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 6th September, 2007**

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Subject: 27th meeting of Standing Committee on Power System Planning in Western region

Sir,

Minutes of the 27th meeting of Standing Committee on Power System Planning in Western region held on 30th July, 2007 at Indore are enclosed.

Encl. As above

(P. K. Pahwa)
Director

Minutes of the 27th meeting of the Standing Committee on Power System Planning held on 30-7-2007 at Indore

The 27th meeting of the Standing Committee on Power System Planning was held on Monday the 30th July 2007 at Indore. The list of participants is at Annex-I.

Shri V.Ramakrishna, Member (PS), CEA welcomed all the participants to the meeting and thanked POWERGRID for organizing the meeting. He stated that during XI Plan additional transmission capacity corresponding to 78500 MW generation additional program needed to be developed. Most of the upcoming thermal stations would be pit head stations and accordingly transmission would need to be planned from these stations to load centers located at a far off distance. The pace of development in transmission and sub- transmission needed to be stepped up. He hoped that the constituents would lend necessary cooperation and also take necessary steps to meet the targets in transmission and sub-transmission. The agenda items were thereafter taken up for discussions.

1. Confirmation of the minutes of 26th meeting of Standing Committee on Power System Planning in WR held on 23-02-2007 at Mumbai.

1.1 Chief Engineer (SP&PA) stated that minutes of 26th meeting of the Standing Committee on Power System Planning in Western Region held on 23.02.2007 at WREB, Mumbai were circulated vide CEA letter no. 26/10/2002-SP&PA/110-124 dated 19.03.2007. Chief Engineer, MPTRANSCO vide his letter no. 04-01/PSP/N-171/2796 dated 9th April 2007 has stated that he had proposed LILO of Indore-Asoj line at Indore 765 kV (PG) whereas the minutes reflected LILO of Indore-Nagda 400 kV D/C line at Indore 765 kV (PG) . He had sought corrections in second sub-para of para 5.0 on page 11 of the minutes. No comments from any other constituent had been received. The minutes of the 26th meeting of SCM of WR were thereafter confirmed with the following amendments:

Second sub para of para-5.0 on page 11 to be read as:

"Chief Engineer, MP TRANSCO stated that instead of LILO of Indore-Nagda 400 kV D/C line at proposed Indore 765 kV substation of PGCIL, LILO of both the Indore-Asoj S/C lines should be proposed at Indore 765 kV S/S of PGCIL

At sl. no. X page no. 12

"LILO of both circuits of Indore-Nagda 400 kV D/C line at Indore (PG) (765)" to be deleted and replaced by "LILO of both the Indore-Asoj 400 kV single circuit lines at Indore (PG) (765)"

2. Review of Progress of Earlier agreed transmission schemes

2.1 The status of various schemes under implementation indicated by PGCIL during the meeting is enclosed at Annex-2

2.2 Chief Engineer, MPPTCL stated that target date as in the Standing Committee Meeting and reason for delay should also be indicated in the status report. He also suggested that proposed capacity allocation to various constituents at the time of firming up the evacuation system and the subsequent revision, if any, of the capacity allocation should also be included in the information.

2.3 NPCIL suggested that progress of underlying transmission schemes from the sub-station of PGCIL should be reviewed and the format should include target date, status, reason for delay, etc for these transmission elements also.

2.4 It was agreed that the format of reporting would be suitably reviewed and modified from the next meeting.

3. Transmission System for evacuation of power from Krishnapattnam UMPP (4000 MW) and requirements for additional transmission capacity between SR-WR

3.1 Chief Engineer (SP&PA) stated that transmission system for evacuation of power from Krishnapattnam UMPP (4000 MW) was discussed in the last meeting of the Standing Committee on Power System Planning of WR and agreed. Subsequently based on feedback and considering that the time frame of Tamil Nadu UMPP had slipped with respect to Krishnapattnam UMPP and also considering that additional generation was being taken-up at Bhopalpalli (500MW), Mettur(500 MW), Tuticorin Stage-IV (1000 MW), North Chennai TNEB (500 MW), Ennore TPS (500 MW) and Nagarjuna TPS (1015 MW) etc and estimated exportable surplus of 6700 MW (peak) and 12000 MW (off-peak) corresponding to 2014-15 conditions based on National Electricity Plan-Transmission, the total scheme was reviewed and discussed in the Standing Committee of SR on 18th June (24th meeting of SCM of SR) and the revised proposal had emerged and was agreed in SR. Thereafter he detailed the proposal and the studies as circulated in the Agenda note.

3.2 Chief Engineer, MPPTCL stated that detailed techno-economic justification for 1000 MW HVDC back-to-back at Narendra/Kolhapur along with cost benefit analysis and the justification for Pune (WR) – Navi Mumbai (WR) 400 kV D/C line under system strengthening work of Western Region showing the power flow under various conditions should be given.

3.3 CE, SP&PA, CEA stated that as brought out in the Agenda note for the meeting, the total requirement of inter-regional links between SR and WR was based on projections for 2013-14 wherein exportable surplus of SR was estimated to be of the order of 6700 MW during peak hours and 12000 MW during off peak hours of winter month. The projections as brought out in the ' National Electricity Plan ' Volume-II – Transmission – Page 5.4 (copy enclosed) had shown that Northern Region would be needing to import most of the power and as such, the power received by WR on the SR-WR links would be partly utilized in the WR and mostly wheeled to NR through displacement. The load flow studies and analysis

circulated with the agenda note for the 26th meeting had clearly shown the need of providing additional SR-WR transmission capacity through 2x765 kV S/C lines between Raichur (SR) and Sholapur (WR) and addition 1000 MW link between Narendra (SR) and Kolhapur (WR).

3.4 Advisor, CSEB, stated that Pune-Navi Mumbai 400 kV D/C line was primarily for the benefit of the Maharashtra alone and therefore, the reason for treating it as a regional system strengthening work was required to be elaborated.

3.5 Member (PS), CEA stated that Pune-Navi Mumbai 400 kV D/C line was identified as a part of total scheme and was proposed as a regional system strengthening scheme considering that the line would be required in the system irrespective of which generation project feeds the power in to the system. As the requirement of this line was a system requirement for catering to increasing load demand in the grid and not very specific to a particular generation projects, as was the practice, this was proposed as a regional system strengthening scheme. Such proposals had earlier been considered and agreed in other states also.

3.6 After further detailed discussion, the members concurred to the following schemes. It was also decided that a para giving details of cost economics would be included in the minutes.

3.6.1 Scheme –A : Increasing SR-WR Inter-Regional Transmission Capacity through HVDC back-to-back

Transmission System:

1) Narendra – Kohlapur 400kV D/C line
2) 1000 MW HVDC back-to-back at Narendra (or at Kolhapur, to be decided based on land availability) of which 500 MW through shifting of equipment from Sasaram.

As, transfer of equipment from Sasaram would involve commercial and assets related issues. Transmission charges of the existing scheme at Sasaram for equipment to be shifted as well as unusable and leftover assets, from the date of decommissioning, would be required to be transferred to new scheme and would

become payable by SR/WR constituents. The usable left over assets of land and building at Sasaram, would be credited when utilized in some future scheme.

Transmission Charges:

Transmission charges for this scheme would be shared by SR and WR constituents on 50:50 basis. Transmission scheme would be regional pool scheme of SR and WR.

Target Date:

Target would be to complete the transmission line and shifting HVDC back-to-back module by June 2010 and establish second HVDC back-to-back module by December 2010.

3.6.2 Scheme –B : Synchronous Inter-connection of SR and WR

Transmission System:

1) Raichur - Sholapur 765kV S/C line-1

Transmission Charges:

Transmission charges for this scheme would be shared by SR and WR constituents on 50:50 basis. Transmission scheme would be regional pool scheme of SR and WR

Target Date:

Target would be to match with the Krishnapatnam UMPP generation project.

3.6.3 Scheme –C : Evacuation System for Krishnapatnam UMPP

Transmission System:

1) Krishnapatnam UMPP – Nellore 400 kV, Quad D/C line
2) Krishnapatnam UMPP – Kurnool 400kV, Quad D/C line
3) Krishnapatnam UMPP –Gooty, 400 kV, Quad D/C line
4) Raichur - Sholapur 765kV S/C line-2
5) Sholapur – Pune 765kV S/C line
6) Kurnool – Raichur 765kV S/C line
7) 765kV substations at Kurnool, Raichur, Sholapur and Pune, with 765/400kV 3000 MVA transformers at each of the substations.
8) Inter-linking of Raichur 765kV (PG) S/S with Raichur(KPTCL) 400kV S/S

Transmission Charges:

Transmission charges for this scheme would be shared by all the beneficiaries of Krishnapatnam UMPP in ratio of their shares in Krishnapatnam UMPP.

Target Date:

Target would be to match with the Krishnapatnam UMPP generation project.

3.6.4 Scheme –D : System strengthening in Western Region corresponding to power from Krishnapatnam UMPP

Transmission System:

1) Pune (WR) – Navi Mumbai (WR) 400kV D/C line

Transmission Charges:

Transmission charges for this scheme to be shared by WR constituents as regional pooled transmission charges together with WR share from Krishnapatnam UMPP considered for revised ratios for sharing of WR pooled transmission charges

Target Date:

Target would be to match with the Krishnapatnam UMPP generation project.

Revised ratio for sharing of WR pooled transmission charges.

Corresponding to share of WR in Krishnapatnam UMPP, 800 MW to be added in denominator for all constituents and in numerator of Maharashtra.

3.7 *Para on Cost Economics :*

The estimated costs of schemes A, B, C & D are tentatively estimated to be about Rs 300 crore, Rs 400 crore, Rs 3000 crore and Rs 300 crore respectively. The total of the four schemes works out to be of the order of Rs 4500 crore. For facilitating evacuation of 4000 MW of power from Krishnapatnam UMPP plus additional exchanges between SR-WR or SR-NR via WR, this would be a cost effective solution. The increased transmission cost of WR regional charges would be 50% of scheme A + 50% of Scheme B + NIL out of Scheme C +100% of Scheme D totaling to

about Rs 900 crore. Transmission charges for this cost would be of the order of Rs.10 crores per month. Taking share of WR in Krishnapatnam UMPP which was 800MW share of Maharashtra, with PLF of 80%, this would give rise to additional energy of about 460 MU per month plus additional 140 MU towards operational exchanges (say 2000 MW at 10% load factor) the unit cost of transmission charges for this system would work out to be of the order of 17 p/kwh.

4. Transmission system from the new generation capacity planned by DVC viz. Koderma TPS (2x500 MW), Bokaro-A (1x500 MW), Mejia-B (2x500 MW), Durgapur Steel (2x500 MW) and Raghunathpur TPS(2x500 MW) together with review of transmission system associated with North Karanpura (3x660MW) and Maithon RB (1000MW)

4.1 Chief Engineer (SP&PA) stated that DVC was undertaking generation projects at Koderma TPS (2x500 MW), Bokaro-A (1x500 MW), Mejia-B (2x500 MW), Durgapur Steel (2x500 MW) and Raghunathpur TPS (2x500 MW). Out of the above 3600 MW and 500 MW would be exported to Northern and Western Region respectively. Besides this, Maithon Right Bank generation of 2x500 MW was also being taken up which was expected by 2010, from which 400 MW of power was to be supplied to Delhi. The balance power would be available with DVC and Maithon RB generator for utilization/trade. Transmission system for North Karanpura and Maithon RB was evolved and agreed earlier. However, review of the evacuation system was necessitated as the transmission corridor for power from the DVC Projects in Eastern Region to Western Region and Northern Region would be the same for North Karanpura, Maihon RB as well as new generation capacity planned in DVC.

4.2 Based on studies, revised transmission system had been evolved and discussed in NR and ER. The studies had established need of 765kV pooling stations at Ranchi for Western Region and Sasaram and Gaya for

the Northern Region. From Ranchi pooling station, towards Western Region 2xS/C 765kV lines had been proposed up to Sipat pooling Station. Interconnecting from the generating station to the grid points in ER as well as pooling stations for NR and WR had been identified. For the Northern Region, the overall transmission system from Gaya at 765 kV would be through three numbers 765 kV lines, two on the Sasaram-Fatehpur-Agra corridor and one through the Balia-Lucknow-Bareili-Meerut corridor. Gaya would be connected to Sasaram as well as Balia via 765 kV lines whereas Sasaram and Balia both would receive power from east at 400kV also. The 765kV Sasaram-Fatehpur-Agra corridor where one line would be provided under evacuation system from Maithon RB, Bokaro Extn, Kodarma and Mejia Extn and the other 765kV line under ATS for Sasan in NR. These links would help Western Region also through the Agra-Gwalior 2xS/C 765kV corridor.

4.3 Establishment of the required 765 kV substations, common transmission network for all the proposed generation projects and generation specific transmission schemes had been identified and proposed to be taken-up through various transmission schemes to be executed by PGCIL, Private Sector in Transmission, Generators (or their transmission agency) and DVC. Government of India had constituted an Empowered Committee to identify the transmission schemes for execution by the private sector through competitive tariff based bidding. The list of schemes proposed to be implemented by the private sector identified by the Empowered Committee included the transmission schemes for evacuation system for North Karanpura, Maithon RB, Kodarma and Mejia-B. In the evolved schemes, the evacuation system for Bokaro-A was integrated with evacuation system for Kodarma and hence this was also included.

4.4 Regarding sharing of the transmission charges, the proposal was that transmission charges for the transmission system from the generation projects up to the pooling stations was proposed to be shared by all the beneficiaries of the generation project (or projects) and transmission system

beyond the pooling points for NR and WR was proposed to be shared by the beneficiaries of the respective region as pooled transmission charges.

With respect to Western Region there was no change in already agreed Sipat(PP)-Seoni 765kV S/C covered under scheme for Evacuation system for North Karanpura. The scheme was being taken-up through private sector participation in transmission through SPV of REC. Establishment of Sipat(PP) station and Sipat(PP)-Sipat 765kV S/C interconnecting line are as per already agreed system. Earlier one 765kV S/C line from North Karanpura to Sipat (PP) was proposed. In the revised evacuation system from North Karanpura being at 400kV only and no 765kV voltage level at North Karanpura, pooling station at 765 kV for WR at Ranchi had been proposed where power from other sources in ER would also be injected. Accordingly, the revised proposal was to have 2 no 765 kV lines towards Sipat(PP) from Ranchi. The need for 2 lines was on account of additional power to be lifted from Ranchi for WR. One of the 765 lines could be associated with these projects and the other 765 kV line could be associated with projects for which the transmission was yet to be tied up. This interconnection from Ranchi to Sipat (PP) was proposed in addition to Ranchi-Sipat 400kV D/C line which was already under construction. Western region focused studies had also been done in this context which had shown that by providing two lines, the losses are reduced by 100MW (from 6263MW all India – study Annex-4.1 of agenda to 6163MW – study Annex-4.2 of agenda). Further, additional generation of more than 7000 MW (Early 12th Plan) was being envisaged in Orissa from where most of the power would actually be utilized in Western Region either through long-term PPAs or short-term trading transactions. Optimum transmission system for this power transfer requirement could be HVDC which could be ±800kV 6000MW capacity. The HVDC link from a suitable location near Baripada in Orissa to either Aurangabad or Indore was being envisaged. Parallel AC system would need strengthening to support the HVDC line under pole outage. The two 765 kV lines between Ranchi and Sipat (PP) covered

under the proposal would also provide parallel ac network and would get fully justified in this context. He stated that the system proposed with Orissa generation would need to be further studied before firming-up

4.5 Chief Engineer (SP&PA) stated that though in DVC generation WR has only 500 MW, there would be additional operational surplus which could be utilized to meet the availability demand gap of WR and opined that Seoni-Wardha 765 kV line and Seoni S/S planned as part of ATS for Mundra would also need pre-ponement corresponding to December 2010 to utilize in WR the exportable power of ER consequence upon DVC projects.

4.6 ED (PGCIL) stated in view of the proposed capacity addition in Orissa instead of 765 kV lines from Ranchi towards Sipat (PP) option of 1200 kV 4.6Member (PS), CEA stated that experience of reactive power management of 765 KV lines needs to be understood prior to adopting higher voltage level. Also the underlying network needs to be strong to take care of contingencies.

4.7 After discussions the proposal for one 765 kV line between Ranchi and Sipat (PP) together with 765 kV substation at Ranchi and Sipat (PP) and also the 765 kV interconnection to Sipat (PP) either through LILO of one of the Sipat-Seoni 765 kV S/C lines or through a separate Sipat-Sipat (PP) 765 kV S/C line was agreed and it was agreed that in case the proposal on Ranchi-Sipat (PP) corridor was required to be further enhanced, this would be taken up in the next Standing Committee meeting of WR.

4.8 It was also agreed that proposal for further strengthening of ER-WR corridor and east-west strengthening within WR in the context of Orissa and Chhatisgarh generation projects would be further studied and discussed in the next meeting.

4.9 **Expediting 765/400kV pooling station near Sipat in view of the proposed generation projects of Mahan(1200MW), Lanco-I & II(600MW), Dheeru(600MW) in Chhattisgarh which has sought open access**

CE, SP&PA, CEA stated that a number of applications seeking long term open acess in transmission for generation projects located in Chhatisgarh area had been received. Beneficiaries from these were mainly WR and NR constituents. Some of the projects were Mahan(1200MW), Lanco-I & II (300MW) at Pathadi, Dheeru(600MW) etc.in Chhattisgarh. A comprehensive approach for evolving transmission system for these projects was required. It was already proposed to establish a 765/400kV Pooling Station at a suitable location near Sipat. Power from the above generation projects could be pooled at this pooling station and transmitted onwards at 765kV.

It was agreed that the establishment of the 765/400kV pooling station near Sipat **(WRPS near Sipat)** with 3x1500MVA 765/400kV transformation capacity would be expedited to facilitate evacuation of power from the projects in the area which were seeking open access. It was also agreed that this would be taken-up as a regional system strengthening scheme of WR.

5.0 Transmission System associated with Mundra (4000 MW) and Sasan (4000 MW) UMPPs

5.1 Chief Engineer (SP&PA) stated that the transmission system for power evacuation from Sasan and Mundra was discussed and agreed during the 25th and 26th meeting of SCM of WR. In the 26th meeting of Standing Committee held on 23rd Feb. 2007, GETCO had suggested establishment of 400/220 kV S/S at Shivlakha by LILO of Mundra-Ranchhodpura 400 kV D/C line to meet increasing load demands in that area and it was decided that CEA would examine the proposal. Subsequent to the last meeting System planning studies had been carried out in CEA, Studies indicated that with Shivlakha there was reduction in transmission losses in the part of Gujarat network of the order of 25 MW, and in WR regional

network loss reduction was of the order of 68 MW and loss reduction of about 78 MW in all India network. In view of this the proposal of GETCO could be agreed.

5.2 Chief Engineer (SP&PA) further stated that evacuation lines emanating from Mundra had been agreed to be with triple moose conductor. However, PGCIL in their communication to CEA vide their letter no C/ENG/SEF/W/00/Mundra dated 04 April 2007 had stated that the standard/tested line designs are available for Triple Snow bird conductors but not for Triple Moose conductors. The testing of new line design with Triple Moose conductor would add to the existing cost of the lines. Also the thermal capacity of the Triple Snow bird (1625 MVA at 85^0C) and Triple Moose (1635 MVA at 85^0C) conductor was almost same. Therefore, PGCIL had requested for change of conductor from Triple Moose to Triple Snow bird.

5.3 Executive Director GETCO informed that PGCIL and GETCO had identified a location 400/220 kV substation at Bhachau instead of Shivlakha.

5.4 Members concurred to the proposed changes viz Establishment of 400/220 kV substation at Bhachau by LILO of Mundra UMPP – Ranchodpura 400 kV D/c line and also to the triple snowbird conductor for lines emanating from Mundra UMPP as suggested by PGCIL.

5.5 Chief Engineer (SP&PA) informed that recently a meeting was held in CEA under the Chairmanship of Member (PS), CEA to discuss the implementation schedule of transmission system associated with Mundra UMPP. During the meeting the representative from Tata Power informed the following tentative program of commissioning for Mundra UMPP unit 1-6 for the purpose of finalizing the implementation schedule of the transmission for Mundra UMPP

1st unit June 2011
2nd unit December 2011
3rd unit June 2012
4th unit Oct 2012
5th unit February 2013

The above tentative schedule was based on zero date of Sept 2007.

Based on the tentative program of implementation of the generating units the following program of implementation of transmission lines emanating from Mundra UMPP was drawn up:

Before the 1st unit that is by May 2011

(i) Mundra- Limbdi 400 kV triple conductor D/C

(ii) Gandhar-Navsari 400 kV D/C

(iii) Navsari 400 kV substation 2x315 MVA 400/220 kV

(iv) LILO of both ckts of Kawas-Navsari 220kV D/C line at Navsari 400kV s/s.

Before the 2nd unit that is by November 2011

(v) Mundra- Bhachau -Ranchodpura 400 kV triple conductor D/C

(vi) Bhachau 400 kV substation 2x315 MVA 400/220 kV

(vii) Navsari-Mumbai New Location (PG) 400kV D/C and connecting to HVDC side of MSEB at this new s/s.

Before the 3rd unit that is by May 2012

(viii) Mundra-Jetpur 400kV triple conductor D/C

Before the 4th unit ie by Sept 2012

(ix) Wardha 765kV s/s with 3x1500 MVA, 765/400kV.

(x) 765kV operation of Seoni-Wardha 2xS/C lines.

(xi) Wardha-Aurangabad 400kV D/C quad with 40% Fixed Series Capacitor

In case of any change in commissioning schedule of the generating units the transmission program would also undergo a corresponding change.

Members noted the above implementation program.

5.6 The proposal for connectivity of the proposed 765/400 kV substation of PGCIL at Indore with MPPTCL's 400 kV substation at Indore covered under the ATS for Sasan UMPP was also discussed. It emerged that if two additional 400 kV bays could be made available at the MPPTCL's substation it would be most appropriate to have the connectivity through a 400 kV quad D/C line instead of LILO arrangement for any of the existing 400 kV lines. It was accordingly agreed to

adopt the same, subject to confirmation of availability of space for two additional 400 kV bays at their Indore 400 kV substation by MPPTCL. '[*Subsequently, MPPTCL vide their letter no 04-01/PSP/7651 dated 25.08.2007 have confirmed the required space availability*.]'

5.7 Chief Engineer (SP&PA) further informed that the transmission system in Northern Region for Sasan and Mundra was planned in a comprehensive manner. However, considering the time schedule of implementation for the UMPPs the proposed transmission system for Northern Region was split in two parts, one part as ATS for Mundra UMPP and the other part as ATS for Sasan UMPP.

5.8 With the above modifications, the revised ATS for Mundra and Sasan as agreed was as under:

Mundra Transmission

In WR

(i) Mundra-Limbdi 400 kV D/C (Triple Snowbird)
(ii) Mundra-Bhachau-Ranchhodpura 400 kV D/C (Triple Snowbird)
(iii) Mundra-Jetpur 400 kV D/C (Triple Snowbird)
(iv) Bhachau 400/220 kV 2x315 MVA S/S
(v) Gandhar-Navsari 400 kV D/C
(vi) Navsari 400/220 kV 2x315 MVA S/S
(vii) LILO of both ckts of Kawas-Navsari 220 kV D/C line at Navsari 400kV s/s
(viii) Navsari-Mumbai New Location (PG) 400kV D/C and connecting to HVDC side of MSEB at this new s/s
(ix) Wardha 765kV s/s with 3x1500 MVA, 765/400kV
(x) 765kV operation of Seoni-Wardha 2xS/C lines
(xi) Wardha-Aurangabad 400kV D/C quad with 40% Fixed Series Capacitor

In NR

(i) Agra-Sikar 400kV D/C quad
(ii) New 400/200kV 2x315MVA s/s at Sikar
(iii) Sikar-Jaipur PG 400 kV D/C
(iv) Sikar–Ratangarh 400kV D/C
(v) LILO of both circuits of Nathpajahkri-Abdullapur 400kV D/C at Panchkula with 2x315MVA 400/220kV s/s at Panchkula

Sasan Transmission

In WR

(i) Sasan-Satna 765 kV 2x S/C
(ii) Satna 765/400 kV, 2x1000 MVA S/S
(iii) Satna- Bina (PG) 765 kV 2x S/C
(iv) Bina(PG)-Bina(MP) 400 kV D/C (2^{nd} line)
(v) LILO of both circuits of one of the Vindhyachal-Satna 400 kV D/C line at Sasan 400 kV 2xD/C
(vi) Fixed Series Comp 30% on 400 kV Sasan-Satna D/C
(vii) Fixed Series Comp 30% on both of Satna-Bina 2xD/C
(viii) Bina(PG)- Indore 765 kV S/C
(ix) New 765 kV substation at Indore , 2x1500 MVA 765/400 kV
(x) Indore (PG) – Indore (MPPTCL) 400 kV quad D/C
(xi) 765 kV operation of Agra-Gwalior-Bina-Seoni 765 kV lines and upgrading Bina and Gwalior s/s to 765 kV: 2x1000 MVA 765/400 kV at Bina and 2x1500 MVA 765/400 kV at Gwalior

In NR

(i) Sasaram-Fathepur 765 kV S/c (2^{nd} line)
(ii) Fathepur-Agra 765 kV S/C (2^{nd} line)

6. Transmission system for Korba-III (500 MW)

6.1 Chief Engineer (SP&PA) stated that in the SCM of WR for long term open access held on 23-2-2007 the transmission system for Korba-III through Korba III STPS switchyard – WR PS near Sipat 400 kV D/C was agreed.

Subsequently, PGCIL in their communication to CEA had stated that in the time period left (one and half years) for commissioning of the generating units it would be difficult to establish proposed 765/400 kV WR pooling station near Sipat matching with generating units and had suggested revision of the transmission system. They had suggested a 400 kV D/C line from Korba-III- Bhatapara instead of from Korba-III to Sipat Pooling station. Chief Engineer (SP&PA) opined that since load drop at Bhatapara was not very high it may not be the appropriate point for termination of the line and suggested extension of this line up to Raipur. Member (PS) CEA suggested that to save cost of bays at Bhatapara the line should directly go up to Raipur. Chief Engineer Chhatisgarh endorsed the view of Member (PS), CEA.

6.2 CE (SP&PA), CEA stated that while evolving Korba-III evacuation via pooling station near Sipat, it was also agreed to expedite the 765 kV Bina – Indore S/C line covered under the ATS for the Sasan UMPP and charge it at 400 kV along with Indore 400 kV substation of PGCIL which would be later upgraded to 765 kV. However, with the revised evacuation system for Korba-III, the Indore substation of PGCIL might be planned directly for 765 kV matching with schedule of Sasan UMPP.

6.3 After discussion the above proposed/revised transmission system was agreed. The ATS for Korba-III was agreed as following:

- Korba-III STPS switchyard – Raipur 400 kV D/C

7. Allocation of 2 no 400 kV bays at Aurangabad substation of MSETCL

7.1 Chief Engineer (SP&PA) stated that the 400 kV Wardha –Aurangabad D/C line had been planned as a part of transmission system associated with Mundra UMPP. PGCIL vide their letter dt 25th June 2007 to CEA have informed that MAHATRANSCO had intimated them that space for 2 no bays at Aurangabad for terminating the above line was not available and in view of that PGCIL had proposed for a new 400 kV substation at Aurangabad. A new 400 kV substation for only 2 no of bays may not be justified and it would be better to see how space could be created at the existing substation for accommodating the new line.

Executive Director (MSECLT) stated that they had a program of generation capacity addition in that area and in this context MSETCL had requested for a new substaytion. Member (PS), CEA opined that the proposal of a new substation would need to be looked in to considering the program of MSETCL. Also MSETCL would need to seek open access if they wish to use regional network for transmitting their power. After discussions it was decided that proposal would be reviewed after MSETCL furnishes their plan with respect to Aurangabad

8. Interconnection of 400 kV S/S at Raigarh with 220 kV CSEB network

8.1 Chief Engineer (SP&PA) stated that CSEB should expedite their programme for utilizing all the 4 bays of 220 kV which were provided at the 400 kV Raigarh substation of PGCIL on CSEB's demand. CSEB representative stated that they had already planned to utilize 2 bays and would plan to utilize the other 2 bays also at the earliest.

9. Other Issues

9.1 NER-NR/WR Interconnector

9.1.1 Member Secretary WRPC raised the issue of NER-NR/WR interconnector and stated that based on recommendation of CEA of equal allocation to NR and WR from Subansiri Lower HEP 50: 50 % sharing of transmission charges had been proposed and sought clarification on the transmission charges in case the final allocation between WR and NR was not equal. He also sought clarification on locating the substation at Agra in NR instead of at Gwalior in WR.

9.1.2 Member (PS), CEA clarified that in case final allocation was different then the sharing of transmission charges would be the ratio of shares of NR and WR in allocation to NER hydro power from Kameng, Subansiri and other future projects. Regarding location of the HVDC station at Agra Member (PS), CEA clarified that for reliable operation of the HVDC inverter, it was desireable that the Ac bus to which it would be connected should have a high short circuit (SC) level. As Agra had a much higher short circuit level than Gwalior the termination of the HVDC line at Agra was preferred. Also the back up ac transmission was going towards NR. Further, as Gwalior would be well connected to Agra through 2 no 765 kV lines and also with Bina through 2 no 765 kV lines, WR would have reliable system to draw its share of power.

9.2 Raipur-Wardha 400 kV D/C Quad line

Executive Director (Engg), PGCIL stated that Raipur-Wardha 400 kV D/C line with twin moose conductor along with 25% series compensation was agreed during the 20th SCM. Subsequently in 25th SCM it was decide to construct this line with quad conductor. With the change in conductor specifications PGCIL the requirement of series compensation had

undergone change and it was 40 % Members noted the revised compensation and concurred to the same.

9.3 Interconnection between 400/220 kV Pirana(PG) s/s and Pirana (Torrent)

Executive Director (Engg), PGCIL informed that during the 26th SCM it was decided that Dehgam-Pirana 400 kV D/C line along with 400/220 kV 2x315 MVA Piran s/s would be taken up as a regional scheme. It was also decided that Torrent Power would draw power from proposed PGCIL substation at Pirana. However, in their recent communication Torrent Power had indicated that 220 kV interconnection between Pirana (PG) and Pirana (Torrent) was not possible as no 220 kV voltage level was existing at Pirana (Torrent). They had now proposed to lay a 400 kV line from Pirana (PG) to Pirana (Torrent) at their cost. The issue was discussed with Torrent Power and it emerged that 2 no 400 kV line bays for interconnection at PGCIL substation was required to be provided. The 4 no 220 kV bays could be utilized by GETCO.

Members noted and concurred to the provision of 2 no 400 kV bays at Pirana (PG) station for interconnection with Pirana (Torrent) and also utilization of 4 no 220 kV bays by GETCO.

9.4 Western Region Strengthening Scheme-III

Executive Director (Engg), POWERGRID stated that Vapi-Magarwada (D&D) 220 kV and Vapi-Kharadpada(DNH) 220 kV were agreed to be taken up as regional scheme by construction of a multi circuit 2x D/C line between Vapi and route alignment of existing Bhilad-Kharadpada220 kV D/C and Bhilad Magarwada 220 kV D/C line and by passing both the lines at Bhilad. He raised the question of ownership of the existing Bhilad-Kharadpada and Bhilad- Magarwada lines which were presently owned by UT of DNH and D&D respectively.

Member (PS), CEA stated that UT of DNH and UT of D&D should hand over assets to PGCIL. Representatives from both the UT of DNH and D&D

agreed to the same. It was also decided that POWERGRID would coordinate with both the UTs in this regard for early transfer of assets.

10. Long term Open access cases

Summary of the decisions on open access cases discussed in the 27th meeting of Standing Committee on Power System Planning in Western Region are enclosed at Appendix – OA. Detailed minutes would be issued by PGCIL

Appendix- OA

Summary of decision on Open Access Cases discussed in the 27th meeting of Standing Committee on Power System Planning of WR held on 30.07.2007 at Indore

General Remark: LTOA is only for specific capacities for pre-specified quantum/customer. If transactions are other than pre-specified quantum/customer, these would be through STOA.

1. Essar Power M.P Ltd.

Applicant	:	M/s Essar Power MP Ltd
Generation project	:	Mahan(2x600MW), Distt. Sidhi in M.P.
Long term Open Access sought	:	1100MW 400MW to M.P 700MW to Essar Steel Ltd.(Hazira)in Gujarat
Requested date of open access:		2010-11 1st unit is expected by Oct, 2010.

GETCO informed that interconnection to Essar Steel Hazira plant is stand alone, i.e. on radial mode and shall not be connected to 220kV network at any point.

LTOA agreed with effect from commissioning of following network:

Connectivity and dedicated system to be provided by applicant/project developer:

a) Mahan-WRPS near Sipat 400kV D/C (triple cond.)
b) Gandhar(NTPC) – Hazira 400kV D/C (twin cond.)
c) 400/220 s/s at Essar Steel Hazira (s/s capacity to be decided by provider)

Regional System to be provided by PGCIL (or by any other agency if so decided):

d) 765/400kV, 3x1500MVA WRPS near Sipat
e) 765/400kV, 3x1500MVA Wardha substation
f) Charging of Seoni-Wardha 2xS/C line at 765kV level

Arrangement for evacuation through STOA before commencement of LTOA:

LILO of one ckt. of Vindhyachal – Korba STPS 400 kV line at Mahan and on commissioning of (a) and (d), the LILO arrangement of Vindhychal-Korba line at Mahan TPS shall be removed and the line shall be restored in its original configuration. All provision in this respect at the cost of applicant/project developer.

2. M/s Adani Power Ltd.

Applicant	:	M/s Adani Power Ltd
Generation project	:	Mundra(8x330MW), in Gujarat.
Long term Open Access sought	:	200MW 200MW to Maharashtra(MSECDCL)
Requested date of open access:		Dec 2008

1st unit is expected by Dec, 2008.

GETCO to have have 400kV and 220kV network for their drawal.

LTOA agreed with effect from commissioning of following network:

Connectivity and dedicated system to be provided by applicant/project developer:

a) Mundra APL- Dehgam 400kV D/C along with suitable degree of series compensation at any suitable point on the line and line reactor of 80MVAR at both ends on each circuit.

Regional System: As already provided

3. EMCO Energy Ltd.

Applicant	:	M/s Emco Energy Ltd
Generation project	:	Warora, Distt Chandrapur(2x135MW +1x250MW)
Long term Open Access sought	:	520MW 200MW to MSECDL,Maharashtra . 200 MW to MPPTC, MP 100 MW to GUVNL, Gujarat 20 MW to WR constituents
Requested date of open access:		June 2009 1st unit is expected by June, 2009.

LTOA agreed with effect from commissioning of following network:

Connectivity and dedicated system to be provided by applicant/project developer:

a) EMCO generation project – Bhadravati 400 kV D/C

Regional System to be provided by PGCIL (or by any other agency if so decided):

b) WRSSS-II-A
c) WRSSS-II-B

Arrangement for evacuation through STOA before commencement of LTOA:

On commissioning of the dedicated system by the project developer transmission of power from the project would be through STOA till availability of regional system

4. NTPC Ltd. (Farakka-III generation project)

Applicant	:	NTPC		
Generation project	:	Farakka-III(1x500), W Bengal.		
Long term Open Access sought	:	500MW Merchant Plant		
Target beneficiaries		Gujarat UVNL	: 78 MW	WR 205 MW
		MPSEB	: 46 MW	
		Maharastra Discom	: 81 MW	
		PSEB	: 34 MW	NR 245 MW
		Haryana PGCL	: 21 MW	
		Rajasthan	: 39 MW	
		DTL	: 64 MW	
		UPPCL	: 87 MW	

West Bengal : 50 MW ER 50 MW

Requested date of open access: Nov 2009

LTOA agreed with effect from commissioning of following network:

Connectivity and dedicated system: Nil
Regional System to be provided by PGCIL (or by any other agency if so decided):

a) Farakka – Kahalgaon 400kV D/C to be suitably connected to Kahalgaon or LILOed into one of the lines from Kahalgaon

Arrangement for evacuation through STOA before commencement of LTOA:

Evacuation would be through STOA till availability of (a)

5. M/s KVK Nilachal Power Pvt. Ltd(KVK)

Applicant	:	M/s KVK Nilachal Power Pvt Ltd
Generation project	:	Gurudijhatia(560MW), Distt Cuttak, Orrisa.
Long term Open Access sought	:	560MW
		GRIDCO in ER : 140 MW
		Maharashtra in WR : 140 MW
		Punjab in NR : 140 MW
		Kerala in SR : 140 MW

Requested date of open access: Dec 2009

Member (PS), CEA suggested that the project developer may like to review its beneficiaries in order to reduce the number of regions and considering the projected power supply position of the regions, may like to target Kerala as STOA customer rather that LTOA customer. In any case the developer could sell to customer in any state/region through STOA.

LTOA agreed with effect from commissioning of following network:

Connectivity and dedicated system to be provided by applicant/project developer:

a) LILO of both ckts of Baripada-Mendhsal 400 kV D/C line at generation switchyard.

Regional System As provided

6. M/s PTC India (Chitrapur Coal & Power Ltd.)

Applicant	:	M/s PTC India Ltd
Generation project	:	Chitrapur(480MW), Jharkhand
Long term Open Access sought	:	480MW
		240 MW to Gujarat in WR
		240MW to Punjab in NR

Requested date of open access: Sept 2009

GETCO informed that proposal for purchase of power from Chitrapur TPS would be through competitive bidding process and the acceptance of M/s PTC's proposal in this regard is subject to finalization by GUVNL. In case the RfP is found competitive

and acceptable, GUVNL will sign the PPA for procurement of power from the proposed project.

M/s Chitrapur Coal & Power clarified that in case GETCO will not draw power from the project, they may sell it to Maharshtra in WR. It was clarified to them that in that case their LTOA application would need to be revised.

On the query of CEA about the status of generation project and of any expansion plan, M/s Chitrapur clarified that EPC contract of the generation project has already placed and expansion plan of the project was yet to be finalised.

It emerged that considering the progress status of the generation project, connectivity with the ER grid through a 400kV Chitrapur TPS – Ranchi D/c may be provided. Further, M/s PTC India/Chitrapur Coal & Power Ltd. may resolve the issue of power transfer to Gujarat as well as any expansion plan. Their LTOA application would be processed further based on getting these inputs from them. Regarding transfer of power to Punjab, the issue shall be discussed in NR.

Connectivity and dedicated system to be provided by applicant/project developer:

a) Chitrapur TPS-Ranchi 400kV D/C

7. PTC India (Dheeru generation project)

Applicant	:	PTC Ltd
Generation project	:	Dheeru(2x300MW), Churri,Distt. Korba
Long term Open Access sought	:	600MW 300MW to MPPTCL, M.P in WR 300MW to Punjab in NR
Requested date of open access:		July 2010 1st unit is expected by July, 2010.

M/s Dheeru Power informed that unit size of the generation project may be enhanced to 2x350MW in place of 2x300MW. Their LTOA application would be processed further based on getting confirmation on their unit size from them. Regarding transfer of power to Punjab, the issue shall be discussed in NR.

Connectivity and dedicated system to be provided by applicant/project developer:

a) Dheeru-WRPS near Sipat 400kV D/C

Essential Regional System required for receiving power at the connectivity point:

b) 765/400kV, 3x1500MVA WRPS near Sipat

8. M/s PTC India (Lanco Amarkantak)

Applicant	:	PTC Ltd
Generation project	:	Pathadi-II (300 MW) LancoAmarkantak, Pathadi,Distt. Korba
Long term Open Access sought	:	273MW

273MW to Haryana Gen Corp Ltd, Haryana

Requested date of open access: Sept 2009

CEA enquired whether M/s Lanco Amarkantak Power Pvt. Ltd. has any plan about capacity expansion of the generation project. M/s Lanco clarified that the proposed project is the expansion of Pathadi TPS-I(300MW) and they have also other expansion plan up to 1200MW capacity at this generation complex including Pathadi-II(300 MW) project..In view of the above, it was recommended to have 400kV Pathadi-WR Pooling Station D/C line with quad conductor.

LTOA agreed in respect of use of WR network with effect from commissioning of following network:

Connectivity and dedicated system to be provided by applicant/project developer:

a) Lanco Amarkantak-WRPS near Sipat 400kV D/C quad line

Regional System to be provided by PGCIL (or by any other agency if so decided):

b) 765/400kV, 3x1500MVA WRPS near Sipat

Arrangement for evacuation through STOA before commencement of LTOA:

On commissioning of the Pathadi-II TPS, M/s PTC India would be allowed to interconnect the units at the existing Pathadi station which is already interconnected with WR grid by LILO of 400kV Korba STPS – Sipat S/c and power transfer to HPGCL may be effected on short-term basis.

Before start of LTOA, M/s PTC India/Lanco Amarkantak would complete 400kV Pathadi – WRPS near Sipat D/CQuad line and open the LILO arrangement of Korba STPS – Sipat S/C at Pathadi and restore the Korba STPS - Sipat direct interconnection.

9. IFFCO Chhattisgarh Power Ltd.

Applicant	:	M/s IFFCO Chhatisgarh Power Ltd
Generation project	:	Premnagar, Distt Sarguja, Chhatisgarh
Long term Open Access sought	:	1000MW 900 MW to Chhatisgarh 100MW to Madhya Pradesh

Requested date of open access: October 2010

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On clarification from developer and based on discussion it emerged that 900MW to Chhatisgarh and 100 MW to M.P.from their generation project would be supplied through their interconnection directly to the grid of the respective states and not be injected into ISTS of POWERGRID. The ICPL generation project shall be interconnected to proposed 400kV Raipur(CSEB) S/S and power transfer to M.P would be through 400kV Bhilai- Satpura line. In view of the above, LTOA in ISTS was not applicable.

Annexure - I

List of participants of the 27th meeting of the Standing Committee on Power System Planning held on 30-7-2007 at Indore

S.N.	S/Shri	Designation	Organization	Mobile/Tel no	E mail address
1	V. Ramakrishna	Member (PS)	CEA		
2	A.K. Asthana	Chief Engineer	CEA		
3	P.K. Pahwa	Director	CEA		
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Annexure - 2

STATUS OF WESTERN REGION TRANSMISSION SCHEMES EARLIER AGREED UNDER IMPLEMENTATION

S. No.	Description of Scheme	Date of firming up in Standing Committee	Target as in Standing Committee Meeting	Date of FR	Date of investment approval	Date of award of the major part	Target date as of now	Remarks
1.	Associated Tr. System of Sipat-I (3x660MW) a) Sipat-Seoni 765kV 2xS/c b) Seoni-Khandwa 400kV D/c c) Nagda-Dehgam 400kV D/c d) LILO of 400 kV Korba-Raipur at Sipat e) LILO of Bhilai – Satpura 400kV S/c at Seoni f) Seoni 765/400kV 3000 MVA and 400/220kV 2x315 MVA S/s g) Rajgarh 400/220kV 2x315MVA S/s by LILO of S.Sarover-Nagda D/c line	15th (20.03.02)	To match with the commissioning of Sipat-I (in early 11th plan)	Jan' 01	Dec'03 (CCEA)	Feb'04	 Dec'07 Sept'07 Oct'07 Aug'07 Aug'07 Dec'07	Ckt-I expected to be commissioned by Aug'07 and ckt-II by Dec'07. Commissioned in Apr'06.
2.	Bina-Nagda 400kV D/c line	16th (06.09.02)	To match with the commissioning of Sipat-I	Nov'03	June'04 (PG)	Sept'05	Mar'08	Earlier proposed for implementation through IPTC
3.	Associated Tr. System of Sipat-II (2x500MW) a) Khandwa-Rajgarh 400kV D/c b) Bina-Gwalior 765kV S/c (initially op. at 400kV) c) Seoni 765/400kV 1500MVA ICT (Aug.) d) Gwalior 400/220kV,2x315 MVA S/s e) Bhatapara 400/220kV 2x315MVA S/s by LILO of Korba-Raipur line	16th (06.09.02)	To match with the commissioning of Sipat-II (ahead of Sipat-I by one year)	Jul' 03	Aug'04 (CCEA)	Mar'05	 Mar'08 Dec'07 Aug'07	 Commissioned in Mar'07. Commissioned in Mar'07.

S. No.	Description of Scheme	Date of firming up in Standing Committee	Target as in Standing Committee Meeting	Date of FR	Date of investment approval	Date of award of the major part	Target date as of now	Remarks
4.	Sipat-II Supplementary Tr. System a) Seoni-Wardha 765kV S/c (initially op. at 400kV) b) Wardha-Akola 400kV D/c c) Akola-Aurangabad 400kV D/c d) Wardha 400/220kV 2x315MVA S/S	18th (31-10-03)	To match with the commissioning of Sipat-II (ahead of Sipat-I by one year)	Mar'04	June'05 (CCEA)	Sept'06	June'08 June'08 June'08 June'08 June'08	
5.	WR Strengthening Scheme-I a) Sipat-Raipur 400kV D/C line b) 40% Series Comp. on Seoni-Khandwa 400kV D/c c) Installation of 1x315, 400/220kV transformer at Itarsi	18th (31-10-03)	10th Plan	Mar'04	July'04 (PG)	Aug'05	Nov'07 Nov'07 Nov'07	
6.	Associated Tr. System of Kahalgaon-II Ph- II (3x500MW) a) Ranchi-Sipat 400kV D/C with 40% series compensation	18th (31-10-03)	To match with the commissioning of Kahalgaon-II Ph- II (03/07)	Nov'03	Jan'05 (CCEA)	Oct'05	Dec'07	
7.	North-West Tr. Corridor Strengthening Scheme a) Agra- Gwalior 765kV 2nd S/c (initially op. at 400kV) b) Kankroli-Zerda 400kV D/c	20th (23.01.04)	To match with the commissioning of Kahalgaon-II Ph- II (03/07)	Aug'04	Dec'05 (PG)	May'06	Jan'09 Jan'09	
8.	East-West Tr. Corridor Strengthening scheme a) Ranchi-Rourkela 400kV D/c b) Rourkela-Raigarh 400 kV D/c c) Raigarh-Raipur 400 kV D/c 40% FSC on Raigarh-Raipur 400 kV 2nd D/c	20th (23.01.04)	To match with the commissioning of Kahalgaon-II Ph- II (03/07)	Jul'04	June'06 (CCEA)	Under award	June'09	

S. No.	Description of Scheme	Date of firming up in Standing Committee	Target as in Standing Committee Meeting	Date of FR	Date of investment approval	Date of award of the major part	Target date as of now	Remarks
9.	Western Region System Strengthening Scheme-II Set-A: For absorbing import in eastern and central part of WR Grid ***(being implementation by POWERGRID)*** a) Raipur – Wardha 400kV D/c b) Seoni – Wardha 765kV 2nd S/c (initially to be operated at 400kV) c) Wardha – Parli(PG) 400kV D/c (Quad) d) Bhadravati – Parli(PG) 400kV D/c e) Parli(MSEB) – Parli(PG) 400kV D/c Set-B: For regional strengthening in Southern Maharashtra ***(100 % private)*** a) Parli(PG) - Pune 400kV D/c b) Pune – Aurangabad 400kV D/c c) Parli(PG) – South Solapur 400kV D/c d) South Solapur - Kolhapur 400kV D/c e) LILO of Lonikhand – Kalwa 400kV D/c line at Pune f) LILO of Sholapur – Karad 400kV S/c line at South Solapur Set-C: For regional strengthening	20th (23.01.04)	03/2007	Jul/ Nov '04/ Sep'05 (Rev)	July'06 (CCEA)	Under tendering	July'10	Earlier considered for implementation through Private investment

S. No.	Description of Scheme	Date of firming up in Standing Committee	Target as in Standing Committee Meeting	Date of FR	Date of investment approval	Date of award of the major part	Target date as of now	Remarks
	in Gujarat ***(100 % private)*** a) Rajgarh – Karamsad 400kV D/c b) Limdi(Chorania) – Ranchodpura 400kV D/c c) Ranchodpura – Zerda(Kansari) 400kV D/c Set-D: For regional Strengthening in Northern Madhya Pradesh ***(being implemented by POWERGRID)*** a) Korba STPP – Birsinghpur 400kV D/c b) Birsinghpur - Damoh 400kV D/c c) Damoh - Bhopal 400kV D/c d) Bina – Gwalior 765kV 2nd S/c (initially to be operated at 400kV) Sub-Station portion of WRSS-II ***(being implemented by POWERGRID)*** a) Establishment of 400/220kV 2x315MVA substation at Pune and South Solapur b) Establishment of 400kV switching station at Parli(PG) c) 25% Fixed Series Compensation at Rajgarh & Wardha d) Bay extension of existing substations to terminate lines					May'07 Under tendering		

S. No.	Description of Scheme	Date of firming up in Standing Committee	Target as in Standing Committee Meeting	Date of FR	Date of investment approval	Date of award of the major part	Target date as of now	Remarks
	under Set-A/B/C/D							
10.	Barh Transmission System (1980 MW) (WR Portion) a) Seoni- Bina 765 kV S/c (initially to be operated at 400kV)	20th (23.01.04)	To match with the commissioning of Barh	Mar'04	Dec'05 (CCEA)	June'06	Sept'09	
11.	WR Strengthening Scheme-III c) Vapi(PG)- Magarwada 220 kV D/c d) Vapi(PG)-Kharadpada 220kV D/c	23rd (23-11-04)	At the earliest	May' 05	Jan'06 (PG)	July'06	Aug'08 Aug'08	
12.	WR Strengthening Scheme-IV a) 400/220 kV 2x315 MVA Substation at Damoh along with two nos. 220 kV bays b) 1x63 MVAR Bus Reactor at Damoh	24th (26.09.05)	To match with the commissioning Sanjay Gandhi TPS	Nov'05	Mar'06 (PG)	Apr'06	Mar'08	
13.	Western Region System Strengthening -V a) 400 kV Vapi- Navi Mumbai D/c b) LILO of 400 kV Lonikhand/Pune - Kalwa line at Navi Mumbai c) Establishment of 400/220 kV, 2 x 315 MVA new S/s (GIS) at Navi Mumbai d) 220 kV Vapi- Khadoli D/c	25th (30.09.06)	At the earliest	Jan'07	Investment approval awaited		30 months from Investment Approval	
14.	Western Region System Strengthening -VI	25th (30.09.06)	At the earliest	Jan'07	Investment approval awaited		27 months from Investment	

S. No.	Description of Scheme	Date of firming up in Standing Committee	Target as in Standing Committee Meeting	Date of FR	Date of investment approval	Date of award of the major part	Target date as of now	Remarks
	a) Pirana – Dehgam 400 kV D/c b) Establishment of 400/132 kV, 2 x 315 MVA S/s at Pirana c) Installation of additional 400/220 kV, 1x315 MVA transformers along with associated 220 kV line bays at Wardha, Pune, Gwalior, Raipur and Bina(PG)						Approval	
15.	Western Region System Strengthening -VII a) Provision of 420 kV, 1x125 MVAR Bus reactor at Khandwa b) Provision of 420 kV, 1x125 MVAR Bus reactor at Dehgam	26th (23.02.07)	At the earliest	May' 07	Investment approval awaited		30 months from Investment Approval	
16.	Western Region System Strengthening –VIII a) 400kV Wardha – Aurangabad D/c (Quad) line along with 40% fixed series compensation at Wardha end b) 25 ohm Series Bus Reactor at Raipur Substation	26th (23.02.07)		FR under preparation	Investment approval awaited		36 months from Investment Approval	
17.	Western Region System Strengthening -IX a) Establishment of 400/220kV 2x315MVA substation at Shujalpur by LILO of 400kV Bina-Nagda D/c line b) Installation of 3rd 1x315MVA, 400/220kV	26th (23.02.07)	At the earliest	Jun'07	Investment approval awaited		33 months from Investment Approval	

S. No.	Description of Scheme	Date of firming up in Standing Committee	Target as in Standing Committee Meeting	Date of FR	Date of investment approval	Date of award of the major part	Target date as of now	Remarks
	transformer at Vapi and Dehgam							
18.	Tr. System of Sasan Ultra Mega Power Project (4000 MW) Transmission Lines a) Sasan – Satna 765 kV 2xS/c b) Satna - Bina(PG) 765 kV 2xS/c c) Bina(PG)-Indore(PG) 765 kV S/c d) LILO of Vindhyachal-Satna 400 kV D/c at Sasan e) LILO of Indore(MP)- Nagda 400 kV D/c at Indore (PG) f) Bina(PG)-Bina(MP) 400 kV D/c Substations a) 25% Fixed Series Compensation each on Sasan-Satna 400 kV D/c at Satna end b) 25% Fixed Series Compensation each on Satna-Bina 400 kV 2xD/c at Satna end c) Establishment of new 765/400 kV, 2x1500MVA substation at Gwalior and 765/400 kV, 2x1000 MVA at Bina(PG) for charging of Bina-Gwalior and Agra-Gwalior 2xS/c lines at 765 kV level d) Provision of 765 kV Bays for	26th (23.02.07)	To match with the commissioning of Sasan	Jun'07	PIB awaited		48 months from Investment Approval	

S. No.	Description of Scheme	Date of firming up in Standing Committee	Target as in Standing Committee Meeting	Date of FR	Date of investment approval	Date of award of the major part	Target date as of now	Remarks
	charging of Seoni- Bina S/c line at 765 kV level e) Establishment of new 765/400 kV, 2x1000 MVA substation at Satna f) Establishment of new 765/400 kV, 2x1500 MVA substation at Indore(PG)							
19.	Tr. System of Mundra Ultra Mega Power Project (4000 MW) Transmission Lines a) Mundra – Ranchodpura 400 kV (Triple) D/c b) Mundra – Jetpur 400 kV (Triple) D/c c) Mundra – Limbdi 400 kV (Triple) D/c d) Gandhar-Navsari 400 kV D/c e) Navsari-New Location near Mumbai 400 kV D/c f) LILO of 400kV Mundra – Ranchodpura D/c at Bachchau g) LILO of both circuits of Kawas-Navsari 220 kV D/c at Navsari (PG) h) Wardha-Aurangabad 400 kV(Quad) D/c Substations a) 40% Fixed Series Compensation each on Wardha - Aurangabad 400 kV D/c at Wardha end b) Establishment of new	26th (23.02.07)	To match with the commissioning of Mundra	Jun'07	PIB awaited		48 Months from Investment Approval	

S. No.	Description of Scheme	Date of firming up in Standing Committee	Target as in Standing Committee Meeting	Date of FR	Date of investment approval	Date of award of the major part	Target date as of now	Remarks
	400/220 kV, 2x315 MVA substation at Bachchau, Navsari & a 400 kV switching station at New Location near Mumbai (GIS) c) Establishment of new 765/400 kV, 3x1500 MVA, substation at Wardha for charging of Seoni - Wardha 2xS/c lines at 765 kV level							