

**Agenda Note for 28th meeting of the Standing Committee on Power
System Planning of Northern Region**

1. Confirmation of minutes of 27th meeting held on 30.5.2009

1.1 Minutes of 27th meeting was circulated vide letter dated 11.06.2009. Regarding item no. 15.1, “Enhancing system reliability by LILO of 400 kV Dehar – Bhiwani and 400 kV Dehar – Panipat lines”, HVPNL has commented that LILO of 400 kV Dehar – Panipat line at Panchkula S/S (PGCIL) would provide reliability benefit to NR Region as a whole and it should be constructed as a regional scheme.

Regarding LILO of 400 kV Dehar-Bhiwani line at Rajpura, PSEB has stated in 13th NRPC meeting held on 27.06.2009 that PSERC has not granted investment approval for establishing Rajpura S/S.

Regarding operation of Dehar generating m/cs in synchronous condenser mode & use of GT tap positions to control overvoltage, BBMB informed in 13th NRPC meeting that Dehar m/cs are not designed to operate in synchronous condenser mode and changing of GT tap position was not adequate enough to control high voltages experienced at Dehar in winter months.

Therefore, Members may deliberate the issue afresh.

1.2 The minutes of the 27th standing committee meeting held on 30.05.2009 may be confirmed.

2. Follow up issues of 27th SCM

2.1. System strengthening scheme in Punjab

PSEB was to review its requirement of 220 kV bays in view of CERC regulation (ICT and downstream system to be paid by the concerned beneficiary) and revert in one month. Response of PSEB is still awaited.

2.2. Provision of spare ICT in NR-II

It had been agreed that Powergrid would procure one spare ICT in NR II as it takes about 15 months for repair of a failed transformer. Powergrid was to put up a consolidated proposal in this regard. Response of Powergrid is still awaited.

2.3. Enhancing Reliability of Generation at Narora Atomic Power Station

UPPCL was to submit detailed plan along with time frame of implementation for overcoming transmission network constraint in Western U.P. to CEA. Response of UPPCL is still awaited.

2.4. Overloading of 2x315 MVA, 400/220 kV ICTs at Bhiwadi

PGCIL to look into the possibility of diversion of one 315 MVA, 400/220 kV ICT at Bhiwadi S/S to avoid overloading of existing 2 ICTs at Bhiwadi. Powergrid response is still awaited.

3. Status of Projects approved in the SCM/RPC

PGCIL may furnish the status of various transmission projects agreed in the earlier meeting of Standing Committees/Regional Power Committees.

4. Dehradun – Abdullapur 400kV D/C:

In the 23rd Standing committee meeting held on 16th February, 2008 it was agreed that power from Kotlibehl HEP ST-1A, 1B & 2 would be evacuated by a 220kV line to Dehradun 220kV S/S of PTCUL from where it could be evacuated to Dehradun 400/220kV S/S of POWERGRID. For evacuation of power beyond Dehradun 400/220kV S/S, Dehradun-Abdullapur 400kV D/C was considered as a regional scheme for Kotlibehl. The Kotlibehl system upto Dehradun 400/220kV S/S was to be constructed by PTCUL and tariff recovered by PTCUL from generation developer who could recover it through tariff of their power and transmission.

During the 25th standing committee meeting held on 17/7/2008, NHPC stated that as per the Electricity act 2003, they had a mandate upto generation switchyard and as such the wheeling charges for the line between Kotlibhel to Dehradun should be realized by PTCUL directly from beneficiaries of the project. In the meeting it was agreed until the commercial issue between NHPC and Uttarakhand is resolved, it would be difficult to proceed on the evacuation system. Till date no confirmation has been received from NHPC/PTCUL in this regard. NHPC/ PTCUL may update on the same.

Further it is to mention that Dehradun – Abdullapur 400 kV D/C line was planned to provide an additional transmission corridor from UP towards western part of the grid via Uttarakhand in addition to transfer of power from Kotlibhel. Dehradun – Abdullapur 400 kV line would also facilitate for transfer of power from Meerut - Bagpat – Saharanpur corridor towards Haryana. In addition it is also to be mentioned that till the time Dehradun – Abdullapur line is completed the Dehradun S/S shall remain radially connected from Saharanpur.

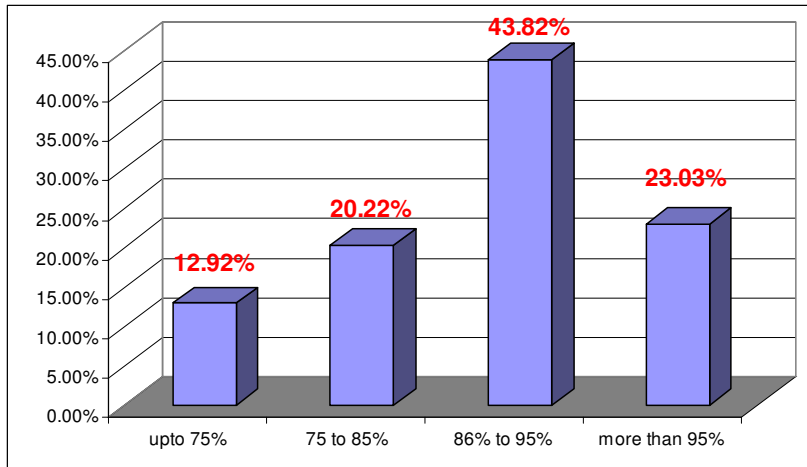
The proposed transmission line is required for transfer of Kotlibehl power and power from Eastern part of NR towards western part of Northern Region. Keeping above in view and considering that this line has been agreed earlier, it is proposed to take up Dehradun – Abdullapur 400kV D/C line as Northern Regional System Strengthening-XXIV with quad conductor configuration.

Members of the Committee may discuss and concur.

5. Augmentation of transformation of Raibareilly:

For evacuation of Unchahar-III transmission system a 220/132kV S/S was established at Raibareilly. Raibareilly substation is connected to Unchahar generation complex by three nos of 220kV lines and Lucknow by two (2) nos of 220kV lines. The substation presently has a transformation capacity of 2x100 MVA and caters to loads of Raibareilly and nearby areas. The daily maximum loading per transformer as percentage of MVA capacity is plotted in figure below. From the chart it is seen that loading on the transformers is greater than 85% of rating about 67% of the time. There is no redundancy to meet transformer contingency. Looking into the high loading of existing transformers augmentation of existing transformers by another 100 MVA transformer is proposed.

Time
period



Loading as % of MVA capacity

Member of the Committee may discuss and concur.

6. Provision of Bus reactors in Northern region:

In Northern region power from generating plants needs to be transferred over long distances to major load centers through long EHV lines. As power flow on these lines varies widely, it has been seen that during low loading condition most of the 400 kV buses including the generation complexes experience very high voltages. The problem of high voltage is very acute in the eastern part of Northern Region, in Haryana / Punjab and J&K area during low hydro & light load conditions, in Rajasthan area etc. The voltage profile of some of the substations is tabulated in Annexure- . From the table it is seen

- 77% of time voltage at Gorakhpur remained more than 420 kV.
- The voltage at Allahabad was above 410kV for more than 92% of time . In fact it was over 420kV more than 42% of time, with voltage profile in July August being 420kV more than 75% of time.
- Voltage at Mainpuri remains above 410 kV about 45% of time. Infact the voltage dipped less than nominal voltage, i.e 400kV, for only 15.56% of time indicating high voltage profile.
- Voltage at Hissar was above 410kV for more than 46% of time. And in October, November and December when the hydro is less, the voltage remained above 410kV more than 93% of time.
- Jullandhar voltage remained above 410kV for more than 39% of time. In November the voltage remained above 410kV more than 90% of time. Infact in Novemeber the voltage was above 420kV for more than 32% of time. From October to April 2009, for more than 18% of time , the voltage at Jullandhar remained more than 420kV.
- 53% of time voltage at Amritsar remained more than 410 kV.
- Kankroli voltage profile indicates that voltage is on the higher side. The voltage was more than 410kV for 62% of time. In the month of July it was above 410 kV for 99% of time

To control the high voltage in the system, Bus reactors have been / are being provided as a part of various transmission schemes, however there are some other 400 kV buses where reactors are to be provided urgently and which not included as part of

any transmission scheme. The requirement of bus reactors to be provided at various buses is given below:

S. No.	Name of Substation	Proposed Bus Reactor (MVAR)
1	Gorakhpur	1X125
2	Allahabad	1X125
3	Mainpuri	1x125
4	Hissar	1x125
5	Jullandhar	1x125
6	Amritsar	1x80
7.	Kankroli	1x125

Keeping above in view it is proposed to provide bus reactors mentioned above as a separate scheme for implementation as a regional strengthening scheme NRSS XXV. Members of the Committee may discuss and concur.

7. Provision of 2 nos. of 220kV line bays at Allahabad POWERGRID substation

Railways have been allocated 100 MW power from the unallocated share of NTPC. The power is presently being drawn from Dadri and Auraiya. To improve the reliability of power supply, Railways have requested for two(2) nos of 220kV bays at Allahabad substation of POWERGRID. The power would be taken into NCR network of railways and will be additional injection point. The entire cost of the 220kV bay would be borne by Railways.

Members of the Committee may discuss and concur

8. Dulhasti-Samba 400kV D/C

Presently Dulhasti (390MW) generation of NHPC is being evacuated by Dulhasti-Kishenpur-400kV S/C. The issue of reliable power evacuation from Dulhasti HEP was discussed during the 14th NRPC meeting held on 19/09/2009 wherein it was agreed to provide a 400 kV D/C quad conductor line from Dulhasti to Samba in order to provide reliability as well as for optimal utilization of RoW, keeping in view the future generation potential.

For evacuation of 390 MW with the provision of 3 nos, 400 kV circuits (one Twin & two Quad) would result in light loading on the lines, resulting into over voltage & excessive MVAR incidental on the generation machines. Further the time frame of future generation in the nearby area is still very uncertain.

Keeping above in view it is proposed that at present we may string only one circuit (with Quad conductor) of Dulhasti – Samba 400 kV D/C (Quad) line and stringing of second circuit can be taken up later with the coming up of more generation in the vicinity. This would optimize the investment as well as conserve the Right of Way.

Members of the Committee may discuss and concur

9. Transmission System associated with Tilaiya UMPP (4000 MW) in Jharkhand (To be shared by constituents in proportion to allocation)

In 27th Standing Committee Meeting of Northern Region, following transmission system was agreed:-

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

Subsequently, Director (Trans), PGCIL stated in Eastern Region Standing Committee Meeting held on 14th September 2009, that constructing 765 kV D/C line on the same tower to Baliya instead of going by 2xS/C 765 kV lines would be better option as tower outage being a rare phenomenon. CEA is also of the opinion that the 765 kV Tilaiya UMPP-Balia D/C line would save RoW and the cost of the D/C line relative to 2xS/C lines would be lesser. In view of the above, following revised transmission system was proposed:-

- Tilaiya UMPP – Balia 765 kV D/C line
- Tilaiya UMPP – Gaya 765 kV S/C line

The above transmission system has already been agreed by the constituents of Eastern Region and the same is now put up for consent of NR constituents.

10. Transmission system associated with IPPs located in Orissa, Jharkhand, West Bengal, Madhya Pradesh, Chattisgarh and Southern Region:

10.1 New IPP projects in Chattisgarh and the associated transmission system

A review of progress of IPPs in Chhattisgarh was done in various review meetings held on 18.07.09 at CSPTCL, Raipur, 04.08.09 at CEA, New Delhi. Out of the comprehensive list of generation projects only 12 no IPPs which have shown some progress and are likely to materialize during end of XI Plan and early 12th Plan have been considered. The list is as under:

S.N	Developer	Capacity (MW)	LTOA (MW)	Unitwise comm schedule	Target Allocation-Region (MW)			
					WR*	NR	SR	TOTAL
RAIGARH COMPLEX								
1	RKM Powergen Ltd.(4x360)	1440	1440	Mar'11,Jun'11,Sep'11,Dec'11	840	300	300	1440
2	Athena Chhattisgarh Power Ltd.(2x600)	1200	1200	Mar'12, Aug'12	823	377		1200
3	Jindal Power Ltd.(4x600)	2400	2400	Mar'12,Jul'12,Nov'12,Mar'13	1610	790		2400
4	Jindal Power Ltd.(1x500)	500	500	Existing	500			500
5	SKS Ispat & Power Ltd.(4x300)	1200	1200	Nov'11,Dec'11,Mar'12,Mar'12	800	400		1200
6	Korba West Power Co. Ltd.(1x600)	600	600	Jul'12	600			600
7	DB Power Ltd.(2x600)	1200	1200	Nov'11,Feb'12	818	382		1200
	sub-total	8540	8540		5991	2249	300	8540
JANJGIR-CHAMPA COMPLEX								
1	Wardha Power Co. Ltd (6x600)	3600	3600	Feb'12,Jun'12,Oct'12,Feb'13,Jun'13,Oct'13	3600			3600
2	BALCO(4x300)	1200	900	Jun'10, Sep'10, Dec'10, Mar'11	450	450		900
3	Vandana Vidyut Ltd.(2x135+1x270)	540	540	Apr'11,Dec'11,Mar'12	440	100		540
4	Lanco Amarkantak Power Pvt. Ltd.(2x660)	1320	1320	Mar'12,Jun'12	462	858		1320
5	Chhattisgarh Steel & Power Ltd.(1x35+1x250)	285	285	Existing, Dec'11	200	85		285
	sub-total	6945	6645		5152	1493	0	6645
	Total	15485	15185		11143	3742	300	15185

** WR allocation also includes Chhattisgarh Share (3600 MW) @35% on a/c of FRR

The generation from 12 IPPs is likely to materialize during 11th plan/early 12th plan. The total installed capacity of these 12 IPPs is 15485 MW out of which 7 IPPs with capacity 8540 MW were located near Raigarh complex and 5 no. of IPPs with capacity 6945 MW are located near Janjgir-Champa complex. The target beneficiaries as indicated by these IPPs are 11143 MW to WR and 3742 MW to NR.

The following Transmission System which has already been agreed by WR constituents in their 29th SCM, is proposed for evacuating power from these IPPs to WR/NR:-

- Transmission System within WR associated with New IPP projects in Chhattisgarh

- (i) Raipur Pooling station- Wardha 765 kV 2x D/C (initially 1st D/C line to be operated at 400 kV)
- (ii) Wardha- Aurangabad(PG) 765 kV 2x D/C (initially 1st D/C line to be operated at 400 kV)
- (iii) Aurangabad- Padge(PG) 765 kV D/C
- (iv) Aurangabad- Dhule (New) (PG) 765 kV S/C (*Implementation by private sector through tariff based competitive bidding route*)
- (v) Dhule (New) – Vadodara (PG) 765 kV S/C (*Implementation by private sector through tariff based competitive bidding route*)
- (vi) Establishment of 765/400 kV 2x1500 MVA substations at Dhule(New) (*Implementation by private sector through tariff based competitive bidding route*)
- (vii) Dhule (New) – Dhule (MSETCL) 400 kV D/C (quad) (*Implementation by private sector through tariff based competitive bidding route*)
- (viii) Establishment of 765/400 kV 2x1500 MVA substations at Aurangabad and Padghe(GIS)
- (ix) Aurangabad(PG)-Khargar 400 kV D/C (quad)
- (x) Padghe(PG)- Padghe 400 kV D/C (Quad)
- (xi) Vadodra-Asoj (GETCO) 400 kV D/C (Quad)
- (xii) Dhule (New) – Nasik (MSETCL) 400 kV D/C (quad)
- (xiii) Dhule (New) – Malegaon (MSETCL) 400 kV D/C (quad)
- (xiv) \pm 600 kV, 4000 MW HVDC bipole between Raigarh pooling station (Kotra) -Dhule
- (xv) 4000 MW, 600 kV HVDC bipole terminal each at Raigarh pooling station (Kotra) and Dhule

- Transmission System in NR associated with New IPP projects in Chhattishgarh

- (i) \pm 800 kV, 6000 MW HVDC bipole between Champa Pooling Station – Near Kurukshetra (NR) in Harayana (initially to be operated at 3000 MW)
- (ii) 3000 MW, 800 kV HVDC bipole terminal each at Champa pooling station and near Kurukshetra in Haryana with provision to upgrade the terminals to 6000 MW
- (iii) Kurushetra- Jallandhar 400 kV D/C (Quad) (one ckt via Nakodar S/S)
- (iv) LILO of Abdullapur- Sonapat 400 kV D/C (triple) at Kurushetra
- (v) Establishment of 400/220 kV, 2x500 MVA substation at Kurushetra

- Pooling Stations along with their interconnections for New IPP projects in Chhattishgarh

- (i) Raigarh Pooling Station (Kotra)- Raipur Pooling station 765 kV D/C (initially to be operated at 400 kV)
- (ii) Raigarh Pooling Station (Kotra)- Champa Pooling station 765 kV S/C
- (iii) Champa Pooling station- Raipur Pooling station 765 kV D/C (initially to be operated at 400 kV)
- (iv) Raigarh Pooling station (Kotra) - Raigarh Pooling station (Tamnar) 765 kV D/C (initially to be operated at 400 kV) for Jindal Power.
- (v) Champa Pooling station – Dharamjaygarh 765 kV S/C
- (vi) Establishment of 765/400 kV pooling stations at Raigarh (near Kotra), Raigarh (near Tamnar), Champa, and at Raipur (the pooling stations will be initially at 400 kV and later upgraded to 765/400 kV).
- (vii) Raigarh Pooling Station (Kotra) - Raigarh existing 400 kV D/C (to be kept open at a later date).
- (viii) Raipur Pooling Station – Raipur existing 400 kV D/C (to be kept open at a later date)

Note: *At present only Jindal Power project is connected to Raigarh (Tanmar). Jindal Power is yet to get coal linkage. Therefore the implementation of Raigarh(Tanmar) pooling station should be linked with the progress of works at Jindal Power.*

- Dedicated transmission System up to pooling point under the scope of Project developer for generation projects in Raigarh Complex

RKM Powergen Ltd.(4x360MW)	(i) RKM Powergen – Raigarh Pooling Station(near Kotra) 400kV D/C(Quad)
Athena Chhattisgarh Power Ltd. (2x600MW)	(i) Athena Chhattisgarh – Raigarh Pooling Station(near Kotra) 400kV D/C(Quad)
Jindal Power Ltd.(4x600MW + 1x500MW)	(i) Jindal Power – Raigarh Pooling Station (near Tamnar) 400kV 2xD/C (Quad) along with 765/400kV 3x1500MVA transformers at Raigarh Pooling station (Tanmar)
SKS Ispat & Power Ltd. (4x300MW)	(i) SKS Ispat - Raigarh Pooling Station (near Kotra) 400kV D/C(Quad)
Korba(West) Power Ltd. (1x600MW)	(i) LILO of Athena Chhattisgarh – Raigarh Pooling Station 400kV D/C at Korba(W)
DB Power Ltd.(2x600 MW)	(i) DB Power – Raigarh Pooling Station (near Kotra) 400kV D/C (Quad)

- Dedicated transmission System up to pooling point under the scope of Project Developer for generation projects in Champa Complex

Wardha Power Ltd.(6x600MW)	(i) Wardha Power – Champa Pooling Station 400kV 2xD/C (Quad) along with 765/400kV 3x1500MVA transformers at Champa Pooling Station.
Balco Ltd.(4x300MW)	(i) Balco – Champa Pooling Station 400kV D/C (Triple)
Vandana Vidyut Ltd. (2x135 + 1x270MW)	(i) Vandana Vidyut – Champa Pooling Station 400kV D/C
Lanco Amarkantak Power (2x660MW)	(i) Lanco - Champa Pooling Station 400kV D/C (Quad)
Chhattisgarh Steel &Power Ltd.(1x35+1x250MW)	(i) LILO of Vandana Vidyut – Champa Pooling Station 400kV D/Cat CSPL

- Interim arrangement for connectivity of projects coming prior to availability of transmission

Balco Ltd.	(i) LILO of both circuits of Korba - Birsinghpur 400kV D/C at Balco
RKM Powergen Ltd.	(i) LILO of Rourkela- Raigarh 400kV D/C at RKM Powergen
Vandana Vidyut Ltd	(i) LILO of one ckt of Korba – Birsinghpur 400kV D/C at Vandana Vidyut

The above interim arrangement is purely a temporary transmission arrangement to be carried out by the respective IPP and power transfer may takes place on short-term open access basis. The LILO shall be removed and the line shall be restored in its original configuration by the respective developer, after interconnection of the generation project at the identified Pooling Station.

➤ Phasing of transmission works associated with new Chhattisgarh IPPs Projects

Stage – I: 36 months from the date of signing of BPTA by the IPPs (Tentatively by Sept 2012)

- (i) Raigarh Pooling Station (Near Kotra) – Raigarh (existing) 400kV D/C (temporary arrangement)
- (ii) Raipur Pooling Station – Raipur (existing) 400kV D/C (temporary arrangement)
- (iii) Raigarh Pooling Station (Near Kotra) – Raipur Pooling Station 765kV D/C (initially to be operated at 400kV)
- (iv) Champa Pooling Station – Raipur Pooling Station 765kV D/C (initially to be operated at 400kV)
- (v) Raigarh Pooling station(near Kotra) – Raigarh pooling station(near Tamnar) 765 kV D/C(initially to be operated at 400kV)
- (vi) Raipur Pooling Station – Wardha 765kV D/C (initially to be operated at 400kV)
- (vii) Wardha – Aurangabad (PG) 765kV D/C (initially to be operated at 400kV)

- (viii) Aurangabad(PG) – Khargar 400kV D/C(Quad)
- (ix) Establishment of 400kV Raigarh Pooling Station (near Kotra) [provision to upgrade at 765kV level]
- (x) Establishment of 400kV Raipur Pooling Station (provision to upgrade at 765kV level)
- (xi) Establishment of 400kV Champa Pooling Station (provision to upgrade at 765kV level)
- (xii) Establishment of 400kV Raigarh Pooling Station (near Tamnar) [provision to upgrade at 765kV level]

Stage – II: 42 months from the date of signing of BPTA by the IPPs (Tentatively by March 2013).

- (i) Raipur Pooling Station – Wardha 765kV D/C (2nd).
- (ii) Wardha – Aurangabad (PG) 765kV D/C (2nd).
- (iii) Padghe – Padghe(PG) 400kV D/C (Quad).
- (iv) Aurangabad (PG) – Padghe(PG) 765kV D/C.
- (v) Raigarh Pooling Station (near Kotra) – Champa Pooling Station 765kV S/C.
- (vi) Champa Pooling Station – Dharamjaygarh 765kV S/C.
- (vii) Upgradation of 400kV Raigarh Pooling station (near Kotra) to 765/400kV, 4x1500MVA capacity, Raipur pooling station to 765/400kV 1x1500MVA capacity, Champa pooling station to 765/400kV 3x1500MVA capacity, Raigarh pooling station(near Tamnar) to 765/400kV 3x1500MVA capacity for charging of terminating 765kV lines at 765kV level
- (viii) Establishment of 765/400kV 2x1500MVA Aurangabad (PG) S/S for charging of 765kV lines at 765kV level.
- (ix) Establishment of 765/400kV 2x1500MVA Padghe (PG) S/S
- (x) Aurangabad- Dhule (New) (PG) 765 kV S/C (*Implementation by private sector through tariff based competitive bidding route*).
- (xi) Dhule (New) – Vadodara (PG) 765 kV S/C (*Implementation by private sector through tariff based competitive bidding route*)
- (xii) Vadodra-Asoj (GETCO) 400 kV D/C (Quad).
- (xiii) Establishment of 765/400 kV 2x1500 MVA substations at Dhule (New) (*Implementation by private sector through tariff based competitive bidding route*)
- (xiv) Dhule (New) – Dhule (MSETCL) 400 kV D/C (quad) (*Implementation by private sector through tariff based competitive bidding route*).

Stage – III: 52 months from the date of signing of BPTA by the IPPs (Tentatively by December 2013)

- (i) 600kV, 4000MW HVDC bipole between Raigarh Pooling Station (Kotra) – Dhule
- (ii) Dhule (New) – Nasik (MSETCL) 400kV D/C (Quad)
- (iii) Dhule (New) – Malegaon (MSETCL) 400kV D/C(Quad)
- (iv) Establishment of 4000MW 600KV HVDC bipole terminal each at Raigarh Pooling station (near Kotra) and Dhule respectively.

Stage - IV: 55 months from the date of signing of BPTA by the IPPs (Tentatively by March 2014)

- (i) 800kV, 6000MW HVDC bipole between Champa Pooling Station – around Kurukshetra in Haryana (NR) [initially to be operated for 3000MW).
- (ii) Establishment of 3000MW 800KV HVDC bipole terminal each at Champa Pooling station and Kurukshetra(NR) respectively (provision to upgrade the terminals at (6000 MW at a later date)
- (iii) Kurukshetra(NR) - Jalandhar 400kV D/C(Quad) one ckt. via 400/220kV Nakodar S/S.
- (iv) LILO of Abdullapur – Sonapat 400kV D/C (triple) at Kurukshetra.
- (v) Establishment of 400/220kV 2x500 MVA S/s at Kurukshetra

The above transmission system and phasing of transmission works have been agreed by the constituents of Western Region and the same is now put up for consent of NR constituents.

10.2 Transmission System for evacuating power from IPPs in Madhya Pradesh Generation Projects and Chhattisgarh Generation Projects (pooled at Bilaspur Pooling Point)

Sl. No.	Applicant	Gen. Project Capacity (MW)	LTOA Applied for (MW)	Location	Time Frame	Quantum allocated in the region	
						WR	NR
1.	Maruti Clean Coal	300(1x300)	300	Near Bilaspur	Jun'12	222	78
2.	PTC (Dheeru)	600(3x350) - part	600	Near Bilaspur	Sep'12, Dec'12, Mar'13	300	300
3.	Dheeru Power Gen	450(3x350) - part	450	Near Bilaspur	Sep'12, Dec'12, Mar'13	367.5	82.5
	Total	1350	1350			889.5	460.5

Sl. No.	Applicant	Gen. Project Capacity (MW)	LTOA Applied for (MW)	Location	Time Frame	Quantum allocated in the region	
						WR	NR
1.	Jaiprakash Power Ventures Ltd.	1320(2x660)	1320	Near Nigri	May'13, Nov'13	908	412
2.	Aryan Coal Benefications	1200(4x300)	1200	Near Sidhi	Mar'13, Mar'14, Dec'14, Mar'15	900	300
	Total	2520	2170			1485	635

IPPs having installed capacity of 3870 MW(as listed above) are likely to materialize in 11th/early 12th plan period in Madhya Pradesh & Chattishgarh which are proposed to be pooled at Bilaspur pooling station. The target beneficiaries indicated by these IPPs are 2375 MW for WR and 1095 for NR.

The following Transmission System is proposed for evacuating power from these IPPs to WR/NR:-

- System strengthening in WR associated with above generation projects
 - (i) Indore - Vadodara 765kV S/C
 - (ii) Vadodara – Pirana 400kV D/C (Quad)
 - (iii) Establishment of 765/400kV 2x1500MVA Vadodara substation
- Dedicated transmission System up to pooling point under the scope of Project Developer

Maruti Clean Coal &Power Ltd. (300 MW)	(i) Maruti – WR Pooling Station(Bilaspur) 400 kV D/C (ii) Two nos of 400kV bays at WR Pooling Station (Bilaspur)
Dheeru Powergen (450MW) and PTC India(600MW)	(i) Dheeru Power Gen – WR Pooling Station (Bilaspur) 400 kV D/C (high capacity) (ii) Two nos of 400kV bays each at WR Pooling Station (Bilaspur)
Jaiprakash PowerVentures Ltd.(1320MW)	(i) Jaiprakash – Satna 400kV D/C (high capacity) (ii) Two nos of 400kV bays at Satna(POWERGRID)

The above transmission works have been agreed by the constituents of Western Region and the same is now put up for consent of NR constituents.

10.3 Transmission System for evacuating power from IPPs in Orissa

SI no	Projects	Generation Developer/ Open Access Applicant	Date of Commissioning	Installed Capacity (MW)	LTOA Required (MW)				
					NR	WR	ER	SR	Total
1	Sterlite	Sterlite Energy Ltd	Jun-09	2400	200	200	-	-	400
2	GMR	GMR Kamalanga Energy Ltd	Sept -11	1050	600	-	-	200	800
3	Navbharat	Navabharat Power Pvt. Ltd	Jul - 11	1050	465	255	-	-	720
4	Monnet	Monet Power Company Ltd	June-12	1050	300	375	225	-	900
5	Jindal	Jindal India Thermal Power Ltd	March-11	1200	834	210	-	-	1044
6	Lanco Babandh	Lanco Babandh Power Pvt Ltd	Dec-13	2640	650	950	-	-	1600
7	Ind Barath	Ind Barath Energy(Utkal) Ltd	Sept-11	700	266	350	-	-	616
Subtotal(Orissa)				10090	3315	2340	225	200	6080

Seven (7) IPPs with total capacity 10,090 MW are likely to materialize in Orissa by end of 11th Plan/ early 12th plan. The target beneficiaries indicated by these IPPs are 2340 MW to WR and 3315 MW to NR and balance to ER/SR. The comprehensive transmission system for evacuating power from these projects has been discussed and

agreed in the 27th Standing Committee Meeting of NR constituents held on 30th May 2009. Subsequently, this transmission system was discussed in SCM of WR and ER held on 10th September 2009 & 14th September 2009 respectively and following elements in the transmission system were added:-

- *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.
- Jabalpur Pooling station – Jabalpur 400 kV D/C (high capacity)

* Interim arrangement. LILO to be removed after establishment of 765 kV pooling station at Angul.

The details of comprehensive Transmission System now proposed with above additions for evacuating power from these IPPs is given below:-

- System strengthening common for WR and NR associated with Orissa IPPs

- (i) Establishment of 765kV switching substation at Dharamjaygarh
- (ii) Establishment of 2x1500 MVA, 765/400kV Jabalpur Pooling Station
- (iii) Jharsuguda Pooling Station – Dharamjaygarh (WR) 765kV D/C
- (iv) LILO of Ranchi – Sipat (Bilaspur) PS 765kV S/C line at Dharamjaygarh
- (v) Dharamjaygarh – Jabalpur Pool 765kV D/C line
- (vi) Jabalpur Pooling station – Jabalpur 400 kV D/C (high capacity)**
- (vii) Jabalpur Pooling station – Bina 765kV D/C line
- (viii) Bina – Gwalior 765kV S/C (3rd circuit)

- System strengthening in WR associated with Orissa IPPs

- (i) Establishment of 2x1500MVA, 765/400kV Bhopal Pooling Station. (*Implementation by private sector through tariff based competitive bidding route*)
- (ii) Jabalpur Pooling station – Bhopal 765kV S/C (*Implementation by private sector through tariff based competitive bidding route*)
- (iii) Bhopal – Indore 765kV S/C (*Implementation by private sector through tariff based competitive bidding route*)
- (iv) Bhopal New substation – Bhopal (M.P.) 400kV D/C (high capacity) (*Implementation by private sector through tariff based competitive bidding route*)

- System strengthening in NR associated with Orissa IPPs

- (i) Gwalior - Jaipur 765kV S/C line (2nd circuit)*
- (ii) Jaipur - Bhiwani 765kV S/C line

* 1st ckt. covered under Rihand III evacuation system.

- Pooling Stations along with their interconnections for IPPs in Orissa

- (i) Establishment of 2X1500 MVA,765/400kV Pooling Station at Jharsuguda
- (ii) Establishment of 4X1500 MVA,765/400kV Pooling Station at Angul
- (iii) Angul Pooling Station – Jharsuguda Pooling Station 765kV 2xS/C
- (iv) LILO of Rourkela – Raigarh 400kV D/C at Jharsuguda Pooling station
- (v) *LILO of Meramundali – Jeypore 400kV S/C line at Angul pooling station**

(vi) *LILO of one ckt of Talcher - Meramundali 400kV D/C line at Angul pooling station.

* Interim arrangement. LILO to be removed after establishment of 765 kV pooling station at Angul.

- Dedicated transmission System up to pooling point under the scope of Project Developers of Orissa IPPs

Sterlite (2400 MW)	(i) Sterlite- Jharsuguda Pooling station 400 kV D/C line with associated bays
IND-Barath(700 MW)	(i) IND-Barath- Jharsuguda Pooling station 400 kV D/C line with associated bays
Jindal Thermal (1200MW)	(i) Jindal Thermal- Angul Pooling station 400 kV D/C line with associated bays
Monnet (1050 MW)	(i) Monnet- Angul Pooling station 400 kV D/C line with associated bays
GMR (1050 MW)	(i) GMR- Angul Pooling station 400 kV D/C line with associated bays
Lanco Babandh (2640MW)	(i) Lanco Babandh- Angul Pooling station 400 kV 2xD/Cline with associated bays (ii)3x1500 MVA, 765/400 kV transformers at Angul along with associated bays
Navbharat Phase-I (1050 MW)	(i) Navbharat - Angul Pooling station 400 kV D/C line with associated bays

The above transmission works have been agreed by the constituents of Western and Eastern Region and the same is now put up for consent of NR constituents.

10.4 Transmission System for evacuating power from IPPs in Jharkhand & West Bengal

Sl No	Projects	Developer/Applicant	Time Frame	Ins. Cap	LTOA	Allocation			
						NR	WR	ER	Total
A Jharkhand Projects									
1	Adhunik	Adhunik Thermal Energy Ltd	Mar-12	1005	910	500		350	850
2	Corporate	Corporate Power Ltd	Mar-12	660	594	594			594
3	ESSAR	Essar Power (Jharkhand) Ltd.	Dec-11	1200	1100	400	400	300	1100
5	Dumka	CESC Ltd.(Dumka)	Jun-12	600	540	270	270	0	540
			Subtotal	3465	3144	1764	670	650	3084
B West Bengal Projects									
		WBPDC/WBSEDCL	2011-12	2000	2000	1200	800	-	2000
			Total	5465	5144	2964	1470	650	5084

In Jharkhand and West Bengal (WBSEDCL), IPPs having total installed capacity of 5465 MW as listed above are likely to materialize by end of 11th Plan/ early 12th plan. The target beneficiaries indicated by these IPPs are 1470 MW for WR and 2964 MW for NR and balance to ER.

The following Transmission System is proposed for evacuating power from these IPPs to WR/NR:-

- System strengthening, common for WR and NR associated with IPP Projects in Jharkhand and West Bengal Generation projects:

- (i) Ranchi - Dharamjayagarh 765kV S/C
- (ii) Dharamjayagarh – Jabalpur 765kV D/C (2nd line) (*Implementation by private sector through tariff based competitive bidding route*)

The above transmission works have been agreed by the constituents of Western Region and the same is now put up for consent of NR constituents.

10.5 Transmission System for evacuating power from IPPs in Southern Region

The following IPP projects are likely to come in Southern Region:-

- (i) East Coast Energy Pvt Ltd (4x660 MW) in Srikakulam, AP
- (ii) NCC Power Project Ltd. (2x660 MW) in Srikakulam, AP
- (iii) Coastal Energen Pvt Ltd (2x660 MW), Tuticorin area Tamil Nadu
- (iv) IND - Barath Power Madras Ltd (4x350 MW), Tuticorin area Tamil Nadu

The transmission system for these IPPs projects is given as under:-

A. Transmission System for East Coast Energy Pvt Ltd (4x660 MW) and NCC Power Project Ltd. (2x660 MW) projects in Srikakulam Area, Andhra Pradesh:

- (i) LILO of one circuit of Behrampur– Gazuwaka 400kV D/C line at East-Coast switchyard
- (ii) LILO of 2nd circuit of Behrampur – Gazuwaka 400kV D/C line at NCC switchyard
- (iii) East Coast – Angul 765 kV 2xS/C line (one circuit via NCC).
- (iv) Angul – Jharsuguda - Dharamjaigarh 765 kV 2xS/C line.
- (v) Provision of 2x1500 MVA, 765/400 kV transformers at East Coast
- (vi) Provision of 1x1500 MVA, 765/400 kV transformers at NCC

B. Transmission System for Coastal Energen Pvt Ltd (2x660 MW) and IND-Barath Power Madras Ltd (4x350 MW) projects in Tuticorin of Tamil Nadu:

- (i) Establishment of 765 kV pooling stations in Tuticorin and Salem (to be initially charged at 400kV).
- (ii) Coastal Energen generation switchyard- Tuticorin pooling station 400kV D/C Quad / High capacity line
- (iii) IND-Barath generation switchyard - Tuticorin pooling station 400kV D/C Quad/ High capacity line
- (iv) Tuticorin Pooling station – Salem Pooling station 765kV D/C line (to be initially charged at 400kV)
- (v) Salem pooling station–Madhugiri pooling station 765kV S/C (to be initially charged at 400kV).
- (vi) Madhugiri – Yelahanka 400kV Quad D/C line
- (vii) Tuticorin pooling station – Tuticorin JV 400kV D/C quad line

C. Common Transmission System for transfer of power from SR to WR & NR:

- (i) Sholapur – Pune 765 kV 2nd line (1st already covered under transmission associated with Krishnapatnam UMPP).
- (ii) Establishment of 765kV station at Orai by LILO of one circuit of Satna – Gwalior 765 kV line.
- (iii) Establishment of 765kV station at Bulandshahar by LILO of Agra – Meerut 765kV line.
- (iv) Establishment of 765kV station at Sonipat by LILO of Bhiwani – Meerut 765kV line.
- (v) Jabalpur Pooling station – Orai 765kV S/C line.
- (vi) Orai – Bulandshahar – Sonipat 765 kV S/C line.

Note: (a) Transmission charges for all the transmission systems at “A” and “B” above would be shared by all the IPPs of Southern Region who have applied for LTOA in proportion to the capacity for which LTOA had been applied/granted. These charges would be transferred to their beneficiaries as and when confirmed.

(b) Transmission charges for the item no. (i) and (ii) at “C” above would be shared by all the IPPs of Southern Region who have applied for LTOA for exporting power to Western Region and Northern Region. These charges would be transferred to their beneficiaries as and when confirmed.

(c) Transmission charges for the item no. (iii), (iv), (v) and (vi) at “C” above would be shared by all the IPPs of Southern Region who have applied for LTOA for exporting power to Northern Region. These charges would be transferred to their beneficiaries as and when confirmed.

The above transmission works have been agreed by the constituents of Southern Region in their 29th Standing Committee Meeting held on 27.08.2009 and the same is now put up for consent of NR constituents.

11. Grant of Membership for HPPTCL

Himachal Pradesh Power Transmission Corporation Ltd. (HPPTCL) is a state Govt. undertaking of Himachal Pradesh who is entrusted to plan and execute all new transmission works of 66 KV and above in the state. The Corporation is also to co-ordinate the transmission related issues with IPPS/CTU/CEA/MOP etc.

HPPTCL has requested that they may be formally enrolled as member of the Standing Committee for Power System Planning in Northern Region.

Members may concur the same.