

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

No. 51/4/SP&PA-2013/ 1693-1704

Date: 27-September-2013

To

1.The Member Secretary, Southern Regional Power Committee, 29, Race Course Cross Road, <b>Bangalore 560 009.</b> <b>FAX : 080-22259343</b>	2.The Director (Projects), Power Grid Corp. of India Ltd. “Saudamini”, Plot No.2, Sector-29, <b>Gurgaon 122 001, Haryana.</b> <b>FAX : 95124-2571932</b>
3.The Director (Grid Operation), Transmission Corp. of Andhra Pradesh Ltd., Vidyut Soudha, <b>Hyderabad – 500 082.</b> <b>FAX : 040- 23321751</b>	4.The Director (Transmission), Karnataka State Power Transmission Corp.Ltd., Cauvery Bhawan, <b>Bangalore 560 009.</b> <b>FAX : 080 -2228367</b>
5.The Member (Transmission), Kerala State Electricity Board, Vidyuthi Bhawanam, Pattom, P.B. No. 1028, <b>Thiruvananthapuram - 695 004.</b> <b>FAX : 0471-2444738</b>	6. Member (Distribution), Tamil Nadu electricity Board (TNEB), 6 <sup>th</sup> Floor, Eastern Wing, 800 Anna Salai, <b>Chennai - 600002.</b> <b>FAX : 044-28516362</b>
7.The Director (Power), Corporate Office, Block – I, Neyveli Lignite Corp. Ltd., <b>Neyveli , Tamil Nadu – 607 801.</b> <b>FAX : 04142-252650</b>	8.The Superintending Engineer –I, First Floor, Electricity Department, Gingy Salai, <b>Puducherry – 605 001.</b> <b>FAX : 0413-2334277/2331556</b>
9. Director (Projects), National Thermal Power Corp. Ltd. (NTPC), NTPC Bhawan, Core-7, Scope Complex, Lodhi Road, <b>New Delhi-110003.</b> <b>FAX-011-24360912</b>	10. Director (Operations), NPCIL, 12 <sup>th</sup> Floor,Vikram Sarabhai Bhawan, Anushakti Nagar, <b>Mumbai – 400 094.</b> <b>FAX : 022- 25991258</b>

**Sub: 36<sup>th</sup> meeting** of the Standing Committee on Power System Planning of Southern Region

- **Minutes of the meeting**

Sir,

The **36<sup>th</sup> meeting** of the Standing Committee on Power System Planning of Southern Region was held on 4-September- 2013 at NRPC, Katwaria Saria, New Delhi. **Minutes of the meeting** is enclosed. It is also available at CEA’s website ( [www.cea.nic.in](http://www.cea.nic.in)).

Yours faithfully,

(Pardeep Jindal)

Director(SP&PA)

(Telephone: 011 26198092, Fax No. 011 26102045)

**Copy to:**

Shri S. K. Soonee, CEO, POSOCO,  
B-9, Qutub Institutional Area,  
Katwaria Sarai,  
New Delhi-110016

ED, SRLDC,  
29, Race Course Cross Road,  
Bangalore 560 009  
FAX – 080-22268725

**Minutes of 36th Meeting of the  
Standing Committee on Power System Planning in Southern Region (SCPSPSR)  
held on 04-September-2013 at NRPC, Katwaria Saria, New Delhi**

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1.0 COO(CTU), POWERGRID welcomed the participants and observed that the agenda for today's meeting included some critical issues such as system for increasing import of power into Southern Region, transmission system planning for Andhra and Tamil Nadu, STATCOM in Southern Region.

List of participants is given at **Annex-I**.

Director (SP & PA), CEA then took up the agenda for the meeting.

**2.0 Confirmation of the minutes of 35<sup>th</sup> meeting of the Standing Committee**

2.1 Director(SP&PA), CEA stated that minutes of the 35<sup>th</sup> meeting of the Standing Committee on Power System Planning of Southern Region were issued vide CEA's letter No. 51/4/SP&PA-2013/202-213 dated 19<sup>th</sup> Feb, 2013. In this regard, some observations were received from POWERGRID. Based on these observations, corrigenda to the minutes of the 35<sup>th</sup> meeting were issued vide CEA letter no. 51/4/SP&PA-2013/827-838 dated 12-6-2013. Further, TANTRANSCO vide their letter no. CE/Plg&R.C/ SE/EE1/AEE1/ F.35SCM/D.138/2013 dated 03-04-2013, has given their observations on – (i) discussion in 34<sup>th</sup> and 35<sup>th</sup> meeting regarding upgrading of Pugalur HVDC at 765kV, (ii) to check overloading of Tuticorin-Chekanurani and Tuticorin – Pugalur 400kV lines in case of connecting Pugalur HVDC, (iii) to add 'LILO of one of the NLC TS-II – NMTPS 230kV D/C lines at TANTRANSCO 230kV S/S at a later date. He explained that, the 765kV at Pugalur was in agenda but was not agreed, the studies carried out did not show overloading on the Tuticorin lines and LILO at TANTRANSCO 230kV S/S not agreed, and as such no corrigendum was needed on these observations.

2.2 Minutes of the 35<sup>th</sup> meeting along with corrigenda, as circulated, were confirmed.

**3.0 Wardha – Hyderabad 765kV D/C line**

3.1 Director(SP&PA), CEA stated that during the 35<sup>th</sup> meeting of the Standing Committee POWERGRID raised the issue to anchor the planned Hyderabad – Wardha 765kV D/C line at some intermediate station because the length of this

line is becoming more than 500 km based on the preliminary survey. After discussions, it was decided that the location and connectivity at 400kV level of the intermediate station would be decided on the basis of joint studies/visit by CTU, APTRANSCO and CEA.

- 3.2 During the joint studies of a team comprising of officers from CTU, CEA and APTRANSCO it was found that Nizamabad could be the perspective location for the intermediate station. PGCIL SRTS-I and APTRANSCO has identified 3-4 locations around Nizamabad area, and the line length of the Wardha - Nizamabad and the Nizamabad - Hyderabad lines would be approximately 250 km each. After studies following system was proposed :

For Maheshwaram (Hyderabad) 765/400kV S/s:

1. Establishment of Maheshwaram(PG) 765/400kV substation with 2x1500 MVA transformers
2. LILO of Hyderabad – Kurnool 400kV S/c line at Maheshwaram(PG)
3. Maheshwaram(PG) – Mahboob Nagar 400kV D/c line
4. Establishment of Maheshwaram(AP) 400/220kV substation with 2x500 MVA transformers – **by APTRANSCO**
5. Maheshwaram (PG) – Maheshwaram (AP) by bus extension or by short 400kV D/c line – **by APTRANSCO**
6. Maheshwaram (AP) – Yeddumailaram (Shankarapalli) 400kV D/c line (to be established by re-alignment of the ‘LILO of Srisailam – Mamadipalli at Shankarapalli’ and re-instating the Srisailam – Mamadipalli 400kV D/c line) - **by APTRANSCO**

For Nizamabad 765/400kV S/s:

1. Establishment of Nizamabad 765/400kV substation with 2x1500 MVA transformers
2. Nizamabad – Dichpalli 400kV D/c line
3. Nizamabad – Yeddumailaram (Shankarapalli) 400kV D/c line
4. LILO of Nizamabad – Yeddumailaram (Shankarpalli) 400kV D/c line at Narsapur – **by APTRANSCO**

- 3.3 ED(SRLDC), POSOCO said that APTRANSCO should build their S/s and proposed lines in the matching time frame of the ISTS lines and substations, which was agreed by APTRANSCO.

- 3.4 Director(SP&PA) suggested that the 400kV portion of the above total system can be implemented as a separate scheme ahead of the 765kV system. This would help strengthening of the southern grid. He also suggested that as the Wardha – Hyderabad 765 kV D/c and the Hyderabad 765/400 kV S/S were identified by Empowered Committee for implementation by POWERGRID, therefore, minor modification now proposed for providing anchoring point to long line like

Nizamabad 765/400 kV station and associated LILO works may also be implemented by POWERGRID. Some of the link lines essential for anchoring of the new S/Ss with the grid may also be implemented by POWERGRID.

3.5 Members agreed for the above proposal.

#### **4.0 System strengthening scheme in WR for transfer of power to SR**

4.1 Director(SP&PA), CEA stated that POWERGRID had proposed to implement a Aurangabad - Sholapur 765 kV double circuit line to help transfer of power to Southern Region from Western Region under the system strengthening scheme in WR for transfer of power to SR. The Sholapur-Pune 765 kV second circuit and Kohlapur-Padghe 765kV double circuit lines were planned in scenario of export of power from SR to WR through Raichur - Sholapur 765kV 2xS/c line and Narendra - Kolhapur 765kV D/C line, however, the situation has reversed. After analyzing the studies furnished by the POWERGRID and the urgency of the Aurangabad - Sholapur 765 kV double circuit line in view of synchronization of SR with NEW grid, CEA vide their letter 51/4/2013-SP&PA/52 dated 29-5-2013 has given the in-principle approval to the above proposal with following modifications in earlier planned system:

- (i) Aurangabad - Sholapur 765 kV double circuit line may be implemented by the POWERGRID as system strengthening scheme in lieu of the Sholapur - Pune 765 kV second circuit.
- (ii) LILO of one circuit of Aurangabad - Padghe 765 kV double circuit line at Pune 765 kV S/s, in lieu of the Kolhapur - Padghe with one circuit via Pune 765 kV line .

4.2 COO(CTU) informed that the LILO covered under (ii) above was not agreed in the SCMPSP of Western Region held on 29-8-2013.

4.3 After discussions, the proposal of Aurangabad - Sholapur 765 kV double circuit line (to be implemented by the POWERGRID) as system strengthening scheme in was agreed in lieu of the Sholapur - Pune 765 kV second circuit.

#### **5.0 Proposal of Electricity Department, Puducherry for erection of 230kV line to Karaikal**

5.1 Director, CEA stated that in the 35th meeting of the standing committee it was decided to implement a direct 230kV D/c line from NLC TS-I switchyard or any other switchyard/substation in NLC complex to the proposed Karaikal S/s as regional system strengthening scheme. For this, it was also decided that CTU would coordinate with Puducherry, TNEB and NLC to confirm the 230kVS/s, from

where this line may be built. But Electricity Department, Puducherry informed that during their visit to Neyveli it was found that there is no vacant 230kV bay available at NLC TS-II at present. The TS-I switchyard would be dismantled after 2015. Thus there is no scope of bays availability at TS-I also. PGCIL in their visit report has also said that no bay is available at present. However, in the time frame of establishment of new NNTPS, bays may be available at NNTPS and Neyveli TANTRANSCO 230kV new S/S. In view of this, it was proposed to again consider the original proposal i.e. LILO of existing 230kV Neyveli- Bahour line to proposed 230kV Auto S/s at Karaikal.

- 5.2 After deliberations, it was agreed to LILO of the 230kV Neyveli- Bahour line at proposed 230kV Auto S/s at Karaikal in such a way that in future as per the bay availability at NLC the 230kV Karaikal S/S may directly be connected to NLC and 230kV Neyveli- Bahour line may be restored.
- 5.3 It was also agreed that the Karaikal S/s would be implemented by Electricity Department, Puducherry and NLC the NLC – Karaikal 230kV D/C line(or initially in the form of LILO of the 230kV Neyveli- Bahour line at Karaikal) may be implemented by POWERGRID. A team of officials from CEA, CTU, TNEB and NLC would visit NLC site and firm up the termination point for the NLC-Karaikal 230kV line.

## **6.0 Associated transmission system for Kaiga APP St-III(U-5& 6)**

- 6.1 Director(SP&PA), CEA stated that in the 34<sup>th</sup> and 35<sup>th</sup> meeting of the Standing committee it was observed that for evacuation of the power of Kaiga APP St-III(U-5&6) re-conductoring of the existing lines i.e. Kaiga –Davangere(Guttur) and Kaiga - Narendra 400kV twin moose D/C line with HTLS conductor is a feasible solution. But during the re-conductoring period, power from the existing KAPP generations (4x220 MW) shall have to be evacuated with reduced reliability of the evacuation system or backing-down of the generation. NPCIL was asked to confirm their acceptance for operation of existing Kaiga units at reduced reliability of evacuation system (which are also needed for cooling of the core) for the period of re-conductoring which may take 48 months or more in total and as such they would have to operate on reduced reliability or less generation output.
- 6.2 ACE, NPCIL stated that the subject matter of backing down has been discussed in detail and it emerged that it would not be advisable to reduce the generation at Kaiga due to evacuation constraints. He opined that the 220kV lines from KGS-1&2 i.e. Kaiga-Kadra & Kaiga-Kodasali 200kV lines, may be upgraded with higher capacity conductor initially and subsequently re-conductoring of 400kV lines may be carried out for Kaiga to Davagere/Narendra. This shall facilitate evacuation of

power from Kaiga 1-4 units through 1\*400kV D/C and upgraded 220kV lines and shall avoid backing-down of the generation.

- 6.3 ED(SRLDC), POSOCO opined that the re-conductoring of Kaiga- Kadra and Kaiga - Kodalali 220kV lines would not help in the evacuation of power from Kaiga generation as these lines are for evacuation of Hydro power and re-conductoring would hinder the evacuation of power at the Kadra, Kodalali and Nagjhari hydro-electric projects.
- 6.4 After discussion, it emerged that for reliable transmission system from 2200 MW generation complex (after the Kaiga U 5&6), one more 400kV corridor shall be required. Towards this, NPCIL may appraise their Ministry for their support to resolve the RoW/Forest clearance issue for laying 3<sup>rd</sup> transmission corridor from Kaiga.
- 6.5 It was decided to convene a separate meeting involving CEA, Department of Atomic Energy, NPCIL, POWERGRID, SRLDC and forest authorities to resolve the issues involved in reliable evacuation of power from the proposed Kaiga U-5&6 of 1400 MW generation project.

## **7.0 Transmission system for 2x800 MW Krishnapatnam AP TPS**

- 7.1 Director(SP&PA), CEA stated that APTRANSCO had informed that APGENCO's 2x800 MW Krishnapatnam power project units are near to the date of commissioning.
- 7.2 Director, APTRANSCO said that the Krishnapatnam AP - Nellore and Krishnapatnam AP - Chittoor 400kV quad lines would be made ready matching with the generation project. He also said that part of the generation from this project would be coming to 400kV Chittoor S/S of AP and would flow towards Tamil Nadu on the Chittoor – Thiruvalam 400kV line which is under construction, and requested that Tamil Nadu should complete the down stream 230kV system at Thiruvalam.
- 7.3 APTRANSCO informed that the 1<sup>st</sup> and 2<sup>nd</sup> unit would be commissioned by Oct'13 and Jan'14 respectively and Krishnapatnam AP - Chittoor 400kV quad lines would be ready by Dec'13. Regarding the drawl of power at Chittoor, APTRANSCO said that at Chittoor the power from Rayalseema project is also available. The transmission lines from Rayalseema generation are also getting overloaded and additional 400kV S/s at Kalikiri has been planned and is covered in the agenda.
- 7.4 POWERGRID informed that Chittoor – Thiruvalam 400kV line would be ready by Dec'13. TANTRASCOSCO informed that Thiruvalam S/S would be ready by July 2014.
- 7.5 SRLDC said that with the non-availability of the downstream system at both Chittoor and Thiruvalam, power of Krishnapatnam generation may get bottled up.

- 7.6 After discussions, it was decided that TANTRASCO should expedite the work at Thiruvalem S/S and its down-stream system. TANTRASCO should also plan more outlets of 230kV lines from the Thiruvalem S/s.
- 7.7 It was also decided that APTRASCO, would review the evacuation system for Rayalseema Generation and also plan strengthening of their network in Rayalseema area, in association with CEA and CTU.

## **8.0 TANGEDCO/TANTRASCO proposals**

8.1 Director (SP&PA), CEA stated that TANGEDCO had proposed a generation capacity addition programme of 3440 MW in Chennai area (ETPS Exp. 1x660MW, ETPS Replacement 1x660MW, NCTPS Stage–III 1x800MW, NCTPS Stage–IV 2x660MW, Udangudi 2x660MW and Udangudi Exp. 1X800 MW). As ETPS Expansion (1x660MW) and NCTPS Stage –IV (2x660MW) are likely to be commissioned by the year 2016-2017, the transmission evacuation system is to be finalised at the earliest. They have also proposed transmission system for three(3) nos. of 400 KV Pooling stations for solar power evacuation.

8.2 Chief Engineer, TANGEDCO presented their proposal as given below:

I. ATS FOR ETPS EXPANSION – 1X660MW:

- i. 400kV DC Quad connectivity from ETPS Expansion switchyard to the 765/400kV Pooling station at North Chennai. (Generation at 400kV Level)
- ii. 1X80MVAR Bus Reactor at generation switchyard.

II. ATS FOR ENNORE SEZ (NCTPS Stage-IV) – 2X660MW:

- i. 400kV DC Quad connectivity from Ennore SEZ switchyard to the 765/400kV Pooling station at North Chennai. (Generation at 400kV Level)
- ii. 400kV DC Quad inter link between the above two plants switchyard for reliability.
- iii. 1X125MVAR Bus Reactor at generation switchyard.

III. ATS FOR NCTPS Stage III – 1X800MW:

- i. 765kV DC line from NCTPS Stage III switchyard to the Pooling station. (Generation at 765kV Level)
- ii. 1X125MVAR Bus Reactor at generation switchyard

IV. ATS FOR ETPS Replacement – 1X660MW:

- i. 765kV DC line from ETPS Replacement switchyard to Pooling station. (Generation at 765kV Level)
- ii. 765kV DC inter link between the above two plants switchyard for reliability.
- iii. 1X80MVAR Bus Reactor at generation switchyard.

- V. ATS for M/S.OPG Power generation Ltd.- 2X360MW : (By OPG)
- i. 400kV DC line to the North Chennai Pooling station.
  - ii. 1X63 MVAR Bus Reactor at the generation switchyard.
- VI. Establishment of Pulianthope 400/230kV SS as System Strengthening :
- i. 400kV DC line from North Chennai Pooling station to the proposed Pulianthope 400/230kV SS.
  - ii. With 2X315MVA, 400/230kV ICT at Pulianthope 400kV SS
  - iii. With 230kV connectivity of existing Basin Bridge 230kV SS.
- VII. Establishment of 765/400kV Pooling Station in North Chennai area:
- i. 2X1500MVA, 765/400kV ICTs at North Chennai Pooling station.
  - ii. 765kV DC connectivity from North Chennai 765kV pooling station to the proposed Kilpennathur 765/400kV SS.
  - iii. 400kV DC line from North Chennai Pooling station to the proposed Pulianthope 400/230kV SS.
- VIII. Establishment of 765/400/230kV SS in Kilpennathur:
- i. 2X1500MVA, 765/400kV ICTs with the following 765kV and 400kV connectivity.
  - ii. 765kV DC connectivity from the proposed Kilpennathur 765/400kV SS to the 765/400kV North Chennai Pooling station
  - iii. 765kV DC connectivity from Kilpennathur 765/400kV SS to the proposed Coimbatore 765/400kV SS.
  - iv. 765kV DC connectivity from Kilpennathur 765/400kV SS to the Thiruvalem PGCIL 765/400kV SS.
  - v. LILO of Pugalur – Kalivantapattu 400kV DC Quad line with other approved connectivity of Singarapet S/S.
  - vi. 1X125MVAR Reactor at Kilpennathur 765/400kV SS.
- IX. Establishment of 765/400kV SS in Coimbatore region (upgradation of Rasipalayam 400kV SS):
- i. 2X1500MVA, 765/400kV ICTs with the following 765kV and 400kV connectivity.
  - ii. 765kV DC connectivity to the proposed Kilpennathur 765/400kV SS.
  - iii. 400kV DC connectivity to the proposed Edayarpalayam 400kV SS with other approved connectivity.
  - iv. 1X125MVAR Reactor at Coimbatore 765/400kV SS
- X. ATS for proposed power plants at Udangudi:



- i. Establishment of 765/400kV Pooling Station in Udangudi with 2X1500MVA, 765/400kV ICTs.
  - ii. 2X400kV DC line from Udangudi Stage-1 switchyard to the 765/400kV Pooling station. (Generation at 400kV Level)
  - iii. 765kV DC line from Udangudi Stage-2 switchyard to the 765/400kV Pooling station. (Generation at 765kV Level)
  - iv. 1X125MVAR Bus Reactor at each generation switchyard.
  - v. Udangudi Pooling Station – proposed Kilpennathur 765kV DC line with an anchoring 765/400kV SS near Karaikudi/Sivaganga.
  - vi. Establishment of 765/400kV SS with 2X1500MVA ICTs in Karaikudi/Sivaganga
  - vii. 765kV DC line from Karaikudi/Sivaganga from Udangudi Pooling station.
  - viii. 765kV DC line from Karaikudi/Sivaganga to proposed Kilpennathur 765/400kV SS
  - ix. LILO of Karaikudi – Pugalur 400kV DC Quad line at 765/400kV Karaikudi SS.
  - x. 400kV DC line from Karaikudi/Sivaganga to the proposed Tanjore /Thiruvavur 400kV SS with 2X315MVA 400/230kV ICTs.
  - xi. 1X125MVAR Reactor at Karaikudi 765/400kV SS.
- XI. Transmission system for the proposed 400 KV Pooling station for solar power Evacuation:
- i. Establishment of Kamudhi 400/230-110 KV SS with 3x 315MVA 400/230kV ICTs and 3x200 MVA, 400/110kV ICTs
  - ii. 400 KV DC line from Kamudhi SS to the existing Karaikudi 400kV PGCIL SS
- XII. Kayathar – Koilpatty (Tuticorin Pooling point) 400kV DC Quad line:
- i. Kayathar – Koilpatty (Tuticorin Pooling point) 400kV DC Quad line for additional connectivity with ISTS and increased reliability purpose.

8.3 He also proposed following additional transmission system for evacuation of power from 2x500 MW Neyveli Lignite Corporation Ltd. TS-I (Replacement) (NNTPS) in Neyveli, Tamil Nadu:

- (i) NNTPS switchyard – Neyveli (TANTRANSCO 230kV S/S), 230kV D/C line with HTLS conductor (by TNEB).
- (ii) Neyveli TPS-II – Neyveli (TANTRANSCO 230kV S/S), 230kV D/C line (by TNEB) also be with HTLS conductor.

This additional transmission system for NNTPS was agreed by the SCPSR.

- 8.4 Regarding the transmission proposal of TANGEDCO/TANTRASCO mentioned at 8.2 above, it was discussed and brought out that these proposals need additional studies considering overall developments in whole of Southern region for instance the renewable injections, import through high capacity HVDC link with Chhatisgarh, timeframe of proposed generation projects in Tamil Nadu, progress on already planned intra-state transmission system, etc. However, the plan for Tamil Nadu should be firmed up at the earliest.
- 8.5 As such, members agreed in-principle, however it was decided that CEA, CTU and TANGEDCO would carry out necessary studies to finalize and firm up the transmission plans for Tamil Nadu.

## **9.0 APTRANSCO proposals**

### **9.1 Augmentation of transmission system for Talcher-II via Gazuwaka and Erection of 400/220kV Garividi SS in Vizianagaram District of Andhra Pradesh**

9.1.1 APTRANSCO had proposed for the augmentation of transmission system between Gazuwaka -Vijaywada section for transfer of power from Talcher-II via Gazuwaka. The matter was also discussed in 34<sup>th</sup> meeting of the standing committee and it was decided that CEA/POWERGRID would carry out studies to plan a system for above requirement. APTRANSCO also proposed a 400/220 kV S/S at Garividi connecting with Kalpakka S/s through 400kV quad moose line and 220/132kV S/S at Pydibhmavaram to reduce the overloading of 400/220kV ICTs at Kalpaka and Gazuwaka.

9.1.2 Members agreed for the above proposal.

### **9.2 Power evacuation system from 1040 MW power plant of M/s Hinduja at Vishakapatnam**

9.2.1 For evacuation of power from 1040 MW power plant of M/s Hinduja following is proposed by APTRANSCO:

- (i) 400kV twin moose D/c line from Kalpaka S/s to Hinduja (HNPCL) Switchyard.
- (ii) A new 400/220kV KVKota S/s with 2x315MVA capacity and 400kV twin moose D/c line from HNPCL switchyard to the proposed KVKota S/s.
- (iii) 400/220kV Suryapet S/s with 2x315MVA capacity and 400kV quad moose D/c line from proposed KVKota S/s to proposed Suryapet S/s.
- (iv) 400kV quad moose D/c line from proposed Suryapet S/s to 400/220kV Yeddumailaram(Shankarapally). (this line is to be made through Manikonda which can be made LILO upon realization of 400kV Manikonda S/s).

(v) 400kV twin moose D/c line from proposed KVKota S/s to Vemagiri S/s.

9.2.2 COO(CTU), PGCIL said that the Hinduja generation project is getting ready for commissioning and APTRANSCO is very late in formulating its proposal for a sufficient transmission system which would enable evacuation of power from the project.

9.2.3 ED(SRLDC), POSOCO said that in view of the constraints in the system beyond Vemagiri, full evacuation of power from Hinduja project may not be possible as APTRANSCO is yet to start construction of above transmission system.

9.2.4 Member agreed for the above proposed transmission system. It was also agreed that in the absence of above transmission system the generation at Hinduja may have to be backed-down to avoid over-loadings in the grid. It was indicated that about 600 MW of power may be injected into ISTS either at Vemagiri or at Hinduja. The actual quantum of gas based injections at Vemagiri and that at Hinduja power project that may be allowed under different scenarios would be worked through operational studies on case to case basis.

### 9.3 Transmission requirement scheme of AP for 2013-14:

9.3.1 APTRANSCO has proposed to erect 4 number of 400kV S/Ss at Maheshwaram, Manikonda, Kalikiri and Podili along with 12 new 220/132kV S/S. The proposed 400kV works are as under:

- (i) 400/220kV Manikonda S/s (2x315MVA) with LILO of both circuits of proposed 400kV Suryapet - Yeddumailaram quad moose D/c line
- (ii) 400/220kV Maheshwaram S/s(APTRANSCO) ( 2x315MVA) with 400kV twin moose D/c line to 765/400kV Maheshwaram S/S(PGCIL)
- (iii) 400/220kV Podili S/s (3x315MVA) with 400kV twin moose D/c line to 400/220kV Narsaraopeta/Sattenpalli S/S(APTRANSCO)
- (iv) 400/220kV Kalikiri S/s (2x315MVA) with LILO of both circuits of 400kV RayalseemaTPP-IV - Chittoor D/C line.

9.3.2 Members agreed for the above proposals of APTRANSCO.

## **10.0 Transmission schemes in Southern Region for evacuation of power from Renewable Energy Sources in Southern Region**

10.1 Director(SP&PA), CEA stated that a number of transmission schemes for evacuation and integration of power from renewable energy sources are proposed to be implemented and posed for KfW funding under the India-Germany bilateral

cooperation. These include 400kV, 220kV and 132kV state transmission systems in Tamil Nadu, Karnataka and Andhra Pradesh. The 400kV works included in these schemes have already been discussed and approved in previous meetings of the Standing Committee on Power System Planning of SR. The proposed 220/132kV works are furnished for discussion and approval as a part of coordinated planning process. The ISTS proposals would be taken up in the Connectivity/LTA agenda.

- 10.2 ED(SRLDC), POSOCO said that during the system planning for renewable generations the reactive power management should also be planned. DGM, PGCIL stated that dynamic studies would be carried out to work out the proposal for reactive power compensation.
- 10.3 Members agreed to the intra-state transmission system as given in the agenda. The same is listed at - Annex-II(a) for Andhra Pradesh, Annex-II(b) for Karnataka and Annex-II(c) for Tamil Nadu, of these minutes.

#### **11.0 Transmission system for increasing import of power into Southern Region**

- 11.1 Director(SP&PA), CEA stated that SR may have a shortage of 11000 MW by the end of the 12<sup>th</sup> Plan i.e. 2016-17. To enable import of power of this order, system studies were carried out to plan (i) additional links connecting SR with WR and (ii) system strengthening within SR for transmitting power beyond the import points of Vemagiri and Hyderabad.
- 11.2 DGM(CTU), PGCIL informed that joint studies were conducted by CEA and CTU in association with TANTRANSCO, APTRANSCO and KPTCL and comprehensive requirement of transmission system augmentation were included in the agenda. It was informed that earlier a comprehensive high capacity Common Transmission System associated with gas based ISGS projects in Vemagiri area of Andhra Pradesh was evolved for evacuation & transfer of power to their target beneficiaries which inter-alia comprised of 2 Nos 765 kV D/c lines from Vemagiri to Hyderabad which was extended by 765 kV D/c line from Hyderabad to Wardha and Wardha to Jabalpur. Subsequently the generation project developers have informed that the Govt. of India has issued an advisory not to plan any additional gas based power project till 2015-16 due to short fall in the gas production. The deferment of gas based generation projects coupled with delay/deferent of large no. of generation projects including Krishnapatnam UMPP has changed the entire scenario wherein instead of projected surplus situation earlier, the Southern Region may have large deficit. CERC has also directed CEA and CTU to reexamine the entire matter afresh.
- 11.3 During the discussions it was brought out that the Southern Region would be deficit of power due to high load growth and the fact that some of the planned

generation projects, like Krishnapatnam UMPP, Ind Barath, Yermarus, Edlapur, Kalpakkam, Udangudi, Cheyyur UMPP, etc are not materializing/ getting delayed. It was assessed that the Southern Region would have deficit of 7000 to 11000 MW of power by 2016-17. The details of expected power supply position by 2016-17 under various scenarios are as under:

Sl. No.	Items	Optimistic generation additions (MW)	Pessimistic generation additions (MW)
1.	Existing Capacity	42952	42952
2.	Existing Availability	32428	32428
3.	Capacity addition from new generation projects	22380	17230
4.	Availability from new generation projects	19544	15760
5.	Total Availability	51972	48188
6.	Projected Demand (2016-17)	57221	57221
7.	Import (-) / Export (+)	(-) 5249	(-) 9033
8.	Import from Talcher Generation	2000	2000
9.	Net Import (-) / Export (+)	(-) 7249	(-) 11033

#### **Raigarh (Chhatisgarh) – Pugalur (Tamil Nadu) WR-SR HVDC Bipole Link -regarding**

11.4 Regarding the proposal of a HVDC line from Raigarh, in Chhattisgarh to a suitable location in Southern Region, the following system, as given in the agenda, was agreed:

##### **System Strengthening – HVDC bipole link**

- (i) Raigarh Pooling Station – Pugalur(a new HVDC Station) 4000 MW HVDC bipole line. (This bipole line would be in place of the Raigarh – Dhule 4000 MW HVDC line that was earlier planned )
- (ii) Pugalur Pooling Station – Pugalur Existing 400kV (quad) D/c line
- (iii) Pugalur Pooling Station – Arasur 400kV (quad) D/c line
- (iv) Pugalur Pooling Station – Thiruvalem 400kV (quad) D/c line
- (v) Pugalur Pooling Station – Edayarpalayam 400kV (quad) D/c line
- (vi) Edayarpalayam – Udumalpet 400kV (quad) D/c line
- (vii) Establishment of 400/220kV substation with 2x500 MVA transformers at Edayarpalayam
- (viii) HVDC terminal stations at Raigarh Pooling station and Pugalur(New) station of 4000 MW capacity each.

- 11.5 COO(CTU), PGCIL observed that in view of large deficit and requirement of transmission system to meet market requirements, the HVDC should be implemented with a capacity of 6000 MW. This shall also be prudent considering conservation of RoW and utilization of spares & expertise already developed for  $\pm 800$  kV, 6000 MW HVDC bipole.
- 11.6 CEO, POSOCO said that economic analysis considering cost of such large investment in this system vis-à-vis savings due to cheaper power that may be available in Chhattisgarh and its impact on the POC charges to the States of Southern Region should be assessed.
- 11.7 Director (SP&PA), CEA stated that the studies included in the present agenda were carried out for the 4000 MW HVDC capacity. As such, we would have to carry out the studies to assess - the need for 6000 MW for HVDC bipole, adequacy of total evacuation system from Chhattisgarh, dispersal of power beyond Pugalur & other system strengthening to cater to contingency of outage on such a high capacity link and other requirements as per the transmission planning criteria.
- 11.8 Chairperson, CEA was of the view that in consideration of RoW constraints and fast growing demand of SR it would be desirable to plan this link as 6000 MW capacity HVDC and additional strengthening should be studied and put up for discussion in the next meeting of the Standing Committee. The same was agreed.

### **System strengthening within Southern Region - regarding**

- 11.9 To increase capacity of the transmission system for importing power in SR and as suggested by CERC, various alternatives were studied and discussed in the Standing Committee meeting. The various alternatives taken up for discussions during the meeting are given below:

#### **Alternative- 1:**

- i) Vemagiri – Khammam– Hyderabad 765kV D/C line (This transmission line is already awarded through TBCB)
- ii) Hyderabad - Kurnool 765 kV D/C line
- iii) LILO of Kurnool - Thiruvallur 765kV D/C line at Cuddapah
- iv) Cuddapah - Salem 765kV D/C line
- v) Cuddapah – Hindupur 400 kV (quad) D/C line
- vi) Cuddapah – Hoody 400kV (quad) D/C line
- vii) Establishment of 765/ 400 kV sub-stations at Cuddapah with 2x1500 MVA transformers

#### **Alternative- 2:**

- i) Vemagiri – Chilakaluripeta – Cuddapah – Salem 765 kV D/C line

- ii) Chilakaluripeta – Podili 400 kV (quad) D/C line
- iii) Cuddapah – Hindupur 400 kV (quad) D/C line
- iv) Cuddapah – Hoody 400 kV (quad) D/C line
- v) Establishment of 765/400 kV sub-stations at Chilakaluripeta and Cuddapah with 2x1500 MVA transformers each
- vi) Establishment of 400/220 kV sub-stations at Podili 2x315 MVA transformers each

Alternative- 3:

- i) Vemagiri – Khammam– Hyderabad 765 kV D/C line (This transmission line is already awarded through TBCB)
- ii) Hyderabad - Kurnool 765 kV D/C line
- iii) LILO of Kurnool - Thiruvalem 765kV D/C line at Cuddapah
- iv) Vemagiri – Chilakaluripeta – Cuddapah – Salem 765kV D/C line
- v) Chilakaluripeta – Podili 400 kV (quad) D/C line
- vi) Cuddapah – Hindupur 400 kV (quad) D/C line
- vii) Cuddapah – Hoody 400 kV (quad) D/C line
- viii) Establishment of 765/400 kV sub-stations at Chilakaluripeta and Cuddapah with 2x1500 MVA transformers each
- ix) Establishment of 400/220 kV sub-stations at Podli 2x315 MVA transformers each

11.10 Director(SP&PA), CEA stated that both the Alternative-1 and Alternative-2 can independently fulfill the requirement of import of transmitting the power from the proposed gas injections at Vemagiri / import through Angul –Srikakulam –Vemagiri 765 kV D/C line. The Alternative-3 which is a superset of other two alternatives satisfies both the requirements and provides additional reliability.

11.11 DGM(CTU), PGCIL stated that the delay / deferment of generation projects has mostly taken place in the southern part of the grid thereby requiring power flow towards Tamil Nadu. It is prudent to strengthen corridor down south rather than the alternative towards Hyderabad. Accordingly, CTU proposed to defer implementation of Vemagiri-Khammam-Hyderabad 765kV lines till there is a clarity on availability of gas based generation projects in Vemagiri area of Andhra Pradesh and the Alternative-2 may be agreed for strengthening of Southern Region grid to facilitate dispersal of power to be imported through Angul – Srikakulam – Vemagiri corridor beyond Vemagiri.

11.12 CEO, POSOCO stated that Vemagiri – Khammam – Hyderabad 765kV D/C line shall interconnect two transmission corridors from Eastern and Western Regions, hence should also be implemented for reliability purpose as part of Alternative-3.

Director (SP&PA), CEA stated that some of the post-award activities for this line, which is awarded to a company of PGCIL, have already been completed.

11.13 As such a consensus regarding resuming the implementation / deferment of the first Vemagiri – Khammam – Hyderabad 765kV D/C line could not be reached in the meeting.

## **12.0 Review of the evacuation scheme for Yeramarus (2x800 MW), Edlapur(1x800 MW) Thermal Power Generation**

12.1 Director(SP&PA), CEA explained that KPTCL, vide their letter no CEE(P&C)/SEE(PIg)/EE(PSSS)/KCO-97/55319/2013-14 dated 18-06-2013, has requested to review the system in view of the studies carried out by them. Subsequently, joint studies have been carried out in Hyderabad on 29-30 June 2013 and following system was agreed to be taken up for discussion in the standing committee:

(A) The following transmission system already planned, must be implemented by KPTCL at the earliest:

- (i) Edlapur TPS - Yeramarus TPS S/S 400 kV D/C Twin moose line
- (ii) The existing Raichur TPS – Davangere 400kV SC line to be converted to 400kV DC line with QUAD conductors along with shifting of Raichur termination point to Yeramaras TPS switchyard. Both the circuits to be LILLOed at BTPS
- (iii) BTPS – Madhugiri (Tumkur) 400 kV Quad D/C line

(B) In line with the provisions of the new transmission planning criteria the following additional transmission system was found essential for evacuation of power from Yeramarus, Edlapur & Bellary TPS:

- (i) Establishment of 400kV Switching Station near Chikkanayakanahalli (C.N.Halli) near LILLO point of Hassan 400kV Substation on Talaguppa – Neelamangla 400kV S/c line
- (ii) LILLO of both circuits of Talguppa – Neelamangla 400kV D/c line at Chikkanayakanahalli
- (iii) Termination of the LILLO towards Hassan at Chikkanayakanahalli thereby making Hassan – Chikkanayakanahalli 400kV D/c line
- (iv) BTPS – Chikkanayakanahalli 400kV Quad D/C line
- (v) Chikkanayakanahalli – Mysore 400kV D/C line



(C) The additional transmission system earlier planned for reliability i.e. YTPS – Raichur (New) 400kV Quad D/c line is proposed to be dropped due the increased fault level at the existing Raichur generation plant.

12.2 Director(SP&PA), CEA informed that KPTCL has now again requested to re-review the above system again, in view of RoW problems and the proposed generation at Gulberga. He further stated that KPTCL is not present in the meeting, however, we may initiate studies to again review the planned transmission system as per request from KPTCL.

12.3 Chairperson, CEA stated that KPTCL should implement the already planned system and transmission requirement due to generation at Gulberga may be planned as additional system.

### **13.0 Response to POSOCO report on Operational Feedback on Transmission Constraints**

13.1 CM(SRLDC), POSOCO presented the operational constraints in Southern region, highlights of which are given below:

13.2 **High line loading** : Transmission systems planned at various stages but needs to be accelerated on priority.

- 400kV Somanahalli-Salem New DC &LILLO of Somanahalli-Salem at Hosur.
- 765kV Raichur-Karnool-Tiruvalam corridor
- 400kV Vijayawada-Nellore-Tiruvalam –Melakotayur DC line
- 765kV Madhugiri-Salem DC line
- 400kV Gooty/BTPS-Madhugiri-Yelahanka/Bidadi corridor
- North Chennai TPS Transmission system-TN
- Narsaraopeta connected transmission system-AP
- Extra ICTs are planned at various substations in 33<sup>rd</sup> meeting of SCPSPSR-needs to be accelerated

### **13.3 Andhra Pradesh:**

- **Hyderabad Metro network:** 220kV network of Hyderabad are loaded heavily with no N-1.
- **Kothagudem TPS Evacuation:** KTPS (1220 MW) evacuating 220kV lines to Khammam and Hyderabad area are loaded heavily with No N-1, needs to be strengthened.
- **Evacuation of Rayalaseema TPS:** 220 KV Evacuation lines are loaded heavily

- **South and Coastal:**With the increased loads in south and coastal Andhra Pradesh, the loadings on the following 220 kV lines increased and need strengthening.
  - 220 KV VTPS-Podili SC line
  - 220 KV VTPS-Narsaraopet SC line
  - 220 KV VTS- Tadikonda DC line
  - 220kV Tadikonda-Parchur-Ongole SC line
  - 220kV Chinakampalli-Renigunta SC line
  - 220kV Chinakampalli-Rajampet SC line
  - 220kV Chinakampalli-Kalkiri SC line
- 220kV Upper Sileru –Pendurthi line gets loaded beyond 150 MW with full generation in Sileru complex & Donkarai and this passes through forests.
- 220kV Nellore-Sulurpet-Gummidipoondi(TN) line gets loaded heavily with 80-100 MW Drawal by Tamilnadu, which is one of critical line for Chennai loads.

#### 13.4 Karnataka:

- **Bangalore Metro:-**The following 220kV corridors in Bangalore metro needs attention
  - Nelamangala-Peenya
  - Peenya-Somanhalli
  - Somnahalli-Hoody
  - Somanhalli-Yerandahalli

#### Evacuation Issues

- 400kV Jindal-BTPS heavily loaded due to addition of Jindal generation without extra evacuating lines.
- During the Sharawathi full generation, the evacuating 220kV lines i.e 220 kV Sharavathy-Shimoga lines (4 nos) and 220 kV Sharavathy-Talaguppa D/C, heavily loaded.
- Evacuation of Kali complex: When Kali complex generation(Nagjheri, Kadra and Kodasalli) is high, the evacuating 220kV lines towards Hubli/Narendra see very high flows. These lines pass through dense forest and their trippings caused many disturbances.
- The 220kV Shimoga-Mysore corridor is LILoed in multiple places(7 LILOs) and wind generation is also evacuated on this corridor.
- 220kV Mysore-T.K.Halli-Somanahalli is vital link supplying power to water pumping stations and has seen many interruptions.
- 220kV Shimoga-Varahi-Kemar corridor getting heavily loaded with full generation(4x115 MW) and UPCL(2x600 MW), needs strengthening.
- 220kV Davanagere-Chithradurga-Hiriyur-DB pura is single circuit line LILoed at various wind and Load points, mostly kept radial to control the loading.

#### 13.5 Kerala:

- At present the North Kerala loads are largely fed from 400/220kV Madakathara SS , 400/220kV Palakkad SS and 220kV Kadkola-Kaniyampeta which is feeding radially during peak condition. The 220kV transmission system from Madakathara to wards North Kerala i.e. 220kV Madakathara - Areacode, 220kV Madkathara - Shoranur and 220kV Madakathara - Malaparamba, are highly stressed.
- 220kV Kadkola - Kaniyampeta line heavily loaded during peak load condition of Kerala.
- Due to high loading, North Kerala system also facing low voltage problems

### 13.6 Tamil Nadu:

- **Wind evacuation:** Wind Generation Installed Capacity in TN is about 7000 MW with peak generation reaching about 3900 MW. Many 230 kV/110 kV lines and 400/230kV ICTs at Tirunelveli get severely stressed during wind peak in Tirunelveli area. The following 230kV lines are heavily loaded:
  - Abishekapatti-Kayathar
  - Abishekapatti-Sankaneri
  - Kayathar-Udayathur-Abishekapatti
  - Kayathar-kodikurchi-Veeranam
  - TTPS-Koodankulam-SR pudur
  - TTPS-Sipcot
  - Chekkanurani-Sembatti
  - Chekkanurani-Theni
  - Kundah-Othakalamantapam
- 230kV Hosur-Shoolagiri line is a short line and is loaded beyond 200 MW for most of the time due to drawal at Shoolagiri by loads at Hosur and Yerandahalli(Karnataka).
- **Chennai 230kV Network:** the following 230kV lines are heavily loaded
  - 230kV Alamatty-Manali DC line
  - 230kV Alamatty-Mosur
  - 230kV SV Chathram-oragadam
  - 230kV Manali-Koratur
  - 230kV Kalavindapattu-S.PKoil
  - 230kV Kalavindapattu-Siruseri
  - 230kV NCTPS/ETPS evacuation lines
  - Many 230kV lines are kept open to control loading, which in turn leads to reduced reliability.

13.7 DGM(CTU), PGCIL informed that the transmission schemes to overcome the constraints in the ISTS mentioned in the report have already been planned and many of these are under implementation.

13.8 Chairperson, CEA asked all the STUs and CTU to complete the transmission schemes as highlighted in the POSOCO operational feedback report, on priority.

#### **14.0 Constraint in evacuation of power from Srisaillam PSS HEP**

14.1 During the discussion on operational feedback, the constraint in the Srisaillam – Kurnool transmission line was also highlighted. Some solutions like re-conductoring with HTLS, explore possibility of additional bays at generation switchyard, replacing the S/C line with D/C line & bunching of circuits if additional bays are not available at Srisaillam etc were suggested.

14.2 It was agreed that studies/analysis to resolve the constraint in Srisaillam transmission system would also be taken-up during the proposed joint studies for Rayalseema area as mentioned above.

#### **15.0 Installation of reactors at certain 400kCV Substations by APTRANSCO**

15.1 Director(SP&PA), CEA stated that APTRANSCO had proposed the installation of 125MVAR reactors at Vemagiri, Mamadipalli, Gajwel Malkaram , Kurnool and 80 MVAR reactors at Kalpakka, Sankrapalli, Mahboobnagar substations in order to avoid line trippings in 400kV transmission lines.

15.2 DGM, POWERGRID opined that looking into persistent high voltages in these areas it would be better to provide all reactors of 125 MVAR capacity.

15.3 After deliberations it was agreed that APTRANSCO would install 125 MVAR reactors at each of the eight(8) substations viz (i)Vemagiri (ii)Mamadipalli (iii)Gajwel (iv)Malkaram (v)Kurnool (vi)Kalpakka (vii)Sankrapalli and (viii)Mahboobnagar.

#### **16.0 Provision of Bus Reactor for controlling high voltages**

16.1 Director (SP&PA),CEA stated that POWERGRID has proposed the installation of 1x125 MVAR bus reactor each at (i)Gooty, (ii)Kaiga, (iii) Hassan, (iv)Khammam, (v) Malkaram, (vi) Gajwel, (vii)Narendra(New), (viii)Trivendrum and 2x63 MVAR bus reactors at (ix)Yelahanka substation due to persistent high voltage problem in these areas. Out of these, APTRANSCO has already agreed to provide reactors at Gajwel and Malkaram.

16.2 ACE, NPCIL said that they have already installed 1x63 MVAR reactor at Kaiga as suggested earlier. The voltage problem is due to the fact that KPTCL has not installed the reactor at Davangere bus which is now long due. He also said that there is now no space in the switchyard to accommodate additional reactor.

16.3 After discussion following was agreed:

- (a) PGCIL to provide 1x125 MVAR reactors at – (i)Gooty, (ii) Hassan, (iii)Khammam, (iv)Narendra(New), (v)Trivendrum and Nellore(existing)
- (b) PGCIL to provide 2x63 MVAR reactors at Yelahanka
- (c) 2x80 MVAR switchable line reactors at Nellore Poling station for Nellore (Pooling station) – Gooty 400 kV Quad D/c line
- (d) Possibility to provide additional reactor at Kaiga / replace the 63 MVAR with 125 MVAR by using the 63 MVAR as regional spare would be explored
- (d) Request KPTCL to expedite provision of reactor at Davangere

**17.0 Development of Analytics as part of Unified Real Time Dynamic State Measurement (URTDSM) scheme**

17.1 Director(SP&PA), CEA stated that implementation of URTDSM scheme was agreed in the Joint Meeting of all the Regional Standing Committees on Power System Planning held on 5th Mar’12 as system strengthening. It consists of installation of Phasor Measurement Unit(PMU) at existing intra-state, ISTS and IPP stations and lines at 400kV and above including that coming up by 2014-15, generation switchyard at 220kV and above, Phasor Data Concentrator(PDC) at all SLDC, RLDC & NLDC along with OPGW communication links. Analytics for utilizing PMU data were proposed to be developed in parallel in association with premier academic institutions like IITs and CTU,STU,POSOCO, RPC & CEA.

17.2 CM(STF-Smart Grid), POWERGRID made the presentation and informed that development of analytics have been undertaken with IIT-B and NIT for URTDSM has been issued. The technical bid has been opened. The analytics to be developed in parallel with implementation of the URTDSM scheme, there objective and time frame is listed below:

S.No	Analytics	Objective	Timeline
1	Line Parameter Estimation	Estimate & Validate transmission line parameter	February 2014
2	On line vulnerability analysis of distance relays	Development of software for validating distance relay characteristic in real time basis by superimposing on field setting of distance relays	February 2014
3	Linear State Estimator	Development of 3-phase linear state estimator	August 2014
4	Supervised Zone-3 distance protection scheme to prevent unwanted tripping	The analytics will provide adaptive Zone-3 backup protection to avoid unwanted Zone-3 tripping	February 2015

S.No	Analytics	Objective	Timeline
5	CT/CVT Calibration	This module will evaluate the accuracy of these instruments	May 2015
6	Control Schemes for improving system security (Based on angular, voltage & frequency stability )	Based on the analysis of the evolving trajectories a decision on whether to take an automatic control action and its quantum & location shall be taken by such a scheme.	January 2016

17.3 Members appreciated the efforts being made by POWERGRID and requested to give updates time to time on the developments.

### **18.0 Provision of Transformation capacity at Madurai.**

18.1 Director(SP&PA), CEA stated that transformers at Madurai had been reported high loading specially during high wind conditions. The above issue was deliberated during the special TCC meeting held at Bengaluru on 24<sup>th</sup> June, 2013. To address the overloading of transformers, it is proposed to provide additional 1x500 MVA 400/220 kV transformer at Madurai.

18.2 Members agreed.

### **19.0 Provision of Spare 765/400 kV Transformers in Southern Region.**

19.1 COO(CTU), PGCIL stated that to cater to the increasing load demand and import requirement Southern Region is going to have substantial 765 kV grid. In the near future 7 nos. of 765 kV substations are likely to be available which include Nellore pooling station, Raichur, Kurnool, Tiruvallem, Srikakulam, Vemagiri & Hyderabad. Further, in the present meeting 3 more new 765/400 kV stations are proposed at Chilakluripeta, Cudddapha, Nizamabad. 765 kV system are bulk capacity systems which shall have very adverse effects incase of outage of 765/400 kV transformers requiring long time for repair and replacement. Therefore, POWERGRID had proposed to procure 2 number of 500 MVA transformers as spare and kept at suitable location to meet any exigencies at the earliest.

19.2 After discussion, the proposal of procurement of 2 number of single phase 500 MVA transformer units as spare was agreed.

19.3 It was also agreed that CEA would formulate a policy for requirement of spare transformers in consultation with CTU and RPCs and same would be discussed in next meeting of the Standing Committees.

## **20.0 Installation of line reactors for Narendra - Madhugiri 765kV D/C line (initially at 400kV level)**

- 20.1 DGM(CTU), POWERGRID proposed to provide line reactors of 63MVAR both at the sending end and the receiving end of Narendra - Madhugiri 765kV D/C line (initially at 400kV level) to control the over voltages during the charging of the line. Also POWERGRID had proposed to provide NGRs on line reactors for the above line to limit the secondary arc current for successful single pole auto re-closure.
- 20.2 Members agreed to the proposal.

## **21.0 Contingency Plan for evacuation of Power from ILFS (2x600 MW).**

- 21.1 Director(SP&PA),CEA stated that due to delay in commencement of work for Nagapatinam - Salem 765kV S/C line & Salem - Madhugiri 765kV S/c line on the 765kV lines by PNMTL, CERC has directed POWERGRID to submit the contingency plan of action to evacuate the power from ILFS project.
- 21.2 DGM(CTU), POWERGRID explained that they have carried out the load flow studies for contingency plan for ILFS and found that LILO of both the circuits of Neyveli - Trichy 400kV D/C line at Nagapatinam pooling station shall provide additional reliability and give advantages in some cases for evacuation of power to the extent margins available in grid. LTA granted to ILFS shall be effective only on commissioning of transmission system being implemented under TBCB till such time the power may be transferred by availing short term/ medium term open access to the extent margins available in grid.
- 21.3 It was informed that because of the urgency of the evolving contingency plan in view of delay of main transmission system and after analyzing the studies furnished by the POWERGRID, CEA vide their letter 51/4/2013-SP&PA/467 dated 23-08-2013 has given the in-principle approval to the above proposal.
- 21.4 CEO(POSOCO) opined that LILO of only one circuit Neyveli - Trichy 400kV D/C line shall be sufficient to provide start up power to the plant as well as evacuation of some power to the extent margins available in grid.
- 21.5 ED(SRLDC), POSOCO said that Neyveli - S P Budur line always remains overloaded and allowing ILFS to evacuate the power would further increase the overloading.
- 21.6 It was explained that with contingency arrangement of LILO of 2<sup>nd</sup> circuit (LILO of 1<sup>st</sup> circuit already under implementation), the power injection of Neyveli or any other existing project in vicinity shall not be made to affect. Based on joint studies to be carried out by CEA, CTU and SRLDC the quantum of power injection shall be worked out before hand so as not to hamper grid security.

21.7 The matter was deliberated and following was agreed:

- (a) LILO of 2<sup>nd</sup> circuit of Neyveli - Trichy 400kV D/C line (LILO of 1<sup>st</sup> circuit already under implementation) would be carried out at Nagapatnam pooling station as contingency plan, by CTU.
- (b) Strengthening of Neyveli TS-II to Neyveli TS-I expansion link with higher capacity conductor as contingency plan, by CTU.
- (c) ILFS would be allowed to evacuate through these lines only if there are margins available in the grid.

21.8 Chairperson, CEA asked POWERGRID to complete the evacuation system for ILFS generation project i.e. Nagapatinam - Salem 765kV S/C line and Salem - Madhugiri 765kV S/c line at the earliest through their transmission company that has been awarded this project.

## **22.0 “System Strengthening in SR for import of power from ER” - being implemented through TBCB route:**

22.1 Director(SP&PA),CEA stated that the scheme ‘System Strengthening in SR for import of power from ER’ inter-alia involves 400kV Khammam Pooling Station - Nagarjuna Sagar S/Stn D/C line. Due to delay in the commissioning of Khammam Pooling Station, the termination of above line has been modified to Khammam (existing) substation. CEA had conveyed the in-principle approval for the modification i.e. 400kV Khammam (existing) - Nagarjuna Sagar S/Stn D/C line instead of 400kV Khammam Pooling Station - Nagarjuna Sagar S/Stn D/C line.

22.2 Members agreed for the above change in termination point.

## **23.0 Transmission System associated with Kudankulam APP :**

23.1 DGM(CTU), PGCIL informed that and the Kudankulam APP transmission system inter-alia comprise of Kudankulam - Tirunelveli 400kV Quad 2xD/c lines, and any untoward incidence at Tirunelveli substation shall have adverse effect on the safe operation of Kudankulam APP. For Kudankulam - 3 & 4, 400 kV Quad D/c line to Tuticorin Pooling station and suitable rearrangement at Kudankulam generation switchyard was agreed.

23.2 POWERGRID proposed the following:

- (i) Turicorin Pooling station – Tirunelveli section of the agreed Turicorin Pooling station – Kudankulam 400 kV Quad D/c line may be constructed ahead of Kudankulam – 3 & 4 and one of the existing Kudankulam – Tirunelveli 400 kV Quad D/c may be connected to the same making Kudankulam – Turicorin Pooling station 400kV Quad D/c line. This arrangement shall



facilitate two termination points viz. Tirunelveli & Tuticorin Pooling station for evacuation of power from Kudankulam – 1 & 2 and shall avoid operational difficulties in case of any bus fault at either Tirunelveli or Tuticorin pooling stations.

- (ii) Interim arrangement: As the above scope includes construction of about 100 km of transmission line and the Kudankulam APP – 1&2 units are ready for commissioning, therefore, an interim arrangement for safe operation in case of any untoward incidence at Tirunelveli substation is needed. In this regard it may be mentioned that, one 400 kV circuit from Kudankulam and one 400kV circuit from Madurai are terminating in the same diameter at Tirunelveli substation and therefore, through opening of two main breakers & keeping tie breaker in closed position in normal condition shall provide the required bypass arrangement. By this arrangement, 3 nos. of 400kV circuits from Kudankulam shall be terminated at Tirunelveli, however one 400kV circuit shall be going to Madurai and provide two different termination points. This shall ensure that even with both the main busses out of service at Tirunelveli, the evacuation of Kudankulam APP is not affected.

23.3 Director(SP&PA),CEA informed that in view of urgency for the interim arrangement, CEA has already agreed in principle for the interim arrangement.

23.4 Members agreed for both of the above proposals.

#### **24.0 Mangalore (UPCL) – Kasargode - Kozhikode 400 kV link**

24.1 Director(SP&PA),CEA stated that the scheme 'Mangalore (UPCL) – Kasargode - Kozhikode 400 kV line' was approved in the 35<sup>th</sup> meeting of the Standing Committee on Power System Planning Southern Region held on 04.01.2013 for implementation through tariff based competitive bidding (TBCB). Subsequently, the scheme was put up before the Empowered Committee on Transmission in its 31st meeting held on 18.02.2013 for recommending it to the Government for implementation through TBCB. During the discussions, POWEGRID pointed out that there is a severe Right-of-Way (RoW) problem in the area and requested the co-operation of Kerala govt. in the implementation of the scheme. It was also informed that as per the current practice in other parts of the country, the compensation only for the tower footing should be paid, as otherwise the scheme would become unviable in case the compensation is sought for the land covered by the shadow of the conductors. Accordingly, the Empowered Committee has recommended the Scheme for implementation through TBCB subject to obtaining (i) commitment from Kerala govt. for compensation only for Right-of-Way for the tower footing area; and (ii) commitment from UPCL to provide two no. of 400 kV bays at Mangalore (UPCL) switchyard.

- 24.2 With regard to the issue of RoW, the Kerala State Government has committed to vide their letter no. 2625/ C2/ 2013/ PD dated 22.06.2013 to pay for land compensation only for right-of-way only for the tower footing area, instead of the entire corridor, as proposed by KSEB.
- 24.3 With regard to space availability at their Sub-station, UPCL informed vide their letter no: UPCL/B23/2013/7332 dated 26.07.2013 that they have no surplus land available to erect the 2 no. of 400kV bays as desired. Further, as per the provisions of the Power Purchase Agreement entered into with the buyers, UPCL stated that any additional expenditure that it may incur on account of the maintenance of the above bays needs to be approved by them. Therefore, UPCL have requested to take up this with Karnataka Power Transmission Corporation Ltd. (KPTCL), who is the nodal agency for power transmission.
- 24.4 As no representative of KPTCL were present in the meeting so it was decided to convene a separate meeting with KPTCL along with UPCL to resolve the issue.
- 24.5 Chairperson, CEA said that the proposed ISTS line was important for SR grid and for supplying power to northern part of Kerala, so all efforts should be made to realize this line.

#### **25.0 Dynamic Compensation in SR:**

- 25.1 Director(SP&PA),CEA stated that in the 35<sup>th</sup> standing committee meeting of SR Static VAr Compensators (SVC) / STATCOMs of  $\pm 400$  MVAR was agreed at three (3) locations i.e. Hyderabad (PG), Udumalpet and Trichy. It was also agreed that the choice of SVCs / STATCOMs would be evaluated through relevant studies for technology selection. Further analysis had been carried out in order to finalise the technology, size etc which would be suitable to Indian Grid conditions.
- 25.2 COO(CTU), PGCIL said that a series of meetings/discussions with various manufacturers and utilities were undertaken by POWERGRID in order to get the insight of the technology along with their opinion/feedback. To further assist on the above, Dr. Narain G. Hingorani, a consultant of International repute in the field of HVDC, FACTS, Power Electronics, Power Systems and T&D was appointed. After studies and discussions the conclusions arrived at were:
- (i) For dynamic compensation, STATCOM is preferred over SVCs in view of its faster response, requirement of less space and above all its state-of-the-art technology.
  - (ii) The STATCOMs may be combined with mechanically switched Reactors & Capacitors controlled by STATCOM controller.

- (iii) The STATCOM would be primarily for dynamic compensation while the mechanically switched reactors / capacitors would be for reactive compensation under steady state

25.3 The matter was discussed by the SCPSPSR and it was agreed to provide STATCOMs with Mechanically Controlled Reactor & Capacitors to meet the dynamic reactive compensation requirements at following Southern Region sub-stations:

Sl. No.	Location	SC MVA GVA / KA	Dynamic Compensation (STATCOM)	Mechanically Switched Compensation (MVAR)	
				Reactor	Capacitor
1.	Hyderabad (PG)	18.4 / 26.5	± 200 MVAR	2 x 125	1 x 125
2.	Udumalpet	19.4 / 28.0	± 200 MVAR	2 x 125	1 x 125
3.	Trichy	12.5 / 18.0	± 200 MVAR	2 x 125	1 x 125

## 26.0 Dropping of Hosur-Electronic City Line

26.1 COO(CTU), PGCIL said that the Hosur – Electronic City 400kV D/c line was agreed in 28<sup>th</sup> Standing Committee meeting held on 15.06.2009 and further discussed in the 13<sup>th</sup> & 14<sup>th</sup> SRPC meetings held on 11.05.2010 & 27.08.2010 respectively as regional system strengthening scheme to take-up by POWERGRID. However, after assessing various alternatives for the construction of the line, in association with KPTCL, owing to the severe ROW issues, it was found that the same is not feasible. The same was informed to SRPC in the 20<sup>th</sup>, 21<sup>st</sup> & 22<sup>nd</sup> SRPC meetings held on 28.09.2012, 02.02.2013 & 18.05.2013 respectively for dropping the project. During SRPC it was suggested that the same may be taken up in the Standing Committee.

26.2 The matter was discussed and it was agreed to drop the Hosur – Electronic City 400kV D/c line in view of the severe ROW issues.

## 27.0 Requirement of additional Man-lift for maintenance in the Valve halls of ±500kV Talcher-Kolar HVDC Bi-pole

27.1 CM, POWERGRID informed that due to high demand in the Southern Region, ±500kV Talcher-Kolar HVDC Bi-pole link is being operated at 2500MW for ten (10) hours in a day during peak demand in Southern States and at more than 2000MW for considerable period in a year. In view of such high loading pattern, it becomes difficult for obtaining sanction of outage from SRLDC for maintenance of Valve hall equipment. Even at times it becomes difficult to carry out all

maintenance functionalities within the Valve hall during the approved outage duration, with only one (1) available man-lift at both Talcher and Kolar terminals. In view of such squeezed duration of outage as approved by SRLDC it is suggested that one(1) more man-lift be procured for both Talcher and Kolar ends to minimize the outage duration. The availability of two(2) man lifts at both the stations shall facilitate maintenance of Valve hall equipment simultaneously at both the valve halls at Talcher and Kolar during bipole outage.

27.2 After deliberations members agreed for procurement of one(1) more man-lift for both Talcher and Kolar ends.

## 28.0 System in respect of Connectivity/LTA applications and related issues

28.1 The connectivity/LTA applications and related issues were discussed in the 16th meeting of SR constituents regarding LTA and Connectivity applications in SR. Minutes of the meeting as issued by POWERGRID are given at Annex-III.

28.2 Regarding the connectivity applications from wind power projects in Andhra Pradesh and Tamil Nadu, received by CTU, it was decided that following transmission system may be required:

28.3 For connectivity to wind generation projects in Tirunelveli area:

### Common Transmission system for Connectivity

1. Establishment of 400/220/132kV new pooling station in Tirunelveli area, Tamil Nadu
2. Tirunelveli pooling station – Tuticorin pooling station 400 kV Quad 2xD/c lines
3. Charging of Tuticorin – Salem & Salem – Madhugiri 765kV lines & substations at its rated voltage 765 kV level

### Proposed Transmission system for Connectivity

Sl. No	Applicant	Location	Connectivity for (MW)	Connectivity System
1.	Mytrah Energy (India) Ltd	Tirunelveli Dist., Tamil Nadu	300	Mytrah wind farms – Tirunelveli PS 230kV D/c line
2.	Samimeru Windfarms Private Limited **	Tirunelveli Dist., Tamil Nadu	48.5	Samimeru wind farms – Tirunelveli PS 230 kV D/c line
3.	SISL Green Infra Limited **	Tirunelveli Dist., Tamil Nadu	48.5	
4.	Samiran Udaipur Wind farms Limited **	Tirunelveli Dist., Tamil Nadu	48.5	
5.	Shivam Filaments Private Limited **	Tirunelveli Dist., Tamil Nadu	48.5	
6.	R.S. India Global Energy Limited	Tirunelveli Dist., Tamil Nadu	270	RS India wind farms – Tirunelveli PS 230kV D/c line
7.	Suzlon Power Infrastructure Limited	Tirunelveli Dist., Tamil Nadu	1000	Suzlon wind farms – Tirunelveli PS 400kV D/c line
	<b>Total</b>		<b>1764</b>	

**\*\* Note – M/s Samimeru Windfarms Pvt. Ltd. shall be the lead generator for connectivity applications of wind generators mentioned in table at Sl. No. 2 – 5.**

28.4 For connectivity to wind generation projects in Coimbatore area of Tamil Nadu

Sl. No	Applicant	Location	Connectivity for (MW)	Connectivity System
1.	Suzlon Power Infrastructure Limited	Coimbatore Dist., T.Nadu	200	Suzlon switchyard –Pugalur 230 kV D/c line
2.	Vestas Wind Technology India Private Limited	Coimbatore and Tirupur Districts	150	Vestas wind farms – Udumalpet 230kV D/c line
	<b>Total</b>		<b>350</b>	

28.5 For connectivity to wind generation projects in Anantpur area of Andhra Pradesh

Sl. No	Applicant	Location	Connectivity for (MW)	Connectivity System
1.	Suzlon Power Infrastructure Limited	Anantpur Dist., Andhra Pradesh	300	Suzlon wind farms – Gooty 230kV D/c line

28.6 It was also decided that after the Wind developers apply for LTA as per the CERC Regulations, 2009, for at least 25% quantum of their installed capacity, connectivity and LTA shall be granted and transmission system shall be taken up for implementation.

**29.0 Meeting ended with vote of thanks.**

----- X ----- X ----- X -----

**List of participants of the 36<sup>th</sup> Meeting of Southern Region held on 04.09.2013 at NRPC, Katwaria Sarai, New Delhi.**

**Sl. No. Name and Organization Designation**

**Central Electricity Authority (CEA)**

1.	Ravinder	Chairperson & Member(PS)
2.	K. K.Arya	Chief Engineer(SP&PA)
3.	Pardeep Jindal	Director (SP&PA)
4.	Chandra Prakash	Dy. Director(SP&PA)
5.	Manjari Chaturvedi	Dy. Director(SP&PA)
6.	NRK Prasad	Dy. Director(SP&PA)
7.	Santosh Kumar	Dy. Director(SP&PA)

**Southern Region Power Committee (SRPC)**

8.	S R Bhat	Member Secretary I/c
9.	Anil	Executive Engineer

**Power Grid Corporation of India Limited (POWERGRID)**

10.	Y K Sehgal	COO(CTU)
11.	N. K. Jain	GM(CTU)
12.	Dilip Rozekar	DGM(CTU)
13.	A. Sensaram	DGM(CTU)
14.	Vineeta Agarwal	CM(STF-Smart Grid)
15.	Anil Kumar Meena	DCDE(CTU)
16.	Nageswar Rao	Sr. Engineer(CTU)
17.	Shruti Jiwani	Engineer
18.	G. Venkatesh	Engineer
19.	Ankush Patel	ET(CTU)

**Power System Operation Corporation Limited (POSOCO)**

20.	S.K. Soonee	CEO, POSOCO
21.	P. Raghuram	ED, SRLDC
22.	S. R. Narsimhan	DGM, NLDC
23.	S P Kumar	Chief Manager, SRLDC
24.	Madhukar G.	Sr. Engineer, SRLDC

**NTPC Limited (NTPC)**

25.	S. S. Mishra	AGM (Engg-Electrical)
26.	Shilpa Agarwal	Manager (Engg-Electrical)

**Nuclear Power Corporation of India Limited (NPCIL)**

27. Sandeep Sarwate ACE (Tr.)

**Transmission Corp. of Andhra Pradesh Ltd. (APTRANSCO)**

28. Mohd. Anwaruddin Director, GO  
29. M. Jayachandra CE(PS)  
30. C V Subba Rao SE (SP)  
31. V V Ramana Murthy DE/System Studies

**Kerala State Electricity Board (KSEB)**

32. K.V. Nair Member (Trans. & Sys. Operations)  
33. G Sreenivasan Resident Engineer

**Tamil Nadu Electricity Board (TNEB) / TANGEDCO/TANTRANSCO**

34. S Akshaya Kumar Dir / Tran.Projects (TANTRANSCO)  
35. S. Balaguru Chief Engineer/Planning (TANGEDCO)  
36. R. Santhana Kumar EE/ System Studies (TANGEDCO)  
37. R. Kumutha AEE/ System Studies (TANGEDCO)

**Electricity Department Pudduchery**

38. K Mathivanan Superintending Engineer  
39. T Gopalakrishnan Executive Engineer

**ANDHRA PRADESH**  
Amount = 2585 Rs. Crore

**A: 400kV Hindupur Substation:**

Sl. No.	Description of Line/ Substation	Length/ Capacity	Unit	Estimated Cost (Rs. Lac)
1	400/220kV Substation at Hindupur - 3 Nos. 315 MVA PTRs	3x315	MVA	11,422.90
2	80 MVAR Bus Rector	1	No.	965.00
3	400kV DC Quad Moose Line from Hindupur SS to 400kV Uravakonda SS	130	km	31,200.00
4	220kV DC Moose Line from 400kV Hindupur SS to 220kV Penukonda SS	50	km	3,492.00
5	220/132 kV Substations at Penukonda	2x100	MVA	1,961.43
6	220kV DC Twin Moose line from 400kV Hindupur SS to 220kV Pampanur Tanda SS	90	km	10,701.00
7	220/132 kV Substation at Pampanur Tanda	2x100	MVA	2,108.14
<b>Sub-Total(A):</b>				<b>61,850</b>

**B:400kV Jammalamadugu Substation:**

Sl. No.	Description of Line/ Substation	Length/ Capacity	Unit	Estimated Cost (Rs. Lac)
1	400/220/132kV Substation at Jammalamadugu	4x315 & 2X160	MVA	14,949.13 (LOI issued)
2	400kV Quad Bay Extensions at Kurnool 400kV Substation	2	Nos.	1,518.80 (LOI issued)
3	80 MVAR Bus Rector	1	No.	965.00 (LOI issued)
4	400kV DC Quad Moose Line from 400kV Jammalamadugu to 400kV Kurnool SS	125	km	30,000.00
5	400kV DC Quad Moose Line from 400kV Jammalamadugu to 400kV Uravakonda SS	110.00	km	26,400.00
6	220kV DC Moose line from 400kV Jammalamadugu SS to 220kV Tirumalaipally SS	17	km	1,187.28 (LOI issued)
7	220/132 kV Substation at Tirumalaipally	2x160	MVA	2,385.65



				(LOI issued)
8	220kV DC Moose line from 400kV Jammalamadugu SS to 220kV Betamcherla	68	km	4,749.12
9	220/132/33 kV Substation at Betamcherla	2x100& 2x31.5	MVA	2,704.51
10	220kV DC Moose line from 400kV Jammalamadugu SS to 220kV Chakrayapet SS	70	km	4,888.80
11	220/132/33 kV Substation at Chakrayapet	2x100 & 2x31.5	MVA	2,535.09
12	220kV DC Moose line from 400kV Jammalamadugu SS to 220kV Porumamilla SS	75	km	5,238.00
13	220/132 kV Substation at Porumamilla	2x100	MVA	1,906.26
<b>Sub-Total (B):</b>				<b>99,427</b>

**C:400kV Uravakonda Substation:**

Sl. No.	Description of Line/ Substation	Length/ Capacity	Unit	Estimated Cost (Rs. Lac)
1	400/220kV Substation at Uravakonda	4x315	MVA	14,225.91 (LOI issued)
2	400kV Quad Bay Extensions at Mahaboobnagar 400kV Substation	2	Nos.	1,943.35
3	80 MVAR Bus Rector	1	No.	965.00 (LOI issued)
4	400kV DC Quad Moose line from 400kV Uravakonda SS to 400kV Mahaboobnagar SS	190	km	45600.00
5	220kV DC Twin Moose line from 400kV Uravakonda SS to 220kV Vajrakarur SS	13	km	1545.70 (LOI issued)
6	220/132 kV Substation at Vajrakarur	1x100	MVA	1,555.16 (LOI issued)
7	220kV DC Twin Moose line from 400kV Uravakonda SS to 220kV Borampalli SS	68	km	8,085.20 (LOI issued)
8	220/132 kV Substation at Borrampalli	1x100	MVA	1,555.16
<b>Sub-Total (C):</b>				<b>75,475</b>

**D: 220kV Interconnectivities:**

Sl. No.	Description of Line/ Substation	Length/ Capacity	Unit	Estimated Cost (Rs. Lac)
1	220kV DC Moose line from 400kV Hindupur SS to 220kV Hindupur Substation	20	km	1,396.80
2	220kV DC Moose line from 400kV	50	km	3,492.00

	Uravakonda SS to 220kV KalyanDurg SS			(LOI issued)
3	LILO of both the circuits of 220kV DC Moose line from 400kV Uravakonda SS to 220kV KalyanDurg SS at 220kV Borampalli SS	10	km	1,396.80
4	220kV DC Moose line from 400kV Jammalamadugu SS to 220kV Tadipatri SS	40	km	2,793.60
5	220kV Bay Extensions at 220kV Hindupur Substation	2	Nos.	221.90
6	220kV Bay Extensions at 220kV Kalyandurg Substation	2	Nos.	221.90 (LOI issued)
7	220kV Bay Extensions at 220kV Tadipatri Substation	2	Nos.	221.90
<b>Sub-Total(D):</b>				<b>9,745</b>

**E: 132 kV Interconnectivities:**

Sl. No.	Description of Line/ Substation	Length/ Capacity	Unit	Estimated Cost (Rs. Lac)
1	132 kV DC line from 220/132 kV Penukonda SS to 132/33 kV Penukonda SS	10	km	441.70
2	132 kV DC line from 220/132 kV Jammalamadugu SS to 132/33 kV Jammalamadugu SS	12	km	530.04
3	132 kV DC line from 220/132kV Porumamilla SS to 132/33 kV Porumamilla SS	10	km	441.70
4	132 kV Bay Extensions at 132/33 kV Penukonda Substation	2	Nos.	132.80
5	132 kV Bay Extensions at 132/33 kV Jammalamadugu Substation	2	Nos.	132.80
6	132 kV Bay Extensions at 132/33 kV Porumamilla Substation	2	Nos.	132.80
<b>Sub-Total(E):</b>				<b>1,812</b>

<b>F</b>	<b>Communication Equipment Cost for 400 kV, 220 kV, 132 kV Works - (Rs. Lac)</b>	<b>6270</b>
<b>G</b>	<b>Total (A+B+C+D+E+F) : (Rs. Crore)</b>	<b>2546</b>
<b>H</b>	<b>(Special T &amp; P + Contingencies + Estt. and other charges + Interest During Construction) -- in Rs. Crore</b>	<b>687</b>
<b>I</b>	<b>Grand Total (G+H) - (Rs. in Crores) :</b>	<b>3233</b>
<b>Final Total ( excluding works for which LOI has been issued) – (Rs. in Crores)</b>		<b>2585</b>

**KARNATAKA**

Amount = 527 Rs. Crore

**Intra State Transmission System strengthening for RE projects:**

Sl. No	Name of the Project	Line Length (ckm)	Approximate Cost (Crore Rs.)	Status for preparation of DPR
1	<p><b>Dhoni:</b> Establishment 2x500MVA, 400/220kV Station along with associated Transmission lines as noted below;</p> <p>a) By LILO'ing the existing S/C 400 KV line running between 400 KV station at Davanagere and Guddadahally.</p> <p>b) By LILO'ing the existing 220KV D/C line running between 220 KV station at Gadag and Lingapur to the proposed 400/220 KV station at Dhoni.</p>	<p>a) 52</p> <p>b) 6</p>	190	Line survey is under progress.
2	<p><b>Shivanasamudram:</b> Establishment 2x100MVA, 220/66kV Station along with associated Transmission lines noted below:</p> <p>a) By LILO'ing the existing 220 KV D/C line running between 220 KV stations at T.K.Hally and Madhuvinahally.</p> <p>b) Conversion of existing 220 kV Hootagally – Vajamangala – T.K. Halli S/C line to D/C line with Drake conductor – (associated transmission system strengthening)</p>	<p>a) 4</p> <p>b) 130</p>	80+39 = 119	Line survey to be taken up.
3	<p><b>Hosadurga:</b> Establishment 2x100MVA, 220/66kV Station along with associated Transmission lines noted below;</p> <p>a) By extending 220 KV D/C line from the existing 400/220 KV station at Hiriyur.</p>	84	60	Line survey to be taken up.
4	Running of 220kV D/C line between 220 KV stations at Gadag and		50	DPR ready.

	Bagalkote & LILO'ing of one of the existing 220kV D/C line running between 220 KV stations at Bidnal and Lingapur.	191.4		
5	Conversion of existing 220kV SC line to 220kV DC line running between 220 KV stations at Guttur and Chitradurga.	170	52.5	DPR ready.
6	Conversion of the existing 220kV SC line to 220kV DC line running between 220 KV stations at Chitradurga and Hiriyur together with running of 2 <sup>nd</sup> 220 KV S/C line between 400/220 KV & 220/66 KV stationa at Hiriyur.	120	27.5	DPR ready.
7	LILO'ing of one of the circuit of the existing 220KV DC line running between 220 KV stations at Narendra and Haveri to 220 KV station at Bidnal.	24	16	Line survey to be taken up.
8	Conversion of existing 66kV DC line equipped with 'Coyote ACSR' to 'Drake ACSR' between 66 KV station at <b>Sakalespura</b> and 220 KV station at <b>Hassan</b> .	72	12	DPR under preparation.
	<b>TOTAL (Rs. Crore)</b>		<b>527</b>	

**TAMIL NADU**

Amount = 3758 Rs. Crore

**(A) PHASE – I Works:****I.400 KV SUB STATIONS**

Sl. No	Name of 400 KV SS	Details of the Substation		Estimated cost (Rs. in Cr.)	Status of land acquisition	Remarks
		Transformer Capacity/ Reactor Details	Description of Bays and other works			
1	Thappugundu 400/110 KV in Theni area	1) 400/110kV, 200 MVA – 5 Nos  2) 400 KV 63 MVAR Reactor	1) 400kV Feeder Bays – 2 nos 2) 400kV Transformer Bays-4 nos 3) 400 KV Reactor bay – 1 No. 4) 110kV Feeder Bays- 8 nos 5) 110kV Transformer Bays-4 nos 6) Relay Panels, PLCC Equipments and SAS 7) Civil works in the sub station	109.00	Land available	Cost as per TANTRASCO Administrative approval dt.03.12.12 is Rs.93.11 crores. Variation in administrative approval cost is due to addition of 1 No. 200 MVA 400/110 KV Transformer with its associated equipments.
2	Anaikadavu 400/230-110 KV in Udumalpet area	1) 400/230kV, 315 MVA – 2 Nos  2) 400/110kV, 200 MVA – 2 Nos	1) 400kV Feeder Bays – 4 nos 2) 400kV Transformer Bays-5 nos 3) 230kV Feeder Bays- 6 nos 4) 230kV Transformer	142.00	Land available	Cost as per TANTRASCO Administrative approval

			<p>Bays-3 nos  5)110kV Feeder Bays- 4 nos  6) 110kV Transformer Bays-2 nos  7) Relay Panels, PLCC Equipments and SAS  8) Civil works in the sub station</p>			<p>dt.03.12.12 is Rs.124.00 crores. Variation in administrative approval cost is due to addition of 1 No. 200 MVA 400/110 KV Transformer with its associated equipments.</p>
3	Rasipalayam 400/230-110 in Udumalpet area	<p>1) 400/230kV, 315 MVA – 2 Nos  2) 400/110kV, 200 MVA – 2 Nos  3) 400 KV 63 MVAR Reactor – 1 No.</p>	<p>1) 400kV Feeder Bays – 8 nos  2) 400kV Transformer Bays-5 nos  3) 400 KV reactor bay – 1 No.  3) 230kV Feeder Bays- 4 nos  4) 230kV Transformer Bays-2 nos  5)110kV Feeder Bays- 5 nos  6) 110kV Transformer Bays-3 nos  7) Relay Panels, PLCC Equipments and SAS  8) Civil works in the sub station  9) 400 KV Bay provision at Salem (PGCIL) SS for Rasipalayam _ Salem 400 KV DC line.</p>	178.00	Land available	<p>Cost as per TANTRASCO Administrative approval dt.03.12.12</p>
4	Kanarpatty 400/230-110 KV in Tirunelveli area	<p>1) 400/230kV, 315 MVA – 2 Nos  2) 400/110kV, 200 MVA – 2 Nos</p>	<p>1) 400kV Feeder Bays – 4 nos  2) 400kV Transformer Bays-4 nos  3) 230kV Feeder Bays- 5 nos  4) 230kV Transformer</p>	130.00	Land available	<p>Cost as per TANTRASCO Administrative approval</p>

			Bays-2 nos 5)110kV Feeder Bays- 7 nos 6) 110kV Transformer Bays-2 nos 7) Relay Panels, PLCC Equipments and SAS 8) Civil works in the sub station			dt. 4.06.2007 is Rs.87.00 crores which is for 400/230k V SS. However, it is proposed to introduce 400/110k V ratio also Hence, the cost is revised. Data sheet is enclosed.
5	400 KV Bay provision at Udumalpet (PGCIL) 400 KV SS for LILO of one circuit of Thappagundu-Anikadavu 400 KV DC Line		1) 400 KV Feeder bays – 2 Nos.	12	--	
<b>TOTAL</b>				<b>571</b>		

**II.400 KV TRANSMISSION LINES:**

Sl. No	Name of 400 KV Line	Approx. Route Length (Km)	Rate per Km (Rs. In cr)	Estimated cost (Rs. in Cr.)	Remarks
1	Thappagundu- Anaikadavu 400 KV Twin DC	179	1.72	307.88	Cost as per TANTRANSCO Cost data for 2012-13
2	Anaikadavu- Rasipalayam 400 KV Twin DC	43	1.72	73.96	-do-
3	Rasipalayam - Salem/Dharmapuri (PGCIL SS) 400 KV Quad DC	171	2.64	451.44	-do-

4	Kanarpatti – Tirunelveli(PGCIL) 400 KV Quad DC	15	2.64	39.60	-do-
5	Kanarpatty – Kayathar 400 KV DC Twin line	12	1.72	20.64	-do-
6	LILO of one circuit of Thappagundu-Anikadavu 400 KV DC Line at Udumalpet (PGCIL) 400 KV SS	25	1.72	43.00	
	TOTAL			936.52 OR SAY <b>937.00</b>	

**Additional Proposals:**

**(B) PHASE - II Works:**

**I. 400 KV SUB STATIONS:**

Sl. No	Name of 400 KV SS	Details of the Substation		Estimat ed cost (Rs. in Cr.)	Status of land acquisition	Rema rks
		Transformer Capacity/ Reactor Details	Description of Bays and other works			
1	Thenampatty 400/230 KV in Tirunelveli area	1) 400/230kV, 315 MVA – 4 Nos	1) 400kV Feeder Bays – 4 nos 2) 400kV Transformer Bays-4 nos 3) 230kV Feeder Bays-8 nos 4) 230kV Transformer Bays-4 nos 5) Relay Panels, PLCC Equipments and SAS 6) Civil works in the sub station	135.00	Land to be finalise d	Cost break up enclosed.
2	Vagarai 400/230-110 KV in Udumalpet area	1) 400/230kV, 315 MVA – 4 Nos 2) 400/110kV, 200 MVA – 2 Nos	1) 400kV Feeder Bays – 4 nos 2) 400kV Transformer Bays-6 nos 3) 230kV Feeder Bays-8 nos 4) 230kV Transformer Bays-4 nos 5)110kV Feeder Bays- 6 nos 6) 110kV Transformer Bays-2 nos 7) Relay Panels, PLCC Equipments and SAS 8) Civil works in the sub station	180.00	Land to be finalise d	Cost break up enclosed



3	400 KV Bay provision at Kayathar, Koilpatty for Thenampatty 400 KV Line, Udumalpet for Vagarai line, Salem for Singarapet line, Singarapet for Rasipalayam and Salem Line 400 KV DC Line		1) 400 KV Feeder bays @ Kayathar for Thenampatty 400 KV Line - 2 Nos. 2) 400 KV Feeder bays @Koilpatty for Thenampatty 400 KV line- 2 Nos. 3) 400 KV Feeder bays @ Udumalpet for Vagarai 400 KV line - 2 Nos. 4) 400 KV Feeder bays @ Salem Singarapet 400 KV Line- 2 Nos. 5) 400 KV Feeder bays @ Singarapet for Rasipalayam & Salem 400 KV Line - 4 Nos. Total 400 KV bays - 12	72	--	
	<b>TOTAL</b>			<b>387</b>		

## **II. 400 KV TRANSMISSION LINES:**

Sl. No	Name of 400 KV Line	Approx. Route Length (Km)	Rate per Km (Rs. In cr)	Estimated cost (Rs. in Cr.)	Remarks
1	Thenampatty-Kayathar 400 KV Quad DC	30	2.64	79.2	Cost as per TANTRANSCO Cost data for 2012-13
2	Thenampatty-Koilpatty 400 KV Quad DC	40	2.64	105.6	-do-
3	Vagarai - Rasipalayam 400 KV Twin DC	100	1.72	172.2	-do-
4	Vagarai – Udumalpet (PGCIL) 400 KV Twin DC	40	1.72	68.8	-do-
5	Salem – Singarapet 400 KV DC Quad Line	90	2.64	237.6	-do-
6	Rasipalayam- Singarapet 400 KV DC Quad line	260	2.64	686.4	-do-
	<b>TOTAL</b>			1349.6 OR SAY <b>1350.00</b>	

**III. 230 KV TRANSMISSION LINES:**

Sl. No	Name of 230 KV Line	Approx. Route Length (Km)	Rate per Km (Rs. In cr)	Estimated cost (Rs. in Cr.)	Remarks
1	Kayathar – Tuticorin Auto 230 KV DC Line	15	0.8343	12.52	Cost as per TANTRANSCO Cost data for 2012-13
2	Veeranam-Tirunelveli 230 KV DC Line	55	0.8343	45.89	-do-
3	Veeranam- Kodikurichi 230 KV DC Line	10	0.8343	8.34	-do-
4	OK Mandapam- Thudiyalur 230 KV DC Line	28	0.8343	23.36	-do-
5	Ingur-Thiruppur 230 KV DC Line	20	0.8343	16.69	-do-
6	Arasur- MC patty 230 KV DC line	30	0.8343	25.03	-do-
7	Arasur- Thiruppur 230 KV DC line	20	0.8343	16.69	-do-
8	Sembatti-Madurai 230 KV DC line	40	0.8343	33.37	-do-
9	Cuddalore- Neyveli 230 KV DC line	40	0.8343	33.37	-do-
10	Villupuram - Neyveli 230 KV DC line	57	0.8343	47.56	-do-
11	Neyveli- SP Koil 230 KV DC line	130	0.8343	108.5	-do-
	<b>TOTAL</b>			<b>371.32 OR SAY 370.00</b>	

**IV. 230 KV BAY EXTENSION:**

Sl. No	Name of 400 KV SS	Details of the bay provision	Description of Bays and other works	Estimated cost (Rs. in Cr.)
1	230 KV Bay provision at the respective Sub stations for termination of the above 11 Nos. 230 KV DC Lines	11 x 4 bays	Provision of 44 Nos. 230 KV line bays @ Rs.2.35 crores per bay	103.40
<b>TOTAL</b>				<b>103.4 or say Rs.103 Crores</b>

**V. AUGMENTATION OF 230/110KV TRANSFORMATION CAPACITY :**

SL.NO	NAME OF THE SS	AUGUMENTATION	AMOUNT IN CRORES
1	Sembatty SS	2X100 MVA	6
2	Anupankulam SS	2X100 MVA	6
3	Cuddalore SS	2X100 MVA	6
4	Pudhukottai SS	2X150 MVA	8
5	Tiruvanamalai SS	2X150MVA	8
6	Villupuram SS	2X100MVA	6
<b>TOTAL</b>			<b>40 Crores</b>

पावर ग्रिड कारपोरेशन ऑफ इंडिया लिमिटेड  
(भारत सरकार का उद्यम)

POWER GRID CORPORATION OF INDIA LIMITED  
(A Government of India Enterprise)



केन्द्रीय कार्यालय: "सौदामिनी" प्लॉट सं० 2, सेक्टर-29, गुडगाँव-122 001, हरियाणा  
फोन : 0124-2571700-719 फैक्स : 0124-2571760, 2571761 तार 'नेटग्रिड'  
Corporate Office : "Saudamini" Plot No.2, Sector-29, Gurgaon-122 001. Haryana  
Tel.: 0124-2571700-719 Fax: 0124-2571760, 2571761 Gram : 'NATGRID'

संदर्भ संख्या/Ref. No.

C/CTU/S/LTA-Meeting

25<sup>th</sup> September 2013

**As per Distribution List**

**Sub: 16<sup>th</sup> meeting of Southern Region constituents regarding LTA and Connectivity applications in Southern Region - Minutes of the meeting**

Dear Sir,

Please find enclosed the Minutes of 16<sup>th</sup> meeting of Southern Region constituents regarding LTA and Connectivity applications in Southern Region held on 4<sup>th</sup> September, 2013 at NRPC Office, New Delhi.

The minutes are also available at our website [www.powergridindia.com](http://www.powergridindia.com) >> Quick links >> LTOA.

Thanking You,

Yours faithfully

(Y K Sehgal)

Chief Operating Officer (CTU)

Copy to : CEO (POSOCO) / ED (Commercial) / ED (SRTS-I) / ED (SRTS-II)

Encl. : Minutes

## Distribution List – 1

<p><b>1. Member (PS)</b> Central Electricity Authority Sewa Bhawan, R.K.Puram, New Delhi-110 066. FAX : 011-26102045</p>	<p><b>2. Chief Engineer (SP &amp; PA)</b> Central Electricity Authority Sewa Bhawan, R.K.Puram, New Delhi-110 066. FAX : 011-26102045</p>
<p><b>3. Member Secretary</b> Southern Regional Power Committee 29, Race Course Cross Road Bangalore 560 009. FAX : 080-22259343</p>	<p><b>4. Director (Transmission)</b> Transmission Corp. of Andhra Pradesh Ltd. Vidyut Soudha Hyderabad – 500 082. FAX : 040-66665137</p>
<p><b>5. Member (Transmission)</b> Karnataka State Power Transmission Corp.Ltd. Cauvery Bhawan Bangalore 560 009. FAX : 080 -22228367</p>	<p><b>6. Member (Transmission)</b> Kerala State Electricity Board Vidyuthi Bhawanam, Pattom, P.B. No. 1028 Thiruvananthapuram – 695 004. FAX : 0471-2444738</p>
<p><b>7. Director (TANTRANSCO)</b> Tamil Nadu electricity Board (TNEB) 6<sup>th</sup> Floor, Eastern Wing, 800 Anna Salai, Chennai – 600 002. FAX : 044-28516362</p>	<p><b>8. Superintending Engineer –I</b> First Floor, Electricity Department Gingy Salai Puducherry – 605 001. FAX : 0413-2334277/2331556</p>
<p><b>9. Director (Power)</b> Corporate Office, Block – I Neyveli Lignite Corp. Ltd. Neyveli , Tamil Nadu – 607 801. FAX : 04142-252650</p>	<p><b>10. Director (Operations)</b> Nuclear Power Corporation of India Ltd., 12<sup>th</sup> Floor, Vikram Sarabhai Bhawan, Anushakti Nagar, Mumbai – 400 094. FAX : 022- 25991258</p>
<p><b>11. Director (Projects)</b> National Thermal Power Corp. Ltd. (NTPC) NTPC Bhawan, Core-7, Scope Complex Lodhi Road, New Delhi-110003. FAX-011-24360912</p>	

## **Distribution List – 2 (Connectivity/LTA Applicants)**

<p>1. <b>Shri B. Narasimha Rao</b>, Vice President (Projects) East Coast Energy Private Limited, #7-1-24, B Block, 5th Floor, Roxana Towers, Green Lands, Begumpet, Hyderabad- 500 016</p>	<p>2. <b>Sh. B. S. Rao</b> General Manager M/s NSL Nagapatnam Power and Infratech Private Limited NSL ICON, 4<sup>th</sup> Floor, # 8-2-684/2/A, Road No. 12, Banjara Hills, Hyderabad – 500 034</p>
<p>3. <b>Shri S N Barde</b> Executive Vice President GMR Rajahmundry Energy Limited 10<sup>th</sup> Floor, D Block, IBC Knowledge, Bannerghatta Road, Bangalore – 560 029</p>	<p>4. <b>Sh. V Chandramoleeswaran</b> Director Chettinad Power Corporation Private Limited 5<sup>th</sup> Floor, Rani Seethai Hall Building, 603 Anna Salai, Chennai – 600 006.</p>
<p>5. <b>Shri K S N Murthy</b> Vice President Samalkot Power Limited Camus Capri Apartments, 6-3-1090/A, Raj Bhavan Road, Somaijiguda Hyderabad - 500 082.</p>	<p>6. <b>Shri M Subramanyam</b> Business Head Sindya Power Generating Co. Pvt. Ltd. 2nd Floor, 77-Potti pati Plaza Nunganbakkam High Road, Nunganbakkam, Chennai – 600 034.</p>
<p>7. <b>Shri Rakesh Kumar Gupta</b> Chief Operating Officer Lanco Kondapalli Power Private Limited Plot #4, Software Units layout HITEC City, Madhapur Hyderabad – 500 081.</p>	<p>8. <b>Sh. B. S. Yadav</b> Chief Executive Officer M/s RS India Global Energy Limited 3<sup>rd</sup> Floor, GL Complex, Opp. Udyog Vihar (Dundahera), Old Delhi Gurgaon Road, Gurgaon-122016, Haryana</p>
<p>9. <b>Sh. Naresh Panchal</b> Head &amp; GM Suzlon Power Infrastructure Ltd. One Earth Opp. Magarpatta City , Hadapsar, Pune-411028, Maharashtra, India</p>	<p>10. <b>Sh. Naresh Panchal</b> Head &amp; GM Samimeru Windfarms Pvt. Ltd. One Earth Opp. Magarpatta City , Hadapsar, Pune-411028, Maharashtra, India</p>
<p>11. <b>Sh. C.R. Srinivas</b> Associate Vice President – Projects M/s Mytrah Energy (India) Ltd 8001, Q-City, S.No:109,Nanakramguda, Gachibowli, Hyderabad - 500032, India</p>	<p>12. <b>Sh. Venkatesan Rajagopalan</b> Deputy General Manager - Construction Vestas Wind Technology India Private Limited 298 Rajiv Gandhi Salai, Sholinganallur Chennai – 600119, India</p>
<p>13. <b>Sh. Akhil Agarwal</b> Associate Vice President IL&amp;FS Tamil Nadu Power Co. Ltd., C/o IL&amp;FS Energy Development Company Ltd 1<sup>st</sup>, Corporate Office Tower, Ambience Mall Complex, NH-8, Gurgaon – 122 001 Haryana</p>	

**Minutes of 16<sup>th</sup> Meeting of Southern Region constituents  
Regarding Long Term Access and Connectivity Applications in Southern Region  
held on 4<sup>th</sup> September, 2013 at NRPC Office, Katwaria Sarai, New Delhi.**

List of Participants is enclosed at **Annexure-I**.

**1.0** DGM (CTU), POWERGRID informed that the connectivity applications from 11 nos. of applicants were included in the agenda for grant of Connectivity including 8 nos. of earlier discussed applications from Wind developers and 4 nos. of new applications.

**1.1** Earlier Connectivity Applications from wind IPP developers:

Sl. No	Applicant	Time frame	Location	IC (MW)	Connectivity Sought for (MW)
1.	Mytrah Energy (India) Limited	Mar, 2013	Tirunelveli Dist., Tamil Nadu	300	300
2.	SISL Green Infra Limited **	Dec, 2012	Tirunelveli Dist., Tamil Nadu	48.5	48.5
3.	Samimeru Windfarms Private Limited **	Dec, 2012	Tirunelveli Dist., Tamil Nadu	48.5	48.5
4.	Samiran Udaipur Wind farms Limited **	Mar, 2013	Tirunelveli Dist., Tamil Nadu	48.5	48.5
5.	Shivam Filaments Private Limited **	Mar, 2013	Tirunelveli Dist., Tamil Nadu	48.5	48.5
6.	R.S. India Global Energy Limited	Mar, 2014	Tirunelveli Dist., Tamil Nadu	270	270
7.	Suzlon Power Infrastructure Limited	Mar, 2014	Tirunelveli Dist., Tamil Nadu	1000	850
8.	Suzlon Power Infrastructure Limited	Dec, 2012	Coimbatore Dist., Tamil Nadu	200	180
	<b>Total</b>			<b>1964</b>	<b>1794</b>

\*\* Note – M/s Samimeru Windfarms Pvt. Ltd. shall be the lead generator for connectivity applications of wind generators mentioned in table at Sl. No. 2 – 5.

**1.2** New Connectivity Applications from wind IPP developers:

Sl. No	Applicant	Time frame	Location	IC (MW)	Connectivity Sought for (MW)
9.	Vestas Wind Technology India Private Limited	Sept, 2014	Coimbatore and Tirupur Dist., TN	150	150
10.	Suzlon Power Infrastructure Limited	Mar, 2014	Anantpur Dist., Andhra Pradesh	300	270
	<b>Total</b>			<b>450</b>	<b>420</b>

**1.3** New Connectivity Application from IPP developers:

Sl. No	Applicant	Time frame	Location	IC (MW)	Connectivity Sought for (MW)
11.	IL&FS Tamil Nadu Power Company Ltd.	April, 2017	Cuddalore, Tamil Nadu	2400	2400
12.	East Coast Energy Private Ltd (ECEPL) (1320 MW)	June, 2015	Srikakulam, Andhra Pradesh	1320	1320
	<b>Total</b>			<b>3720</b>	<b>3720</b>

## **2.0 Grant of Connectivity to applicants for Wind generation project in SR**

2.1 The connectivity application from wind IPP developer were discussed in earlier meeting wherein it was suggested POWERGRID should seek necessary legal opinion whether these applicants are legal entities to apply for Connectivity as per the prevailing CERC regulations, as the present connectivity applicants may not remain the owner of the wind generation plant, once Connectivity is granted.

2.2 As per the decision POWERGRID sought the legal opinion and the observations are as given below:

*“It is a common practice of the Wind Developers transferring the generating stations to third parties after commissioning of the generating unit. There is nothing in law which prohibits them from effecting such transfer. Such transfers are done mostly of the shares of the generating company and not by sale of generating station as such.*

*In other words, a generating company is formed, the wind project is established in the generating station and thereafter the Promoters sell the shares to third parties. The connectivity under the Connectivity Regulations is given to a generating station and not necessarily to a company as a whole. In my opinion, there is no difficulty whatsoever in regard to the connectivity granted, if there is a change in the ownership of the shares or even when there is a change in the ownership of the generating station. While granting the approval for connectivity, Powergrid can specify that the connectivity is restricted to the generating station and will not be available for transfer to any other generating station or unit.*

*As regards the ownership change, Powergrid can provide in the approval that in case of change of ownership, the developer and the new owner shall file a declaration with Powergrid and the new owner shall be bound by all the terms and conditions of the approval granted for the connectivity.”*

2.3 The representative from Mytrah Energy (India) Ltd. informed that they fall under the IPP category and the ownership of the firm remains with Mytrah Energy (India) Ltd. even after commissioning of generating units and is responsible for payment of transmission charges. The representative of Suzlon Energy Ltd. informed that transferring of ownership after commission of each generating unit is a common practice in industry and the responsibility of payment of transmission charges, whatsoever, lies with new owner who may change from time to time.

2.4 COO (CTU) informed that these wind developers have not applied for LTA and the development of new transmission system for evacuation of power shall not take place without commitment for payment of transmission charges. He requested wind developers to apply for LTA at the earliest so that the required transmission system may be developed looking into the very short gestation period for Wind farms so that the power is not bottled-up.

2.5 Director (TANTRANSCO), informed that Tamil Nadu is not in position to absorb power from these wind generation firms and are supposed to transfer power to other states to meet their RPO obligations.

2.6 ED (SRLDC), POSOCO informed that wind generation is intermittent in nature and requires separate transmission system to integrate with grid and opined that reactive power requirement should also be addressed while evolving the transmission system so as to maintain voltage profile within operational limits of the grid.



- 2.7 Chairperson, CEA opined that without the commitment for payment of the transmission charges for common system, the connectivity cannot be granted without LTA as it will overload the grid unless the requisite transmission system is in place, therefore he requested all the wind developers to apply LTA for atleast 25% quantum of their installed capacity and sign requisite agreement for development of the transmission system.
- 2.8 The members decided that following transmission system shall be required for connectivity to wind generation projects in Tirunelveli area

**Common Transmission system for Connectivity**

1. Establishment of 400/220/132kV new pooling station in Tirunelveli area
2. Tirunelveli pooling station – Tuticorin pooling station 400 kV Quad 2xD/c lines
3. Charging of Tuticorin – Salem & Salem – Madhugiri 765kV lines & substations at its rated voltage 765 kV level

**Proposed Transmission system for Connectivity**

Sl. No	Applicant	Location	Connectivity for (MW)	Connectivity System
1.	Mytrah Energy (India) Limited	Tirunelveli Dist., Tamil Nadu	300	Mytrah wind farms – Tirunelveli PS 230kV D/c line
2.	Samimeru Windfarms Private Limited **	Tirunelveli Dist., Tamil Nadu	48.5	Samimeru wind farms – Tirunelveli PS 230 kV D/c line
3.	SISL Green Infra Limited **	Tirunelveli Dist., Tamil Nadu	48.5	
4.	Samiran Udaipur Wind farms Limited **	Tirunelveli Dist., Tamil Nadu	48.5	
5.	Shivam Filaments Private Limited **	Tirunelveli Dist., Tamil Nadu	48.5	
6.	R.S. India Global Energy Limited	Tirunelveli Dist., Tamil Nadu	270	RS India wind farms – Tirunelveli PS 230kV D/c line
7.	Suzlon Power Infrastructure Limited	Tirunelveli Dist., Tamil Nadu	1000	Suzlon wind farms – Tirunelveli PS 400kV D/c line
	<b>Total</b>		<b>1764</b>	

\*\* Note – M/s Samimeru Windfarms Pvt. Ltd. shall be the lead generator for connectivity applications of wind generators mentioned in table at Sl. No. 2 – 5.

- 2.9 The transmission system required for Connectivity for wind generation projects in Coimbatore area of Tamil Nadu

Sl. No	Applicant	Location	Connectivity for (MW)	Connectivity System
1.	Suzlon Power Infrastructure Limited	Coimbatore Dist., Tamil Nadu	200	Suzlon switchyard –Pugalur 230 kV D/c line
2.	Vestas Wind Technology India Private Limited	Coimbatore and Tirupur Districts	150	Vestas wind farms – Udumalpet 230kV D/c line
	<b>Total</b>		<b>350</b>	

- 2.10 Similarly the transmission system required for Connectivity for wind generation projects in Anantpur area of Andhra Pradesh

Sl. No	Applicant	Location	Connectivity for (MW)	Connectivity System
1.	Suzlon Power Infrastructure Limited	Anantpur Dist., Andhra Pradesh	300	Suzlon wind farms – Gooty 230kV D/c line

2.11 It was also decided that after the Wind developers apply for LTA as per the CERC Regulations, 2009, for atleast 25% quantum of their installed capacity, connectivity and LTA shall be granted and the transmission system shall be taken up for implementation.

**3.0 Grant of Connectivity for IL&FS Tamil Nadu Power Company Ltd. (ITPCL) (2400 MW)**

3.1 DGM (CTU) informed that IL&FS has been granted Long Term Open Access (LTOA) under CERC Regulations, 2004 for its Phase-I (2x600 MW) generation projects at Cuddalore area in Tamil Nadu. Now ITPCL has applied for connectivity for its Phase-II expansion of the generation project (4x600 MW) in Cuddalore area of Tamil Nadu.

3.2 Chairperson, CEA stated that the transmission system should be planned only after ITPCL apply for Long Term Access and as the generation project has already connected with the grid through Phase-I transmission system, the present regulations does not allow second connectivity to any of the generation project whether it is connected to a State grid or ISTS grid.

3.3 The representative of ITPCL informed that they will apply for LTA within 6 months.

**4.0 Grant of Connectivity for East Coast Energy Private Ltd (ECEPL) (1320 MW)**

4.1 DGM (CTU) informed that East Coast Energy Private Ltd (ECEPL) had earlier submitted application no. EIPL/PGCIL/ECEPL/071010 dated 11.10.2007 seeking Long Term Open Access (LTOA) under CERC Regulations, 2004. ECEPL was granted LTOA vide ref. no. C/ENG/SEF/TA/L/S/09/005(R1) dated 06.05.2010. The conditions stipulated for grant of LTOA included dedicated transmission line from generation switchyard to Srikakulam pooling station to be constructed by ECEPL and strengthening of transmission system beyond Srikakulam pooling station which was to be constructed by POWERGRID.

4.2 ECEPL has now submitted Connectivity application seeking connectivity from June, 2015 for the same generation project in the Srikakulam Area to process under the CERC Regulations, 2009 so that the dedicated transmission line viz. Generation switchyard - Srikakulam Pooling Station 400kV Quad D/c line may be considered under the coordinated planning of CEA & CTU and shall be developed as ISTS transmission system.

4.3 COO (CTU) stated that in the approved Detailed Procedure of CTU, a specific time was provided to the Long Term Open Access (LTOA) applicants which were under process as per CERC Regulations, 2004, however after that time period there is no provision under present CERC Regulations, 2009 to process again the already granted applications. He further stated that the strengthening system beyond Srikakulam pooling station is in progress and shall be implemented as per the BPTA schedule signed with ECEPL. Also as the applicant sought connectivity from June'2015 and the construction works for dedicated line had not yet been started by the generation developer. It indicates that there will be a mismatch between availability of dedicated line and the generation project or the availability of the transmission system which is

under implementation by POWERGRID. Such delay will be solely responsibility on part of generation developer.

- 4.4 ECEPL representative informed that due various environmental issues in the implementation of generation project, the cost of the generation projects is already going very beyond their estimates and their lender are asking them to cut down the cost of the generation project. Therefore, it is not possible for the generation developer to implement the dedicated transmission line by its own and requested to consider their connectivity application so that the dedicated transmission line can be implemented under as ISTS system.
- 4.5 Chairperson, CEA stated that since very long time has passed and now their request to migrate from Regulations, 2004 to Regulations, 2009 cannot be accepted at this point of time. Therefore, the generation developer should take-up the implementation of the dedicated transmission line matching with the ISTS Transmission system being developed by POWERGRID for coordinated evacuation of power from the generation project.
- 4.6 COO (CTU) further informed that irrespective of the availability of the dedicated transmission line ECEPL will have bear the transmission charges as par BPTA schedule and suggested ECEPL for constructing the dedicated line in compressed time schedule matching with generation project.

**5.0 Long pending Connectivity applications due to non-satisfactory progress - discussed in earlier meetings.**

- 5.1 DGM (CTU) informed that there are no. of connectivity/LTA applications are pending with CTU including applications granted LTA but repeatedly delaying the signing of LTTA agreement and furnishing Bank Guarantee. Such Connectivity & LTA applications were discussed in the 15<sup>th</sup> Meeting also, wherein 6 months extension was given to see the progress of their generation projects and discuss in the next meeting.
- 5.2 Chairperson, CEA enquired for the status of pending Connectivity / LTA applications in Southern Region.
- 5.3 No representative from Lanco Kondapalli was present to update the status of the generation project. However, they have written a letter to CTU requesting for deferment of their application till availability/allocation of the Gas to the project by MoPNG. It was informed that keeping LTA application in abeyance shall not facilitate development of transmission system causing bottling up of power, therefore whenever Lanco Kondapalli informs about availability of gas that shall be considered as date of LTA application and shall be processed thereafter.
- 5.4 DGM (CTU) informed that Connectivity & LTA was granted to NSL Nagapatnam Power & Infratech Private Limited (2x660 MW) on 17-08-2011 but the generation developer failed to sign LTTA agreement and furnish Bank Guarantee till date.

Representatives of NSL Power requested for extension for signing of the LTA keeping in view the force majeure like condition, preventing the progress of their 2x660 MW Thalanchangadu Thermal Power project. They further explained that

though majority of the clearances / approvals are available for execution of the project, on account of embargo imposed by Govt. of Tamil Nadu which inter-alia restricts establishment of highly polluting industries including Thermal Power Plant within 5 km of River Cauvery, they are not able to proceed further on the project. This has been done by TN Govt in spite of NSL project having environmental clearance from MOEF and also the fact that their project will not be using river water. Writ petition filed, in this respect in the Honorable High Court of Madras, has been transferred to National Green Tribunal, Chennai and the proceedings are in progress. They are expecting a favorable judgment from NGT, Chennai by early next year. Thus, they requested for six months time extension for execution of the LTA.

Keeping in view the prevailing circumstances, six months time extension is being granted with an advice to NSL Nagapatnam Power & Infratech Pvt. Ltd. to execute the LTA within this extended time period.

5.5 DGM (CTU) informed that LTA was granted to Chettinad Power Corporation Ltd. (2x660 MW) on 27-12-2011 but the generation developer failed to sign LTTA agreement and furnish Bank Guarantee till date. The representative from Chettinad Power Corporation informed that their project has received necessary clearances and they will sign requisite LTTA agreement within 1(one) month with POWERGRID.

5.6 In view the discussion, committee decided as below

5.6.1 Connectivity & LTA applications (under consideration for grant)

Sl. No	Connectivity & LTA Applicant	Time frame	Applied for Connectivity & LTA Quantum	Decision of the Committee
1.	Sindya Power Generating Company Pvt Ltd	June, 2014	Conn - 1320 MW LTA - 1060 MW	Extension of 6 months

5.6.2 LTA applications (under consideration for grant)

Sl. No	Connectivity & LTA Applicant	Time frame	Applied for LTA Quantum	Decision of the Committee
1.	Lanco Kondapalli Power Limited (Phase-III : 2x240 + 2x130 MW)	December, 2012	LTA - 550 MW	Extension of 6 months

5.6.3 LTA applications (LTA granted but yet to sign LTA agreement)

Sl. No	Connectivity & LTA Applicant	Time frame	Applied for LTA Quantum	Decision of the Committee
1.	NSL Nagapatnam Power & Infratech Private Limited	October, 2014	1240 MW	Extension of 6 months

6.0 Meeting ended with vote of thanks.

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**List of participants of the 16<sup>th</sup> Meeting of Southern Region regarding Connectivity and LTA applications of SR held on 04.09.2013 at NRPC, New Delhi**

**Sl. No. Name and Organization      Designation**

**Central Electricity Authority (CEA)**

1.	Ravinder	Chairperson
2.	K K Arya	CE (CEA)
3.	Pardeep Jindal	Director (SP&PA)
4.	Chandra Prakash	Dy. Director (SP&PA)
5.	Manjari Chaturvedi	Dy. Director (SP&PA)
6.	N.R.L.K Prasad	Dy. Director (SP&PA)

**Southern Region Power Committee (SRPC)**

7.	S R Bhat	Member Secretary I/c
8.	Anil Thomas	SE (Commercial)

**Power Grid Corporation of India Limited (POWERGRID)**

9.	Y K Sehgal	COO (CTU)
10.	N K Jain	GM (Commercial)
11.	Dilip Rozekar	DGM (CTU)
12.	Anil Kumar Meena	DCDE (CTU)
13.	Nageswara Rao M.	Sr. DE (CTU)
14.	Ankush Patel	DE (CTU)
15.	Venkatesh G	DE (CTU)

**Power System Operation Corporation Limited (POSOCO)**

16.	S K Soonee	CEO
17.	P R Raghuram	ED, SRLDC
18.	S.R. Narasimhan	DGM, NLDC
19.	S P Kumar	Chief Manager, SRLDC
20.	G Madhukar	Sr. Engineer, SRLDC

**NTPC Limited (NTPC)**

21.	S S Mishra	AGM
22.	Shilpa Agarwal	Manager

**Nuclear Power Corporation of India Limited (NPCIL)**

23.	Sandeep Sarwate	ACE (T)
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**Transmission Corp. of Andhra Pradesh Ltd. (APTRANSCO)**

24.	Mohd. Anwaruddin	Director
25.	M Jayachandra	CE(PS)
26.	C V Subba Rao	SE (SP)
27.	V V Ramana Murthy	DE/System Studies

**Tamil Nadu Electricity Board (TNEB) / TANTRANSCO**

- |     |                 |                                  |
|-----|-----------------|----------------------------------|
| 28. | S Akshaya Kumar | Dir / Tran.Projects (TANTRANSCO) |
| 29. | S Balaguru      | CE (TANGEDCO)                    |
| 30. | R Santhanakumar | EE(TANGEDCO)                     |
| 31. | R Kumutha       | AEE(TANGEDCO)                    |

**Kerala State Electricity Board (KSEB)**

- |     |                |  |
|-----|----------------|--|
| 32. | K.V Nair       | Member (Transmission & System Operation) |
| 33. | G. Sreenivasan | Resident Engineer                        |

**Electricity Department Pondicherry**

- |     |                  |       |
|-----|------------------|-------|
| 34. | K Mathivanan     | SE-V  |
| 35. | T gopalakrishnan | EE-VI |

**Connectivity/LTA Applicants**

- |     |                      |                |                                 |
|-----|----------------------|----------------|---------------------------------|
| 1.  | Samanth Jha          | A.M.           | IL & FS Energy Dev. Co. Ltd.    |
| 2.  | H. L. Tayal          | Head (Bus Div) | IL & FS Energy Dev. Co. Ltd.    |
| 3.  | B. Narasimharao      | COO            | East Coast Energy Ltd.          |
| 4.  | R Srinivasan         | V P Corporate  | East Coast Energy Ltd.          |
| 5.  | Jeetendra Yadav      | Head-R&D       | RS India Global Energy Ltd.     |
| 6.  | Madan Mohan          | GM Projects    | Mytrah Energy (I) Ltd.          |
| 7.  | Kiran V              | DGM PRSS       | Mytrah Energy (I) Ltd.          |
| 8.  | T. N. Pathak         | VP (C&E)       | NSL Power, Hyderabad            |
| 9.  | Balachandra. K       | VP (Projects)  | Sindhya Power Gen. Co. Pvt. Ltd |
| 10. | V Chandramoleeswaram | Director       | Chettinad Power Corporation     |
| 11. | Mahesh Vipradas      | GM             | Suzlon Energy Ltd.              |
| 12. | Naresh Panchal       | Head (PE)      | Suzlon Energy Ltd.              |
| 13. | NSM Rao              | Advisor        | Suzlon Energy Ltd.              |