

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

No. 51/4/SP&PA-2011/ 1647-58

Date: 15 November 2011

To

1.The Member Secretary, Southern Regional Power Committee, 29, Race Course Cross Road, Bangalore 560 009. FAX : 080-22259343	2.The Director (Projects), Power Grid Corp. of India Ltd. “Saudamini”, Plot No.2, Sector-29, Gurgaon 122 001, Haryana. FAX : 95124-2571932
3.The Director (Grid Operation), Transmission Corp. of Andhra Pradesh Ltd., Vidyut Soudha, Hyderabad – 500 082. FAX : 040-66665137	4.The Director (Transmission), Karnataka State Power Transmission Corp.Ltd., Cauvery Bhawan, Bangalore 560 009. FAX : 080 -22228367
5.The Member (Transmission), Kerala State Electricity Board, Vidyuthi Bhawanam, Pattom, P.B. No. 1028, Thiruvananthapuram - 695 004. FAX : 0471-2444738	6. Member (Distribution), Tamil Nadu electricity Board (TNEB), 6 th Floor, Eastern Wing, 800 Anna Salai, Chennai - 600002. FAX : 044-28516362
7.The Director (Power), Corporate Office, Block – I, Neyveli Lignite Corp. Ltd., Neyveli , Tamil Nadu – 607 801. FAX : 04142-252650	8.The Superintending Engineer –I, First Floor, Electricity Department, Gingy Salai, Puducherry – 605 001. FAX : 0413-2334277/2331556
9. Director (Projects), National Thermal Power Corp. Ltd. (NTPC), NTPC Bhawan, Core-7, Scope Complex, Lodhi Road, New Delhi-110003. FAX-011-24360912	10. Director (Operations), NPCIL, 12 th Floor, Vikram Sarabhai Bhawan, Anushakti Nagar, Mumbai – 400 094. FAX : 022- 25991258

Sub: 33rd meeting of the Standing Committee on Power System Planning of Southern Region
- **Minutes of the meeting.**

Sir,

The **33rd meeting** of the Standing Committee on Power System Planning of Southern Region was held on **20th October, 2011** (Thursday) at Conference Hall of Northern Region Power Committee, Katwaria Sarai, New Delhi.

Minutes of the meeting is enclosed. It is also available at CEA’s website (www.cea.nic.in).

Yours faithfully,

(Pardeep Jindal)

Director (SP&PA)

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

Copy to:

(1) Sh. SK Soonee, CEO, POSOCO,
B-9, Qutub Institutional Area,
Katwaria Sarai,
New Delhi-110016

(2) Sh. Shashi Shekhar, Joint Secretary,
Min. of New & Renewable Energy,
CGO Complex,
New Delhi -110003

**Minutes of 33rd Meeting of
Standing Committee on Power System Planning in Southern Region (SCPSPSR)
held on 20th October, 2011 (Thursday) at Northern Region Power Committee,
Katwaria Sarai, New Delhi.**

1.0 List of participants is given at Annex-I.

2.0 Member (Power Systems), CEA welcomed the participants and observed that the agenda for today's meeting included some critical issues such as interconnection of SR with NEW grid with emphasis for implementation of interregional links for the reliable and secure operation of All India Grid and transmission system for Bhavanapadu Thermal project and many important issues such as review of associated transmission systems for Krishnapatnam UMPP, Kudgi, Yeramara/Edlapur and Neyveli Replacement generation projects and system strengthening aspects in Southern Region. He asked Director (SP & PA), CEA to proceed with the Agenda for the meeting.

3.0 Confirmation of the minutes of 32nd meeting of the Standing Committee

3.1 Director(SP&PA), CEA stated that minutes of 32nd meeting of the Standing Committee on Power System Planning of Southern Region were issued vide CEA's letter number 51/4/SP&PA-2011/991-1001 dated 06-07-2011. In this regard, an observation was received from SRPC, regarding transmission system for evacuation of power from Simhadri-II TPS(2x500MW) of NTPC, quoting 'The existing transmission system (ISTS) in Southern region is fully capable of handling the entire LTA of the region including the generation from Simhadri-II and only STOA will be curtailed if needed be'.

3.2 Based on these observations, a corrigendum to the minutes of the 32nd meeting was issued vide CEA letter no. 51/4/SP&PA-2011/1085-1095 dated 08 August 2011. The minutes of the 32nd meeting along with corrigendum, as circulated, were confirmed. **Copy of the corrigendum is given at Annex-II.**

4.0 Delinking of Associated Transmission System of Krishnapatnam UMPP from Krishnapatnam UMPP generation due to uncertainty.

4.1 Director(SP&PA), CEA stated that for the ease of implementation matching with the commissioning schedule of different units of Krishnapatnam UMPP the ATS has been taken up in three parts viz. Part-A, Part-B and Part-C. The Part-A & C mainly comprised of elements for immediate evacuation of power and part-B mainly comprised of those elements that are aimed at synchronous inter-connection of SR and WR. Matching with the commissioning requirement of first unit of KUMPP, works for part-A had been initiated at site. The preliminary activities for Part-B and Part-C were also completed.

4.2 Member(PS), CEA said that the transmission system is generally planned for grid

requirement corresponding to a given time frame and likely load-generation scenario in that time frame. This planned system is then programmed for implementation under various schemes. A major part of the KUMPP transmission system was also planned for looking into requirement of the Southern grid though programmed to be implemented as part of KUMPP ATS. Now, if there is delay/uncertainty of the KUMPP generation project, we should identify the transmission system that would otherwise also be required for development of the Southern grid.

- 4.2 DGM, PGCIL stated that due to likely delay of generation project, it has become necessary to review the ATS of KUMPP looking into the overall grid development, as the Part-B primarily consists of elements which establish synchronous interconnections between SR & WR through 765kV Raichur – Sholapur S/c lines. Here it may be pertinent to mention that the other 765kV Raichur – Sholapur S/c line has already been awarded through tariff based competitive bidding. The synchronous interconnection between SR & WR is of urgent nature as the existing interregional capacity is inadequate to cater to the interregional transfer requirement, as were observed during this summer when there was a large variation in the prices of electricity in SR & NEW Grid. Further, synchronization of SR with NEW grid shall be a major milestone in Indian Power system development thereby establishing nationwide synchronous grid. The synchronization of SR with WR grids have been planned through Raichur – Sholapur 765 kV 2xS/c lines. Therefore, it is necessary that the Krishnapatnam UMPP Part-B transmission system comprising of following elements may be de-linked from the commissioning of Krishnapatnam UMPP generation project.

KUMPP Part-B

- (i) Establishment of new 765/400 kV substations at Raichur & Sholapur with 2x1500 MVA ICTs and 1x240 MVAR bus reactor each
- (ii) Establishment of new 765/400 kV GIS substation at Pune with 2x1500 MVA ICTs and 1x240 MVAR bus reactor
- (iii) LILO of existing Raichur – Gooty 400 kV Quad D/c line at Raichur (New) substation
- (iv) Raichur – Sholapur 765 kV S/c line with 240 MVAR switchable line reactors at each end
- (v) Sholapur – Pune 765 kV S/c line with 240 MVAR switchable line reactors at each end
- (vi) LILO of Aurangabad – Pune 400 kV D/c at Pune (GIS)
- (vii) LILO of Parli – Pune 400 kV D/c at Pune (GIS).

Members agreed for the proposal of de-linking of Part B from commissioning of Krishnapatnam UMPP generation project.

- 4.4 The Part-C comprised of Krishnapatnam UMPP – Kurnool 400kV D/c line, Kurnool – Raichur 765kV S/c line and establishment of Kurnool 765/400 kV substation. This part mainly caters to the immediate evacuation of power from Krishnapatnam UMPP generation project. Hence the same may be deferred for the time being till position of generation projects commissioning gets clear. However, here it may be mentioned that Kurnool 765/400kV substation is necessary for interconnection of the Nellore Pooling Station –

Kurnool 765 kV D/c line and Kurnool – Raichur 765 kV S/c line being taken up as part of Krishnapatnam LTA system. Therefore, establishment of Kurnool 765/400kV substation alongwith its connectivity to grid viz. LILO of N'Sagar – Gooty 400 kV S/c line at Kurnool (New) substation & Kurnool (New) – Kurnool (APTRANSCO) 400 kV D/c quad line may also be delinked from Krishnapatnam UMPP generation project. Accordingly, the part of the KUMPP Part-C that is to be taken up now and part which may be deferred till the picture on KUMPP generation project becomes clear are as given below:

KUMPP Part-C1 transmission system to be taken up delinking with generation

- (i) Establishment of new 765/400 kV substation at Kurnool with 2x1500 MVA ICTs and 1x240 MVAR bus reactor.
- (ii) LILO of N'Sagar – Gooty 400 kV S/c line at Kurnool (New) substation
- (iii) Kurnool (New) – Kurnool (APTRANSCO) 400 kV D/c quad line.

KUMPP Part-C2 transmission system to be deferred

- (i) Krishnapatnam UMPP – Kurnool (New) 400 kV D/c Quad line with 63 MVAR line reactors at each end on both circuits
- (ii) Kurnool (New) – Raichur 765 kV S/c line

Members agreed for the proposal of de-linking of Part C1 from commissioning of Krishnapatnam UMPP generation project.

4.5 POWERGRID informed that the above de-linking of Krishnapatnam Part B & Part C1 from Krishnapatnam UMPP generation project was discussed and approved in the 17th Meeting of SRPC held on 12th August 2011 subject to ratification in the Standing Committee. Further, it was also informed that POWERGRID has submitted petition for regulatory approval for the above system.

4.6 DGM, POWERGRID said works for the transmission system of Part A viz. Krishnapatnam – Nellore 400 kV quad D/c and Krishnapatnam – Gooty 400 kV D/c quad lines has already initiated at site. Considering the uncertainty of Krishnapatnam UMPP generation project, this line is proposed to be terminated at Nellore Pooling Station instead of Krishnapatnam UMPP so as to make Nellore Pooling Station – Gooty 400 kV D/c quad line. This line shall help in dispersal of power available at Nellore from Eastern Region as well as other projects in the north-eastern part of Andhra Pradesh to rest of the grid. It was explained that this line in conjunction with Gooty – Madhugiri 400 kV D/c line shall help in strengthening the grid. Therefore it was proposed that Nellore Pooling Station – Gooty 400 kV D/c quad line may be considered as Regional Strengthening Scheme.

Members agreed for re-alignment of Krishnapatnam UMPP – Gooty 400 kV D/c line as Nellore Pooling Station – Gooty 400 kV D/c quad line and implement the same as regional strengthening scheme.

4.7 POWERGRID informed that adjacent to KUMPP another power plant of 1320 MW

capacity of Thermal Powertech Corporation India Limited (TPCIL) is coming up during the same time frame. Under the Connectivity Transmission System of TPCIL a 400 kV D/c quad line is proposed from their switchyard to Nellore Pooling Station. Therefore the under implementation Krishnapatnam UMPP – Nellore 400 kV D/c quad line is proposed to be made TPCIL – Nellore Pooling Station 400 kV D/c quad line. This shall avoid contractual issues as the contracts for the line has already been awarded and same is under implementation. Accordingly, it was proposed that the under implementation KUMPP – Nellore 400 kV D/c quad line shall be made as TPCIL – Nellore Pooling Station 400 kV D/c quad line and this line shall be associated with Connectivity System of TPCIL.

Members agreed for re-alignment of Krishnapatnam UMPP – Nellore 400 kV D/c line as TPCIL - Nellore Pooling Station 400 kV D/c quad line and implement the same as Connectivity System of Thermal Powertech Corporation India Limited.

5.0 Srikakulam Pooling station – Vemagiri Pooling Station 765 kV D/C line

5.1 DGM, POWERGRID stated that under common system for ISGS generation in Srikakulam area, Srikakulam Pooling Station – Angul 765 kV D/C line and Angul – Jharsuguda – Dharamjaigarh 765 kV D/C lines were planned. However, recently due to development on coal regulation in Indonesia has resulted into slowing down of capacity addition based on imported coal. As a consequence Southern Region is expected to be net importer of power. Towards this, utilising Angul – Srikakulam Pooling Station line proposed with IPPs in Srikakulam area an AC interconnection through Srikakulam Pooling Station to Vemagiri 765 kV D/c line can be made.

5.2 He further informed that in the studies it is observed that about 2000 MW power gets displaced from IPP projects in Orissa. This coupled with 1320 MW of East Coast power results into injection of about 3200 MW power at Vemagiri Pooling Station. Therefore, it was proposed that alongwith Srikakulam Pooling Station – Vemagiri Pooling Station the 2nd 765 corridor viz. Vemagiri Pooling Station – Khammam – Hyderabad 765 kV D/c may also be taken up.

5.3 ED, POWERGRID stated that under uncertainty of Krishnapatnam UMPP, Southern Region may need import of huge quantum of power which may need augmentation of existing/under implementation/planned links.

5.4 After deliberations, following was agreed:

- (i) **Srikakulam Pooling Station – Vemagiri Pooling Station, 765 kV D/c line as a system strengthening scheme for import of power from Eastern Region to Southern Region.**
- (ii) **To go ahead with implementation of the Vemagiri Pooling Station – Khammam – Hyderabad 2nd 765 kV D/C.**

6.0 Transformer Augmentation in Southern Region.

6.1 Director(SP&PA), CEA stated that augmentation of transformation capacity in existing

substations of Southern Region is necessary based on the power flows study results for 2014-15 conditions carried out by POWERGRID. In this regard, POWERGRID, SRLDC and KPTCL had proposed transformer augmentations in various substations in Southern Region.

6.2 After discussions, following augmentation of the transformer capacity at the existing 400/220kV sub-Stations were agreed:

Sl. No.	Substation	Agency	Present Transformation Capacity (MVA)	Proposed Augmentation Capacity
1.	Hyderabad PG (Ghanapur)	POWERGRID	3x315	1x500 MVA
2.	Warangal	POWERGRID	2x315	1x500 MVA
3.	Khammam	POWERGRID	2x315	1x500 MVA
4.	Vijayawada	POWERGRID	2x315	1x500 MVA
5.	Gooty	POWERGRID	2x315	1x500 MVA
6.	Cuddapah	POWERGRID	2x315	1x500 MVA
7.	Malekuttiayur	POWERGRID	2x315	1x500 MVA
8.	Somanahalli	POWERGRID	2x500	1x500 MVA
9.	Mysore	POWERGRID	2x315	1x500 MVA
10.	Narendra	POWERGRID	2x315	1x500 MVA
11.	Pugalur	POWERGRID	2x315	1x500 MVA
12.	Trichy	POWERGRID	2x315	1x500 MVA
13.	Karnool	APTRANSCO	2x315	1x315MVA
14.	Gajwel	APTRANSCO	315	1x315 MVA
15.	Hyderabad(AP)	APTRANSCO	315x3	1x315 MVA
16.	Malkaram	APTRANSCO	2x315	1x315 MVA
17.	Nelamangala	KPTCL	2x315	1x500 MVA
18.	Hoody	KPTCL	2x315	1x500 MVA

6.3 Director(SP&PA), CEA stated that SRLDC has also indicated requirement of augmentation of transformer capacity at the Gazuwaka S/S. POWERGRID informed that because of lack of space augmentation of transformation capacity is not possible at the Gazuwaka S/S. **It was decided that this requirement would be considered while planning a new 400kV S/S in Gazuwaka area as was also discussed in the 32nd meeting of the committee.**

6.4 GM, SRLDC stated that augmentation of the transformation capacity would only be effective if STU take necessary strengthening at 220kV level for drawl of power from these substations. Director(SP&PA), CEA stated that **STUs may carry out preliminary analysis of the system strengthening requirement at 220kV level and then joint studies can be carried out with them and CTU to find an optimal solution.**

7.0 Construction of 220kV Mylatti- Puttur line as a System Strengthening Scheme

7.1 Director(SP&PA), CEA stated that KSEB has proposed the construction of 220kV inter state line from Mylatti S/s of KSEB to Puttur S/s of KPTCL as a regional system strengthening scheme. This proposed link at 220kV level would also provide an additional corridor from S1 to S2 thereby reducing the congestion to some extent.

7.2 The issue was discussed by the SCPSPSR and it was decided that CEA would convene a separate meeting of POWERGRID, KPTCL and KSEB for discussion on the issue.

8.0 Connectivity for Nirmal 400kV S/S of APTRANSCO

8.1 Director(SP&PA), CEA stated that the connectivity for Nirmal 400kV S/S of APTRANSCO was discussed in the 32nd meeting of SCPSPSR. The Committee had agreed for LILO of one of the circuits of Ramagundam – Hyderabad 400kV lines at Nirmal by APTRANSCO for 2x315 MVA 400/220kV new Substation at Nirmal/Adilabad by APTRANSCO. It was decided that APTRANSCO would coordinate with CEA and POWERGRID in selection of circuit to be LILOed and reactive compensation, if required, to be provided at the new substation.

8.2 DGM, POWERGRID stated that two circuits of Ramagundam – Hyderabad 400kV lines are already being LILOed, either of the remaining two circuits can be LILOed at Nirmal S/s. Director, CEA stated that while deciding about the circuit to be LILOed, care must be taken to minimize length of the Nirmal-Hyderabad section of the line as the LILO to Nirmal in itself would be a long link.

8.3 It was decided that APTRANSCO and POWERGRID would decide the circuit that can be LILOed at Nirmal S/s as per the geographic configuration and inform the same to CEA along with tentative length of the each line between Ramagundam and Hyderabad after the proposed LILO.

8.4 ED, POWERGRID stated that the LILO arrangement is planned for drawl of power and at a later date if this LILO connection is used for the any injection of power then connectivity and LTA shall have to be obtained in line with the CERC regulations. The same was agreed.

9.0 Transmission System for evacuation of power from 2x500MW Neyveli Lignite Corporation Ltd. TS-I (Replacement) in Neyveli, Tamil Nadu.

9.1 Director (SP & PA), CEA informed that the following transmission system for Connectivity and LTA was agreed during the 32nd Meeting of SCPSPSR:

Connectivity Transmission System

- (i) LILO of existing Neyveli TS II – Neyveli TS – I expansion 400 kV S/s at generation switchyard
- (ii) Provision of 2x315 MVA, 400/220 kV transformer at generation switchyard

(iii) 1x80 MVAR Bus Reactor at generation switchyard

LTA Transmission System

(iv) Neyveli (Replacement) – Sholinganallur 400 kV D/c line

He further stated that NLC had proposed to work out an alternate system instead of LILO of existing Neyveli TS-II – Neyveli TS-I expansion 400 kV S/c at generation switchyard.

9.2 In this regard, POWERGRID explained that Neyveli TS II, Neyveli TS-II expansion, Neyveli Ts-I expansion and the proposed replacement comprise a single power complex. Looking into the number of transmission lines emanating from Neyveli complex the proposed LILO was envisaged. It was further explained that LILO of any of the line which is practically convenient to implement should be finalised. ED (SR-II), POWERGRID said that the proposed LILO seems to be the most workable option.

9.3 Director, TANTRANSCO said that Neyveli – Sholinganallur 400 kV D/c line may not be required as a number of generation projects viz. Vallur TPS (1500 MW), North Chennai expansion (1200 MW) etc. are proposed in the Chennai area. Accordingly, transmission strengthening proposed earlier viz. Neyveli (Replacement) – Sholinganallur 400 kV D/c may not be taken up.

9.4 It was decided that NLC and POWERGRID based on the site realities may decide upon which line to be LILOed at Neyveli (Replacement) switchyard. As regards the implementation, POWERGRID said that - this line LILO line is under the ownership of NLC and lies entirely in the Neyveli complex therefore its implementation should be taken up by NLC only.

9.5 Director(SP&PA), CEA said that as the existing 230kV lines are very old and it is right time to replace/upgrade these lines as they would serve for next 25-30 years period i.e. for the life of the replacement project.

9.6 Member(Power System), CEA opined that for strengthening the network at 230kV level conductor of good configuration may be used and instead of 2x315 MVA transformer 7x166MVA single phase transformers (i.e. 1000 MVA capacity) can be installed.

9.7 After deliberations following was agreed for the 2x500MW Neyveli Lignite Corporation Ltd. TS-I Replacement Project:

9.7.1 To be carried out by NLC(for connectivity system):

- (i) Provision of 7x166 MVA single phase 400/230 kV transformer at generation switchyard**
- (ii) 1x80 MVAR Bus Reactor at generation switchyard**
- (iii) LILO of existing Neyveli TS-II – Neyveli TS-I expansion 400 kV S/c at generation switchyard or of any other line as decided by NLC and**

POWERGRID based on the site realities.

9.7.2 To be carried out by TANTRANSCO/TNEB:

- **To coordinate with NLC to reconfigure and re-conductor the existing 230kV network emanating from NLC project. TNEB may take help from CEA/CTU for system studies/design of the system.**

9.7.3 To be carried out by POWERGRID (for LTA Transmission System):

- **POWERGRID would identify the 400kV line for LTA requirement in place of the earlier agreed Neyveli (Replacement) – Sholinganallur 400 kV D/c line, in coordination with TNEB and NLC.**

10.0 Transmission System for evacuation of power from Kudgi TPS (3x800 MW in Phase-I) of NTPC Limited.

10.1 Director (SP & PA), CEA informed that the transmission system for Kudgi TPS was agreed in the 32nd Meeting of Standing Committee on Power System Planning in SR held on 8 June, 2011 which inter-alia included stepping up of generation at 765 kV and 765 kV D/C lines from Kudgi to Narendra and Narendra to Madhugiri. Subsequently, KPTCL requested that the proposed Narendra (new) substation may be constructed nearer to Kudgi site as they can help in identification and procurement of land for the substation close to the Kudgi generation project. Further, they suggested 400 kV D/c quad lines from Kudgi to Narendra (existing) and Raichur (new) alongwith Narendra(New) to Madhugiri 765 kV D/c (charged at 400 kV) as a part of evacuation system for Kudgi TPS.

10.2 In this regard, POWERGRID informed that the Narendra (new) substation is covered under the inter-regional scheme viz. Narendra – Kolhapur 765 kV D/c (initially charged at 400 kV). This link is required in the timeframe of Raichur-Sholapur 765 lines for smooth synchronisation of two large grids. Therefore, it is utmost important that this inter-regional scheme and transmission system for Kudgi should not be clubbed. Prima-facie in line with the proposal of KPTCL the Narendra (new) substation can be constructed near Kudgi TPS site which can later be integrated with Kudgi transmission system matching with the Kudgi generation project.

10.3 Construction of 765/400kV substation at Narendra (new) near Kudgi was discussed with respect to adoption of AIS/GIS. ED (POWERGRID) explained that they have gone ahead with 400kV Narendra (new) substation as a GIS substation under the SR-WR inter-regional scheme. After deliberations it was decided that the 400kV Narendra (new) substation near Kudgi site may be constructed as GIS. **Accordingly, the same system as already approved scheme in Standing Committee and RPC and under implementation by POWERGRID with following configuration was agreed as the inter-regional link:**

- Establishment of 400kV GIS substations at Narendra (New, near Kudgi) and Kolhapur(New) (with provision to upgrade to 765kV at a later date)**
- Narendra (New) – Kolhapur (New) 765 kV D/C line (initially charged at 400 kV)**
- Narendra (New) – Narendra (Existing) 400 kV D/C quad line**

- (iv) **LILLO of both circuits of Kolhapur – Mapusa 400 kV D/C line at Kolhapur (New)**

10.4 As regard Kudgi Transmission System following system was agreed:

Transmission system for Kudgi Phase-I Generation project of NTPC (3x800 MW)

To be provided by NTPC:

- (i) **Stepping up of power at the generation project to 400 kV**
- (ii) **Provision of Bus reactor of 2x125 MVAR at generation switchyard.**
- (iii) **Provision of 2x500 MVA, 400/220kV transformers at generation switchyard and 6 nos. 220 kV bays**

To be implemented as ISTS (as evacuation system for Kudgi TPS Phase-I):

- (i) **Kudgi TPS – Narendra (New) 400 kV 2xD/C quad lines**
- (ii) **Narendra (New) – Madhugiri 765 kV D/C line (initially charged at 400 kV)**
- (iii) **Madhugiri – Bangalore 400 kV D/c (quad) line. (The terminal point at Bangalore is yet to be decided, for which POWERGRID would take action and inform CEA/SCSPSR)**

10.5 In addition to above, a 400 kV D/c quad line from Narendra (New) to Raichur(New) would be considered while planning the transmission system when NTPC applies for LTA for Phase-II (1600 MW) of the Kudgi TPS.

11.0 Erection and Commissioning of Interstate line from 132kV Kistampeth S/S (AP) to proposed 132kV Sironcha S/s (MS)

11.1 Director, CEA stated that MSETCL has proposed an interstate line from 132kV Kistampeth S/S (AP) to proposed 132kV Sironcha S/s (MS). At present 66kV S/S at Sironcha is fed from 220kV Gadchandur S/s, which is situated about 240km away. Due to long lines passing through dense forest area, frequent supply interruptions and low voltage problem prevail in this area. MSETCL has already planned new 132kV S/S at Alapalli, Yetapalli and Sironcha. A 132kV S/s at Kistampeth in AP is 35km away from Sironcha and is fed from 220kV Ramagundam S/s. the load at Sironha S/s will be around 5.0MW & future load growth is also very small.

11.2 CE (PS), APTRANSCO said that they did not agree for the proposal and this would lead to voltage violations for their network.

11.3 After deliberations it was agreed that MSETCL would be informed about opinion of APTRANSCO in the WR Standing Committee meeting to be held next day (21-10-2011) in New Delhi.

12.0 Start-up power and Power evacuation for the 1320 MW Bhavanapadu Thermal Power Project in Srikakulam District, Andhra Pradesh-

12.1 Director (SP & PA), CEA informed that following system was identified for evacuation of power from 1320 MW Bhavanapadu Thermal Power Project:

- (i) For drawl of start-up power through LILO of one circuit of the Gazuwaka – Behrampur 400 kV D/c line (being developed by RPTL)
- (ii) East Coast Energy generation switchyard – Srikakulam Pooling Station 400 kV D/c quad lines (to be developed by East Coast Energy) and Srikakulam corridor (to be implemented by POWERGRID) for evacuation of power.

12.2 He further said that as the Gazuwaka – Behrampur 400 kV D/c line being developed by RPTL was getting delayed, an alternative system for the start-up power would need to be identified. In this regard, POWERGRID mentioned that since there are no ISTS substations/lines in the vicinity, the East Coast Energy may approach APTRANSCO for start-up power. On enquiry, APTRANSCO informed that East Coast Energy had not approached them for start-up power and they confirmed that they would study the proposal when made. Further East Coast Energy had indicated the commissioning schedule of first unit by August, 2014 and second unit by December, 2014.

12.3 On a query from representative of East Coast Energy, regarding establishment of Srikakulam Pooling Station and Srikakulam – Angul 765 kV D/C line, POWERGRID mentioned that they have already gone ahead with the preliminary activities including proposal for land acquisition, tendering etc. Further, POWERGRID requested generation developer to sign the revised annexure of BPTA with revised schedules. East Coast Energy representative agreed to sign the revised annexure of BPTA.

13.0 Transmission System for evacuation of power from Yermarus TPS(2x800 MW)/Edlapur TPS(1x800 MW) of KPCL in Karnataka

13.1 Director, CEA stated that KPTCL has informed about the transmission system ,they had planned to take up for evacuation of power from these generating stations in which they had not listed Hiriyur (under construction) –Madhugiri 400 kV D/c twin line, Yeramaras – Basavanabagewadi (BB Wadi) 400 kV D/c Twin line and establishment of BB Wadi 400/220 kV substation. He further stated that in the absence of part of transmission system, KPTCL may face bottleneck in evacuation of power from the Yeramaras and Edlapur TPS.

13.2 Director, KPTCL said that the transmission system for evacuation of power from Yeramaras and Edlapur TPS was decided when Kudgi project was not firmed up but as now Kudgi project is also coming in the same time frame so studies should be carried out again considering the Kudgi project.

13.3 After deliberations it was decided to rework the transmission system for evacuation of power from Yeramaras and Edlapur TPS taking Kudgi Project in consideration, for which joint studies would again be carried out by CEA, POWERGRID and KPTCL.

14.0 Establishment of 400/220kV S/s near Doni to facilitate Wind Energy Evacuation:

14.1 Director(SP&PA), CEA stated that KPTCL proposed for the establishing 400/220kV substation, near Doni cross in Gadag with LILO of Guddadahalli (Munirabad) PGCIL-Guttur (Davanagere) 400 kV SC line for a distance of nearly 30 Kms to facilitate wind energy evacuation.

14.2 In the proposal KPTCL has not mentioned the quantum for wind power to be evacuated, capacity of 400/220kV S/s, time frame by which this system is needed and relevant system studies.

14.3 Director, KPTCL informed that the capacity of Wind generation is 600 MW and it would submit the system studies along with time frame and the location of the wind generation project.

14.4 It was decided that any requirement for system strengthening in KPTCL system would be assessed during the proposed joint studies for the Yermarus TPS/Edlapur TPS transmission system. After the studies, it would be taken up in the next meeting of the SCPSPSR.

14.5 Dr. P. C. Maithani, Director, MNRE thanked the Chairman for considering the request of MNRE for representation in Regional Standing Committees for Power System Planning and inviting MNRE to such meeting and this was the first meeting being attended by MNRE.

He said that the potential of wind, solar and small hydro power is confined to a few States and that too in certain pockets. Most of the generating units are small in size and dispersed. These locations are in the remote places. For harnessing renewable power potential from such locations, it is of utmost important that the generated power is evacuated from such locations to the load centers. Till now the capacity addition from renewable power is not very large and states are consuming this power through strengthening of STU network wherever necessary. With the growing environmental concerns and conducive policies large capacity additions are expected from renewable projects and state transmission system in the renewable resource rich states should be planned considering such capacity additions in future. Further, due to infirm nature of this renewable power particularly wind home states would not be able to consume this power due to cost and infirmness and therefore this power needs to be transmitted beyond the home state for which proper planning of ISTS network is required.

15.0 Connectivity of Samalkot power project with CTU grid through LILO of 400kV Gazuwaka-Vijaywada line

15.1 Director(SP&PA), CEA stated that Reliance Power vide their letter SPL/BBY/BD/ dated 18-07-2011 has requested for LILO connectivity to 400kV Gazuwaka – Vijayawada D/c line for evacuation of power from Samalkot power Station on the opportunity basis as an interim arrangement till commissioning of LTA system. In this regard following may be noted:

- (i) Samalkot power project has been granted connectivity to CTU grid through 2x400kV quad D/C line connecting to Vemagiri-II 765/400kV pooling station.
- (ii) APTRANSCO has given temporary connectivity through LILO of one circuit of

Kalpakka-Vemagiri-I(AP) 400kV line for the purpose of drawing start-up power. For this, a part of one of the 400kV quad D/C line from Samalkot to Vemagiri(PG pooling station) will be utilized. On completion of Vemagiri-Khammam-Hyderabad 765kV line, this temporary LILO would be removed and the line taken to Vemagiri (PG).

- 15.2 Member(Power System), CEA stated that if the generating units at Samalkot are commissioned and they have sufficient fuel before commissioning of the Vemagiri-II system, there may be constraint in evacuation of power from the project. He requested the constituents to consider this aspect while allowing additional connectivity to Samalkot project.
- 15.3 APTRANCO clarified that they had granted temporary connectivity only for the purpose of drawing startup power.
- 15.4 Members opined that there is no provision in the regulations for giving more than one connectivity. Further, there is already a constraint in the transmission system beyond Vemagiri/Vijayawada and evacuation of power under LTA from Simhadri-II is already getting effected. This constraint has been discussed in detail in the previous meetings by this Committee and accordingly, system strengthening has been planned beyond Vijayawada/Vemagiri, which is likely to be completed in about 3-4 years. After discussions, members decided that the requested additional connectivity to Samalkot project may not be possible.

16.0 Requirement of Spare Converter Transformers for HVDC back to back station at Vizag (Gazuwaka)

- 16.1 POWERGRID proposed following requirement of spare converter transformers at Vizag (Gazuwaka) and Chandrapur HVDC back to back stations:
- (i) At Chandrapur : 3 nos, Single phase converter transformers
 - (ii) At Gazuwaka: 2 nos, Single phase converter transformers
- 16.2 ED, POWERGRID stated that HVDC back to back links were earlier planned for exchange of power during contingencies. However, these links are now being utilized for continuous exchange of power between two connected Regions. This incremental investment would provide reliability and security to the grids.
- 16.3 AGM (OS), POWERGRID had informed that presently HVDC Back-to-Back Stations at Chandrapur (2x500MW) and Vizag (2x500MW) has been in operation as under:

	Chandrapur	Vizag(Gazuwaka)
Pole-I	: 01.10.97	01.09.99
Pole-II	: 01.03.98	01.03.05

The HVDC Back-to-Back Station at Chandrapur has been consistently being operated at Utilisation factor more than 93% during 2011 (except during June and July, 2011) and has exceeded 99% during Feb & March, 2011. Further frequent change in Power Order depending upon Grid condition/system requirement, the Converter Transformers are subjected to frequent operation of On Load Tap Changers and transformers are subjected to enormous stress which ultimately has long term effect on its life. Each of the Back-to-Back stations at Chandrapur and Vizag are having 12 nos. Converter Transformers against which, only one (1) spare converter transformer unit is available at Chandrapur and two (2) spare units at Vizag(Gazuwaka). These units are off-shored manufactured item. As such multiple unit failure at a station may lead to long outage of a pole leading to reduction of evacuation capacity by 500 MW which will entail a huge financial loss to both the connected regions.

These back-to-back systems have high capacity utilisation due to inter-regional demand and there is a need of higher reliability of HVDC systems because loss of any unit will have serious evacuation constraint leading to severe economic loss to the beneficiaries. Further, as a practice even for HVDC bi-pole links, one (1) Converter Transformer for each pole at each bus is provided. Therefore, it is proposed to provide additional spare Converter Transformer for HVDC Back-to-back stations at Chnadrapur and Gazuwaka.

16.4 MS, SRPC opined that these are the Inter-Regional links and reliability and security of both grids depend upon the reliable operation of these links.

16.5 GM, SRLDC stated that the converter transformers are subjected to frequent operation of on load tap changers and transformers are subjected to enormous stress which ultimately has long term effect on its life.

16.6 After deliberations, following spare single phase converter transformers were agreed:

(i) At Chandrapur (3 nos.)

3x Single phase converter transformers - 400/93/93kV, 234 MVA each

(ii) At Vizag(Gazuwaka)(1+1 no.):

1x Single phase converter transformers - 400/93/93kV, 234 MVA, and

1x Single phase converter transformers - 400/74.5/74.5kV, 201.2 MVA.

17.0 Other Issues:

17.1 Use of Multi-circuit for portions of the Electronic City – Hosur 400 kV D/c line and booking of cost:

ED (POWERGRID) mentioned that two strengthening schemes were agreed in the earlier Standing Committee Meetings viz. Electronic City – Hosur 400 kV D/C line and LILO of existing Somanahalli – Salem 400 kV S/C line at Hosur. He further informed that due to severe Right-of-Way (RoW) problem in the vicinity of Hosur substation, these lines are required to be constructed on multi-circuit towers for a small stretch. Director, KPTCL said that the Electronic City – Hosur 400 kV D/C was being constructed utilising the existing RoW of existing 220 kV inter-State line between Yerandahalli and Hosur at some locations

where severe RoW problem was envisaged. Therefore, the Electronic City – Hosur 400 kV D/c line was also constructed with multi-circuit towers supporting Electronic City – Hosur 400 kV D/c and Yerandahalli – Hosur 220 kV D/c line where the above 220 kV line RoW was used.

ED, POWERGRID proposed that both the above Multi-circuit portions may be covered under the scope of Electronic City – Hosur 400 kV D/c line for the purpose of booking of cost. The members agreed for the same.

17.2 RoW issue of the North Trissur – Kozhikode 400 kV D/c quad line:

ED, POWERGRID said that POWERGRID was to implement North Trissur – Kozhikode 400 kV D/c quad line, however the scheme could not take-off due to severe RoW problems in Kerala. While approving the scheme during 31st Meeting of Standing Committee on Power System Planning in SR held on 16 November, 2010, it was stated that, this scheme could be taken up provided RoW of existing 220 kV Thrissur - Kozhikode line was given to POWERGRID. Therefore, he requested that this scheme should be kept under abeyance till RoW issue is resolved. In this regard, ED (SR-II), POWERGRID informed that, as per the discussions with KSEB, KSEB may release the existing Thrissur – Kozhikode 220 kV line, if the under construction Mysore – Kozhikode 400 kV D/c being implemented by POWERGRID materialises. He further informed that the Stage-I clearance of MoEF has been recently obtained and therefore there is likelihood that Mysore – Kozhikode 400 kV D/c line can be taken up after resolving all the RoW issues.

The members took note of the issue.

17.3 Thiruvallam 765/400kV S/S – construction of 765kV switchyard as GIS:

ED, POWERGRID informed that under the “Vallur Supplementary Scheme” a 400kV substation at Thiruvallam with provision to upgrade it to 765 kV in future has been envisaged. However, POWERGRID was facing problem in acquisition of adequate land at Thiruvallam for AIS for both 400 kV and 765 kV switchyards. The Revenue authority had asked POWERGRID to reduce the land requirement for which it is proposed that 765 kV portion may be constructed with GIS and 400kV portion with AIS.

Members agreed for the above proposal.

17.4 LILO of Gazuwaka – Vijayawada 400 kV S/c line by GREL and related issue:

ED, POWERGRID said that under the “Common Transmission System Associated with ISGS projects in Vemagiri Area of Andhra Pradesh”, a LILO of existing 400 kV Gazuwaka – Vijayawada S/c line was proposed for initial integration of grid. In the Vemagiri area of Andhra Pradesh, GMR Rajahmundry Energy Limited (GREL) is constructing a 768 MW gas based combined cycle power plant and had requested to review their grant of LTA/Connectivity considering the development of pooling station in Vemagiri Area.

GREL during the 32nd Meeting of Standing Committee on Power System Planning in SR held on 8 June, 2011, had indicated that as an interim arrangement they were constructing the LILO of Gazuwaka – Vijayawada 400 kV S/c line at their generation switchyard. This LILO line was required to be further extended up to Khammam S/S for LTA. Considering the planning of High Capacity Corridor from Vemagiri to Hyderabad via Khammam, GREL

was allowed to terminate their lines at Vemagiri Pooling Station instead of Khammam. During the above meeting, GREL further proposed to LILO their LILO portion of Gazuwaka – Vijayawada 400 kV S/c line at Vemagiri Pooling Station and this portion to be constructed on multi-circuit tower to avoid construction of another LILO of Gazuwaka – Vijayawada 400 kV S/c line at Vemagiri Pooling Station under “Common Transmission System Associated with ISGS projects in Vemagiri Area of Andhra Pradesh” and the same was agreed in the above meeting.

However, considering that initial integration of Vemagiri Pooling Station is through LILO of Gazuwaka – Vijayawada line and many other generations are being pooled in this pooling station and high capacity corridor from this point, it was felt prudent that LILO of Gazuwaka –Vijayawada line at Vemagiri Pooling Station shall be implemented by POWERGRID. GMR would extend their interim LILO arrangement to Vemagiri Pooling Station. This will also help in operation of the Pooling Station and the High Capacity Corridor.

Members agreed for the same.

17.5 Proposal for laying of OPGW and Associated Optical Fibre Communication(OFC) equipments) in Southern Region:

17.5.1 In the meeting, the requirement of OPGW and associated OFC equipments at substations in Southern Region was also discussed. POWERGRID stated that the problems were being faced for grid management and substation operations in absence of reliable communication. Further, the requirement of bandwidth was increasing manifold due to high volume of SCADA data, implementation of several Special protection Schemes (SPS) and PMUs etc under Smart Grid Projects, therefore, OPGW (Minimum 24 Fibers) and associated OFC equipment should be provided along with the construction of transmission and generation projects so as to connect all the substations and generating stations. In Southern Region, fiber optic connectivity was being provided to connect all the existing substations and major power plants and has already been approved by SRPC.

17.5.2 In view of above, following was agreed:

1. (i) The OPGW and associated OFC equipments shall be installed to provide the fiber optic connectivity to all the newly planned substations and generating station for which the transmission system is planned by this Standing Committee.
- (ii) The lines where OPGW is to be installed shall be identified in such a way that the communication network meets the N-1 criteria for reliability of the communication network. This identification would be carried out by CTU.
- (iii) The identified lines would be discussed in the Standing Committee for finalization.
2. The cost of OPGW and associated OFC equipments at substations shall be included in the project cost of transmission/generation scheme.
3. Accordingly, OPGW will be installed on the following lines which were approved in

the present meeting, i.e. under the Transmission System Associated with Krishnapatnam UMPP, Connectivity system of TPCIL Generation, Srikakulam Pooling Station – Vemagiri Pooling Station, NTPC Kudgi TPS(Phase-I):

- (i) Nellore Pooling Station – Gooty 400 kV D/c (quad) line
- (ii) TPCIL – Nellore Pooling Station 400 kV D/c (quad) line
- (iii) Srikakulam Pooling Station – Vemagiri Pooling Station 765 kV D/c line
- (iv) Kudgi (POWERGRID) – Kudgi (NTPC), in case of bus extension this is not required.
- (v) LILO Portion of 400kV Gazuwaka – Vijayawada 400 kV S/c Line at Vemagiri Pooling Station

17.5.3 It was also agreed that, in short lines where distance protection is not feasible, OPGW shall be provided for current differential protection.

**List of participants for the 33rd meeting of SCPSR, held on 20th October, 2011
at Northern Region Power Committee, at Katwaria Sarai, New Delhi**

<u>Sl. No.</u>	<u>Name and Organization</u>	<u>Designation</u>
<u>Central Electricity Authority (CEA)</u>		
1.	Ravinder	Member (Power System)
2.	Pardeep Jindal	Director (SP&PA)
3.	Manjari Chaturvedi	Deputy Director (SP&PA)
4.	Nageswara Rao Maragani	Engineer (SP&PA)
<u>Southern Region Power Committee (SRPC)</u>		
1.	S D Taksande	Member Secretary
2.	S. R. Bhatt	Superintending Engineer
<u>Power Grid Corporation of India Ltd (PGCIL)</u>		
1.	Y. K. Sehgal	ED(SEF, CE & IT)
2.	Bharat Bhushan	ED(SR-I)
3.	S. Ravi	AGM(SR-I)
4.	Kamal Sarkar	AGM(OS)
5.	A. S. Kushwaha	AGM(LD&C)
6.	Minoo Verghese	DGM (SR-II)
7.	Dilip Rozekar	DGM (SEF)
8.	R V Madan Mohan Rao	CDE(SEF)
9.	Gunjan Aggarwal	Mgr (OS)
<u>Power System Operation Corp. Ltd (POSOCO)</u>		
1.	P R Raghuram	GM (SRLDC)
2.	S P Kumar	CM (SRLDC)
<u>National Thermal Power Corp. (NTPC)</u>		
1.	Abhijit Sen	Addl. GM (Project Engg.-Elect.)
2.	S S Misra	DGM (Engg)
<u>Neyveli Lignite Corp. (NLC)</u>		
1.	S.Muthu	CGM
2.	R. Suresh	CGM(Commercial)
<u>Transmission Corp. of Andhra Pradesh Ltd. (APTRANSCO)</u>		
1.	M Jayachandra	CE(PS)
2.	Ch.V.S.Subbarao	SE(SP)

<u>Sl. No.</u>	<u>Name and Organization</u>	<u>Designation</u>
3.	P.V.Rao	DE/System Studies

Karnataka Power Transmission Corp. Ltd. (KPTCL)

1.	Pratap Kumar	Director(Transmission)
2.	D.Chethan	EE (PSS)
3.	K.Paramesha	AEE (PSS)

Kerala State Electricity Board (KSEB)

1.	M.A.Rawther	Member(Transmission)
----	-------------	----------------------

Tamil Nadu Electricity Board (TNEB)/Tamil Nadu Transco

1.	S.Akshya Kumar	Dir/Tran.Projects(TANTRANSCO)
2.	K Thangachamy	SE/System Studies(TANGEDCO)
3.	S.Ravi Chandra	EE/System Studies(TANGEDCO)

Ministry of New & Renewable Energy (MNRE)

1.	Dr. P.C.Maithani	Director
2.	J.K.Jethani	Scientist-'D'

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

Annex – II

Corrigendum to Minutes of the 32nd Meeting of the Standing Committee on Power System Planning of Southern Region held on June 08,2011

Minutes of 32nd meeting of the Standing Committee on Power System Planning of Southern Region were issued vide our letter number 51/4/SP&PA-2011/991-1001 dated 06-07-2011. SRPC, vide their letter no. SRPC/SE-I/2011/5401-02 dated 19-07-2011 have given their observation regarding transmission system for evacuation of power from Simhadri-II TPS(2x500MW) of NTPC.

Based on observations given by SRPC, following Para is added in the Minutes of 32nd meeting of the Standing Committee on Power System Planning of Southern Region:

Para7.6 GM,SRLDC informed that the existing transmission system (ISTS) in Southern region is fully capable of handling the entire LTA of the region including the generation from Simhadri-II and only STOA will be curtailed if needed be.

————— X ————— X ————— X ————— X