

**Government of India  
Central Electricity Authority  
System Planning & Project Appraisal Division  
Sewa Bhawan: R.K.Puram  
New Delhi-110066**

No.26/10/2002-SP&PA/

Dated 7<sup>th</sup> Dec. 2004

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**Subject: 23<sup>rd</sup> Standing Committee meeting on Power System Planning in Western region**

Sir,

Minutes of the 23<sup>rd</sup> Standing Committee meeting on Power System Planning in Western region held on 23<sup>rd</sup> Dec. 2004 at WREB, Mumbai are enclosed.

**Encl. As above**

*P.K. Pahwa*  
7/12/2004  
**(P. K. Pahwa)**  
**Director (SP&PA)**

**Minutes of the 23rd meeting of the Standing Committee on Power System Planning for Western Region held on 23<sup>rd</sup> November 2004 at WRB, Mumbai.**

- 1.0 The 23<sup>rd</sup> meeting of the Standing Committee on Power System Planning for Western Region was held on Tuesday, the 23<sup>rd</sup> November 2004 at Mumbai. The list of participants is enclosed at Annex-I.
- 1.1 Chief Engineer (SP&PA) welcomed the participants to the meeting and thanked WREB for organizing the meeting. He stated that transmission system associated with Gandhar-II and Kawas-II was discussed during the last two meetings. The network proposed was generally acceptable to all. However, GEB had some suggestions regarding their 220 kV system and also wanted to get the fault levels checked. Further studies had been carried out which do not consider any additional 220 kV network in Gujarat but Torrent-Dehgam 400 kV D/C line as part of Torrent generation had been considered. As desired by some members during the last meeting load data, generation capacity addition considered in the study, tentative line length and estimated cost had been indicated in the agenda note for this meeting. The results of the study had been enclosed along with the agenda. He hoped that fruitful discussions would take place during this meeting and members would be able to arrive at a decision with regard to transmission network associated with Gandhar-II and Kawas-II.
- 1.2 Member Secretary, WREB thanked the participants for attending the meeting and stated that it was the privilege of WREB to host this meeting. The agenda items were thereafter taken up for discussion.
- 2.0 Confirmation of the minutes of the 22<sup>nd</sup> meeting of the Standing Committee on Power System Planning for Western Region.**
- 2.1 CE (SP&PA) stated that the minutes of the 22<sup>nd</sup> meeting of the Standing Committee on Power System Planning for Western Region held on 11<sup>th</sup> October, 2004 at Aurangabad were circulated vide CEA letter no. 26/10/2002-SP&PA/678-690 dated 19.10.2004. Subsequently MPSEB vide their letter 04-01/PSP/6884 dated 27-10-2004 had stated that views of MPSEB wherein they had requested for tentative cost of various works and line lengths had not been recorded in the minutes of the meeting.
- 2.2 The minutes of 22<sup>nd</sup> meeting were thereafter confirmed after addition of following para pertaining to views of MPSEB at the end of para 3.15 of the minutes.
- “He further added that in order to get approval from the management, it would be necessary to indicate cost of various works discussed and finalized during various Standing Committee meetings for implementation. He added that tentative length of lines might also be intimated based on the maps available with Powergrid”.

### **3.0 Transmission system associated with Gandhar Stage-II (1300 MW) and Kawas Stage-II (1300 MW)**

- 3.1 Giving a brief background Chief Engineer (SP&PA) stated that transmission system associated with Gandhar Stage-II and Kawas Stage-II was first discussed during the 21<sup>st</sup> meeting, wherein, it was decided that state utilities would visit CEA to view the studies and check the load generation scenario & 220 kV network of states considered in the study. To avoid any constraints in interconnection of the proposed 400 kV substations at Navi Mumbai with the existing MSEB network, it was also decided that a survey would be undertaken by MSEB and PGCIL engineers to identify the location of the proposed 400 kV substation. Subsequent to the 21<sup>st</sup> meeting engineers from MSEB and GEB visited CEA to view the results of the studies. The studies were updated by considering revised load and generation data received from GEB, MSEB, MPSEB and CSEB in July 2004. Torrent CCGT (1095 MW) proposed to come in the same time frame was also considered. Based on inputs received from PGCIL for survey of Mumbai area, LILO of 220 kV Apta-Kalwa D/C and Kharghar-Kandalgaon D/C at Navi Mumbai was considered. To meet the increased load demand of UT of DNH and their total central sector share, additional 220 kV line from Vapi (PG) to Khadoli was considered. The results of the studies were deliberated during the 22<sup>nd</sup> meeting, wherein, proposal of step up voltage of 400 kV was agreeable to all. Also establishment of 400/220 kV substation at Navi Mumbai by LILO of 400 kV Kalwa-Pune D/C line, LILO of 220 kV D/C Apta-Kalwa and Kharghar-Kandalgaon at Navi Mumbai was agreeable. The proposal of Vapi-Magarwada (D&D) 220 kV D/C, Vapi-Kharadpada (DNH) 220 kV D/C and 220 kV Vapi-Khadoli (DNH) 220 kV D/C was agreeable to all. In respect of Vapi-Magarwada and Vapi-Kharadpada 220 kV D/C lines, it was decided to construct a multi circuit 2X D/C line between Vapi (PG) and line alignment of Bhilad-Magarwada (D&D) and Bhilad-Kharadpada (DNH) lines by bypassing both the lines at Bhilad. It was also decided that these lines would be part of regional system from the date of their commissioning. Proposal of Gandhar-Rajkot (GEB) 400 kV D/C, Gandhar-II-Kawas-II 400 kV D/C and Kawas-II-Vapi (PG) 400 kV D/C with Quad conductor was agreeable to all except GEB who were to give their confirmation based on their study / analysis. During the meeting GEB had suggested that since fault levels in GEB network were high no additional 220 kV lines from Gandhar be considered. MPSEB had suggested additional 400 kV substations at Shujalpur to draw their increased share of power from Central Sector and it was decided that the proposal of MPSEB would be studied. Subsequent to the 22<sup>nd</sup> meeting further case studies had been done without considering any additional 220 kV network from Gandhar-II but considering Torrent-Dehgam 400 kV D/C line as part of Torrent generation. Studies indicated that provision of 3<sup>rd</sup> 315 MVA, 400/220 kV transformer at Vapi helped in reducing overloading in 220 kV network. Also flow from 400 kV to 220 kV justified the need for 3<sup>rd</sup> transformer at Vapi. Based on study results LILO of Kawas-Gandhar at Torrent as part of Torrent generation was a better option compared to LILO of Gandhar-Vapi 400 kV D/C line as the latter causes more flow on the underlying 220 kV network. Studies had shown that LILO of Gandhar-Dehgam 400 kV D/C at Karamsad (Kasor), which was earlier, agreed in 20th meeting, would not be required. Studies indicate short circuit

levels at Haldarva 220 kV would be of the order of 38 kA and with parallel operation of 400 and 220 kV network, some of the 220 kV lines of GEB would be overloaded. These could be addressed by bus splitting / insertion of reactors, shifting of loads and GEB would need to carry out study with regard to reconfiguration of their network. For meeting increased load demand in MPSEB, a 400/220 kV substation at Shujalpur by LILO of both circuits of Bina-Nagda 400 kV D/C was proposed. He requested the members to deliberate on the proposals.

- 3.2 CE (GEB) while agreeing to the proposal stated that the exhibits of load flows enclosed complete details of flows on 220 kV lines from Kakrapar (1&2) had not been indicated. He opined that with the proposed Gandhar-Rajkot 400kV D/C line there would be a need for third 400/220 kV, 315 MVA transformers at Rajkot. Based on GEB study the short circuit level at Haldarva was of the order of 43 KA and requested CEA for a study for reconfiguration of 220 kV / 132 kV GEB network to reduce loadings and short circuit levels.
- 3.3 CE (SP&PA) clarified that network represented in the study considered complete 220 kV network of Kakrapar. However, it was not possible to show the detailed network on A-4 size sheet and only relevant network had been shown. He agreed that flows as per study on the various 220 kV lines from Kakrapar would be forwarded to GEB. Regarding third 315 MVA transformer at Rajkot, he clarified that Rajkot substation was under the preview of GEB and in case they felt the need for 3<sup>rd</sup> transformer, GEB could install the same. With regard to study for reconfiguration of 220 kV network of GEB, CE (SP&PA) stated that CEA could carry out a study only if complete data with regard to switching schemes of all substation, ratings of CBs, availability of space for providing sectionalizes etc. was made available. CE (GEB) agreed to send the required data and also associate GEB engineers in the study.
- 3.4 Chief Engineer, NPCIL stated that LILO of 220 kV Tarapur-Navsari at Bhilad had been proposed by WREB for which NPC had reservations. Now since loads of UT of DNH and D&D are being shifted from Bhilad to Vapi this LILO may not be necessary. CE (SP&PA) clarified that issue of LILO of 220 kV Tarapur-Navsari at Bhilad needs to be resolved in Operating Committee meetings of WR.
- 3.5 To a query from Member Secretary, WREB regarding the basis of allocation of shares in Gandhar-II and Kawas-II, GM (NTPC) clarified that the allocation was mainly based on the Gadgil formulae. However, paying capacity of the constituents was also taken in to consideration.
- 3.6 ED (PGCIL) stated that in the proposal the Gandhar-II and Kawas-II network had been shown jointly and suggested that while finalizing the network the same should be segregated. However, PGCIL would be preparing a joint DPR and implementing both the projects concurrently. AGM (WR), PGCIL informed that 200m x 200m of land had been identified near Panvel for setting up a 400/220 kV substation at Navi Mumbai and a GIS would be established instead of conventional outdoor substation. Members agreed to GIS substation at Navi Mumbai against conventional substation in case adequate land was not available.

The suggestion of PGCIL for segregating the network for Gandhar-II and Kawas-II was also agreed.

- 3.7 GM, NTPC informed that in the bids floated for Kawas-II generation project a 400/220 kV interlinking transformer had been included as part of specifications. He stated that in case NTPC decided to retain this transformer then to avoid increase in fault levels and overloading on 220 kV side this transformer would be operated in radial mode and would not be interconnected with the 220 kV side.
- 3.8 To a query from Member Secretary regarding the agency, which would be carrying out the LILO of Apta-Kalwa 220 kV D/C and Khargar-Kandalgaon 220 kV D/C line, it was clarified by CE (SP&PA) that LILO works would be under the preview of MSEB. However provision of line bays would be provided by PGCIL. As per normal practice for Central Sector transmission, for every 315 MVA ICT, 2 no 220 kV line bays would be provided. The balance line bays would be at the cost of MSEB.
- 3.9 After discussions the following network for Gandhar-II and Kawas-II was agreed.

**Transmission System associated with Gandhar-II**

- i) Gandhar (NTPC)-Rajkot (GEB) 400 kV D/C
- ii) Gandhar (NTPC)-Kawas 400 kV D/C
- iii) Establishment of 2x315 MVA 400/220 kV substation at Shujalpur
- iv) LILO of both circuits of Bina-Nagda 400 kV D/C line at Shujalpur.

**Transmission System associated with Kawas-II**

- i) Kawas-II-Vapi (PG) 400 kV D/C Quad
  - ii) Vapi (PG)- Navi Mumbai 400 kV D/C
  - iii) LILO of Kalwa-Pune (PG) 400 kV S/C line at Navi Mumbai,
  - iv) Vapi (PG)-Khadoli (DNH) 220 kV D/C
  - v) Establishment of 400/220 kV 2x315 MVA S/S at Navi Mumbai (GIS in case adequate land is not available).
  - vi) LILO of Apta-Kalwa and Khargar-Kandalgaon 220 kV D/C lines at Navi Mumbai. (LILO works under preview of MSEB, 220 kV bay provision at Navi Mumbai by PGCIL)
  - vii) Installation of 400/220 kV 1x315 MVA 3<sup>rd</sup> transformer at Vapi
- 3.10 It was also decided that LILO of both circuits of Gandhar-Dehgam 400 kV D/C at Karamsad (Kasor) agreed during the 20<sup>th</sup> meeting of the Standing Committee would not be required and stands deleted.
- 3.11 It was further decided that Vapi (PG)-Magarwada (D&D) 220 kV D/C and Vapi (PG)-Kharadpada (DNH) would be taken up as independent system strengthening scheme and these lines would form part of regional system from the date of their commissioning. These lines would be implemented by construction of a multi circuit 2xD/C line between Vapi and route alignment of existing Bhilad-Kharadpada and Bhilad-Magarwada lines and by bypassing both the lines at Bhilad.

#### **4.0 Other Items**

- 4.1 CE (NPCIL) stated that for evacuation of power from Kakrapar Extn (3&4) based on preliminary study carried by CEA, NPC had requested GEB for confirmation of space availability for termination of one line bay at Ukai 400 kV S/S, however GEB had apprehensions that under outage of 400 kV Kakrapar Extn-Ukai S/C line there is possibility of some of their 220 kV lines from Ukai getting overloaded. CE (SP&PA) clarified that detailed studies for evolving transmission system for Kakrapara Extn 3&4 would be carried out after all necessary clearances are in place. The results of the detailed studies would be discussed in this forum and views of various constituents would be considered.
- 4.2 CE (GEB) raised the issue of sharing of cost of inter regional 400 kV Ranchi-Rourkela-Raipur line by WR constituents. CE (SP&PA) clarified that Ranchi-Rourkela –Raipur line was meant purely for transfer of surplus power of Eastern Region to Western Region. As per projected load generation scenario WR would continue to be deficit by about 4000-6000 MW during XI Plan period and Eastern Region would continue to remain surplus. He stated that pick up point Ranchi was strongly connected to the ER grid and due to long transmission distance involved, it was necessary to have an anchor point Rourkela in ER. The studies indicated that that the power flow on the Ranchi-Rourkela line would be purely meant for transmission to WR and no benefit would accrue to ER. This link was for catering to the requirements of WR exclusively and hence it was felt that transmission charges for this link should be fully borne by WR. The issue was discussed and agreed during the 19<sup>th</sup> meeting. The agenda note for that meeting gives justification for bearing of full transmission charges by WR constituents. To a request by CE (GEB), CE (SP&PA) agreed to send a detailed note on this subject to GEB

#### **5.0 Long term open access for interstate transmission system**

- 5.1 Long-term open access of interstate transmission pertaining to request of LANCO Amarkantak Pvt. Ltd for 250 MW was discussed. Detailed minutes in this regard would be issued by PGCIL.
- 5.2 During the meeting LANCO representative indicated that they had plan for future expansion. No decisions were taken as LANCO had to confirm regarding time frame of commissioning of various stages, ultimate capacity and beneficiaries of the project.

In the end Chief Engineer (SP&PA) thanked the participants for attending the meeting and arriving at decision with regard to transmission network for Gandhar-II and Kawas-II. He thanked WREB for organizing the meeting.

**Annexure-I**

**List of Participants**

The following officers participated in the **23<sup>rd</sup> Standing Committee Meeting** on Power System Planning held on 23<sup>rd</sup> November 2004 at WREB, Mumbai.

S. No	Name	Designation	Tel. / Mobile / Fax No.
<b><u>CEA (SP&amp;PA)</u></b>			
1.	V. Ramakrishna	Chief Engineer.	
2.	P. K. Pahwa	Director.	
<b><u>WREB</u></b>			
3.	S. Sivan	Member Secretary	
4.	Manjit Singh	S. E. (op.)	022-28209506 / 28321386
5.	S. G. Tenpe	S.E. (C)	
6.	S. Satyanarayan	E.E. (OS)	022-28320756, 9819064944 022-28370193 (fax)
7.	N. V. Prasad	E.E.	
8.	V. K. Gupta	A.D.	
<b><u>MSEB</u></b>			
9.	P. R. Ganage	CE (Tr. Pl.)	
10.	N. J. Katekar	S. E. (Tr. Plg)	9819218824
<b><u>CSEB</u></b>			
11.	D. P. Sharma	Addl. CE.	
<b><u>MPSEB</u></b>			
12.	Dr. R.P. Bhatele	Supdt. Engineer (PSP)	0761-2702148 / 9425152817
13.	Smt. Deshraj Rekhi	E.E.	
<b><u>GEB</u></b>			
14.	J. B. Shah	C. E. (Tr.)	
15.	G. B. Prasad	D. E. (System)	
<b><u>Elec. Dept. of GOA</u></b>			
16.	S. A. Mandrekar	SE (Com./EHV)	
<b><u>Daman Elect.</u></b>			
17.	N. N. Tandel	E.E.	
<b><u>D.N.H. Elec. Deptt.</u></b>			
18.	H. M. Patel	D.E.	
<b><u>NPCIL</u></b>			
19.	N.S.M. Rao	CE	
20.	Sandeep Sarwate	SO/F	
<b><u>NTPC</u></b>			
21.	N. N. Misra	GM (P.E.)	0120-2410228
22.	Parmod Kumar	DGM (P.E.)	
<b><u>PTC</u></b>			
23.	S.K. Dube	Director (O)	011-51659503
24.	H. Saran	Sr. Mgr.	

	<u>POWERGRID</u>		
25.	R.N. Nayak	Exe. Director (Engg.)	0124-2571801, 9811422111
26.	Y.N. Sehgal	DGM (ENGG)	0124-2571815, 9811227885
27.	D.K. Valecha	AGM (WRTS)	0712-2641472