भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
केन्द्रिय विद्युत प्राधिकरण
Central Electricity Authority
प्रणाली योजना एवं परियोजना मुल्यांकन प्रभाग
System Planning & Project Appraisal Division
सेवा भवन, आर. के. पुरम, नई दिल्ली-110066
Sewa Bhawan, R. K. Puram, New Delhi-110066
वैबसाईट / **Website: www.cea.nic.in**

[ISO: 9001:2008]

No. 1/9/SP&PA-2013 /117-135 **Dated: 20.01.2014**

-As per list enclosed-

Sub: Minutes of 33rd Standing Committee Meeting on Power System Planning of Northern Region held on 23rdDecember, 2013 at NRPC, Delhi.

Sir,

The Minutes of 33rd Standing Committee Meeting on Power System Planning of Northern Region have been uploaded on CEA website: www.cea.nic.in (path to access- Home Page- Wing-wise Documents of CEA- Power System Wing- Standing Committee on Power System Planning - Northern Region) for information and necessary action please.

Yours faithfully,

(K.K. Arya)

Chief Engineer(I/C),SP&PA

-List of Addressee-

1 - Member Secretary NRPC, 18-A Shajeed Jeet Singh Sansanwal Marg, Katwaria Sarai, New Delhi - 110016 (Fax-01 1-26865206)	2. Director (W&P) UPPTCL, Shakti Bhawan Extn,3rd floor, 14, Ashok Marg, Lucknow - 226 001 (Fax-0522-2287822)	3. CEO, POSOCO B-9, Qutab Institutional Area Katwaria Sarai New Delhi - 110016. (Fax : 26852747)
4. Director (Projects) NTPC, NTPC Bhawan, Core 7,Scope complex-6,Institutional Area, Lodhi Road, New Delhi- (Fax-01 1-24361018)	5. Director (Projects) PTCUL, Urja Bhawan, Campus, Kanwali Road Dehradun- 248001. Uttarakhand (Fax-0135-2763431)	6. Member (Power) BBMB, Sectot-19 B Madya Marg, Chandigarh-1 60019 (Fax-01 72-2549857)
7. Director (T&RE) NHPC Office Complex, Sector - 33, NHPC, Faridabad - 121 003 (Fax-0129-2256055)	8. Director (Operations) Delhi Transco Ltd. Shakti Sadan, Kotla Marg, New Delhi - 11 0 002 (Fax-01 1-23234640)	9. Chief Engineer(Transmission) NPCIL,9- S-30, Vikram Sarabhai Bhawan, Anushakti Nagar, Mumbai - 400 094 (Fax-022-25993570, 25563350)
10. Director (Projects) POWERGRID, Saudamini, Plot no. 2, Sector - 29, Gurgaon-122 001 Fax-0124-2571932'	11. Director(Technical), Punjab State Transmission corporation Ltd. (PSTCL), Head Office The Mall, Patiala - 147 001 (Fax-0 1 75-230401 7)	12. Chief Engineer(Operation) Ministry of Power, UT Secretariat, Sector-9 D Chandigarh - 161 009 (Fax-01 72-2637880)
13. Director (Technical) RRVPNL, Vidyut Bhawan, Jaipur-302 005. Fax 0141-2740794	14. Director (Technical) HVPNL, Shakti Bhawan, Sector -6, Panchkula - 134 109 (Fax-01 72-2560640)	15.Managing Director, HP PowerTransmission Corporation Ltd., Barowalias, Khalini, SHIMLA-171002 (Fax-01 77-2623415
16. Director(Technical) HPSEB Ltd. Vidyut Bhawan, SHIMLA-171004 (Fax-01 77-2813554)	17. Director(Technical) THDC Ltd. Pragatipuram, Bypass Road, Rishikesh- 249201 Uttarakhand, (Fx-0135-2431519)	18. Development Commissioner (Power), Power Development Department, Grid Substation Complex, Janipur, Jammu. Fax No. 191-2534284
19. COO(CTU), POWERGRID, Saudamini, Plot no. 2, Sector - 29, Gurgaon-122 001 (Fax-0124-2571809)		

MOM of 33rd Standing Committee Meeting on Power System Planning of Northern Region held on 23rdDecember, 2013 at NRPC, Delhi.

List of participants is enclosed at **Annexure 1**.

Chief Engineer (SP&PA), CEA welcomed the participants of 33rd Standing Committee Meeting on Power System Planning of Northern Region. He thanked them for their presence in the meeting and stated that the meeting had been convened at a short notice as certain important issues were to be discussed on priority. He requested Director (SP&PA) & CTU to take up the agenda items for discussion.

1.0 Confirmation of minutes of 32nd Standing Committee Meeting held on 31.08.2013

1.1 Director(SP&PA) stated that minutes of the 32nd meeting of Standing Committee on Power System Planning in Northern Region held on 31.08.2013 at NRPC, New Delhi, were circulated vide CEA letter No. 1/9/SP&PA/2013 dated 27.09.2013 and uploaded on website. He stated that no comments had been received from the constituents.

1.2 Director (SP&PA) further stated that in para 15.5 of minutes of the meeting, it had been recorded that "*HPPCL informed that Sainj project is expected by Dec'14. PKTCL is constructing 400 kV 2xS/c lines from Parbati-II HEP to Koldam HEP. Portion of these lines between Parbati-III HEP and Parbati Pooling Station has been completed for evacuation of Parbati-III HEP. It was proposed that PKTCL may be requested to extend these 400 kV lines up to Sainj HEP switchyard by December, 2014 matching with the scheduled commissioning of Sainj HEP for evacuation of power from Sainj HEP."*

1.3 He informed that POWERGRID had requested that above para might be recorded as "As informed by HPPCL, Sainj project is expected by Dec'14. PKTCL is constructing 400 kV 2xS/c lines from Parbati-II HEP to Koldam HEP. Portion of these lines between Parbati-III HEP and Parbati Pooling Station has been completed for evacuation of Parbati-III HEP. It was further informed that Parbati-II and Sainj HEPs are located in very close proximity. For evacuation of power from Sainj, it was agreed that both the 400 kV circuits from Koldam HEP may be constructed upto Parbati-II HEP. As Parbati-II switchyard would not be available

by December 2014, these circuits (i.e. one coming from Parbati Pooling station and other from Parbati-III generation) may be joined together. For evacuation of power from Sainj, LILO of 400 kV direct circuit from Parbati- II HEP to Parbati Pooling station (Banala) may be implemented by HPPCL. This arrangement would provide reliable evacuation of power even under N-1 contingency.

1.4 It was also proposed that PKTCL may be requested to extend these 400 kV lines up to Parbati-II and join both the circuits at dead-end tower of Parbati-II switchyard by December, 2014 matching with the scheduled commissioning of Sainj HEP for evacuation of power from Sainj HEP. "The above modification was agreed to by the constituents.

1.5 Director (SP&PA), CEA enquired about the status of Sainj HEP. HPPCL confirmed the date of commissioning as Dec.'14. HPPCL requested that for testing purpose the system may be made available by Oct'14. After deliberations on the issue it was agreed that the lines may be completed by Dec.'14. HPPCL requested that the LILO part at Sainj HEP Switchyard may be constructed by PKTCL as a deposit work of HPPCL. He further informed that they have taken up the matter with PKTCL in this regards but PKTCL did not agree for this work as the LILO work was beyond the scope of works for which PKTCL had obtained transmission license.

1.6 COO, CTU advised HPPCL to send a letter to CTU regarding their willingness to get the LILO work executed by PKTCL as a deposit work of HPPCL and he would take up the issue with PKTCL.

1.7 UPPTCL stated that in para 6.2 (i) of the minutes of the 32nd Standing Committee Meeting (regarding Evacuation System for Lalitpur STPS 3x660 MW), it might be added that the 50% Fixed Series Compensation (FSC) in 765 kV Lalitpur-Agra (UP) 2xS/c lines would be installed at Agra end. This addition in the MOM was agreed & MOM stands corrected accordingly.

1.8 Thereafter, the minutes of the 32nd meeting were confirmed.

2.0 Evacuation of Power from Koldam HEP(800MW)

2.1 POWERGRID informed that considering the R-o-W constraints in the Parbati valley area in Himachal Pradesh, high capacity (Triple/Quad conductor) lines are being implemented for evacuation of power from various HEPs. However it was

observed from the data received from NTPC in connection agreement that NTPC had provided Koldam Hydro generation switchyard with one and half breaker switching scheme with main bus rating of 3000 Amps but the rating of 400 kV line bay equipments is only 2000 Amps which may pose transmission constraints in future when further generations are added in the Parbati valley.

2.2 CTU also informed that NTPC has proposed that when upgradation of bay equipments on account of capacity addition in the complex may be taken up as part of system strengthening rating as and when required.

2.3 COO, CTU stated that since the evacuation lines are of high capacity (triple/quad) the bay equipments rating should be the same.

2.4 The issue was discussed by the members and the following were agreed:

- Considering that the Koldam HEP generation is to be commissioned shortly and the switchyard is already commissioned, the line bay equipment rating of 2000 Amp provided at Koldam switchyard may be considered at present as the bay equipments had already been erected.
- In future depending upon the requirement, NTPC would carry out the up-gradation of bay equipments rating in line with the evacuation lines, as per the directions of SCM / NRPC. This up-gradation work would not be a taken up as strengthening scheme and it will be done by NTPC at their cost.

3.0 Bairasuil - Sarna 220 kV Double Circuit line

3.1 Director (SP&PA), CEA informed that during the 30th SCM held 19/12/11 an additional 220 kV D/c evacuation line from Bairasuil HEP to Sarna 220kV substation of PSTCL was agreed to as a system strengthening scheme (ISTS) to be implemented through Tariff based Competitive Bidding route. The 220 kV double circuit transmission line project is presently under bid processing stage through RECTPCL. As per Survey out of 80 km total length, 60km line shall traverse through forest involving about 208 hectares of forest area and entire 60 km stretch would fall in hilly area as well. Considering the survey report furnished by RECTPCL the project cost was reviewed by CEA & CTU and revised estimated cost of the subject cited project worked out to Rs.250 Crores i.e. line cost/km

came to more than Rs 3 Crores. As the cost of line was very high it was decided the matter may be put up the constituents of Northern Region.

3.2 RVPN and HVPN stated that cost of line is very high and some alternate solution for reliable evacuation of Bairasiul HEP should be considered. HPPTCL informed that one circuit of existing 220 kV Bairasiul-Pong D/c line had already been LILOed at Jessore substation and additional outlets for dispersal of power are available at Jessore. HPPTCL suggested that 2nd circuit of this line may also be LILOed at Jessore as an alternative solution.

3.3 The issue was deliberated and all the constituents were of the view that considering the very high cost of Bairasuil – Sarna 220 kV D/c line the implementation of this line may be dropped.

3.4 It was opined that Baira Suil HEP is a very old generating station commissioned about 31 years ago and power is being evacuated with the existing Bairasuil – Pong 220 kV D/c line. HPPTCL informed that they do not envisage any additional generation to be evacuated using this line.

3.5 After detailed deliberations, following was agreed in the meeting:

i. One circuit of existing Bairasuil – Pong 220 kV D/c line is looped in looped out at Jessore 220 kV substation of HPSEB. Option should be explored to LILO the second circuit of at Jessore substation.

ii. Strengthening of existing 220 kV Bairasiul-Pong D/c line may be taken up by POWERGRID and conductor may be replaced as per the requirement. Protection measures to avoid sinking of towers may be taken up. If required rerouting of small portion of line (say 4-5 km) may also be considered.

iii. An additional circuit (220 kV S/c) may be planned from Bairasuil to Jessore after looking into the availability of corridor and after detailed costing.

3.6 It was decided that for examining the above alternatives, a committee comprising of representative from CEA, POWERGRID and HPPTCL would be constituted. The committee will furnish recommendations regarding economically viable alternative solution for reliable evacuation of Bairasiul HEP.

3.7 It was also decided that Bairasuil- Sarna 220 kV D/c line may be dropped.

Members agreed with the above.

4.0 Status of UITP scheme of Uttarakhand

4.1 During the 31st Standing Committee Meeting of NR, it was agreed that PTCUL would make all efforts to complete the Pipalkoti-Srinagar-Kashipur 400 kV D/c(Quad) line matching with the commissioning of Tapovan Vishnugad HEP to facilitate the evacuation of power from Tapovan Vishnugad HEP.

4.2 NTPC informed that Tapovan Vishnugad HEP would be commissioned by Feb. 2017. PTCUL was requested to inform the status of the Pipalkoti-Srinagar-Kashipur 400 kV D/c (Quad) line. PTCUL stated that works for Pipalkoti- Srinagar 400 kV D/c (Quad) line have been re-tendered and NIT would be issued next month and the works would be awarded by May'14 with 30 month time for commissioning of above line works. For Srinagar- Kashipur 400 kV D/c (Quad) line it was informed that the award of the work is expected in Dec.'13 with commissioning schedule of 30 months. PTCUL informed that both the lines would be ready by Dec.'16. Regarding statutory clearances for execution of above works, PTCUL informed that no reserved forest and wild life sanctuary is involved and Forest clearance has been taken.

4.3 COO, CTU stated that Tapovan Vishnugad being a greenfield project, PTCUL would have to expedite the evacuation works matching with the project commissioning schedule.

4.4 CTU stated that post CERC decision in which the UITP scheme of Uttarakhand had been declared deemed ISTS, all developers need to apply for Long term access to POWERGRID. Regarding Lata Tapovan- Joshimath- Pipalkoti 220kV D/c lines required for 171MW Lata Tapovan HEP (NTPC), 250MW Tamak Lata HEP (UJVNL) & other HEPs in Alaknanda Basin, POWERGRID requested that PTCUL may provide information whether the scheme was part of UITP scheme approved by CERC. NTPC informed that schedule for Lata Tapovan HEP is June'17. POWERGRID informed that no LTA application has been received as on date for the above projects. PTCUL was also requested to inform the status of connectivity applications received by them from other hydro generators. PTCUL agreed to provide the above details.

4.5 THDC informed that Vishnugad Pipalkoti HEP(444MW) is scheduled to be commissioned in Jan.'18. POWERGRID advised THDC to apply for connectivity and LTA for this project.

4.6 After detailed deliberations, it was decided to form a coordination forum of CEA, POWERGRID, NTPC, THDC, NHPC, SJVNL, UJVNL (Uttarakhand), IPPs etc. A meeting of this forum would be held on 15th Jan.'14 in Dehradun to look into the status of the UITP transmission system & the commissioning schedules of the generations to be evacuated. PTCUL would issue the meeting notice to all the forum members.

5.0 LILO of 2nd circuit of 400kV Talwandi Sabo–Nakodar D/c at MogaS/s (PG)

5.1 Director (SP&PA) informed that Talwandi Sabo is a 1980MW (3x660MW) state generation being developed in Punjab and for evacuation of power from the projects in Punjab, PSTCL is constructing following transmission system:

- Talwandi Sabo - Muktsar 400 kV D/c line
- Muktsar - Patti - Nakodar 400 kV D/c line
- Patti - Amritsar (PGCIL) 400 kV D/c line
- Talwandi Sabo - Nakodar 400 kV D/c (one ckt to be LILOed at Moga 400kV PGCIL s/s)
- Talwandi Sabo - Dhuri 400 kV D/c
- Dhuri - Rajpura 400 kV D/c
- Rajpura - Rajpura TPS 400kV D/c
- Rajpura TPS - Nakodar 400kV D/c
- Establishment of 400/220 kV S/S by PSEB at Muktsar, Patt andNakodar with 2x315 MVA 400/220kV trf at each
- Establishment of 400/220 kV S/S by PSEB at Rajpura and Dhuri with2x500 MVA 400/220kV trf at each

5.2 The above mentioned transmission system was discussed and agreed during the 26th Standing Committee on Power system planning of Northern Region held on 13/10/2008.

5.3 Director (SP&PA) stated that PSTCL had requested for Loop-in-Loop-out of second circuit of Talwandi Sabo - Nakodar 400 kV D/C at Moga S/s (PG). PSTCL has indicated that under light load condition overloading of Talwandi-Moga-

Nakodar line is being faced and the proposed LILO of second circuit ofTalwandi Sabo - Nakodar 400 kV D/C at Moga would mitigate this overloading problem. The proposed LILO would also provide better connectivity of Moga (ISTS) substation with the 400kV intra-state transmission system of PSTCL and facilitate Punjab to draw more power from ISTS during high load period when the generation of Talwandi Sabo Plant is low. He stated that considering the above, the proposal of PSTCL may be agreed to.

5.4 POWERGRID informed that space for only one number of 400kV bay is available at Moga S/s (PG). It was discussed that in future Kishenpur-Moga lines would be charged at 765kV and additional 765kV lines are envisaged from Suratgarh under Green energy corridor. To further distribute power, additional transformation capacity would be required at Moga substation. Considering the above and the anticipated future growth in Moga area, it was proposed that POWERGRID may acquire additional land at Moga substation.

5.5 Members opined that while acquiring the land, availability of adequate R-o-W for entry of additional lines in the substation may be verified in the area. Possibility of substation extension as GIS may also be explored if required.

Members agreed to the above.

6.0 Agra-Sikar 400kV D/c line

6.1 POWERGRID stated that Agra-Sikar 400kV D/c was proposed under System strengthening in Northern region for Sasan & Mundra UMPP and is nearing completion. At the time of planning, the line length was estimated to be about 310km and accordingly, 50MVAR line reactors were planned at both ends of this line. However, the actual line length as per the final route is about 385km.

6.2 Considering the increased line length and existing voltage profiles, POWERGRID proposed that the 50MVAR line reactors of this line at Agra end may be replaced by 80MVAR line reactors. This would facilitate the line charging from Sikar end also. The 50MVAR line reactors getting spared at Agra S/s may be diverted for gainful utilization under any ongoing or future scheme.

6.3 **After discussions, it was agreed that 80 MVAR line reactors would be provided at Agra end of 400 kV Agra-Sikar D/c line and 50 MVAR line**

reactors getting spared at Agra substation would be diverted to other locations for gainful utilization under any ongoing or future scheme.

POWERGRID also informed that the Agra – Sikar 400 kV D/c line is ready whereas, the bays at Agra substation for terminating 400 kV Agra – Sikar D/c line would take some time. Accordingly, POWERGRID proposed for terminating this line at Gwalior bays of Agra –Gwalior line, which were vacated after charging of Agra- Gwalior line at 765kV level. It was confirmed that later on after the completion of 400 kV line bays at Agra S/s, the Agra – Sikar line shall be diverted to these bays for which shutdown would be required. **Members agreed with the above.**

7.0 Series Bus reactors

7.1 Director(SP&PA) stated that during the 32nd Standing committee meeting, the issue of increase in short circuit levels in NCR area due to growth in the network and generation was discussed and the proposal of POWERGRID to provide the following series reactors to control the short circuit level at 400 kV substations in/around Delhi was deliberated in detailed:

- Dadri-Mandaula 400kV Ckt-I & II – 2nos
- Dadri-Maharanibagh 400kV Ckt – 1nos
- Dadri-Greater Noida 400kV Ckt – 1nos
- Ballabhgarh-Bamnoli 400kV Ckt-I & II – 2nos
- Ballabhgarh-Nawada 400kV Ckt-I – 1nos
- Bawana-Mandaula 400kV Ckt-I & II – 2nos
- Bawana-Mundka 400kV Ckt-I & II – 2nos
- Jhattikhara-Mundka 400kV Ckt-I & II – 2nos
- Series bus reactors of at 400 kV Mandaula & Ballabhgarh substations

7.2 It was informed that it was decided in 32nd Standing committee meeting that initially only two series bus reactors and two series line reactors on anyone D/c line might be taken up in first phase and subsequently with the acquired operational experience, the other series reactors could be considered for implementation. Accordingly, the provision of series reactors at following locations in first phase was approved:

Series bus reactors

i. 400 kV Mandaula substation

ii. 400kV Ballabhgarh substation

Series Line reactors:

iii. Dadri-Mandaula 400kV Ckt-I & II – 2 Nos.

7.3 In addition to the above, proper sectionalizing arrangement was also agreed at 765kV Greater Noida S/s so that the 400 kV Dadri-Greater Noida-Nawada-Ballabhgarh line is kept isolated from main bus of 765/400 kV Greater Noida substation of UPPTCL under normal operation & only connected as a contingency measure when requirement arises.

7.4 UPPTCL stated that the increase in short circuit levels in NCR area was due to increase in ISTS network and restrictions for the interconnection of 765/400 kV Greater Noida S/s (UPPTCL) & 400/220 kV G.Noida S/s (UPPTCL) may not be appropriate.

7.5 POWERGRID informed that the grid is growing at a fast pace to meet the load growth and we have to tackle the issue of high short circuit levels collectively. In the present case existing 400kV Greater Noida is connected to the Delhi Ring. Inter-connection of existing 400 kV Greater Noida S/s with proposed 765kV Greater Noida substation directly/indirectly would increase the short circuit level appreciably as:

- Any fault contribution from 765kV for a fault at 400kV level shall get almost doubled due to transformer step down.
- As the 765/400 kV transformation capacity is large, reduction in fault contribution due to transformer impedance will not be significant.

7.6 It was also stated by POWERGRID that the above restriction for inter connection of 765 and 400 kV Greater Noida S/s was proposed as a last resort after considering the effect of addition of all series bus reactors and series line reactors as detailed in Para 7.1 above. The relevant studies were also circulated to all Members with the agenda of 32nd Standing Committee Meeting. Even with the proposed sectionalizing under normal operation, UPPTCL would have the flexibility to connect with Delhi ring as and when need arises.

7.7 DTL opined that keeping in mind the security of the Grid as well as the 400/220 kV substations, even the Delhi ring has also been sectionalized at Jhatikara. Otherwise, the switchgear at all the substations in the ring would have to be upgraded.

7.8 After discussions UPPTCL agreed to the provision of series reactors as listed under para-7.2 above. It was agreed that POWERGRID would proceed with the series line reactors on both circuits of Dadri-Mandola andseries bus reactors on Mandola and Ballbagarh as agreed in the 32nd SCM.

7.9 Regarding proposed sectionalising of 765/400 kV Greater Noida substations, it was proposed that further discussions would be held with UPPTCL.

Members agreed to the above.

8.0 Ballabhgarh – Greater Noida 400 kV D/c line along with 400/220 kV substation at Greater Noida (NRSS-XXXIII)

8.1 Director (SP&PA), CEA stated that during the 31st Standing committee meeting, Noida Power Company Ltd. (NPCL)'s application for connectivity for drawl of 500MW power for distribution in Greater Noida area in Uttar Pradesh was discussed. During the meeting it was informed that M/s NPCL had executed a Long Term PPA with M/s Essar Power (Jharkhand) Ltd for procurement of 240 MW power from April 2014 for 25 years and CTU had already granted Long Term Access of 400 MW (for Target Beneficiaries) in Northern Region to M/s Essar Power (Jharkhand) Ltd and they have requested to approve / provide LTA of 240 MW to NPCL being the actual beneficiary, out of total approved 400MW LTA in NR. Presently 400/220 kV, 3x315MVA transformers are installed at Greater Noida substation of UPPTCL and the transformers are loaded heavily and to meet the future power demand another substation is required in the area. Considering the requirement of UP and of Noida Power Company following system was agreed as system strengthening scheme NRSS-XXXIII to be implemented through Tariff Based Competitive Bidding route:

- Ballabhgarh – Greater Noida (New) 400 kV D/c (5 km from Ballabhgarh S/s on multi-circuit towers)
- Establishment of 2x500 MVA, 400/220 kV GIS substation at Greater Noida(New) with a short circuit current rating of 50 kA.

8.2 Director (SP&PA), CEA informed that the above transmission strengthening scheme was to provide connectivity & LTA to Noida Power Company and additional drawl of power by UPPTCL to meet future load growth in Noida & Greater Noida area. He further intimated that the PPA of NPCL with M/s Essar Power had gone in dispute and presently being heard in UPERC and in view of this, the implementation of NRSS-XXXIII transmission scheme was put on hold.

8.3 UPPTCL stated that they do not require this proposed new 400/220 kV substation as they have their own plans for supply of power in this area.

8.4 POWERGRID informed that NPCL has now applied for Long Term Access for 500 MW with target source from Western (400 MW) and Eastern Region (100 MW).

8.5 Regarding connectivity application of Noida Power Company **it was decided that Noida Power Company is already connected to STU grid and additional connectivity could not be provided. As the Greater Noida substation was planned as system strengthening scheme the additional connectivity to Greater Noida was agreed from New Greater Noida substation.**

8.6 Regarding LTA application of Noida Power Company it was deliberated that the Noida Power Company is a State embedded entity and therefore for providing LTA to Noida Power Company, NOC from STU (UPPTCL) is required as per the CERC regulations. **It was decided that after receipt of NOC from UPPTCL, the LTA application shall be processed and discussed with the constituents. It was requested to UPPTCL for early processing of NOC to greater Noida.**

8.7 Thereafter POWERGRID would submit the petition for regulatory approval from CERC for implementation of the above identified scheme. After approval from CERC, the scheme can be taken up for implementation.

8.8 In view of the above, it was decided that the implementation of NRSS-XXXIII scheme would be kept on hold.

Members agreed with the same.

9.0 Karcham Wangtoo Reactors

9.1 Director (SP&PA), CEA stated that for evacuation of power from Karcham Wangtoo HEP, Karcham Wangtoo –Abdullapur 400kV D/c quad line with 80MVAR line reactors at Karcham Wangtoo end was implemented. In the 31st Standing

committee meeting of NR, it was agreed to Loop-in Loop-out both circuits of this 400 kV D/c line at new Kala Amb (HP) S/s to be implemented by HPPTCL and provide 40% Series Compensation on 400 kV Karcham Wangtoo – Kala Amb D/c line under NRSS-XXXI. The scheme is being implemented under Tariff Based Competitive Bidding. The expected length of Karcham Wangtoo-Kala Amb line after Loop-in Loop-out is about 120km.

9.2 It was proposed by POWERGRID that considering the reduction in length of the above line and proposed 40% series compensation on this line, the existing 80 MVAR line reactors at Karcham Wangtoo switchyard may be converted as 400 kV bus reactors and both the line reactors could be connected through one 400 kV bay.

9.3 M/s Jaypee representative informed that proposed conversion of line reactors to bus reactors would require extension of all 6 nos. 400 kV bus bars which is difficult and would also require shutdown of existing GIS for atleast a month. He agreed to examine the feasibility of bus extension and provision of additional GIS bay equipments and would inform CTU/CEA in 2 months.

9.4 **It was decided to consider the above proposal in next Standing Committee meeting of NR.**

10.0 Kishenganga HEP(330MW)

10.1 Director(SP&PA), CEA stated that the following transmission system for evacuation of power from Kishenganga HEP (330MW) of NHPC in J&K was discussed and agreed during the 18th Standing committee meeting held on 6/6/2005:

- Kishenganga – Alusteng - New Wanpoh 220 kV D/c line
- Kishenganga - Amargarh 220kV D/c line.

10.2 Director (SP&PA), CEA asked NHPC about the commissioning schedule of Kishenganga HEP. NHPC informed the commissioning schedule as January''16.

10.3 POWERGRID stated that to implement above evacuation scheme, space for 4 nos. of 220 kV bays at Alusteng (PDD) and space for 2 nos. of 220 kV bays at Amargarh substations of PDD, J&K would be required. PDD, J&K shall have to carry the above works on deposit basis.

10.4 PDD informed that space for 2 nos 220 kV bays is available at Amargarh S/s. However the space for 4 nos. 220 kV bays at Alusteng S/s would not be feasible. In addition it was informed that PDD is already implementing Alusteng-New Wanpoh 220kV D/c line.

10.5 **Members discussed and decided that as there is space constraint at Alusteng S/s, POWERGRID may go ahead with minor modification in the approved Kishenganga-Alusteng-New Wanpoh D/c line of the evacuation scheme and the modified scheme for Kishenganga would be :**

Kishenganga – Amargarh 220 kV D/c

Kishenganga – Wagoora 220 kV D/c

Members agreed to the above

11.0 Gorakhpur & Sultanpur Bus reactors

11.1 Director(SP&PA), CEA stated that studies for providing bus reactors in Northern region were discussed in the 32nd Standing Committee meeting and following 400kV Bus reactors were agreed to:

S.No.	SUBSTATION	MVAr
1	HINDAUN	125
2	PANCHKULA-PG	125
3	SULTANPUR	125
4	GORAKHPUR(UP)	2x125
5	SONEPAT-PG	125
6	MANESAR	125
7	KAITHAL	125
8	KANPUR(PG)	125
9	JAIPUR(S)	125
10	BASSI	125
11	MERTA	125

11.2 It was also agreed in the above meeting that the reactors would be provided by the owner of the respective substation. The proposal was put up in 29th NRPC meeting wherein UPPTCL objected for providing bus reactors at their 400 kV Sultanpur and Gorakhpur substations. He opined that the problem of high voltage was being caused by addition of a number of lines which remained lightly loaded. He also mentioned that installation of the above reactors would have cost implications as well as liability of maintenance.

11.3 POWERGRID informed that presently UPPTCL owns and operates 410km of 765kV line and about 4000 ckm of 400kV lines. The total MVAR generation by these lines would be about 3200MVAR. As against this the total reactive compensation provided by UPPTCL in its system is only 2400MVAR (1470MVAR line reactor + 920MVAR bus reactor). The total compensation at 400kV is only about 75%. Even out of this 2400 MVAR one 50MVAR reactor at Muradnagar is provided by POWERGRID and 300MVAR reactors are not in working condition.

11.4 It was also mentioned by POWERGRID that in ISTS the level of reactive compensation presently provided is about 90% at 400 kV level and more than 110% including 765 kV system.

11.5 UPPTCL stated that UP is a sink of reactive power. The voltages are high due to disproportionate generation &associated transmission network & reactive power supply to UP through ISTS. However old defective reactors at Lucknow, Sultanpur & Bareilly totalling to 300 MVAR would be brought back in service in a month's time.

11.6 POWERGRID informed that system is planned for peak and off peak conditions and there would be requirement of both capacitors as well as reactors depending on different operating conditions. Unlike active power reactive power cannot be transferred over long distances. Other states like Rajasthan has agreed to provide reactive compensation in their station as identified.

11.7 **Members deliberated the issue and decided that UPPTCL should take up the reactive compensation at Gorakhpur and Sultanpur S/s as mentioned above to control the over-voltage in these areas as high voltage would be detrimental for the equipments installed at these substations as well as nearby substations.**

12.0 220kV Intra-state system of Haryana

12.1 Director(SP&PA), CEA stated that HVPNL has intimated the implementation of the following 220kV transmission system proposed for implementation under Intra-state transmission system:

- 220kV S/s at Sec-46 Faridabad with Capacity 2x160MVA, 220/66kV+1x100MVA 220/33kV Transformers
- LILO of both circuits existing 220kV D/c Palla-Palli line at proposed 220kV S/sat Sec-46 Faridabad
- 220kV S/s at Sec-58 Faridabad with Capacity 2x160MVA, 220/66kVTransformers
- LILO of both circuits existing 220kV D/c Faridabad-Samaypur (POWERGRID)line at proposed 220kV S/s at Sec-58 Faridabad
- 220kV S/s at Neemwala with Capacity 2x100MVA , 220/132kV Transformers
- Kaithal(POWERGRID) – Neemwala 200kV D/c (0.5 moose conductor) –36kms
- 220 kV S/s at Mehna Khera with 2x100 MVA 220/132 kV +1x100 MVA 220/33 kV transformers.
- LILO of both circuits of 220 kV Fatehabad-Rania D/c line at Mehna Khera substation.
- 132kV network beyond Neemwala to various load centres.

12.2 POWERGRID stated that presently evacuation from Faridabad CCGT (430 MW) is at 220kV. There are 2nos. of 220kV D/c lines, one D/c line towards 220kV Samaypur S/s of BBMBand other line towards 220kV Palla S/s of HVPNL. The entire power of Faridabad is allocated to Haryana and the tariff of these lines is solely borne byHaryana. In the 31st SCM following was proposed by HVPNL and samewas agreed to.

- LILO of one circuit of 220 kV A5-A4 D/c line at Faridabad generating station
- LILO of one circuit of 220 kV Faridabad Generation station-A3 (Palla) D/c lineat BPTP S/s
- LILO of other circuit of 220 kV A5-A4 D/c line at BPTP substation.

12.3 Director (SP&PA), CEA stated that the present proposal of LILO of both circuits existing 220kV D/c Faridabad-Samaypur (POWERGRID) line at proposed 220kV S/s at Sec-58 Faridabad would reduce injection of power into Samaypur and

relieve loading on Samaypur-Ballabgarh 220kV lines and as such the prosal of HVPN may be agreed. **Members agreed to the above proposal of HVPN.**

12.4 **Members noted the other intra-state transmission works of HVPN as detailed above.**

13.0 Construction of 220kV transmission system by PDD, J&K for drawing power from ISTS Substation in J&K

13.1 Director (SP&PA), CEA stated that to meet the growing power demand and provide additional touch points for drawl of power by Jammu and Kashmir, 400/220kV substations were approved at Samba and New Wanpoh. These substations have been commissioned and facilitate drawl of power by J&K. During the 32nd Standing committee meeting, PDD, J&K requested that the LILO of the Sarna-Hiranagar 220kV line at 400/220kV Samba (PG) substation may be implemented as an ISTS scheme. The same was agreed and J&K was directed to submit the program with firm schedule of completion of their 220kV lines/substations for drawing power from 400/220kV Samba and New Wanpoh S/s of POWERGRID. J&K was requested to furnish the information to the constituents.

13.2 PDD, J&K stated that they have planned extension of 220kV D/c Alistang – Mirbazar line to New Wanpoh bypassing Mirbazar (6.2km) and additionally a 220kV D/c Mirbazar to New Wanpoh line has been planned. 220kV Kishenpur-Mirbazar line already exists. Thus four no. of bays can be utilised at New Wanpoh. For evacuation from Samba substation, LILO of both circuits of Bishnah-Hiranagar 220kV D/c and LILO of Gladni- Hiranagar S/c has been planned. J&K informed that due to fund constraints these planned intra-state transmission works are being held up and requested to be taken as ISTS.

13.3 Members opined that as the above works are of intra-state nature these should be carried out by PDD, J&K.

13.4 PDD, J&K requested that LILO of Sarna- Hiranagar 220kV line at 400/220kV Samba (PG) was recorded in the 32nd Standing committee meeting minutes which may be corrected as LILO of both circuits of Bishnah- Hiranagar 220kV D/c line at 400/220kV Samba (PG).

13.5 Members opined that 220 kV Sarna-Hiranagar is an ISTS line and in 32nd SCM the LILO of this line at Samba S/s (ISTS) was agreed. Since the 220 kV

Bishnah- Hiranagar D/c line is an intra-state line of PDD, J&K the LILO of this line at Samba S/s as an ISTS work could not be agreed and this work should be implemented by PDD,J&K.

13.6 Regarding lack of funds for implementing above planned intra-state works of PDD, J&K, it was agreed that PDD, J&K would provide copies of relevant correspondences with J&K Govt. to CEA and CEA will take up the matter with Principal Secretary. J&K to resolve the issue of fund constraints.

13.7 Members agreed with the above.

14.0 Two nos. of 400 kV bays at Bhiwani(PG) 765/400/220kV substation

14.1 POWERGRID stated that as expansion of STU network, establishment of Dhanonda (HVPNL) –Bhiwani (POWERGRID) 400 kV D/c line of HVPNL was agreed in the 31st Standing Committee Meeting of Northern Region held on 02/01/13. For execution of 2 nos. of 400 kV bays at Bhiwani (POWERGRID) substation an agreement was signed between POWERGRID and HVPNL to carry out the work by POWERGRID on behalf of HVPNL. Award for execution of these 400kV bays was placed on L&T. The work on these bays is almost complete and M/s L&T is repeatedly requesting for the payments. For these works payments to be made by HVPNL.

14.2 Subsequently, after the conversion of Transmission System of Adani Power Limited as ISTS system, the Dhanonda (HVPNL) – Bhiwani (POWERGRID)400 kV D/c line by HVPNL was discussed again during the 32nd Standing Committee Meeting of Northern Region held on 31/08/13. After discussions it was agreed to take up the Mohindergarh – Bhiwani 400 kV D/c line withTwin HTLS as ISTS strengthening scheme instead of Dhanonda (HVPNL) – Bhiwani(POWERGRID) 400 kV D/c line by HVPNL. Considering the above development, HVPNL had conveyed that the works of Bhiwani (POWERGRID) substation needs to be cancelled.

14.3 Keeping above in view, it was discussed & agreed that the 2 nos. of 400 kV bays at Bhiwani S/s (PG) which were being implemented by POWERGRID on behalf of HVPNL would be included as part of ISTS system for terminating Mohindergarh – Bhiwani (POWERGRID) 400 kV D/c line in future. The tariff for the 2 no. of 400 kV line bays at Bhiwani S/s which are nearing completion can be sought from the day of the commissioning of these bays.

14.4 It was also decided that the Mohindergarh – Bhiwani 400 kV D/c line would be constructed with Twin Moose conductor instead of Twin HTLS conductor as all the eight no. of bays and also the existing parallel 400 kV D/c line is of Twin Moose conductor.

14.5 Members agreed to the above proposal.

Addl. Agenda-1 : Construction of 132/220 kV, 2x80/100 MVA Sub Station at Tahliwala (Distt. Una in Himachal Pradesh) by LILO of 220 kV Bhakra-Jamalpur D/c line of BBMB and injection of power in ISTS at Hamirpur S/s (PG)

15.1 Director (SP&PA), CEA stated that HPPTCL has informed that heavy transmission losses are being incurred by drawl of power from Jessore and Hamirpur S/s through long 132 kV lines in order to meet the load requirements in Una/ Tahliwala area.

15.2 HPPTCL informed that discussions were held with BBMB wherein it was proposed by BBMB that H.P. may LILO of both circuits of 220 kV Bhakra-Jamalpur (Punjab) D/c line passing through H.P. and establish a 220/132 kV substation at Tahliwala in HP. This would help BBMB to facilitate black start through this alternate load route to Bhakra complex as well as power to Tahliwala industrial area in H.P. shall be available at 220 kV level with reduced losses. It was further desired by BBMB that the proposal be got concurred by Northern Region Constituents in the meeting of Standing Committee.

15.3 It was discussed and agreed that the LILO of both circuits of 220 kV Bhakra-Jamalpur (Punjab) D/c line at 220/132 kV substation at Tahliwala in HP is technically in order subject to re-conductoring of the line with HTLS conductor (for the Bhakra-Tahliwala portion of the line) and bay equipment upgradation at Bhakra as per requirements. The implementation of the above works may be decided in the BBMB committee meeting.

15.4 Director (SP&PA), CEA stated that HPPTCL is constructing a 220kV substation near Hamirpur. HPPTCL informed that the want to inject 220MW at 400/220 kV HamirpurS/s of POWERGRID.

15.5 POWERGRID stated that the Hamirpur is an ISTS substation planned for drawl of power by HP. For injection of power into this substation HPPTCL would need to

apply for Long term access declaring quantum of power and time frame of injection along with the certification that the generation is already connected to the state grid.

15.6 **Members agreed with the above.**

Addl. Agenda-2 : Ensuring adequacy in the planning and development of Inter State Transmission System

16.1 Chairperson & Member (PS) stated that in the present transmission system, congestion is often experienced due to the fact that while the transmission system the transactions of Short/Medium open access and Power Exchanges are not considered and therefore a regime is required where the all type of injection and drawl of power from the planned transmission system is considered for adequate transmission system planning. She informed that keeping this in view the concept paper on General Network Access (GNA) is being presented in the meeting to appraise constituents about this new concept in Transmission system Planning and it is to be discussed with all stake holders for their valuable suggestions.

16.2 Chief Engineer (SP&PA) gave a detailed presentation on GNA concept paper.

16.3 Chairperson & Member (PS) explained that present transmission planned only corresponds to Long Term Access to the generator. Also, connectivity to any generator is almost free of cost. Therefore, the Generation capacity connected to the grid is much in excess to LTA granted actually. Short Term exchange of power has been increased considerably (about 11%) of total generation. Due to this congestion is increasing in the present planned transmission system. In GNA concept, net installed capacity would have to be paid at the point of injection irrespective to the kind of agreement of power purchase and without knowing the purchaser of that power. Subsequently the generator and drawee can seek for LTA(Point to Point)/MTOA/STOA. Chairperson & Member (PS) asked constituents for their views on the GNA concept.

16.4 Some of the states were agreeable to the concept while some states had some reservations. States where of the view that as there is a policy change approval of the management would be necessary.

16.5 Chairperson & Member (PS) concluded the discussion and requested that each constituents may communicate their views to CEA through e-mail by 2nd January,

2014 enabling CEA to incorporate necessary changes in the concept of General Network Access.

16.6 Members noted the same.

Addl. Agenda-3: Creation of 400kV Substation at Etawah to strengthen the link between Western & Northern Grids

17.1 POWERGRID stated that there are 2 nos. 765/400kV ICTs of 1500MVA capacity each at Gwalior substation. This capacity is presently not in use as there is no connectivity at 400kV level from Gwalior substation except three(3) nos. 315MVA, 400/220kV ICTs. A Gwalior 765/400 kV – Morena 400 kV D/C line with establishment of 2X315 MVA, 400/ 220 kV substation at Morena has been proposed. It is proposed to extend the line upto Northern Region. The Interconnection would not only help in effective utilize the available capacity of around 2000MVA of 765/400kV ICTs at Gwalior but also establish a strong Tie link between Western & Northern Grids from the Grid security point of view. The following system is being envisaged

(i) Creation of 400kV Substation at Etawah along with 400kV/220kV, 2x500MVA ICTs.
(ii) Construction of 400kV Quad D/c line between Etawah & Morena S/s
(iii) LILO of 400kV S/c Kanpur-Ballabhgarh (400Km long) and one ckt of 400kV D/c Kanpur-Ballabhgarh at Etawah substation.
(iv) LILO of 220kV D/c Auraiya-Agra(Sikandra) at Etawah Substation.

17.2 The concept of strengthening the corridor between Western & Northern Grids will be studied in detail and would be put up in subsequent Standing committee meeting.

Members noted the same.

Addl. Agenda-3: Replacement of 50 MVAr Bus Reactor by 125 MVAr at Malerkotla

18.1 DGM(OS), stated that Malerkotla end has experienced high voltages upto 430kV under certain circumstances resulting in difficulty in operation of this line. This problem has led to over fluxing of ICTs at Malerkotla as reported by PSTCL. In view of this, he proposed to replace 50MVAr Bus Reactor at Malerkotla by 125

MVAr Reactor & the dismantled 50 MVAr Reactor maintained as Regional spare after refurbishment. Members were of the view that need for the reactor may be studied with already approved bus reactor and STATCOM in the area.

Addl. Agenda-4: Augmentation of transformation capacity at Moga Substation

19.1 DGM(OS), stated that in the 25th NRPC, augmentation of Transformation Capacity at Moga Substation by replacement of 2x250 MVA ICTs by 2x500 MVA ICTs was approved and it is observed that Moga ICTs loadings have increased by over 14% during last one year. He observed that to cater to the need of future load growth, 1x250MVA ICT and 1x315 MVA ICTs at Moga be replaced with 2x500MVA ICTs and the dismantled ICTs to be maintained as Regional spare after refurbishment. Member's states that total MVA capacity of Moga would be about 1565MVA and with the proposed augmentation it would increase to 2000MVA. More than ten 220kV outlets would be required for 2000MVA ICT capacity. Accordingly, it was agreed that the proposal would be reviewed looking into already approved transformation augmentation and no. of feasible 220kV outlets from Moga.

Addl. Agenda-5: Augmentation of transformation capacity at Bhiwadi Substation

20.1 DGM(OS), POWERGRID stated that in view of the increased loading pattern of 400/220 kV ICTs at Bhiwadi(PG) S/s, 2x315 MVA ICTs may be replaced by 2x500MVA ICTs & the dismantled ICTs would be maintained as Regional spare after refurbishment. RVPN stated that the load at Bhiwadi would soon be diverted to Neemrana & Alwar which are going to be commissioned. Accordingly, it was decided that augmentation of transformation capacity Bhiwadi would not be required presently.

Annexure-1

List of participants for the 33rd Standing Committee Meeting of Northern Region held on 23.12.2013 at NRPC, Delhi.

	Name	Designation
CEA		
1.	Smt. Neerja Mathur	Chairperson & Member (PS)
2.	Sh. K.K. Arya	Chief Engineer I/c (SP&PA)
3.	Sh. B.K. Sharma	Director (SP&PA)
4.	Sh. A.K Saha	Dy. Director
PGCIL		
5.	Sh. Y.K.Sehgal	COO (CTU)
6.	Sh. Mukesh Khanna	DGM(CTU)
7.	Sh. Dilip Rozekar	DGM(CTU)
8.	Smt. Manju Gupta	DGM(CTU)
9.	Sh. A. Sensarma	DGM (OS)
10.	Sh. V. Thiagarajan	CDE(CTU)
11.	Sh. S.K Varshney	CM (Comml)
12.	Ms. R.P. Joshi	Sr. Engineer(CTU)
13.	Ms. Ankita Singh	Engineer(CTU)
14.	Sh. Nunavath Ravi	Engineer(CTU)
15.	Ms. Shruti Tiwari	Engineer (OS)
NTPC		
16.	Sh. S.S. Mishra	AGM (Elect.)
17.	Sh. A.K Bishnoi	AGM (Comml.)
18.	Sh. S.Saran	AGM (Comml.)
19.	Ms. Sagarika Mohanty	DGM (PE-Elect.)
NHPC		
20.	Sh.Nain Singh	Executive Director
DTL		
21.	Sh.S.P Routray	Manager(Planning)
HPPTCL		
22.	Sh.R.K Sharma	Director (Proj)
23.	Sh. Sandeep Sharma	Sr. Manager(Plg)

HVPNL

24.	Sh. R.K.Arora	Advisor
25.	Sh. J.K. Juneja	CE(Plg)
26.	Sh. S.B. Moudgil	Chief Engineer(comm.)

RVPNL

27.	Sh L.N. Nimawat	Chief Engineer (PPM)
28.	Ms. Sona Shishodia	XEN(PSS)

J&K PDD

29.	Sh. Asgar Ali Majaz	Dev. Comm.(P)
30.	Sh. Mohd. Ishaq	

POSOCO

31.	Sh. S.K Soonee	CEO (POSOCO)

NRLDC

32.	Sh. D.K Jain	AGM (SO-I)

PSTCL

33.	Ms. Akanksha Yadav	A.E (P&TA)

UPPTCL

34.	Sh.Suman Guchh	SE (UPPTCL)

PTCUL

35.	Sh.S.K Sharma	CE (O&M)

THDC

36.	Sh. P.K Srivastava	GM (EM-D)