

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

No. 51/4/SP&PA-2010/ 1295-1305

Date: 10 December 2010

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 : 95124-2571932 |
| 3.The Director (Transmission), Transmission Corp. of Andhra Pradesh Ltd., Vidyut Soudha, Hyderabad – 500 082. FAX : 040-66665137 | 4.The Director (Transmission), Karnataka State Power Transmission 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 : 0471-2444738 | 6. Member (Distribution), Tamil Nadu electricity Board (TNEB), 6 th Floor, Eastern Wing, 800 Anna Salai, Chennai – 600002. FAX : 044-28516362 |
| 7.The Director (Power), Corporate Office, Block – I, Neyveli Lignite Corp. Ltd., Neyveli , Tamil Nadu – 607 801. FAX : 04142-252650 | 8.The Superintending Engineer –I, First Floor, Electricity Department, Gingy Salai, Puducherry – 605 001. FAX : 0413-2334277/2331556 |
| 9. Director (Projects), National Thermal Power Corp. Ltd. (NTPC), NTPC Bhawan, Core-7, Scope Complex, Lodhi Road, New Delhi-110003. FAX-011-24360912 | 10. Director (Operations), NPCIL, 12 th Floor, Vikram Sarabhai Bhawan, Anushakti Nagar, Mumbai – 400 094. FAX : 022- 25991258 |

Sub: 31st meeting of the Standing Committee on Power System Planning of Southern Region-
Minutes of the meeting.

Sir,

Minutes of 31st meeting of the Standing Committee on Power System Planning of Southern Region (SCPSPSR) **held on 16th November 2010 at Northern Region Power Committee, Katwaria Sarai, New Delhi are enclosed.** The minutes are also available at CEA’s website www.cea.nic.in.

Yours faithfully,

Pardeep Jindal)
Director (SP&PA)
(Telephone: 011 26198092,
Fax No. 011 6102045)

Minutes of 31st Meeting of the

Standing Committee on Power System Planning of Southern Region (SCPSPSR)

Held on November 16,2010 at Northern Region Power Committee, Katwaria Sarai, New Delhi.

1.0 List of participants is given at Annex-VIII.

- 2.1 Member (Power Systems) welcomed the participants and observed that the agenda for today's meeting included number of critical issues including transmission system for Gas based IPP projects in Vemagiri area having short gestation period. Therefore, it was important that decisions should be arrived at the earliest to avoid any mismatches between generation and transmission. In this regard, he suggested that if required small study group might be constituted for in-depth study to expeditiously arrive at such decisions.
- 2.2 Chief Engineer, CEA while welcoming the participants stated that a large number of applications were being made for connectivity without matching applications for Long-term Access (LTA). He observed that as per the present regulations on LTA/Connectivity the grid strengthening could be taken only for the LTA requests, effectively meaning that the Connectivity applicants would be leaning entirely on the existing/planned transmission system meant for the Long-term beneficiaries. He said that the present grid did not have any capacity left to accommodate such large number of Connectivity requests. Therefore, it was necessary that the Connectivity might be given to only those applicants who were applying for the LTA also and suggested the Connectivity applicants to apply for LTA as early as possible. He further stated that the applicants granted Connectivity/LTA must sign BPTA and submit requisite Bank Guarantee in line with the CERC regulations, 2009. Chief Engineer (CEA) asked Director (SP & PA), CEA to proceed with the Agenda for the meeting.

3.0 Confirmation of the minutes of 30th meeting of the Standing Committee:

- 3.1 Director, CEA stated that the minutes of 30th meeting of the Standing Committee on Power System Planning of Southern Region, held on 13th April 2010 at Gurgaon, were issued vide CEA's letter number 51/4/SP&PA-2010/ 442-451 dated May 05,2010 and that there were no comments/observations on the circulated minutes.
- 3.2 The minutes as circulated were confirmed by the Standing Committee.

4.0 Review of Inter-regional Scheme - Narendra – Kolhapur 400kV D/c line with 1000 MW HVDC back-to-back at Kolhapur:

- 4.1 Director (SP&PA), CEA said that the Narendra-Kolhapur 400kV D/C line between SR and WR alongwith a 2x500 MW HVDC back-to-back modules at Kolhapur as asynchronous link between SR-WR was planned in 2007 to export surplus power from SR to WR/NR. This link was planned under scheme for augmentation of SR-WR inter-regional capacity and was targeted to come during 2010-11 as it was anticipated that by 2011, SR would have surplus exportable power. In order to reduce cost and time of commissioning of the asynchronous link, it was proposed that one unit of HVDC back-to-back at Sasaram would be shifted to Kolhapur. However, the anticipated generation additions in SR have got delayed and this asynchronous

link could not be implemented. As the SR is now planned to be synchronously connected with rest of All-India grid through Raichur-Sholapur 765kV 2xS/C lines matching with commissioning of Krishnapattanam UMPP by 2013-14, there was a need to review the Narendra-Kolhapur asynchronous link. He requested POWERGRID to make presentation on the issues involved in review of this SR-WR asynchronous link.

- 4.2 ED, POWERGRID made presentation (copy of the presentation is given at Annex-II) and informed that at the time of planning of this asynchronous SR-WR link, a large number of generation projects had sought Long term open access indicating their commissioning by 2011 and SR was expected to have operational surplus by 2011. As the synchronous interconnection of SR-WR associated with Krishnapattanam UMPP was planned for 2013-14 matching with commissioning of the Krishnapattanam UMPP project, an asynchronous link in the form of Narendra-Kolhapur 400kV D/C line with a HVDC back-to-back of 1000 MW between SR and WR grids at Kolhapur was planned for implementation by 2011. A number of the anticipated generation capacity (details in Annex-II) got delayed and the link could not be taken up for implementation. Also, with the high decommissioning and reinstallation cost of the 500 MW back-to-back module from Sasaram to Kolhapur, the cost benefit of using existing module may not be available. He said that as per estimates, un-recovered cost of Sasaram HVDC is about Rs 200 Cr, capitalization of tariff during implementation about Rs 50 Cr and cost for decommissioning at Sasaram, transportation and re-commissioning at Kolhapur would be about Rs 180Cr. Thus, total cost would be about 430 Cr, which was close to cost of new module.

Additionally, to cater to the evacuation requirement of number of coastal based IPPs proposing generation projects in Nagapattinam/Cuddalore area apart from Raichur - Sholapur 765kV, one more 765kV corridor viz. Madhugiri - Basawan Bagewadi – Sholapur 765kV was planned. To optimize total number of corridors from SR to WR, it was proposed that in place of two corridors viz. 1000 MW HVDC back-to-back alongwith Narendra - Kolhapur 400 kV D/c line and Madhugiri - Basawan Bagewadi – Sholapur 765kV, one transmission corridor viz. Madhugiri – Narendra – Kolhapur – Padghe 765 kV D/c line, one circuit of Kolhapur – Padghe 765 kV D/c line to be LILLOed at Pune might be planned.

Studies with this new configuration, given with LTA agenda studies were discussed by the members.

- 4.3 CEO, POSCO stated that large renewable generation potential was coming up in SR and it was important that SR and NEW grid were synchronised urgently through strong multiple links. As large quantum of generation was planned in Southern Tamilnadu, it would be prudent to consider long HVDC bipole links from SR to WR/NR. He also opined that the recent exercise on transmission pricing i.e. Point of Connection (PoC) charges, gave revealing insights for requirement of transmission addition and the same could be put to good use by planners to identify areas that need augmentation.

4.4 After discussions, following were agreed:

- 4.4.1 The proposal of HVDC back-to-back modules of 2x500 MW on Narendra- Kolhapur link may be dropped.**

- 4.4.2 Madhugiri – Narendra – Kolhapur – Padghe (one circuit via Pune) 765kV D/C line may be planned in place of the proposal for Madhugiri - Basawan Bagewadi – Sholapur 765 kV D/C lines for additional generation projects in Cuddalore/Nagpattnam/Tuticorin area.**
- 4.4.3 The Narendra – Kolhapur 765kV D/C line initially charged at 400 kV may be taken up separately as additional SR-WR synchronous link matching with the commissioning of Raichur – Sholapur 765 kV 2xS/C lines. This Narendra-Kolhapur 765kV D/C line operated at 400kV would be in place of the Narendra-Kolhapur asynchronous link and thus would be implemented as system strengthening scheme for SR/WR regions.**
- 4.4.4 Following works would be included in this system strengthening scheme:**
- (a) New 400kV substation each at Narendra (GIS) and Kolhapur (to be later upgraded to 765kV)**
 - (b) Narendra (GIS) – Kolhapur (new) 765kV D/C line (initially charged at 400 kV)**
 - (c) LILO of both circuits of Kolhapur – Mapusa 400 kV D/C line at Kolhapur (new)**
 - (d) Narendra (GIS) - Narendra (existing) 400 kV D/C Quad line.**
- 4.4.5 765kV operation of the above Narendra-Kolhapur line and upgradation of Narendra and Kolhapur S/Ss to 765kV level would be part of the evacuation system for generation projects in Southern Region.**

5.0 Transmission System for Evacuation of Power from Yermarus TPS (2x800 MW) and Edlapur TPS (1x800 MW) of KPCL :

5.1 Director, CEA said that a transmission system for Yermarus TPS (2x800 MW) and Edlapur TPS (1x800 MW) of KPCL was agreed in the 28th meeting of the Standing Committee on power system planning in Southern Region held on 15th June, 2009. Subsequently, due to high short circuit levels in Raichur and adjoining buses, CEA suggested KPTCL to review transmission system for these two projects. It was suggested that instead of connecting Edlapur TPS to the existing Raichur TPS switchyard, it might be connected to Yermarus TPS switchyard at 400 kV through a 400 kV D/C line. The power from Yermarus and the Edlapur TPS could be transmitted through Yermarus – Basavana Bagewadi 400kV quad D/C line, and Yermarus - Raichur New 765 kV S/C line. This would also reduce the fault levels at 400 kV Sub-stations at Raichur TPS, Yermarus TPS and Raichur New. This alternative required a 765kV S/S at Yermarus. To avoid a 765kV S/S at Yermarus and to optimize transmission requirement for Yermarus and Edlapur TPS's revised studies were carried out in CEA in June 2010 jointly with engineers from KPTCL and PGCIL. The following transmission system was found to be the most suitable considering the fault level and the flows in the grid (details given in the study report attached with Agenda Note)

- (1) Edlapur TPS - Yermarus TPS S/S 400 kV D/C line.
- (2) Yermarus TPS – Raichur New (PGCIL) 400 kV Quad D/C line.
- (3) The planned LILO of RTPS-Gooty at Raichur New would be bypassed through a bypass arrangement so as to retain RTPS-Gooty direct connection.
- (4) Basavana Bagewadi 400/220 kV 2x500 MVA Substation.
- (5) Yermarus – Basavana Bagewadi 400 kV Quad D/C line.
- (6) Basavana Bagewadi – Narendra (PGCIL) 400kV D/C line.

He requested the members to discuss the study report and agree for above transmission system, which had been evolved through joint studies with KPTCL and POWERGRID.

- 5.2 Director(Transmission), KPTCL stated that a new Generation project at Kudgi near Basavana Bagewadi had been planned and was being undertaken by NTPC. Karnataka had also signed PPA with NTPC. AGM, NTPC confirmed that NTPC was planning to setup Kudgi power project in two stages, 3x800 MW in Stage-I to be commissioned in 2015-16 and 2x800 MW in Stage-II to be commissioned in 2016-17. Though complete allocation of the power from Kudgi project was yet to be decided, about 50% of power could be allotted to Karnataka.
- 5.3 Chief Engineer, CEA asked NTPC to confirm the share of power from Kudgi and asked them to apply for Long Term Access to POWERGRID, so that a comprehensive transmission system could be evolved. NTPC agreed to apply for LTA as soon as possible.
- 5.4 Director, KPTCL informed that the Yeramarus project was scheduled to be commissioned in 2014-15 and Edlapur in 2015-16. He said that the transmission system, evolved through joint studies and as proposed in the Agenda, should be re-evolved in view of Kudgi project.
- 5.5 **As requested by Director, KPTCL, it was decided that the transmission system for evacuation of power from Yeramarus TPS and Edlapur TPS generation projects of KPCL would be re-reviewed through joint studies by CEA, POWERGRID and KPTCL. These studies would be carried out during the 1st week of December 2010 at PGCIL head office, Gurgaon.**
- 6.0 **Transmission System for evacuation of power from Rayalseema TPP Stage IV (1x600 MW) of APGENCO:**
- 6.1 Director (SP&PA), CEA stated that for evacuation of power from RTPP-St IV (1x600 MW) power plant of APGENCO, APTRANSCO had proposed to construct a 400kV D/C twin moose line connecting the generation switchyard with Gooty substation of PGCIL. He said that 4x220 MW are in operation at Rayalseema(Muddanur) TPP, and power is evacuated through 220kV lines, the fifth unit of 220 MW which is under-construction would also be evacuated through existing 220kV lines.
- 6.2 GM, SRLDC informed that the evacuation of 4x210 MW itself was a challenge at 220kV and the fifth unit would also be added without much strengthening in 220kV. The 6th unit of 600 MW is being evacuated to Gooty Station and would increase the flows towards Bangalore. He suggested that for evacuation of power from Muddanur/ Rayalseema a 400kV line to Hindupur, as this link would be short and would reach the load centre in addition to a 400 kV S/C line to Gooty could be considered.
- 6.3 Chief Engineer, CEA stated that injection at Gooty could be overloading other grid lines of Southern region, so APTRANSCO may consider planning self-sufficient intra-state transmission system upto its load centers for evacuation of power from a State generating station. He said that this system could be additionally interconnected with ISTS network for improving reliability of the State's grid.

6.4 The Committee agreed that a joint study with CEA, CTU, POSOCO and APTRANSCO would be taken up during 1st week of December 2010 at POWERGRID head office, Gurgaon to plan suitable transmission system.

7.0 LILO of Ramagundam-Chandrapur 400kV D/C line at Nirmal by APTRANSCO:

7.1 Director, CEA said that APTRANSCO have proposed to make LILO of one circuit of Ramagundam-Chandrapur 400kV D/C line at Nirmal(Adilabad district) to meet the growing load demand in that area. He asked APTRANSCO to inform estimated load demand at Nirmal and transformer capacity proposed by APTRANSCO at the 400/220kV S/S at Nirmal.

7.2 DGM, POWERGRID stated that Ramagundam–Chandrapur D/C line being an inter- regional line, LILO of this line at Nirmal would adversely affect import/export capacity between SR and WR.

7.3 GM, SRLDC said that the LILO of one circuit of the Inter Regional link may restrict the Inter Regional ATC depending upon the drawal at Nirmal and suggested that the existing Dichipalli line could be LILOed or a new line from BPL could be thought of.

7.4 After discussion it was decided that an alternate feed to proposed Nirmal 400kV S/S of APTRANSCO would also be planned alongwith other studies to be jointly carried out during 1st week of December 2010 at PGCIL head office, Gurgaon.

8.0 Transmission schemes proposed by KSEB:

8.1 Director, CEA said that KSEB had proposed to make LILO of existing Kayamkulam – Pallom 220kV D/C line of POWERGRID, which was part of the evacuation system for Kayamkulam CCPP (RGCCPP), at Punnapra 220kV S/S. This LILO work and the Substation would be built by KSEB. KSEB was upgrading their 110kV Substation to Punnapra to 220kV.

8.2 The issue was discussed and members agreed the above proposal.

9.0 Review of Transmission system for the NLC-TNEB JV project at Tuticorin (NTPL) (2x500 MW):

9.1 Director, CEA said that for evacuation of power from ISGS NLC-TNEB JV project at Tuticorin namely NTPL of 2x500 MW capacity, following transmission system was agreed in the 22nd meeting of Standing Committee on Power System Planning in Southern Region held on 17-8-2006 at Bangalore:

- Tuticorin JV TPS-Chekkannurani(Madurai) 400kV D/C quad line.
- 2x315MVA,400/230kV ICT at Tuticorin TPS JV.
- LILO of two Nos. 230kV circuits at Tuticorin TPS JV.

The 2x315 MVA transformers were planned to serve the purpose of absorbing power by TNEB at 230kV level and also for supplying start-up power for the JV project.

9.2 Director, TANTRANSCO(TNEB) said that due to upcoming generation projects in Tuticorin area, they could meet their local loads without the 2x315 MVA transformers. Even if the

transformers were provided there would be very less flow on them. There was right of way problem also for the LILO of 230kV lines at the JV project. In view of this the ATS for the JV project should be revised by removing the 2x315 MVA transformers from its scope. He also said that if NLC have already ordered the transformers, TNEB would utilize them at some of their planned substations.

9.3 GM, NLC said that as they have already placed orders for supply and erection of switchyard equipments, station transformers and power transformers, which are under various stages of manufacturing, the original scope of the transmission system should be maintained.

9.4 **After discussions it was decided that the TNEB would make LILO of only one 230kV line at the JV project switchyard and one 315 MVA transformer was sufficient at the generation switchyard. As NLC had already ordered both the transformers, NLC would install 2x315 MVA transformers as per the already agreed scheme; however, NLC would shift the second transformer, to their other project at a later date, in consultation with the Standing Committee. Accordingly, the revised ATS for Tuticorin TPS JV (NTPL) of 2x500 MW would be:**

- **Tuticorin JV TPS-Chekkannurani(Madurai) 400kV D/C quad line.**
- **2x315MVA,400/230kV ICT at Tuticorin TPS JV (second transformer to be shifted from Tuticorin JV at a later date).**
- **LILO of one 230kV circuit at Tuticorin TPS JV.**

10.0 **Transmission scheme proposed by TNEB – Setting up of Karamdai 400/230kV Substation by TNEB:**

10.1 Director, CEA, said that TNEB had proposed to LILO one circuit of their Arasur – Mettur TPS-III 400kV D/C line and set-up a 400kV S/S at Karamdai with 2x315 MVA 400/230kV transformers. Director, TNEB said that they would like to LILO both the circuits at Karamdai and put 3x315 MVA transformers to meet the load demand in the area.

10.2 **The proposal was discussed and agreed by the committee.**

11.0 **Transmission scheme proposed by TNEB – For evacuation of power from new wind projects in Udumalpet, Theni and Tirunelveli areas of Tamil Nadu:**

11.1 Director, CEA stated that new wind projects of 3900MW capacity were planned to be added in Udumalpet, Theni and Tirunelveli areas of Tamil Nadu. TNEB have proposed to evacuate power from these wind projects by setting-up 400kV S/Ss at Anikadvu/Periapatty (in Udumalpet area), Thappugundu (in Theni area) and Kazhugumalai (in Tirunelveli area).

11.2 Chief Engineer, CEA said that huge wind generation capacity addition, in Tamil Nadu or any other State for that matter, should be factored in transmission planning so that wind generation does not have to back down when local demand is not sufficient. The requisite inter-State transmission system should be put in place for absorbing surplus wind generation in the rest of the country. The requisite system strengthening for this purpose should be done as a matter of transmission planning philosophy without requiring any application for LTA. The intra- State

transmission system up to the ISTS points near boundary of the State or up to ISTS pooling point directly feeding to 765kV /HVDC trunk transmission system should be developed by STU.

- 11.3 It was decided that a suitable transmission system would be planned through **joint study to be taken up during 1st week of December 2010 at POWERGRID head office, Gurgaon.**

12.0 Status of Under Construction / Approved Schemes:

12.1 Status of transmission schemes submitted by POWERGRID is given at Annex-III.

12.2 Status of transmission schemes submitted by KSEB is given at Annex-IV.

12.2 Status of transmission schemes submitted by TNEB is given at Annex-V.

12.2 Status of transmission schemes submitted by APTRANSCO is given at Annex-VI.

12.2 Status of transmission schemes submitted by KPTCL is given at Annex-VII.

13.0 System Strengthening Schemes

13.1 GM, SRLDC said that at present the congestion between the S1 and S2 areas were due to limited capacity, low voltages at Chennai area and large quantum of purchase by Tamilnadu from the Power Exchange. As this had become a regular phenomenon especially during Jan-May period, it was necessary to strengthen the S1-S2 corridor for the future to factor in any Load-Generation imbalances. As was discussed in the last SCC and additional 400 kV D/C link from Salem to Hosur in addition to the planned 400 kV D/C Quad link between Salem and Bangalore could be thought of. He also informed that the Gazuwaka HVDC link was used in export mode only to relieve congestion (with import ATC to SR as NIL) and the situation would worsen with upstream generators like Simhadri and GMR-2 coming up and the situation might demand a decrease in ATC of WR-SR as well. He said that the flow on the 400kV Vijayawada-Nellore was also high in the 2013-14 base case itself and suggested that an additional link could be thought of. He also informed that the flow on 400 kV Khammam – Nagarjuna Sagar was in the order of 860 MW in the 2013-14 base case and this link may also need to be strengthened.

He further said that certain schemes which were approved earlier like – (a) LILO of N'Sagar-Gooty at Kurnool, and (b) migrating Gooty –Hoody to Nelamangala should be taken up quickly as these would help relieve high loading on the 400 kV Kurnool-Gooty and help relieve the flow on existing 400 kV Gooty-Nelamangala line.

- 13.2 The Committee decided that a joint study with CEA, CTU, POSOCO, APTRANSCO, KPTCL, TNEB and KSEB should be taken up during 1st week of December 2010 to find solution to address the above constraints within the SR grid.

14.0 Numbers of 220kV bays with 400/220kV transformers under ISTS:

14.1 DGM, POWERGRID said that a norm for providing 220kV bays with new 400/220kV transformers should be made for bringing clarity in the scope of substation. Director, CEA informed that a similar norm had been decided by Northern Region Standing Committee in their 23rd meeting held on 16-02-2008, and the same could be adopted by Southern Region.

14.2 The issue was discussed and following norm was decided for providing 220kV bays with new substations:

- for 2x315 MVA transformers - 6 nos. of line bays
- for 3rd / 4th 315 MVA transformer - 2 line bays per transformer
- for 500 MVA transformer - 4 line bays per transformer

15.0 Discussions on the connectivity and LTA applications for Projects in Southern Region:

Minutes of the LTOA discussions issued by POWERGRID vide their letter no. C\ENG\SEF\S\00\LTOA dated 01-12-2010 are given at **Annex-I**.

Minutes for 11th Meeting of Southern Region constituents regarding Long Term Access and Connectivity Applications of Southern Region held on 16 November, 2010 at NRPC, Katwaria Sarai, New Delhi.

1. List of Participants is enclosed at **Annexure-I**.
2. Member (Power Systems) welcomed the participants and observed that the agenda for today's meeting includes number of critical issues including transmission system for Gas based IPP projects in Vemagiri area having short gestation period. Therefore, it is important that decisions should be arrived at the earliest to avoid any mismatches between generation and transmission. In this regard, he suggested that if required small study groups may be constituted for in-depth study to arrive at such decisions.
3. Chief Engineer, CEA while welcoming the participants stated that it has been observed a number of applications are being made for connectivity without matching applications for Long-term Access (LTA). He observed that as per the present regulations on LTA/Connectivity the grid strengthening can be taken only for the LTA requests, effectively meaning that the Connectivity applicants shall be leaning entirely on the existing/planned transmission system meant for the Long-term beneficiaries. He said that the present grid does not have any capacity left to accommodate such large number of Connectivity requests. Therefore, it is necessary that the Connectivity may be given to only those applicants who are applying for the LTA also and suggest the Connectivity applicants to apply for LTA as early as possible.

He further stated that the applicants granted Connectivity/LTA must sign BPTA and submit requisite Bank Guarantee in line with the CERC regulations, 2009. Further with regard to the signing of BPTA and submission of Bank guarantee by the applicants granted LTA, Chief Engineer, CEA has mentioned that the LTA applicants may note that the date of commencement of LTA is sacrosanct and the transmission charges will be levied from that date.

4. ED, POWERGRID welcomed applicants of Connectivity/LTA for the meeting. He stated that large number of applications for LTA has been received in the Vemagiri area for substantial gas based capacity addition having very less gestation period. He noted that the grid in the vicinity does not have any capacity left to accommodate such capacity addition therefore it is challenging task to construct transmission system required for the gas based projects in such a less time frame. He cautioned that there shall some period of time when there would be severe transmission constraints for these new generation capacity. He then requested DGM (SEF) POWERGRID to take up agenda. It was informed that the applications for the connectivity/LTA are primarily pertaining to Vemagiri, Nagapattinam/Cuddalore, Krishnapatnam area. Further there are few cases at some other areas of SR also. The applications for connectivity/LTA were taken up area wise as covered in the agenda circulated earlier.
5. **Connectivity/LTA of generation developers in Vemagiri area, AP** – The transmission proposed for the Vemagiri area, AP was presented to the Standing Committee members and applicants. It was informed that following applicants had applied for Connectivity/LTA in Vemagiri area :

Connectivity Applications

| Sl. No. | Applicant | Connectivity applied for (MW) | Connectivity required from |
|---------|------------------------------------|-------------------------------|--------------------------------------|
| 1. | Spectrum Power Generation Ltd. | 1400 | December, 2012 |
| 2. | Reliance Infrastructure Limited | 2400 | September, 2012 / September, 2013 |
| 3. | GVK Gautami Power Ltd. | 800 | September, 2012 |
| 4. | GVK Power (Jegurupadu) Pvt. Ltd | 800 | September, 2012 |
| 5. | Rajanagaram Gas Power Pvt. Ltd. | 1100 | December, 2012 |
| 6. | RVK Energy (Rajahmundry) Pvt. Ltd. | 360 | September, 2011 |
| | Total | 6860 | |

LTA Applications






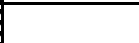



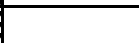



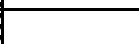


| Sl. No. | Applicant | Installed Capacity (MW) | LTA applied for (MW) | Time Frame | Target Beneficiary Regions | | |
|---------|-----------------------------------|-------------------------|----------------------|-----------------|----------------------------|-------------|------------|
| | | | | | SR | WR | NR |
| 1. | Spectrum Power Generation Limited | 1400 | 1350 | March, 2013 | 1120 | 330 | - |
| 2. | Reliance Infrastructure | 2400 | 2200 | January, 2012 | 1500 | 700 | - |
| 3. | GVK Gautami Power Ltd. | 800 | 800 | September, 2012 | 433 | 100 | 267 |
| 4. | GVK Power (Jegurupadu) Pvt. Ltd | 800 | 800 | September, 2012 | 520 | 100 | 180 |
| | Total | 5400 | 5150 | | 3573 | 1230 | 447 |

The transmission system for Connectivity was discussed and finalised in the 10th meeting of SR Constituents regarding Connectivity applications in SR held on 10th August 2010. During the meeting, while finalising the transmission system for Connectivity the generation developers were advised to apply for LTA to evolve the common transmission system.

Subsequently out of the 6 applicants who applied for Connectivity, 4 nos. applicants have applied for LTA as detailed above.

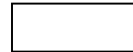
During the meeting it was informed that as indicated in the agenda the transmission system required for the above LTA applications have been evolved based on the load flow studies and phased corresponding to quantum of generation actually getting materialized in the area. The transmission system was deliberated wherein the representative of APTRANSCO enquired about the integration of Hyderabad 765/400 kV Ss with the existing Hyderabad 400 kV ring. Towards this it was decided the termination of above 400 kV D/c interconnection shall be based on the convenience of load drawl by APTRANSCO and availability of Right-of-way for construction of line. Members agreed to the same.

The status of preparedness of generation projects was assessed wherein the applicants updated status of their respective generation projects and the same is as given below:

| Applicant | Land | Fuel | MoE | EPC |
|-------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Spectrum Power Generation Limited |  |  |  |  |
| Reliance Infrastructure Phase-I (1200 MW) |  |  |  |  |
| GVK Gautami Power Limited |  |  |  |  |
| GVK Power (Jegurupadu) Private Limited |  |  |  |  |



Available



Not Available

It emerged that the generation projects have made substantial progress for initiating development of transmission system.

It was explained to the IPP applicants that the commissioning schedule of their power plants is too less for construction of dedicated transmission line upto pooling station as well as a transmission system beyond pooling station for further dispersal of power. It was explained that the minimum time line for construction of transmission system is about 9 months for project preparation activities plus CERC time line as specified in the tariff regulations which is of the order of 3 years. Therefore the transmission system for evacuation of power from these projects might be available only by 2013-14.

Accordingly it was decided to grant LTA for above applicants' alongwith the following system for Connectivity and LTA:

Transmission system for Connectivity:

(i) Spectrum Power Generation Ltd (1400 MW)

- a. 400 kV quad D/c line to Vemagiri-II pooling station
- b. 125 MVAR Bus Reactor at generation switchyard

(ii) Reliance Infrastructure Ltd (2400 MW)

- a. 2x400 kV quad D/c line to Vemagiri-II pooling station (the two nos. of dedicated lines may be phased matching with the commissioning of the two phases).
- b. 2x125 MVAR Bus Reactor at generation switchyard (the two nos. of 125 MVAR bus reactors may be phased matching with the commissioning of the two phases).

(iii) GVK Gautami Power Ltd (800 MW)

- a. Bus extn of the existing switchyard
- b. 400 kV D/c line to Vemagiri-II pooling station
- c. 80 MVAR Bus Reactor at generation switchyard

(iv) GVK Power (Jegurupadu) Pvt Ltd (800 MW)

- a. Bus extn of the existing switchyard or LILO of one of the existing 400 kV D/c line at new switchyard
- b. 400 kV D/c line to Vemagiri-II pooling station
- c. 80 MVAR Bus Reactor at generation switchyard

Note: (1) *The bays, works and bus reactor(s) at the generation switchyard shall be under the scope of generation developers.*

(2) *The bays and works at the pooling station shall be under the scope of entity developing transmission system for connectivity.*

POWERGRID has informed to the applicants the timeline for construction of lines for connectivity shall be 9 months + CERC time line as specified in the tariff regulations, in case if the applicant desires to have connectivity before these time lines then they may construct the connectivity lines by themselves.

Common Transmission System for projects located in Vemagiri area:

- (i) Establishment of 765/400kV GIS Pooling station at Vemagiri with 4x1500 MVA transformer with sectionalisation arrangement to control short circuit MVA
- (ii) LILO of Gazuwaka – Vijayawada 400kV S/c line at Vemagiri Pooling Station for initial integration with SR grid and which later shall be bypassed
- (iii) Establishment of 765/400kV GIS Pooling station at Khammam & Hyderabad with 2x1500 MVA transformers each
- (iv) Hyderabad 765/400 kV S/s – Hyderabad (existing) 400 kV D/c (quad) line
- (v) Khammam 765/400 kV S/s – Khammam (existing) 400 kV D/c (quad) line
- (vi) Vemagiri Pooling Station – Khammam 2x765kV D/c line
- (vii) Khammam – Hyderabad 2x765 kV D/c line
- (viii) Hyderabad – Wardha 765 kV D/c line
- (ix) Wardha – Jabalpur Pooling station 765 kV D/c
- (x) Beyond Jabalpur Pooling Station the transmission system will be provided integrating with the proposed High Capacity Power Transmission Corridor – IX i.e. Jabalpur Pooling Station – Orai – Bulandshahr 765 kV S/c depending upon the inter-regional power transfer.

Members agreed for the same.

6. **Connectivity/LTA of generation developers in Nagapattinam/Cuddalore area** – It was informed that following applicants had applied for Connectivity/LTA in Nagapattinam/Cuddalore area :

Connectivity Applications

| Sl. No. | Applicant | Connectivity applied for (MW) | Connectivity required from |
|---------|----------------------------------------|-------------------------------|-------------------------------|
| 1. | Sindya Power Generation Co. Pvt. Ltd. | 970 | April, 2013 |
| 2. | PPN Power Generating Co. Pvt. Ltd. | 1080 | 1 st quarter, 2013 |
| 3. | Chettinad Power Corporation Ltd. | 1200 | September, 2013 |
| 4. | Empee Power & Infrastructure Pvt. Ltd. | 1241 | April, 2013 |
| | Total | 4491 | |

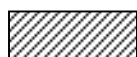
LTA Applications

| Sl. No. | Applicant | IC (MW) | LTA applied for (MW) | Time Frame | Quantum allocated in the region | | |
|-------------------------------|----------------------------------------|-------------|----------------------|-------------|---------------------------------|-------------|------------|
| | | | | | SR | WR | NR |
| Under Regulations 2004 | | | | | | | |
| 1. | NSL Power Pvt. Ltd. | 1320 | 800 | 2014 | 267 | 267 | 266 |
| 2. | PEL Power Ltd. | 1050 | 987 | June, 2013 | 700 | 0 | 287 |
| 3. | IL&FS Tamil Nadu Power Co. Ltd. | 1200 | 1150 | June, 2013 | 575 | 575 | 0 |
| Under Regulations 2009 | | | | | | | |
| 4. | Sindya Power Generation Co. Pvt. | 1050 | 970 | Dec, 2013 | 650 | 250 | 70 |
| 5. | Chettinad Power Coporation Pvt. Ltd. | 1320 | 1110 | Jul, 2014 | 500 | 500 | 110 |
| 6. | Empee Power & Infrastructure Pvt. Ltd. | 1320 | 1241 | April, 2014 | 496 | 496 | 248 |
| Total | | 7260 | 6258 | | 3188 | 2088 | 981 |

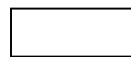
The transmission system for Connectivity and LTA as given in the agenda was discussed. It was also informed that the earlier evolved system for Nagapattinam / Cuddalore area and augmentation SR-WR link through 1000 MW HVDC back-to-back link has been reviewed based upon the future inter-regional power transfer requirement of Southern and Western regions.

The status of preparedness of generation projects was assessed wherein the applicants updated status of their respective generation projects.

| Applicant | Land | Fuel | MoE | EPC |
|----------------------------------------|----------|------|-----|-----|
| NSL Power Pvt. Ltd. | 650/1300 | | | |
| PEL Power Ltd. | 546/700 | | | |
| IL&FS Tamil Nadu Power Co. Ltd. | 670/780 | | | |
| Sindya Power Generation Co. Pvt. Ltd. | 357/600 | | | |
| Chettinad Power Corporation Pvt. Ltd. | 173/263 | | | |
| Empee Power & Infrastructure Pvt. Ltd. | 421/530 | | | |



Available



Not Available

It emerged that though land of varying extent is available with all the applicants but fuel tie-up is available with NSL, PEL and IL&FS only. Further, these applicants have also progressed in acquiring Environment clearance. For the balance three applicants viz. Chettinad, Sindya Power and Empee Power the fuel linkages are not available. Therefore it was decided that Long Term

Access may granted to NSL, PEL and IL&FS and the balance applications viz. Chettinad, Sindya Power and Empee Power shall be taken up in the next meeting for consideration of grant of LTA.

On query, it was informed by the generation developers that they are ready to sign the BPTA and submit requisite Bank Guarantee, if LTA is granted. In this regard, Chief Engineer, CEA has mentioned that the LTA applicants may note that the date of commencement of LTA is sacrosanct and the transmission charges will be levied from that date. Further, he has also mentioned that the applicants who had applied Connectivity only are advised to apply for LTA immediately.

Accordingly it was decided to grant of LTA to the following applicants as per above mentioned details alongwith the following system for Connectivity and LTA:

Transmission system for Connectivity application made under regulations 2004 (in the scope of respective generation developers):

- (i) NSL Power Pvt. Ltd. (800 MW)
 - a. 400 kV quad D/c line to Nagapattinam pooling station
 - b. 125 MVAR Bus Reactor at generation switchyard
- (ii) PEL Power Ltd. (987 MW)
 - a. 400 kV quad D/c line to Nagapattinam pooling station
 - b. 80 MVAR Bus Reactor at generation switchyard
- (iii) IL&FS Tamil Nadu Power Co. Ltd. (1150 MW)
 - a. 400 kV quad D/c line to Nagapattinam pooling station
 - b. 125 MVAR Bus Reactor at generation switchyard

Note: (1) *The bays, works and bus reactor(s) at the generation switchyard and Nagapattinam Pooling station shall be under the scope of generation developers.*

POWERGRID has informed to the applicants the timeline for construction of lines for connectivity shall be 9 months + CERC time line as specified in the tariff regulations, in case if the applicant desires to have connectivity before these time lines then they may construct the connectivity lines by themselves.

Common Transmission System for projects located in Nagapattinam/Cuddalore area:

- (i) New 765/400kV Pooling station at Nagapattinam (GIS) with 4x1500 MVA transformers
- (ii) Nagapattinam Pooling Station – Salem 765kV D/c line
- (iii) Salem – Madhugiri 765 kV S/c line – 2
- (iv) Madhugiri – Narendra 765kV D/c line
- (v) Narendra – Kolhapur 765kV D/c line
- (vi) Kolhapur – Padghe 765 kV D/c one circuit via Pune
- (vii) New 765/400kV Pooling station each at Narendra (GIS) and Kolhapur with 2x1500 MVA transformers
- (viii) Provision of 2x1500 MVA, 765/400 kV transformers each at Madhugiri and Salem

- (ix) LILO of both circuits of Kolhapur – Mapusa 400 kV D/c line at Kolhapur 765/400 kV Ss
- (x) Charging of Salem – Madhugiri 765 kV S/c line – 1 (*planned with Tuticorin LTOA projects*) at its rated voltage
- (xi) LILO of Neyveli – Trichy 400kV S/c line at Nagapattinam Pooling Station for interim arrangement which later shall be bypassed
- (xii) 400 kV interconnection between Narendra (existing) and Narendra 765/400 kV GIS Ss

As explained above, looking into the synchronous operation of SR and NEW grid by 2013-14 through Raichur – Sholapur 765 kV 2xS/c lines it is desirable that Narendra – Kolhapur 765 kV D/c link shall also be available by that timeframe for smooth synchronization. Accordingly the Narendra – Kolhapur section alongwith necessary interconnections are proposed to be delinked with generation development in the Cuddalore/Nagapattinam area and taken up separately matching with the timeframe of Raichur-Sholapur 765 kV lines. The 765 kV operation of this link shall be undertaken matching with the progress of generation projects in Cuddalore/Nagapattinam area.

Scheme for SR and NEW grid interconnection

- (i) New 765/400kV substation each at Narendra (GIS) and Kolhapur initially charged at 400 kV
- (ii) Narendra (GIS) – Kolhapur (new) 765kV D/c line (initially charged at 400 kV)
- (iii) LILO of both circuits of Kolhapur – Mapusa 400 kV D/c line at Kolhapur (new)
- (iv) Narendra (GIS) - Narendra (existing) 400 kV D/c (quad) line.

Members agreed for the same.

7. **Connectivity/LTA of generation developers in Krishnapatnam area** – It was informed that following applicants had applied for Connectivity/LTA in Krishnapatnam area :

Connectivity Applications

| Sl. No. | Applicant | Connectivity applied for (MW) | Connectivity required from |
|---------|-----------------------------------|-------------------------------|----------------------------|
| 1. | Thermal Powertech Corporation Ltd | 1320 | 1 st Qtr 2013 |
| 2. | Pragdisa Power Private Limited | 1320 | December, 2013 |
| | Total | 2640 | |

LTA Applications

| Sl. No. | Applicant | Installed Capacity (MW) | LTA applied for (MW) | Time Frame | Quantum allocated in the region | | |
|---------|---------------------------------------------|-------------------------|----------------------|---------------|---------------------------------|-----|----|
| | | | | | SR | WR | NR |
| 1. | Thermal Powertech Corporation India Limited | 1320 | 1320 | January, 2014 | 1125 | 115 | 0 |


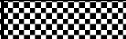
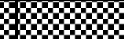







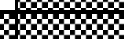

| | | | | | | | |
|----|------------------------------------|-------------|-------------|-------------|-------------|------------|----------|
| 2. | Nelcast Energy Corporation Limited | 1320 | 1240 | March, 2015 | 840 | 400 | 0 |
| 3. | Meenakshi Energy Private Limited | 300 | 273 | June, 2012 | 273 | 0 | 0 |
| | Total | 2940 | 2833 | | 2238 | 515 | 0 |

The transmission system for Connectivity and LTA as given in the agenda was discussed. It was further informed that the common transmission system for generation projects located in Krishnapatnam area was already identified and had been granted regulatory approval by CERC is as given below:

- Establishment of 765/400 kV, 2x1500 MVA pooling station at Nellore by LILO of Simhapuri-Nellore 400 kV D/c quad line
- Nellore Pooling station – Kurnool 765 kV 2xS/c line
- Kurnool – Raichur 2nd 765 kV S/c line (1st line under Krishnapatnam UMPP)

POWERGRID had also informed during the meeting that while evolving above mentioned common transmission system, it was indicated that if all the generations envisaged in this area materialize, then the common transmission system identified would require strengthening. However this strengthening to be worked out based on the success of materialisation of generation capacity addition in the area, till such time allocation of the transmission capacity to be made on the basis of signing of BPTA and Bank Guarantee submission.

The status of preparedness of generation projects was assessed wherein the applicants updated status of their respective generation projects and the same is as given below:

| Applicant | Land | Fuel | MoE | EPC |
|---------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Thermal Powertech Corporation India Limited |  |  |  |  |
| Nelcast Energy Corporation Limited |  |  |  |  |
| Meenakshi Energy Private Limited |  |  |  |  |



Available



Not Available

It emerged that the generation projects Thermal Powertech & Meenakshi Energy have fuel tie-up whereas Nelcast Energy has yet to tie-up fuel linkages. However representative of Nelcast Energy requested time for submission of documents related to fuel linkages.

Therefore it was decided that Long Term Access may granted to Thermal Powertech and Meenakshi Energy and the balance application viz. Nelcast Energy shall be granted LTA subject to evidence of fuel linkage tie-up. Further, LTA to above applicants is granted subject to signing of BPTA and submission of requisite Bank Guarantee. POWERGRID had again informed during the meeting that while evolving above mentioned common transmission system, it was indicated that if all the generations envisaged in this area materialize, then the common transmission system identified would require strengthening. However this strengthening to be worked out based on the

success of materialisation of generation capacity addition in the area, till such time allocation of the transmission capacity to be made on the basis of signing of BPTA and Bank Guarantee submission. Members agreed for the same.

Further, POWERGRID had informed that Andhra Pradesh Power Development Company Limited (APPDCL) was also earlier granted LTOA of 175 MW to NR from their power plant in Krishnapatnam area. However in the meeting held in CEA on 01.02.2010 they had expressed their desire to withdraw their application. Accordingly the same was not considered in the list of projects for which the regulatory approval of CERC for High Capacity Corridor from this area. Subsequently APPDCL vide their letter dated 21-07-2010 had requested to restore the earlier granted LTOA for 175 MW to NR from their power plant in Krishnapatnam area. Members agreed for the restoration of LTOA granted earlier as per CERC, Regulations 2004.

Also POWERGRID has informed that site has reported facing severe ROW constraint for implementing the Nellore – Kurnool 765 kV 2xS/c, hence it is proposed that this line shall be constructed as 765 kV D/c line. Members agreed for the same.

In view of above, the following is proposed.

Transmission system for Connectivity:

- (i) Thermal Powertech Corporation India Limited (1320 MW)
 - a. 400 kV quad D/c line to Nellore pooling station
 - b. 125 MVAR Bus Reactor at generation switchyard

Note: (1) *The bays, works and bus reactor(s) at the generation switchyard shall be under the scope of generation developers.*
 (2) *The bays and works at the pooling station shall be under the scope of entity developing transmission system for connectivity.*

POWERGRID has informed to the applicants the timeline for construction of lines for connectivity shall be 9 months + CERC time line as specified in the tariff regulations, in case if the applicant desires to have connectivity before these time lines then they may construct the connectivity lines by themselves.

- 8. **Applications made for Connectivity only without LTA Application**– It was informed that following applicants had applied for Connectivity only without LTA application.

| Sl. No. | Applicant | Connectivity Sought (MW) | Connectivity required from |
|---------|------------------------------------|--------------------------|-------------------------------|
| 1. | Neyveli Lignite Corporation | 1000 | April, 2014 |
| 2. | Hinduja National Power Corporation | 1040 | 1st Quarter, 2013 |
| 3. | Shree Renuka Energy Limited | 1050 | March, 2014 |
| 4. | Vainateya Power Private Limited | 1320 | December, 2013 |
| 5. | NTPC Limited | 1050 | 2013-14 |
| 6. | PPN Power Generating Co. | 1080 | 1 st quarter, 2013 |
| 7. | Pragdisa Power Private Limited | 1320 | December, 2013 |

In this regard, Chief Engineer (CEA) mentioned that as per the present regulations the grid strengthening is to be planned only with the LTA request inter-alia meaning that the connectivity applicants shall be depending entirely on existing/planned transmission system, which shall not have adequate capacity to accommodate large number of applications only for connectivity. He accordingly advised the applicants for connectivity to make applications for LTA so that suitable transmission system strengthening may be planned.

NTPC while agreeing to applying for LTA requested to indicate them tentative number of bays in the generation switchyard, it was indicated that provision of 5 nos. 400 kV bays (2 nos. for 400 kV lines and 2 nos. for 400/220 kV Transformers and 1 no. for Bus Reactor) and additionally space provision for 2 nos of 400 kV bays may be kept in the generation switchyard.

9. Meeting ended with vote of thanks to the participants.

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IPP Projects getting delayed

| Applicant | Generation Capacity (MW) | Location | Time Frame |
|--------------------------------------------|---------------------------------|--------------------------------|------------------------------|
| <i>East Coast Energy Pvt. Ltd.</i> | 2640 | <i>Srikakulam, A.P.</i> | <i>Oct, 2010</i> |
| <i>Coastal Energen Pvt. Ltd.</i> | 1200 | <i>Tuticorin, T.N.</i> | <i>Mar, 2011</i> |
| <i>IND-Barath Power (Madras) Ltd.</i> | 1400 | <i>Tuticorin, T.N.</i> | <i>Mar, 2011</i> |
| <i>NSL Power Pvt. Ltd.</i> | 1320 | <i>Nagapattinam, T.N.</i> | <i>Oct, 2011</i> |
| <i>NCC Vamsadhara Power Project</i> | 1980 | <i>Srikakulam Dist., A.P.</i> | <i>Nov, 2011</i> |
| <i>Krishnapatnam (AP Genco)</i> | 1600 | <i>Nellore A.P.</i> | <i>Dec' 11</i> |
| <i>Gautami</i> | 1150 | <i>Vemagiri, A.P.</i> | <i>Jan, 2012 / Dec, 2013</i> |
| <i>Krishnapatnam Power (Navayuga)</i> | 1980 | <i>Nellore, A.P.</i> | <i>June, 2011</i> |
| <i>North Chennai Power Co. Ltd.</i> | 1200 | <i>Near Chennai, T.N.</i> | <i>Jan, 2012 / Dec, 2013</i> |
| <i>PEL Power Ltd.</i> | 1000 | <i>Nagapattinam Dist, T.N.</i> | <i>Dec, 2011</i> |
| <i>IL&FS Tamil Nadu Power Co. Ltd.</i> | 1500 | <i>Cuddalore, T.N.</i> | <i>Dec, 2012 / Jun, 2013</i> |
| <i>SRM Energy Pvt. Ltd.</i> | 1800 | <i>Cuddalore, T.N.</i> | <i>Dec, 2012</i> |
| Total | 14040 | | |

11th Plan Projects getting delayed

| | Generation Capacity (MW) |
|----------------------------|---------------------------------|
| <i>Kudankulam</i> | 2000 |
| <i>Neyveli TS-II</i> | 500 |
| <i>Tuticorin Ext.</i> | 1000 |
| <i>Kalpakkam PFBR</i> | 500 |
| <i>Cuddalore</i> | 1000 |
| <i>Kudgi</i> | 1000 |
| <i>North Chennai Extn.</i> | 500 |
| <i>Tuticorin JV</i> | 1000 |
| <i>Kothagudem ST-IV</i> | 500 |
| Total | 8000 |

Status of Southern Region New Schemes - POWERGRID

| Sl. No | Name of Scheme & Elements | Standing Committee Approval | FR Date | Investment approval by POWERGRID Board/CCEA | Target as of now | Comments/Reasons of delay |
|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|----------|---------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. | <p><u>Kaiga U-3&4 Tr. System</u></p> <p>a) Narendra – Davangere 400 kV D/c line</p> <p>b) LILO of existing Kolar – Sriperumbudur 400 kV S/c at new 400/220 kV substation at Melakottaiyur</p> <p>c) Provision of 2nd 315 MVA, 400/220 kV transformer at Hiriyur 400/220 kV substations each.</p> <p>d) Establishment of new 400/220 kV substations at Melakottaiyur with 2x315 MVA, 400/220 kV transformers</p> <p>e) Mysore – Kozhikode 400 kV D/c line</p> <p>f) Establishment of new 400/220 kV substations at Kozhikode with 2x315 MVA, 400/220 kV transformers</p> | 16 th Meeting on 20.01.03 | Oct, 03 | CCEA Approval – March, 2005 | Commissioned Except Mysore-Kozhikode line and Kozhikode substation | – Mysore – Kozhikode is getting delayed due to ROW (50 Kms) of coffee planters in Karnataka portion, forest clearance problem in Kerala & Karnataka portion. The matter is taken with highest level with State Governments and further being followed up through intervention of Ministry of Power. |
| 2. | <p><u>Kudankulam Tr. System</u></p> <p>a) Kudankulam – Tirunelveli 2x400 kV D/c lines with Quad conductors</p> <p>b) Tirunelveli – Udumalpet 400 kV D/c lines with Twin conductors.</p> <p>c) LILO of both circuits of Madurai – Trivandrum 400 kV D/c line at Tirunelveli</p> <p>d) Establishment of new 400/220 kV transformers with 2x315 MVA transformers at Tirunelveli and Muvattupuzha.</p> <p>e) Transformation augmentations with 1x315 MVA transformers at Udumalpet and Trivandrum 400/220 kV substations.</p> <p>f) Tirunelveli – Edamon 400 kV Multi-ckt line (2 ckts of quad & 2 ckts of twin)</p> | 18 th Meeting on 05.03.04 | June, 04 | CCEA – May, 2005 | Commissioned Except Edamon – Muvattupuzha – North Trichur corridor | – Generation project is delayed to Mar' 2011 / Dec' 2011. – Severe ROW problems facing in Edamon – Muvattupuzha – North Trichur corridor |

| Sl. No | Name of Scheme & Elements | Standing Committee Approval | FR Date | Investment approval by POWERGRID Board/CCEA | Target as of now | Comments/Reasons of delay |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|----------|---------------------------------------------|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| | g) Edamon – Muvattupuzha 400 kV D/c line (with Quad conductors) constructed in new ROW corridor h) Muvattupuzha - North Trichur 400 kV D/c line with quad conductor | | | | | |
| 3. | <u>Transmission System associated with Tuticorin JV</u> a) Tuticorin – Madurai 400kV D/c line (Quad conductor) | 22 nd Meeting on 17.08.06 | Jun, 07 | Feb, 09 | Feb' 12 | – Generation getting delayed revised schedule Aug' 2012 as per 14 th SRPC minutes |
| 4. | <u>Kalpakkam PFBR Tr. System</u> a) KPFBR - Kancheepuram 230 kV D/c line b) KPFBR – Arni 230 kV D/c line c) KPFBR – Sirucheri 230 kV D/c line d) 2 nos of 230 kV bays each at Kancheepuram, Arni and Sirucheri 230 kV substations of TNEB | 20 th Meeting on 07.10.04 | Mar, 08 | Mar, 10 | Dec'11 / Mar'12 | – Award placed in Mar' 2010 – Implementation works are in progress, facing severe ROW problems |
| 5. | <u>System Strengthening – VIII</u> a) 11 nos. of 63 MVAR Reactors (7 bus reactors + 4 line reactors) | 23 rd Meeting on 22.01.07 | Mar, 07 | Jan, 08 | Commissioned | – |
| 6. | <u>Transmission system associated with Chennai NTPC-TNEB JV TPS</u> a) LILO of Alamanthy – Sriperumbudur 400 kV D/c line at North Chennai TPS JV | 24 th Meeting on 18.06.07 | Nov, 07 | May' 08 | Mar' 11 | – Activities in progress, Gen. likely by Oct' 2011 as per 14 th SRPC minutes – Sever ROW problems, line route realigned |
| 7. | <u>System Strengthening – IX</u> a) Hassan - Mysore 400 kV D/c line | 24 th Meeting on 18.06.07 | Aug, 08 | Feb, 09 | Feb' 12 | – Implementation works are in progress |
| 8. | <u>System Strengthening – X</u> a) Establishment of new 400/220 kV substation at Bidadi with 7x167 MVA 400/220 kV transformers and 1x63 MVAR bus reactor b) LILO of one circuit of Neelamangla – Somnahalli 400 kV D/c line at Bidadi | 24 th Meeting on 18.06.07 | Sept, 08 | Dec, 09 | Apr' 12 | – Implementation works are in progress |

| Sl. No | Name of Scheme & Elements | Standing Committee Approval | FR Date | Investment approval by POWERGRID Board/CCEA | Target as of now | Comments/Reasons of delay |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|----------|---------------------------------------------|-----------------------|----------------------------------------|
| | 400 kV substation | | | | | |
| 9. | <u>Simhadri-II Tr. System</u> a) LILO of both circuits Gazuwaka-Vemagiri 400 kV D/c line at Simhadri-II. | 28 th Meeting on 15.06.09 | Nov, 09 | Jan, 10 | Jul' 11 | - Implementation works are in progress |
| 10. | <u>System Strengthening – XI</u> a) Establishment of new 400/220 kV substation at Chulliar (Palakkad) with 2x315 MVA transformers and 1x63 MVAR bus reactor. b) LILO of both circuits of Udumalpet - Madakathara (North Trichur) 400kV D/C line at Chulliar 400 kV substation | 25 th Meeting on 28.03.08 | Oct, 08 | Feb, 09 | Jul' 11 | - Implementation works are in progress |
| 11. | <u>System Strengthening – XII</u> a) Establishment of new 400/220 kV substation at Yelahanka with 2x500 MVA transformers and 1x63 MVAR bus reactor. b) LILO of Neelamangla-Hoody 400kV S/c line at Yelahanka 400kV substation c) LILO of Somanhally-Hoody 400kV S/c line at Yelahanka 400kV substation | 27 th Meeting on 03.03.09 | July, 09 | Feb, 10 | Jun' 12 | - Implementation works are in progress |
| 12. | <u>Supplementary Transmission System associated with Vallur TPS</u> a) Extending 400 kV D/c of original Vallur TPS transmission system from LILO point to Malekottaiyur by suitably utilizing part of the LILO of Kolar-Sriperumbudur line at Melakottaiyur. Kolar – Sriperumbudur 400 kV shall be restored as direct lines. b) Establishment of Tiruvelam 765/400kV switching station initially charged at 400kV Tiruvalam (POWERGRID) - Chittoor 400kV D/C quad line | 28 th Meeting on 15.06.09 | Aug, 09 | Aug, 10 | Apr' 13 | - Implementation works are in progress |
| 13. | <u>System Strengthening – XIII</u> a) Establishment of new | 28 th Meeting on | Dec, 09 | | 32 Months from | - FR prepared - Investment to be |

| Sl. No | Name of Scheme & Elements | Standing Committee Approval | FR Date | Investment approval by POWERGRID Board/CCEA | Target as of now | Comments/Reasons of delay |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|----------|---------------------------------------------|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| | 400/220 kV substation at Madhugiri with 2x500 MVA transformers with provision of establishing a 765/400kV substation in future. b) Gooty – Madhugiri 400kV D/c line c) Madhugiri – Yelahanka 400kV D/c Quad line – 1x63 MVAR bus reactor at Madhugiri | 15.06.09 | | | Investment Approval | taken shortly |
| 14. | <u>System Strengthening – XIV</u> a) Salem New – Somanahalli 400kV Quad D/c line b) Augmentation of 1x315 MVA 400/220kV Transformer at Hosur | 30 th Meeting on 13.04.10 | | | | – FR under approval |
| 15. | <u>System Strengthening – XV</u> a) North Trissur – Kozhikode 400kV Quad D/C line | 30 th Meeting on 13.04.10 | | | | – FR under approval |
| 16. | <u>Transmission System associated with Krishnapatnam UMPP – Part-A</u> a) Krishnapatnam UMPP- Nellore 400 kV D/c Quad b) Krishnapatnam UMPP- Gooty 400kV D/c Quad | 24 th Meeting on 18.06.07 | July, 10 | | June, 2013 matching with generation | – Revised FR prepared after splitting the scheme - UMPP developer indicated Unit #1 commissioning by June, 2013 |
| 17. | <u>Transmission System associated with Krishnapatnam UMPP – Part-B</u> a) Establishment of new 765/400 kV substations at Raichur, Sholapur & Pune with 2x1500 MVA ICTs and 1x240 MVAR bus reactor each b) LILO of existing Raichur – Gooty 400 kV Quad D/c line at Raichur (New) substation c) Raichur – Sholapur 765 kV S/c line d) Sholapur – Pune 765 kV S/c line e) Pune (New) – Pune 400 kV Quad D/c line | 24 th Meeting on 18.06.07 | | | | – FR under approval |
| 18. | <u>Transmission System associated with Krishnapatnam UMPP –</u> | 24 th Meeting on 18.06.07 | | | | – FR under approval |

| Sl. No | Name of Scheme & Elements | Standing Committee Approval | FR Date | Investment approval by POWERGRID Board/CCEA | Target as of now | Comments/Reasons of delay |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|---------|---------------------------------------------|-------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| | <p>Part-C</p> <p>a) Establishment of new 765/400 kV substations at Kurnool with 2x1500 MVA ICTs and 1x240 MVAR bus reactor</p> <p>b) Krishnapatnam UMPP – Kurnool (New) 400 kV D/c Quad line with 63 MVAR line reactors at each end on both circuits</p> <p>c) Kurnool (New) – Raichur 765 kV S/c line</p> <p>d) LILO of N’Sagar – Gooty 400 kV S/c line at Kurnool (New) substation</p> <p>e) Kurnool (New) – Kurnool (APTRANSCO) 400 kV D/c quad line</p> | | | | | |
| 19. | <p><u>Common Transmission System Associated with LTA Projects in Krishnapatnam Area</u></p> <p>a) Establishment of 765/400kV 2x1500MVA Pooling station at Nellore by LILO of Simhapuri – Nellore 400kV D/c line</p> <p>b) Nellore Pooling station – Kurnool 765 kV D/c</p> <p>c) Kurnool – Raichur 2nd 765 kV S/c line</p> | 26 th Meeting on 13.06.08 | Nov, 09 | | 32 Months from Investment Approval | <ul style="list-style-type: none"> – FR prepared – Investment to be taken shortly |
| 20. | <p><u>Common Transmission System Associated with LTA Projects in Tuticorin Area- Part-A</u></p> <p>a) Establishment of 765 kV pooling station in Tuticorin (initially charged at 400 kV)</p> <p>b) Tuticorin pooling station – Tuticorin JV 400 kV D/c quad</p> | 29 th Meeting on 27.08.09 | Nov, 09 | | 30 Months from Investment Approval | <ul style="list-style-type: none"> – FR prepared – Investment to be taken shortly |
| 21. | <p><u>Common Transmission System Associated with LTA Projects in Tuticorin Area- Part-B</u></p> <p>a) Salem pooling station – Madhugiri pooling station 765 kV S/c initially charged at 400 kV - 80 MVAR line reactors at each end on both</p> | 29 th Meeting on 27.08.09 | Jun, 10 | | 36 Months from Investment Approval | <ul style="list-style-type: none"> – FR prepared – Investment to be taken shortly |

| Sl. No . | Name of Scheme & Elements | Standing Committee Approval | FR Date | Investment approval by POWERGRID Board/CCEA | Target as of now | Comments/Reasons of delay |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|---------|---------------------------------------------|-------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| | <p>circuits.</p> <p>b) Establishment of 765 kV pooling station in Salem (initially charged at 400kV)</p> <p>c) Interconnection of Salem pooling station with existing Salem 400/230kV substation through 400 kV D/c (quad) line.</p> <p>d) Tuticorin Pooling station – Salem Pooling station 765 kV D/c line initially charged at 400 kV – 63 MVAR line reactor at Salem.</p> | | | | | |
| 22. | <p><u>Common Transmission System Associated with LTA Projects in Srikakulam Area-Part-A</u></p> <p>a) Establishment of 765 kV pooling station in Srikakulam (initially charged at 400 kV)</p> <p>b) Srikakulam Pooling Station – Angul 765 kV D/c (initially charged at 400 kV) – 400 km.</p> <p>c) Provision of 1x1500 MVA, 765/400 kV transformer at Angul.</p> | 30th Meeting on 13.04.10 | Oct, 10 | | 36 Months from Investment Approval | <ul style="list-style-type: none"> – FR prepared – Investment to be taken shortly |
| 23. | <p><u>Common Transmission System Associated with LTA Projects in Srikakulam Area-Part-B</u></p> <p>a) Angul – Jharsuguda 765 kV 2nd D/c line (1st D/c line covered under Orissa IPPs)</p> <p>b) Jharsuguda – Dharamjaigarh 765 kV 2nd D/c line (1st D/c line covered under Orissa IPPs)</p> | 30th Meeting on 13.04.10 | | | | <ul style="list-style-type: none"> – FR under preparation |

| Sl. No . | Name of Scheme & Elements | Standing Committee Approval | FR Date | Investment approval by POWERGRID Board/CCEA | Target as of now | Comments/Reasons of delay |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|---------|---------------------------------------------|------------------|---------------------------|
| 24. | <p><u>Common Transmission System Associated with LTA Projects in Srikakulam Area-Part-C</u></p> <p>a) Provision of 2x1500 MVA, 765/400 kV transformers at Srikakulam Pooling Station</p> <p>b) Charging of Srikakulam Pooling station – Angul 765 kV D/c at its rated voltage.</p> | 30th Meeting on 13.04.10 | | | | – FR under preparation |

Annex –IV

Progress of Power Evacuation/ Transmission Scheme - furnished by Kerala State Electricity Board

1- Areakode 220Kv SS-

Bay extension work completed. Line work awarded and will be completed by 31/3/2011.

2- Palakkad

- a) Bay extension work-foundation completed.
- b) Line work-stub setting 15/19 locations completed. Tender for tower erection and stringing opened and under evaluation, will be completed by Mar-2011.

3- Cochin East(Pallikkara)

will be completed by Mar-2011.

**Progress of Power Evacuation/ Transmission Scheme - furnished by
by TNEB / TANTRANSCO**

| Sl. No. | Name of the Schemes | Voltage | Length (CKM) | TL (Nos) | Stubs (Nos) | TE (Nos) | Strg. (CKM) | Present Status |
|------------|--------------------------------------------------------------------------------------------------|---------|--------------|----------|-------------|----------|-------------|--------------------------------------------|
| I | NCTPS Stage -II (2x600 MW) | | | | | | | |
| | 1) Erection of 400 KV MC line form NCTPS Stage to Alamathy 400 KV SS | 400 | 168 | 113 | 74 | 22 | | Work under progress |
| | 2)Erection of 400 KV MC from Alamathy 400 KV SS to SV Chatram | 400 | 94 | 158 | 61 | 5 | | Work under progress |
| | 3) LILO of 230 KV NCTPS - Mosur line start up in NCTPS Stage - I Power Project. | 230 | 3 | 2 | 2 | 2 | | Energised on 22.09.10 |
| II | NTPC-TNEBJV-Vallur Stage-I(2x500 MW) 750 MW (share) | | | | | | | |
| | 1) LILO of 400 KV Alamathy - Sriperumbudur DC line at JV project | 400 | 8 | 12 | | | | Work under progress |
| III | MTPS Stage III - 1x600 MW | | | | | | | |
| | 1) 400 KV DC line with Twin Moose conductor from MTPS Stage III to Singarapet 400 KV SS | 400 | | | | | | Land for Singarapet SS is to be identified |
| | 2) 400 KV SC line on DC towers with Twin Moose conductor from MTPS Stage III to Arasur 400 KV SS | 400 | 280 | 324 | 288 | 120 | | Work under progress |
| | 3) LILO of MTPS - Gobi 230 KV line at MTPS Stage III 230 KV Bus | 230 | 8.13 | 17 | 17 | 15 | 3.3 | Work under progress |
| | 4) LILO of Malco - Pallakapalayam 230 line at MTPS Stage III 230 KV Bus | 230 | 7.882 | 20 | 20 | 20 | 7.882 | Work completed |
| IV | Udangudi TPS | | | | | | | |
| | 1) Erection of 400 KV line from Udangudi to Kayathar | 400 | 110 | | | | | Survey completed |
| | 2) Erection of 400 KV line from Udangudi to Karaikudi | 400 | 250 | | | | | Survey work under progress |
| V | Back Bone Network | | | | | | | |
| | 1)Erection 400 KV line from Karanarpatty to Kayathar | 400 | 30 | | | | | Work is not taken up at present |
| | 2)Erection 400 KV line from Kayathar to Karaikudi | 400 | 200 | | | | | Survey work under progress |
| | 3)Erection 400 KV line from Karaikudi to Pugalur | 400 | 250 | | | | | |
| | 4)Erection 400 KV line from Pugalur - Singarapet - Solinganallur (Ottiambakam) | 400 | | | | | | Survey work under progress |

| Sl. No. | Name of the Schemes | Voltage | Length (CKM) | TL (Nos) | Stubs (Nos) | TE (Nos) | Strg. (CKM) | Present Status |
|-----------|----------------------------------------------------------------------------------------------------------|---------|--------------|----------|-------------|----------|-------------|---------------------------------|
| VI | Establishment of 400 KV SS at Kayathar | | | | | | | |
| | 1)Erection 400 KV line from Kayathar to Karanarpatty | 400 | 30 | | | | | Presently deferred |
| | 2)Erection 400 KV line from Kayathar to Karaikudi | 400 | 200 | | | | | Survey work under progress |
| | 3) LILO of Kayathar - Annupankulam 230 KV SC line at Kayathar 400 KV SS | 230 | 6 | | | | | Profile under preparation |
| | 4) LILO of Kayathar - Pasumalai 230 KV SC line at Kayathar 400 KV SS | 230 | 6 | | | | | Profile under preparation |
| | 5) Erection of 230 KV DC line on DC towers from Kayathar 400 KV SS to sanctioned Vannikonendal 230 KV SS | 230 | 30 | | | | | Work is not taken up at present |

Annex – VI

Progress of Power Evacuation/ Transmission Scheme - furnished by APTRANSCO

KTPS-VI:-

The 400Kv DC LINE from KTS-VI to 400kv KHAMMAM SS scheduled to be completed by December 2010

Unit –proposed date of commissioning on 15/01/2011

BHOOPALPALLY –STAGE-II

The 400Kv DC LINE from **BHOOPALPALLY** to GAJWEL scheduled to be completed by August 2012.

Unit –proposed date of commissioning on December 2012.

KRISHNAPATNAM-APGENCO

The 400Kv QUAD DC LINE from Power plant to 400kv Nellore ss scheduled to be completed by December 2011.

The 400Kv QUAD DC LINE from Power plant to 400kv chittoor s/s is under tendering process.

Unit1 –proposed date of commissioning on March 2013.

UnitII –proposed date of commissioning on September 2013.

**Progress of Power Evacuation/ Transmission Scheme - furnished by
by KPTCL**

| Scheme / Particulars of work | DPR cost in Rs lakhs | Date of DWA | Target date | % progress | Remarks |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|------------------------|------------------------|-----------------------|---------------------------------------------------------------------------------------------------------------|
| <u>Shanthigrama 220 kV lines :</u> Construction of 1. 2 nos of 220 kV DC lines from 400 kV PGCIL station to LILO the existing Shimoga- Mysore 220 kV DC M1 & M2 lines near Melgodu limits. 2. 220 kV DC line from Shanthigrama station to existing B4 line near Hedanahalli limits. | 1050.11 | 13-Mar-09 | 13-Mar-10 | 65 | 1) Commissioned on 24- Jun-2010. 2) 18/34 loc excavated, 18/34 stubs concreted, 5 towers erected. |
| <u>UPCL- Nandikur to Shanthigrama line</u> Const. of 400kV DC line with Quad Moose ACSR of 180Kms from NPCL, Nandikur to proposed 400/200kV Stn. Shanthigrama | 39639.71 | 19-Nov-08 | 10-May-10 | 40 | Stubs concreted : 349/527 . Towers erected: 267/527 Stringing : 15.373 Kms(49) spans compltd. |

**List of participants for the 31st meeting of SCPSPSR, held on 16th November 2010
at Northern Region Power Committee, at Katwaria Sarai, New Delhi**

Sl. No. Name and Organization Designation

Central Electricity Authority (CEA)

| | | |
|----|--------------------|--------------------------|
| 1. | S M Dhiman | Member (Power Systems) |
| 2. | Ravinder | Chief Engineer (SP&PA) |
| 3. | Pardeep Jindal | Director (SP&PA) |
| 4. | Manjari Chaturvedi | Asst. Director-I (SP&PA) |
| 5. | Shivani Sharma | Asst. Director-I (SP&PA) |

Southern Region Power Committee (SRPC)

| | | |
|----|--------------|----------------------|
| 6. | S D Taksande | Member Secretary I/c |
| 7. | S R Bhatt | SE |

Power Grid Corporation of India Limited (POWERGRID)

| | | |
|-----|---------------------|-------------------|
| 8. | Y K Sehgal | ED (SEF, CE & IT) |
| 9. | S Ravi | AGM(SR-I) |
| 10. | Dilip Rozekar | DGM(SEF) |
| 11. | P Lakshmi Narayana | DGM(SR-II) |
| 12. | A Nagaraju | DGM (SR-II) |
| 13. | R V Madan Mohan Rao | CDE (SEF) |

Power System Operation Corporation Limited (POSOCO)

| | | |
|-----|--------------|-----------|
| 14. | S K Soonee | CEO |
| 15. | P R Raghuram | GM, SRLDC |
| 16. | S P Kumar | CM, SRLDC |

NTPC Limited (NTPC)

| | | |
|-----|-------------|----------|
| 17. | Abhijit Sen | AGM (PE) |
| 18. | S S Mishra | DGM |

Neyveli Lignite Corporation Limited (NLC)

| | | |
|-----|---------|----------|
| 19. | S Muthu | GM (PSE) |
|-----|---------|----------|

Sl. No. Name and Organization Designation

Transmission Corp. of Andhra Pradesh Ltd. (APTRANSCO)

- | | | |
|-----|-------------------|---------------------------|
| 20. | P Srirama Rao | Director (Grid Operation) |
| 21. | M Jayachandra | CE (PS) |
| 22. | M Balasubramanyam | DE/System Studies |

Karnataka Power Transmission Corporation Limited (KPTCL)

- | | | |
|-----|--------------|-------------------------|
| 23. | Pratap Kumar | Director (Transmission) |
|-----|--------------|-------------------------|

Kerala State Electricity Board (KSEB)

- | | | |
|-----|---------------|-----------------------|
| 24. | K Asokan | Member (Transmission) |
| 25. | S S Biju | AEE (SSG) |
| 26. | G Sreenivasan | Resident Engineer |

Tamil Nadu Electricity Board (TNEB)/TANTRANSCO

- | | | |
|-----|-----------------|-----------------------|
| 27. | S Akshaya Kumar | Director (TANTRANSCO) |
| 28. | K Thangachamy | SE (System Studies) |
| 29. | V K Jain | Resident Manager |
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