भारत सरकार/Government of India

केन्द्रीय विधुत प्राधिकरनण/Central Electricity Authority

प्रणली आयोजना एवं रीयोजना मूल्यांकनण प्रभाग/SP&PA Division

आर के रम/R.K. Puram

नई दिल्ली/New Delhi -110606

[आई.एस.ओ. : 9001-2000]

संखया/No. 1/9/08-SP&PA/ दिनांक/Date: 04-MAY-2009

-As per List enclosed-

विष्य/Subject: **27th meeting of the Standing Committee on Power System Planning of Northern Region**

महोदय/Sir,

The Agenda Note for the forthcoming (27th) Standing Committee meeting on Power System Planning of Northern Region was uploaded on CEA website on 9th April 2009.

2. HVPNL have pointed out that the last exhibit of Agenda entitled “400/765 kV transmission system of Northern Region” has minor discrepancies which are linked to evacuation system of Jhajjar TPS and Khedar TPS (Hissar TPS). Incorporating the corrections, Powergrid has furnished the revised exhibit and the same is enclosed as ‘Rev. Exhibit-8’. Exhibit-7A could not be uploaded last time, the same is also enclosed.

It is informed that in para-8.5 dealing with Option-2, “outage of one circuit of Bareilly – Meerut 400 kV line” has been indicated inadvertently. It may be read as “outage of one circuit of Bareilly – Moradabad 400 kV line”.

3. During the 11th TCC and 12th RPC meeting of Northern Regional Power Committee (NRPC), NRLDC had raised certain issues concerning grid reliability. The deliberations are enclosed at Annex-I. It was agreed that the deliberations may be referred to CEA for consideration in the instant meeting. Powergrid has also sent an agenda item, enclosed at Annex-II. Members may deliberate.

4. It is to inform that this letter along with exhibits and annexure are available at CEA website (www.cea.nic.in at the link i.e. Home page – Power System – Standing Committee on Power System Planning – Northern Region) as “Additional Agenda”. You may download it. The exact date and venue shall be intimated shortly.

(रविन्द्र)

मुख्य अभियंता

Annexure-I

Reliability Related Issues for Electricity Grid of Northern Region

(I) Enhancing System Reliability by LILO of 400 kV Dehar-Bhiwani and 400 kV Dehar-Panipat

In view of the high voltages being observed around Dehar during winter night off-peak hours to control high voltage, 400 kV Dehar-Bhiwani and 400 kV Dehar-Panipat lines have to be opened resulting in opening of 400 kV loop from 400 kV Panipat to 400 kV Bhiwani via Dehar HEP. To address these issues the options suggested were:

- 400 kV Dehar-Bhiwani should be LILO at 400 kV Patiala (PG) or 400 kV Kaithal (PG) and the 400 kV Dehar-Panipat should be LILO at 400 kV Abdullapur (PG) or 400 kV Panchkula (To be commissioned.) This would provide sufficient anchoring and control the voltage at Dehar.
- Installation of reactors at suitable locations.

(II) Enhancing Reliability of Generation at Narora Atomic Power Station

Network related constraints are being faced in western UP. Further, it is also observed that low generation at Harduaganj & Narora coupled with load growth in western UP are resulting in low voltages in this area and critical loading of network in western UP, particularly 220 kV Bareilly-C.B. Ganj interconnector, 220 kV Mainpuri (PG)-Harduaganj, 220 kV Mainpuri (UP)-Harduaganj, 2x240 MVA, 400/220 kV ICTs at Moradabad, 2x315 MVA, 400/220 kV ICTs at Agra (UPPTCL). Efforts are to be made to remove the constraints by strengthening the system.

(III) Enhancing Reliability of Generation at Paricha Thermal

It was brought out hat the primary reason for frequent outage of **Paricha Thermal** power station is the transmission inadequacy. Evacuation of Paricha generation is through 220 kV Paricha-Mainpuri via Saifai S/C and 220 kV Paricha-Mainpuri via Orai. Frequent trippings are observed on this line. It was suggested that Paricha evacuation system be strengthened. Paricha is located on the border of Madhya Pradesh and transmission system strengthening scheme for this power station could consider lines connected with nearby substations in MP (in Western Region).

(IV) Overloading of 2x315 MVA, 400/220 kV ICTs at Bassi as well as Bhiwadi

Delay in addition of generation within Rajasthan at Kota TPP (Unit-7)-195 MW, Suratgarh TPP (Unit 4)-250 MW and Chhabbra TPS (2 units)-500 MW each coupled with load growth in Rajasthan are resulting in overloading of ICTs at Bassi and Bhiwadi during winters. Further, parallel operation of 220 kV Bhiwadi-Rewari line is also getting delayed due to anticipated overloading of 2x315 MVA, 400/220 kV ICT at Bhiwadi.

The third 315 MVA ICT at Bhiwadi approved in the 26th Standing Committee Meeting on Power System Planning of Northern Region needs to be in place by 31st October 2009.

(v) Network Constraints in Uttarakhand

Connectivity of Uttarakhand power systems with ISTS at 400 kV level is through 400 kV Moradabad-Kashipur and 400 kV Muzaffarnagar-Rishikesh system. Outage of any one of these circuits would result in severe constraints in Uttarakhand system.

400 kV Muzaffarnagar-Rishikesh line is planned for LILO at 400 kV Roorkee (POWERGRID) substation. However, this would still leave Uttarakhand with only two in-feeds from South side. During low hydro period when Uttarakhand's own demand is high, reliability of Uttarakhand power system becomes poor as witnessed by several outages. Additional in feed from (say) 400 kV Baraut (UPPTCL) or 400 kV Shamli (UPPTCL) or 400 kV Hapur (UPPTCL) might be considered to remove these constraints.

Annexure-II

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

1.0 Following generation projects are envisaged to come up in North Eastern Region, Sikkim and Bhutan by the year 2014.

North Eastern Region : About 4000 MW

(Lower Subansiri HEP:2000 MW, Kameng HEP:600 MW, Bongaigaon TPS:750 MW, Pallatana GBPP:726 MW)

Sikkim : About 4900 MW (24 nos. hydro projects)

Bhutan : About 1200 MW (Punatsangchu-I HEP)

On further review of the generation projects in Sikkim, it is known that 10 no. of projects with total capacity of about 2424MW are in the advanced stage and scheduled to be commissioned by 2012-13. The details of the projects are given below.

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	Tingting	99	Mar-12
5	Rongnichu	96	Mar-12
6	Bhasmey	51	Mar-12
7	Tashiding	97	June-12
8	Rangit-II*	66	June-12
9	Teesta-VI	500	Nov-12
10	Rangit-IV	120	Jun-13
	Total	**2424**	

* yet to apply for LTOA

Further, the Punatsangchu-I HEP (1200MW) in Bhutan is also likely to be commissioned by Sept., 2014. The other future projects in Bhutan like Mangdechu(670MW) and Punatsangchu-II (990 MW) are expected to be commissioned by 2016.

The Lower Subansiri HEP and Kameng HEP projects in NER are expected to be commissioned in 2012-13.

2.0 In order to evacuate the power from the generation projects in NER, Sikkim and Bhutan, a comprehensive transmission scheme has been evolved which consists of Bishwanath Chariyali(NER) - Agra(NR), ±800kV, 6000MW HVDC bipole line with 3000MW HVDC converter stations at Bishwanath Charyiali and Agra proposed under "NER – NR/WR Interconnector-I" which has already been concurred by the constituents of NR and WR. The balance portion of the scheme consists of 3000MW converter station each at a suitable location near Alipurduar/Coochbihar/Rajganj and Agra along with loop-in & loop-out of 6000MW HVDC bipole line at Alipurduar/Coochbihar/Rajganj.

3.0 Power from generation projects coming up during 2011-13 in Sikkim is to be brought up to Kishanganj, a pooling substation in the north of West Bengal/Bihar, through substations at Melli & Rangpo in Sikkim. From Kishanganj substation power would be further transferred through AC lines like LILO of Siliguri-Purnea 400kV D/c lines at Kishanganj and Kishanganj-Patna 400kV D/c lines. As mentioned above, the HVDC station is proposed at a pooling station near Alipurduar/Coochbihar/Rajganj in North of West Bengal so as to pool power from Punatsangchu-I HEP in Bhutan as well as from generation projects in Sikkim, thereby optimizing the utilization of Right-of-Way.

4.0 The transmission system for evacuation of the above projects has been divided into three parts. The first part is for evacuation of power from the first two projects in Sikkim i.e. Chujachen(99 MW) and Teesta-III(1200 MW). The 2nd part would be for evacuation of the next 1100MW of power i.e. total 2400MW from Sikkim generation projects. The 3rd part would provide the corridor towards NR/WR with adequate reliability and security for the above generation projects in Sikkim as well as help in evacuation of power from Phunatsangchu-I generation project in Bhutan and also initial evacuation of future generation projects in Bhutan like Punatsangchu-II, Mangdechu etc.

5.0 The details of the transmission system are given below.

(i) By 2011-12, for evacuation of 1300 MW from Sikkim

Part-A : Transmission System for development of pooling station at Kishanganj in Northern part of West Bengal/Bihar

- Establishment of new 2x315 MVA, 400/220kV 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 the higher capacity(HTLS) conductor
- LILO of Siliguri – Dalkhola 220kV D/c line at new pooling station in northern part of West Bengal / Bihar
- 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.

(ii) By 2012-13, when additional 1100 MW materializes in Sikkim

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 220/132kV, 3x100MVA Gas Insulated Substation at Rangpo
- Establishment of 10x167MVA, 1 phase, 400/220kV Gas Insulated substation at New Melli
- LILO of Teesta III – Kishanganj 400kV D/c line at New Melli
- 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 and Melli – Rangpo 132kV lines (constructed under part-A through LILO of Gangtok-Melli 132kV S/c line upto Rangpo) at Rangpo
- LILO of Teesta V – Siliguri 400kV D/c line at New Melli
- Kishanganj – Patna 400kV D/c (quad) line

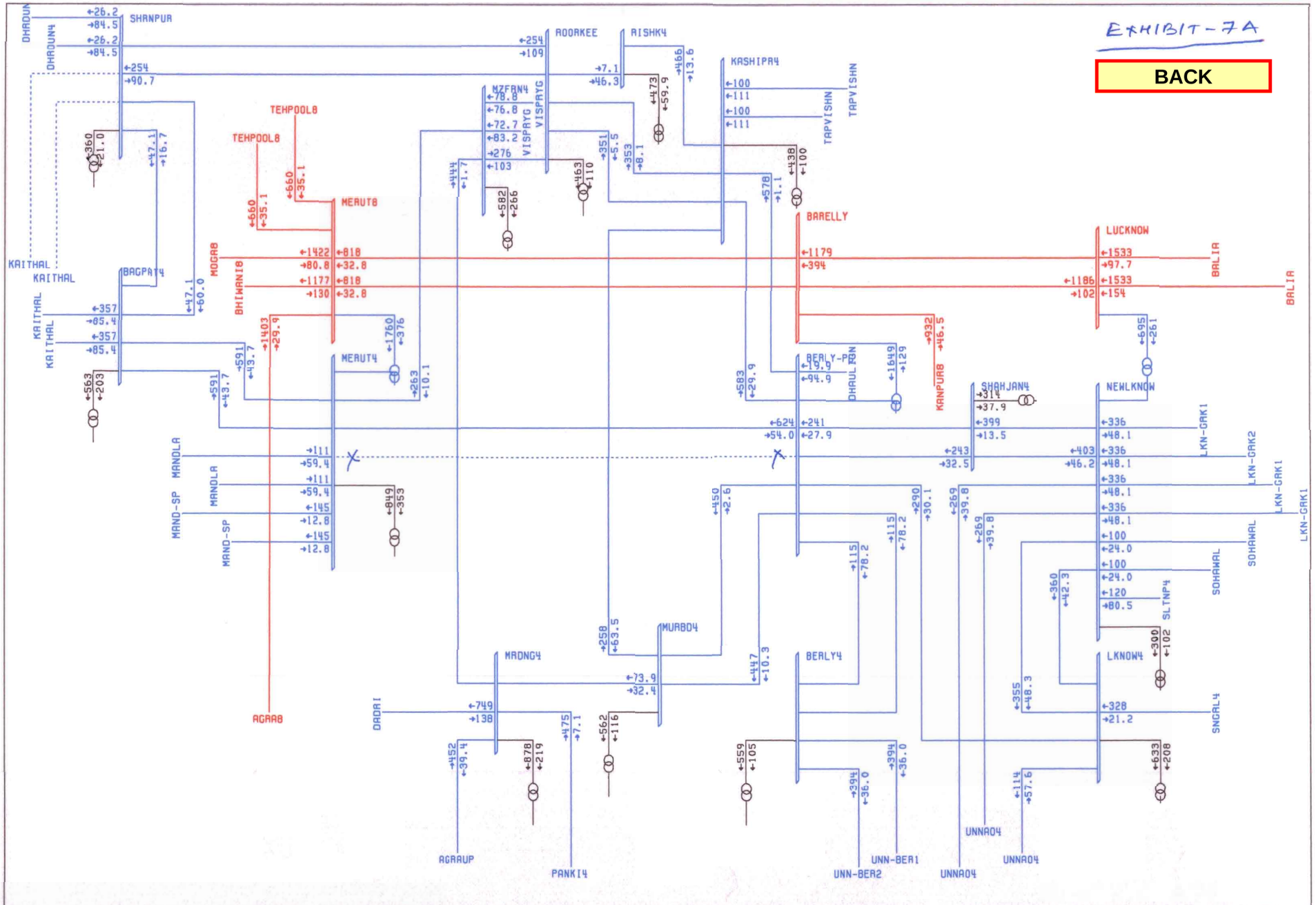
(iii)By 2014-15, when Punatsangchu-I (1200 MW) comes up in Bhutan

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

- New 400kV AC & HVDC sub-station with $\pm$ 800kV, 3000MW converter module at new pooling station in Alipurduar/Coochbihar/Rajganj
- Extension of $\pm$ 800 kV HVDC station with 3000 MW inverter module at Agra
- LILO of Bishwanath Chariali – Agra HVDC line at new pooling station in Alipurduar/Coochbihar/Rajganj for parallel operation of the HVDC station
- LILO of Bongaigaon – Siliguri 400kV D/c line existing line(twin moose) at new pooling station in Alipurduar/Coochbihar/Rajganj
- LILO of Tala-Siliguri 400kV D/c line at new pooling station in Alipurduar/Coochbihar/Rajganj.

EXHIBIT-7A

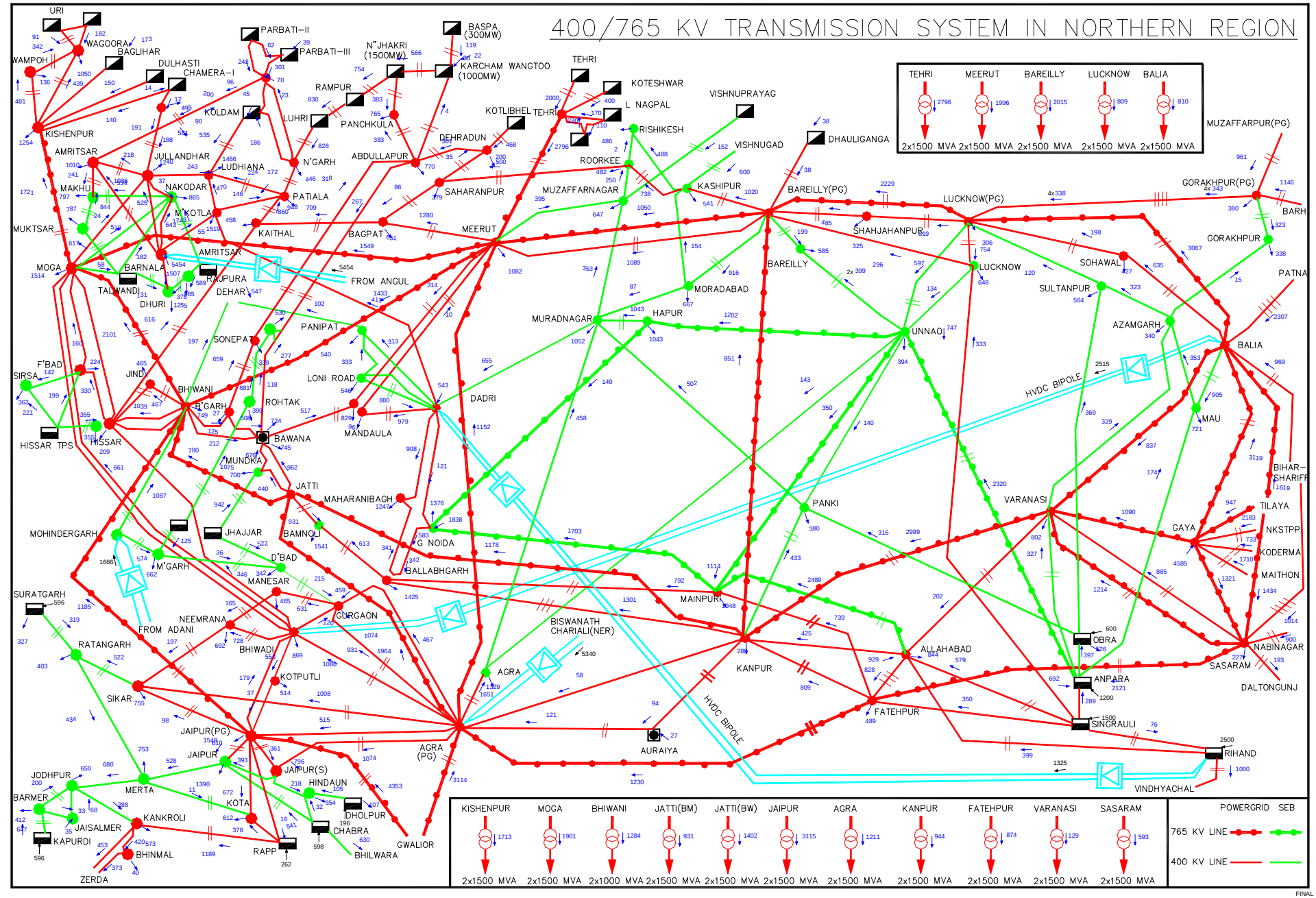
BACK



POWER TECHNOLOGIES, INC.®	EXHIBIT-7A : 2014-15 CONDITION WED, APR 08 2009 12:39	KV: ≤220 , ≤400 , ≤765	BUS - NONE BRANCH - MW/MVAR EQUIPMENT - MW/MVAR

BACK

400/765 KV TRANSMISSION SYSTEM IN NORTHERN REGION



FINAL