

Gist of Discussions on 22.8.2014 Sub-Committee Meeting on Congestion

The list of the participants is enclosed as ***Annexure-1***.

1. Shri A. K. Saxena, Chief (Engg.) CERC welcomed the participants and briefed them regarding formation of the Sub-Committee in the backdrop of congestion being faced in transmission of power and discussion in regard to the same in Central Advisory Committee meeting held on 12.5.2014.

2. Chairman of the Sub-Committee, Shri R. V. Shahi, Former Secretary (Power), Government of India mentioned that the transmission capacity in the Country needs to be planned keeping the maximum generation capacity which needs to be evacuated. He added that the average PLF of Thermal Power stations in the country has in the last four years been declining and the average PLF has reached around 65% but there approximately 30 thermal power stations which can operate upto 90% PLF. The transmission capacity therefore needs to be planned for the maximum capacity /PLF and not for average capacity/PLF. He further added that if the Transfer Capability is 90-95% of Transmission Capacity, it is acceptable but it raises questions when it is around 1/3rd of the Capacity. He added that it is well recognised that the transmission capability will depend on the weakest link in the chain but wanted light to be thrown in regard to national & international scenario in this regard. He further added that issues like non-availability of coal and consequent non-availability of generation units, non-availability of State transmission system or even if Coal , Generation & Transmission being available, DISCOM may choose not to procure power due to its financial condition or it may procure if it is sure that the cost shall be pass-through, shall not be considered for the purpose of discussion in the Sub-Committee.

3. Shri Ashok Khurana, DG (APP) mentioned that all the Developers share concern regarding congestion in transmission and whatever is feasible should be done. He further mentioned that Ministry of Power had invited expert opinion from Shri Mata Prasad and

wanted that a copy of the letter written by him to Ministry of Power in this regard be placed before the Sub-Committee. He also expressed that there may be an element of over-cautiousness on the part of System Operator after grid failures of 2012. CEO, POSOCO agreed to provide a copy of the aforementioned letter.

4. Prof. S. C. Srivastava of IIT, Kanpur stated that Shri Mata Prasad has, in his letter, indicated one of the major causes of the gap between Transmission Capacity (TC) and Available Transfer Capability (ATC) to be lack of adequate reactive power compensation. He added that TC and ATC are well understood and it is also well understood that algebraic sum of TC does not provide Total Transfer Capability since power flows through least impedance path, thereby overloading it and at times creating voltage problem. He added that since ATC is declared in advance, this may make the declared ATC impractical in real-time. He was of the view that ATC may be declared more frequently and ATC declaration philosophy may have to be revisited so that more power could be transferred. We may install few controllable devices like FACTS Controller so that power flow be controlled. In regard to present methodology of ATC declaration being conservative or over-cautious, he mentioned that System Operator is declaring ATC properly, duly following the procedure but frequency of ATC calculation can be increased and it should be calculated / revised in near term (hourly or so). He added that the actual load and generation data was not being sent by the State Utilities/ Discoms to POSOCO which makes the base case or baseline itself wrong.
5. Sh. Hemant Sharma, CMD (GRIDCO) mentioned the following issues
 - a. Are there any international benchmarks in regard to calculation of ATC or practices which could possibly be adopted to improve ATC?
 - b. If it is an issue of improper transmission planning, consumers are paying for transmission system which is not used fully. Should consumers pay for ATC or TC?

- c. Is it an issue with management of transmission system that it is not put to optimum use? Could it be done with better topology or reactive power management?
- d. Transparency in calculation of ATC is required and ATC should be revised as per dynamic conditions.
- e. Is it possible to do gaming?

6. Shri I. S. Jha, Director (Projects), POWERGRID stated that

- a. Transmission is a passive element and ATC is affected by generation and load profile.
- b. At present congestion is existing in the following
 - i. Raipur-Wardha due to forest clearance
 - ii. NR-WR: Gwalior-Jaipur due to delay in constitution of National Wildlife Board.
 - iii. SR & NEW Grid: Load & generation scenario in SR Grid vis a vis NEW grid has undergone reversal. Raichur – Tamil Nadu line is held up due to ROW problem in Karnataka. Karnataka is asking for cost of land.

All the above lines are expected to come in next 3-4 months, but the associated 220 kV network in the States has not come up in many cases.

- c. There has been a growth of about 51% in ISTS in last 5 years but no 220 kV network of the state exists in respect of 15 sub-stations of 400 kV.
- d. Transmission planning is not able to capture location of generation properly as generation is rotating. For example, during the 11th Plan, Eastern Region (ER) was to supply power to NR but generating stations (Barh, DVC, Tilaiya, etc.) did not come up. The inter-regional transmission capacity therefore becomes grossly underutilised.
- e. Planning is done for import of power by states considering States' load, State own Generation, State transmission losses + 30% for taking care of variation in estimate. Aggregate of such import requirement of states in a region gives inter-regional power transfer requirement. However, in actual conditions, flow varies. For example, Raichur-Solapur

was built for exporting power from SR to WR but there has been a complete reversal in load-generation scenario of SR & WR.

A copy of presentation prepared by POWERGRID bringing out salient issues circulated in the meeting is attached at ***Annexure-II.***

7. CERC mentioned its concern on the matter that situational awareness about congestion becomes available to stakeholder very late. While system is being planned five years in advance and till one year before it is stated that new transmission line will result in increase of integrated power transfer, but just before commissioning of transmission assets, it is declared that Transfer Capability would not increase as expected. In such a situation generation & drawee customers have no time to react to the situation. CEA, CTU & POSOCO have access to better data & simulation facilities. They should therefore make stakeholders aware about emerging situation well in advance so that contracts of power transfer do not get affected at the last moment.
8. CEA, CTU & POSOCO in consultation with stakeholders should come out with a consistent approach to consider SPS in ATC/ TTC computation and issue of SPS rating of Agra-Gwalior line must be settled expeditiously for optimum utilisation of 765kV systems.
9. Shri Shahi mentioned that gestation period of transmission being shorter than generation, transmission planning needs to be sensitive to dynamic conditions unfolding in regard to generation. Gap between TC & ATC attributable to States may be found and the same needs to be communicated to them. It needs to be found out that how much of the gap has occurred due to dynamic situation. States need to be called for discussion & mechanism should be institutionalised, may be by involving consultants to provide first hand information about realistic data and gaps in execution so that one could navigate and replan.

10. Prof. Srivastava of IIT, Kanpur mentioned that given the generation which is there, the transmission system can evacuate only to the extent load is there and this is leading to under utilisation of transmission system. Therefore, the load not met / served needs to be identified. Shri Shahi mentioned that States are not indenting power and generation being highly capital intensive, load needs to be met by the States for mitigating shortage of power. He also emphasised that till the situation we are beset with, do we recognise constraining of generation or there are some methods which can yield quicker results in mitigating congestion in transmission.

11. Sh. S. K. Soonee, CEO, POSOCO presented highlights of a presentation prepared by POSOCO covering following.

- a. Loading of transmission lines decreases with increase in quantum of power to be transferred. Even in advanced countries, the loading is of the order of 21%. He circulated lists containing loading of lines in various countries (**Annexure- III**).
- b. A list of NERC tutorials and documents, POSOCO has been referring to.
- c. ATC issue is entirely due to market. Every Generator wants to sell power where he can get higher rate and customer wants to buy power from cheaper sources. Thus cost of generation impacts transmission planning.
- d. The transmission system should be planned on the basis of ATC and not on the basis of TC.
- e. In the last 4 years, many generators have come up with only Connectivity and no planned evacuation system and they are desirous of evacuation in 360 degrees.
- f. Culture of forecasting Import and Export by each State has to be inculcated.
- g. Dampening controllers are required to control oscillations.

A copy of the presentation prepared by POSOCO circulated in the meeting is enclosed at **Annexure-IV**.

12. Prof. Soman of IIT, Mumbai gave a presentation on methodology of managing congestion. He gave an example where TTC was raised from 1800 MW to 3000 MM by use of phase shift transformers and congestion in Mumbai system was mitigated. A copy of the same is enclosed at **Annexure-V**.
13. POWERGRID representative mentioned that the problem of congestion has been witnessed during last 3-4 years and having known them, 11 High Capacity Power Transmission Corridors are being developed based on target region only to cater to requirements of market. Green Energy Corridors are also being developed for evacuation of power from Renewable Energy Sources. However, in order to improve TTC/ATC declaration, more real time studies are required and the tools for the same are presently not available.
14. It is noted that reliability standards like the ones in NERC, may also be devised in India. NERC document on Reliability concepts is available at http://www.nerc.com/files/concepts_v1.0.2.pdf which explains important issues like credible contingencies.
15. During the discussions it was felt that CEA may also be invited in the meetings so as to get their views and inputs in regard to existing & proposed methodology of transmission planning & TTC/ATC declaration.
16. After discussions, the following action points emerged for being addressed :
 - a. POWERGRID and POSOCO may determine following:
 - i. How much transmission capacity has been created and how much of it has become partly or completely redundant/ idle contributing to the gap. Reasons for same may be categorised under major heads like non-

availability of state network, non-availability of expected generation, dynamic generation, etc.

ii. Short term solutions covering strategic shift in operation of generating units like backing down or two shifting of units, installation of hardware /software be suggested so that larger flows become permissible.

iii. Measures/ safeguards be suggested under following heads

1. Short term : less than 3 months
2. Medium term : 3-6 months
3. Long term : more than 6 months

iv. A mechanism like an audit to check working of the requisite systems as per requirements may be institutionalised.

b. APP to get data from Generators regarding issues in dispatch of power plants.

17. Next meeting is proposed to be held at 10.30 a.m. on 15.9.2014 in CERC Committee Room, third floor.

List of participants for Congestion Sub-Committee meeting on 22.8.2014

Sl.No.	Name(S/Shri)
1.	R.V. Shahi, Former Secretary (Power),Gol
2.	Ashok Khurana, DG, APP
3	Hemant Sharma,CMD GRIDCO
4.	I.S. Jha, Director (Projects), POWERGRID
5.	S.K. Soonee, CEO, POSOCO
6	Prof. S.C. Srivastava, IIT Kanpur
7	Prof. S.A. Soman, IIT Mumbai
8.	A.K. Saxena, Chief (Engg.), CERC
9.	Y.K. Sehgal, COO, CTU
10.	V.K. Agarwal, ED, NLDC
11	S.R. Narasimhan, AGM, POSOCO
12	V. Menghani, CERC
13	Vikram Singh, CERC
14	D Rozekar, AGM, POWERGRID
15	Shilpa Agarwal, CERC