

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

No. 51/4/SP&PA-2006/

Date: 25-08-2006

To

1. The Member Secretary,
Southern Regional Power Committee,
29, Race Course Cross Road,
Bangalore - 560 009.
FAX : 080-22259343
2. The Director (Projects),
Power Grid Corp. of India Ltd.
“Saudamini”, Plot No.2, Sector-29,
Gurgaon - 122 001, Haryana.
FAX : 95124-2571760
3. The Director (Transmission),
Transmission Corp. of Andhra Pradesh Ltd.,
Vidyut Soudha, Hyderabad – 500 082.
FAX : 040-55665137
4. The Director (Transmission),
Karnataka State Power Trans. Corp. Ltd.,
Cauvery Bhawan, Bangalore - 560 009.
FAX : 080 -22228367
5. The Member (Transmission),
Kerala State Electricity Board,
Vidyuthi Bhawanam, Pattom, P.B. No. 1028,
Thiruvananthapuram - 695 004.
FAX : 0471-2446452, 2448213
6. Member (Distribution),
Tamil Nadu electricity Board (TNEB),
6th Floor, Eastern Wing,
800 Anna Salai, Chennai – 600 002.
FAX : 044-28525587, 28525639
7. The Director (Power),
Neyveli Lignite Corp. Ltd.,
Corporate Office, Block – I,
Neyveli – 607 801, Tamil Nadu.
FAX : 04142-252646
8. The Superintending Engineer –I,
First Floor, Electricity Department,
Gingy Salai, Pondicherry – 605 001.
FAX : 0413-2334277
9. Director (Projects),
National Thermal Power Corp. Ltd.
(NTPC),
NTPC Bhawan, Core-7, Scope Complex-7,
Institutional Area, Lodhi Road,
New Delhi-110003.
FAX-011-24360912
10. Shri N. S. M. Rao
Chief Engineer (Transmission),
Nuclear Power Corp. of India Ltd., 12th Floor,
Vikram Sarabhai Bhawan, Anushakti Nagar,
Mumbai – 400 094.
FAX : 022-25556513/25563350
11. The Director (Operation),
PTC India Limited, 2nd Floor, NBCC Tower,
15 Bhikaji Cama Place, New Delhi 110066.
FAX-011-51659504

Sub: 22nd meeting of the Standing Committee on Power System Planning of Southern Region – Summary Record of Discussions

Sir,

Summary Record of Discussions of the 22nd meeting of the Standing Committee on Power System Planning of Southern Region held on August 17, 2006 at Southern Regional Power Committee, 29, Race Course Cross Road, Bangalore – 560 009, is enclosed.

Yours faithfully,

(P. K. Pahwa)
Director (SP&PA)
Ph: 011-26108118

Minutes of the 22nd Standing Committee meeting on Power System Planning in Southern Region held on 17th August, 2006 at SRPC, Bangalore.

1.1 The 22nd meeting of Standing Committee on Power System Planning in Southern Region was held on Thursday the 17th August, 2006 at SRPC, Bangalore. The list of participants is at Annexure.

1.2 Shri V. Ramakrishna Member (Power System), CEA welcomed the participants to the meeting and thanked SRPC for organizing the meeting and stated that some of the items of the agenda for the meeting were also deliberated during the last meeting. The transmission system for evacuation of power from Tuticorin TPS JV (2x500 MW) and North Chennai TPS JV (2x500 MW) were discussed during the last meeting and based on issues raised during that meeting revised studies had been carried out by CEA considering 2000 MW of wind generator plants in and around Tuticorin area and also considering two scenarios with and without Ennore CCP (1000 MW). He further stated that there was scope of Southern region exporting 4000-5000 MW during surplus conditions by displacement to Western Region/Northern Region. However, for this strengthening of transmission system beyond Talcher up to Rourkela would be required. The strengthening works would physically be in Eastern Region but would be for the benefit of Southern Region. He listed out other items of the agenda viz Back up transmission system for Talcher Stage II, requirement of reactors in Southern Region to contain over voltages for which POWERGRID had carried out a study, APTRANSCO's proposal for 400 kV ring main around twin cities of Hyderabad and Secunderabad and Rangareddy Distt and TNEB's request for release of 230 kV bays at Tirunelveli 400 kV S/S and hoped that fruitful discussions would take place during the course of meeting and members would be able to arrive at a decisions. The agenda items were thereafter taken up for discussions.

2. Confirmation of minutes of 21st Standing Committee on Power System Planning in Southern Region held on 22nd September 2005 at Bangalore.

2.1 Chief Engineer (SP&PA) CEA stated that minutes of the 21st meeting held on 22nd September 2005 were circulated vide CEA letter No. 51/4/SP&PA/2001 dated 24.10.2005. Subsequently observations on the minutes were received from NPCIL vide their letter No. NPCIL/CE (ED-TAPS)/2005/M/131 dated 9th November, 2005. Based on he observations of NPCIL, corrigendum to the minutes was issued vide CEA letter No. 51/4/SP&PA/2001 dated 22.11.2005. The minutes of the meeting along with the corrigendum to the minutes was thereafter taken as confirmed.

3. Transmission system for evacuation of power from Tuticorin (2x500 MW) and North Chennai (2x500 MW).

3.1 Transmission System for Tuticorin TPS JV (2x500 MW)

3.1.1 DD (SP&PA) made a presentation of the studies carried out jointly by CEA and TNEB and stated that 2000 MW of wind power around Tuticorin, inputs for which were furnished by TNEB had been considered in the study. Because of uncertainty of Ennore CCP two transmission scenarios with and without Ennore had

been studied. For evolving evacuation system for Tuticorin TPS JV, a number of alternatives and cases were studied of which two main alternatives had been circulated in the agenda note. The first option was with 2 no 400 kV D/C lines with twin moose conductors from Tuticorin, one line to Madurai and another to Karaikudi. The second alternative had a single 400 kV D/C line with Quad Conductors from Tuticorin to Madurai. The studies indicated that alternative - 2 was a better option, as in alternative-1 power flowing towards Karaikudi was getting re-injected towards Madurai and off take at Karaikudi 400/220 kV ICT was also marginal.

3.1.2 CE (SP&PA) stated that basic evacuation system had been identified. Tamil Nadu had a 75% share in the project and balance 25% was meant for other beneficiaries which are yet to be identified. Additional transmission strengthening would be required and this would be firmed up after allocation of this 25% is finalized.

3.1.3 Member Secretary, (SRPC) confirmed that Tuticorin was a Joint Venture Project of Tamil Nadu & NLC and North Chennai TPS was a Joint Venture Project of Tamil Nadu and NTPC. He further informed that during the 130th SREB meeting the states had given their requirement. However, allocation of power had not yet been finalized.

3.1.4 NLC stated that two 400 kV DC lines should be provided to cover tower outage conditions. He also stated that inter-connection with existing Tuticorin TPS was suggested but there was no space for bays at existing Tuticorin.

3.1.5 Member (PS), CEA stated that providing two 400 kV D/C lines to cover tower outage as a evacuation planning criteria as a general rule was an expensive proposition. Such stipulation was there in the planning criteria only for power evacuation from nuclear station and in cyclone prone areas and not for every generating station. The tower design aspects took care of reliability and PGCIL had Emergency Restoration Systems (ERS) for restoration of lines within 48 hours in cases of tower failure. He stated that alternative-2 was satisfying the CEA planning criteria of single line contingency. Regarding inter-connectivity he stated that 2 circuits of 220 kV lines of TNEB presently emanating from Tuticorin TPS could be LILoed at Tuticorin TPS JV thus forming an interconnection.

3.1.6 Shri K. Rao, Director APTRANSCO stated that reliability and cost both have to be considered as all the beneficiaries had to share the transmission charges and endorsed the views expressed by CEA.

3.1.7 TNEB stated that they had already conveyed their concurrence to alternative 2 as proposed by CEA.

3.1.8 After discussions the following evacuation system was agreed for Tuticorin TPS JV (2x500 MW):

- i) Tuticorin JV TPS - Madurai 400 kV D/C Quad
- ii) 2x315 MVA 400/220 kV ICT at Tuticorin TPS JV.
- iii) LILO of 2 nos. of 220 kV circuits at Tuticorin TPS JV. *

***Note:**

- 1) With the above, there would be provision of 2 nos. of 400 kV line bays and 4 nos. 220 kV line bays at Tuticorin TPS JV switchyard.
- 2) Works for LILO of 220 kV line would be under the purview of TNEB.

3.1.9 It was also decided that after finalization of the beneficiaries for 25% of share is made additional transmission strengthening required would be firmed up.

3.2 Transmission system for North Chennai TPS (2x500 MW).

3.2.1 DD (CEA) made a presentation of the studies and stated that study cases for three alternatives were circulated with the agenda note. The first option was with one 400 kV D/C line from North Chennai to Alamathy with quad conductor, second option was two 400 kV D/C lines with twin moose conductors one D/C line to Alamathy and second D/C line to Melakotaiyur and the third option was LILO of both circuits of Alamathy-Sriperumbudur 400 kV D/C line at North Chennai JV and construction of Melakotaiyur-Alamathy 400 kV D/C line. He stated that third option which was recommended would provide reliable evacuation of power and also improve reliability and security of power supply to North Chennai where most of the loads were concentrated. He informed that TNEB had also conveyed their approval to this option.

3.2.2 Members enquired whether the transmission system being proposed took care of the evacuation from wind power plants coming up in TNEB. CE (SP&PA) clarified that wind power plants are within the state sector and TNEB need to augment their state transmission network, no fresh assets were being provided under regional schemes and only the margins available in regional network could be utilized by seeking short term open access. Under outage conditions when margins in the regional network would be much less or not available wind power plants may or may not get open access depending on the operating conditions. Also, when wind power generation would be substantial other generators of TNEB may need to back down. However, if TNEB or the wind power generation wanted to have firm transmission capacity, they would need to seek long term open access so that required additional transmission system could be built based on their commitment to pay long term transmission charges.

3.2.3 After discussions the following network as suggested by CEA was agreed:

1. LILO of Alamathy- Sriperumbudur 400 kV D/C line at North Chennai TPS JV
2. Melakotaiyur - Alamathy 400 kV D./C line with twin moose conductor.
3. 2x315 MVA 400/230 kV ICT at North Chennai TPS JV.
4. 4 no. 230 kV bays at switchyard of North Chennai TPS JV
5. 230 kV inter connection with existing North Chennai TPS (under scope of TNEB at their cost).

4. TNEB's request for release of 230 kV bays of the Tirunelveli-Trivandrum 400 kV (operated at 230 kV) for TNEB.

4.1 Chief Engineer (SP&PA) stated that during the last meeting TNEB's request for providing three nos. of 230 kV bays at Tirunelveli was discussed and accorded at their cost. TNEB had now requested to allot them in future two 230 kV bays at Tirunelveli S/S which would get vacated after energizing the Tirunelveli-Trivandrum 400 kV D/C lines presently operated at 230 kV to 400 kV. After discussions this was agreed and for the third bay, TNEB would need to pay the costs to PGCIL. TNEB also wanted to have one more bay and it was agreed that the fourth bay could also be provided at the cost of TNEB.

5. APTRANSCO's proposal for 400 kV ring main around twin cities of Hyderabad and Secunderabad and Rangareddy district.

5.1 Chief Engineer (SP&PA) stated that during the last meeting establishment of 400 kV S/S by APTRANSCO by LILO of one ckt. of Ramagundam -Ghanapur was agreed. APTRANSCO have now proposed 400 kV Malkaram sub-station by LILO of other ckt of Ramagundam-Ghanapur 400 kV line. He stated that they have also proposed a 400 kV ring main by inter connection of Gajwel-Yeddumailaram-Hyderabad.

5.2 Sh K. Rao, Director, APTRANSCO stated that load growth was taking place at a rapid pace around Hyderabad and number of industries, IT parks are SEZ zones would be coming in that area and this was the reason why APTRANSCO was going in for 400 kV ring main, He stated that all the works would be under the preview of APTRANSCO at their cost.

5.3 Member (PS), CEA opined that in principle there was no objection to creation of ring main by APTRANSCO but the system should be optimal. He stated that lengths of ring main lines as depicted in the proposal appeared to be very long. He also stated that 400 kV and 220 kV ring in parallel would increase the fault level and it needs to be studied where the system is to be kept open .

5.4 Shri K.Rao, Director, APTRANSCO stated that 400 kV Malkaram S/S by LILO of Ramagundam-Ghanapur was important for APTRANSCO and that could be agreed and the inter-connection could be reviewed by CEA.

5.5 POWERGRID representative stated that 400/220 kV ICT at Ghanapur was fully loaded. Member (PS) clarified that once the 400/220 kV substation at Malkaram was established and 220 kV inter connections reviewed the loadings should also come down.

5.6 After discussions establishment of 400/220 kV S/S at Malkaram by APTRANSCO by LILO of one circuit of the 400 kV Ramagundam-Ghanapur transmission line was agreed. It was also decided that comprehensive interconnection proposal of APTRANSCO would be forwarded to CEA for review.

6. Augmentation of transmission system for Talcher Stage II (4x500 MW) Power Evacuation and further system towards WR/NR.

6.1 CE (SP&PA) stated that the proposal for 400 kV D/C line from Bhuvaneshwar (Mendhasal) to Gazuwaka via Berhampur required for reliability of transmission system for Talcher-II where adequate system to meet the outage of one pole of Talcher-Kolar HVDC line was not provided in the first instance. He informed that the proposal of 50:50 transmission charges sharing between Southern Region and Eastern Region together with Southern Region seeking long term open access for 500 MW through Eastern Region was taken up with Eastern Region constituents in meeting held on 22.6.2006. However, Eastern Region constituents had sought some more time to that proposal. He informed that in case Orissa was not keen for sub-station at Berhampur then a switching station could be built. He further stated that in case Eastern Region constituents did not agree to proposal of 50:50 sharing, the line could still be built with 100% charges by Southern Region and SR seeking short term open access for wheeling through Eastern Region system for which transmission charges at present are 25% of long term open access.

6.2 To a query from Members whether adequate margins was available between Talcher to Mendhasal (Bhuvaneshwar) and whether there would be constraints in getting short- term open access. CE (SP&PA) clarified that there was adequate margins for additional 500 MW from Talcher to Bhuvaneshwar and it seemed that for the next eight-ten year generally there would not be any constraints. He informed that as per regulations if margins were available in transmission network, open access could not be denied. He opined that both the proposals were equally viable for SR as in the 1st proposal transmission charges have to be shared 50:50 by SR and long term open access charges paid by Southern Region to Eastern Region. In the second proposal 100% transmission charges for the line have to be borne by SR along with the short - term open access charges which at present are 25% of long-term open access.

6.3 After discussions members were agreeable to both the proposals depending upon the response of ER constituents. The following was decided:

(i) In case Eastern Region constituents agreed to share transmission charges the 400 kV D/C Bhuvaneshwar-Berhampur-Gazuwaka would be built with 50:50 sharing of transmission charges along with 400 kV sub-station/switching station at Behrampur and Southern Region constituents would seek long- term open access for 500 MW of power from ER.

(ii) If Eastern Region constituents do not agree for sharing transmission charges the 400 kV D/C Bhuvaneshwar- Berhampur-Gazuwaka line along with switching station at Behrampur would be built fully by Southern Region and SR constituents would seek short term open access for transfer of 500 MW of power from ER.

(iii) The scheme for augmentation of Talcher II transmission system would include cost of switching station at Behrampura. If Orissa would consent to have substation at Behrampur, the same could be provided subject to Orissa paying the cost difference.

7. Strengthening of transmission system from Talcher towards Rourkela/Raigarh for export of SR surplus.

7.1 CE (SP&PA) stated that under surplus conditions in Southern region, power of the order of 2000-3000 MW could be exported from SR to NR/WR through displacement by limiting the drawl on Talcher-Kolar HVDC line and Gazuwaka HVDC back to back and diverting the same towards Rourkela and other grid S/S of Eastern Region. However, for this transmission system beyond Talcher up to Rourkela would need to be augmented. He suggested a 400 kV D/C line from Talcher to Rourkela. The line would be physically in ER but would be for the benefit of Southern region constituents hence the charges would have to be borne fully by Southern Region. He further informed that beyond Rourkela a 400 kV D/C Rourkela-Raigarh-Raipur line was existing and another D/C was under implementation. Also a 400 kV Rourkela-Ranchi- Sipat was under implementation as part of Kahlgaon –II transmission system. Transmission system between ER and NR was also being augmented to provide adequate capacities. As such, SR could seek open access to export by displacement through ER system.

7.2 To a query from members whether reverse flow was possible on Talcher-Kolar HVDC, POWERGRID confirmed that HVDC Talcher-Kolar was designed for power flow in both directions.

7.3 Shri Keshav Rao Director APTRANSCO was of the view that the augmentation was in the interest of Southern Region and SR constituents could not depend on GRIDCO line for evacuating and selling their surplus. He opined that Talcher-Rourkela 400 kV quad line would be a better option from long term perspective.

7.4 Member (PS) concurred with APTRANSCO for quad line and stated that capacity of 400 kV quad line was double that of normal twin moose line whereas the cost was only about 1.5 times the cost of normal twin moose conductor line. He also stated that with series compensation, more power could be routed via the quad line. The series compensation could be provided at a later date depending on need of SR exports.

7.5 After discussions all the members agreed to a Talcher-Rourkela 400 kV D/C line with quad conductor and it was decided that POWERGRID would go ahead with the preparation of DPR and approval.

8. Requirement of Reactors to contain over voltages in the Southern region.

8.1 PGCIL made a presentation of the studies carried out by them for determining the requirement of reactors in Southern Region. He informed that against installed capacity of the order of 37000 MW the off peak demand of SR was of the order of 11000-12000 MW and these conditions had been considered for determining the requirement of reactors in the Southern Grid. As per the study 25 nos of reactors (20 bus reactors + 5 line reactors) of 63 MVAR each were required to be provided in SR grid in addition to the existing 64 nos. of reactors (8 bus reactors and 56 line reactors). Out of these 11 nos. of reactors (7 bus reactors +4 line reactors) were required at the substation of PGCIL for which they wanted to have approval for

taking up as regional system strengthening scheme. The remaining 14 reactors (13 bus reactors + 1 line reactor) were required at generation switchyard of NTPC (1 bus reactor), NPCIL (1 bus reactor), NLC (2 bus reactors), substation of KPTCL (5 bus reactors) and APTRANSCO (4 bus reactors + 1 line reactor). The list of reactors required as per PGCIL study is as under:

Bus Reactors

S.no	Bus Name
POWERGRID	
1	Hosur
2.	Kolar
3.	Hiriyur
4.	Salem
5.	Munirabad
6.	Hyderabad (PG)
7.	Sriperumbudur
NTPC	
8.	Ramagundam
NPCIL	
9.	Kaiga
NLC	
10.	Neyveli-Expn.

S.no	Bus Name
11.	Neyveli TS-II
KPTCL	
12.	Raichur TPS
13.	Talaguppa
14.	Davanagere
15.	Neelamangala
16	Hoody
APTRANSCO	
17.	Simhadri
18.	Srisailam LBPH
19.	Kurnool
20.	Vizag

Line Reactors

S.no	Bus Name
POWERGRID	
1.	Trichy
2	Madurai
3	Udumalpet
4	Trivandrum
APTRANSCO	
5.	Hyderabad (AP)

8.2 Member (PS) CEA stated that installation of reactors took a period of about 18-24 months after start of implementation and hence conditions of 2008 need to be considered. PGCIL should carry out a study for 2008 conditions to ensure that the configuration arrived at by PGCIL would meet the 2008 conditions and the reactor proposed under the scheme did not become redundant in the study of 2008 conditions.

8.3 PGCIL stated that requirement of reactors could change with additions in the grid network and when required necessary shifting of reactors may have to be done. Also bus reactors could be used as line reactors.

8.4 CE (SP&PA) stated that POWERGRID should find out the feasibility of installation of reactors at various places as suggested by them before firming up. He also stated that for implementation of complete scheme including reactors at PGCIL stations as well as other utilities could be taken up by PGCIL as one scheme. The issue of modalities of maintenance of reactors installed at switchyard/substations of

other utilities was also discussed and it was suggested that modalities in this respect could be worked out.

8.5 After discussions it was agreed that installation of 25 nos of reactors (20 bus reactors + 5 line reactors) would be taken up as a regional system strengthening scheme but before firming up, PGCIL would confirm that:

- the proposed installation would be feasible at each of the identified location. If there was any constraint, the scheme would be appropriately revised.
- the reactor procured under the scheme did not become redundant in the study of long term conditions.

9. Conclusions

9.1 Summarizing the discussions Member (PS) stated that

- a) The minutes of the 21st meeting along with the corrigendum to the minutes confirmed.
- b) The following evacuation system for Tuticorin TPS JV (2x500 MW) had been agreed:
 - i) Tuticorin JV TPS - Madurai 400 kV D/C Quad
 - ii) 2x315 MVA 400/220 kV ICT at Tuticorin TPS JV.
 - iii) LILO of 2 nos. of 220 kV circuits at Tuticorin TPS JV. (under scope of TNEB at their cost)
- c) The following evacuation network for North Chennai TPS JV had been agreed:
 - i) LILO of Alamathy- Sriperumbudur 400 kV D/C line at North Chennai TPS JV
 - ii) Melakotaiyur - Alamathy 400 kV D./C line with twin moose conductor.
 - iii) 2x315 MVA 400/230 kV ICT at North Chennai TPS JV.
 - iv) 4 no. 230 kV bays at switchyard of North Chennai TPS JV
 - v) 230 kV inter connection with existing North Chennai TPS (under scope of TNEB at their cost).
- d) TNEBs request for release of third 230 kV bay at Tirunelveli agreed at their cost It was also agreed that fourth 230 kV bay could also be provided at their cost.
- e) Establishment of 400/220 kV S/S at Malkaram by APTRANSCO by LILO of one circuit of the 400 kV Ramagundam-Ghanpur transmission line was agreed. It was also decided that comprehensive interconnection proposal of APTRANSCO would be forwarded to CEA for review.
- f) For augmentation of transmission system for Talcher Stage-II the 400 kV D/C Bhuvanewar-Behrampur-Gazuwaka line was agreed and it was decided that:
 - (i) In case Eastern Region constituents agreed to share transmission charges the 400 kV D/C Bhuvanewar-Behrampur-Gazuwaka would be built with 50:50 sharing of

transmission charges along with 400 kV sub-station/switching station at Behrampur and Southern Region constituents would seek long- term open access for 500 MW of power from ER.

- (ii) If Eastern Region constituents do not agree for sharing transmission charges the 400 kV D/C Bhuvanewar-Behrampur-Gazuwaka line along with switching station at Behrampur would be built fully by Southern Region and SR constituents would seek short term open access for transfer of 500 MW of power from ER.
 - (iii) The scheme for augmentation of Talcher II transmission system would include cost of switching station at Behrampur. If Orissa consented to have substation at Behrampur, the same could be provided subject to Orissa paying the cost difference.
- g) Regarding strengthening of transmission system beyond Talcher for export of SR surplus Talcher-Rourkela 400 kV D/C line with quad conductor was agreed and it was decided that POWERGRID would go ahead with the preparation of DPR and approval.
- h) Installation of 25 nos of reactors (20 bus reactors + 5 line reactors) would be taken up as a regional system strengthening scheme but before firming up, PGCIL would confirm that:
- the proposed installation would be feasible at each of the identified location. If there was any constraint, the scheme would be appropriately revised.
 - the reactor procured under the scheme did not become redundant in the study of long term conditions.

The meeting ended with a vote of thanks to the Chair.

Annex

List of participants during the 22nd meeting of Standing Committee on Power System Planning held on 17th August 2006 at SRPC, Bangalore

Organisation Name

S.no		<u>Designation</u>
	<u>CEA</u>	
1.	V. Ramakrishna	Member (PS)
2.	A.K. Asthana	Chief Engineer(SP&PA)
3.	P.K. Pahwa	Director (SP&PA)
4.	Pradeep Jindal	Dy. Director (SP&PA)
5.	<u>SRPC</u>	
	K. Srinivasa Rao	Member Secretary
	<u>POWERGRID</u>	
6.	Subir Sen	CDE (Engg.)
7.	Dilip Rozekar	CDE (Engg.)
8.	V.K. Agarwal	G.M, SRLDC
9.	P.R. Raghuram	AGM, SRLDC
10.	Sachidanand Singh	GM, SRTS-II
11.	Gururaja Rao	DGM/Engg, SR-II
12.	M.R.V. Holla	DGM/OS, SR-II
	<u>APTRANSCO</u>	
13.	G. Keshava Rao	Director (Tr.&GO)
	<u>TNEB</u>	
14.	N. Pattabiraman	CE/Planning
15.	C. Vijaykumar	SE/System Studies
16.	S. Balaguru	EE/System Studies
	<u>KSEB</u>	
17.	K.P. Kunhi Marakar	CE (System Operation)
	<u>KPTCL</u>	
18.	K.G. Ramesh	SEE Planning
19.	M.S. Prabhakar	EEE (PSS)
	<u>Pondicherry</u>	
20.	Ramnath Ashok	Executive Engineer Elect. Department
	<u>NPCIL</u>	
21.	Sandeep Sarwate	SO/E (Trans)
	<u>Neyveli Lignite Corp.</u>	
22.	V. Sethuraman	Director/Power
23.	S. Mothu	D.G.M.