

**Central Electricity Authority**  
**System Planning & Project Appraisal Division**  
**Sewa Bhawan, R.K. Puram, New Delhi – 110066.**

No. 51/4/SP&PA-2001/

Date : 14-9-2004.

**To**

1.The Member Secretary, Southern Regional Electricity Board, 29, Race Course Cross Road, Bangalore 560 009. FAX : 080-22259343	2.The Executive Director (Engineering), Power Grid Corp. of India Ltd. “Saudamini”, Plot No.2, Sector-29, Gurgaon 122 001,Haryana.. FAX : 95124-2571802
3.The Director (Transmission), Transmission Corp. of Andhra Pradesh Ltd., Vidyut Soudha,Hyderabad – 500 082.  FAX : 040-55665137	4.The Director (Transmission), Karnataka State Power Transmission Corp. Ltd.,Cauvery Bhawan, Bangalore 560 009. FAX : 080 -22228367
5.The Member (Transmission), Kerala State Electricity Board, Vidyuthi Bhawanam, Pattom, P.B. No. 1028, Thiruvananthapuram - 695 004. <b>FAX : 0471-2446452, 2448213</b>	6.The Executive Director/ Planning, Tamil Nadu Electricity Board, 6 <sup>th</sup> Floor, Eastern Wing, 800 Anna Salai, Chennai – 600 002. <b>FAX : 044-28525587, 28525639</b>
7.The Director (Power), Corporate Office, Block – I, Neyveli Lignite Corp. Ltd., Neyveli, Tamil Nadu – 607 801. <b>FAX : 04142-252646</b>	8.The Superintending Engineer –I, First Floor, Electricity Department, Gingy Salai, Pondicherry – 605 001.  <b>FAX : 0413-2334277</b>
9.Shri K. Prakasa Rao, General Manager I/C Engineering Division, NTPC Ltd., Engg. Office Complex, A-8, Sector 24, Noida – 201 301. <b>FAX: 95120-2410201</b>	10. Shri N. S. M. Rao The General Manager (Transmission), Nuclear Power Corp. of India Ltd., 12 <sup>th</sup> Floor,Vikram Sarabhai Bhawan, Anushakti Nagar, Mumbai – 400 094. <b>FAX : 022-25556513/25563350</b>
11. The Director (Tech), Power Trading Corpn. of India Limited, 2 <sup>nd</sup> Floor, NBCC Tower, 15 Bhikaji Cama Place, NewDelhi 110066. <b>FAX-011-51659504</b>	

**Sub:** 20<sup>th</sup> meeting of the Standing Committee on Power System Planning of Southern Region

**Sir,**

Please find enclosed the agenda note for 20<sup>th</sup> meeting of the Standing committee on Power System Planning of Southern Region. The venue, date & time of the meeting shall be intimated separately.

Encl: As above.

Yours faithfully,

**(B. M. Sethi)**  
Dy. Director (SP & PA)

## **Agenda for 20<sup>th</sup> Meeting of the Standing Committee on Transmission System Planning in Southern Region**

### **1. Confirmation of the minutes of 19<sup>th</sup> standing committee meeting held on 14<sup>th</sup> June, 2004 at Hyderabad.**

The summary record of the 19<sup>th</sup> meeting held on 14-6-04 at Hyderabad was circulated vide our letter No.CEA/51/4/SP&PA –2001/315-325 dt. 18-6-04. TNEB vide their letter No.SE/SS/EE1/AEE1/F Stg. Comm/D 268/2004 dated 18.8.2004 (copy enclosed) had some observations on the minutes, which are discussed below:

- 1.1 As regards the proposal of TNEB for reviewing of the LILO of 400 kV Gazuwaka-Vijaywada D/C line of Powergrid at Vemagiri S/S of APTRANSCO, it is intimated that in the earlier Standing Committee meetings and also in the 135<sup>th</sup> SRE Board meeting held on 10-08-04 at Chennai, all the constituent including TNEB agreed to the LILO works as it would improve security and reliability of the APTRANSCO network and also the entire SR grid.
- 1.2 In the context of the proposal for additional spare converter Transformers at Talcher and Kolar, TNEB wanted additional data on failure details and availability of HVDC converter transformers at Chandrapur, Padghe, Rihand and Dadri in India. Though in the 135<sup>th</sup> SRE Board meeting, all constituents agreed to the proposal, POWERGRID has been requested to furnish the information to all the constituents in SR.
- 1.3 Regarding utility of 80 MVar bus reactor at Nellore after completion of the construction of 400kV Nellore S/S by APTRANSCO, adequacy of the reactor could be evaluated by APTRANSCO and POWERGRID.
- 1.4 TNEB have proposed to take up construction of 400 kV Melakottaiyur S/S covered under Kaiga -II transmission system earlier by POWERGRID to meet growing load growth in Chennai area. They have proposed commissioning of the substation by March, 2006. Members may discuss the issue of pre-poning the substation. However, the issue needs to be discussed in SREB forum as it involves sharing of transmission charges by the beneficiary constituents of Southern Region.

No other observations have been received from participants. The minutes may, therefore, be confirmed.

## 2. Evacuation System for 500MWe Kalpakkam Prototype Fast Breeder Reactor (KPFBR) based Atomic Power Project

2.1 Kalpakkam PFBR atomic power plant with a capacity of 1x500 MWe is being programmed for commissioning in 2010 by Bharatiya Nabhikiya Vidyut Nigam Limited (BHAVINI), an undertaking of Govt. of India under the Deptt. of Atomic Energy. This project will be situated in the vicinity of the existing Madras Atomic Power Station (390MWe), Kalpakkam in Tamil Nadu..

2.2. NPCIL vide their D.O. Ir no.NPCIL/51000/Tr/225 dt. 18-5-04 have proposed to determine the evacuation arrangement for the power plant on the basis of the following tentative allocation made by MoP in their letter No. 8/2/2003-DVC dt 09-6-03 (copy enclosed).

Andhra Pradesh	-132MW
Karnataka	-72MW
Kerala	-43MW
Tamil Nadu	-167MW
Pondicherry	-11MW
<u>Unallocated</u>	<u>-75MW</u>
<b>Total</b>	<b>500MW</b>

2.3 Presently, MAPS (Kalpakkam) generation, in which TNEB have the major share, is evacuated through 220kV system and absorbed by the SR beneficiaries by displacement. As regards evacuation arrangements for the proposed KPFBR station (1x500MWe), studies have been carried out in CEA by stepping up the generation voltage both at 220 kV and 400 kV. Accordingly, the following transmission alternatives are being proposed together with the evacuation system earlier proposed by TNEB.

**KPFBR (1X500MWe) TRANSMISSION ARRANGEMENTS**

<b>Evacuation System (s)</b>		<b>Remarks</b>
<b>Option-I</b>	<p><b><u>Step-up Voltage at 220kV</u></b></p> <ul style="list-style-type: none"> <li>(i) KPFBR - Tharamani 220kV D/C line</li> <li>(ii) KPFBR - Kancheepuram 220kV S/C line</li> <li>(iii) KPFBR - Arni 220kV S/C</li> <li>(iv) LILO of existing MAPS-Villupuram 220kV S/C line at KPFBR</li> <li>(v) KPFBR - MAPS 220 kV S/C (2nd ckt.)-cable</li> </ul>	Transmission Proposal earlier proposed by TNEB and also indicated vide NPCIL lr. no.NPCIL/5100 0/Tr/225 dt 18-5-04
<b>Option-II</b>	<p><b><u>Step-up Voltage at 400kV</u></b></p> <ul style="list-style-type: none"> <li>(i) LILO of 400kV Neyveli-S P Budur S/C line at the PFBR station</li> <li>(ii) 2x315MVA, 400/220kV s/s at PFBR station</li> <li>(iii) LILO of existing MAPS-Villupuram 220kV S/C line at PFBR</li> <li>(iv) PFBR - MAPS 220kV 2nd Ckt (cable)</li> </ul>	
<b>Option-III</b>	<p><b><u>Step-up Voltage at 220kV</u></b></p> <ul style="list-style-type: none"> <li>(i) KPFBR - Kancheepuram 220kV D/C line</li> <li>(ii) KPFBR - Arni 220kV D/C</li> <li>(iii) PFBR - MAPS 220kV D/C-cable</li> </ul>	

**2.4 Results of Power Flow Studies on Transmission Arrangements**

The evacuation arrangements proposed in para 2.3 have been studied in CEA by taking into consideration the possible contingencies on case to case basis corresponding to the load-generation scenario of 2009-10 in SR. The share of other constituents is catered to by displacement.

**2.4.1** In Option-I, as suggested earlier by TNEB, generation from KPFBR station is stepped up to 220kV and evacuated through 220kV lines connected to Taramani, Kancheepuram, Arni & Villupuram 220kV sub-stations of TNEB. As KPFBR is close to potential load centers of TN, the KPFBR generation is primarily absorbed in TNEB grid and shares of other states is by displacement. Power flows on the various transmission lines are shown at Exhibit-I. The proposed 220kV system envisages construction of S/C lines in KPFBR-Kancheepuram and

KPFBR-Arni corridor, which could create RoW problems in future for further expansion of transmission lines in these corridors. As such, in this alternative, utilization of RoWs is sub-optimal. Also, it appears that the connection to Taramani may have to be made through cable resulting in more investment.

- 2.4.2** As an alternative, Option-II has been formulated in which generated power from KPFBR station is stepped up to 400kV and evacuated through LILO of 400kV Neyveli-S P Budur S/C line at the KPFBR with the creation of 400/220kV,2x315MVA step-down arrangement at the station. Power flows on the various transmission lines are shown in Exhibit-II. It is seen that power flow on lines emanating from the KPFBR plant are within limits even under contingencies. However, the transmission losses in this alternative are about 10 MW more than those in 220 kV alternative.
- 2.4.3** In the third case (Option-III), generated power from KPFBR station is stepped up to 220kV and evacuated exclusively through the 220kV arrangement. In this alternative, construction of a 220kV D/C line each to Arni, Kancheepuram and MAPS from KPFBR station are considered. Instead of constructing 220kV S/C line(s) in certain corridors as proposed in Option-I, the utilization of transmission corridors and RoWs is better in this alternative and distribution of transmission flows shown at **Exhibit-III** is more even. The results of the studies show that proposed system would meet evacuation requirements under all credible contingencies.
- 2.4.4** Tentative investment requirement have been worked out in all the above alternatives and a comparative statement is given in Annex-1.

The results of the studies as well as the likely investments have shown that Option-III would provide most optimal solution.

**Members may discuss and finalize the evacuation arrangement.**

## **2.5 Arrangement for Start - up power**

As per the planning criteria, an atomic power project should have two independent sources of supply for start-up power. As per Option-III, KPFBR Station would be strongly connected to the 220kV sub-stations of TNEB and the criteria of supplying start-up power from two independent sources could be met.

### **3. Additional spare Converter Transformers at Talcher and Kolar HVDC terminal stations.**

In the 19<sup>th</sup> meeting of the Standing Committee, all the constituents of SR agreed to implement the proposal subject to POWERGRID providing details regarding failure rate of the transformers within the country as well as in other countries, commercial implications etc. for taking up the matter in the 135<sup>th</sup> SRE Board meeting. POWERGRID vide their letter dt. 02-07-04 (copy enclosed) forwarded the information to all concerned justifying the technical requirement of the proposal. The issue was discussed in the 135<sup>th</sup> SREB meeting held on 10.8 2004 and all the constituents agreed to the proposal.

### **4. 400/220kV Kaiga sub-station and Upgradation and Operation of Kaiga-Davanagere 220kV D/C line at 400kV.**

Regarding upgradation and operation of Kaiga-Davanagere 220 kV D/C line at 400 kV, the 400 kV bay extension work at Davanagere S/s by KPTCL was targeted to be completed by July 2004 and the sub-station work at Kaiga APP by NPCIL was scheduled for completion by October 2004. NPCIL and KPTCL may intimate the status. Also APTRANSCO may intimate the present status of construction of Nellore Substation.

### **5. 10<sup>th</sup> and 11<sup>th</sup> Plan transmission program of State Utilities in SR and schedule for completion of various transmission works**

- 5.1 In the 10<sup>th</sup> & 11<sup>th</sup> plan period, generation capacity additions are being planned under State / Private / Central sectors to meet future load growth of the State utilities in Southern Region. Each state transmission utility has to prepare details of 400 kV, 220 kV, 132 kV and 66 kV transmission and transformation works in their state to be executed during 10<sup>th</sup> and 11<sup>th</sup> plan and submit the same to CEA.
- 5.2 Based upon the information received from the state utilities in response to CEA's letter no. 236/4/04-SP&PA/250-265 dated 19-05-2004, the status on X plan 220 kV and 132 kV programs of state utilities has been compiled and is enclosed at Annexure-II.
- 5.3 A presentation on the above was made to MoP in which MoP has desired following action plan:
- Reassessment of X plan 220 kV, 132 kV and also 66 kV requirement considering detail of
- Existing 220 kV / 132 kV / 66 kV network.
  - Deficiencies in the existing network.

- Programme for X plan and XI plan for overcoming the difficulties in the existing network and additional network to meet the transmission requirement corresponding to additional generation capacities and increase in load demand.
- Financial requirement for 220 kV / 132 kV / 66 kV works and how these are proposed to be funded. MOP has suggested that loan funds for expansion projects may also be sourced from PFC / REC.

State utilities may make a presentation covering above.

**6. LILO of one circuit of Ramagundam STPS-Hyderabad 400kV lines of POWERGRID at 400kV Gajwel S/S of APTRANSCO**

The construction of 2x315MVA, 400kV Gajwel S/S in AP and interconnecting 400kV lines to Ramagundam BPL station and 400kV Hyderabad (Mamidipalli) sub-stations have been approved to be established by APTRANSCO as part of evacuation system for Ramagundam BPL project (520MW) during 10<sup>th</sup> plan. The sub-station work could not be taken up due to delay in taking off the IPP generating station at Ramagundem. However, APTRANSCO have now intended to establish the S/s with a view to meeting the growing load requirements in Gajwel area. For feeding this sub-station, it is proposed to LILO of one circuit of Ramagundam STPS-Hyderabad 400kV lines of POWERGRID by APTRANSCO at their own cost.

**Members may discuss and finalize.**

**7. Status of various on-going Transmission works in central sector by POWERGRID in SR**

As desired in the 19<sup>th</sup> Standing Committee Meeting, POWERGRID may furnish the status of various transmission works being executed by them in the SR as also inter-regional schemes.

**8. Any other issue with the permission of Chair.**

**Annexure-II**

**Status of Xth Plan 220 kV & 132 kV Programme during 2004-07**

	220 kV Ckt. Kms		132/110 kV Ckt. Kms		220/132.220/66, 22033, 220/11 KV MVA		132/33, 132/11, 110/33, 110/11 KV MVA	
	Normative Requirement	Programme	Normative Requirement	Programme	Normative Requirement	Programme	Normative Requirement	Programme
<b>Andhra Pradesh</b>	<b>1308</b>	<b>4770</b>	<b>1195</b>	<b>560</b>	<b>3910</b>	<b>6720</b>	<b>3910</b>	<b>2500</b>
<b>Karnataka</b>	<b>936</b>	<b>3190</b>	<b>855</b>	<b>1062</b>	<b>2800</b>	<b>2300</b>	<b>2800</b>	<b>1270</b>
<b>Kerala</b>	<b>404</b>	<b>122</b>	<b>326</b>	<b>267</b>	<b>1210</b>	<b>1920</b>	<b>1210</b>	<b>1003</b>
<b>Tamil Nadu</b>	<b>1123</b>	<b>2122</b>	<b>1025</b>	<b>3215</b>	<b>3350</b>	<b>3700</b>	<b>3350</b>	<b>2700</b>
<b>Pondicherry</b>	<b>0</b>	<b>0</b>	<b>29</b>	<b>29</b>	<b>160</b>	<b>160</b>	<b>189</b>	<b>189</b>
<b>Southern Region</b>	<b>3771</b>	<b>10204</b>	<b>3430</b>	<b>5133</b>	<b>11430</b>	<b>14800</b>	<b>11459</b>	<b>7662</b>