

Govt. of India
Central Electricity Authority
System Planning & Project Appraisal Division
Sewa Bhawan, R.K. Puram, New Delhi – 110066.

No. 26/10/2009-SP&PA/

Date: 10th December, 2010

To

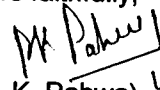
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|----|-------------------------------------------------------------------------------------------------------------------------------------------------------|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | The Member (PS),
Central Electricity Authority,
Sewa Bhawan, R. K. Puram,
New Delhi-110066 | 8 | Shri M.L Jadhav, Chief Engineer (Trans),
Nuclear Power Corp. of India Ltd.,
9S30, VS Bhavan, Anushakti Nagar, Mumbai-
400094
Fax 022-25993570 |
| 2 | The Member Secretary,
Western Regional Power Committee,
MIDC Area, Marol, Andheri East, Mumbai
Fax 022 28370193 | 9 | The Executive Director (Engg.),
NTPC Ltd., Engg. Office Complex,
A-8, Sector-24, NOIDA 201301
Fax 0120-2410201/2410211 |
| 3 | The Director (Projects),
Power Grid Corp. of India Ltd., "Saudamini",
Plot No. 2, Sector-29, Gurgaon-122001
Fax 0124-2571760/2571932 | 10 | The Chief Engineer,
Electricity Department,
The Government of Goa, Panaji
Fax 0832 2222354 |
| 4 | Chairman and Managing Director,
MPPTCL, Shakti Bhawan,
Rampur, Jabalpur-482008
Fax 0761 2664141 | 11 | Executive Engineer (Projects)
UT of Dadra & Nagar Haveli,
Department of Electricity , Silvassa
Ph. 0260-2642787 |
| 5 | The Managing Director,
CSPTCL, Dangania,
Raipur (CG)-492013
Fax 0771 2241141 | 12 | Executive Engineer
Administration of Daman & Diu (U.T.)
Department of Electricity
Moti Daman-396220
Ph. 0260-2250889, 2254745 |
| 6 | The Managing Director,
GETCO, Sardar Patel Vidyut Bhawan,
Race Course, Baroda-390007
Fax 0265-2337918 | 13 | ED, WRLDC (invitee)
Plot no F-3, MIDC Area, Msarol,
Andheri(East) Mumbai-400093
Fax no 022-28235434 |
| 7. | Director (Operation),
MAHATRANSCO, 'Prakashgad', Plot No.G-9,
Bandra-East, Mumbai-400051
Fax 022-26390383/26595258 | 14 | Executive Director, NLDC (invitee)
B-9, Qutab Institutional Area, Katwaria Sarai
New Delhi-110016
Fax 011-26852747 |

Sub: Agenda for the 31st meeting of the Standing Committee on Power System Planning in Western Region.

Sir,

The 31st meeting of the Standing Committee on Power System Planning of Western Region is proposed to be held in the last week of December 2010. The agenda for the meeting is available on CEA website (www.cea.nic.in at the following link: Home page-Power Systems-Standing Committee on Power System Planning-Western Region). Additional agenda items would also be uploaded shortly. The date and venue of the meeting would be intimated in due course.

Yours faithfully,


(P. K. Pahwa) 10/12/10
Director, SP&PA

Agenda Note for 31st Meeting of Standing Committee on Power System Planning in Western Region

1.0 Confirmation of the minutes of 30th meeting of the Standing Committee on Power System Planning in Western Region held on 8th July 2010 at New Delhi.

1.1 The minutes of the 30th SCM were issued vide CEA letter No.26/10/2009-SP&PA/146-159 dated 09th August 2010. GETCO vide their letter no. SE (CP&SS)/System/517-520/42 dated 01.09.2010 has sent the following comments on the minutes of the 30th SCM.

(i) GETCO has sent the following comments on para 9.5 and 11.5 of the minutes

Existing para 9.5 in minutes

“9.5 The proposal of 765/400 kV GIS substation at Pune was agreed. Regarding 765/400 kV substation at Vadodra it was decided that PGCIL and GETCO would jointly survey and sort out the issue of acquisition of suitable land for setting up 765/400 kV AIS substation.”

Modification suggested by GETCO

The proposal of 765/400 kV GIS substation at Pune was agreed. The land acquisition process for 765/400 kV Vadodra AIS substation is to be done by Powergrid. GETCO will extend help only in case of any difficulty at revenue level.

Based on GETCO's suggestion the following amendment is proposed in para 9.5 of minutes

Para 9.5 may be modified to read as under:

“9.5 The proposal of 765/400 kV GIS substation at Pune was agreed. Regarding 765/400 kV substation at Vadodra it was decided that GETCO would assist PGCIL in identifying suitable land for setting up 765/400 kV AIS substation.”

(ii) Existing para 11.5 in the minutes

“After deliberation Bhimsar (Bhachau) – Versana 400 kV D/c line as System strengthening scheme was agreed.”

Modification suggested by GETCO

GETCO has requested to modify the above para as: After deliberation Bhimsar (Bhachau) – Versana 400 kV D/c line as System strengthening scheme under Mundra UMPP transmission system (ATS)

With respect to the above modification proposed by GETCO, it is clarified that the Mundra UMPP ATS has already been finalized long back and is under implementation stage. Therefore, Bhimsar (Bhachau) – Versana 400 kV D/c line cannot form part of Mundra transmission and has to be implemented as a separate system strengthening scheme. Also discussions in the last meeting were also on similar lines as reflected in the minutes. Hence no amendment for this para is proposed

The minutes of the 30th SCM issued vide CEA letter No.26/10/2009-SP&PA/146-159 dated 09th August 2010 with the amended para 9.5 as suggested above may be confirmed.

2.0 Transmission system associated with 1400 MW (2X700 MW) Kakrapar Atomic Power Project Unit 3 & 4 (2x700MW)

2.1 Nuclear Power Corporation of India Limited has proposed to set up Kakrapar Atomic Power Project Unit 3 & 4 (2x700 MW) near village Vyara in Surat District, Gujarat. Power from the project has been allocated to the constituents of Western Region. The unit wise commissioning schedule and allocation of power from the project is as under:

S.No.	Unit	Commissioning Schedule
1	1 st unit (700 MW)	Dec'2015
2	2 nd unit (700MW)	Jun'2016

SI.No.	Beneficiary	Allocation(MW)
1	Gujarat	475.88
2	Maharashtra	378.67
3	Madhya Pradesh	218.98
4	Chhattisgarh	87.55
5	Goa	15.68
6	Daman & Diu	5.44
7	Dadra Nagar Haveli	7.78
8	Unallocated	210
	Total	1400

2.2 The existing Unit 1 & 2 of (2X220 MW) of Kakrapar Atomic Power Project is stepped up at 220 kV level and the proposed Unit 3 & 4 of (2X700 MW) of Kakrapar Atomic Power Project will be stepped up at 400 kV level and would not be interconnected at 220 kV level.

2.3 PowerGrid has carried out the load flow studies corresponding to 2015-16 timeframe to evolve the transmission system requirement for transfer of power from the generation project to the beneficiaries. Peak demand of WR is considered as about 70,000 MW against the projected demand of about 60,000MW as per 17th EPS.

2.4 Based on the load flow studies, two alternatives have been studied. In alternative -1 power from project is proposed to be evacuated through two no 400 kV D/C twin moose lines, one circuit terminating at Navsari and the other circuit at Vapi whereas in alternative 2 both the circuits are proposed to be terminated at Navsari.

Alternative-1

- Kakrapar NPP – Navsari 400kV D/c – 65 km
- Kakrapar NPP – Vapi 400kV D/c – 120 km

Estimated Cost- about Rs 250 Cr

Alternative-2

- Kakrapar NPP – Navsari 400kV 2xD/c – 65 km
- Augmentation of transformation capacity of 400/220kV S/s at Navsari with 1x500MVA ICT

Estimated Cost- about Rs 225 Cr

Load flow result without KAPP generation is enclosed at **Exhibit-1**. Load flow result for Alternative 1 and Alternative 2 enclosed at **Exhibit-2** and **Exhibit-3** respectively.

- 2.5 It is seen from the exhibits that loading on the 400 kV lines from the Kakrapar NPP in both the alternatives is within limits in base case as well as contingency conditions. However, higher loadings are observed on 220kV Navsari(PG)-Navsari (GETCO) D/c line in the Gujarat network. To overcome this additional 220 kV outlets from Navsari(PG) needs to be established by GETCO.
- 2.6 Alternative 1 is a better proposal from reliability point of view as KAPP gets connected to two separate transmission corridors, one towards Gujarat via Navsari and other towards Maharashtra via Vapi and technically is a better option. Alternative-1 slightly costlier by about 10 % compared to Alternative 2. Considering that Alternative 1 is technically better from reliability consideration even though it is slightly expensive it is suggested that alternative 1 may be adopted:

To off take power and to overcome loading on 220 kV lines emanating from Navsari, system strengthening within Gujarat viz Navsari (PG) - Valthan 220 kV D/c is required to be implemented by GETCO.

Members may deliberate and decide.

3.0 Transmission system associated with 4000 MW (6X660) Chhattisgarh UMPP

- 3.1 Chhattisgarh UMPP is proposed to come up near Village Salka and Khamaria in Surguja Distt. Chhattisgarh. The tentative unit wise commissioning schedule is Unit-I – Dec 2016, Unit-II – May 2017, Unit-III – Dec 2017, Unit-IV – May 2018, Unit-V – Dec 2018, Unit-VI – May 2019. The tentative allocation to WR constituent states is as under:

Sl.No.	Beneficiary	Allocation(MW)
Western Region		
1	Chhattisgarh	2000
2	Maharashtra	1000
3	Madhya Pradesh	425
4	Gujarat	275
5	Goa	200
6	UT DD	50
7	UT DNH	50
	Total	4000

- 3.2 In the 30th Standing Committee meeting held on 8th July 2010 the preliminary information on the Chattishgarh UMPP was intimated and it was also decided that the evacuation voltage level for Chattishgarh UMPP would be 765 kV level.
- 3.3 Based on the above information, Load Flow studies have been carried out by PGCIL to evolve the transmission system of the above generation project. Load generation scenario and network configuration of Western Region corresponding to 2016-17 time frame has been considered taking into account various Central/State/Private Sector generation projects proposed to be set up by the time frame. Peak demand in WR is considered as 80,000 MW which is about 25% higher than the projected demand growth of about 65,000 MW as projected by the 17th EPS. The higher load growth has been considered in view of the availability of additional power from various IPPs like Chhattisgarh, Madhya Pradesh, Orissa, Jharkhand, Andhra Pradesh and Tamilnadu who are on the advance stage of developments and scheduled for commissioning progressively by above time frame.

In view of the development of 765/400kV Jabalapur Pooling as a part of transmission system for IPPs in Orissa and Champa Pooling Station as a part of transmission system for IPPs in Chhattisgarh, connectivity of Chhattisgarh UMPP with Jabalpur Pooling Station as well as Champa Pooling station at 765kV level has been envisaged. Based on studies for further transfer of power with reliability and security, strengthening of 765kV Jabalpur Pooling Station-Vadodra transmission corridor via Bhopal/Indore is proposed. For dispersal of power from 400kV network onwards, transmission strengthening with 400kV high capacity D/c lines from Jabalpur Pool to Damoh as well as Vadodra to Karamsad has been proposed. In view of the critical loading of Indore and Vadodra 765/400kV ICT, installation of 3rd 1500 MVA transformer is proposed. Further to provide connectivity of UMPP at 400kV level with the grid, LILO of Ranchi-Sipat 400kV D/c line is proposed. Load flow result with above proposed strengthening is shown at **Exhibit-4**. Accordingly, following associated transmission system is proposed:

- Chhattisgarh UMPP- Jabalpur Poling Station 765kV D/c – 350 km
- Chhattisgarh UMPP- Champa Poling Station 765kV D/c – 150 km
- Jabalpur Poling Station – Bhopal 765kV D/c – 330 km
- Bhopal – Indore 765kV 2nd S/c – 180 km
- Indore - Vadodra 765kV 2nd S/c – 300 km
- Jabalpur Pool – Damoh 400kV D/c -180 km
- Vadodra- Karamsad 400kV D/c (Quad)
- LILO of Ranchi – Sipat 400kV D/c line at Chhattisgarh UMPP 400kV-60 km
- Establishment of 2x1000 MVA, 765/400kV substation at Chhattisgarh UMPP
- Augmentation of transformation capacity at 765/400kV Indore and Vadodra Substation each by 1x1500 MVA

Broad Estimated cost: Rs. 5000 Cr.

PGCIL may present the results of the studies along with the various other options/alternatives studied and members may deliberate.

4.0 Transmission system of Mauda Stage-II (1320 MW) and Bus Splitting arrangement at 400kV Wardha(PG) S/s

- 4.1 The transmission System for Mauda Stage-I(1000 MW) was initially agreed in the 29th meeting of SCM with two 400 kV D/c quad outlets one to Wardha and other to Khaperkheda. Subsequently MSETCL intimated that due to space constraints it would not be possible to terminate the line at their Khaperkheda substation. The transmission system of Mauda Stage-I (1000 MW) and Mauda Stage-II (1320 MW) of NTPC was again discussed in the 30th Standing

Committee meeting and under Mauda Stage-I one no quad line to Wardha was agreed and it was decided that other quad line outlet would be covered under Mauda Stage-II (1320 MW) and would be taken up in the next meeting after further study.

4.2 Based on the studies, PGCIL has proposed the following:

Mauda-II transmission system:

- **Mauda Stage-II- Wardha 400kV D/c (Quad)**

PGCIL may present their studies and Members may deliberate.

4.3 During the last meeting to contain the short circuit levels bus splitting at Wardha 400 kV bus was agreed. PGCIL has now informed the following bus splitting arrangement:

Bus Splitting at 400kV Wardha(PG) substation

400kV Wardha S/s is proposed to be split into two sections (Section-A and B) with following interconnections to contain the short circuit levels within permissible limits (40kA).

Wardha Section-A Interconnections

- Mauda-I – Wardha- A 400kV D/c (Quad)
- Mauda-II – Wardha-A 400kV D/c (Quad)
- Wardha-A -Aurangabad 400kV D/c (Quad) along with 40% FSC at Wardha-A (with provision to upgrade at 1200kV level)
- 765/400kV, 2x1500MVA transformer at Wardha A

Wardha Section-B Interconnections

- Raipur-Wardha-B 400kV D/c (Quad)
- Warora- Wardha-B 400kV D/c (Quad)
- Wardha-B - Akola 400kV D/c
- Wardha-B - Parli(PG) 400kV D/c (Quad)
- 765/400kV 1x1500MVA transformer at Wardha B

5.0 Transmission System for Tilaiyya (4000 MW) UMPP

5.1 Following revised evacuation transmission system of Tilaiya UMPP was intimated during the 30th Standing Committee Meeting of Western Region held on September 10, 2009:

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

5.2 Subsequent to the above meeting to provide reliability of power supply to Gaya from Tilaiya UMPP, provision of second in-feed to Gaya through LILO of one circuit of Tilaiya UMPP – Balia 765kV D/c line was discussed and agreed in the Standing Committee meeting of Eastern Region held on 20-09-2010. Accordingly, the revised ATS for Tilaiya UMPP would be as following:

- 765kV Tilaiya- Gaya S/c
 - 765kV Tilaiya-Balia D/c
- } Already agreed
- LILO of one circuit of 765kV Tilaiya-Balia D/c line at Gaya
- } Additional element

Members may take note of the above.

6.0 Review of 765kV Aurangabad-Padghe transmission corridor as a part of IPPs generation projects in Chhattisgarh

- 6.1 Transmission system associated with upcoming IPP generation project in Chhattisgarh was discussed and agreed in 29th/30th Standing Committee meetings on Power System Planning in WR. Subsequently, MSETCL have informed that they have planned 400kV Kudus (Padghe II) substation along with 400kV Aurangabad(PG) – Babhaleshwar – Kudus D/c Quad line . Therefore 765kV Padghe (PG) S/s and 765kV Aurangabad (PG)- Padghe(PG) D/C line agreed as a part of transmission system for IPPs in Chhattisgarh, may not be required.
- 6.2 Further, MSETCL has also informed that about 3300 MW generation project is coming up near Dhule. For this earlier agreed 400kV interconnections of Dhule(PG) with Nasik and Malegaon as part of transmission system of IPP generation projects in Chhattisgarh may not be required.
- 6.3 In view of the above earlier evolved corridors for IPP projects in Chhattisgarh has been reviewed. The earlier evolved corridor from Aurangabad towards Padghe has been deleted and instead corridor towards northern part viz 765 kV Aurangabad-Dhule- Vadodra S/C line has been included. Also as desired by MSETCL 400 kV D/C quad lines from Dhule towards Malegaon and Nasik have been deleted. With these proposed changes modification in scope of works for transmission system for IPPs in Chhattisgarh is as under:

Addition in earlier scope

- 765kV Aurangabad - Dhule –Vadodara 2nd S/c

Deletion from earlier scope

- 765kV Aurangabad- Padghe(PG) D/c line
- 400kV Padghe(PG) – Padghe(MSTECL) Quad D/c line
- Dhule(PG) –Malegaon 400kV D/c (Quad)
- Dhule(PG) –Nasik 400kV D/c (Quad)
- Establishment of 765/400kV,2x1500 MVA S/s at Padghe (GIS)

Members may deliberate

7.0 Evacuation of power from generation projects coming up in Sikkim and Bhutan

- 7.1 Transmission system comprising of three parts for evacuation of power from various IPP generation projects coming up in Sikkim and generation projects in Bhutan was discussed during the 29th Standing Committee Meeting of Western Region held on September 10, 2009. Transmission System comprised of three parts viz Part –A Transmission System for development of pooling stations at Kishanganj and associated transmission works, Part-B Transmission System for development of pooling substations within Sikkim and transfer of power to a new pooling station Kishanganj in northern Part of West Bengal/Bihar, and Part-C transmission System for development of pooling station in Northern part of West Bengal and transfer of power from Bhutan to NR/WR. The following changes/modifications have subsequently been agreed by the ER constituents

Under Part-A LILO of Siliguri-Purnea 400 kV D/C line (being reconducted with HTLS conductor) at Kishanganj substation would be with quad conductor instead of the HTLS conductor.

The Part-B of the scheme included establishment of 400/220kV, 10x167 MVA (Single Phase transformers) at New Melli GIS substation and 220/132kV, 3x100 MVA GIS S/s at Rangpo. Subsequently, based on the survey, it was found by PGCIL that due to transportation

constraints, it would not be possible to transport the 167 MVA transformers to the site and transformer upto 40 MVA only can reach the New Melli S/s. Accordingly, scope of works in respect of substation at Rangpo and New Melli was reviewed and modified under Part-B as under:

- Establish a 400/220/132 kV new sub-station at Rangpo (400/220kV, 16x105 MVA, 1 ph transformers and 220/132kV, 3x100 MVA)
- 220 kV switching station at New Melli
- LILO of 400 kV D/c lines (Teesta-III to Kishanganj and Teesta-V to Siliguri) earlier proposed at New Melli would now be done at Rangpo.

Under Part-C 400 kV lines from Phunatsanchu I & II which were earlier proposed with HTLS conductors were reviewed based on request of Bhutan and revised to twin moose conductor up to Bhutan Border and Quad conductor in Indian territory.

7.2 The revised transmission System with the above modifications has been agreed in the Standing Committee meeting of Eastern Region held on 20-09-2010. The latest status of IPP generation projects in Sikkim as intimated by PGCIL and revised transmission system is as under:

List of phase-I IPP projects in Sikkim			
Sl. No.	Project	Capacity (MW)	Schedule
1	Chujachen	99	Mar-10
2	Teesta-III	1200	Aug-11 to Jan-12
3	Jorethang	96	Dec-11
4	Rongnichu	96	Mar-12
5	Bhasmey	51	Mar-12
6	Teesta-VI	500	Nov-12
7	Rangit-IV	120	Jun-13
	Total	2160	

Part –A: Transmission System for development of pooling stations at Kishanganj and associated transmission works,

- Establishment of New 2x315 MVA, 400kV sub-station at Kishanganj
- LILO of Siliguri (Existing) – Purnea 400kV D/c line(quad) at new pooling station Kishanganj
- LILO of Siliguri (Existing) – Purnea 400kV D/c line (on which reconductoring is being carried out) at Kishanganj with higher capacity (quad) conductor
- LILO of Siliguri – Dalkhola 220kV D/c line at new pooling station Kishanganj
- LILO of Gangtok-Melli 132kV S/c line upto Rangpo, where Chuzachen-Rangpo 132kV D/c would be connected so as to form Chuzachen-Gangtok and Chuzachen-Melli 132kV S/c lines. [This would be a temporary arrangement till establishment of Rangpo pooling substation under Part-B of the scheme and termination of Gangtok-Rangpo, Melli-Rangpo and Chuzachen-Rangpo 132kV lines at Rangpo]

Part-B: Transmission System for development of pooling substations within Sikkim and transfer of power to a new pooling station Kishanganj in northern Part of West Bengal/Bihar,

- Establishment of 400/220/132kV (400/220kV, 16x105 MVA, Single Phase transformers and 220/132kV, 3x100MVA) Gas Insulated Substation at Rangpo
- Establishment of 220kV Gas Insulated switching station at New Melli

- LILO of Teesta III – Kishanganj 400kV D/c line (quad, Teesta III – Kishanganj 400kV D/c line to be constructed through JV route) at Rangpo
- Rangpo – New Melli 220kV D/c line (with twin Moose conductor)
- LILO of Gangtok-Rangit 132kV S/c line at Rangpo and termination of Gangtok-Rangpo/Chujachen and Melli – Rangpo/Chujachen 132kV lines (constructed under part-A through LILO of Gangtok-Melli 132kV S/c line upto Rangpo) at Rangpo sub-station
- LILO of Teesta V – Siliguri 400kV D/c line at Rangpo
- Kishanganj – Patna 400kV D/c (quad) line

Part-C: Transmission System for development of pooling station in Northern part of West Bengal and transfer of power from Bhutan to NR/WR.

- New 400kV AC & HVDC sub-station with + 800kV, 3000MW converter module at new pooling station in Alipurduar
- Extension of + 800 kV HVDC station with 3000 MW inverter module at Agra
- LILO of Bishwanath Chariali – Agra HVDC line at new pooling station in Alipurduar for parallel operation of the HVDC station
- LILO of Bongaigaon – Siliguri 400kV D/c line at new pooling station in Alipurduar
- LILO of Tala-Siliguri 400kV D/c line at new pooling station in Alipurduar
- LILO of Birpara-Salakati 220 kV D/C line at New Pooling station in Alipurduar
- Punatsangchu-I (generation project in Bhutan)-Alipurduar 400 kV D/C with quad conductor (Indian portion)

Members may take note of the above

8.0 Proposal of GETCO for interconnection of STU and CTU network in Gujarat

8.1 GETCO vide their letter no. SE (CP&SS)/System/511/43 dated 04.09.2011 has proposed the following interconnections between STU and CTU network in Gujarat:

A. LILO of Wanakbori TPS – Soja (GETCO) 400 kV S/C line at Dehgam (PG) substation

The installed capacity of Wanakbori TPS is 1470 MW (7X210 MW). The evacuation of power from the TPS at 400 kV level is through Wanakbori TPS – Soja 400 kV 2XS/C lines and Wanakbori TPS – Asoj 400 kV S/C line. Out of the Wanakbori TPS – Soja 400 kV 2XS/C lines, one ckt is already made LILO at Dehgam (PG) substation.

GETCO has informed that the expansion of Wanakbori TPS by 800 MW is planned in the 12th five year plan. And for evacuation of additional 800 MW, Wanakbori TPS – Soja 400 kV D/C line and Soja – Zerda 400 kV D/C line has been planned.

In view of the expansion and to overcome the uneven loading of Wanakbori TPS – Dehgam 400 kV S/C line and Wanakbori TPS – Soja 400 kV S/C line, GETCO has proposed LILO of the 2nd Wanakbori TPS – Soja 400 kV S/C line also at Dehgam (PG) substation.

PGCIL may confirm availability of space for two nos. of 400 kV bays at Dehgam for the LILO arrangement.

B. Koasamba (GETCO) – Vapi (PG) 400 kV D/C line.

GETCO has informed that at present there is only one in feed to Vapi (PG) 400 kV substation through Sugan – Vapi 400 kV S/C line and sometimes critical loading on this lines necessitates backing down of generation at Sugan. Further with completion of Vapi – Navi Mumbai 400 kV D/C line, an additional outlet from Vapi, may result in further loading of the Sugan – Vapi 400 kV S/C line. In view of this GETCO has proposed Koasamba (GETCO) – Vapi (PG) 400 kV D/C line to have a strong interconnection between STU and

CTU network in South Gujarat area having substantial industrial load and generation projects.

PGCIL has informed that in view of planned and future proposed interconnection at Vapi from Kawas –II(1300 MW) and Kakrapar (1400 MW) there is space constraints at Vapi for termination of this line.

With the proposed future injections at Vapi the critical loadings on Sugen-Vapi line is likely to be overcome. PGCIL and GETCO may further explore the alternatives.

C. LILO of one ckt. of the proposed Ukai TPS – Kosamba (GETCO) 400 kV D/C line at Navsari (PG) 400 kV substation.

The installed capacity of Ukai TPS is 850 MW (2X120 + 2X200+ 1X210 MW). Its expansion is planned by provision of one 500 MW unit. GETCO has planned Ukai TPS- Kosamba 400 kV D/C line for evacuation of power from Unit -6 (500 MW) at Ukai TPS.

GETCO has proposed LILO one ckt. of the proposed Ukai TPS – Kosamba (GETCO) 400 kV D/C line at Navsari (PG) 400 kV substation to have an interconnection of Navsari (PG) with GETCO grid at 400 kV level.

Since GETCO has planned adequate network for evacuation of power from future proposed Ukai TPS unit 6 (500 MW) the above connectivity through LILO arrangement is basically for reliability and may be agreed.

D. Provision of 2 nos. 220 kV feeder bays at Pirana (PG) 400 kV substation.

In the 30th Standing Committee meeting held on 8th July 2010, Pirana - Dehgam 400 kV D/C line (2nd) and installation of 1X315 MVA , 400/220 kV ICT (3rd) at Pirana was agreed as Transmission system strengthening in WR associated with Pipavav Energy Pvt. Ltd 1200 MW generation project.

With the provision of 1X315 MVA, 400/220 kV ICT (3rd) at Pirana, GETCO has requested for provision of two no. of 220 kV bays at Pirana substation for evacuation of power from Pirana 400 kV substation to GETCO system.

The above proposal of GETCO is basically for drawal of power from Pirana and may be agreed.

E. LILO of 400 KV DIC Vadavi (Ranchhodpura) - Zerda (Kansari) line at proposed 400/220 KV Sankhari (GETCO) substation

GETCO has proposed the above LILO to facilitate evacuation of power from Solar Park1 & 2 (590+500 MW) at Sankhari. They have further intimated that the injection from Solar park would be in range of 300 MW to 600 MW and have also proposed LILO of one D/C ckt of Mundra(Adani)- Zerda 2x400 kV D/C lines .

The above proposal is for injection of power in to inter-state network then GETCO would need to seek long term open access and the adequacy of the inter-state network would need to be ascertained.

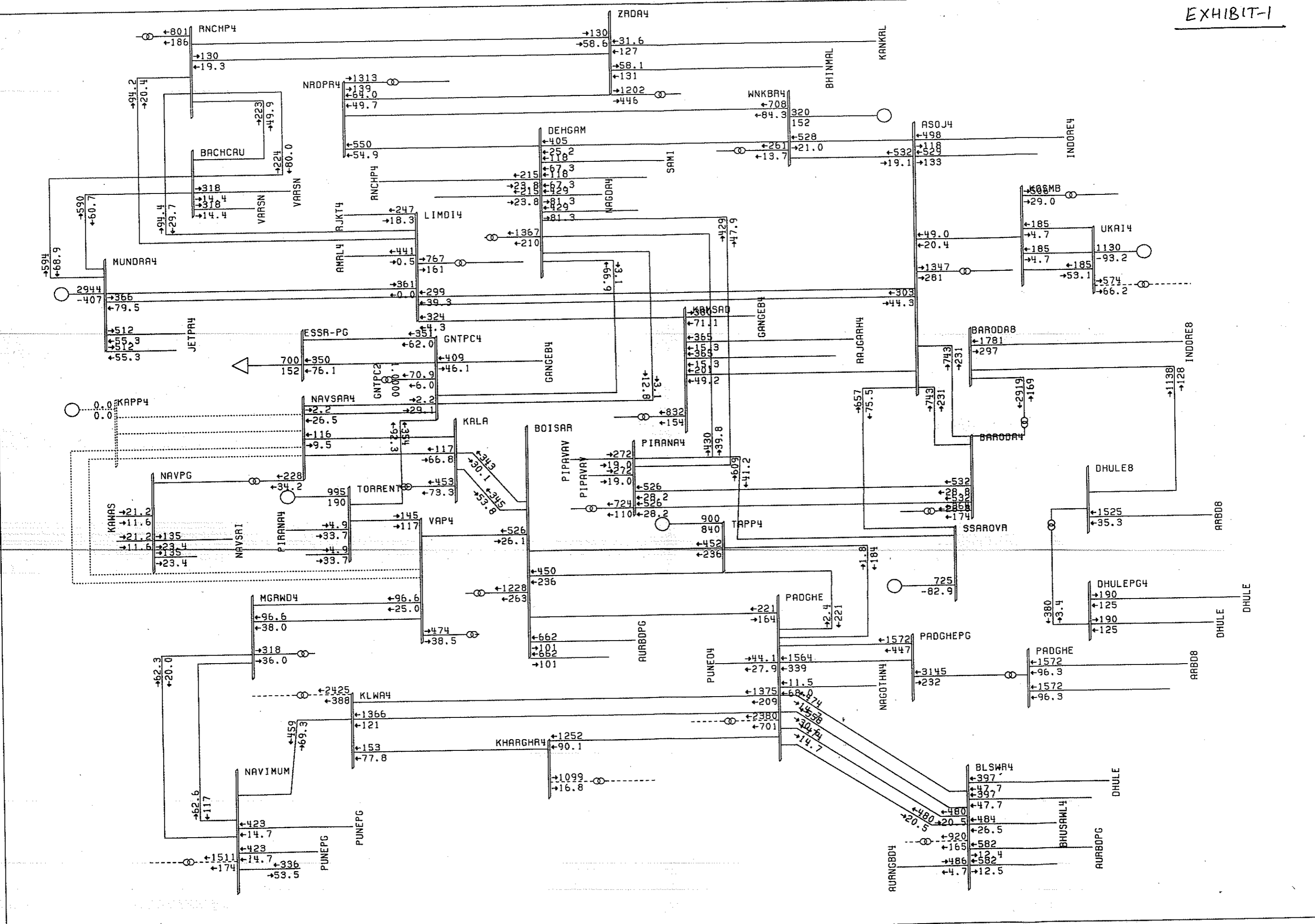
Members may deliberate.

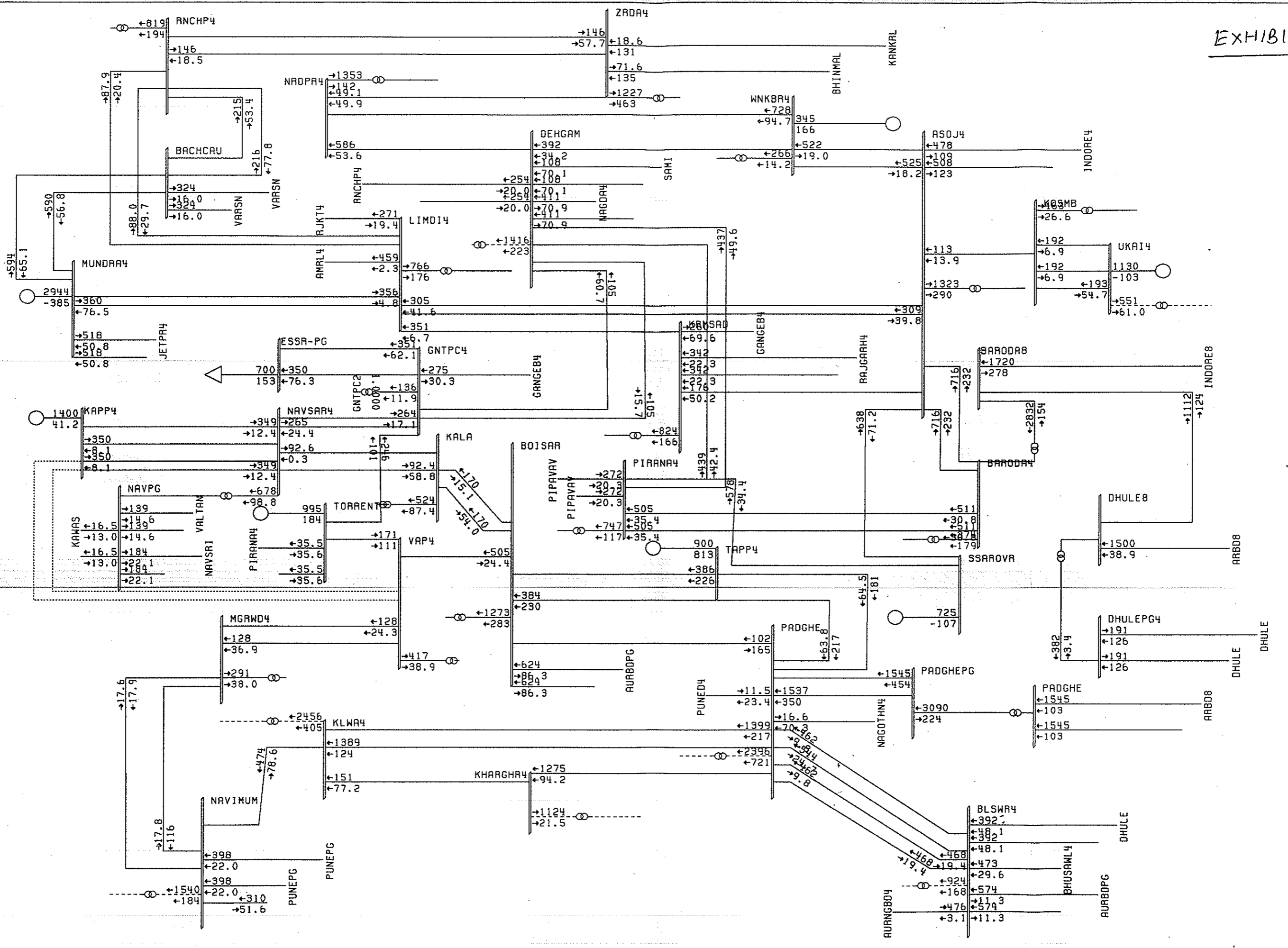
9.0 Proposal of MPPTCL for interconnection of Pithampur (MPPTCL) 400 kV substation with Indore (PG) 765/400 kV substation

MPPTCL vide their letter no. 04-02/PSP-14/908 dated 16.08.2010 has requested the connectivity of their Pithampur 400 kV substation with through a 400 kV D/C line for absorbing power in their system.

The above proposal may be agreed. PGCIL may confirm the space availability for two nos. of 400 kV bays at Indore (PG) 765/400 kV substation.

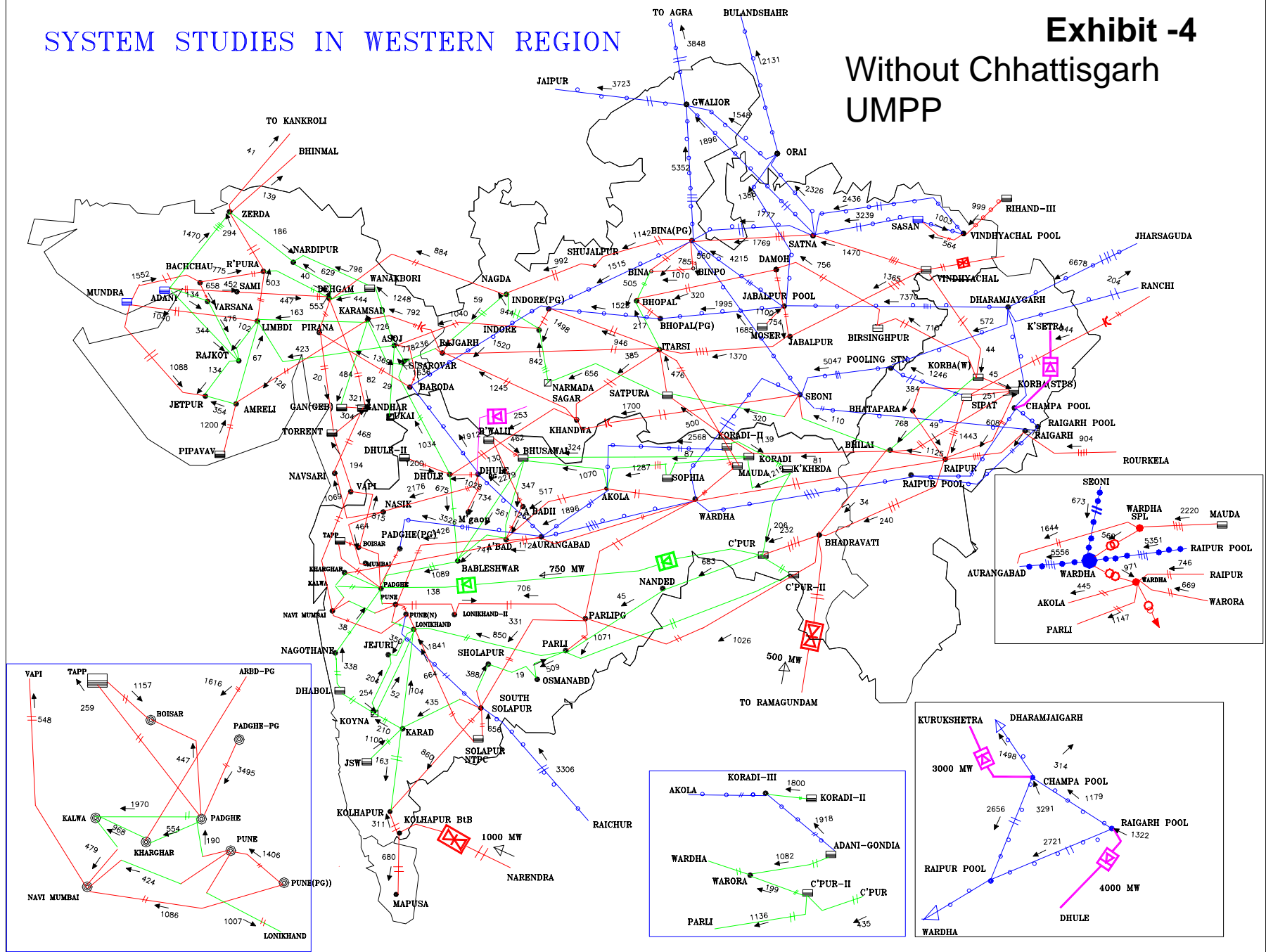
10. The agenda received from PGCIL regarding Connectivity and Long Term Open Access (LTOA) applications in Western Region is enclosed at Annexure-1.





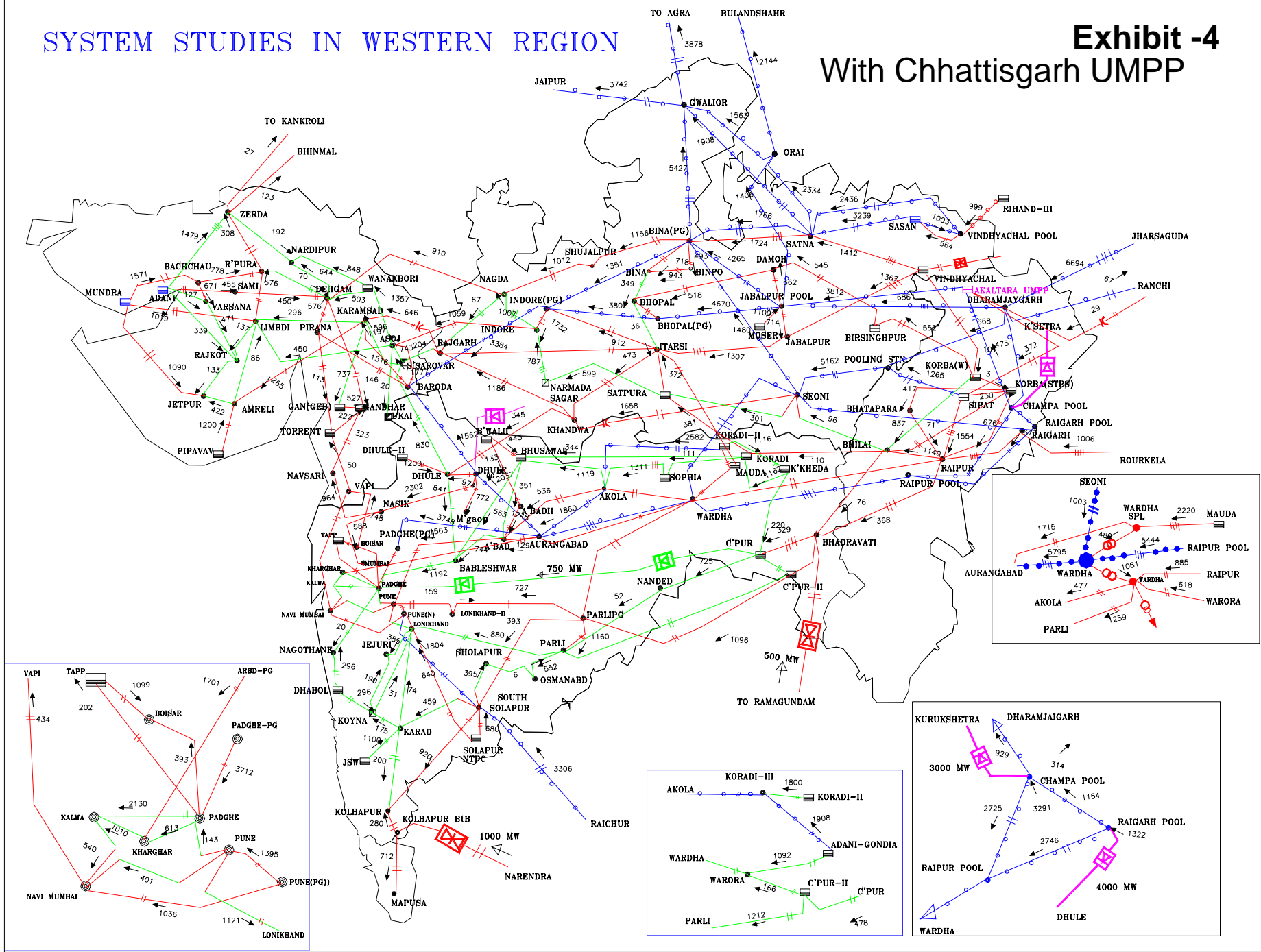
SYSTEM STUDIES IN WESTERN REGION

Exhibit -4 Without Chhattisgarh UMPP



SYSTEM STUDIES IN WESTERN REGION

Exhibit -4 With Chhattisgarh UMPP



A. Agenda for Proposed Connectivity in ISTS for IPP Projects in WR

1.0 Following applications for Connectivity in ISTS from various applicants who have proposed to set-up IPP generation projects in Western Region are received:

a) Gujarat

1. Bharuch Power Limited (BPL) (4x1600+1x800MW)
2. Torrent Energy Ltd. (TEL) (3x400MW)
3. Adani Power Dahej Ltd.(APDL) (4x660MW)
4. Tata Power Company Ltd. (TPCL) (2x830MW)
5. Shapoorji Pallonji Energy(Gujarat) Pvt. Ltd.(SPEPL) (2x660MW)
6. Torrent Power Ltd.(TPL) (1x382.5MW)
7. NTPC Ltd - Gandhar-II (1300 MW)
8. NTPC Ltd- Kawas-II(1300 MW)

b) Chhattisgarh

9. MB Power(Chhattisgarh) Ltd.(MBPL) (2x660MW)
10. Prakash Industries Ltd. (5x25+2x100+2x150MW) & Prakash Industries Ltd. (2x660MW) (PIL)
11. Lanco Power Limited (LPL) (2x660MW)

c) Madhya Pradesh

12. Banas Thermal Power Pvt. Ltd.(BTPPL) (2x660MW)
13. Prakash Industries Ltd. (PIL) (2x660MW)
14. DB Power (Madhya Pradesh) Ltd.(2x660MW)

d) Maharashtra

15. Astarc Power Pvt Ltd. (APPL) (2x660MW)

2.0 Details of Connectivity applications

Details of above generation projects are enclosed at **Annexure-1**.

3.0 Status of Generation project

As per the applications, the status of above generation projects is enclosed at **Annexure-2**.

4.0 Proposed Connectivity of above generation project

In view of the provisions in CERC regulation 2009 and considering the location & unit sizes of generation projects etc, following connectivity of the generation projects is proposed based on technical examination as per CEA (Technical Standards for connectivity to the Grid) regulations, 2007:

A) IPP Generation projects in Gujarat

As per the connectivity applications received in the State of Gujarat, 3 nos. applicants viz. Bharuch Power Ltd., Torrent Energy Ltd., Adani Power Dahej Ltd., have applied for connectivity of about 11,000 MW capacity near Bharuch Area. In view of the quantum of connectivity desired, it is proposed to establish 765/400kV Pooling station near Bharuch/Dahej by LILO of proposed 765kV Dhule-Vadodra line and provide connectivity to these projects at 765kV or 400kV level of 765/400kV Pooling station near Bharuch/Dahej. Details of proposed connectivity are as under:

i) Bharuch Power Limited (BPL), Distt. Bharuch, Gujarat

- Project Capacity - $4 \times 1600 + 1 \times 800 \text{ MW} = 7200 \text{ MW}$
- Connectivity applied for/from- 7200 MW/Jan'13
- Commissioning schedule- Jun'13 onwards

Applicant has indicated step up voltage as 400kV. However, in view of the project capacity, it is proposed to step up the generation at 765 kV level and following interconnection arrangement is considered :

- Bharuch GPP–Vadodra 765kV D/c
- Bharuch GPP- Pooling station near Bharuch /Dahej 765kV D/c
- LILO of 765kV Dhule- Vadodra S/c line at Bharuch/Dahej Pooling Station
- Establishment of 765kV Pooling station near Bharuch/Dahej

Considering above proposed connectivity arrangement, provision of following at generation switchyard, implementation of **which shall be under the scope of the M/s Bharuch Power Ltd** is proposed:

- 765kV line bays : 4 nos.
- 765kV bus reactor : $2 \times 240 \text{ MVAR}$
- 765kV bus reactor bay : 2 no.
- 765kV line reactors : 2 nos.

Till the availability of proposed transmission system above, interconnection of BPL with WR grid may be provided by LILO of 765kV Dhule- Vadodra S/c line at BPL Generation switchyard as an interim arrangement. On completion of 765/400kV Bharuch/Dahej Pooling Station- BPL D/c, above proposed LILO at Dhule- Vadodra S/c line, provided as an interim arrangement, shall be removed and connectivity shall be effected through BPL– Bharuch/Dahej Pooling station 765kV D/c line.

ii) Torrent Energy Ltd. (TEL), Distt. Bharuch, Gujarat

- Project Capacity - $3 \times 400 \text{ MW} = 1200 \text{ MW}$
- Connectivity applied for/from – 970 MW/ Oct'12
- Commissioning schedule- Jan'13 onwards

In view of the project capacity, unit size as well as the location of the generation project, following connectivity of the M/s Torrent Energy Ltd (DGEN project) is proposed:

- DGEN (TEL) TPS – Bharuch/Dahej Pooling Station 400kV D/c(Triple)
- Establishment,765/400kV Pooling station near Bharuch/Dahej along with installation of 1x1500MVA Transformer

Considering above proposed connectivity arrangement, provision of following at generation switchyard, implementation of **which shall be under the scope of the M/s Torrent Energy Ltd.**, is proposed:

- 400kV line bays : 2 nos.
- 400kV bus reactor : 1x125 MVAR
- 400kV bus reactor bay: 1 no.
- 765/400kV 1500MVA transformer at Bharuch Pool : 1 no.
& associated transformer bays

Till the availability of proposed transmission system above, interconnection of TEL with WR grid may be provided by LILO of one ckt of 400kV Gandhar-Navsari D/c at TEL Generation switchyard as an interim arrangement. On completion of 400kV Bharuch/Dahej Pooling Station- TEL D/c, above proposed LILO at Gandhar-Navsari D/c line, provided as an interim arrangement, shall be removed and connectivity shall be effected through TEL– Bharuch/Dahej Pooling Station 400kV D/c (Triple) line.

iii) Adani Power Dahej Ltd.(APDL), Distt. Bharuch, Gujarat

- Project Capacity - 4x660MW=2640MW
- Connectivity applied for/from – 2640MW/ Aug'13
- Commissioning schedule- Aug'13 onwards

Applicant has informed step up voltage as 400kV. However, in view of the project capacity, unit size etc. it is proposed to step up the generation voltage at 765 kV level and following interconnection arrangement is considered:

- Adani Power Dahej TPS –Bharuch/Dahej Pooling station 765kV D/c
- LILO of 765kV Dhule – Vadodra S/c line at Bharuch Pooling station
- Establishment of 765kV Pooling station near Bharuch/Dahej

Considering above proposed connectivity arrangement, provision of following at generation switchyard, implementation of **which shall be under the scope of the M/s Adani Power Dahej Ltd.** is proposed:

- 765kV line bays : 2 nos.
- 765kV bus reactor : 1x240MVAR
- 765kV bus reactor bay: 1 no.

Till the availability of proposed transmission system above, interconnection of APDL with WR grid may be provided by LILO of 765kV Dhule- Vadodra S/c line at APDL Generation switchyard as an interim arrangement. On completion of 765kV Bharuch/Dahej Pooling Station- APDL D/c, above proposed LILO at 765kV Dhule- Vadodra S/c line, provided as an interim arrangement, shall be removed and connectivity shall be effected through APDL–Pooling station near Bharuch/Dahej 765kV D/c line.

iv) Tata Power Company Ltd, Distt. Kutch, Gujarat

- Project Capacity - 2x830MW=1660MW
- Connectivity applied for/from – 1600MW/ Jan'14
- Commissioning schedule- Mar'14 onwards

M/s Tata Power is implementing the Mundra Ultra Mega Power 5x800 MW (4000MW) Project in Kutch District. Now, it has proposed to expand the above project capacity by putting up additional 2x830MW (U-6/7) units at the same location. However due to fault level constraints, M/s Tata Power has requested to plan a separate evacuation system for above 1600MW expansion project.

Considering above, following connectivity of the above project is proposed:

- Mundra Ext TPS (U-6/7) – Bachau 400kV D/c (Quad) (2nd)**

*** However 400kV Mundra Ext bus shall not be interconnected with the Mundra UMPP bus (5x800 MW).*

Considering above connectivity arrangement, provision of following at generation switchyard, **which shall be under the scope of the M/s Tata Power**, is proposed:

- 400kV line bays : 2 nos.
- 400kV bus reactor : 1x125 MVAR
- 400kV bus reactor bay : 1 no.

v) Shapoorji Pallonji Energy (Gujarat) Pvt. Ltd. (SPEPL), Distt. Junagadh, Gujarat

- Project Capacity - 2x660MW=1320MW
- Connectivity applied for/from – 500MW/Jan'15
- Commissioning schedule- Jan'15 onwards

Shapoorji Pallonji Energy (Gujarat) Pvt. Ltd has proposed to set up 1320MW (2x660MW) generation project in Dist Junagadh in Phase-1. However as M/s SPEPL has signed PPA with GUVNL for supply of 800 MW power from above project, connectivity for balance 500MW have been applied. M/s GUVNL has informed vide letter dated 22.10.10 (*Copy enclosed at Annex-3*) that SPEPL has been granted connectivity at 400kV Amreli (GETCO) station.

In view of the above, as applicant has already obtained the connectivity with the grid through 400kV GETCO network, additional connectivity at ISTS is not required as the purpose of getting connected to the grid is being fulfilled.

However, transmission system strengthening to facilitate power transfer on long-term basis shall be identified once M/s SPEPL apply for Long-term Access as per CERC Regulations, 2009.

vi) Torrent Power Ltd.(TPL), Distt. Surat, Gujarat

- Project Capacity - 1x382.5MW =382.5MW
- Connectivity applied for/from – 382.5MW/Apr'12
- Commissioning schedule- Jul'12

M/s Torrent Power Ltd.(SUGEN) has earlier been granted LTOA for transfer of 500MW power from its 1147MW (3x382.5MW) with following interconnection:

- LILO of Gandhar-Vapi 400kV S/c at SUGEN switchyard
- SUGEN - Pirana 400kV D/c

M/s Torrent Power Ltd. has further proposed expansion of the above generation project with 1x382.5MW capacity. Applicant has informed that this will be a standalone unit and will not be connected at 400kV and/or 220kV level of SUGEN Generating station (*Copy of the letter dated 20.10.10 is enclosed at Annexure-4*). Considering the connectivity requirement generation capacity of 382.5 MW, following connectivity of the M/s Torrent Power Ltd is proposed:

- LILO of 400kV SUGEN- Pirana (PG) 400kV one ckt. at SUGEN TPS (382.5 MW)

Considering above proposed connectivity arrangement, provision of following at generation switchyard, implementation of **which shall be under the scope of the M/s Torrent Power Ltd.**, is proposed:

- 400kV line bays : 2 nos.
- 400kV bus reactor : 1x80MVAR
- 400kV bus reactor bay : 1 no.

vii)NTPC Limited (Gandhar-II), Distt. Bharuch, Gujarat

- Project- Gandhar Stage-II
- Project Capacity - 1300MW
- Connectivity applied for/from – 1300MW/2013-14
- Commissioning schedule- 2013-14

Existing Gandhar CCPP (650MW) generaion is stepped up at 220kV level and connected to the WR grid at 220kV as well 400kV level. 400kV Gandhar is presently connected to Dehgam as well as Vapi. Now NTPC has proposed expansion at Gandhar Stage-I (650MW) generation by another 1300MW capacity as Stage-II with schedule for commissioning in 2013-14.

Considering the connectivity requirement for generation capacity of 1300 MW, following connectivity of the Gandhar Stage-II is proposed :

- Generation Step-up at 400kV level & interconnection at existing Gandhar 400kV bus

Considering above proposed connectivity arrangement, provision of following at generation switchyard, implementation of **which shall be under the scope of the M/s NTPC Ltd.**, is proposed:

- 400kV bus reactor : 1x125MVAR
- 400kV bus reactor bay: 1 no.

Future Provision

- 400kV line bays : 2 nos.
- 400kV line reactor : 2 nos.

However, transmission system strengthening to facilitate power transfer on long-term basis shall be identified once M/s NTPC apply for Long-term Access as per CERC Regulations, 2009.

viii) NTPC Limited.(Kawas-II), Distt. Surat, Gujarat

- Project- Kawas Stage-II
- Project Capacity - 1300MW
- Connectivity required for/from – 1300MW/2013-14
- Commissioning schedule- 2013-14

Existing Kawas CCPP (650MW) generation is stepped up at 220kV level. Now NTPC has proposed expansion at Kawas Stage-I (650MW) by another 1300MW capacity as Stage-II with schedule for commissioning in 2013-14.

Considering the connectivity requirement for generation capacity of 1300 MW, following connectivity of the Kawas Stage-II is proposed :

- Kawas -II - Vapi 400kV D/c (Quad)

Considering above proposed connectivity arrangement, provision of following at generation switchyard, implementation of **which shall be under the scope of the M/s NTPC Ltd.**, is proposed:

- 400kV line bays : 2 nos.
- 400kV bus reactor : 1x125MVAR
- 400kV bus reactor bay: 1 no.

However, transmission system strengthening to facilitate power transfer on long-term basis shall be identified once M/s NTPC apply for Long-term Access as per CERC Regulations, 2009.

B) IPP Generation projects in Chhattisgarh

i) MB Power(Chhattisgarh) Ltd.(MBPL), Distt. Janjgir, Champa, Chhattisgarh

- Project Capacity - $2 \times 660 \text{ MW} = 1320 \text{ MW}$
- Connectivity applied for/from – 1234MW/Jan'14
- Commissioning schedule- Jul'14 onwards

In view of the project capacity, unit size as well as the proximity of the generation project, following connectivity of M/s MB Power (Chhattisgarh) Ltd. is proposed:

- MB Power TPS –Champa Pooling Station 400kV D/c (Quad)

Considering above proposed connectivity arrangement, provision of following at generation switchyard, implementation of **which shall be under the scope of the M/s MB Power (Chhattisgarh) Ltd.**, is proposed:

- 400kV line bays : 2 nos.
- 400kV bus reactor : 1x125MVAR
- 400kV bus reactor bay: 1 no.

ii) Prakash Industries Ltd. (PIL), Distt. Janjgir, Champa, Chhattisgarh

Project-I

- Project Capacity - $5 \times 25 + 2 \times 100 + 2 \times 150 \text{ MW} = 625 \text{ MW}$
- Connectivity applied for/from – 500MW/Dec'12
- Commissioning schedule- Sep'10 onwards

Project-II

- Project Capacity - $2 \times 660 \text{ MW} = 1320 \text{ MW}$
- Connectivity applied for/from – 1320MW/ Oct'13
- Commissioning schedule- Oct'13 onwards

M/s Prakash Industries Ltd. has proposed to set up 625MW ($5 \times 25 + 2 \times 100 + 2 \times 150 \text{ MW}$) Captive generation project in Dist Jangir-Champa. However, connectivity is applied for 500MW from Dec'12. In the near vicinity of the above project, M/s Prakash Industries Ltd. has also proposed to set up another 1320MW($2 \times 660 \text{ MW}$) IPP generation project in Dist. Jangir-Champa with commissioning schedule of Oct'13. In view of the above, PIL has proposed to establish total 1945 MW capacity in Champa-Janjgir complex, out of which connectivity is applied for 1820 MW, for which a 400kV Quad D/c transmission line is required. However, as connectivity for Project-I (625 MW) is desired earlier than the Project-II, connectivity is proposed from the Project-I. Subsequently, with the Project-II, a tie- interconnection between two projects is proposed.

In view of the desired connectivity schedule as well as the proximity of the generation project, following connectivity of Project-I(625 MW) is proposed:

- Prakash TPS(625MW) – Champa Pooling Station 400kV D/c line(Quad)

However, for connectivity of the Project-II (1320 MW), following is proposed:

- PIL (1320MW) – PIL (625 MW) 400kV D/c line (Quad)

Considering above proposed connectivity arrangement, provision of following at generation switchyard, implementation of **which shall be under the scope of the M/s Prakash Industries Ltd.**, is proposed:

Project-I (625 MW)

- 400kV line bays : 4 nos.
- 400kV bus reactor : 1x125 MVAR
- 400kV bus reactor bay: 1 no.

Project-II (1320 MW)

- 400kV line bays : 2 nos.

iii) Lanco Power Ltd. (LPL), Distt. Korba, Chhattisgarh

- Project Capacity - 2x660MW =1320MW
- Connectivity applied for/from – 1320MW/Jan'14
- Commissioning schedule- Aug'14 onwards

M/s Lanco Power has earlier been granted LTOA for transfer of power from its 2x660MW (Unit 3&4) generation project at Pathadi, Chhattisgarh with commissioning schedule of Jan'12 with following dedicated Transmission system:

- Lanco Power TPS –Champa Pooling station 400kV D/c (Quad)

Now, M/s Lanco Power has proposed extension of above generation project with 2x660MW (Unit 5&6) having commissioning schedule of Jan'14 and applied connectivity for the above project. Applicant has indicated generation step up voltage as 400kV.

Considering above, following connectivity is proposed :

- Lanco Power TPS –Champa Pooling station 400 kV 2nd D/c (Quad)

In view of the above proposed connectivity arrangement, provision of following at generation switchyard, implementation of **which shall be under the scope of the M/s Lanco Power Ltd.**, is proposed:

- 400kV line bays : 2 nos.
- 400kV bus reactor : 1x125 MVAR
- 400kV bus reactor bay: 1 nos.

C) IPP Generation projects in MP

i) For Banas Thermal Power Pvt. Ltd. (BTPPL), Distt. Katni., MP

- Project Capacity - 2x660MW =1320MW
- Connectivity applied for – 1320MW/ Dec'13
- Commissioning schedule- Mar'14 onwards

In view of the project capacity, unit size as well as the proximity of the generation project, following connectivity of M/s Banas Thermal Power Pvt Ltd. is proposed:

- Banas TPS –Damoh 400kV D/c (Quad)

Considering above proposed connectivity arrangement, provision of following at generation switchyard, implementation of **which shall be under the scope of the M/s Banas Thermal Power Pvt. Ltd.**, is proposed:

- 400kV line bays : 2 nos.
- 400kV bus reactor : 1x125MVAR
- 400kV bus reactor bay: 1 no.

ii) Prakash Industries Ltd. (2x660MW), Distt. Anuppur, MP

- Project Capacity - 2x660MW =1320MW
- Connectivity applied for/from – 1320MW/Dec'13
- Commissioning schedule- Dec'13 onwards

In view of the project capacity, unit size as well as the proximity of the generation project, following connectivity of the M/s Prakash Industries Ltd. (2x660MW) is proposed :

- Prakash MP TPS – Jabalpur Pooling Station 400kV D/c line(Quad)

Considering above proposed connectivity arrangement, provision of following at generation switchyard, implementation of **which shall be under the scope of the M/s Prakash Industries Ltd.** is proposed:

- 400kV line bays : 2 nos.
- 400kV bus reactor : 1x125MVAR
- 400kV bus reactor bay: 1 no.

iii) DB Power (MP) Ltd., Distt. Singrauli, MP

- Project Capacity - 2x660MW =1320MW
- Connectivity applied for/from – 1320MW/Jul'14
- Commissioning schedule- Jul'14 onwards

In view of the project capacity, unit size as well as the proximity of the generation project, following connectivity of the M/s DB Power (MP) Ltd. (2x660MW) is proposed:

- DB TPS – Jabalpur Pooling Station 400kV D/c line(Quad)

Considering above proposed connectivity arrangement, provision of following at generation switchyard, implementation of **which shall be under the scope of the M/s DB Power (MP) Ltd.** is proposed:

- 400kV line bays : 2 nos.
- 400kV bus reactor : 1x125MVAR
- 400kV bus reactor bay: 1 no.

D) IPP Generation project in Maharashtra

i) For Astarc Power Pvt Ltd., Distt. Nagpur, Maharashtra

- Project Capacity - 2x660MW =1320MW
- Connectivity applied for/from – 1241MW/Jun'14
- Commissioning schedule- Jun'15 onwards

In view of the project capacity, unit size as well as the proximity of the generation project, following connectivity of the M/s Astrac Power Pvt Ltd.(2x660MW) is proposed:

- LILO of Seoni – Wardha 765kV (2nd) S/c line at Astrac TPS

Considering above proposed connectivity arrangement, provision of following at generation switchyard, implementation of **which shall be under the scope of the M/s Astarc Power Pvt Ltd.**, is proposed:

- 765kV line bays : 2 nos.
- 765kV bus reactor : 1x240MVAR
- 765kV bus reactor bay: 1 no.

5.0 For all the generation projects who have applied for Connectivity under CERC regulation, 2009, in addition to other applicable provisions in CERC regulations 2009 on Grant of connectivity, Long Term Access and Medium-term Open Access in inter-state transmission and related matters, following are to be noted:

- a) The grant of connectivity shall not entitle above applicants to interchange any power with the grid unless they obtains long-term access, medium term open access or short term open access. However, the above IPP shall be allowed to undertake interchange of power including drawl of power for commissioning activities and injection of infirm power in to the grid during full load testing before being put into commercial operation, even before availing any type of open access, after obtaining permission of the concerned regional load dispatch centre, which shall keep grid security in view while granting such permission.
- b) Above applicants are required to inform/confirm following to facilitate connectivity:
- i) Likely date of synchronization, likely quantum and period of injection of infirm power before being put into commercial operation to the SLDC and RLDC concerned at least one month in advance.
 - ii) In case the dedicated transmission system upto point of connection is to be undertaken by CTU/Inter-State Transmission Licensee, the applicants need to sign transmission agreement within one month of grant of connectivity, furnish requisite Bank Guarantee and fulfill other terms & conditions as stipulated in the CERC Regulations/Detailed Procedure, 2009 in this regard.
Further, time frame for commissioning of above dedicated transmission system from the signing of Transmission Agreement would be 9 months plus the time lines as specified by CERC in tariff regulations, 2009 or actual date of commissioning desired by the applicant and agreed to by the CTU, whichever is earlier. However, the scope or works at generation switchyard like terminal bays, bus/line reactors, associated bays etc. shall be under the scope of respective generation developer.
 - iii) The applicants shall abide by all provisions of the Electricity Act, 2003, CERC (Grant of Connectivity, Long-term Access and Medium-term Open Access in inter-State transmission and related matters) Regulations, 2009, CEA (Technical Standards for connectivity to the Grid) and Indian Electricity Grid Code as amended from time to time.
 - iv) All the applicants shall have to apply for "Connection Offer" to CTU at least more than 2 years prior to physical interconnection as well as have to sign "Connection Agreement" with CTU prior to physical interconnection as per CERC Regulations, 2009.
- c) Transmission system strengthening to facilitate power transfer on long-term basis shall be identified once above applicants apply for Long-term Access as per CERC Regulations, 2009.

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B. Agenda for Long-term Open Access of IPP generation projects in Western Region

1.0 BACKGROUND

A large number of private generation developers(IPP) have proposed to set-up generation projects in various states in WR have applied for Long-term Open Access as per CERC (Open Access in ISTS) Regulations, 2004. POWERGRID have received no. of applications from IPPs in the state of Chhattisgarh in Raigarh/Raipur/Champa/Korba generation complex as well as in the state of MP. Out of above, 18 nos. applicants/developers has already been granted LTOA having installed capacity of 21575 MW & LTOA quantum of 19175 MW in Chhattisgarh complex and 2 no. of developers has been granted LTOA having installed capacity of 1350 MW and LTOA quantum of 1053 MW in M.P Complex.

Besides above IPPs considered under Phase-1, there are 32 nos. IPPs/applicants in Western Region (*List enclosed as Annexure-1*) with installed capacity of about 35,000MW and LTOA quantum of about 28,500MW who have applied for Long term open access in ISTS for transfer of power from their proposed generation projects to various beneficiaries in Western and Northern Region. These IPPS had applied for LTOA prior to notification of CERC (Grant of connectivity, Medium-term Open Access, Long-term Access in ISTS and related matters) Regulations, 2009. Long-term access proposal of the above IPPs was informed to WR constituents. However, keeping in view the status/progress of the IPP projects, it was decided that same shall be taken up in subsequent phases.

Agenda for LTOA applications of above IPPs was discussed in 30th standing committee in WR & 12th LTOA meeting. In the meeting, it was decided that a separate meeting may be convened with IPPs & POWERGRID to review the status of above generation project. In this regard, a meeting was held on 19.07.10 at POWERGRID Gurgaon with CEA & IPPs in Chhattisgarh/MP/Maharashtra likely to come up in 12th plan period, to assess readiness/progress of generation projects. In the meeting, it was decided that the applicant would provide information such as realistic commissioning schedule, unit sizes, Quantum of LTA, Date of commencement of LTOA and concurrence from Chhattisgarh/MP for their allocation from above projects, if any to POWERGRID till 31st Aug, 2010.

Subsequently out of 32 nos. IPPs, 9 nos. IPPs provided information about the project, which are as under. Status regarding achievements of key milestones by those IPPs is also enclosed at **Annexure-I**.

Chhattisgarh Complex

S.no.	Developer	Installed Capacity (MW)	LTOA (MW)	Comm. Schedule
Raigarh (Tamnar) Complex				
1	Sarda Energy and Minerals Ltd.(2x135+1x30+1x50MW)	350	150	Jun-13
2	Mahavir Energy & Coal Benefication (2x30MW)	60	50	Dec-14
3	Mahavir Global (4x135MW)	540	450	Mar-16
4	Godawari Energy(2x660MW)	1320	776	Jul-15
5	CSPTCL*		479	
Sub Total		2270	1905	
Champa/Janjgir Complex				
6	Karnataka Power(2x800MW)	1600	1040	Sep-14
7	CSPTCL*		560	
Sub Total		1600	1600	
Dharamjaygarh/Korba complex				
8	Sarda Energy and Minerals Ltd.(2x660MW)	1320	825	Jun-16
9	AES Chhattisgarh Energy Ltd.(2x660 MW)	1320	1100	Mar-17
10	CSPTCL*		495	
Sub Total		2640	2420	
Raigarh (Kotra) complex				
11	Suryachakra (2x300MW)	600	339	Jan-14
12	CSPTCL*		207	
Sub Total		600	546	
Total		7110	6471	

*Allocation details for CSPTCL is enclosed at Annex-2.

MP COMPLEX

S.no.	Developer	Installed Capacity (MW)	LTOA (MW)	Comm. Schedule
1	Today's Energy (2x660MW)	1320	800**	Dec-14

** GoMP allocation for 35% from M/s Today Energy

PROPOSED TRANSMISSION SYSTEM

Firm beneficiaries of above IPPs are yet to be finalized. Applicant have informed only target regions for power transfer. Keeping above in view and the proximity of the IPP projects with already planned 765/400kV pooling stations in Chhattisgarh/MP, it is considered prudent to connect proposed IPP generation projects at above pooling stations in Chhattisgarh/M.P. Further, above projects shall also be integrated with already identified high capacity transmission corridors for Chhattisgarh generation complex to facilitate interconnection of IPP generation projects with the grid.

Keeping above in view, following dedicated transmission system for grant of long term open access to these projects is proposed:

Chhattisgarh Complex

Sno	Developer	Comm. Schedule	Proposed Dedicated Tr. System
Raigarh (Tamnar) complex			
1	Sarda Energy and Minerals Ltd.(350 MW)	Jun-13	SEML - Raigarh Pooling station(Nr. Tamnar) 400kV D/c
2	Mahavir Energy & Coal Benefication(60 MW)	Dec-14	Mahavir- Raigarh Pooling station(Nr. Tamnar) 400kV D/c
3	Mahavir Global(540 MW)	Mar-16	LILO of Mahavir Energy- Raigarh Pool (Tamnar) 400kV D/c at Mahavir Global
4	Godawari Energy(1200 MW)	Jul-15	Godawari TPS- Raigarh Pooling station(Tamnar) 400kV D/c(Triple)
Champa/Janjgir complex			
5	Karnataka Power(1600 MW)	Sep-14	KPL TPS- Champa Pooling Station 400kV D/c (Quad)
Dharamjaygarh/Korba complex			
6	Sarda Energy and Minerals Ltd.(1200 MW)	Jun-16	Sarda TPS- D'garh/Korba Pooling Station 400kV D/c (Triple)

Sno	Developer	Comm. Schedule	Proposed Dedicated Tr. System
7	AES Chhattisgarh Energy Ltd. (1320MW)	Mar-17	AES TPS- D'garh/Korba Pooling Station 400kV D/c (Triple)
	Raigarh(Kotra) complex		
8	Suryachakra Power Corp. Ltd.(600 MW)	Jan-14	Suryachakra - Raigarh Pooling Station (Kotra) 400kV D/c

MP Complex

Sno	Developer	Comm. Schedule	Proposed Dedicated Tr. System
1	Today's Energy (1320 MW)	Dec-14	Today Energy-Jabalpur Pool 400kV D/c (Quad)

The identified dedicated transmission system including bays at terminal in ISTS shall be under the scope of generation developer and shall be built, owned, operated and maintained by respective generation developers.

To facilitate evacuation of power from above IPPs, augmentation of interconnection of these pooling stations is required. As power is to be injected from IPPs in Raigarh(Kotra), Champa, Raigarh(Tamnar), Dharamjaygarh/Korba complex and Jabalpur Complex at 400kV level, augmentation of transformation capacity to facilitate power transfer to 765kV level is proposed which is as under:

Sno	Station	Proposed Augmentation
	IPPs in Chhattisgarh	
1	Champa Pooling Station	400/765kV, 2x1500 MVA transformers at Champa Pool
2	Dharamjaygarh Pooling Station	400/765kV, 2x1500 MVA transformers at Dharamjaygarh
3	Raigarh Pooling Station (Nr. Tamnar)	400/765kV, 2x1500 MVA transformers at Raigarh Pool (Nr. Tamnar)
4	Raigarh Pooling Station (Nr. Kotra)	400/765kV, 1x1500 MVA transformers at Raigarh Pool (Nr. Kotra)
	IPP in MP	
5	Jabalpur Pooling Station	400/765kV, 1x1500 MVA transformers at Jabalpur Pooling Station

For onward transfer of power from the proposed IPP projects, the transmission system strengthening required in all the regions for absorption by the beneficiaries would be evolved subsequently depending on the further progress made by such generation projects and identification of beneficiaries by them. The transmission system proposed in this agenda note shall facilitate in bringing power upto the pooling station(s), beyond pooling station, power shall be transferred mainly through already identified transmission corridor as well as additional strengthening if any.

As IPPs in Chhattisgarh are getting connected to the transmission system of High capacity corridors of Chhattisgarh IPPs, **the transmission charges of this corridor shall be shared by these IPPs in proportion to the capacity for which LTOA has been sought.** Details of the transmission corridor for sharing of transmission charges are enclosed at **Annexure-3**. Further, transmission charges of augmentation of transformation capacity at existing pooling stations/new pooling stations in these complexes, strengthening of interconnection between Pooling stations and further transmission system strengthening required beyond pooling stations shall also be shared by these IPPs. In addition, these IPPs shall share the transmission charges of Western Region for full quantum of LTOA sought and transmission charges of other regions in proportion to power required to be transferred to that region.

Schematic showing above proposed dedicated transmission system is shown at **Exhibit-I**.

High power transmission corridors have already been identified in M.P, as a part of the IPP projects in Southern region and IPP projects in Bilaspur complex in Chhattisgarh & MP, for which LTOA has already been granted. Therefore, considering proximity of pooling station with Today's Energy in MP, it can be integrated with the above high capacity transmission corridors. Accordingly, the transmission charges of respective corridors shall be shared by M/s Today's Energy in proportion to the capacity for which LTOA has been sought/granted. Details of the transmission corridors for sharing of transmission charges are enclosed at **Annexure-4**. In addition, M/s Today's Energy shall share the transmission charges of Western Region for full quantum of LTOA sought and transmission charges of other regions in proportion to power required to be transferred to that region.

All the above IPPs shall sign the BPTA/TSA with POWERGRID/Tr. licensee for sharing of transmission charges of the already identified transmission corridors and other applicable regional transmission charges and furnish bank guarantee @ Rs. 5 lakh/MW of LTA quantum to POWERGRID. Also, IPPs should indicate the date of signing of above BPTA as well as submission of bank guarantee at the time of deliberation of the proposal.

LTOA may be provided to above 9 IPPs with identified dedicated transmission system. As balance 23 IPPs did not furnish desired information including progress status till date, it is proposed that LTOA applications of the above IPPs may be closed & inform the respective developers accordingly. Subsequently, IPPs may apply afresh in case good progress is achieved towards setting up of generation projects.

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Annexure-1

IPP Generation Project in Chhattisgarh

S.no.	Developer	Installed Capacity (MW)	LTOA * (MW)	Comm. Schedule
Raigarh (Kotra)				
1	Bhushan Power & Steel Ltd.	1000	900	Dec-11
2	Patni Power Projects Pvt. Ltd.	540	540	Jan-12
3	Ispat Industries Ltd.	1200	650	Mar-12
4	Suryachakara Power Corpn. Ltd.	600	546	Jan-14
5	Topworth Energy Pvt Ltd	1200	702	Jan-13
6	Ind Barath energy Ltd.	600	552	Feb-13
7	Essar Power Chhattisgarh	1200	750	Mar-13
8	BEC Power Pvt. Ltd.	505	450	Mar-13
9	Jindal India Thermal Power Ltd.	1320	1320	Sep-13
10	Chambal Infrastructure Ventures Ltd.	1320	1250	Dec-14
	<i>Sub Total</i>	9485	7660	
Raigarh (Tamnar)				
11	Singhal Energy	270	155	Sep-11
12	Godawari Energy	1320	1234	Jul-15
13	Sarda Energy and Minerals Ltd	350	171	Jun-13
14	Mahavir Energy & Coal Benefication	60	50	Dec-14
15	Mahavir Global	540	450	Mar-16
	<i>Sub Total</i>	2540	2060	
Champa/Janjgir				
16	Sona Power Pvt. Ltd.	600	525	Mar-12
17	KVK Power & Infrastructure	1320	1200	Mar-13
18	Torrent Power Ltd.	1320	1214	Jun-13
19	Karnataka Power	1600	1600	Sep-14
20	Bhushan Energy Ltd.	1000	1000	Dec-13
21	Vandana Global	1260	1050	2013-14
22	JSW Energy Ltd.	1320	800	Apr-14
23	Adhunik Thermal Energy Ltd.	1005	900	
	<i>Sub Total</i>	9425	8289	
Dharamjaygarh/Korba				
24	Indiabulls-Bhaiyathan	1320	500	Dec-12
25	Shyam Century Infrastructure Ltd.	600	600	Sep-13

S.no.	Developer	Installed Capacity (MW)	LTOA * (MW)	Comm. Schedule
26	Jain Energy Ltd.	1200	1092	Sep-13
27	AES Chhattisgarh Energy Ltd.	1320	1100	Mar-17
28	ACB India(Aryan Coal) Pvt. Ltd.	1200	1100	Mar-15
29	Sarda Energy and Minerals Ltd.	1320	1320	Jun-16
	<i>Sub Total</i>	6960	5712	
	Grand Total	28410	23721	

* Including CSPTCL allocation-whenever applicable

IPP generation projects in Madhya Pradesh and Maharashtra

Sl. No.	Applicant	Location (State)	Installed Capacity (MW)	LTA (MW)	Time Frame
1.	Reliance Industries(Shadol)	MP	1050	1050	Jan'13
2.	Today's Energy	MP	1320	800	Dec-14
3.	Maharashtra Energy (RPL)	Maharashtra	4000	2800	Jan'13
		Total	6370	4650	

Annexure-2

S.no.	Developer	LTOA (MW)
1	Chhattisgarh State Power Trading co. Ltd (allocation from above IPPs on FRR)	
	Sarda Energy(350 MW)	21
	Mahavir ECBL(60 MW)	-
	Mahavir Global(540 MW)	-
	Godawari(1320 MW)	458
	Karnataka Power(1600 MW)	560
	SEML (1320 MW)	495
	AES(1320 MW)	-
	Suryachakra(600 MW)	207
	Sub total	1741

ANNEXURE-3

Transmission System of IPPs generation projects coming up in Raigarh & Champa complex in Chhattisgarh IPP

(1) Common transmission system strengthening to be implemented by POWERGRID

- 1) Raigarh Pooling Station (Kotra)- Raipur Pooling station 765 kV D/c
- 2) Raigarh Pooling Station (Kotra)- Champa Pooling station 765 kV S/c
- 3) Champa Pooling station- Raipur Pooling station 765 kV D/c
- 4) Raigarh Pooling station (Kotra) - Raigarh Pooling station (Tamnar) 765 kV D/c
- 5) Champa Pooling station – Dharamjaygarh 765 kV S/c
- 6) Raipur Pooling station- Wardha 765 kV 2xD/c
- 7) Wardha- Aurangabad(PG) 765 kV 2xD/c
- 8) Aurangabad- Padghe(PG) 765 kV D/c
- 9) Aurangabad(PG)- Boisar/ Khargar 400 kV D/c (quad)
- 10) Padghe(PG)- Padghe 400 kV D/c (quad)
- 11) Vadodra-Asoj (GETCO) 400 kV D/c (quad)
- 12) Establishment of 2x315 MVA, 400/220 kV Dhule (PG).
- 13) Dhule (PG) – Dhule (IPTC) 400 kV 2x D/c (High Capacity)
- 14) Dhule (PG) – Nasik (MSETCL) 400 kV D/c (quad)
- 15) Dhule (PG) – Malegaon (MSETCL) 400 kV D/c (quad)
- 16) Kurushetra- Jalandhar 400 kV D/C (Quad) (one ckt via Nakodar S/s)
- 17) LILO of Abdullapur- Sonapat 400 kV D/c (triple) at Kurushetra
- 18) Raigarh Pooling Station (Kotra) - Raigarh existing 400 kV D/c (to be kept open at a later date).
- 19) Raipur Pooling Station – Raipur existing 400 kV D/c (to be kept open at a later date)
- 20) Augmentation of transformation capacity by 400/220kV, 1x500 MVA at Boisar S/s
- 21) Establishment of 765/400 kV pooling stations at Raigarh (4x1500 MVA) near Kotra, at Raigarh near Tamnar(3x1500 MVA, at Champa (6x1500 MVA), and at Raipur (1x1500 MVA)
- 22) Establishment of 765/400 kV 2x1500 MVA substations at Aurangabad and Padghe (GIS)
- 23) ± 600 kV 4000 MW HVDC bipole between Raigarh pooling station (Kotra) – Dhule (PG) with metallic return conductor
- 24) 4000 MW, 600 kV HVDC bipole terminal each at Raigarh pooling station (Kotra) and Dhule (PG)

25)± 800 kV 3000 MW HVDC bipole between Champa Pooling Station – Near Kurushetra (NR) in Haryana with metallic return (Provision to upgrade to 6000MW at later date).

26)3000 MW, 800 kV HVDC bipole terminal each at Champa pooling station and near Kurushetra in Haryana with provision to upgrade the terminals to 6000 MW.

27)Establishment of 400/220 kV, 2x500 MVA substation at Kurushetra

(2).Transmission System under Private Sector Route through tariff based competitive bidding.

- Aurangabad – Dhule (IPTC) 765kV S/c
- Dhule (IPTC) – Vadodara (PG) 765kV S/c
- Establishment of 765/400kV 2x1500MVA Dhule(IPTC) S/s
- Dhule (IPTC) – Dhule (MSETCL) 400kV D/c Quad

Annexure-4

(A)Transmission Charges of the following transmission system to be shared by M/s Todays Energy along with other IPPs near Bilaspur complex in Chhattisgarh & MP

- Indore- Vadodra 765kV S/c
- Vadodra – Pirana 400kV D/c (Quad)
- Establishment of 765/400kV, 2x1500 MVA substation at Vadodra

(B)Transmission Charges of the following transmission system to be shared by M/s Todays Energy along with other IPPs projects in Southern Region

- Establishment of 2x1000MVA 765/400 kV station at Orai by LILO of one circuit of Satna – Gwalior 765 kV line
- Establishment of 2x1500MVA 765/400 kV station at Bulandshahar by LILO of Agra – Meerut 765 kV line
- Establishment of 2x1500MVA 765/400 kV station at Sonipat by LILO of Bhiwani – Meerut 765 kV line
- Jabalpur Pooling station – Orai 765 kV S/c line.
- Orai – Bulandshahar – Sonipat 765 kV S/c line.
- Orai-Orai (UPPCL) 400kV D/c Quad
- Sonipat-Kurushetra 400kV D/c (Quad)
- Sonipat (New) - Sonipat (Under Construction) 400kV D/c (Quad)
- Bulandshahr - Hapur (UPPCL) 400kV D/c (Quad)

(C) Transmission Charges of the following transmission system to be shared by M/s Todays Energy along with M/s MB Power MP Ltd

- Jabalpur Pooling Station – Bina 765kV S/c line (3rd) (*Implementation through pvt. Sector*)