Central Electricity Regulatory Commission
3rd & 4th floors, Chanderlok Building, 36, Janpath, New Delhi-11001
Telephone: 011-23753917

No: CERC/Engg/Trans/Transmission Planning/2015 9th September, 2015

To

The Members of the Task Force
(As per List Enclosed)

Subject: Minutes of the 1st Meeting of the Task Force for giving inputs for framing of Draft Regulation on Transmission Planning.

Madam/Sir,

Please find enclosed herewith minutes of the 1st Meeting of the "Task Force for giving inputs for framing of Draft Regulation on Transmission Planning" held in CERC on 27.7.2015.

Encl.: As above

Yours faithfully,

SD/-

(Shilpa Agarwal)
Dy. Chief (Engineering)
(Convenor of Task Force)

Members of the Task Force

Sl. No.	Name of the Member	Name of Organisation	Designation
1.	Shri A.K. Saxena	CERC	Chief (Engg.)
2.	Mr. Karuna Sarma	AEGCL	AGM (E)
3.	Ms. Arundhati Ghosh	WBSETCL	Chief Engineer, CPD
4.	Mr. Rajiv Porwal	POSOCO	AGM (System Operation)
	Mr. Vivek Pandey (Alternate Member)	POSOCO	Chief Manager (System Operation)
5.	Mr. Ashok Pal	POWERGRID	AGM (CTU)
6.	Mr. Suman Guchh	UPPTCL	CE, Transmission Planning & Power System Studies
7.	Mr. Pardeep Jindal	CEA	Director (SP & PA)
8.	Mr. Omprakash k Yempal	MSETCL	Director (Operation/Projects)
9.	Mr. Ch. V. Subba Rao	APTRANSCO	Superintending Engineer/Power Systems
	Mr. A. Satyanarayana	APTRANSCO	Superintending Engineer/Planning
10.	Ms. Shilpa Agarwal	CERC	Dy. Chief (Engg.)

Task Force for giving inputs for forming of Draft Regulations on Transmission Planning

Minutes of the 1st meeting of the Task Force on Transmission Planning held on 29th July, 2015 at CERC, New Delhi

List of participants is enclosed at Annexure-I and the presentation given by CEA is attached at Annexure-II.

1. Shri A.K. Saxena, Chief (Engg.), CERC welcomed the participants and briefed them regarding formation of the Task Force in the backdrop of the need being felt in transmission planning to explicitly define roles and responsibilities of various entities so as to facilitate transmission planning. He also stated that a proper backing is required to facilitate and strengthen transmission planning. We intend to complete the exercise in 4-5 months.

2. During the course of discussion, members of the Task Force presented their views on various issues presently being faced by planners. Their views have been consolidated under various heads as detailed in succeeding paragraphs.

3. **Necessity of regulation on transmission planning:**

3.1. The representative of CEA mentioned that as per Section 73 (a) of the Electricity Act, 2003, it is the duty of CEA to formulate short-term and perspective plans for development of the electricity system and co-ordinate the activity of the planning agencies for optimal utilization of resources. He submitted that CEA in order to fulfill its duties has constituted Regional Standing Committees for Power System Planning (SCPSP) to firm up transmission addition proposals. The Commission should consider statutory functions of CEA defined in the Act while framing regulations on transmission planning, especially in respect of preparation of National Electricity Plan under Section 3 of the Act and also functions of CERC under Section 79(4) of the Act.

3.2. The representative of POWERGRID also mentioned that need for regulation on transmission planning should be discussed before framing regulation on transmission planning. The present regulation is applicable only for ISTS which is only one part of the entire power system. He further submitted that we need to have effective participation from all stakeholders so as to make the planning exercise fruitful. He added that discussions on General Access Network (GNA)

are under-way wherein we are including commitment from the user end as well. Further, CERC Regulations on Connectivity and long term access are available where planning is carried out based on the LTA requirement of the applicants. He submitted that various aspects including timeline involved in connectivity/open access Regulations need to be kept in mind while framing new regulations on transmission planning.

3.3. Representative of AEGCL further submitted that CTU has taken responsibility of undertaking development of important inter-regional links which are crucial for transmission system in NER and Assam.

3.4. All the participants agreed that the Regulations on transmission planning would facilitate transmission planning process.

4. **Who all should be part of transmission planning process?**

4.1. Representative of CEA stated that as per Section 3, Section 38, Section 39 and Section 73 of the Act, it is the duty of CEA, CTU and STU to plan transmission system. However, other stakeholders which include transmission licensees, DISCOMs, traders, Governments, RPCs, Generators and public at large need to be consulted and coordinated with. Accordingly, the proposed Regulations may define this process.

5. **Methodology of transmission planning presently being followed & suggestion for its improvement**

5.1. Representative of CEA stated that following aspects of transmission planning are important and needs considerations:

(a) Timeframe of planning
(b) Planning on anticipation basis or as per applications
(c) Perspective planning
(d) Integrated resource planning
(e) Planning needs to be made more objective than subjective.

5.2. Representative of CEA mentioned that presently planning in India is done on the basis of Long Term requirement not for medium term or short term. Load-Generation balance is being done on the basis of Electric Power Survey published by CEA. He submitted that it is required to get real information of existing system and to streamline the process of planning to make load forecasting as close to real load. He also gave example of some developed countries where Regulator provides a Statement of Opportunities (SOO) on the basis of which planning to transmission system is done. In India, transmission planner takes data from Planning Commission, Electric Power Survey Reports, etc. which generally projects growth more than the actual one. He further submitted that seasonal load-generation data are considered

but should be updated on regular basis in view of changing climatic scenario.

5.3. The representative of CEA further submitted that the transmission planning should be guided by the Electricity Act, 2003, National Electricity Policy, National Electricity Plan, Grid Standards, Transmission Planning Criteria, Design Codes, and Transmission Access Regulations. He further gave example of growth of electricity sector in some European countries and India and showed that growth in India is very high and development of transmission system should match that growth. He stressed on the need of regional and state level planning in view of difference in growth and demand in different regions and states which will finally result in development of an efficient ISTS. The present method of Top-Bottom approach should now be accompanied with detailing of 220 kV and below transmission network. For this States should provide characteristics of their load centres like MW load, power factor, growth rate, etc.

5.4. The representative of CEA also mentioned that presently planning for development of transmission system is done keeping in view 6 scenarios i.e. peak and off-peak requirement of three seasons. It can also be done for 8 scenarios i.e. peak and off-peak requirement quarter wise.

5.5. The representative of POWERGRID mentioned that at present planning of transmission system is done by CEA and CTU on the basis of long term requirements of the customers. He further added that transmission is a licensed activity while generation has been delicensed which is posing great challenge for transmission planners. He stressed the need of certified data from State Utilities and their involvement in the system studies towards planning for both inter-State and intra-State transmission system.

5.6. Chief (Engg.), CERC stated that ISTS and associated intra-state system should come in same timeframe to avoid assets remaining unutilised/ under-utilized.

5.7. The representative of CEA stated that principles of transmission planning may be specified which may include base assumptions about generation and demand scenarios, procurement strategy of States, economic analysis including Production Cost Analysis and Regulatory Investment Tests for selection of transmission plan.

6. **General Access Network (GNA)**

6.1. The representative of POWERGRID mentioned CEA has brought out concept of General Access Network (GNA) for transmission planning which is under discussion at various levels.

6.2. The representative of CEA mentioned that GNA has been discussed widely with different states but till date CERC has not been involved in discussion.

6.3. It was decided that a separate meeting to discuss GNA in detail shall be organised at CERC

7. **Utility of Perspective Planning:**

7.1. The representative of CEA mentioned that with the rate (approximately 8%) at which demand of electricity may be growing in India, the demand would get doubled in about 10 years. In developed countries like France, Britain, etc., growth in demand is very less and it will take almost 35 to 40 years for the demand to get doubled. He stated that growth rate for Great Britain is 2% and they have a 10 year plan and with a growth rate of 8% in India, 20 year plan loses its significance. Therefore, developed countries can plan for transmission system for next 20 to 30 years. However, in India, the planning horizon should be about 5-7 years.

8. **Need for Requirement of data from DISCOMs**

8.1. The representative of WBSETCL stated that planning should start from DISCOM level. DISCOM should provide data to STU regarding area wise load by 15th January every year so that STU can plan system properly and provide proper data to CTU.

8.2. The representative of MSETCL mentioned that distribution companies should provide requirements of power for different types of consumers in their respective areas for the next five years to the concerned STU and CEA. He also stated that actual variation from EPS is to the tune of 2-3%. He stated that a timeframe must be suggested by which states should also come out with similar regulations for transmission system in the States.

8.3. Representative of AEGCL mentioned that the distribution companies are not giving proper feedback in regard to load growth in their respective areas. He submitted that planning for the development of transmission system should be done for the next 10 to 15 years and DISCOMS are not providing inputs for planning. In their state, construction takes more than 4 years due to forest issues.

8.4. Representative of APTRANSCO mentioned that planning should be done proactively than reactive planning. He stated that proper load forecasting is not happening in the distribution areas. APTRANSCO is doing proactive planning for transmission system development. He

further submitted that generation planning should also be done along with transmission planning as generators are also facing many uncertainties like coal shortage, unavailability of gas, environment and forest clearances, etc.

8.5. Representative of POSOCO mentioned that IEGC provides SLDC shall carry out its own demand estimation from the historical data and weather forecast data from time to time and all distribution licensees and other concerned persons shall provide relevant data and other information as required by SLDC for demand estimate which is presently not being followed by state utilities.

8.6. Representative of CEA stated that they need substation-wise data at 220kV level for transmission planning and do not require data at 11kV/33 kV but STU requires the same. He mentioned that forecasting of load by distribution companies is therefore very important. However, distribution companies are not providing sub-station wise load growth in their areas. He emphasized that distribution companies should forecast load up to 11 kV and 33 kV which should be mapped to STU level planning.

9. **Participation of States in transmission planning:**

9.1. The representatives of CEA and CTU mentioned that States are not informing properly the load that would be incident on 220 kV system in the next five years. They are also not completing downstream system matching with ISTS which causes non utilization of assets developed for states and stranding of huge capital assets. Also there is no financial implication for non-completion of downstream system. They further mentioned that involvement of various stakeholders including STU and distribution companies with defined roles and responsibilities as per the Act along with time frame for completion of activities may also be included in Transmission Planning Regulations.

9.2. Representative of MSETCL mentioned that strengthening only ISTS network would not serve the goal of development of electricity sector in India. He submitted that State transmission network must also be matched with ISTS for efficient development. He further, pointed out that States like Andhra Pradesh and Kerala have taken proactive steps in development of state network by forming committee similar to Standing Committee for Power System Planning of CEA where all stakeholders including distribution companies, RPC, SLDC, STU, generators, etc., are invited to discuss and resolve different issues faced by them for early decision making. Maharashtra already has a Standing Committee at state level.

10. **Renewable Integration:**

10.1. The representative of CEA mentioned that Central Government is putting a lot of emphasis on generation of energy based on renewable sources especially on solar based energy generation. Since, generation of energy based on renewable sources is of intermittent nature and gestation period for the same is relatively less, planning of transmission system for evacuation of energy generation based on renewable sources is very necessary. Therefore, integration of power generation based on renewable sources should also figure in transmission planning. He mentioned that developers are not approaching CTU for considering evacuation system at the time of inception. It is not possible for planners to develop efficient transmission system if they are not informed about the location and quantum of power to be evacuated well in time. He suggested that developers of generation of energy based on renewable sources should be asked to apply for evacuation system at the time of generation planning itself. Representative of CEA stated that states should allow only the quantum of renewable for which it can do balancing

11. Other issues highlighted by CEA in the transmission planning are as under:

(i) Adequacy of present load forecasting methods
(ii) Land Acquisition
(iii) Fuel linkages for coal based power plants
(iv) Beneficiaries of most of IPPs not firmed up
(v) <u>Uncertainty in Hydro-electric Generation Projects</u>
  a) Difficulty in Environment clearance
  b) Longer Gestation Period
  c) Geological surprise
  d) Local issues
  e) Basin wise development
(vi) <u>Open Access in Transmission and Power Exchange</u>
  a) Market driven exchanges influence pattern of power flow
  b) Increasing share of sale under STOA and MTOA
(vii) <u>Issues in Implementation of Transmission Projects</u>
  a) Environment/forest/RoW
  b) Contractual delays
  c) Issues in TBCB: Representative of CEA raised issue regarding monitoring execution of transmission lines under TBCB. He also stated that even the lines awarded to POWERGRID under "compressed time schedule" need to be monitored whether they are being executed at required pace or not.
  d) Need for periodic review of plan

(viii) Manpower requirement in planning with respect to quantity and quality.

(ix) How much congestion as a percentage can be allowed

12. Members of the Task Force were requested to provide their suggestions by 6th August, 2015.

Annexure-I

1st Meeting of Task Force for giving input for framing of Draft Regulations on "Transmission Planning" on 29.07.2015 at 10.30 am.

List of participants

Sl.No.	Name	Designation and Organisation	e-mail	Signature
1.	Karuna Sarma	AGM(E) AEGCL	Karunasarma@gmail.com	
2.	Kelkar S.G.	CE, STU, MSETCL	cestu@mahatransco.in	
3	L. Pardha Sarathi	ADE/Powersystems	cepowersystems@rediffmail.com	
4	Akhil Kr Gupta	Jt. Chief (Engg)	akhilkg@cercind.gov.in	
5.	Shilpa Agarwal	Dy. Chief (E)	shilpadce@yahoo.com	
6.	A.K Saxena	CCE)		
7	VIKRAM SINGH	DC (Engg)	VIKRAMSINGHFMS@GMAIL.COM	
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10	राजीव पोरवाल	डी एम एस (NRLDC) Posoco	rajivporwal@gmail.com	
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12.	RAMANJANEYULU G	AC, (Engg), CERC.	ramcerc@gmail.com	
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14.	JYOTI PRASAD	AGM Powerlink	nishantjyoti@yahoo.com	
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16	PARDEEP JINDAL	Director CEA	jindal_pardeep@yahoo.co.in	

Annexure-II

TRANSMISSION PLANNING

PROCESS

'First meeting of Task Force for regulations on transmission planning'

at CERC

Pardeep Jindal, CEA

21-July-2015

Coordinated Planning

- CTU - Central Transmission Utility i.e. PGCIL, to carry out planning for Inter State Transmission System (ISTS) (Sec 38 of Electricity Act 2003)
- STUs - State Transmission Utilities, to carry out planning for Intra State Transmission System (Intra-STS) (Sec 39 of E. Act 2003)
- CEA - Central Electricity Authority, to coordinate planning of transmission system as part of its functions and duties under Section 73(a) of the E. Act 2003.
- The process of integrated planning is being coordinated by CEA. To fulfill this objective, CEA has constituted Regional Standing Committees for Power System Planning (SCPSP) to firm up transmission addition proposals.

CTU (and STU)

- Undertake transmission of electricity through inter-State (intra-State) transmission system;
- Provide non-discriminatory open access to its transmission system for use by –
  - Any licensee or generating company on payment of the transmission charges
  - Any consumer as and when such open access is provided by the State Commission on payment of the transmission charges and a surcharge
- 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
- Discharge all functions of planning and coordination relating to ISTS (IntraSTS) with -
  - State Transmission Utilities (CTU);
  - Central (State) Government;
  - RPCs, CEA, Licensees,
  - generating companies;

Transmission Licensee (sec 40)

- To build, maintain and operate an efficient, co-ordinated and economical inter-State transmission system or intra- State transmission system, as the case may be;
- To comply with the directions of the RLDC and SLDC as the case may be
- To provide non-discriminatory open access to its transmission system for use by –
  - Any licensee or generating company on payment of the transmission charges
  - Any consumer as and when such open access is provided by the State Commission on payment of the transmission charges and a surcharge

Other Duties, Functions & Entitlements

- (Sec 41) A transmission licensee may, with prior intimation to the Commission, engage in any business, provided -
  - a proportion of the revenues be utilised for reducing its charges for transmission,
  - that it shall maintain separate accounts for each such business – to ensure it neither subsidizes nor encumbers in any way its transmission assets,
  - that shall not enter into any contract or otherwise engage in the business of trading in electricity
- Others: Shall abide by – MOP/Govt/CEA/CERC rules and Regulations, Sec 68, Sec164, RLDC, SLDC etc.(IEGC)

Requirements for Transmission Planning

Data:

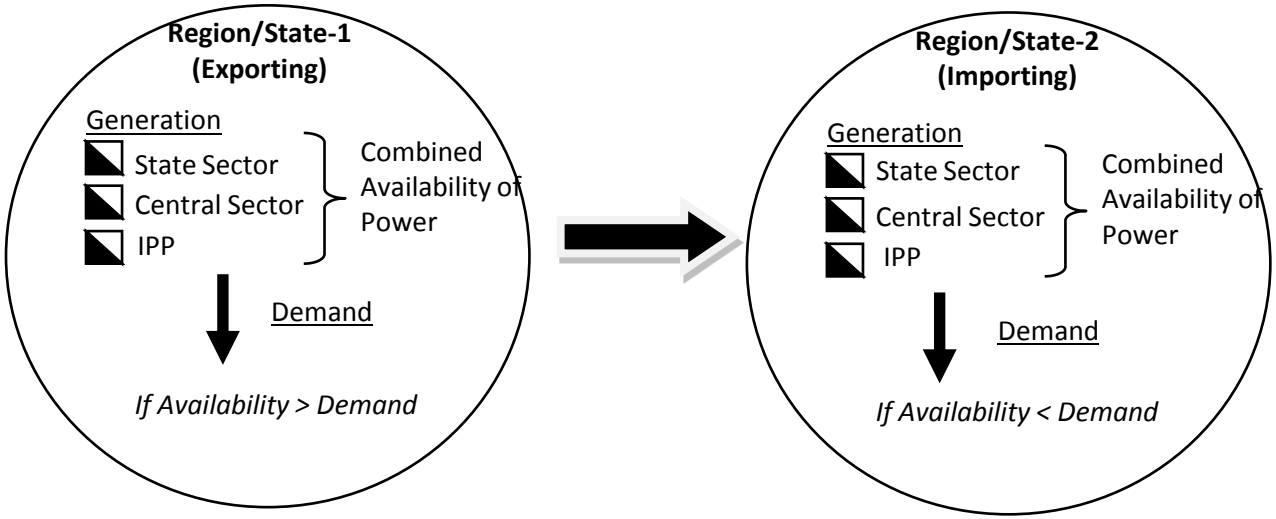
- Data on existing system
- Load forecast (*allocations, beneficiaries, PPA*)
- Generation expansion plan (perspective / LTA)
- Seasonal load-generation scenario
- Time-frame for studies

Network Expansion Options

Guidelines and Concepts:

- Electricity Act 2003 / NE Policy
- Regulations
- NE Plan /Transmission Planning Objectives
- Grid Standards/ Transmission Planning Criteria/ IEGC
- Design Codes / Safety Requirements
- Technology Options

Planning Methodology



- Transmission System planning based on Region-wise Import Export Requirement, worked out for 3 Seasons : Winter, Summer and Monsoon (to improve for Monthly/Quarterly)
- State-wise import-Export requirement – essential for Stae & regional plan
- Top-to-Bottom Approach : detailing of 220kV and below system – as next step
- RES Capacity Integration to be worked out

Studies - Type of Studies

Network Expansion Options

- Load Flow studies
- Contingency (and reliability)Studies
- Short circuit studies/ Fault analysis
- Stability /Voltage stability studies
- Techno-economic analysis

Transmission Expansion Plan

Standing Committees on Power System Planning

Transmission schemes are evolved based on power system studies and firmed up through the Regional SCPSPs

- → These Regional Committees constituted by CEA
- → Representation of CEA, CTU, STUs, Central generating cos, RPCs
- → The inter-state transmission system developed either for evacuation of the generation or for system improvement is discussed in the SCPSPs and finalized.
- → As almost all the LTA applications require strengthening of ISTS, these issues are also discussed in the SCPSPs
- → State – transmission system also

Challenges in Transmission Planning

- **Uncertainty in Load Growth**
  - Seasonal , and Long term
  - Substation-wise ?,
  - Are thes present forecast adequate ?
- **Uncertainty in Generation**
  - De-licensing of Thermal Generation
  - Acquisition of Land, Fuel linkage
  - Beneficiaries of IPPs projects not firmed up
- **Uncertainty in Hydro-electric Generation Projects**
  - Difficulty in Environment clearance
  - Longer Gestation Period
  - Geological surprise
  - Local issues
  - Basin wise development

Cont…

Challenges in Transmission Planning

- **Open Access in Transmission and PX**
  - Market driven exchanges influence pattern of power flow
  - Increasing share of sale under STOA MTOA
  - Merits of Long-term power procurement – may be debated ?
- **Issues in Implementation of Transmission Projects**
  - Environment/forest/RoW
  - Contractual delays
  - Issues in TBCB
  - Need for periodic review of plan

Solution to the Challenges **??**

Other issues/ Challenges in Transmission Planning

- Congestion – economic ?, How much to avoid (can it be quantified)
- Planning Approach - Anticipation v/s Application
- Coordination: ISTS (CEA & CTU) – STU, and STU – DISCOM
- Manpower , capacity in transmission planning bodies

thanks

Macro Picture

	Load, (GW)	Gen. I/C (GW)	Tr.Lines (Tckm)	S/s (GVA)
11th Plan	130	200	257	410
Existing (Nov 2014)	148	255	306	571
12th Plan (as per NEP)	199	320	365	692
13th Plan (2021-22)	283	?	?	?
20-year ahead (2033-34)	? 616	?	?	?

I/C –incl. RES, Lines and S/S – 220kV and above

Loads - based on 18th EPS

Installed Capacity during 12th and 13th Plans

(in MW)

Plan-Wise Generation Addition (Region - Wise)				
	Up to July 2014 (Actual) (A)	Balance in XII Plan (B)	Addition in XIII Plan (C)	Total (End of XIII Plan) (D = A+B+C)
NR	64387	20929	16890	102206
WR	91847	36709	20262	148818
SR	57232	38650	23076	118958
ER	33881	12738	31195	77813
NER	2910	3511	8202	14623
Bhutan	1416	3066	2120	6602
Total	**251673**	**115603**	**101745**	**469020**

MW capacity under construction, and about 33000 MW of renewable capacity

Installed Capacity fuel-wise by end of 13th Plan (in MW)

	Fuel Mix of Generation (Region Wise) (end of XIII Plan)						Demand
	Coal	Nuclear	Gas	Hydro	RES	Total	**86461**
NR	**51238**	**4420**	**6714**	**26656**	**13178**	**102206**	86054
							82199
WR	106478	3940	11804	7879	18717	148818	35928
							4056
SR	**59520**	**4820**	**9673**	**12765**	**32180**	**118958**	1000
							283470#
ER	68617	0	207	8572	417	77813	
NER	810	0	1803	1135	651	14623	

with diversity without Bangladesh Export