CENTRAL ELECTRICITY REGULATORY COMMISSION
New Delhi

Coram:

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No. L-1/220/2017-CERC Date: 23rd July 2018

In the matter of

Central Electricity Regulatory Commission (Planning, Coordination and Development of Economic and Efficient Inter-State Transmission System by Central Transmission Utility and other related matters) Regulations, 2018.

Statement of Reasons

1. Introduction:

1.1. The Commission vide notification dated 26th April 2017 issued Draft Central Electricity Regulatory Commission (Transmission Planning and other related matters) Regulations, 2017 along with Explanatory Memorandum seeking comments/ suggestions/ observations from the stakeholders/public.

1.2. Comments have been received from 19 stakeholders, organizations, and individuals, etc., which included Distribution Companies, Central Electricity Authority (CEA), Power System Operation Corporation (POSOCO), Powergrid, Associations and independent individuals. Thereafter, the Commission conducted public hearing on 18.09.2017. Six (06) organizations /individuals made oral submissions or presentations during the public hearing. List of stakeholders who submitted written comments and who made submissions during the public hearing is given at Appendix-I & Appendix-II respectively. The detailed comments are available on CERC website at www.cercind.gov.in.

1.3. The final Regulations, deliberation on the comments/suggestions offered by the stakeholders, statutory bodies and individuals, etc., on the proposed Regulations and the reasons for decisions of the Commission are given in the succeeding paragraphs. While an attempt has been made to consider all the comments/suggestions received, the names of all the stakeholders may not appear in the deliberations. However, the names of all the stakeholders is enclosed as Appendix-I & Appendix-II.

2. Existing CERC Regulations covering aspects of Transmission Planning

2.1. CERC (Indian Electricity Grid Code) Regulations, 2010 provides Planning Code for inter-state transmission under Part-3, which covers various aspects of Planning relating to Inter-State transmission systems. The Planning Code specifies the philosophy and procedures to be applied in planning of National Grid, Regional Grids and Inter Regional links.

2.2. Regulation 3.7 of the CERC (Indian Electricity Grid Code) Regulations, 2010 provides connection between transmission planning and its actual implementation whereby it is provided that the actual program of implementation of transmission lines, interconnecting transformers, reactors/capacitors and other transmission elements will be in accordance with the Detailed Procedure under Central Electricity Regulatory Commission (Grant of Connectivity, Long-term Access and Medium-term Open Access in inter-state Transmission and related matters) Regulations, 2009 as amended from time to time.

3. Need for separate Regulations

3.1. CERC(IEGC) Regulations 2010 under the Planning Code specifies the philosophy and procedures to be applied in planning of National Grid, Regional Grids and Inter Regional links.However the need for separate Regulations was indicated as follows vide the Explanatory memorandum to draft CERC(Transmission Planning and related matters)Regulations 2017:

"A separate Regulation shall cater to following needs:

(i) To explicitly define roles and responsibilities of various entities to facilitate and strengthen transmission planning process.

(ii) To streamline the procedure for transmission planning, collection and exchange of data among different stakeholders and constituents

(iii) To align the transmission planning with changing scenario in power sector such as development of power market, integration of renewable and increase in congestion

(iv) To involve DISCOMs in the transmission planning process;

(v) To monitor implementation of ISTS and associated intra-State transmission system for timely completion and proper utilization

(vi) To put in place a mechanism to review transmission plan;

(vii) To create archive to retain year-wise/quarter-wise data base and corresponding system studies files for future references.

(viii) To ensure adequate and trained manpower for conducting transmission planning exercises in CTU as well as in STUs."

3.2 POSOCO and Sh. S. K. Soonee during the Public hearing stated that the regulations on Transmission Planning were long overdue from the Commission. POSOCO also stated that there is huge variation in demand as compared to EPS. The present load-generation scenario is different from load-generation scenario at the time of planning. It may be easy to say that assumptions have not worked out in reality but we should learn from this. The proposed Regulations cast responsibility

on each entity involved in the process of transmission planning so that planning is less uncertain.

3.3 MPPMCL during the public hearing has stated that it agrees with the proposal in the draft Transmission Planning Regulations.

3.4 We are of the view that accountability can be fixed when responsibility is fixed upfront. This brings seriousness and mitigate grievances of beneficiaries. The above aspects have been considered while finalizing the Regulations.

4. PREAMBLE

4.1. Sh. V. Ramakrishna has submitted that CTU should take the responsibility of planning and development of entire inter-State transmission system as mandated by the Act. The proposed draft regulations dilute responsibilities of CTU by diverting its responsibilities to CEA, RLDC & STUs, which is contrary to the Act. Role of CEA, as per Act as well as per practice, is of advisory and coordinative nature. In the interest of national economy, CEA has also been providing need based assistance to CTU and STUs in system studies and transmission planning. The process of coordination of planning activities by CEA implemented through Standing Committee for Transmission Planning works as an audit of systems planned by CTU and STUs.

4.2. CTU has stated during the public hearing that Planning and co-ordination relating to ISTS has been defined as role of CTU under the Electricity Act, 2003. However, under the proposed Regulations, function of planning & coordination has been delegated to Regional Study Committee (RSC) and Central Study Committee (CSC). Whether RSC and CSC will be able to carry out planning?

4.3. APP has stated that CERC is requested to take up the following matter by issuing Statutory Advice under section 79 (2) of EA, 2003 to Central Government to segregate CTU function from POWERGRID or restrict CTU/STU from engaging in transmission business or as it entails conflict of interest. The same can be done by notifying other Government Companies who are not transmission licensees to take the role of CTU/STU as per Sec 38 and 39 of EA, 2003. Further section 38 and 39 of EA, 2003 to be modified to include that CTU and STU shall not engage in Transmission Business either through its Subsidiaries or its Affiliates.

4.4. GRIDCO has suggested to include efficiency and effectiveness besides transparency as the objective of Transmission Planning.

4.5. CEA has stated as follows:
"CEA (a Statutory Body) has been constituted under the provisions of the Act with defined functions and responsibilities whereas organizations like Regional Power Committees, NLDC, CTU, STU, etc., are established by the Central Government/ the State Governments with functions and powers as defined therein. Therefore, no other organization except the Parliament or the Appropriate Government establishing these organizations can alter or redefine the functions and responsibilities of these organizations.

(a) The preamble clearly states that these regulations have been framed considering "a need has been felt" as such it is clear that these regulations are not framed under any mandate given under the Act and CERC has not been vested with powers to specify such regulations. Therefore, framing of these regulations by CERC is in total contravention to the provisions of the Act.

(b) As per Section 73 of the Act, CEA has been mandated for

advising the Central Government on matters relating to National Electricity Policy, formulate short-term and perspective plan for development of the electricity system and coordinate the activities of the planning agencies for optimal utilization of resources as such the functions of transmission planning is that of CEA.

(c) The Standing Committee on Power System planning for each and every region has been constituted by CEA to carry out development plan to Regional Transmission System and to facilitate coordinated development of the regional system towards fulfillment of the requirement/ short term and perspective plan for power development under Electricity Act, 2003 (Section 73(a)). Accordingly, it is the function of CEA to formulate short term perspective plan for development of the electricity system which inter-alia have been redefined by the said regulations.

(d) Ministry of Power, Government of India under the provisions of the Act has established Regional Power Committees, NLDC and CTU with specified functions and powers therein, as such by carrying out alteration or redefining such powers and functions, as such, any alteration or redefinition need approval of the Government of India, Ministry of Power.

(e) The scope of regulation is defined as "to govern planning and development of an efficient, reliable and economical system of 1STS and associated inter-State systems" whereas such functions have been vested with the CTU under Section 38 of the Act and with the STU under Section 39.

(f) Vide various clauses as mentioned in these regulations directions have been issued to CEA which is totally against the

jurisdiction and powers vested in CERC as CEA is a statutory body empowered to advice CERC and not to take directions from CERC. As per Section 75 of the Act, only Government of India, in public interest, can issue directions to CEA.

(g) Any subordinate legislation like regulations are to be notified under specific provisions of the law and cannot be just enacted by any statutory body without drawing or vested with such powers. CERC is requested to withdraw these regulations."

4.6. Analysis and decision

4.5.1 To analyse the views of Sh. V. Ramakrishna, CEA and CTU, we observe that the mandates are clear in the Electricity Act 2003, National Electricity Policy and National Electricity Plan as under:

(a) Electricity Act 2003

"Section 3. (National Electricity Policy and Plan)

(1) .....

.....

(4) The Authority shall prepare a National Electricity Plan in accordance with the National Electricity Policy and notify such plan once in five years:

Provided that the Authority while preparing the National Electricity Plan shall publish the draft National Electricity Plan and invite suggestions and objections thereon from licensees, generating companies and the public within such time as may be prescribed: Provided further that the Authority shall –

(a) notify the plan after obtaining the approval of the Central Government;

(b) revise the plan incorporating therein the directions, if any, given by the Central Government while granting approval under clause (a).

.....

Section 73. (Functions and duties of Authority):

The Authority shall perform such functions and duties as the Central Government may prescribe or direct, and in particular to –

(a) advise the Central Government on the matters relating to the national electricity policy, formulate short-term and perspective plans for development of the electricity system and co-ordinate the activities of the planning agencies for the optimal utilisation of resources to subserve the interests of the national economy and to provide reliable and affordable electricity for all consumers;
……."

(b) National Electricity Policy:

Para 3 of the National Electricity Policy notified by the Central Government under Section 3 of the Act vide Resolution No.23/40/2004-R&R (Vol.II) dated 12.1.2005 provides as under:

"3. NATIONAL ELECTRICITY PLAN

3.1 Assessment of demand is an important pre-requisite for planning capacity addition. Section 3 (4) of the Act requires the Central Electricity Authority (CEA) to frame a National Electricity Plan once in five years and revise the same from time to time in accordance with the National Electricity Policy. Also, section 73 (a) provides that formulation of short-term and perspective plans for development of the electricity system and coordinating the activities of various planning agencies for the optimal utilization of resources to subserve the interests of the national economy shall be one of the functions of the CEA. The Plan prepared by CEA and approved by the Central Government can be used by prospective generating companies, transmission utilities and transmission/ distribution licensees as reference document.

3.2 Accordingly, the CEA shall prepare short-term and perspective plan. The National Electricity Plan would be for a short-term framework of five years while giving a 15 year perspective and would include:

- Short-term and long term demand forecast for different regions;
- Suggested areas/locations for capacity additions in generation and transmission keeping in view the economics of generation and transmission, losses in the system, load centre requirements, grid stability, security of supply, quality of power including voltage profile etc. and environmental considerations including rehabilitation and resettlement;

- Integration of such possible locations with transmission system and development of national grid including type of transmission systems and requirement of redundancies; and
- Different technologies available for efficient generation, transmission and distribution.
- Fuel choices based on economy, energy security and environmental considerations.

.....

5.3 The Central Transmission Utility (CTU) and State Transmission Utility (STU) have the key responsibility of network planning and development based on the National Electricity Plan in coordination with all concerned agencies as provided in the Act. The CTU is responsible for the national and regional transmission system planning and development. The STU is responsible for planning and development of the intra-state transmission system. The CTU would need to coordinate with the STUs for achievement of the shared objective of eliminating transmission constraints in cost effective manner.

- Network expansion should be planned and implemented keeping in view the anticipated transmission needs that would be incident on the system in the open access regime. Prior agreement with the beneficiaries would not be a pre-condition for network expansion. CTU/STU should undertake network expansion after identifying the requirements in consultation with stakeholders and taking up the execution after due regulatory approvals.
- Structured information dissemination and disclosure procedures should be developed by the CTU and STUs to ensure that all stakeholders are aware of the status of generation and transmission projects and plans. These should form a part of the overall planning procedures."

(c) Tariff Policy:

Para 7.1 (4) of the Tariff Policy notified by Govt. of India, Ministry of Power vide Resolution No. 23/2/2005-R&R (Vol-IX) dated 28.1.2016 provides as under:

"7.1 (4) In view of the approach laid down by the NEP, prior agreement with the beneficiaries would not be a precondition for network expansion. CTU/STU should undertake network expansion after identifying the requirements in consonance with the National Electricity Plan and in consultation with stakeholders and taking up the execution after due regulatory approvals. For smooth operation of the grid, efforts should be made to develop transmission system ahead of generation."

(d) Section 38 (2) of the Electricity Act provides as under:

Section 38. (Central Transmission Utility and functions): ----
(1) .....
(2) The functions of the Central Transmission Utility shall be –
(a) to undertake transmission of electricity through inter-State transmission system; (b) to discharge all functions of planning and co-ordination relating to inter-State transmission system with –
(i) State Transmission Utilities;
(ii) Central Government;
(iii) State Governments;
(iv) generating companies;
(v) Regional Power Committees;
(vi) Authority;
(vii) licensees;
(viii) any other person notified by the Central Government in this behalf;
(c) to ensure development of an efficient, co-ordinated and economical system of inter-State transmission lines for smooth flow of electricity from generating stations to the load centres;
....."

4.5.2 The Act provides that CEA shall be responsible for formulation of short term and perspective plan. The National Electricity Policy provides that the period of short term plan shall be 5 years and that of perspective plan shall be 15 years. The Electricity Plan clearly provides that such short term and perspective plan shall indicate "suggested areas/locations for capacity additions in generation and transmission" and that the Plan prepared by CEA and approved by the Central Government can be used by prospective generating companies, transmission utilities and transmission/ distribution licensees as reference document. It can be concluded from these provisions that CEA's responsibility under the Act is to prepare a plan which can suggest new capacity additions and shall serve as a reference document. However the responsibility of planning and development of ISTS is that of CTU under Section 38 of the Act. The instant Regulations doesnot intend to interfere with CEA's functions of preparation of short term and perspective plan. We agree with suggestions of Sh. V. Ramakrishna and CTU that the responsibility of

ensuring various aspects of planning have been vested with CTU as provided under the Act which is to "undertake" the network development by CTU.

4.5.3 Further we have included Gridco's suggestion to include efficiency in the title of the Regulations.

4.5.4 Further, the Act provides following with respect to functions of Central Commission

"Section 79. (Functions of Central Commission):

(1) The Central Commission shall discharge the following functions, namely:-

.....
(c) to regulate the inter-State transmission of electricity ;
(d) to determine tariff for inter-State transmission of electricity;
.....

(2) The Central Commission shall advise the Central Government on all or any of the following matters, namely:-

(i) formulation of National electricity Policy and tariff policy;
(ii) promotion of competition, efficiency and economy in activities of the electricity industry; .."

Further National Electricity Policy provides as follows:

"5.3.5 .....To facilitate cost effective transmission of power across the region, a national transmission tariff framework needs to be implemented by CERC. The tariff mechanism would be sensitive to distance, direction and related to quantum of flow. As far as possible, consistency needs to be maintained in transmission pricing framework in inter-State and intra-State systems. Further it should be ensured that the present network deficiencies do not result in unreasonable transmission loss compensation requirements."

Hence it is the function of the Commission to regulate interstate transmission of electricity. It is the function of CERC to determine the tariff of ISTS / adopt the tariff of ISTS and provide for its sharing

mechanism among stakeholders while following principles of transparency and inclusion of stakeholders as provided under the Act. Accordingly the Regulations cover various aspects of stakeholder inclusion and transparency.

4.5.5 The Act provides following with respect to the role of Regional Power Committees (RPC) under the Act:

"

2 (55) "Regional Power Committee" means a committee established by resolution by the Central Government for a specified region for facilitating the integrated operation of the power systems in that region.

.....

29 (4) The Regional Power Committee in the region may, from time to time, agree on matters concerning the stability and smooth operation of the integrated grid and economy and efficiency in the operation of the power system in that region."

4.5.6 Further the resolution F.No.23/1/2004-R&R dated 25th May, 2005 of Government of India to establish Regional Power Committees and Part-2 of the CERC (Indian Electricity Grid Code) Regulations, 2010 provides the role of Regional Power Committee (RPC) as under:

"2.4 Role of RPC

2.4.1 In accordance with the Electricity Act, 2003, RPCs have been constituted by the Central Government for the specified Region(s) for facilitating the integrated operation of the power system in the Region. The Secretariat of the RPC is headed by the Member Secretary, who is appointed by the Central Electricity Authority (CEA), together with the other staff for the RPC Secretariat. Under Section 29(4) of the Electricity Act, 2003, the Regional Power Committee in the region may, from time to time, agree on matters concerning the stability and smooth operation of the integrated grid and economy and efficiency in the operation of the power system in that region.

2.4.2 The following functions which go to facilitate the stability and smooth operation of the systems are identified for the RPC:

(a) To undertake Regional Level operation analysis for improving grid performance.

(b) To facilitate inter-state/inter-regional transfer of power.

(c) To facilitate all functions of planning relating to inter-state/ intra- state transmission system with CTU/STU.

(d) To coordinate planning of maintenance of generating machines of various generating companies of the region including those of interstate generating companies supplying electricity to the Region on annual basis and also to undertake review of maintenance programmed on monthly basis

(e) To undertake planning of outage of transmission system on annual / monthly basis

(f) To undertake operational planning studies including protection studies for stable operation of the grid.

(g) To undertake planning for maintaining proper voltages through review of reactive compensation requirement through system study committee and monitoring of installed capacitors.

(h) To evolve consensus on all issues relating to economy and efficiency in the operation of power system in the region.

2.4.3 The decisions of RPC, arrived at by consensus regarding operation of the regional grid and scheduling and despatch of electricity, if not inconsistent with the provisions of IEGC / CERC Regulations, shall be followed by the concerned RLDC/SLDC/ CTU/STU and Users, subject to directions of the Central Commission, if any.

……."

4.5.7 Hence it is the responsibility of RPCs to facilitate all functions of planning related to inter-state and intra-state transmission. As per

section 38 (2) of the Electricity Act, RPCs are required to coordinate with CTU for planning of inter-state transmission system. Accordingly RPCs role as identified under the Act have been considered and accordingly its responsibilities have been identified in these Regulations.

5. Regulation 2: Scope of Regulations

5.1. TPDDL has requested reframing of regulation 2.1 to include "…adequate performance monitoring and ensuring effective utilization of the transmission assets in consultation with all the stakeholders."

5.2. Sh. Ravinder has suggested rewording of word govern to regulate and to include "…an efficient, reliable and economical ISTS in co-ordination with ISGS and STUs…" in Reg 2.1.

5.3. MPPMCL has suggested to include utilization of existing transmission assets and periodic review of implementation and its necessity in scope.

5.4. IEX sought its inclusion in Regional Validation Committee and Central Validation Committee.

5.5. GRIDCO, APP has sought inclusion of other transmission licensees in Regional and Central Validation Committees.

5.6. Commissions Views:

(a) Clause 2.1 of the draft Regulations has been deleted and the relevant points have been included in Preamble of the Regulations. Coordination with STUs and with ISGS or other generators is covered through Regulation No. 5 where it has been provided that CTU shall

ensure coordination with identified agencies involved in Transmission planning process.

(b) MPPCL's views on utilization of existing assets have been considered under Regulation 7(7) whereby the following is provided :

"While planning the transmission system, options of upgrading the existing ISTS in place of building new transmission lines such as increasing line loading through use of compensation, reconductoring, etc. for optimally utilizing the existing assets, should also be considered."

(c) The issue of periodic review is also covered in the Regulations at Regulation 7(8) and Regulation 7(9).

(d) The proposed formation of Regional Validation Committee has been deleted considering stakeholders' views. The responsibility of data collection envisaged under Regional Validation Committee has been assigned to RPCs. Further Central Study Committee has also been done away with. However, Regulation 5 provides for co-ordination with agencies involved in the transmission planning process. Further it has been provided that stakeholders may provide their suggestions at time of uploading of scenarios by CTU as provided in Regulation 7(10).

6 Regulation 3: Definitions

6.1 Regulation 3.1 :Central Repository of Generators:

6.1.1 APP suggested that "all developers who have operational generation plants and generation plants under various stages of construction also must register themselves in the Central Repository of Generators".

6.1.2 POSOCO has stated that while generators have been made mandated to register in the Central Repository of Generators, a repository of

DISCOMS should also be developed wherein each distribution company would be mandatorily required to furnish relevant information such as existing and prospective load centres, projected growth of load in terms of import through 132/33kV and 220/132kV S/Stns of the STU system, in short and long term etc. Each SLDC should conduct monthly / quarterly meetings with its DISCOMS, where such repository should be regularly reviewed and updated. In case distribution companies fail to periodically update their respective database, it should be reported by the concerned SLDC to CEA and CERC.

6.1.3 Shri V. Ramakrishnan suggested that such repository should be maintained by CTU.

6.1.4 **Commissions Views:**

(a) CEA has already notified "National Level data Registry System" vide its notification dated 13.4.2018 which mandates registration for all existing and upcoming generating units of 0.5 MW and above. Hence the specific provision of Central Repository has been deleted from the Regulations. A reference has been made to CEA's "National Level data Registry System" to obtain the data.

(b) POSOCO may take up the suggestion of repository of DISCOMs with CEA.

6.2 Regulation 3.2 : Central Study Committee

6.2.1 APP, FICCI, GRIDCO have suggested to expand the participation of entities at Central Study Committee to include other transmission licensees.

6.2.2 TANGEDCO has suggested that issue based state representation is necessary in Central Study Committee.

6.2.3 Sh. V Ramakrishnan has stated that responsibility of transmission planning lies with CTU and constitution of committees and shifting responsibilities is contrary to provisions of the Act.

6.2.4 Sh. S. K. Soonee, during the public hearing stated that these Regulations place too much reliance on the Committees for collection of data, capacity, Modelling, etc. We also need to institutionalize the process of collection & verification of data, so that transmission planning is in safe hand.

6.2.5 **Commissions Views:**

(a) We agree with Shri Ramakrishnan's and Sh. Soonee's suggestions. Accordingly the proposal of separate Committees has been done away with. However RPCs have been entrusted with assisting the CTU in preparation of base case in consultation with STUs/Distribution Licensees under Regulation 5(5).

(b) It has also been provided at Regulation 7(10) that "CTU shall publish the details of all probabilistic scenarios and suggested transmission schemes on its website and seek stakeholders' comments. CTU shall finalise the transmission scheme after considering the responses received from stakeholders."

6.3 **General Network Access**

6.3.1 POWERGRID has stated that that suitability of proposed transmission planning regulations for GNA regime is difficult to ascertain in absence of clarity regarding GNA regulations.

6.3.2 GRIDCO is of the view that GNA concept should not be a part of these regulations as Commission may accept or may not accept the above concept.

6.3.3 TANGEDCO: Determination of appropriate GNA drawal/injection will be very difficult keeping in view seasonal/intermittent nature of renewable generation.

6.3.4 RVPNL has stated that The Central Repository for Generators and GNA are good concepts and can prove to be very useful tools for maximizing capacity utilization of existing transmission system. With the help of Central Repository for Generators and GNA demand supply balance can be managed at national level so that the

intermittency of RE Generation is compensated and 175 GW RE target is achieved without overbuilding transmission system. The overall demand should be scheduled in various states such that power availability and system stability in national grid is maintained without curtailment of RE power in RE rich states and without load shedding in power deficit states.

6.3.5 **Commissions Views:**

CERC has already notified draft CERC(Grant of Connectivity and General Network Access to the inter-State transmission system and other related matters) Regulations, 2017 on 14.11.2017. Keeping in view stakeholders suggestions, the reference to GNA has been deleted from these Regulations.

6.4 State Power Committee (SPC):

6.4.1 APP, GRIDCO has stated that CERC does not have the legal jurisdiction to order State Government to form SPC.

6.4.2 Powergrid has stated that a detailed explanation of functions and responsibilities of SPC alongwith a timeline for formation of these Committee be specified.

6.4.3 **Commissions Views:**

(a) The rationale of proposing State Power Committee was provided vide Explanatory Memorandum to draft Regulations as under:

"The Regulations has proposed to introduce State power Committee at State level.

Mata Prasad Committee Report has provided as follows:

"6.14.4 Formation of State Power Committee: A State Power Committee similar to Regional Power Committee may be established at State level to coordinate issues affecting state involving all stakeholders within States. Such a committee should coordinate

between STU and DISCOMs for assessment of GNA and between SLDC and DISCOMs for demand/load forecasting. Such a Committee may also see that State has a balanced purchase portfolio. There should also be need of coordination between Regional Power Committee and State Power Committee."

(b) We are of the view that such Committee shall facilitate state level coordination among entities in State. It is suggested that State Government may consider formation of such Committee. It is noticed that such Committee is already there for Karnataka. Considering the views of stakeholders, this has been deleted from definitions.

6.5 Proposal to include new definition

6.5.1 POSOCO has sought addition of the new definitions of Model verification and Model validation. POSOCO has stated that:

- Model Verification: Refers to the process of verification of both static and dynamic models of power system elements at the time of submission of modelling information to ensure that the model accurately represents the physical element's logical structure and behavior. The model verification for generating units shall include but not be limited to generator, excitation system including over-excitation and under-excitation limiters, turbine governor, and power system stabilizers. Modelling of transmission elements shall include but not be limited to transmission lines, transformers, SVCs, FACTS devices, HVDC lines, primary protective equipment like Distance protection relays. Modelling of loads shall cover representation of different load types from incandescent lamps to induction motors and power electronic loads etc.

- Model Validation: Refers to the process of benchmarking of the models of power system elements from time to time by comparison of simulated dynamic response with field

measurements. Periodic model validation is expected to take care of changes in the physical element on intended and unintended modifications (Ageing, Wear and tear, etc.). Although planning system models cannot be directly validated against field measurements, parts of the planning model that represents existing facilities should match with the corresponding validated operations model.

6.5.2 **Commissions Views:**

Commission agrees with views of POSOCO. It is suggested that the aspects related to model verification and model validation could be included in detailed procedure.

7 Objective

7.1 TPDDL has suggested that an independent agency/ existing authority be entrusted with the job monitoring the performance/degree of utilisation of the transmission system/assets vis a vis its technical and declared capacity. It also suggested that the same may be empowered to take necessary penal action against projects/developers who are not confirming to the desired performance standards and should be capable of issuing certification in respect of utilisation of such assets. Any new transmission system should be planned only after ensuring that existing assets are being utilized up to its full capacity in consultation with stakeholders.

7.2 MPPMCL has suggested that objective of the Regulation should also include transparency in development of transmission system both in terms of utilization of existing assets and development of an alternative which is most techno-economical.

7.3 **Commissions Views:**

Suggestion with respect to monitoring the transmission system is agreed to and the same has been considered in the Regulations. The

planners may consider alternatives with respect to re-configuration, use of phase-shifters to divert flow into these lines, etc. The suggestion of MPPMCL to include transparency as one of the objectives has been accepted and included in Objective.

8. Roles and responsibilities of various Organization

8.1 TPDDL has suggested STUs to be obligated to co-ordinate with state utilities/Discoms while planning for intra/interstate Transmission System.

8.2 Sh V. Ramakrishnan suggested that the regulations are stipulated to apply for ISTS and associated intra-state system and as such the approach of taking some upstream or downstream parts of the ISTS instead of entire associated intra-state system leads to sub-optimality and mismatches.

8.3 **Commissions Views**:

(a) The draft Regulations had roles of entities as identified under the Act and the additional roles identified for specified entities under these Regulations. It is observed that roles of the entities should be as specified in the Act. Hence such roles have not been repeated for brevity. To fulfill the responsibilities that arise under the identified roles under that Act, responsibilities of entities have been identified under this Clause.

(b) We agree with suggestions of TPDDL. The suggestion has already been incorporated in the Regulations

(c) We agree with Sh. V. Ramakrishnan on planning for associated intra-state system and the aspect has been covered in the Regulations.

8.4 Role and Responsibility of CEA

8.4.1 RVPNL has suggested that CEA shall co-ordinate for transferring surplus power of RE rich states to neighbouring states within their respective regions and other regions.

8.4.2 **Commission's Views:** We have stated that roles of entities shall be as defined in the Act. Further, we have already noted that responsibility of planning and development of ISTS is that of CTU under the Act. Accordingly, necessary changes have been made. The issue raised by RVPNL regarding evacuation of RE power is covered under Regulation 6.

8.5 Role and Responsibility of CTU

8.5.1 GRIDCO has stated that a) Parameter for measuring the degree of efficiency economy of ISTS need to be objectively specified and b) Base case file and study result file need to be shared with State Power Committee

8.5.2 Sh. Ravinder has suggested that CTU should carry out following roles in addition to roles identified under draft Regulations:

(a) Conduct regular meetings with STUs for coordinating planning, getting their feedback and inputs for ISTS planning, share updated ISTS system study files with STUs for their perusal for integrated intra state planning, to obtain updated intrastate files for present status of intra state system and future base cases of intra state network prepared by STUs.

(b) Conduct quarterly meetings with NLDC on the issues and constraints pointed out by NLDC in its operational feedback reports.

(c) To undertake detailed reoptimization studies for ISTS in an integrated approach every year with the aim of removing congestion, enhancing power transfer capability of ISTS across various seams with existing network so that investment and Right of Way requirement is optimised, system security is improved, losses are optimised, loop flows are avoided, voltage and angular profiles and dynamic stability are improved. The findings and results of the reoptimization study shall be submitted to the

commission in the month of June every year along with specific proposals submitted to the Central Study Committee.

(d) By the end of March every year, the CTU shall submit to the commission for approval its targets for improving the performance of the ISTS under various heads such removing congestion, enhancing power transfer capability of existing network, improving dynamic stability, reducing the requirement of opening transmission lines to control overvoltage and improved voltages during peak load at far ends.

(e) By the end of June every year the CTU shall submit to the commission a Grid Incident Analysis Report for all major grid incidents reported by the NLDC bringing out to what extent simulation studies correspond with the actual system parameters at the time of occurrence of grid incident and immediately thereafter.

(f) To publish CTU forecast of ATC across regions and across states on the beginning of each year up to five years ahead and periodically update the same."

8.5.3 InWEA has suggested that following aspects should be considered while formulating the regulatory framework for the preparation of transmission plan:

(a) Consider annual RE capacity addition and prepare evacuation plan accordingly considering short gestation period of RE/wind power plants (gestation period of wind power plants are less than 12 months while setting up transmission infrastructure takes more than 2 years).

(b) The plan should give priority to setting up of RE evacuation infrastructure over the connectivity for other generators.

(c) The plan should have clear timelines specified based on the RE capacity addition targets of the central/state policy.

(d) New infrastructure to be set up as well as strengthening schemes should be considered under the plan so that future capacity addition (owing to re-powering), in the already connected locations, are taken care of.

8.5.4 TPDDL has suggested that CTU should perform the following functions also:

(a) By the end of every year, the CTU shall submit the asset/line wise performance/utilization report to the Commission for the current year against the maximum transmission capacity of the same for further analysis and setting of its performance level targets for the next year along with the action taken report in the last year for improving the performance of the ISTS.

(b) By the end of every year the CTU shall submit to the commission a report in respect of all major transmission elements (such as Grids and Transmission lines) clearly mentioning its overall down time, effect of the same on the transmission capacity, responsibility centers for such down time/outage along with the future plan to avoid such failure.

(c) To publish forecast of month wise ATC/TTC against the technical capacity of such lines/assets across regions and across states on the beginning of each year and periodic updating of the same.

8.5.5 **Commissions Views:**

We have considered suggestions of GRIDCO, Shri Ravinder, TPDDL, and INWEA and we decide as follows:

(a) In regard to GRIDCO's suggestions to include parameters for measuring degree of efficiency and economy, it is observed that inclusion of such parameters require a detailed stakeholder deliberation. Further, we have decided that the base case file

and study result file have to be shared with RPCs as per the Regulations.

(b) With regards to Sh. Ravinder's suggestions following is observed:

(i) Regular meetings have already been envisaged as per these Regulations.

(ii) We agree with Shri Ravinder that there is a need to undertake reoptimisation studies with the aim of removing congestion, enhancing power transfer capability of ISTS across various seams with existing network so that investment and Right of Way requirement is optimised, system security is improved, losses are optimised, loop flows are avoided, voltage and angular profiles and dynamic stability are improved and consider such studies while planning. CTU shall consider the suggestion while planning.

(iii) The suggestion to provide targets to CTU for improving the performance of ISTS under various heads has not been considered as of now as detailed deliberations are required in this matter.

(iv) Grid Incident reports are already submitted by NLDC and hence reporting by CTU may not be required.

(v) The publishing of ATC across regions shall be considered by CTU as per Connectivity Regulations.

(c) With regards to TPDDL's suggestions, following is observed:

(i) With regards to the suggestion to set performance targets for utilization of assets has not been considered as of now as detailed deliberations are required in this matter.

(ii) We agree with the suggestion that a report on critical transmission elements downtime with analysis of reasons for the system being down, its impact on ATC along with

future plan to avoid such failure in future should be prepared. CTU may discuss this at RPC forum.

(d) With regards to INWEA's suggestions, we observe that planning for RE generation was already provided in the draft and has been included in final Regulations also.

8.6 **Role and Responsibility of STU**:

8.6.1 RInfra has suggested that to involve other planning authorities/Local bodies in planning of transmission infrastructure along with STU.

8.6.2 POSOCO has suggested that STU should prepare base case in standard PSSE format.

8.6.3 GRIDCO has stated that reference to GNA be avoided till GNA is finalized.

8.6.4 **Commissions Views:**

(a) With regards to RInfra comments it is suggested that STUs should coordinate with intra-state entities for preparation of base case as well as estimating import/export requirement of the State.

(b) With regards to POSOCO's suggestions it is suggested that type of format may be included in the detailed Procedure. It is suggested that base case should preferably by prepared in a compatible platform by CTU and STU to facilitate preparation of an All India base case for planning.

(c) With regard to GRIDCO's suggestions, reference to GNA has been deleted.

8.7 Role of National Load Despatch Centre:

8.7.1 GRIDCO has suggested that Study committee should upload study results on NLDC website.

8.7.2 **Commissions Views**:

We have deleted the provisions of separate Study Committees and have directed to upload all the results on website of CTU.

8.8 Role of SLDCs:

8.8.1 POSOCO has suggested specification of periodicity and time line of feedback by SLDCs and synchronization of such reporting of feedback with that provided by NLDC/RLDCs.

8.8.2 Commissions Views: Modalities of timeline of feedback may be included in the detailed Procedure.

8.9 Role of Generators:

8.9.1 POSOCO has suggested that all RE generators of 10MW and above capacity may be mandated to provide technical data for modeling. It has further suggested that since technical parameters of generators are likely to vary over lifetime of generators they be updated every 3 years and validated by CSC/RSC.

8.9.2 APP & FICCI Suggested to include all generators at any voltage level to share data with central Repository of generators.

8.9.3 GRIDCO has suggested collection of technical data of generators upto 33kV level.

8.9.4 RVPNL has suggested that Generating Stations should be ready to absorb MVARs (reactive Power) in case of high voltage during low loads and should declare upfront the quantum /capacity of MVAR support it can provide.

8.9.5 **Commissions Views**:

(a) The modalities of data to be provided by generators and its verification /validation may be covered in the detailed procedure.

(b) CEA's National Level data registry system covers all generators of 0.5 MW and above.

(c) With regards to RVPNL's suggestion it is clarified that generators are mandated to absorb VAR as per their capability curve as provided in

CERC (IEGC) Regulations 2010. Further the aspect of obtaining this data from the generators may be covered in the detailed procedure.

8.10 Role of Standing Committee(s) for Power System Planning

8.10.1 APP & FICCI has suggested that additional State Study committee, Central Study Committee and Regional Study Committee should recommend transmission proposal to Standing Committee.

8.10.2 GRIDCO has suggested that Standing Committee should scrutinize the proposals received from CSC/RSC after prudent cost benefit analysis of the proposed scheme

8.10.3 **Commissions Views**:

We have done away with the CSC/RSC as explained earlier. CTU shall upload the transmission proposals on its website for stakeholders' comments. GRIDCO's proposal on cost-benefit analysis is accepted and the same is already included in the Regulation 6.

8.11 Role of Central Study Committee:

8.11.1 POWERGRID has sought clarifications with respect to the role of CTU and CEA in CSC.

8.11.2 GRIDCO has stated that for better clarity the work flow & the detail role & responsibilities of various parties involved in the Transmission planning should be properly specified in a frame work of flow chart diagram of the transmission planning process, role & responsibilities including the periodicity of assigned job.

8.11.3 MPPMCL has suggested that Central Study Committee should not keep their study limited to technical aspect of the transmission system but should also consider the benefit vis a vis financial impact of new scheme on the DISCOM.

8.11.4 POSOCO has stated that frequency of meeting could be mentioned.

8.11.5 IEX has suggested periodic review on transmission capacity and transfer capability mismatch by CSC.

8.11.6 **Commissions Views:**

(a) We have done away with the CSC/RSC as explained earlier. Hence any clarification on roles or frequency of meeting may not be required.

(b) With regards to MPPMCL suggestion, we have included the requirement of uploading of "Likely capital costs and estimated monthly tariff" on CTU website for the new schemes at Regulation No. 8;

(c) With regards to GRIDCO's suggestions, a flowchart has been included at Annexure-I. The responsibilities of entities have been identified.

(d) With regards to IEX suggestion that there is a need of periodic review on transmission capacity and transfer capability mismatch detailed deliberations are required in this matter. CTU should take up this agenda at the respective RPC and submit first report within 6 months of issue of these Regulations.

8.12 Role of Regional Study Committee:

8.12.1 POSOCO has suggested that for preparation of state-wise system study files, inputs would be required from DISCOMs (in regard to type of loads, Distribution of load growth in different areas of the state), SLDCs (in regard to existing operational network, estimated load growth). So, DISCOMs and SLDCs need to provide requisite inputs to STUs.

8.12.2 GRIDCO has sought clarification on constitution of RSC.

8.12.3 **Commissions Views:**

(a) The requirement of type of data may be finalized in the detailed procedure.

(b) RSC has been done away with, hence there may not be a need to clarify constitution of RSC.

9. Transparency in the planning process:

9.1 Draft Regulation provided as follows:

"For the sake of transparency following is required to be ensured by the CEA, CTU & STU while carrying out planning of transmission system in the Country:

(a) Transmission planning meetings must be open to all affected parties including, but not limited to, all transmission and interconnection customers and other stakeholders.

(b) To disclose to all customers and other stakeholders the basic criteria, assumptions, and data that underlie their transmission system plans.

(c) To provide in writing and make available the basic methodology, criteria, and processes they use to develop their transmission plans.

(d) The stakeholders themselves or through their an independent third party can replicate the results of transmission planning studies and discrepancies/ comments can be furnished to Central Study Committee, Regional Study Committee or CTU or STU.

(e) Disclosure of critical infrastructure information and commercially sensitive data with regard to transmission planning shall be governed by the provisions of Section 8 of the Right to Information Act, 2005."

9.2 GRIDCO has suggested that the rationality of the final decision taken in CSC, RSC & CEA level (along with reason of non-acceptability of any proposed transmission scheme) and results of Transmission

Planning studies should be published in official websites of CEA and CTU or in any other website, as deemed proper.

9.3 FICCI has suggested that stakeholders may be allowed to propose new plans to study committees and there should be a mechanism to comment on such proposals along with reasons for acceptance/ rejection.

9.4 TANGEDCO has suggested that only the relevant data pertaining to stakeholders other than STU can be shared if necessitated. The base case data of the entire state network cannot be disclosed.

9.5 RInfra has suggested that the following be included: (a) Stakeholders be provided with latest base case, (b) ensure security for grid by strengthening IT Infrastructure and by covering under "Prohibited Area", (c) STU & CTU shall form Knowledge Sharing Platform at State and Central level respectively and communicate key learning's to all stakeholders, (d) build a secure data communication mechanism across transmission stations.

9.6 **Commissions Views:**

(a) We agree with suggestions of GRIDCO that results of Transmission Planning studies should be published in official website. CTU has been mandated under these regulations to publish results of studies on its website for comments of stakeholders and reasons for rejection are to be uploaded on website.

(b) With regards to FICCI's suggestions, we have provided that stakeholders can provide comments on the proposals of CTU and CTU shall publish the reasons for acceptance/rejection on website.

(c) With regards to TANGEDCO's suggestion regarding disclosure of base case, it is noted that technical data of base case is a critical input for making All India transmission plan base case and it is suggested that STUs should facilitate providing data to CTU for efficient planning of

ISTS. The modalities of data may further be finalized in detailed procedure.

(d) With regards to RInfra's suggestion, we agree that base case file be provided to stakeholders as per provisions of regulations. We direct CTU to form a knowledge sharing platform with STUs to facilitate knowledge sharing, may be on lines of POSOCO who has developed FOLD (Forum of Load despatchers) with all India State Load dispatch Centers. Further the requirement of secure communication is already covered under CERC (Communication System for inter-State transmission of electricity) Regulations, 2017.

(e) The specific Clauses as proposed under draft Regulation 18 have not been included in the final regulations and have been broadly covered under regulation 8(1). CTU shall maintain the transparency identified at Clause 9.1 above.

10. Broad Principles of Transmission Planning:

10.1 APP has suggested that transmission system should be planned in such a manner that transmission projects to be awarded through TBCB/Nomination route are a whole associated system with downstream system and upstream system except where it is already in operation in case of system strengthening schemes.

10.2 FICCI has referred to CERC statutory advice to MoP dated 14.10.2016 stating that upstream/downstream should be planned together since in the past a whole associated system has been broken into parts and awarded resulting into upstream and downstream network being awarded to different developers. The same has led to co-ordination issues as many times it has happened that the project is ready for commissioning, however the same cannot achieve commissioning on account of lack of downstream network/upstream network being available.

10.3 RInfra has stated that there should be a provision for replacement or refurbishment of obsolete technology & equipments after residual life assessment studies.

10.4 INWEA has stated that with the current trend of increasing capacity addition of RE sources, a share of transmission infrastructure should be apportioned as transmission reserves and the transmission planning framework should ensure development of such reserve infrastructure and the same should form part of the planning at the state level and regional level.

10.5 GRIDCO has suggested that before taking up new planning, assessment of ATC of existing system should be done through independent experts and measures to enhance the transfer capability should be undertaken. It has also suggested that inefficient plants should be considered under likely capacity to be closed rather than old plants. It has suggested that uneconomical generating stations should be closed. It has stated that Congestion level up to certain allowable limit should be taken into account for transmission planning.

10.6 Shri N. Shasidhar has stated that there should be 'feed in tariff' provision available to the consumers to sell the excess power generated from their roof top solar power plants. Thus, each substation directly connected by the nearby utility power generation plants (solar IPP, etc) would meet the demand on first right/preference basis. These sub-stations are not isolated and connected to the national grid to draw power when the dedicated power units generation is falling short of the demand. When the local generation is excess of the demand, the surplus power is exported to the high voltage substation /grid for use elsewhere. Thus each HV transmission line should have bidirectional power flow provision/possibility.

10.7 **Commissions Views**:

(a) We agree with APP and FICCI comments regarding upstream/ downstream system. Further to ensure that due transparency has been followed while planning, stakeholder consultations have been carried out, Regulation 9 have been included which provides for Regulatory filings by CTU and Transmission Licensees at the time of Regulatory Approval, grant of transmission license and application for determination of tariff.

(b) The suggestion of RInfra has already been covered in Regulations 7(7).

(c) The suggestion of INWEA regarding reserving a capacity for renewable is not acceptable since available transmission capacity should be allocated to projects in non-discriminatory manner as per their requests. However we have provided for renewable planning in Regulation 6.

(d) We agree with suggestion of GRIDCO that assessment of ATC of existing system should be done through independent experts and measures to enhance the transfer capability should be undertaken. We have already formulated National Reliability Council (NRCE) for this purpose. CTU and POSOCO should carry out assessment of ATC of existing system itself or through independent experts and measures to enhance the transfer capability should be devised at NRCE. Further the decision with respect to closing of old/inefficient plants shall be as per policy of the Government and guidelines of CEA. Commission is not inclined to set a benchmark for allowable congestion limit as detailed deliberations are required in this matter. A Committee of transmission experts needs to be formed by CTU to undertake the issue and submit the report of such Committee within a year of issue of these Regulations.

(e) With regards to Sh. N Shashidhar's comments, it is stated that feed in tariff is beyond the scope of these regulations. However availability of accurate data definitely helps the planner for efficient planning.

Hence the regulations cast responsibility on STU/DISCOMS / other entities to provide data as per detailed procedure.

11. Transmission Planning Criteria:

11.1 Shri V. Ramakrishnan has suggested that technical issues to be considered in specifying Transmission Planning Criteria should not be put in CERC regulation and should be as per CEA Transmission Planning Criteria. It would be better that instead of including these suggestions in CERC regulations, the inputs are provided to CEA for due consideration. CERC may consider giving these input to Central Government under provision of 79 (2) of Electricity Act. Further all the recommendations covered in Mata Prasad report in this regard may be communicated to Central/State Governments, CEA, RPCs, POSOCO and CTU/STUs.

11.2 TANGEDCO has suggested to include all generators including RE irrespective of the capacity, for steady state & dynamic studies. It has further emphasized on details of reactive compensation and harmonic filters. It has further stated that data should be classified based on planning or operational study and that Scenarios for study can be built based on state specific conditions in line with guidelines of CEA.

11.3 RVPNL has stated that for grid stability and for maintaining reliability of ISTS system the redundancy kept in transmission lines especially long HVDC lines and 765kV Corridors leads to high voltage. The shunt reactors can only compensate small quantum as compared to the high voltage developed in the system e.g. 125MVAr 400kV Shunt reactor can compensate up to 4-5kV only whereas high voltages are to the tune of 440kV. Specific measures have been mentioned in CERC notification; in addition lines injecting high MVArs need to be identified. The issue of high voltage is to be addressed irrespective of inter and intra regional aspect. The intra

state lines which are kept under loaded or floating for system reliability should be declared ISTS without considering 50% criteria. All STATCOMs at strategic nodes and to which huge wind projects and Solar Parks are connected should be installed as ISTS.

11.4 POSOCO has suggested to add "interaction amongst nearby HVDC terminals and interaction of HVDC terminals with AC system". Further in respect of gas turbines and hydro generators, black start capability, dead bus charging as well as charging of the transmission line from the black start generator may also be studied from the view point of resilience of the system. Reactive power compensation should duly factor such conditions.

11.5 GRIDCO has stated that planning process apart from conforming to technical requirements should also be driven by commercial impact to the end use consumer. CTU/ CEA/MOP (the Planners) should make a decision based on social costs (sum of operation costs, investment costs, sunk cost due to uncertainty involved) rather than only taking technical requirement into considerations.

11.6 INWEA has suggested that CEA Planning Criteria should contain specific provisions for RE projects as “Criteria for transmission planning in terms of RE evacuation should have relaxed technical norms considering specifics of the RE project and location (for instance higher thermal loading capacity in high windy zones, N-1 criteria to be relaxed for remotely located wind and solar project evacuation, etc) “

11.7 RInfra has suggested that while specifying the Planning Criteria, CEA shall also consider the following broad principles:

x) At least N-2 criteria for Mega/Metro cities

xx) Capacity upgradation in existing RoW of OH lines in Urban area

11.8 **Commissions Views**:

(a) We agree with Sh. V. Ramakrishanan's suggestions that technical criteria for transmission planning shall be in accordance with CEA Transmission Planning Criteria. CTU may take up the recommendations of Mata Prasad Committee along with suggestions of RVPNL, POSOCO, RInfra, TANGEDCO with CEA within a month of issue of these Regulations, for their consideration in Transmission Planning Criteria. Similarly other suggestions by stakeholders may also be considered by CTU while taking up the issue with CEA.

(b) The suggestion of GRIDCO with regard to cost impact has been included in Regulation 8(3) which mandates CTU to provide "Likely capital costs and estimated monthly tariff;"

12. Classification of Transmission Plans:

12.1 IEX and RInfra have suggested to specify the priority of implementation of different types of upgrades.

12.2 NVVN has suggested that definition of economic upgrade should include "… which shall relieve congestion in bilateral market transactions".

12.3 FICCI has suggested to include Energy storage systems, Dynamic & static compensation and grid stability equipments part of reliability upgrades, so that same can come up for competitive bidding.

12.4 GRIDCO has suggested to maintain balance between optimum use of resources (non-stranded assets), grid stability standards and flexibility and advised prioritization of upgrades. In the name of public policy upgrade, stranded asset should not be created & loaded on the public. In any long term planning within a regulated environment, the investors are ensured of their return on investment but the interest of end use customers should also be equally ascertained in terms of reasonableness of the investment. Limited consideration should not be given to the economic viability of new

projects being considered under public policy upgrade categories. However the assets to be covered under public policy upgrade may be specifically defined. Cost bearing mechanism of different type of transmission planning should be as per the economic benefit received by beneficiaries, e.g. for the public policy upgrade necessary funding may be provided from PSDF fund/ central grant. Hence benefits may be quantified to ensure that the cost allocation is also consistent with transmission planning categories, because at the end of the day it is not the planner who pay, rather it's the end use customer who pay the price.

12.5 Commissions Views:

Keeping in view stakeholder's suggestions to define the priority of each upgrade, the classification of upgrade has not been considered presently in the Regulations.

13. Detail Procedure for Transmission Planning:

13.1 Comments on draft regulation No. 23.1 (a),(b),(c)

13.1.1 POSOCO has stated that different STUs/ SLDCs may have different methodology in Demand projections. In absence of a common guideline, the projections could vary widely, thus lacking credibility. A common guideline for demand projection (including projections of Load growth, type of load & nodal distribution of loads) may be developed by CEA in consultation with CTU / NLDC / RLDCs.

13.1.2 TANGEDCO has stated that while formulating guidelines for a common methodology in demand/load forecasting as opined by POWERGRID, the intra-State demand growth variation specific to each state have to be taken into consideration huge quantum of renewable energy penetration in the generation mix of renewable rich states should be considered.

13.1.3 GRIDCO has stated that as proper and accurate load forecasting is the key foundation to Transmission Planning, the following aspects may be incorporated in the above Regulations to avoid uneconomical planning of the Transmission system:

> "The load forecasting methods and guidelines should be uniform which will be recommended by CEA and CTU for all STUs/DISCOMs for load forecasting as close as possible to real load. Such guidelines on load forecasting should take care of demand forecasting and procurement of power from sources outside the State depending on relative cost economics of generation, import/export requirement from ISTS some years in advance, addition of renewable capacity, change in quantum of power drawn by Open access customers as well as seasonal changes in withdrawal requirements".

13.1.4 POSOCO has stated that it is likely that SLDCs would be able to provide a better estimate (including information regarding upcoming CPPs, etc. in the state) of projected load / generation for purpose of transmission planning. Thus, the projection may be done by CTU in consultation with SLDCs / RLDCs / NLDC / CEA.

13.1.5 RVPNL has stated that while designing ISTS in a state, CTU shall ensure that existing STU system does not become underutilized on this account. The interstate transmission system planned should be such that both inter and intra networks are optimally utilized leading to better economic viability of new transmission assets being added.

13.1.6 **Commission's views:**

(a) We agree with POSOCO that different STUs/ SLDCs may have different methodology in Demand projections and there is a need to have a common guideline for demand projection. POSOCO may take up the matter with CEA.

(b) With regards to TANGEDCO's and GRIDCO's suggestions, it is clarified that STU should provide the projections for the State in coordination with intra-state entities. It is in the absence of such data that CTU may project and finalize the same at RPC so that planning exercise is carried out.

(c) With regards to POSOCO's suggestions, CTU may consult with POSOCO, SLDC or any other entity as deemed fit for the projections.

(d) We agree with RVPNL's suggestions that CTU should carry out comprehensive planning and the aspect of underutilization of state network may also be considered while planning.

13.2 Comments on draft regulation No. 23.1(d), (e),(f),(g)

13.2.1 GRIDCO has stated that Bulk Consumers directly connected to ISTS need to provide their drawal requirements from the ISTS to the respective RSC.

13.2.2 IEX has requested that data uploading exercise may be according to a specific timeline and much before the actual implementation of the plan in order to maintain the purpose of the information dissemination. Further specific format for data being uploaded on the website of CEA and CTU should be devised. An IT enabled database may be maintained in the specified format integrating and accumulating data from all participants at all levels. This compilation shall be available to all and may be used for future reference and for transmission system planning.

13.2.3 IEX has stated that the time frequency and horizon of the review must also be clearly stipulated and the criteria of the review must be defined.

13.2.4 **Commission's views**:

13.2.5 With regards to GRIDCO's suggestions, it is clarified that we have done away with RSC. We agree that bulk consumers directly connected to ISTS should provide their drawl requirement to CTU.

13.2.6 We agree with IEX that there should be a format of data uploading and timeline for same. This aspect and criteria for review shall be covered in the detailed procedure.

13.3 Comments on draft regulation No. 23.1(h)- (p)

13.3.1 POWERGRID has stated that cost estimation for new generating stations is a tricky process as cost of power production varies with competition in the market, contractual obligations, and economic scenario. This function may be carried by a dedicated committee which may include experts in power generation, DISCOMs, CERC and CEA.

13.3.2 GRIDCO has stated that planning must be done not only from the contingency/ congestion removal point of view or from ensuring the reliability point of view but also with a prospective of effective utilisation of the transmission assets so that the cost of creating suboptimal redundant infrastructure won't pass on to the end consumers. Further to assure the most reliable and economical solutions, instead of stochastic coordination of generation and transmission expansion planning model, in a competitive electricity market a more deterministic approach need to be followed. Inter-alia, the "Monte Carlo simulation & scenario reduction" need to be applied by considering the commissioning schedule of Generators, random outages of generating units and transmission lines as well as inaccuracies in the long-term load forecasting to consider sufficient number of planning scenarios & to explicitly address the demand growth uncertainties. Instead of imposing capacity obligation on load serving entities based on forecasted load and reserve margin criteria, it is appreciable to deal with the associated uncertainties & possible outcomes of planning decisions in a scientific manner as suggested above so that the impact of risk is ascertained beforehand. GRIDCO during the public hearing stated that the rationality of choosing

transmission scheme along with reason of non acceptability of any proposed transmission scheme should also be uploaded on the website. During public hearing GRIDCO stated that Periodic review/ monitoring of the stranded asset created from time to time should be a part of procedure of transmission planning.

13.3.3 GRIDCO has further stated that in view of the Govt. of India policy for adding 175 GW of Renewable power by the year 2022, and since, out of the above targeted Renewable capacity, considerable quantum will be localised for injection at 11 kV, 33kV and 66 kV and also at LT level, the same should be considered towards reduction in required Transmission capacity at EHT Level for transmission planning. This condition should be a part of above Regulation, which otherwise will render the Transmission system as under-utilised, un-economical, resulting in stranded transmission assets.

13.3.4 MPPMCL has stated that before conceiving any new transmission system either by CTU or STU, utilization of existing transmission assets should be examined. New systems, if at all required, should be planned in such a way that the utilization percentage of existing assets / stranded assets could be improved. The proposal for new systems should clearly specify its impact on utilization of other assets and additional financial burden / impact on PoC charges of each DIC. This would help DISCOMS in taking considered view on new transmission system. During public hearing MPPMCL stated that DISCOMs should be given major role in the transmission planning.

13.3.5 RInfra has stated that implementation of Critical protection systems like Islanding Scheme/Sectionalizer should be included for planning.

13.3.6 RVPNL has stated that for RE rich states like Rajasthan which do not have Hydro power projects or Gas power projects for flattening load curve Battery Energy Storage System of at least 10% of installed

capacity should be mandatory for RE Generators. Till cost of BESS is reduced 50% grant can be provided to RE developers by MNRE under PSDF or NCEF to make it viable for them. This will have added advantages of improving voltage quality by suppressing harmonics and reducing VAr compensation requirement during off peak injections.

13.3.7 InWEA has suggested that there is a need to design a robust transmission infrastructure to cater to the different markets to permit seamless flow of wind/RE generation across state and regional boundaries.

13.1.1 Commission's views:

(a) With regards to POWERGRID's suggestions on estimation of cost, the variable cost of existing generating stations as available with CEA/Regulatory Commissions shall be considered. The variable cost of new generating stations may be estimated by CTU in consultation with CEA and generating stations based on (a) likely source of fuel, (b) normative heat rate as per CERC Regulations,(c) variable charges of existing generating stations in state and (d) pit head or load center based stations. In case of non-availability of such data, variable charges may be considered by CTU based on similar sized units and norms for heat rate/ specific oil consumption, etc., as per CERC Regulations or CTU may consult experts in this regard.

(b) With regards to GRIDCO's and RInfra's suggestions on technical aspects of transmission planning, the same may be taken up by CTU with CEA.

(c) We agree with GRIDCO's suggestions that rationality of choosing transmission scheme along with reason of non-acceptability of any proposed transmission scheme should also be uploaded on the website. Accordingly, CTU shall upload the same on its website on finalization of the scheme.

(d) We agree with MPPMCL suggestions that utilization of existing assets should be examined. CTU shall consider this while planning. Further the likely cost and monthly tariff shall also be uploaded on CTU website as per the Regulations.

(e) We are not inclined to accept RVPNL's suggestion to make battery mandatory.

(f) We agree with INWEA and GRIDCO with regard to planning for renewable sector and Regulations contain provisions accordingly.

(g) Further, an additional regulation has been included to facilitate transmission system of strategic and national interest.

> "In case a transmission system is required in national interest or security/strategic importance and is funded by Government of India/State Government, CTU may, incorporate such system/ scheme directly on seeking regulatory approval of the Commission."

14. Regulatory approval of transmission System:

14.1 FICCI and IEX have stated that reference to role of Empowered Committee may be deleted and should be as per Tariff Policy.

14.2 TPDDL has stated that to ensure the cost reduction and efficiency in transmission planning the cost plus route for implementation of ISTS should be completely abandoned. Any transmission system should only be implemented through Competitive Bidding.

14.3 **Commissions Views:**

We agree with the suggestions of FICCI and IEX and accordingly, reference to Empowered Committee has been removed. With regard to suggestion of TPDDL, the same is beyond the scope of these regulations.

15. **Review of Transmission Planning:**

15.1 POSOCO has suggested to include NLDC in operational feedback.

15.2 GRIDCO has stated that (i) the detailed procedure formulated by CEA & CTU should be approved by CERC & views of stake holders must be sought for before finalisation of the same. (ii) Periodic review/ monitoring of the stranded asset created from time to time should be a part of procedure of transmission planning in order to restrain over creation of transmission asset leading to under-utilised transmission assets which is occurring at present.

15.3 MPPMCL has stated that there is a considerable gap between the planning of a new transmission system and its implementation. Due to uncertainties associated with addition of projected generation and growth in demand of the projected area, there are situations when the system earlier planned are not required, in the way it had been conceived. Therefore it seems necessary that any new system which has been planned and agreed to in various forums are regularly reviewed by CEA and CTU / STU for their necessity (and not for their justification) before considerable expenditure is incurred by the project developer.

15.4 **Commissions Views:**

(a) We agree with the suggestions of POSOCO and accordingly, NLDC has been included to provide operational feedback in addition to RLDCs.

(b) We agree with views of GRIDCO and MPPMCL that there is a need of periodic review of transmission plan. Accordingly, we have included provision of review by CTU.

16. **Information Exchange timeline:**

16.1 POWERGRID has stated that as per the present timelines, from the date of receipt of application, LTA needs to be granted within (i) 120 days for grant of LTA without system strengthening, and (ii) 180 days for grant of LTA with system strengthening. It is observed that the transmission planning timelines as proposed in the draft Transmission Planning Regulations do not conform to these

requirements. It has further suggested modifications in the proposed timelines.

16.2 FICCI has stated that although regulatory approval of transmission planning is a positive development in the transmission planning process, the time that the Commission takes to dispose of petitions should not be more than one month.

16.3 **Commission's Views**:

Keeping in views POWERGRID's suggestions on modification of timelines, we have removed the detailed timelines from the regulations and the same may be covered in the detailed procedure including the period of retaining study files of final accepted network configuration.

17. **Manpower Deployment in Transmission Planning**

17.1 RVPNL has suggested that CTU should share PSSE software updates and impart training to STU for intra state study regularly.

17.2 POSOCO has stated that Transmission planning study involves collection of various data, their analysis, modelling and integration into system study case and then the simulation and crafting out the planning from these studies. This requires continuous and rigorous training with the changing scenario. The System study needs experts in load flow/transient, voltage and small signal stability/System protection scheme study. Apart from these as the system is becoming complex and various specific studies carried out by consultants like SSR/POD tuning etc. also need to be understood by the planners before implementation. All these require specific training to the manpower deployed for the planning study.

17.3 TANGEDCO has stated that various dynamic and special studies are to be carried out by the planners before implementation. All these require specific training to the manpower deployed for the planning

study. For understanding and proper implementation, imparting continuous and periodical training to STU personnel involved in System studies of respective states.

17.4 RInfra has suggested that STU in consultation with CTU shall ensure building competency / outcome related occupational standards of manpower related to transmission sector as mentioned in "Power Sector Skill Council (PSSC)" under Skill India initiative. Also STU in consultation with CTU shall design the Training requirements for the Manpower deployed for Transmission Planning across all stakeholders.

GRIDCO has suggested that this Regulation should also include that "Before Certification and handling of System Planning, the engineering personnel of CTU, STU and if necessary DISCOMs should be trained sufficiently in various disciplines of power system planning and system studies that includes technical, financial and commercial aspects in line with recommendation of Sri Mata Prasad committee report."

17.5 Sh. S.K. Soonee stated during the public hearing that there should be Key Performance Indicators (KPI) for transmission planners such as loss trajectory, congestion target, reduction in average cost target, etc.

17.6 **Commission's Views:**

(a) We agree with RVPNL, GRIDCO, TANGEDCO and Rinfra that there is a need to impart training to STUs. We have directed CTU to form a knowledge sharing platform with STUs to facilitate knowledge sharing, may be on lines of POSOCO who has developed FOLD(Forum of Load despatchers) with all India State Load dispatch Centers. Further POSOCO's suggestions on need of training for CTU and STU shall be duly taken care by CTU.

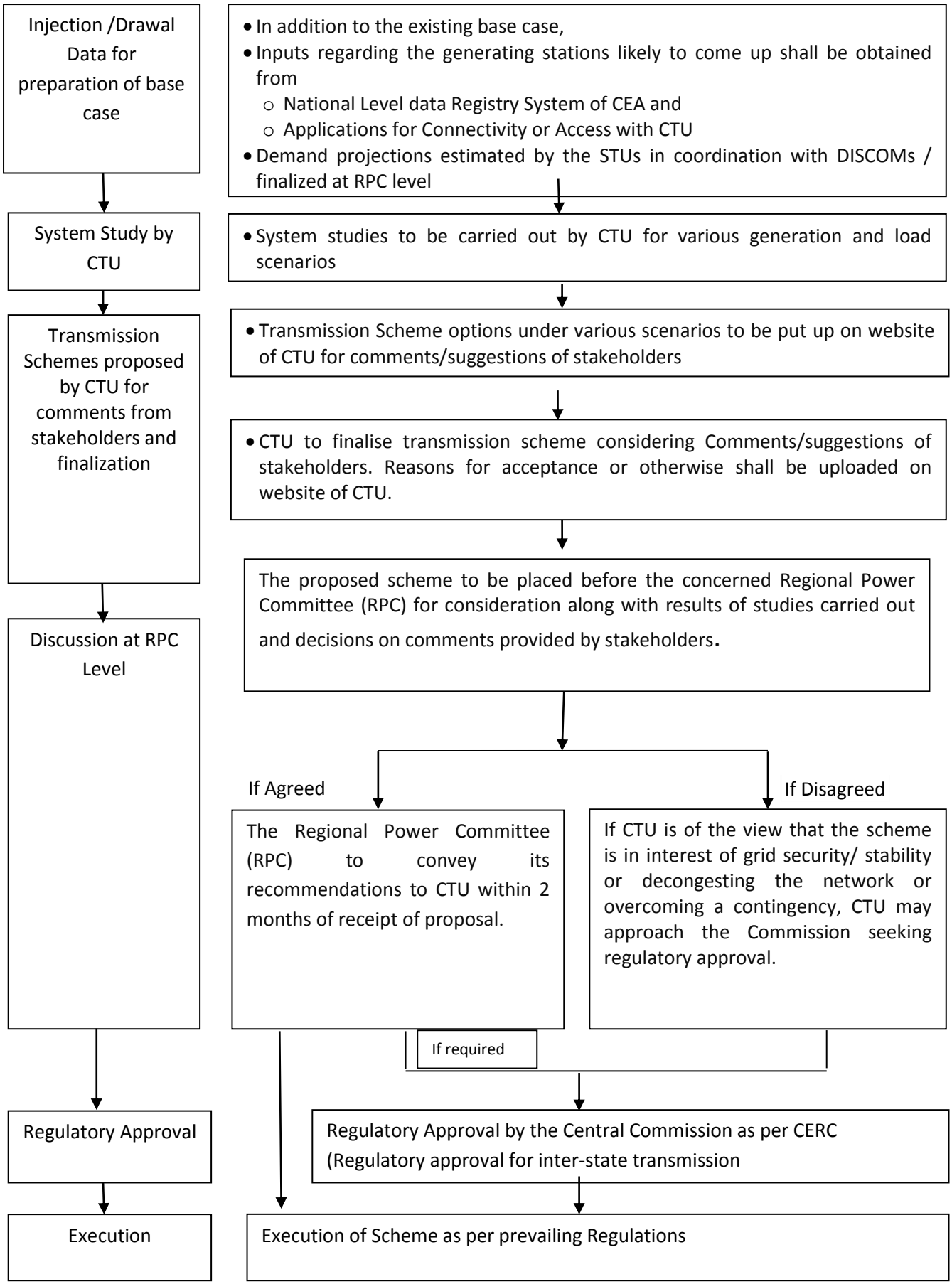
(b) We note that RInfra's suggestions regarding Power Sector Skill Council (PSSC)" under Skill India initiative is a good suggestion. We suggest STUs and CTU to take up the matter with PSSC for further action in this regard.

(c) Sh. Soonee's suggestion on KPIs requires further deliberations and shall be considered separately.

Sd/-	Sd/-	Sd/-	Sd/-
(Dr. M.K. Iyer)	**(A.S. Bakshi)**	**(A.K. Singhal)**	**(P.K. Pujari)**
Member	**Member**	**Member**	**Chairperson**

Annexure-I

Flow Chart of the detailed procedure of Transmission Planning



Appendix-I

CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI

Stakeholders who submitted written comments/suggestions on Draft Central Electricity Regulatory Commission (Transmission Planning and other related matters) Regulations, 2017

S. No.	Company/Stakeholder/Individual
1.	Association of Power Producers (APP)
2.	Central Electricity Authority (CEA)
3.	Delhi Transco Ltd (DTL)
4.	FICCI
5.	GRIDCO Limited
6.	Indian Energy Exchange (IEX)
7.	Indian Wind Energy Association
8.	MP Power Management Company Ltd.
9.	NVVN
10.	POSOCO
11.	POWERGRID
12.	Rajasthan Rajya Vidyut Prasaran Nigam Limited (RVPN)
13.	Reliance Infrastructure Ltd
14.	Shri N. Shasidhar
15.	Shri Pranjal Verma
16.	Shri Ravinder, Ex- Chairperson and Member (Power Systems), CEA
17.	Shri V Raamakrishanan, Ex-Member (PS), CEA
18.	Tamil Nadu Generation and Distribution Corporation Ltd (TANGEDCO)
19.	Tata Power DDL (TPDDL)

Appendix-II

CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI

Stakeholders who made submissions during Public hearing held on 18.09.2017 on Draft Central Electricity Regulatory Commission (Transmission Planning and other related matters) Regulations, 2017

S. No.	Company/Stakeholder/Individual
1.	GRIDCO Limited
2.	MP Power Management Company Ltd.
3.	POSOCO
4.	POWERGRID
5.	Rajasthan Rajya Vidyut Prasaran Nigam Limited (RVPN)
6.	Sh. S.K. Soonee (former CEO, POSOCO)