

केन्द्रीय विद्युत प्राधिकरण  
प्रणाली योजना एवं परियोजना मूल्यांकन प्रभाग  
सेवा भवन, रामकृष्ण पुरम्,  
नई दिल्ली 110 066

सं० 66/9/99/प्र.यो.एवं प.मू./८४४-९९

दिनांक 19.09.2003

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|----|---|-----|--|
| 1  | मुख्य अभियन्ता(पारिषण)<br>बिहार राज्य विद्युत बोर्ड, विद्युत भवन<br>बेली रोड, पटना-800001.          | 2.  | मुख्य अभियन्ता(पी.एस.आर.)<br>दामोदर घाटी निगम,डी.वी.सी.टावर,<br>वी.आई.पी. रोड, कलकत्ता-700054  |
| 3. | सदस्य सचिव,<br>पूर्वी क्षेत्रीय विद्युत बोर्ड,<br>14, गोल्फ क्लब रोड,<br>तोलीगुंज, कलकत्ता-700033   | 4.  | निदेशक(वाणिज्य)<br>ग्रिड कारपोरेश आफ उड़ीसा लि.<br>जनपथ, भुवनेवर, उड़ीसा.  |
| 5. | मुख्य अभियन्ता(सी.पी एवं ई.डी),<br>पं.बं.रा.बि.बोड, विद्युत भवन,-11<br>साल्ट लेक, कलकत्ता-700091    | 6.  | प्रमुख मुख्य अभियन्ता सह सचिव<br>विद्युत विभाग, सिक्किम सरकार,<br>गंगटोक, सिक्किम.   |
| 7. | कार्यकारी निदेशक(इंजिनियरिंग),<br>पावर ग्रिड, बी-9 कुतुब इंस्टी.एरिया,<br>कटवारिया सराय. नई दिल्ली. | 8.  | कार्यकारी निदेशक(इंजिनियरिंग)<br>एन.टी.पी.सी, इंजि.आफिस<br>परिसर, ए-8, क्षेत्र 24, नोएडा.  |
| 9. | सदस्य(तकनीकी), जे.एस.ई.बी,<br>दोरन्दा, रांची-834002.  | 10. | जेनेरल मैनेजर (डिजाइन बी.एंड.एम)<br>एन.एच.पी.सी., एन.एच.पी.सी.कार्यालय<br>परिसर,सैक्टर 33,फरीदाबाद-121003  |
| 11 | निदेशक,पी.टी.सी,<br>एन.बी.सी.सी टावर दूसरी मंजिल,<br>5, भिकाजी कामा पैलेस, न.दिल्ली.66              | 12. | कार्यकारी निदेशक (परिचालन)<br>वेस्ट बंगाल पावर डेवलपमेन्ट कारपोरेशन<br>छठी मंजिल, बी ब्लोक,<br>नया सचिवालय भवन<br>1, के.एस.राय रोड, कोलकत्ता -700 001. |

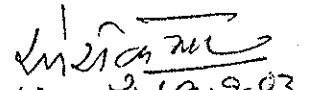
विषय: गंगटोक, सिक्किम में दिनांक 25/8/03 को की गई पूर्वी क्षेत्र की विद्युत प्रणाली आयोजना की स्थाई  
समिति की बैठक की कार्यवृत्ति के संबंध में

महोदय,

गंगटोक, सिक्किम में दिनांक 25/8/03 को की गई पूर्वी क्षेत्र की विद्युत प्रणाली आयोजना की स्थाई  
समिति की बैठक की कार्यवृत्ति की एक प्रति आवश्यक कार्यवाही हेतु संलग्न है.

कृपया पत्र की पावती दें.

संलग्नक: यथोपरि

  
(रमेश कुमार) 19.9.03  
निदेशक

**Minutes of the Standing Committee meeting of the Eastern Region for the issues relating to power system planning held at Gangtok, Sikkim on 25.8.03.**

The list of participants is at Annex-I.

Shri R.N.Nayak, ED, Powergrid welcomed the participants on behalf of the Powergrid and thanked Shri D.D.Pradhan, Secretary, Power Department, Govt. of Sikkim who had spared his valuable time to attend the meeting. He stated that Powergrid was looking forward to finalising of the transmission system for evacuating power from Eastern Region.

Shri Asthana, Director (SP&PA), CEA thanked Powergrid for arranging the meeting at the picturesque city of Gangtok and informed the participants that Shri V. Ramakrishna, Chief Engineer (SP&PA), CEA and Chairman, Standing Committee, could not attend the meeting as he had to cancel his programme due to unavoidable compulsions. However, he wished that deliberations in the meeting would lead to finalising of evacuation system for Kahalgaon Extn., Barh, and Maithon. He stated that multi-regional projects at Kahalgaon Extn., Barh and Maithon, the power from which was to be shared by the States in Eastern, Northern and Western Regions, were being planned in the Eastern Region. Evacuation system for these projects had to be finalised. Further, additional surplus power in ER would also be available particularly during non-peak hours and transmission system for enabling export of this to outside the Eastern Region was needed. Accordingly, CEA had carried out all-India studies and evolved the evacuation system. The proposed system had earlier been discussed with the constituents of the Northern and Western Regions and the same was to be discussed in the Standing Committee of the Eastern Region for finalisation.

Thereafter, the agenda items were taken-up for discussions.

1. **Confirmation of the minutes of the Standing Committee meeting held at Bhubaneswar on 19<sup>th</sup> December, 2002.**
- 1.1 Shri Ramesh Kumar, Director (SP&PA), CEA stated that the minutes of the Standing Committee meeting held at Bhubaneswar on 19<sup>th</sup> December, 2002 were circulated vide CEA letter No. 66/5/99-SP&PA/3-14 dated 2.1.2003 and no comments had been received on the minutes of the meeting. However, WBPDCCL vide their letter dated 30.12.2002 had made certain observations on the evacuation system for Sagardighi TPP Stage-I. Shri Asthana, Director (SP&PA), CEA stated that the issues raised by WBPDCCL were a follow-up of the discussion in the last meeting and the matter of finalising evacuation system for Sagardighi TPP Stage-I had been included in the present agenda item. As such, the minutes as circulated could be confirmed. The members agreed and the minutes were confirmed.

2. **Transmission system for evacuation of power from Kahalgaon TPS-Maithon (RB) TPS and Barh TPS**

2.1 Shri Asthana, Director (SP&PA), CEA stated that Kahalgaon Stage-II TPS (Phase-I: 2x500 plus Phase-II: 1x500 MW) and Barh TPS (1980 MW) had been planned by NTPC and were expected to be commissioned during 10th Plan/early 11<sup>th</sup> Plan. States of the Northern, Western and Eastern Regions were the likely beneficiaries. Tentative allocation of share as indicated by NTPC was:

Beneficiary	Share from BarhTPS (MW)	Share from Kahalgaon Extn. (MW)
Bihar/Jharkhand	290	219
Orissa	Nil	57
West Bengal	Nil	93
<b>Sub Total ER</b>	290	369
NR and WR	1293	906
Railways	100	Nil
Unallocated	297	225
<b>TOTAL</b>	1980	1500

In addition, North Karanpura had also been planned, but the commissioning programme of North Karanpura had become uncertain. Further, Maithon (RB) TPS (1000 MW) was also being planned by DVC and was included as a 10<sup>th</sup> Plan scheme. However, the beneficiaries of power from Maithon (RB) TPS had yet not been decided. He requested PTC, who were tying-up the beneficiaries of Maithon power, to indicate the status in this regard.

2.2 Shri S.K. Dubey, Director, PTC stated that constituent of Northern Region had evinced interest in purchasing power and in all probability Northern Region would be the beneficiary of Maithon (RB) TPS power. However, discussions were going on and final decision in this regard was yet to be taken. He also stated that tie-up for other projects of DVC viz. Mejia and Chandrapura was also in process and suggested that evacuation system for these could be discussed in the next meeting of Standing Committee. This was agreed to.

2.3 Shri Ramesh Kumar, Director (SP&PA), CEA made a power point presentation. A copy of the same is enclosed at Appendix-I. It was evident that in addition to transmission capacity for evacuation of power from multi-regional projects, transmission capacities were also needed to export operational surpluses of ER, which could be utilized by States of Northern and Western Regions. This export would also help in improving capacity utilisation in ER system. The presentation highlighted the need of transmission system having a transmission capacity of the order of 10000 MW between ER and NR and 7000 MW between ER and WR by the end of 11<sup>th</sup> Plan or early 12<sup>th</sup> Plan. The required system was proposed to be built in phases.

- 2.4 Shri Asthana, Director (SP&PA), CEA stated that keeping in view the above scenario, perspective transmission plan was evolved and thereafter, phased requirement corresponding to Kahalgaon extn., Barh and Maithon have been worked out based on power system studies for all India network. For this exercise, 2003-09 was selected as base year because all the units at Kahalgaon extn., Barh and Maithon were programmed for commissioning by that time. The detailed transmission system that had been proposed based on these studies had already been circulated in the agenda note.
- 2.5 Shri S.N. Mukherjee, CE, WBSEB stated that he had no comment on the evacuation system of Kahalgaon, Barh and Maithon TPSs. Shri R.K.Das Gupta, SE (E), DVC enquired who would bear the cost of the evacuation system of the Maithon TPS, which was outside the ER region. Shri A.K. Asthana, Director, CEA stated that the sharing of transmission charges were to be decided by the Central Electricity Regulatory Commission and as per the existing orders, the transmission charges for the system located in a particular region were to be shared by the beneficiaries of that region and in addition, beneficiaries located in one region and importing power from other region were also to pay wheeling charges for the transmission system of the exporting region.
- 2.6 Thereafter, the proposal as contained in the agenda note was discussed in detail and based on the technical need for evacuation and inter-connection system the following decisions were taken:

- (a) The following transmission system for Eastern Region and Inter-regional involving Eastern Region in respect of transmission system associated with Kahalgaon Extn., Maithon and Barh was agreed:

#### **KAHALGAON EXTENSION PHASE-I (2x500MW)**

##### Network in Eastern Region:

1. Kahalgaon-Patna 400kV QUAD DC
2. Patna (PG) 400/220kV Substation, 2x315MVA
3. Maithon (PG)-Ranchi 400 DC
4. Ranchi 400/220kV S/s of PG, 2x315MVA

##### Inter-regional involving Eastern Region:

5. Biharshariff-Balia 400kV QUAD DC
6. Patna-Balia 400kV QUAD DC

#### **KAHALGAON EXTENSION PHASE-II (1x500MW)**

##### Network in Eastern Region: Nil

##### Inter-regional involving Eastern Region:

1. Ranchi-Sipat 400 KV DC with 40% series compensation (in case Sipat Switchyard and 765kV lines from Sipat to Seoni covered under Sipat-II transmission system are delayed, then, instead of Ranchi-Sipat, it would be Ranchi-Rourkela-Raipur 400kV DC with TCSC at Raipur)

## MAITHON TRANSMISSION SYSTEM

### Network in Eastern Region:

1. Maithon RB TPS- Maithon (PG) 400 DC
2. Maithon RB TPS- Ranchi 400 DC

Inter-regional involving Eastern Region: Nil

## BARH TRANSMISSION SYSTEM

### Network in Eastern Region:

1. LILO of both ckts of 400kV Kahalgaon-Patna at Barh 2xDC

### Inter-regional involving Eastern Region:

2. Barh-Balia 400 QUAD DC

- (b) The need of some further system strengthening for dispersal of power corresponding to increased share of Eastern Regional beneficiaries and for taking care of requirements arising out of changes in flow pattern on account of redistribution of inter-state power flows consequent upon growth in demand and addition of generation in State sector was also felt. Shri R.N.Nayak, ED (Engg.), Powergrid, stated that Powergrid would be willing to undertake any work that was required to be undertaken by them. However, the State utilities should carry out the necessary exercise to identify the requirement and make their proposals so that the same could be studied and finalized. A suitable scheme could then be worked out. Shri Asthana, Director, CEA suggested that the Sagardighi-Kahalgaon 400kV SC line which had been identified as a inter-state line required along with Sagardighi TPP Stage-I, 2x250 MW, of WBPDC, could be included in this scheme. Shri Mukherjee, CE, WBSEB stated that Sagardighi-Kahalgaon line was not required for evacuation of Sagardighi power, but they would have no objection if this was considered as a regional scheme. Shri Asthana, CEA stated that the requirement of this line was on account of redistribution of inter-state power flow consequent to additional power in WBSEB system. However, as this was an inter-state line, it came under the ambit of Powergrid works. Shri Sarkhel, Ex. En. EREB stated that EREB also had certain suggestions regarding system strengthening works. Shri A.K. Gupta, HOD(E), NTPC stated that while planning additional lines into Kahalgaon bus, increase in fault level was needed to be considered. However, he confirmed availability of one spare bay which could be used for line from Sagardighi.

After discussion it was decided that a separate system strengthening scheme would be taken up by Powergrid. This scheme would, inter-alia, include 400kV Sagardighi-Kahalgaon SC line, and for the other works to

be covered under the scheme, all the state utilities and also EREB would carry out necessary exercise to identify the requirements and send their proposal along with supporting justification/studies to CEA at the earliest. The proposals would then be studied and discussed in the next Standing Committee meeting which would be convened shortly.

### **3. Evacuation system for Sagardighi TPP Stage-I (2x250 MW)**

3.1 Shri Ramesh Kumar, CEA stated that subsequent to the decision taken in the meeting of the Standing Committee held in December 2002, WBPDCCL had written a letter to EREB with a copy to CEA wherein they stated that for evacuation of Sagardighi TPP-I there was no requirement of strengthening Farakka-Kahalgaon section and that LILO of Farakka-Jeerat line at Sagardighi would suffice its evacuation need for WBSEB system. Shri Mukherjee, C.E., WBSEB stated that total power of Sagardighi TPP Stage-I would be required for WBSEB system and therefore, Sagardighi - Kahalgaon 400 kV S/C line was not needed from power evacuation requirement point of view. He further added that as per the Electricity Act, 2003, construction of inter-state lines was entrusted to CTU. Shri Asthana, Director, CEA stated that even if the contention of WBSEB that entire power of Sagardighi TPP Stage-I would be absorbed by WBSEB was accepted, looking at the trend in demand growth in WBSEB system, and the proposed generation capacity addition programme, WBSEB would have extra power available which would need to be exported out. Shri Dube, Director, PTC stated that they were handling trading of power from Eastern Region and were not able to evacuate power on account of transmission constraint.

3.2 In regard to LILO at Sagardighi, Shri Ramesh Kumar, Director, CEA stated that instead of LILOing the Farakka-Jeerut line as proposed by WBPDCCL, it would be better to LILO the Farakka-Subashgram line, which was the longer one. This was agreed to.

### **4. Evacuation system for Teesta HEP - Stage V**

4.1 Shri Ramesh Kumar, Director, CEA stated that the augmentation of 400/220 kV ICT at Kalabadia by 1x315 MVA and strengthening of network was discussed in the Standing Committee meeting held on 16.12.2002. In that meeting WBSEB had indicated that they were reviewing their earlier request for 132kV line from Kalabadia to their load centres in view of the anticipated O&M problems for the inter-state lines. WBSEB was requested to indicate the status in this regard. Shri Mukherjee, CE, WBSEB stated that in view of anticipated problem, WBSEB would not undertake construction of inter-state line. Shri R.N.Nayak, ED, Powergrid stated that augmentation of 400/220 kV ICT at Kalabadia by 1x315 MVA transformer was considered as a regional scheme at the request of WBSEB & JSEB and GRIDCO and as such all the provisions at Kalabadia including the second transformer were regional system. This was agreed.

5. **Evacuation system for Teesta Low Dam (TLD) Stage-III and IV ,HEPs**

- 5.1 Shri Ramesh Kumar, Director, CEA stated that transmission system of Teesta Low Dam Stage III and IV, which was to be constructed by WBSEB, was required to be finalized, and NHPC had given certain details in this regard based on their interaction with WBSEB. He requested WBSEB to intimate their proposal in this regard.

Shri Mukherjee, Chief Engineer, WBSEB intimated that they had planned three number 220 kV D/C lines viz.:

- (i) Teesta LD-III to New Jalpaiguri (WBSEB S/stn.) 220kV DC line.
- (ii) Teesta LD-IV to 220 kV Birpara (WBSEB S/st.) 220kV DC line. and
- (iii) Teesta LD-III to Teesta LD-IV 220kV DC line.

Shri A.K. Asthana, Director, CEA stated that the scheme proposed by WBSEB called for 4 bays at Teesta LD-III. However, as per the Teesta LD-III scheme which had been accorded TEC of CEA, there was provision of only two bays at Teesta LD-III, and in view of space constraint, provision of additional bays might be difficult.

After discussion, it was concluded that the scheme for evacuation of Teesta LD-III and Teesta LD-IV would be reviewed and discussed between CEA, NHPC and WBSEB before finalisation.

6. **Implementation of transmission system associated with Tala HEP**

- 6.1 Executive Engineer, EREB intimated that as per the decision taken in the last Standing Committee meeting, the requirement of LILO of remaining circuit of Bongaigaon-Malda 400 kV lines at Siliguri and Purnea was placed at EREB forum and the same has been noted and accepted.

The meeting concluded with a vote of thanks.

**List of Participants in the Meeting of Standing Committee on  
Transmission Planning in the Eastern region Held at Gangtok on 25.8.03**

**CEA**

Shri A.K. Asthana, Director (SP&PA)  
Shri Ramesh Kumar, Director(SP&PA)  
Shri A.K. Saha, Assistant Director (SP&PA).

**EREB**

Shri B. Sarkhel, Ex. Engineer  
Shri A. Roy, AD-I

**D.V.C.**

Shri R.K. Das Gupta, SE(E) S.P.M.

**POWER DEPARTMENT, SIKKIM**

Shri D.D. Pradhan, Secretary cum PCE  
Shri P.B. Subba, Addl. CEE

**WBPDC**

Shri K. Samanta, Sr. Manager(E)

**WBSEB**

Shri S.N. Mukherjee, CE(CP&ED)  
Shri M.K. Chowdhury, SE(E), (CP&ED)

**POWERGRID**

Shri R.N. Nayak, ED (Engg),  
Shri G. Singh, GM (ER- TS)  
Shri Y.K. Sehgal, , DGM( Engg. )

**PTC**

Shri S.K. Dube, Director (O)

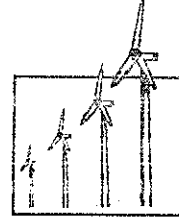
**NHPC**

Shri S.K. Mittal, GM(Teesta)  
Shri D. Chattopadhyay, Chief Engineer (Elect.)

**NTPC**

Shri A.K. Gupta, HOD(Elect.)





**WELCOME  
TO  
STANDING COMMITTEE MEETING  
ON  
TRANSMISSION PLANNING  
IN  
EASTERN REGION**

**ON 25-8-2003  
AT GANGTOK**

**Confirmation Of Minutes Of Meeting  
Held On 19<sup>th</sup> December 2002 at Bhuvaneshwar**

- Minutes issued vide letter dated 2-1-2003.
- No objection received.
- Comments of WBPDC on Sagardighi vide their letter dated 30-12-2002 were follow-up of decision in meeting and item on this is included in present agenda.
- Minutes may be confirmed.



**Transmission system  
for evacuation of power  
from  
Kahalgooan-II,  
Maithon (RB) TPS  
And  
Barh TPS**

NTPC establishing thermal generating stations at Barh, Kahalgaon, North Kanpura in ER.

DVC also setting up generating units at Maithon Right Bank

	Beneficiaries	Expected by
• Barh (1980 MW)	Northern, Western & Eastern Regions	10 <sup>th</sup> plan /early 11 <sup>th</sup> plan time frame.
• Kahalgaon-II(2x500 + 1x500)	Northern, Western & Eastern Regions	10 <sup>th</sup> plan /early 11 <sup>th</sup> plan time frame.
• North Karanpura (1980 MW)	Northern, Western & Eastern Regions	10 <sup>th</sup> plan /early 11 <sup>th</sup> plan time frame.
• Maithon (1000 MW)	- yet to be decided	10 <sup>th</sup> plan.

### Allocation of Share to States of NR

(TENTATIVE)

States	Share from Barh TPS (MW)	Share from Kahalgaon Extn (MW)	Share from North Karanpura (MW)
• Bihar/Jharkhand	290	219	260 (Jharkhand)
• Orissa		57	
• West Bengal		93	
• Sub-total	ER 290	369	260
	NR/WR 1293	906	1323
	Railway 100		
	Unalloc 297	225	297
	TOTAL 1980	1500	1980

## Off peak surplus of Easter Region could be utilized by States of NR and WR

- High thermal capacity in ER best utilized when power is exported during non-peak hours.
- Export would help in improving PLF and thereby reduction in cost of generation.
- Load curves of NR and SR are much flatter.
- Evacuation system needed for export oriented projects.
- Additional transmission system for export.
- Composite system has been planned.

## System Studies

- Power system studies were conducted with 2008-09 as the base year.
- The detailed study on the composite transmission system cover.
  - ✓ National grid connectivity for integrated operation of all India System.
  - ✓ Barh, Kahalgaon-II, North- Karanpura and Maithon.
  - ✓ Evacuation of Eastern region surplus.

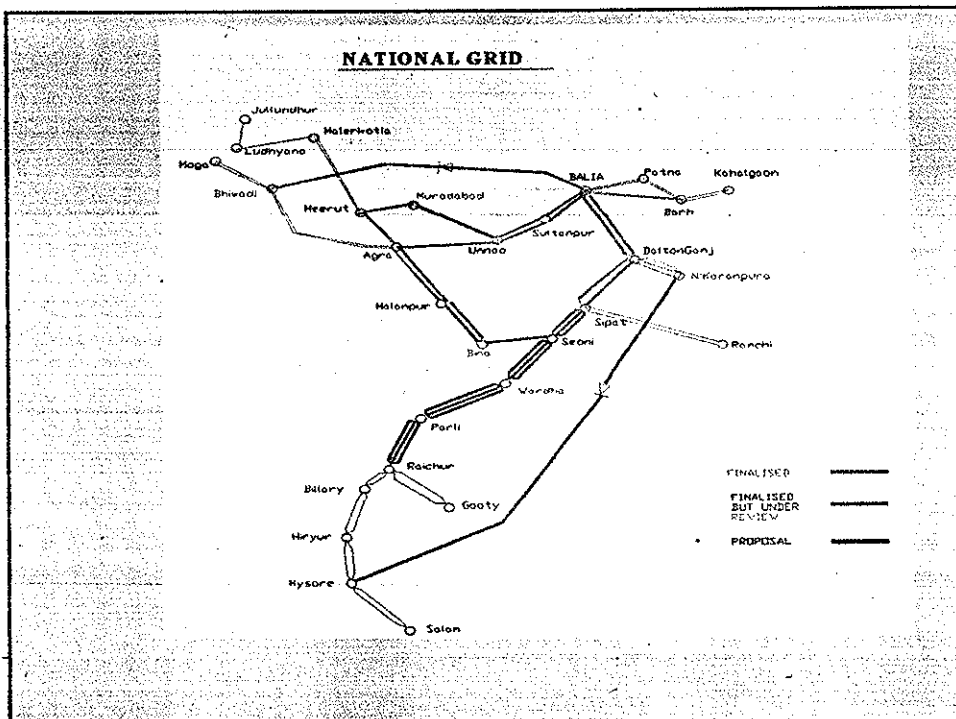
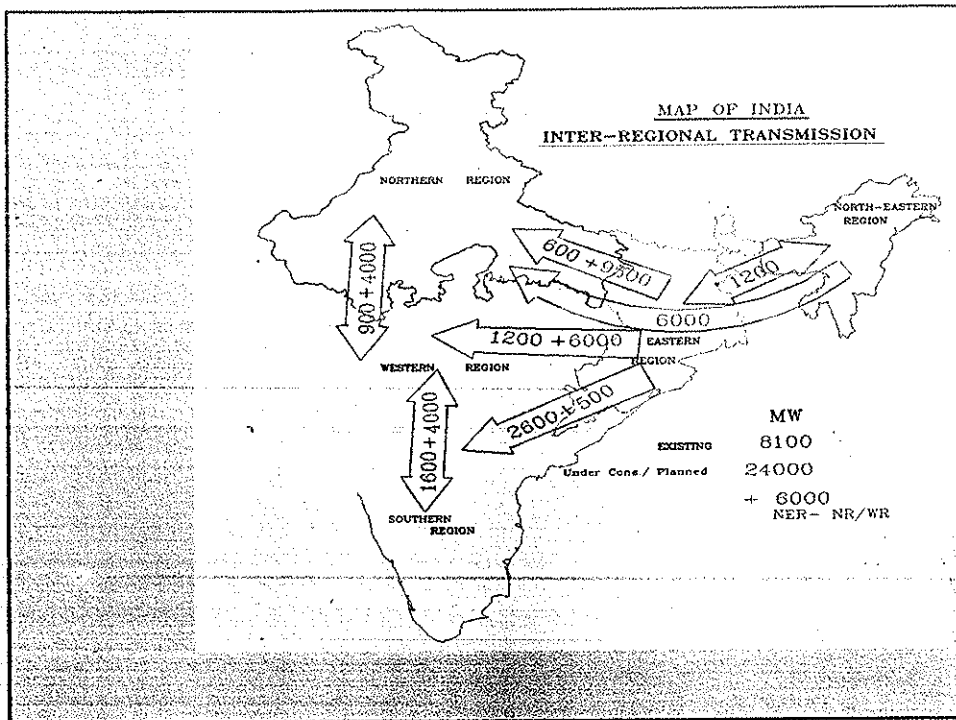
## Projected Demand and Anticipated Generation Capacity

ALL INDIA:	peak MW	Hydro	Thermal	Total
Existing	87000	27000	78000	105000
Add X Plan		15000	26000	41000
Add XI Plan		20000	46000	66000
<b>Total by 2011-12</b>	<b>157000</b>	<b>62000</b>	<b>150000</b>	<b>212000</b>
NR	49000	27000	28000	55000
WR	47000	9000	50000	59000
SR	42000	14000	38000	52000
ER	16000	7000	32000	39000
NER	2700	5000	1800	6800



## Need for Inter-regional Export/Import

	Load			NR	WR	SR	ER	NER
	Hydro	Thermal	of peak					
	%	%	%					
Peak demand				49000	47000	42000	16000	2700
Hydro Capacity				27000	9000	14000	7000	5000
Thermal Capacity				26000	50000	38000	32000	1800
Monsoon peak	100	65	100	-3800	-5500	-3300	11800	3470
Monsoon day	100	65	95	-1350	-3150	-1200	12600	3605
Monsoon night	90	50	75	1550	-2150	100	10300	3375
Winter peak	50	75	100	-14500	-5000	-6500	11500	1150
Winter day	35	75	95	-16100	-4000	-6500	11250	535
Winter night	20	75	70	-7900	6400	1900	14200	460



## National System -- As emerging

### ↓ Transmission Corridors

- ⇔ ER-NR
- ⇔ ER-WR
- ⇔ ER-SR / ER-WR-SR
- ⇔ NER - NR / WR

### ↓ Hybrid network

- ⇔ Preferred option for operational flexibility

## Transmission Planning Criteria

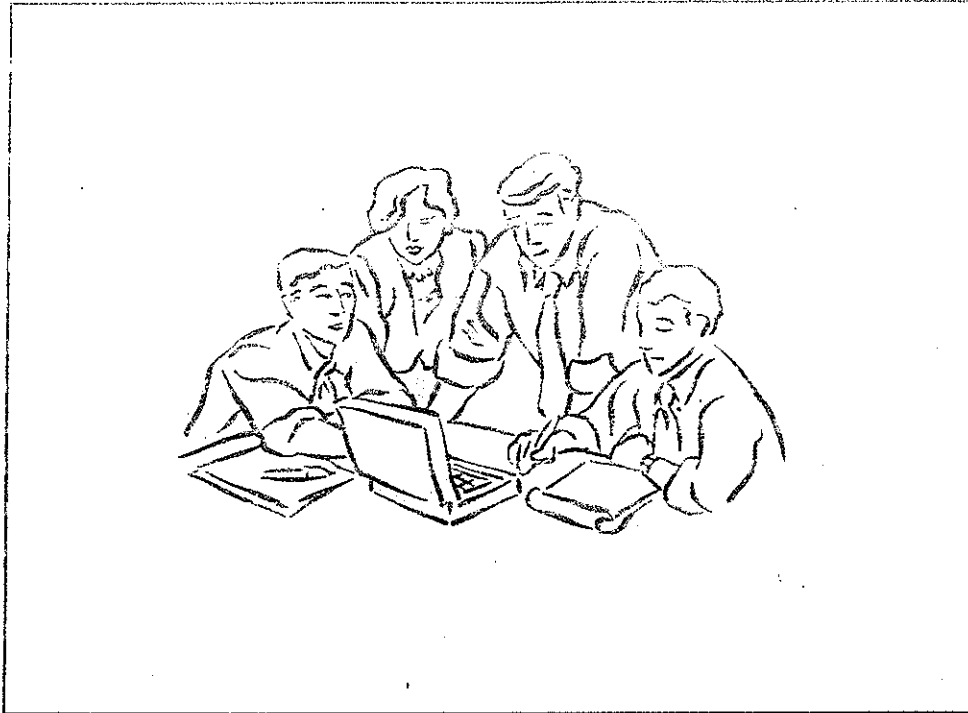
### -- Dispatch schedules for planning studies

#### ↓ Regional approach

- ⇔ Peak demand, maximum hydro and off peak conditions
- ⇔ Maximum generation in a complex for evacuation system

#### ↓ National approach

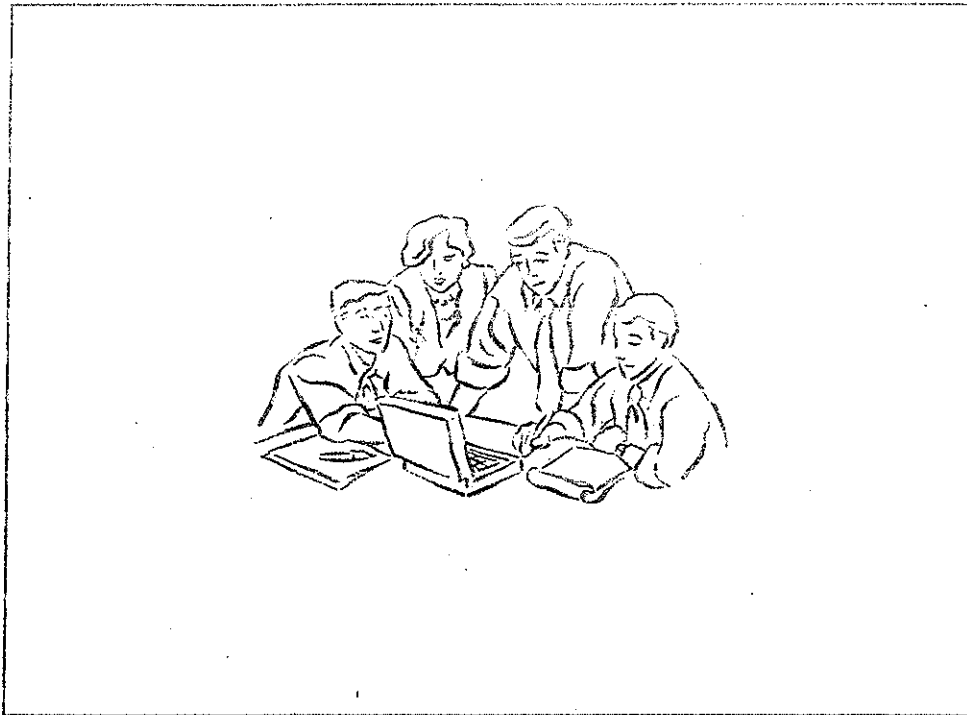
- ⇔ Extreme dispatch scenario by maximizing surplus in surplus region and deficit in deficit region
- ⇔ Combinations of surplus and deficit scenarios for different regions



**Evacuation system  
for  
Sagardighi TPP-I  
(2x250 MW)**

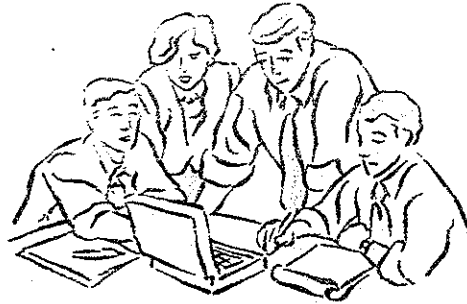
- LILO of Farakkha-Subhashgram instead of Farakkha-Jeerat.
- Sagardighi-Kahalgaon 400kV S/C line as regional scheme.





**Evacuation system  
for  
Teesta HEP – Stage V**

- Augmentation of 400/220 kV Kalabadia(Baripada) by 1x315 MVA
- 220kV additional feed for Balasore.



## **Evacuation system for**

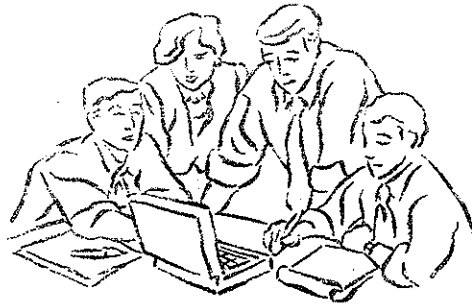
### **Teesta Low Dam Stage-III & IV**

- Utilisation of Central Transmission System beyond Siliguri for wheeling of WBSEB power.

OR

Augmentation of 220 kV System beyond Siliguri by WBSEB

- Evacuation System – NHPC proposal.



## Execution of Tala Transmission System

### POWERGRID TO INTIMATE PROGRESS

EREB representative to confirm bringing to notice of EREB forum regarding LILO of circuits of Bangoigaon-Malda at Siliguri and Purnia as per Tala Transmission Scheme