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 23rd Dec 2008 , 2008**

1 The Member (PS),
Central Electricity Authority,
Sewa Bhawan, R. K. Puram, N. Delhi-110066

2 The Member Secretary,
Western Regl. Electricity Board,
MIDC Area, Marol, Andheri East,
Mumbai
Fax 022 28370193

3 The Executive Director (Engg.),
Powergrid Corp. of India Ltd.,
"Saudamini", Plot No. 2, Sector-29,
Gurgaon-122001
Fax 95124-2571760

4 Chairman and Managing Director,
MPPTCL,,
Shakti Bhawan, Rampur, Jabalpur-482008 Fax 0761 2665593

5 Member (Transmission & Distribution),
Chhatisgarh State Electricity Board,
Dangania, Raipur (CG)-492013
Fax 0771 4066566

6 The Managing Director,
GETCO, Sardar Patel Vidyut Bhawan,
Race Course, Baroda-390007
Fax 0265 2337918 / 2338164

7 Director (Operation),
MAHATRANSCO, 'Prakashgad', Plot No.G-9, Bandra-East, Mumbai-400051
Fax 022 26452868

9 The Executive Director (Engg.),
NTPC Ltd., Engg. Office Complex,
A-8, Sector-24, NOIDA 201301
Fax 95120-2410201

10 The Chief Engineer,
Electricity Department,
The Government of Goa, Panaji
Fax 0832 222354

11 Executive Engineer (Projects)
UT of Dadra & Nagar Haveli,
Department of Electricity
Silvassa
Ph. 0260-2642787

12 Executive Engineer
UT of Daman & Diu Moti
Department of Electricity
Moti Daman-396220
Ph. 0260-2250889,2254745

13 GM, WRLDC
Plot no F-3, MIDC Area, Msarol,
Andheri(East) Mumbai-400093
Fax no 022-28202690

Subject: 28th meeting of Standing Committee on Power System Planning in Western region

Sir,

Minutes of the 28th meeting of Standing Committee on Power System Planning in Western region held on 6th December 2008 at Aurangabad are available on CEA website (www.cea.nic.in at the following link: Home page-Power Systems-Standing Committee on Power System Planning-Western Region).

Encl. As above

(P. K. Pahwa)
Director

Minutes of the 28th meeting of the Standing Committee on Power System Planning held on 6th December 2008 at Aurangabad, Maharashtra

The 28th meeting of Standing Committee on Power System Planning of Western Region was held on Saturday the 6th December 2008 at Aurangabad. The list of participants is enclosed at Annex-I.

ED(WR), PGCIL welcomed all the participants. CE, Aurangabad, MSETCL also welcomed the participants. Director(Projects), PGCIL gave an inaugural speech highlighting role of Standing Committee in coordinated planning of the transmission system. Chief Engineer (SP&PA), CEA welcomed the participants and thanked PGCIL for hosting and arrangements for the meeting. Member(PS),CEA was held up due to flight delay and joined the meeting while the agenda items were being discussed.

CE, SP&PA, CEA stated that the last meeting, that is the 27th meeting was held in July 2007 and thereafter a number of meetings were convened at CEA and RPC levels to discuss the issue of sharing of transmission charges for the transmission system for Ultra mega projects of Sasan, Mundra and Krishnapattnam. A joint meeting of Standing Committee on Power System Planning of WR and NR was held to discuss the sharing formula of transmission charges. And we were able to successfully finalise the sharing formula for Sasan, Mundra and Krishnapattnam UMPPs. The agenda items were thereafter taken up for discussions.

1. Confirmation of the minutes for the 27th Standing Committee Meeting held on 30.07.07 at Indore and Joint meeting of State Utility members of the Standing Committee for Power System Planning of Northern Region and Western Region held on 10th June 2008 at Delhi .

1.1 Minutes of the 27th meeting of the Standing Committee on Power System Planning of WR held at Indore on 30th July 2007 were circulated vide CEA letter no. 26/10/2002-SP&PA/293-306 dated 06.09.2007. Chief Engineer (PS-PMU), MPPTCL vide his letter dated 03.10.07 had forwarded observations on the minutes of the meeting. Considering the observations of MPPTCL the minutes of 27th meeting were confirmed with the following amendments.

i) Annex-2, S.no 18, item-e corrected to read as " LILO of both the Indore-Asoj 400 V lines at Indore(PG) (765 kV) substation"

ii) First line of para 3.6 be replaced by "After further discussions, the members concurred to scheme-B and scheme-C as detailed in following paras 3.6.2 and 3.6.3 and also decided to further re-discuss scheme-A (para 3.6.1) and scheme-D (para 3.6.2) at RPC level.

1.2 The minutes of the Joint meeting of State Utility members of the Standing Committee for Power System Planning of Northern Region and Western Region held on 10th June 2008 at Delhi were circulated vide CEA letter no 26/10/2008/SP&PA/CEA/605-624 dated 12th June 2008. No comments on the minutes had been received. The minutes were confirmed.

2.0 Review of Progress on Earlier Agreed Transmission Schemes

2.1 The list of Western Region transmission schemes already commissioned as furnished by PGCIL is at Annex-IIA and the latest status of progress of various schemes as intimated by PGCIL during the meeting is enclosed at Annex-IIB.

2.2 Representatives from GUVNL and MSETCL stated that WRSS-II scheme was approved in 2004 by the Standing Committee on Power System Planning of WR but implementation of the part-B and C of the scheme was yet to take off by RETL. They had already given concurrence to the scheme and willing to sign BPTA but RETL was raising in one issue or the other for not signing BPTA thus delaying the start of the implementation. Member (PS), CEA stated that the various issues were discussed in a meeting convened by Addl. Secretary, MoP some times back wherein GUVNL and MSETCL were present and the issues were clarified. Director (Projects), PGCIL suggested that a meeting could be convened by CEA wherein RETL should also be invited to sort out any pending issue. This was agreed and it was decided that CEA would convene a meeting at the earliest.

2.3 MD, GETCO stated that Mundra (Adani)-Dehgam 400 kV D/C line was approved in the Standing Committee as a standalone line. Subsequently a switching station had been approved by CEA which was not there in the scheme when it was discussed in the Standing Committee. CE (SP&PA), CEA clarified that Mundra-Dehgam was a dedicated line of more than 400 km and while considering the open access case for Mundra (Adani) generation project, requirement of providing a switching station or series compensation were discussed and it was agreed along with suitable degree of series compensation. MD, GUVNL stated that it must be clarified that the switching station en-route the line was an integral part of the dedicated line and should not be used for any other purpose without concurrence of the Standing Committee. This was agreed.

2.4 Director, MSETCL stated that Sugen(Torrent)-Pirana 400 kV D/C line and LILO of Gandhar-Vapi at Sugen switchyard was agreed in SCM. However the LILO proposal had not been put up to the WRPC. CE (SP&PA) clarified that while discussing the open access application of Torrent for their Sugen generation, adequacy of complete proposed system including the LILO was ascertained based on studies done by PGCIL and the proposal was agreed in the Standing Committee. MS, WRPC stated that proposals finalized in LTOA meeting and SCM had to be sent by CEA/PGCIL to WRPC secretariat for inclusion in WRPC agenda. CE (SP&PA), CEA stated that as the item seems to have been missed in earlier agenda for WRPC, the item could be placed in the next WRPC meeting for ratification.

2.5 Director, MSETCL stated that an interstate HVDC line from Mundra(Adani) to Mahendargarh had been approved without discussion in WR. CE (SP&PA), CEA stated that the generation developer had proposed the HVDC line from Mundra(Adani) to Mahendragarh together with HVDC converter/inverter stations at Mundra(Adani) and Mahendragarh and thereon 400kV D/C line connecting their Mahendragarh terminal station to Mahendragarh 400kV substation of Haryana STU as dedicated transmission lines for supply to Haryana. As the proposed dedicated lines would be connecting to Northern Grid, the proposal was placed in the Standing Committee on Power System planning of NR and has been approved there. Members of WR Standing Committee took note of this development.

2.6 NTPC stated that during the 27th meeting LILO of Vindhyachal-Jabalpur 400 kV D/C line at Sasan was agreed. However, as per studies carried out by NTPC fault levels at Vindhyachal bus was exceeding the permissible limit of 40 kA. He suggested that Sasan UMPP could be connected to the proposed 765/400kV pooling station at Vindhyachal through a direct 400kV D/C line instead of the LILO arrangement agreed earlier. Chief Engineer (SP&PA) suggested that PGCIL should study the proposal and revert back.

2.7 Member (PS), CEA stated that a large no of substations had been agreed and were in the process of being implemented. However, difficulties were being faced in getting land and suggested that considering the difficulties being experienced in getting

land, we should go in for GIS as requirement of land would get considerably reduced making it feasible to located the GIS grid substations nearer to the load centers. This would reduce the requirement of underlying network and also reduce overall transmission losses while reliability would also improve. Also with the increased number of GIS substations the cost differential between GIS and conventional open substation, which had already substantially reduced in the last few years, would further come down. CE, SP&PA, CEA suggested that normally, GIS substations should be adopted and open yard substations should be adopted only when availability of land was not critical.

This was agreed by the members.

2.8 To a query from Member (PS), CEA regarding availability of land in Mumbai New Location for 400/220 kV GIS substation for termination of Navsari- Mumbai New location 400 kV D/C line being implemented by PGCIL. Director, MSETCL informed that they were trying to get land near Bhiwandi. It was decided that in case land near Bhiwandi was not available then this line should be terminated at Boisar and in that case the line would be Navsari-Boisar 400 kV D/C.

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

3.1 Member(PS), CEA stated in the 27th Standing Committee meeting held on 30.07.2007 at Indore, the transmission scheme for Krishnapatnam UMPP was discussed and scheme-B and scheme-C were concurred and it was decided to take up further discussions on scheme-A and scheme-D at WRPC level. These issues were discussed at the highest level in a number of meeting- meeting taken by Chairperson, CEA on 10th Dec 2007 at Pune and 5th February 2008 at New Delhi, Special meeting of WRPC held on 16th April 2008, Joint meeting of State Utility members of Standing Committee for Power System Planning of Northern Region and Western Region held on 10th June 2008 at New Delhi, Joint meeting of WRPC and NRPC held on 22-7-2008 at New Delhi. During the 8th meeting of WRPC held on 12th Sept 2008 concurrence of WRPC was accorded for the proposed as well as proposed sharing of transmission charges for Scheme-B, Scheme-C and Scheme-D. Regarding Scheme-A consisting of Narendra-Kolhapur 400 kV D/C line and 1000 MW HVDC back to back at Kolhapur of which 500 MW was through shifting of equipment from Sasaram, WR constituents agreed to share only 25% transmission charges and suggested that balance 25% charges may be asked from NR constituents as NR would be importing power on this link. This was taken up in NR constituents who had agreed to share 25% only for the purpose of facilitating initiation of the project and the matter is now being taken up at the NRPC level. He stated that a number of IPPs in SR were seeking open access for inter-regional transfer of power to WR and NR. Once the charges are tied up through these Southern Region IPPs, the NR constituents would be relieved of this 25% charges. Member (PS), CEA also informed that Sasaram HVDC had been bypassed and Eastern Region and Northern Region were now fully in synchronous mode operation.

Members noted the above.

4.0 Transmission System Associated with the Tilaiya Ultra Mega Power Project (4000 MW), in Jharkhand, Nabinagar (1000MW) of Railways and NTPC, Barh-II (1320 MW), Rihand-III (1000MW), Vindhyachal-IV(1000MW) and Mauda (1000MW) of NTPC, and IPPs in Jharkhand, Orissa, MP, Chattisgarh, and Maharashtra

4.1 Chief Engineer (SP&PA) informed that a number of generation projects were proposed to come during the period 2011-14, beneficiaries of which would be constituents of WR and NR. Government of India was planning setting up of a Ultra Mega Power Project (UMPP) of around 4000 MW capacity at Tilaiya in Jharkhand through a shell company that would tie-up all necessary inputs needed for development of the project. The project developer would be selected through a tariff based competitive bidding process. The project was expected to materialize by 2014-15. As per the allocations finalized by Ministry of Power for Tilaiya UMPP, Eastern Region would get 1500 MW, Northern Region 1700 MW, and Western Region 800 MW. Nabinagar (1000MW) a JV of Railways and NTPC proposed to come up in 2011-12 had allocation to Bihar, Jharkhand and Railways and out of the power for Railways, 410MW was for supply to their loads in WR and 60 MW for supply to their load in NR. Barh-II of NTPC was also proposed to come during 2011-12. MoP was yet to finalize allocation for this project. However, as per information furnished by NTPC tentative allocation of 367 MW to WR from Barh-II had been indicated.

Vindhyachal-IV (1000 MW) and Mauda (1000 MW) also proposed to materialize during 2011-12 would be for the benefit of WR where as Rihand-III (1000 MW) was for the benefit of NR.

Besides the above generating projects a number of other IPP projects were also coming up in Jharkhand, Orissa, West Bengal, MP, Maharashtra and Chattisgarh which had applied for Long Term Open Access to the CTU seeking to supply to target beneficiaries in the NR and WR, A comprehensive transmission system had been evolved for all these generation projects. From the List of IPPs projects who had sought open access, a sub-set had been worked out for meeting power evacuation needs considering only those IPPs which had shown progress indicating some possibility of their materializing with in the 11th Plan/ early 12th Plan. List of such generation projects and quantum of their sought open access for NR and WR was as given below:

	MW of Open access sought for	
	NR	WR
Jharkhand:		
Essar (1800)	600	600
Corporate (660MW)	594	-
Electrosteel (1200MW)	600	500
Adunik(1005MW)	500	-
Dumka CESC (1200MW)	540	540
Orissa:		
Sterlite (2400MW)	500	500
GMR (1050MW)	350	-
Monet(1005MW)	300	375
Jindal (1200MW)	500	400
Essar (1200MW)	625	-
Lanco (2640MW)	389	1600
West Bengal:		
WBPDCL projects at		

Katwa(1000MW) Bokareshwar(920MW) Santaldih(500MW) and PuruliaPSS(900MW) of which they have sough to export 2000MW	1200		800
Madhya Pradesh			
Jaiprakash(1320MW)	523	797	
Shahdol-RIL (1050MW)	350		700
Today Home (1000MW)	300		400
Maharashtra			
JSW Energy (1200MW)	300		- (900 to Maharastra through STU system not using CTU system)
Maharashtra Egy(4000MW)	-		3500 (500 MW to SR)
Chhatisgarh			
Aryan Coal (270MW)	-	250	
Maruti C Coal (270MW)	48		112
Spectrum C&P (100MW)	-		100
Dheeru (1050MW)	382		300
LancoAmrk-III(1320MW)	84		1236
Korba West (700MW)	-	550	
Athena Chgrh(1320MW)	427		793
SKS Ispat (1200MW)	364	728	
RKM PowerGen(1400MW)	-		900
Vidiocon Ind (1200MW)	335		775
Wardha KSK (3600MW)	-		3000

4.2 CE, (SP&PA) CEA stated that transmission system requirements had been identified based on studies carried out by CEA and PGCIL. The studies had been carried out for evolving the system in an integrated manner considering a transmission system for the new generating stations coming up in all the other regions as well. The studies, carried out based on various transmission configurations and alternatives, indicated that in addition to existing and already planned transmission corridors, new high capacity transmission system, was required in following corridors:

A- From ER towards NR:

(1) Tilaiya – Gaya – Balia - Lucknow – Bareilly – Meerut – Moga

(2) Tilaiya – Sasaram – Fatehpur – Agra – Mundka – Moga

B- From ER towards WR:

(1) Ranchi-Dhramjaygarh-Sipat pooling

(2) Jharsuguda-Dhranjaygarh-Jabalpur pooling-Bina-Indore-Vadodara

C- Between WR and NR:

(1) Bina-Gwalior-Jaipur

(2) Vindhyachal-Satna-Gwalior-Jaipur

D- Within WR:

(1) Raigarh-Raipur-Wardha-Aurangabad

(2) Pune-Phadghe-Aurangabad-Dhule-Vadodara

(3) Raigarh-Champa-Sipat pooling-Raipur

4.3 Chief Engineer (SP&PA) stated that if all the IPP generation projects in Orissa and Chattisgarh which had applied open access were considered and higher demand in WR and NR was also considered, then, in addition to above transmission corridors, HVDC corridors from Orrissa and Chattisgarh to Northern Region would also be required. Power evacuation from projects in Chattisgarh viz Lanco Amrkt-III, Korba West, Athena Chgrh, SKS Ispat(1200 MW), RKM PowerGen, Videocon Ind and Wardha KSK would require HVDC outlet from Chattisgarh. However, as the beneficiaries from these projects and also for the major capacity of other IPP generation projects was yet to be firmed-up, the HVDC outlets from Chattisgarh could not be firmed-up at this stage and would need to be studied further. Therefore, at this stage, it was proposed to further discuss and decide the proposal in respect of only the AC system in the corridors mentioned above.

4.4 CE (SP&PA) further stated that most of the IPPs had not firmed-up their beneficiaries. Also, the generation capacity being stated to be programmed for 11th Plan/ early 12th Plan was much in excess of load demand projected by the state utilities even with accelerated growth. In view of this, it would be desirable to take-up only that subset of transmission system which would provide basic system for connectivity and onward transmission through the main identified corridors. Also, in those transmission corridors on which power that would flow is yet to be tied-up in PPAs, instead of 'N-1' redundancy, only 'N-0' redundancy had been considered.

4.5 CE (SP&PA), CEA further stated that with a view to estimate the investment requirement vis-à-vis power that would be transmitted, it may be noted that the total generation capacity of the projects was 37592 MW out of which allocation/open access sought for supply to WR and NR was 15051 MW and 11361 MW respectively.

4.6 The transmission system proposed and indicated in the agenda note was in three parts, viz (i) Generation specific transmission system, (ii) System Strengthening common for WR and NR and (iii) System Strengthening for WR

(i) **Generation specific transmission system**
The transmission charges for these generations specific inter-connecting lines was proposed to be shared by generators or beneficiaries of the specific generation project.

(ii) **System Strengthening common for WR and NR**,
The transmission charges for System Strengthening common for WR and NR were proposed to be divided in two parts in ratio of allocation to NR and WR from Rihand-III (NR:1000 MW) and Vindhyachal-IV (WR:1000 MW) plus open acess sought to NR and WR, from IPPs in Jharkhand, Orrissa and MP connecting through dedicated or common system to Ranchi, Dharamjaygarh, Jharsaguda, Jabalpur pooling, Vindhyachal pooling or Satna. . From the current list, it would include Essar, Electrosteel and Corporate in Jharkhand, all IPPs of Orrissa, and Jaiprakash, Shadol-RIL and Today Home in MP which in total have sought open

acess of 5631 MW for NR and 5872 MW for WR. That is the transmission charges divided in the ratio of 6631 for NR and 6872 for WR and pooled in to the respective regional charges. Assuming estimated cost of Rs 9000 crores for this system the WR pooled charges would be 6872/(6872+6631)*9000= Rs 4600 crores approx)] The additional MW would go in denominator of respective regions.

(iii) **System Strengthening for WR**

The transmission charges for System Strengthening for WR were proposed to be pooled in to the WR system. Assuming approximately estimated cost of the system is Rs 10000 crores. Additional 6872/(6631+6872) of Rs 9000 crores would add Rs 4600 Crores (approx), that is total addition of transmission system approximately estimated at Rs 14600 Crores. With this additional system 15051 MW (6872 MW + 8179 MW on account of Tillaiya, Nabinagar, Barh-II, Mauda, IPPs in West Bengal, Chattisgarh and Maharastra and IPPs in Jharkhand other than those connected to Ranchi,) would get added to denominator of WR

4.7 CE (SP&PA) stated that the generators interconnecting to System Strengthening common for WR and NR would be required to give a commitment to bear transmission charges till the time the beneficiaries are firmed up and PPAs are signed with them. The phased program of implementation of transmission system would also need to be worked out depending upon the progress of various generating units and IPPs. He requested the members to deliberate and give their views on the proposal.

4.8 Director, MSETCL stated that for Mauda TPS, the generation specific system proposed was Mauda-Nagpur South 400 kV D/C quad and Mauda-Khaperkheda400 kV D/C quad and enquired whether beneficiaries of Mauda would be required to pay STU transmission charges in addition to CTU charges. Chief Engineer (SP&PA) clarified that ATS for Mauda TPS was adequately planned and only CTU transmission charges would be applicable.

4.9 To a query from members whether there was a programme for future expansion at Vindhyachal complex, NTPC informed that in addition to 1000 MW capacity addition under Vindhyachal-IV they had a proposal to add another 500 MW unit, with this addition the total ultimate capacity of Vindhyachal-IV would be 1500 MW. CE(SP&PA) stated that in case NTPC proposed to add another 500 MW unit at Vindhyachal-IV , step-up voltage for all the three units of Vindhyachal-IV should be 765kV and in case of space constraint NTPC should go in for GIS. It was decided that NTPC would study and revert back.

4.10 GUVNL said that Tilaiya could be connected to Ranchi to avoid payment of NR transmission charges by WR. Chief Engineer (SP&PA) stated that as per study there was no technical requirement of Tilaiya-Ranchi line. Regarding the issue of payment of transmission charges of NR, this case was similar to that of Mundra UMPP where NR constituents had suggested direct system from Mundra to NR to avoid WR charges but the same was not agreed due to Mundra UMPP connecting within WR system and supply to NR through displacement was better technical solution and in the process, NR constituents had to pay pooled transmission charges of WR. He stated on similar lines WR would be required to bear NR pooled transmission charges for Tilaiya but no ER charges would be applicable as Tilaiya would be connected to Sasaram and Gaya which was an extension of NR system.

4.11 MPPTCL stated that there was a lot of congestion at Bina substation and also there was the requirement of feeding loads around Bhopal and suggested that out of the 2XD/C 765 kV lines from Jabalpur-Bina that had been proposed under common transmission system from NR and WR, one of the ckts could be routed via Bhopal.

The Bina-Indore 765 kV S/C (2nd ckt) under Transmission system for WR may not be required. This modification as suggested by MPPTCL was agreed along with a 765/400 kV substation at Bhopal.

4.12 Advisor, CSEB stated that Chhattisgarh Government had signed MOU for 42000 MW. Even assuming that 50% of the capacity would come up in 11th and 12th Plan periods, the number of 765 kV ckts required would be about 10. He opined that due to right of way constraint in Chhattisgarh, 765 kV voltage level was not sufficient. He further suggested that for transmission planning only firmed up power should be taken.

4.13 Member(PS),CEA stated that for construction of 765 kV substation station a period of two and a half years was required and clarified that only part of the transmission would be built in a phased manner based on power supply assessment after obtaining commitment from the project developers. For onwards transmission beyond pooling stations in Chhattisgarh, considering the plan of total capacity addition, proposal for +/- 800kV HVDC and 1200kV AC was also envisaged and in a phased development planning, at this stage, 2 number of 400kV D/C lines up-gradable to 1200kV S/C lines on Raipur-Wardha-Aurangabad corridor has been proposed.

4.14 After discussions, the following transmission system was concurred:

A. Generation Specific Transmission System

Tilaiya UMPP (4000MW)

1. Tilaiya UMPP – Sasaram, 765kV S/C line
2. Tilaiya UMPP – Gaya, 765kV S/C line.
3. Tilaiya UMPP – Balia 765kV S/C line

Nabinagar (1000MW)

1. Nabinagar-Sasaram 400kV D/C line

Barh-II (1320MW)

1. Barh – Gorakhpur 400kV quad D/C line

Rihand-IV (1000MW)

1. Rihand-Vindyachal pooling 2xS/C 765kV lines operated at 400kV (considering ageing of Rihand-Dadri HVDC system and possibility of decommission the HVDC system, a 765kV switchyard could be established at Rihand utilizing the space of HVDC terminal and considering this, 2XS/C 765kV lines operated at 400kV was suggested and agreed.

Vindhyachal-IV (1000MW)

1. Vindhyachal-IV – Vindhyachal pooling 400kV quad D/C line or 2x765kV S/C lines depending on feedback from NTPC as discussed in para 4.9 above.

Mauda (1000MW)

1. Mauda-Nagpur South 400kV quad D/C
2. Mauda-Khaperkheda 400kV quad D/C

Essar(1800MW), Electrosteel(1200MW) and Corporate(800MW):

These three IPPs in Jharkhad would connect at 400kV to Ranchi 765/400kV substation through dedicated/common 400kV transmission lines

Adunik (1000MW) and DumkaCESC (1200MW) :

These two IPPs in Jharkhand would connect to ER grid at Jamshedpur/Maithon/Gaya

Sterlite(2400MW), GMR (1050MW), Monet (1005MW),
Jindal (1200MW), Essar(1200MW) and Lanco (2640MW)

These IPPs in Orissa would connect to 765kV and 400kV system specifically proposed in ER for Orissa IPPs. Three 765/400kV pooling stations at Jharsuguda, Angul and Denkenal together with Jarsuguda-Angul-Denkenal-Jharsuguda 2xS/C 765kV lines would be connected to WR system through following provision:

1. LILO of all four circuits of Rourkela-Raigarh 2xD/C 400kV lines at Jharsuguda.

2. Jharsuguda-Dharmjaygarh 2xD/C 765kV lines.

IPP of Sterlite would connect to 765/400 kV pooling station Jharsuguda

IPPs of GMR, Monet, Jindal, Essar and LANCO would connect to Angul 765/400 kV pooling station

WBPDCL projects To be connected to West Bengal and ER grid

IPPs in MP

Jaiprakash (1320MW)

1. Jaiprakash-Satna(or Vindhyachal pooling) 400kV quad D/C

ShahdolRIL(1050MW)

1. Shahdol-Jabalpur pooling 400kV D/C

Today Home(1000MW)

1. Today Home – Jabalpur pooling 400kV D/C

IPPs in Maharashtra

JSW Energy(1200MW) Connected through MSETCL's STU system

Maharashtra Egy(4000MW)

1. MahaEgy – Phadghe 2X S/C 765kV lines
2. MahaEgy – Pune S/C 765kV line

IPPs in Chattishgarh

Aryan Coal (270MW), Spectrum C&P (100MW), Maruti Coal (270MW) and Dheeru (1050MW)

1. All the above projects would be connected to Sipat pooling
2. Earlier open access to Aryan Coal was agreed with connectivity to Bhatpara. In view of revised time frame for the generation project, the revised connectivity would be to Sipat pooling. PGCIL informed that Aryan and Sepctrum had planned to have a common dedicated 400kV line to Sipat pooling.
3. Maruti C Coal and Dheeru would have their own dedicated 400kV lines connecting to Sipat pooling.
4. Open access to Dheeru was already been agreed for 600MW. Their revised application seeking open access of 682 MW (382 to NR and 300 to WR) was noted and approved.

B. System strengthening common for WR and NR:

1. Creation of 765kV Switching station at Daramjaygarh by LILO of Ranchi-Sipat 765kV S/C line
2. Ranchi-Daramjaygarh 765kV S/C line
3. Jarsuguda-Daramjaygarh 2xD/C 765kV lines
4. Dhramjaygarh-Jabalpur 765kV 2xD/C 765kV lines
5. Pooling station at Jabalpur with 2x1500MVA 765/400kV
6. Jabalpur-Bina 765kV lines – one D/C line and one S/C line providing 3 nos. of 765kV circuits.
7. Bina-Gwalior S/C 765kV line (3rd ckt)
8. Gwalior-Jaipur 2XS/C 765kV lines
9. Vindhyacal pooling station with 2x1500MVA 765/400kV
10. Vindhyachal pooling-Satna 2XS/C 765kV lines
11. Satna-Gwalior 765kV S/C

C. System strengthening for WR:

1. Dharamjaigarh-Sipat pooling 765kV S/C line
2. Jabalpur-Bhopal 765kV S/C line
3. Bhopal-Indore 765kV S/C line
4. Indore – Vadodara 765kV S/C line
5. 765/400kV substation at Vadodara, Bhopal, Dhule, Padghe, Aurangabad, Raigarh, Champa, and Raipur each with 2x1500MVA 765/400kV and interconnecting 400kV lines/LILO
6. Raigarh-Raipur 765kV S/C
7. Raigarh-Champa 765kV S/C
8. Champa-Sipat pooling 765kV S/C
9. Champa-Raipur 765kV S/C
10. Sipat pooling-Raipur 765kV S/C
11. Raipur-Wardha 2XD/C 400kV lines upgradable to 2XS/C 1200kV lines
12. Wardh-Aurangabad D/C 400kV line (2nd line) upgrdabale to 1200kV S/C line(2nd line)
13. Pune-Padghe 765kV S/C line
14. Aurangabad-Padghe 765kV S/C line
15. Aurangabad-Dhule 765kV S/C line
16. Dhule-Vadodara 765kV S/C line
17. Wardha-Nagpur South 400kV quad D/C with new 2x500MVA 400/220kV s/s at Nagpur South (Butibori) (with 220kV interconnectivity under preview of MSETCL)

D. Pooling Stations for IPPs in Orissa

- Establishment of 765/400kV Pooling Station at Jharsuguda
- Establishment of 765/400kV Pooling Station at Dhenkanal
- Establishment of 765/400kV Pooling Station at Angul
- Dhenkenal Pooling Station – Angul Pooling Station 765kV 2xS/c

- Angul Pooling Station – Jharsuguda Pooling Station 765kV 2xS/c
- Jharsuguda Pooling Station – Dhenkenal Pooling Station 765kV 2xS/c
- LILO of Rourkela – Raigarh 400kV 2xD/c at Jharsuguda Pooling station
- ***** LILO of Meramundali – Jeypore 400kV S/c line at Angul pooling station
- ***** LILO of one ckt of Talcher - Meramundali 400kV D/c line at Angul pooling station
- ***** LILO of Meramundali-Chandaka 400kV D/c line at Dhenkenal Pooling station

[***** These LILO would be later disconnected when Angul and Dhenkanal pooling stations are developed as 765kV as otherwise it would cause short circuit level problem.]

This is for the information of the members.

4.15 Regarding sharing of transmission charges, after discussion, the following was agreed:

4.15.1 Regarding **Generation specific transmission system (para 4.14– A),** it was agreed that the dedicated transmission lines from the generating stations would be constructed by the generators at their own cost and investment recovered by them through their generation tariff and when a group of generators would have common dedicated lines, they would share the cost between themselves and recover their respective investment through their respective generation tariff.

4.15.2 Regarding **System Strengthening common for WR and NR (para 4.14 – B)**, it was decided that PGCIL should take-up the issue of sharing of transmission charges for this system with CERC and seek directions.

4.15.3 Regarding **System Strengthening for WR (para 4.14 – C)** , it was agreed that the transmission charges for this system would be pooled with the regional system of WR system and recovered as pooled WR charges. The following additional MW would also get added in working out sharing of WR regional pooled charges:

- Allocation or PPA or open access for WR beneficiaries from generations outside WR. This would include allocations and PPAs to WR beneficiaries from Tillaiya UMPP, Nabinagar, Barh-II, IPPs in Jharkhand, West Bengal, Orissa and Sikkim and also PPAs from IPPs in SR as well as allocations from NER projects.
- Allocation or PPA or open access for WR beneficiaries from generation projects in WR connecting to common system for WR and NR. (viz. WR allocations form Sasan, Vindhyachal-IV, Rihand-IV, IPPs connecting to Vindhyachal pooling, Jabalpur pooling, etc. Note that allocations from such generation projects to beneficiaries in NR would not share WR charges as the power would get delivered to NR directly through the common system of WR and NR and would not be utilizing the WR pooled system).
- Total capacity of generation projects in WR connecting only to CTU's network of WR and thereby evacuating their full capacity through WR regional system.
- Open access MW through WR system sought by generation projects in WR connecting to STU as well as CTU system or connecting only through STU system or connecting to CTU system and also having connection to their dedicated load.

- Open access MW across WR using WR system (viz. open access from SR to NR via SR-WR inter-regional transmission capacity).

4.15.4 Regarding **Pooling Stations for IPPs in Orissa (para 4.14 – D) and the 765 kV transmission lines interconnecting them,** all the members from state utilities of WR were of the view that this system should be treated as common system for the IPPs in Orissa and should not be pooled with ER regional system and accordingly, beneficiaries of IPPs in Orissa should share only these charges and not to share ER regional charges.

5.0 Transmission System for Export of power from different generation projects in Sikkim to NR/WR.

5.1 Chief Engineer informed that a large number of generation project developers are setting up generation projects as indicated in agenda note in Sikkim. Based on the list of generation projects and its latest status, as informed by different generation developers, comprehensive transmission system had been evolved and phasing of transmission system matching with the generation schedule has been finalized, the details of which are the following:

A. Transmission System for development of pooling stations in Sikkim and transfer of power to a new pooling station on NER-NR/WR

HVDC interconnecter

Pooling Station

(i) 220/132 kV at Rangpo
(ii) 400/220 kV at New Melli
(iii) 400/132 kV at Mangan
(iv) 400/220 kV near Teesta-II

Transmission Line

i) Teesta-II Pooling Point – Mangan 400 kV D/C (Twin Lapwing)
ii) Mangan – New Pooling Station in Northern part of West Bengal/Bihar (Kishanganj) 400 kV D/C line with quad conductor.
iii) Mangan – New Melli 400 kV D/C (Quad Moose)
iv) Dikchu - Gangtok 132 kV D/C
v) New Melli – New Pooling Station in northern part of West Bengal/Bihar (Kishanganj) 400 kV D/C (Quad Moose).
vi) Rangpo – New Melli 220 kV D/C line (Twin moose).
vii) LILO of Gangtok - Melli and Gangtok – Rangit 132 kV lines at Rangpo.
viii) LILO of Teesta-V - Siliguri 400 kV line at New Melli with quad Moose conductor. [This LILO would be withdrawn at a later date and the 4 nos. of 400 kV bays at New Melli used for LILO would be utilized for New Melli – Kishanganj and New Melli – Mangan 400 kV D/C lines].

Substation

ix) New 400/220 kV GIS Pooling Station near Teesta-II HEP with 7x105 MVA, single phase transformers and 2x80 MVAR bus reactors at 400 kV bus.
x) New 400/132 kV GIS Pooling Station at Mangan with 7x105 MVA, single phase transformers and 2x80 MVAR bus reactor at 400 kV bus.
xi) New 400/220 kV GIS Pooling Station near New Melli with 13x167 MVA, single phase transformers and 2x80 MVAR bus reactors at 400 kV bus.
xii) New 220/132 kV Gas Insulated Pooling Station near Rangpo with 3x100 MVA, transformers.

xiii) Extension of 400 kV Kishanganj new pooling substation with 2 nos.63 MVAR switchable line reactors each on Kishanganj new pooling station end of Mangan and Kishanganj pooling station

Scope of works at Sl.no (ii) viz Mangan-Kishanganj 400 kV D/C quad line along with Teesta-III –Magan 400 kV D/C quad line is proposed to be executed through Joint Venture route between PGCIL and Generator.

B. Transmission System for development of pooling stations on NER-NR/WR HVDC interconnecter.

i) LILO of Siliguri(Existing) – Purnea 400 kV D/C Quad line at the new pooling station.
ii) LILO of Siliguri(Existing) – Dalkhola 220 kV D/C line at new pooling station.
iii) LILO of Biswanath Chariali – Agra +/- 800 kV, HVDC line at new pooling station for parallel operation of HVDC station.
iv) Establishment of New 2x315 MVA, 400/200 kV and +/- 800 kV, 3000 MW HVDC sub-station at new pooling station
iv) Earth Electrode line for the new pooling station.
v) Addition of +/- 800 kV, 3000 MW HVDC Module at Agra.
vi) Earth Electrode line at Agra HVDC terminal.

Members took note of the above.

6.0 Proposal of MPPTCL for 220 kV Shujalpur-Badod D/C line

6.1 CE(SP&PA) stated that MPPTCL had intimated that 220 kV Badod substation in MP by LILO of Kota-Ujjain line had already been taken up by MPPTCL. They had suggested that 220 kV Sujalpur-Badod 220 kV D/C line be taken up as a regional project as it would facilitate Rajasthan in drawing power through Sujalpur-Badod-Kota line.

6.2 This proposal of MPPTCL was discussed. Members felt that in view of Zerda-Kankroli 400kV D/C line which was already under implementation there was no justification in taking up this line as a regional scheme and in case MPPTCL wished they could construct this line on their own. After discussion this proposal was dropped.

7.0 Transmission System at 400kV and 765kV in Maharashtra. Proposal for: Intra-state transmission system of STU, Evacuation system from generating stations (MSPGCL, MAHADISCOM and IPPs) and Inter-regional transmission system proposed as regional schemes

7.1 Chief Engineer (SP&PA) informed that MSETCL had planned requirement of intra-State STU transmission system in Maharashtra. The same was discussed in a meeting between CEA and MSETCL on 4th and 5th November, 2008. The requirement corresponding to the following generation related evacuation system at 400 kV and 765 kV was considered:

MSPGCL Generation

1.	Bhusawal II	2x500 MW	2010-2011
2.	Khaperkheda	1x500 MW	2010-2011
3.	Koradi - II	3x660 MW	2011-12, 2012-13
4.	Chandrapur - II	2x500 MW	2011-2012

MAHADISCOM

1.	Dhopave	2x800 MW	2011-12, 2012-13
2.	Dhule	2x800 MW	2012-13, 2013-14
3.	Aurangabad	2x800 MW	2012-13, 2013-14

IPPs

1.	M/s JSW Energy Ltd.	4x300 MW	2009-10
2.	M/s Wardha Energy Co.	2x135 MW	2009-10
3.	Reliance Ind. Shirur	1x1000 MW	2012-13
4.	Reliance Ind. Talegaon	1x1000 MW	2012-13
5.	India Bulls, Sinnar(Nasik)	2x660 MW	2012-13, 2013-14
6.	Sophia Power Co., Nandgaonpet	4x660 MW	2012-13, 2013-14
7.	M/s Adani - Gondia	3x660 MW	2012-13

Based on studies carried out by MSETCL and further cases studied during the meeting between CEA and MSETCL, the intra state transmission system evolved was as under:

A) Intrastate system strengthening and common system for the comprehensive evacuation system :

1) 7 X 500 Mva-1 phase 765/400 kV pooling S/s at Koradi 765kV s/s
   - LILO of 400 kV Satpura – Koradi-I S/c at Koradi 765kV s/s

2) 7 X 500 Mva-1 phase 765/400 kV S/s at Akola
   - Akola 765kV – Akola 400kV 400kV quad D/C line OR
     LILO of both ckts of Wardha (PG) – Aurangabad (PG) 400kv D/C line at Akola 765kV s/s.

3) Koradi – Akola 765kV 2xS/C lines
4) Akola – Aurangabad (PG) 765kV 2xS/C lines

5) Following new 400 kV substations each with 7 X 167 Mva-1 Phase 400/220 kV: Lonikand-II, Chakan, Hinjewadi, Kesurdi, Nasik, Nanded, Malharpeth (Karad-II), Padghe-II.

The above 400kV substations would have the following transmission connectivity:

1. LILO of both ckts of Parli (PG) – Pune (PG) 400 kV D/c at Lonikand-II.
2. LILO of one ckt of Lonikand-I – Pune (PG) 400 kV at Chakan.
3. LILO of both ckts of Koyna – Jejuri/Lonikand-I 400 kV D/c at Kesurdi.
4. Lonikand-II – Kesurdi 400 kV quad D/c
5. Kesurdi – Hinjewadi 400 kV quad D/c
6. LILO of both ckts of Navsari – Navi-Mumabai 400 kV at Nasik.
7. LILO of Chandrapur-I – Parli 400kV S/C at Nanded
8. LILO of both circuits of New Koyna-Karad 400kV D/C at Malharpeth
9. LILO of both circuits of Tarapur-Padghe 400kV D/C at Padghe-II

B. Intrastate transmission system for generation specific evacuation up to grid points:

MSPGCL Generation

Bhusawal II: Bhusawal-II – Bhusawal 400kV D/C
Bhusawal-II –Aurangabad(MSETCL)400kV D/C

Khaperkheda Khaperkheda - Koradi 765kV 400kV quad D/C

Koradi-II Koradi-II – Koradi 765kV Quad D/C
LILO of 400 kV Koradi-I – Bhusawal S/c at Koradi-II

Chandrapur-II	LILO of both circuits of Chandrapur-parli 400kV D/C at Chandrapur-II (that is LILO of 2 circuits out of 3)
	Chandrapur-II – Warora – Wardha PG 400kV quad D/C with switching station at Warora

MAHADISCOM

Dhopave	Dhopawe – Padghe-II 400kV quad D/C LILO of both circuits of Jaigarh-New Koyna 400kV quad D/C at Dhopave
Dhule	Dhule-Dhule existing 400kV quad D/C
Aurangabad	LILO of both circuits of Aurangabad-Bhusawal 400kv D/C line at Aurangabad TPS

IPPs

M/s JSW Energy Ltd.	Jaigarh – New Koyna 400kV quad D/C Jaigarh – Malharpeth 400kV quad D/C
M/s Wardha Energy Co.	Wardha Egy – Warora Sw.St. 400kV D/C
Reliance Ind. Shirur	Shirur – Lonikhand-II 400kV quad D/C Shirur – Chakhan 400kV quad D/C
Reliance Ind. Talegaon	Talegaon – Hinjewadi 400kV quad D/C Talegaon – Chakhan 400kV quad D/C
India Bulls, Sinnar(Nasik)	Sinnar – Nasik 400kV D/C Sinnar – Bableshwar 400kV D/C
Sophia Power Co., Nandgaonpet	Nandgaonpet–Akola(765kV) 400kV D/C LILO of both ckts Akola-Koradi 400 kV D/C at Nandgaonpet
M/s Adani - Gondia	Gondia – Koradi (765kV) 400kV quad D/C Gondia – Warora 400kV quad D/C

7.2 CE (SP&PA), CEA stated that the studies had shown that this transmission system would meet the intra-State transmission requirements without leaning on the regional grid and would meet the contingency as per specified criteria.

Members took note of the above transmission scheme and concurred with the proposed connectivity with the regional grid.

8.0 Provision of second 400 kV feed to Union Territory of Dadra and Nagar Haveli (DNH) and Daman& Diu

8.1 Member (PS) stated that the present peak demand of DNH was of the order of 400 MW and the 17th EPS had projected a load demand of 778 MW by end of XI Plan. Presently the load demand is met from drawal through GETCO network and 220 kV Vapi-Kharapada line. The 220 kV kV Vapi-Khadoli was under implementation by PGCIL. Considering the future projected load demand another 400 kV feed along with associated transmission line to UT of DNH under regional strengthening scheme would be required.

8.2 PGCIL informed that Navsari- Mumbai new location lines passes near Dadra and Nagar Haveli and this line could be LILOed to create a new 400/220 kV substation at a suitable location along with the 220 kV interconnectivity.

8.3 Members agreed to the 400/220 kV 2x315 MVA substation at a suitable location in DNH by LILO of Navsari-Mumbai new location 400 kV D/C line along with underlying

network interconnectivity. The location of the substation and interconnectivity would be evolved jointly by PGCIL and DNH in consultation with CEA.

8.4 CE (SP&PA), CEA informed that Daman & Diu had also written to CEA that their loads are growing and had requested for a 400/220 kV substation in Daman&Diu. It was decided that PG will examine the same and put up a proposal in the next SCM.

9.0 Control of high voltages in Dhule area

9.1 MSETCL informed that procurement of reactors had already been initiated and 2x50 MVA at Dhule, 1x80 MVAR at Padge, 1x80 MVAR at Karad and 1x80 MVAR at Khargar would be commissioned by April 2009.

9.2 GUVNL informed that they had invited tenders for procurement of reactors of 1x125 MVAR at Kasor and 1x80 MVAR at Nardipur and indicated March 2010 for commissioning of these reactors.

9.3 POWERGRID informed that reactors at PGCIL substations at Khandwa 1x125 MVAR and Dehgam 1x125 MVAR would be commissioned by March 2010.

9.4 MPPTCL stated that presently high voltage conditions were not being experienced in Indore area and informed that there was no space available in Indore 400 kV S/S of MPPTCL for installation of 125 MVAR reactor, however one no 50 MVAR shunt reactor has already been installed by MPPTCL to take care of overvoltages. It was decided that PGCIL would carry out a light load condition study for 2010-11 to bring out requirement of reactors if any.

10.0 Development of 400 kV network at Gwalior

CE (SP&PA) stated that for anchoring of 400 kV Gwalior, PGCIL had suggested development of suitable 400 kV network from Gwalior. They had suggested 400 kV Gwalior-Shujalpur line.

After discussions it was felt that the interconnection to Shujalpur may not be very beneficial. Hence this proposal was dropped.

11.0 Addressing high short circuit level at 400 kV Raipur substation in WR

11.1 Chief Engineer (SP&PA) stated that PGCIL had informed that with the growing number of interconnections the short circuit level at Raipur would exceed the permissible limit of 40 kA. Studies had been carried out by PGCIL and based on studies PGCIL had proposed split bus arrangement and reconfiguration /shifting of some of the terminating lines at Raipur 400 kV. By split bus arrangement and reconfiguration of some of the lines the fault level could be addressed.

11.2 PGCIL had also informed that split bus arrangement at Raipur along with shifting of few line terminals from one side to the other is feasible. Accordingly PGCIL had proposed to split 400 kV Raipur bus into two sections with reconfiguration of few lines /line bays.

11.3 Member (PS), CEA stated it should be ensured by PGCIL that by splitting the bus section should not result in overloading of the bus sectionaliser. To a query from Members about the cost of this reconfiguration, PGCIL informed that total estimated cost for the reconfiguration would be of the order of 5 to 10 crores.

After discussions the bus split arrangement as proposed by PGCIL was agreed as a regional scheme.

12.0 Summary of discussion on Open Access Cases:

12.1 Summary of the decisions on open access discussed in the 28th meeting of the Standing Committee on Power System Planning in Western Region and 10th meeting of WR constituents for LTOA is enclosed at Appendix-OA. Detailed minutes would be issued by PGCIL.

Appendix- OA

Summary of the decision on Long-term Open Access cases/applications discussed in the 28th meeting of Standing Committee on Power System Planning in WR & 10th meeting of WR constituents regarding LTOA held on 06.12.2008 at Aurangabad

General Discussions: It was noted that some of the LTOA applicants for their full generation were applying only for net injection. It was discussed that as the sharing of pooled regional charges was on basis of gross generation capacity the LTOA applicants would also share the transmission charges accordingly. In view of this LTOA was agreed for full installed capacity for such cases. Wherever, the applicants had applied for part capacity with balance to be supplied to STU system or own consumption LTOA would be for capacity applied for. However, such applicants would need to account for their full generation capacity with respect to LTOA(STU) + LTOA(CTU)+ own consumption.

1. M/s Aryan Coal Benefications Pvt. Ltd.

Applicant : M/s Aryan Coal Benefications Pvt. Ltd.
Generation project : 270MW (2x135MW) at Chakabura, Distt Korba, Chhattisgarh
Long-term open access sought: 250MW
Target beneficiaries : GUVNL
Commissioning schedule : Dec'10

LTOA agreed : 270 MW
Dedicated Transmission system :

i) Aryan Coal – WR Pooling Station near Sipat 400kV D/c

2. M/s Spectrum Coal & Power Ltd.

Applicant : M/s Spectrum Coal & Power Ltd.
Generation project : 100MW (2x50MW) at Katghora, Distt Korba, Chhattisgarh
Long-term open access sought: 100MW
Target beneficiaries : CSEB, MPPGCL/GUVNL
Commissioning schedule : 1st unit – Dec'10

LTOA agreed : 100 MW
Dedicated Transmission system :

i) Interconnection of Spectrum generation project with M/s Aryan Coal generation project (to be developed by M/s Spectrum) which in turn will be connected at WR Pooling Station near Sipat through 400kV D/c (to be developed by M/s Aryan)

3. M/s Maruti Clean Coal & Power Ltd.

Applicant : M/s Maruti Clean Coal & Power Ltd.
Generation project : 300MW (1x300MW) at Bandhakhar Distt Korba, Chhattisgarh
Long-term open access sought: 300MW
Target beneficiaries : WR (222MW) & NR (78MW)

Commissioning schedule : Jun'11

LTOA agreed : 300 MW
Dedicated Transmission system :

i) Maruti clean Coal – WR Pooling Station near Sipat 400kV D/c

4. M/s Dheeru Powergen Pvt. Ltd.

Applicant : M/s Dheeru Powergen Pvt. Ltd.
Generation project : 1050MW (3x350MW) at Dhanras Village, Distt Korba, Chhattisgarh
Long-term open access sought: 82.5MW
Target beneficiaries : NR
Commissioning schedule : 1st Unit – Jan'12

Out of 1050MW capacity, earlier M/s PTC India was provided LTOA for transfer of 600 MW power to MPPTCL (300 MW) & PSEB (300MW) from above project. They have now applied for LTOA for 82.5 MW. Since Chhattisgarh share of 367.5 MW would also be injected at Sipat pooling station for delivery to STU network hence LTOA agreed was for 450 MW to account for the full generation capacity of 1050 MW (LTOA earlier provided to PTC- 600 MW+ LTOA now agreed 82.5 MW to NR + 367.5 share of Chhattisgarh through CTU network)

LTOA agreed : 450 MW
Dedicated Transmission system :

i) Dheeru Power – WR Pooling Station near Sipat 400kV D/c [Triple /Twin Lapwing]

The Regional system to be provided by POWERGRID for the Open Access cases at serial number 1 to 4 is:

i) 765/400kV 3x1500MVA WR Pooling Station near Sipat
ii) LILO of Sipat – Seoni 765kV 2xS/c at WR Pooling Station

5. Jaiprakash Associates Ltd.

Applicant : M/s Jaiprakash Associates Ltd.
Generation project : 1320MW (2x660MW) at Nigri,Distt Sidhi, Madhya Pradesh
Long-term open access sought: 1215MW
Target beneficiaries : WR [63.6%*] & NR [36.4%*]
** including merchant sale*

Commissioning schedule : Dec'11

LTOA agreed : 1320 MW
Dedicated Transmission system :

i) JAL – Satna(PG) 400kV D/c [Quad conductor]

6. Aryan Coal Benefication Pvt. Ltd.

Applicant : M/s Aryan Coal Benefication Pvt. Ltd.
Generation project : 1200MW (4x300MW) at Musamudi Distt Sidhi, MP
Long-term open access sought: 1150 MW
Target beneficiaries : MSEDCL/GUVNL, MP, PSEB, HUVPNL, RUVPNL
Commissioning schedule : Mar'12

LTOA agreed : 1200 MW
Dedicated Transmission system :

ii) Aryan (MP) – VSTPP Pooling Station 400kV D/c [Triple conductor]

The Regional system to be provided by POWERGRID for the Open Access cases at serial number 5 and 6 is as agreed in the 28th SCM meeting held on 06.12.2008.

7. JSW Energy Ltd.

Applicant : M/s JSW Energy Ltd.
Generation project : 1200MW (4x300MW) at Jaigad, Distt Ratnagiri, Maharashtra
Long-term open access sought: 300 MW [Balance 900MW to Maharashtra]
Target beneficiaries : Haryana
Commissioning schedule : 1st unit-Oct'09, 4th unit- Apr'10

LTOA agreed : 300 MW

LTOA for transfer of power to Haryana to be provided after commissioning of Balia-Bhiwadi HVDC system.

Dedicated Transmission system :

Connectivity of generation project with Karad and New Koyna S/s of MSETCL

8. Torrent Power

LTOA for 500MW capacity out of 1100MW Sugen generaion project in Gujarat was already provided subject to availability of dedicated and identified system strengthening schemes. However, it was informed that M/s Torrent Power has indicated that out of two LILO (Gandhar – Vapi at Sugen and Gandhar – Dehgam at Sugen –temporary arrangement] LILO of Gandhar – Vapi at Sugen is ready while other LILO of Gandhar-Dehgam at Sugen will take some more time. Further, the first unit was ready for transfer of power.

It was discussed and decided that LTOA may be provided upto 500 MW progressively with already completed LILO arrangement viz with the commissioning of 1st unit of 365 MW LTOA may be provided for 365 MW and with commissioning of 2nd unit of 365 MW LTOA can be enhanced to 500 MW. It was also agreed that the generation unit shall share the WR regional transmission charges corresponding to 365 MW on commissioning of 1st unit and 500 MW with commissioning of 2nd unit. In case of any transmission constraint, suitable measures such as backing down may be required. It was also decided that M/s Torrent Power

should expedite and complete the balance work of the dedicated transmission system at the earliest.

9. Essar Power MP Ltd.

M/s Essar Power MP Ltd was earlier provided LTOA for 1100 MW power from their Mahan generation project of 1200 MW installed capacity. PGCIL informed that Essar Power was insisting on BPTA corresponding to 1100 MW after accounting for auxiliary consumption.

After deliberation, it was decided that as the Generation project is not having any other drawal arrangement except the dedicated transmission system and entire capacity would be connected to the grid, accordingly the applicant need to share the WR regional transmission charges corresponding to entire gross capacity i.e. 1200 MW.

10. Maharashtra Energy Ltd, Today Homes & Infra Ltd., Reliance Industries (Shadol)

LTOA applications of following three applicants were also discussed.

1) Maharashtra Energy (4000 MW) in Distt. Raigad Maharashtra
2) Today Home and Infra (1200 MW) in Distt. Narsimhpur, MP
3) Reliance Industries Ltd (1050 MW) in Distt Shadol MP

It was proposed that Today Home and Reliance Ind. Gen. projects may be interconnected with 400/765 kV Pooling Station near Jabalpur through dedicated 400 kV transmission network between the generation projects and the pooling station. Maharashtra Energy generation project (4000 MW) was proposed to be connected through dedicated 765 kV lines to Padghe and Pune substations. M/s Maharshatra Energy also informed that they had some plan of drawal arrangement directly from the generation switchyard and same shall be informed after finalization.

M/s Reliance informed that their commissioning schedule has been delayed and same shall be informed shortly.

It was decided that all above three applications shall be discussed in the subsequent meetings.

Annexure - I

List of participants of the 28th meeting of the Standing Committee on Power System Planning in Western Region held on 06-12-2008

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		
4	A.K. Yadav	Dy.Director	CEA	011-26732308	awd@rediffmail.com
5	P. Patel	Member Secretary	WRPC		
6	S. Majumdar	Director(Projects)	PGCIL	0124-2571930	smajumdar@ powergridindia.com
7	D. Chowdhury	ED(Engg.II)	PGCIL/CC	9717890989	dchowdhury @ powergridindia.com
8	D.K. Valecha	ED(WR-I)	PGCIL/WR-I	9422811647	dkvalecha @ powergridindia.com
9	Pankaj Kumar	GM (Engg)	PGCIL/CC	0124-2571700	pankaj@ powergridindia.com
10	S.K. Gupta	GM(Pr)	PGCIL ,WRTS-II	09428504051	skgupta.57@gmail.com
11	Prashant Sharma	Addl. General Manager(Comml.)	PGCIL	0124-2571987	prashant @powergridindia.com
12	R.C. Singh	AGM	PGCIL ,WRTS-I	0712 2641472	singh_r_c@yahoo.co.in
13	Subir Sen	DGM(Engg.),	PGCIL/CC	9910378104	subir @ powergridindia.com
14	K.K. Gupta	Chief Mgr.	PGCIL	9422811686	kkgupta@ powergridindia.com
15	A.K. Sharma	Chief Mgr.	PGCIL	9422811659	aksharma@ powergridindia.com
16	Kashish Bhambhani	Dy. Mgr. (Engg.)	PGCIL/CC	9971399117	kashish @ powergridindia.com
17	M.G. Raoot	GM	WRLDC, PGCIL	022-28202691	mraoot5@yahoo.co.in
18	P. Pentayya	AGM	WRLDC, PGCIL	022-28314609	ppentayya @gmail.com
19	Shiv Raj Singh	Advisor, CSEB	CSEB	9827216858	sandyacseb@yahoo.com
20	S.N. Chauhan	Chief Engineer(Tr)	CSEB	0771-2574240	snchauhan@rediffmail
21	A. Roy	Director(O)	MSETCL	9833422206	dirop@mahatransco.in
22	M.R. Khadgi	CE (STU)	MSETCL	9322218169	maharashtrastu.in
23	C.B. Modi	Chief Engineer	MSETCL	9850755884	
24	Sonkavday NR	EE(STU).	MSETCL		n.sonkavday@rediffmail.com
25	S.V. Chavan	Dy. E.E	MSETCL	9423781052	satishchavan @rediffmail.com
26	A.R. Belambe	Dy. E.E	MSETCL	9423781050	-
27	Vinay Khedkar	AE(STU)	MSETCL	9833589409	vgkhedekar@mahaarashtrastu.com
28	Dr.R.P.Bhatele	EDCT	MPPTCL,Jabalpur	9425152817	mpptcl_adb2@yahoo.co.in
29	S.K. Negi	MD	GETCO	9879200622	md.getco@gebmail.com
30	P.J.Jani	DE(SP)	GUVNL	9879618754	deespguvnl@gebmail.com
31	S.G. Prasad	EE(System)	GETCO	9925208598	eesystem.getco@gebmail.com
32	Arun H. Takle	A.S.W (Elect.)	Elec.Deptt. D &NH	0260-2642348	arun999takle@yahoo.com
33	Abhijit Sen	DGM(PE-Elect.)	NTPC Ltd.	9868390601	aksen@ ntpceoe.co.in
34	K.P. Singh	ACE(Trans.)	NPCIL Mumbai	022-25992913	kpsingh @ npcil.in

Annex-II-A

Western Region Transmission Schemes- Already commissioned

S. No.	Description of Scheme	Status
1.	**Kolhapur-Mapusa 400 kV D/c line**	Commissioned
2.	**Rourkela-Raipur 400 kV D/c line**	Commissioned
3.	**Series Compensation (FSC & TCSC) on Raipur-Rourkela 400 kV D/c line**	Commissioned
4.	**Establishment of 400/220 kV S/s at Kahndwa** ▪ LILO of Itarsi-Dhule 400 kV D/c at Khandwa	Commissioned
5.	**Tarapur (Extension) unit# 3&4 Tr. System (2x500 MW)** ▪ Tarapur – Padghe 400 KV D/c ▪ Tarapur – Boisar 400 KV D/c ▪ LILO of Gandhar – Padghe 400kV S/c at Vapi ▪ LILO of Gandhar – Padghe 400kV S/c at Boisar ▪ Tarapur – Boisar 220 kV S/c ▪ Establishment of new 400/220KV, 2x315MVA S/s at Vapi and Boisar	Commissioned
6.	**Raipur-Bhadravati 400 kV D/c line**	Commissioned
7	**Bhadravati-Chandrapur 400 kV 2nd D/c line**	Commissioned
8.	**Vindhyachal –Korba 400kV S/c line**	Commissioned
9.	**Vindhyachal-III (1000 MW) Tr. system** ▪ Vindhyachal – Satna 400 kV D/c ▪ Satna - Bina 400KV D/c ▪ Establishment of new 400 kV switching station at Bina (PG) ▪ LILO of existing Satna – Bina (MP) 400 kV D/c at Bina (PG) ▪ Augmentation of transformation capacity at Satna S/s by 1x315MVA transformer. ▪ LILO of Rourkela - Raipur 400kV D/c at Raigarh ▪ Establishment of New 400/220 kV S/s with 2x315MVA transformer at Raigarh	Commissioned
10.	**Sipat - I Tr. System (1980MW)** ▪ Sipat – Seoni 765 kV 2xS/c ▪ Seoni – Khandwa 400 KV D/c (quad) ▪ Nagda – Dehgam 400kV D/c ▪ LILO of Sardar Sarovar – Nagda 400kV D/c at Raigarh ▪ LILO of Bhilai – Satpura 400kV S/c at Seoni ▪ LILO of Korba– Raipur 400kV S/c at Sipat ▪ Establishment of New 765/400 kV substations at Seoni (with 2X1500 MVA, 765/400kV and 2X315 MVA, 400/220 kV) ▪ Establishment of New 400/220 kV substation at Rajgarh (with 2x15MVA 400/220 kV)	Commissioned
11.	**WR system Strengthening Scheme-I** ▪ Sipat-Raipur 400kV D/c ▪ 40% fixed series compensation on Seoni-Khandwa 400 kV D/c ▪ 400/220 kV 1x315 MVA transformer at Itarsi along with two nos. 220 kV bays	Commissioned
12.	**Bina -Nagda 400 kV D/c**	Commissioned

S. No.	Description of Scheme	Status
13.	**Kahalgaon-II Ph-I Generation Project (2x500 MW)-WR Portion** ▪ Agra-Gwalior 765 kV S/c line (initially to be operated at 400 kV)	Commissioned
14.	**WR System Strengthening Scheme-III** ▪ Vapi(PG)- Magarwada 220 kV D/c ▪ Vapi(PG)-Kharadpada 220kV D/c	Commissioned
15.	**WR System Strengthening Scheme-IV** ▪ Establishment of 400/220 kV, 2x315 MVA Substation at Damoh	Commissioned
16.	**Sipat-II Tr. system** ▪ Khandwa – Rajgarh 400kV D/c ▪ Bina- Gwalior 765kV S/c(Initially to be operated at 400kV) ▪ LILO of Korba – Raipur 400 kV S/c at Bhatapara ▪ 3rd 765/400 kV, 1500 MVA ICT at Seoni ▪ Establishment of New 400/220 kV S/s with 2x315MVA transformer each at Gwalior and Bhatapara	Commissioned

Annex-II- B

STATUS OF WESTERN REGION TRANSMISSION SCHEME

1	2	3	4	5	6	7
S. No.	**Description of Scheme**	**Date of firming up in WR Standing committee**	**Date of FR**	**Date of investment approval**	**Target date as of now**	**Remarks**
1.	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)	Mar'04		Mar'09	Sipat Gen Schedule delayed. Scheme under advance stage of implementation.
2.	Associated Tr. System of Kahalgaon-II Ph- II (3x500MW) a) Ranchi-Sipat 400kV D/C with 40% series compensation	18th (31-10-03)	Nov'03	Jan'05	Dec'08	To be commissioned shortly
3.	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)	Aug'4	Jan'06	Jan'09	To be commissioned shortly
4.	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 d) 40% FSC on Raigarh-Raipur 400 kV 2nd D/c	20th (23.01.04)	Jul'04	June'06	June'09	Under implementation
5.	Western Region System Strengthening Scheme-II	20th (23.01.04)	Sep'05 (Rev)	July'06	July'10	

1	2	3	4	5	6	7
S. No.	**Description of Scheme**	**Date of firming up in WR Standing committee**	**Date of FR**	**Date of investment approval**	**Target date as of now**	**Remarks**
	Set-A: For absorbing import in eastern and central part of WR Grid (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 in					Under implementation Being implemented under Pvt. Sector

1	2	3	4	5	6	7
S. No.	**Description of Scheme**	**Date of firming up in WR Standing committee**	**Date of FR**	**Date of investment approval**	**Target date as of now**	**Remarks**
	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 **(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-Stations (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 under : Set-A					Being implemented under Pvt. sector Under implementation Under implementation

1	2	3	4	5	6	7
S. No.	**Description of Scheme**	**Date of firming up in WR Standing committee**	**Date of FR**	**Date of investment approval**	**Target date as of now**	**Remarks**
	Set-B Set-C Set-D					
6.	Barh Transmission System (1980 MW) (WR Portion) a) Seoni- Bina 765 kV S/c (initially to be operated at 400kV)	20th (23.01.04)	Mar'04	Dec'05	Sept'09	Under implementation
7.	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)	Jan'07	Nov'07	Sep'10	Under implementation
8.	Western Region System Strengthening -VI 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)	25th (30.09.06)	Jan'07	Jan'08	Nov'10	Under implementation
9.	Western Region System Strengthening -VII	26th (23.02.07)	May' 07	Jan'08	Nov'10	Under implementation

1	2	3	4	5	6	7
S. No.	**Description of Scheme**	**Date of firming up in WR Standing committee**	**Date of FR**	**Date of investment approval**	**Target date as of now**	**Remarks**
	a) Provision of 420 kV, 1x125 MVAR Bus reactor at Khandwa b) Provision of 420 kV, 1x125 MVAR Bus reactor at Dehgam					
10.	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 transformer at Vapi and Dehgam	26th (23.02.07)	Jun'07	Apr'08	Jan'11	Under implementation
11.	Tr. System of Sasan Ultra Mega Power Project (4000 MW) **ATS** a) Sasan-Satna 765 kV 2x S/c b) Establishment of Satna 765/400kV, 2x1000 MVA S/s c) Satna- Bina (PG) 765kV 2x S/c d) Bina(PG)-Bina(MP) 400kV D/c (2^{nd} line) e) LILO of both circuits of one of the Vindhyachal-Jabalpur 400 kV D/c line at Sasan f) 765kV line bays for operation of Agra-Gwalior-Bina 2xS/c lines at 765 kV level g) 765kV line bays for operation of Seoni – Bina S/c line at 765kV level	Joint meeting of WRPC/NRPC held on 22.07.08	Jun'07	Nov'08	Nov'12	Under implementation

1	2	3	4	5	6	7
S. No.	**Description of Scheme**	**Date of firming up in WR Standing committee**	**Date of FR**	**Date of investment approval**	**Target date as of now**	**Remarks**
	h) Sasaram-Fatehpur 765kV S/c i) Fatehpur-Agra 765kV S/c **Regional System strengthening in WR for Sasan** a) Bina(PG)-Indore(PG) 765 kV S/c b) Establishment of 765/400 2x1500 MVA S/s at Indore(PG) c) Indore(PG)-Indore(MPPTCL) 400kV D/c (quad) d) Upgrading Bina and Gwalior S/s to 765 kV by 2x1000 MVA 765/400 kV at Bina and 2x1500 MVA 765/400 kV at Gwalior					
12.	Tr. System of Mundra Ultra Mega Power Project (4000 MW) **ATS** a) Mundra-Limbdi 400 kV D/C (Triple Snowbird) b) Mundra-Bachau - Ranchhodpura 400 kV D/C (Triple Snowbird) c) Mundra-Jetpur 400 kV D/C (Triple Snowbird) **Regional System strengthening in WR for Mundra** a) Establishment of Bachchau 400/220 kV 2x315 MVA S/s b) Gandhar – Navsari 400 kV D/c c) Establishment of Navsari (GIS) 400/220 kV 2x315 MVA S/s d) LILO of both circuits of Kawas-Navsari 220 kV D/c at Navsari	Joint meeting of WRPC/NRPC held on 22.07.08	Jun'07	Oct'08	Oct'12	Under implementation

1	2	3	4	5	6	7
S. No.	**Description of Scheme**	**Date of firming up in WR Standing committee**	**Date of FR**	**Date of investment approval**	**Target date as of now**	**Remarks**
	e) Navsari-New location near Mumbai 400 kV D/c f) Establishment of Wardha 765/400 kV 3x1500 MVA S/s g) 765 kV line bays for operation of Seoni-Wardha 2xS/c lines at 765 kV level h) Wardha-Aurangabad(PG) 400kV D/c(Quad) along with 40% fixed series compensation with provision to upgrade the line to 1200kV S/c at a later date i) Establishment of 400kV GIS substation at new location near Mumbai j) Aurangabad (PG)-Aurangabad(MSETCL) 400 kV D/c (quad) k) Establishment of Aurangabad(PG) 400/220 kV 2x315 MVA S/s					
13.	Tr. System associated with DVC, Maithon in ER (Part system) ▪ Ranchi-WR Pooling Station 765kV S/c	27th (30.07.07)	Sep'07	Jul'08	Jul'12	Scheme under implementation
14.	Transmission system of Korba-III (500 MW) Gen. Project ▪ Korba STPS switchyard – Raipur 400kV D/c	27th (30.07.07)	Dec'07		30 Months from Inv. Approval	NTPC to arrange signing of BPTA.
15.	Western Region strengthening	27th	Sep'07		36 months	Investment approval

1	2	3	4	5	6	7
S. No.	**Description of Scheme**	**Date of firming up in WR Standing committee**	**Date of FR**	**Date of investment approval**	**Target date as of now**	**Remarks**
	scheme-X ▪ Establishment of 400/765kV 2x1500MVA WR Pooling Station near Sipat ▪ LILO of Sipat-Seoni 765kV S/c at WR Pooling Station	(30.07.07)			from Inv. approval	awaited.
16.	Western Region strengthening scheme-XI ▪ LILO of Sipat-Seoni 765kV 2nd S/c at WR Pooling Station ▪ Installation of 765/400kV, 1x1500MVA 3rd transformer at WR Pooling Station	27th (30.07.07)	Nov'08		33 months from Inv. approval	Investment approval awaited
17.	Western Region strengthening scheme-XII ▪ Pune–Navi Mumbai 400kV D/c	27th (30.07.07)	May'08		30 months from Inv. approval	Investment approval awaited
18.	Transmission system associated with Krishnapatnam (5x800 MW) (WR Portion) ▪ Raichur – Sholapur 765 kV S/c ▪ Sholapur – Pune 765 kV S/c ▪ Pune (New) – Pune 400 kV Quad D/c ▪ Establishment of new 765/400 kV substations at Sholapur & Pune with 2x1500 MVA transformation capacity	27th (30.07.07)	Jan'08		48 months from Inv. approval	Investment approval awaited
19.	Tr. System associated with South – West interconnection	Special meeting of WR cosnt.	Jan'08			Investment approval awaited.

1	2	3	4	5	6	7
S. No.	**Description of Scheme**	**Date of firming up in WR Standing committee**	**Date of FR**	**Date of investment approval**	**Target date as of now**	**Remarks**
	▪ Establishment of 1000MW HVDC back-to-back station at Kolhapur ▪ Narendra – Kolhapur 400 kV D/c line with Lapwing conductor ▪ LILO of both circuits of existing Kolhapur – Mapusa 400 kV D/c line at Kolhapur HVDC back-to-back station	on 20.06.08				