

26th August

भारत सरकार
केन्द्रीय विद्युत प्राधिकरण
प्रणाली योजना एवं परियोजना मूल्यांकन प्रभाग
सेवा भवन, रामकृष्णपुरम्, नई दिल्ली 110066

क्र. सं.: 26/10/2002/प्रयोपमू/

दिनांक: 17.11.2006

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विषय : पश्चिमी क्षेत्र विद्युत प्रणाली योजना की स्थाई समिति की 26वीं बैठक ।

पश्चिमी क्षेत्र विद्युत प्रणाली योजना की स्थाई समिति की 26वीं बैठक के कायसूची संलग्न है।

संलग्न - उपरोक्त

पि. के. पाहवा
17/11/06
(पि. के. पाहवा)
निदेशक

→ Sh. SP. AP-II
for na
R. Sharma
05/10/16

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/776-33

Dated 17th Nov. 2006

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Subject: 26th meeting of Standing Committee on Power System Planning in Western region

Sir,

Agenda for the 26th meeting of Standing Committee on Power System Planning in Western region held are enclosed. Date and venue of the meeting will be intimated separately. Additional agenda item, if any, proposed by any constituent may please be intimated to us at the earliest.

Encl. As above

P.K. Pahwa
(P. K. Pahwa) 17/11/06
Director, SP&PA, CEA

[Signature]
17-11-06

**Agenda note for 26th Meeting of Standing Committee on
Power System Planning in Western Region.**

1.0 Confirmation of the minutes of 25th Standing Committee on Power System Planning in Western Region held on 30.09.2006 at New Delhi

The minutes of the 25th meeting of Standing Committee on Power System Planning in Western Region held on 26.09.2005 at WREB, Mumbai were circulated vide CEA letter no. 26/10/2002-SP&PA/693-706 dated 31.10.2006.

No comments from any utility have been received.

The minutes may please be confirmed.

2.0 Establishment of 400/220 kV S/S at Shujalpur

- 2.1 During the 23rd meeting of the Standing Committee on Power System Planning held on 23rd November 2004, establishment of 2x315 MVA 400/220 kV S/S at Shujalpur by LILO of both circuits of Bina-Nagda 400 kV D/C was agreed as a part of transmission system associated with Gandhar-II. Subsequently investment approval of Gandhar-II transmission scheme was accorded by the Government in Aug 2006 with the stipulation that "The contract for the transmission system linked to Gandhar-II will be awarded by PGCIL only after NTPC has signed the Fuel supply agreement". CE (Planning) MPPTCL vide its letter no. 04-01/PSP/8375 dated 7-10-06 addressed to Member Secretary, WRPC and a copy endorsed to CE (SP&PA) has proposed taking up Shujalpur S/S as a regional system strengthening scheme (delinked Gandhar-II) so that this S/S could be created at the earliest. MPPTCL has stated that this substation is required to meet the increased system demand. Members may deliberate and decide.

3. Requirement of reactors in WR Grid

- 3.1 Over-voltage conditions are being experienced under light load conditions at some of the substations viz Khandwa, Dhule, Indore, Karamsad, Dehgam Nardipur, Kolhapur and Mapusa substations in Western Grid. PGCIL have carried out a study to assess the requirement of line reactors and bus reactors required at various stations of Western Grid. The list of reactors along with their capacity and stations where they are required is as follows:

- 1x125 MVAR bus reactor each at 400 kV substations at Khandwa, Dhule, Indore, Dehgam, and Kasor
- 1x80 MVAR bus reactors each at 400 kV substations at Karad & Nardipur

Provision of the above reactors could be covered as Western Regional System Strengthening Scheme – VI (WRSSS-VI)

Copy of the proposal received from PGCIL is enclosed at Appendix-3.1. PGCIL may present their study results and members may deliberate/decide.

4. **Inter-regional Transmission system for power export from NER to NR/WR and power evacuation system in NER for Subansiri Lower HEP (2000MW) and Kameng HEP (600MW).**

4.1 Comprehensive transmission system has been evolved for power evacuation from generation projects in NER, Sikkim and Bhutan. Transmission system associated with specific generation and transmission system from the pooling stations up to the de-pooling stations have been identified. The transmission system for NER projects would benefit the NER as well as the other regions which would avail NER power. Similarly for hydro projects in Sikkim and Bhutan, as the projects would benefit ER as well as the other regions which would avail power. Accordingly, the committers who would have the long-term commitment for the transmission charges for the transmission systems have also been identified and allocation of transmission charges suggested.

4.2 Constituents of WR have already concurred to the proposal of NER-NR/WR inter-regional HVDC system subject to firm allocation of power from hydro projects in NER. Earlier, it was proposed to be ± 600 kV, 4000MW HVDC system, upgradable to ± 800 kV, 5330MW system. Taking into account developments in ± 800 kV HVDC technology, the proposal has now been modified to ± 800 kV HVDC system with 3000MW rectifier/inverter modules at Bishwanath Chariyali/Agra and 3000MW rectifier/inverter modules at Siliguri/Agra. The transmission system proposal is:

PART-A: North East – Northern/Western Interconnector-I

- Bishwanath Chariyali HVDC/power pooling station.
- Siliguri HVDC/power pooling station towards north-west of Siliguri town.
- Extension of Agra s/s to have HVDC terminal and associated facilities.
- Bishwanath Chariyali – Siliguri – Agra ± 800 kV, 6000 MW HVDC bi-pole line
- HVDC rectifier/inverter modules of 3000MW at Bishwanath Chariyali/Agra
- HVDC rectifier/inverter modules of 3000MW at Siliguri/Agra
- LILO of Kameng – Balipara 400kV D/C line at Bishwanath Chariyali
- LILO of Ranganadi-Balipara 400kV D/C at Bishwanath Chariyali
- LILO of Depota-Gohpur 132kV S/C at Bishwanath Chariyali
- 2x200MVA 400/132 s/s at Bishwanath Chariyali
- LILO of Teesta-V – Siliguri 400kV D/C line at Siliguri HVDC station.

PART-B: Transmission system for evacuation of power from Kameng HEP

- Kameng-Balipara 400kV D/C line (line to be routed via Biswanath Chariyali)
- 400/220kV 2x315 MVA substation at Rangia through LILO of Balipara-Bongaigon 400kV D/C line
- 220kV 2xD/C lines from Rangia – one D/C line to Gauhati (Assam) and one D/C line to Brynhat (Meghalaya)

PART-C: Transmission system for evacuation from Lower Subansiri HEP up to Biswanath Chariyali pooling station

- Subansiri Lower – Biswanath Chariyali 400kV 2xD/C lines.

4.3 As NR and WR would be beneficiary of the NER-NR/WR inter-connector system, It is proposed that transmission charges for Part-A may be shared by NR and WR in 50:50 ratio, and recovered as pooled transmission charges of the respective region.

CEA has suggested that 70% of power from Kameng and Subansiri Lower may be allocated to NR and WR on 50:50 that is 35% to the NR and 35% to WR. Similar allocations for Sikkim and Bhutan projects should also be considered.

- 4.4 For the beneficiaries outside NER, the transmission charges for Part-B is proposed to be shared in proportion to their allocation from Kameng HEP and the transmission charges for Part-C in proportion to their allocation from Lower Subansiri HEP.
- 4.5 To provide better security of transmission line in the chicken-neck area, it is proposed that the two poles of the bi-pole line could be on separate towers in the chicken-neck area. Both the line should be of bi-pole specification and the second bi-pole could be strung at a later date when next 6000 MW corridors is developed. The benefit of this link would be derived by the States of Northern Region and Western Region would be receiving the much needed power. The tentative estimated cost of Phase-1 of this scheme is Rs 7440 crores (Rs 2400 crores for the HVDC terminals and Rs 5040 crores for the transmission line). In Phase-2, when 3000MW modules are added, the additional cost would be towards the HVDC modules only. In view of the programme of Teesta-III and other HEPs in Sikkim, it may be desirable to go for multi-terminal HVDC scheme from beginning in a single phase implementation.

Members may discuss and concur.

5. Transmission system for power evacuation from Sasan and Mundra Ultra Mega Projects

- 5.1 During the 25th meeting, the transmission system associated with Sasan (4000 MW and Mundra (4000 MW) was discussed and the following evacuation system was agreed

Sasan Transmission System In WR: (Estimated Cost Rs. 3900 Crores)

- (i) Sasan-Satna 765 kV 2xS/C
- (ii) Satna 765/400 kV, 2x1000 MVA S/S
- (iii) Satna 765 kV-Satna 400 kV D/C quad inter-connecting line
- (iv) Satna-Bina (PG) 765 kV 2xS/C
- (v) Bina (PG)-Bina (MP) 400 kV D/C (2nd line)
- (vi) LILO of both circuits of one of the Vindhyachal-Satna 400 kV D/C line at Sasan 400 kV 2xD/C
- (vii) Fixed Series Comp 30% on 400kV Sasan-Satna D/C
- (viii) Fixed Series Comp. 30% on both of Satna-Bina 2xD/C
- (ix) Bina (PG)-Indore 765 kV S/C
- (x) New 765kV substation at Indore, 2x1500 MVA 765/400kV
- (xi) Indore 765kV s/s – Indore existing 400kV s/s 400 kV D/C quad inter-connecting line

- (xii) 765 kV operation of Agra-Gwalior-Bina-Seoni 765 kV lines and Upgrading Bina and Gwalior s/s to 765kV: 2x1000MVA 765/400kV at Bina and 2x1500MVA 765/400kV at Gwalior

Mundra Transmission System In WR: (Estimated Cost Rs. 4100 Crores)

- i) Mundra-Limbdi 400 kV D/C (Triple Moose)
- ii) Mundra-Ranchhodpura 400 kV D/C (Triple Moose)
- iii) Mundra-Jetpur 400 kV D/C (Triple Moose)
- iv) Kawas-Navsari 400 kV D/C
- v) Navsari 400 kV substation 2x315 MVA 400/220 kV
- vi) LILO of both ckts of Kawas-Navsari 220kV D/C line at Navsari 400kV s/s
- vii) Navsari-Mumbai New Location (PG) 400kV D/C and connecting to HVDC side of MSEB at this new s/s
- viii) Wardha 765kV s/s with 2x1500 MVA, 765/400kV
- ix) 765kV operation of Seoni-Wardha 2xS/C lines
- x) Wardha-Aurangabad 400kV D/C quad with 40% Fixed Series Capacitor

Subsequently, based on Northern Region focused studies, transmission system for Sasan and Mundra required in the Northern Region has been finalised in the NR Standing Committee. The system approved for Northern Region is given below.

Sasan and Mundra Transmission System in Northern Region (Estimated cost Rs. 2000 Crores)

- (i) Sasaram-Fatehpur 765kV S/C (second line)
- (ii) Fatehpur-Agra 765kV S/C (second line)
- (iii) LILO of both circuits of Kanpur-Auraiya 400kV D/C to Fatehpur
- (iv) Agra-Reengus(or Alwar) 400kV D/C quad
- (v) New 400/200kV 2x315MVA s/s at Reengus (or Alwar) with 220kV D/C line interconnecting to 220kV s/s
- (vi) Reengus (or Alwar) - Jaipur PG 400kV D/C
- (vii) Reengus (or Alwar) – Ratangarh 400kV D/C
- (viii) LILO of both circuits of Nathpajahkri-Abdullapur 400kV D/C at Panchkula with 2x315MVA 400/220kV s/s at Panchkula
- (ix) Bahadurgarh – Sonipat 400kV D/C with 2x315MVA 400/220kV s/s at Sonipat

The sharing of transmission charges for Sasan and Mundra Transmission system in WR as well as NR was also discussed during the last meeting and any of the following two options were agreed by WR constituents and it was agreed that the option that would be agreeable to the NR constituents would be adopted.

Option-1: Transmission charges for Sasan and Mundra transmission system in WR be pooled in to WR regional pooled transmission charges and NR beneficiaries sharing the same based on their total allocation from WR pool including Sasan and Mundra power. And transmission charges for Sasan and Mundra transmission system in NR shared by NR beneficiaries.

Option-2: Total transmission charges for Sasan and Mundra transmission system in WR as well as in NR be divided in to NR and WR in ratio of their allocation from Sasan and Mundra and pooled in to regional pooled transmission charges of the respective regions.

The sharing of transmission charges was also taken up with the NR constituents and Option -2 of sharing of transmission charges was acceptable and agreed by them. Hence it is proposed that the same could be adopted. Members may deliberate and concur.

6. Upgrading Load Dispatch Scheme

- 6.1 Since the design and implementation of the unified load dispatch scheme, there have been several development in the system for which formulation and implementation of a comprehensive UNIFIED SCADA UP-GRADATION SCHEME is required. Powergrid would need to formulate the scheme and take-up its implementation expeditiously. Such up-gradation schemes should be formulated and implemented every three to four year so as to keep the data telemetry and SCADA functional system up to date at the RLDC as well as SLDCs level. The focus of the upgrade should be to cover all the new as well as missing data so that State Estimation can be functionalized and other higher level EMS functions and state of art developments based on wide-area phase angle measurements are also operationalized.
- 6.2 Transmission charges for the up-grade system could be recovered in the same manner as that for the first Unified scheme.

Member may discuss and concur.

7. Any other item with the permission of chair.