500 032.
2)	Sri Arun Kumar Mishra, Director, National Smart Grid Mission Project Management Unit (NPMU) C/o Power Grid Corporation of India Limited, 5th Floor, Tower-I, EIL R&D Complex, Sector-16, Gurugram- 122 001.
3)	Southern Power Distribution Company of Telangana Limited, (TSSPDCL) #6-1-50, Corporate Office, Mint Compound, Hyderabad – 500 063.
4)	Dr. Anoop Singh, Professor, Centre for Energy Regulation (CER), Department of Industrial and Management Engineering, Indian Institute of Technology Kanpur, Kanpur – 208 016.