



भारत सरकार / Government of India  
विद्युत मंत्रालय / Ministry of Power  
केन्द्रीय विद्युत प्राधिकरण / Central Electricity Authority  
सेवा भवन, आर. के. पुरम, नई दिल्ली-110066  
Sewa Bhawan, R. K. Puram, New Delhi-110066 [ISO: 9001:2008]



No. 1/9/2013-SP&PA/

Dated: 31<sup>th</sup> July, 2014

-As per List Enclosed-

**Subject: The 34<sup>th</sup> Meeting of the Standing Committee on Power System Planning of Northern Region**

Sir,

The 34<sup>th</sup> Meeting of the Standing Committee on Power System Planning of Northern Region would be held at 1100 Hrs. on 8<sup>th</sup> August, 2014 in NRPC Conference Room, Katwaria Sarai, New Delhi. The Agenda for the Meeting is enclosed. The Agenda has also been uploaded in the CEA website [www.cea.nic.in](http://www.cea.nic.in) (path to access-Home page-wing specific documents/Power System wing/Standing Committee/ Northern Region). You are requested to make it convenient to attend the meeting.

Yours Sincerely,

(Goutam Roy)  
Director SP&PA

**Copy for information to:**

- 1) PPS to Chairperson, CEA
- 2) PPS to Member PS, CEA
- 3) Joint Secretary, Ministry of Power, Shram Shakti Bhawan, Rafi Marg, New Delhi

**-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, Sector-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 (Trans.) 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) RRVPL, 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 Power Transmission Corporation Ltd. Barowalia, 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)		

**Agenda note for 34<sup>th</sup> Standing Committee Meeting on Power System Planning in Northern Region.**

**1. Confirmation of the minutes of 33<sup>rd</sup> Meeting of the Standing Committee on Power System Planning in Northern Region held on 23/12/2013**

1.1 The minutes of the 33<sup>rd</sup> meeting of Standing Committee on Power System Planning in Northern Region held on 23<sup>rd</sup> December, 2013 at Delhi at NRPC, Katwaria Sarai, New Delhi, were circulated vide CEA letter No. No. 1/9/SP&PA-2013 /117-135 Dated: 20.01.2014

No observations on any items of the Minutes of the Meeting have been received so far from any of the constituents. Accordingly, the minutes of the meeting may please be confirmed.

**2. LILO of RAPP – Kankroli 400 kV D/c line at Chittorgarh (RVPN)**

LILO of RAPP – Kankroli 400 kV D/c line at Chittorgarh, under NRSS-XXXII, was agreed in the 31<sup>st</sup> Standing Committee Meeting on Power System Planning of Northern Region held on 02/01/2013. Subsequently, during 32<sup>nd</sup> Standing Committee Meeting on Power System Planning of Northern Region held on 31/08/2013 it was agreed to provide Chittorgarh (765/400 kV) S/s– Chittorgarh (RVPN) 400 kV D/c (Quad) interconnection under Green Energy Corridor. Investment approval for NRSS-XXXII has been accorded by the POWERGRID Board of Directors and the scheme is under implementation.

While implementing the LILO of RAPP – Kankroli 400 kV D/c line at Chittorgarh it was observed that at Chittorgarh (RVPN) space is available only for 4 numbers of 400 kV bays whereas the total requirement is of 6 no. of 400 kV bays. As only 4 nos. of bays are available at Chittorgarh (RVPN) substation, there is a need to modify the planned system. Accordingly, it is proposed that only one circuit of RAPP – Kankroli 400 kV D/c line may be LILoed at Chittorgarh instead of Double circuit line, so that space for two nos. bays may be available at Chittorgarh (RVPN) substation for Chittorgarh (765/400 kV) S/s – Chittorgarh 400 kV D/c (Quad) interconnection.

**Members may please deliberate and concur.**

**3. Kishenganga Transmission System – Use of Multi-circuit Towers:**

Transmission system associated with Kishenganga HEP (330 MW) of NHPC was agreed during the 33<sup>rd</sup> Standing Committee Meeting of Power System Planning held on 23/12/2013 wherein following revised system was agreed:

- Kishenganga – Wagoora (POWERGRID) 220 kV D/c – 104 km
- Kishenganga – Amargarh (PDD) 220 kV D/c – 39 km

While preparing the Detailed Project Report, it was observed that construction of two nos. of Separate D/c lines from Kishenganga side, for a distance of about 29 km, is very difficult on account of the following:

1. Both the lines viz Kishenganga - Wagoora and Kishenganga - Amargarh share a common corridor of approximately 30 kms from the emanating point (Bandipore) to Sopore.

2. In the common corridor, there is paucity of space due to Wular lake on one side and hills on the other side with habitation in between.

3. The area is also having dense apple orchards and by taking two lines adjacent to one other will create a lot of ROW problems.

Keeping above in view it is proposed to implement Multicircuit towers from Kishenpur end for a distance of about 29 km and thereafter separate 220 kV D/c line shall be used towards Amargarh and Wagoora.

**Members may please note.**

#### **4. Extension of 400 kV Malerkotla under NRSS-XXXI (Part-B).**

Kurukshetra – Malerkotla – Amritsar 400 kV line was planned as system strengthening (NRSS-XXXI (B)) in the 31<sup>st</sup> Standing Committee Meeting of Power System Planning of Northern Region held on 02/01/2013. The line is being implemented under tariff based competitive bidding and associated 400 kV bays are to be implemented by POWERGRID. The Lol for the line under tariff based competitive bidding has already been issued.

While taking up the implementation of the 400 kV bays at Malerkotla, it has been noted that space is not available for accommodating 4 nos. of AIS bays at Malerkotla and for accommodating the same, outdoor GIS bays shall have to be provided. Accordingly it is proposed to implement 4 nos. of GIS bays at Malerkotla, required for the subject transmission scheme.

**Members may note.**

#### **5. 765/400 kV Substation at Orai**

During the 31<sup>st</sup> Standing Committee Meeting for Power System Planning for Northern Region, a 765/400kV substation at Orai was agreed under Inter-regional System Strengthening Scheme for NR & WR. Constraints are being faced for constructing the 765/400kV substation as AIS at Orai. Most of the land in Orai district is slightly undulated (ravines) and forest area. Irrigation facility is also minimal. In view of these issues, the land availability of more than 100 Acres suitable for AIS Substation is very limited. Under the scheme “Common Transmission System in other regions Associated with IPPs of Southern region” (old scheme name), a piece of land had been identified initially, on Orai-Jhansi highway (around 15 Km from Orai town). But due to heavy protest by farmers, District administration asked POWERGRID to finalise new location for the substation. For construction of 765 KV AIS substation approximately more than 100 acres of land is required and availability along with smooth acquisition of such a large piece of

land is difficult due to severe resistance from land owners/ROW issues. GIS substation requires almost 50% less area of land.

As per the new Land Acquisition Act 2013, which has come into force recently, compensation for the owners of the acquired land will be four times the market value in rural areas and twice in urban areas. These laws are also making land acquisition more difficult.

In view of the above constraints, it is proposed to construct the 765kV substation at Orai as a GIS substation.

**Members may please note.**

#### **6. Line Reactors for Agra – Sikar 400 kV D/c line at Agra end.**

During the 33<sup>rd</sup> SCM meeting of NR held on 23/12/2013 reactive compensation of Agra – Sikar D/c line was discussed. During the meeting it was decided that the 50 MVAR line reactors of Agra – Sikar line at Agra end may be replaced by 80 MVAR reactors and the 50 MVAR line reactors getting spared at Agra S/s may be diverted for gainful utilization under any ongoing or future scheme. The 80MVAR line reactors at Agra end of Agra-Sikar 400kV D/c line are being included in  $\pm 800$ kV , 6000MW HVDC Multi Terminal NER/ER-NR/WR interconnector-I scheme.

**Members may please note.**

#### **7. Gorakhpur & Sultanpur Bus reactors**

As directed by NRPC it was desired that CTU would carry out studies for identifying reactive compensation required in intra-state network at 220kV level. Accordingly, the studies were discussed in the 32<sup>nd</sup> Standing committee meeting and various reactors at 400 kV as well as at 220 kV level were proposed. Regarding reactors at 220 kV level, POSOCO had stated that load is growing at a rapid pace and therefore requirement of reactors at 220 kV level needs to be analyzed critically. During the meeting POWERGRID had informed that the studies have been carried out considering a light load scenario based on the inputs from NRLDC. It was agreed that the requirement of 220 kV reactors may be reviewed during the studies for the states network. After detailed deliberations it was agreed to take up the 400 kV level reactors on priority. It was also decided that reactors shall be provided by the owner of the respective substation. The 400 kV reactors which were proposed also included the 125 MVAR bus reactors at Gorakhpur and Sultanpur. The proposal was put up in 29<sup>th</sup> NRPC for approval. During the meeting UPPTCL stated that reactors for UP at Sultanpur and Gorakhpur had been approved without consulting them. High voltage was being caused by addition of a number of lines by POWERGRID which remain lightly loaded. Further, it was mentioned that installation of reactors would have cost implications as well as liability of their maintenance. The issue was subsequently discussed in subsequent meetings

of NRPC as well as SCM. During the 33<sup>rd</sup> SCM 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. However UPPTCL did not agree to the proposal.

During the NRPC meeting it was decided that a meeting should be held at should be held at NRPC Sectt. to resolve the issue. Accordingly meeting was held on 11/07/2014 wherein UPPTCL had stated three new substations one each at Gonda, Aurai and Sultanpur Road are under construction under PPP mode and likely to be completed in 6 months to one year time. In these substations installation of 80 MVAR bus reactor at each substation has been covered. Further 1x125 MVAR reactor was also being installed at 400 kV Mau substation and upgradation of available 63 MVAR reactor to 125 MVAR reactor at Gorakhpur has also been approved. UPPTCL informed that total of 427 MVAR reactors would be added in the vicinity of Gorakhpur and Sultanpur instead of 375 MVAR as identified in CTU study and as such bus reactors at Sultanpur and Gorakhpur, as agreed in SCM, would not be required. The proposal of UPPTCL was agreed to in the meeting held on 11/07/2014. The same has been informed to NRPC also during the NRPC meeting held on 24/07/2014.

From the above it may be seen that although the issue of providing reactors at 400 kV level has been discussed and agreed however the proposal of bus reactors at 220 kV level still need to be discussed and resolved.

**Members may deliberate and concur.**

#### **8. Bairasuil - Sarna 220 kV Double Circuit line**

During the 30<sup>th</sup> SCM held 19/12/11 an additional 220 kV D/c evacuation line from Bairasuil HEP to Sarna, 220kV substation of PSTCL, was agreed as a system strengthening scheme (ISTS) to be implemented through Tariff based Competitive Bidding route. As per Survey out of 80 km total length, 60km line shall traverse through forest involving about 208 hectares of forest area. Based on the information received from Bid Process Coordinator (RECTPCL), the cost of Bairasuil – Sarna 220 kV D/c line was reassessed and it was estimated that completed cost of this line would be about Rs. 250 Crs. The issue was discussed in the 33<sup>rd</sup> Standing Committee Meeting, wherein it was discussed 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 and instead of taking up the construction of Bairasuil- Sarna 220 kV D/c line at a high cost some other options need to be explored and accordingly following was agreed:

- 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.

- ii. Strengthening of existing 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).
- 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.

The issue was discussed by CEA with POWERGRID and HPPTCL. HPPTCL initially informed that the adequate space is not available at their Jessore substation. However, a small patch of land measuring 90 mts. X 65 mts. is available adjoining to the existing S/S. If the land is utilized for developing a GIS S/S, reorganization, rerouting of the existing bays and lines has to be done and eight bays needs to be developed in the existing S/S. Alternatively, for giving one additional 220 kV path from Bairasuil to Jessore S/S, the existing Jessore S/S need to extended for accommodating one additional bay. HPPTCL has confirmed availability of space of about 8 mts. wide at the edge of the bay and space for about 4.5 mts has to be developed by land filling. HPPTCL need to convey their approval for development of additional bay. If approved by HPPTCL, members may kindly consider the proposal for development of the available land for accommodating one additional bay and constructing one line from Barasuil to Jessore S/S of HPSEB.

**Members may deliberate and concur.**

**9. Augmentation of Transformation Capacity:**

- a) **Mainpuri 400/220 kV substation:** As per the operation feedback it has been observed that the 2x315 MVA ICTs at Mainpuri remains critically loaded in the range of 500-550 MW and outage of one ICT would result into constraints in drawl of power from this substation. Accordingly augmentation of transformation capacity by 1x500 MVA at 400/220 Mainpuri substation is proposed.
- b) **Raebareli 220/132 kV substation:** Raebareli 220/132 kV substation was established alongwith Unchahar-II transmission system. The present transformation capacity at Raebareli is 3x100 MVA. All the three transformers at Raebareli remains critically loaded in the range of 90 MW each. Considering the present loading of Raebareli ICTs, Since space is not available for providing additional ICT, it is proposed to replace two nos. of 100 MVA, 220/132 kV ICTs with two nos. of 200 MVA ICTs. The two nos of 100 MVA ICTs which would become surplus at Raebareli shall be kept as spare. One 100 MVA ICT spare may be kept at Raebareli and other 100 MVA spare ICT may be kept at Sitarganj 220/132 kV substation.
- c) **Varanasi 765/400 kV substation:** As per the operational feedback from POSOCO, it has been observed that the existing 400/220 kV ICTs at Sarnath substation of UPPTCL is critically loaded. POWERGRID is already establishing a 765/400 kV substation at Varanasi under the transmission

scheme of IPPs of Jharkhand and West Bengal. It is therefore proposed to provide 2 nos. of 500 MVA, 400/220 kV ICTs at Varanasi 765/400 kV substation.

**Members may please deliberate and concur**

**10. Strengthening for overloading in Singrauli – Anpara 400 kV line:**

Singrauli – Anpara 400 kV S/c is an important tie line between two generating stations. From the operational experience it has been observed that Singrauli – Anpara 400 kV S/c line remains critically loaded at several occasions especially when the generation at Anpara generation is low. POSOCO had earlier proposed the need for 2<sup>nd</sup> 400 kV circuit between Singrauli and Anpara, however this could not be planned as there severe ROW constraints as well as space is not available at Singrauli 400 kV switchyard. During the 30<sup>th</sup> SCM it was agreed to explore the possibility of providing additional strengthening. During the meeting it was decided that feasibility of connecting Rihand with Anpara need to be explored. NTPC and UPPTCL were requested to confirm about the availability of 2 nos. of 400 kV bays for termination of Rihand-Anpara 400kV D/c and POWERGRID was requested to look into the availability of corridor.

The preliminary examination of the corridor has been examined and prima facie it appears that the 400 kV D/c line from Rihand to Anpara is feasible. NTPC and UP need to confirm the availability of space for two nos. of 400 kV bays each at Rihand and Anpara respectively and in case NTPC and UP confirms the same the Rihand-Anpara 400 kV D/c line may be proposed. Rihand – Anpara 400 kV D/c line shall relieve the overloading of existing Singrauli – Anpara 400 kV line as well provide an additional link between the two generation complexes.

**Members may deliberate and concur.**

**11. Setting up of 400KV Inter State Grid Sub-Stations in Delhi.**

Delhi Transco Limited is a State Transmission Utility responsible for transmission of power in Delhi. As on date, Delhi is meeting a peak demand of about 6000 MW, out of which about 4700 MW power is being procured and brought in from outside. According to CEA study, peak demand by the end of 12<sup>th</sup> & 13<sup>th</sup> Plan would be about 7396 MW and 10373MW respectively. As Delhi has a very limited generation capacity as on date and there is no plan, as such, to add generation capacity within the state in near future, the increasing demand is required to be met by importing power from outside. Thus, very strong Inter State Transmission System alongwith 400/220KV Grid Sub-stations in and around Delhi need to be established to ensure secured transmission network with adequate transformation capacity. Delhi, at present, is having only one 400KV Inter State Grid Sub-Station at Maharani Bagh in addition to four nos. DTL owned 400kV Sub-Stations. However, with the increase in load demand the Delhi 220 kV network become vulnerable and these lines and Sub-Stations would not be adequate to handle the



increasing quantum of power in future with adequate redundancy. In a study conducted by CEA, 400KV & 220KV Sub-Stations have been proposed to be established within the periphery of Delhi to facilitate handling of increasing quantum of power in 12<sup>th</sup> & 13<sup>th</sup> Plans. Accordingly, in 12<sup>th</sup> plan alone, three new 400KV Sub-Station are required to be set up at Rajghat, Tughlakabad, Karampura while existing 220KV Sub-Station at Pappankalan-I is to be upgraded to 400KV level. It is, therefore, proposed to set up Inter State 400KV Grid Sub-Stations alongwith associated 400KV transmission network at above locations under ISTS network strengthening scheme to facilitate import of power from various sources outside Delhi with the following works.

- i) Creation of 400 kV, 4x500 MVA Rajghat S/S by LILO of one circuit of Bawana – Mandola 400 kV D/C line on M/C tower at Rajghat.
- ii) Creation of 400 kV, 4x500 MVA Tughlakabad S/S by LILO of Bamnauli –Samaypur 400 kV D/C line at Tughlakabad
- iii) Creation of 400 kV, 4x500 MVA Karampura S/S with Karampura – Jatikalan More D/C on M/C tower and Karampura – Bawana D/C on M/C tower.
- iv) Creation of 400/220 kV, 4x 500 MVA Papankalan I S/S by LILO of Bamnauli – Jatikalan More one circuit at Papankalan I. The 400 KV Papankalan I S/S would be created by upgrading the existing 220kV Papankalan S/S to 400 kV and converting the existing route of the Papankalan I- Bamnauli D/C to Multi Circuit tower.

With the creation of the above four 400 kV S/S the existing and future loading in the 400 kV and 220 kV network could be met reliably.

## **12. LILO of 220 KV Dhauliganga-Pithoragarh (Chandak) PGCIL line for Construction of Proposed 220KV GIS S/s at Jauljibi, Pithoragarh.**

PTCUL is planning to construct 220KV GIS Substation at Jauljibi for meeting the future load demand & reliability of power supply in Pithoragarh and nearby region. It is to inform that 220 KV Dhauliganga-Pithoragarh (PGCIL) line is passing through at Jauljibi area. PTCUL is planning to construct 220KV GIS Substation at Jauljibi by LILO of 220KV Dhauliganga-Pithoragarh Power Grid line. As and when the 220 KV Dhauliganga-Bareilly Line will be upgraded to 400 KV level, PTCUL will connect this substation with 220 KV substation Pithoragarh (PGCIL). Accordingly, 1 No. 220 KV bay will be required at 220 KV substation Pithoragarh (PGCIL) for the same.

**13. Requirement of 3 Nos. 220 KV Bays at 220 KV S/s Pithoragarh (PGCIL) for proposed 220 KV D/c Almora-Pithoragarh Line and 220/132KV GIS S/s Almora in Kumaon region.**

PTCUL has proposed to construct 220KV GIS substation at Almora and its associated 220KV D/C Almora-Pithoragarh(PGCIL) line which has been approved by CEA vide their office letter no. 12A/G/2006 SP& PA dated 09.01.2007. Proposed 220/132 KV Substation Almora will be energized through 220 KV D/C Almora-Pithoragarh (PGCIL) line which will improve the voltage, reliability and quality of power supply in Kumaon hills & strengthen the Kumaon Hills Transmission System while catering to future load growth also.

Therefore 2.No. of bays at 220KV S/s Pithoragarh (PGCIL) are required for grid connectivity and supply of power to proposed 220KV S/s GIS Almora. Since 01 No. of 220 KV bay at Pithoragarh 220 KV substation is required for feeding 220 /33 KV Jauljibi substation also. Total 3 Nos. of 220 KV bays shall be required at 220 KV Pithoragarh substation (PGCIL).

**Members may please deliberate and concur.**

**14. Regarding Re-planning of UITP Network for Alaknanda Basin.-**

CERC vide its Order dated 31-01-2013 has declared the UTIP Scheme as Deemed interstate Transmission Scheme. CTU is Nodal Agency for vetting of the comprehensive transmission scheme in accordance of the Connectivity Regulation.

PTCUL have informed that due to extra ordinary circumstances & local resistance at the site of proposed 400 KV Pipalkoti Substation, construction of 400 kV S/S at Pipalkothi could not materialized. Considering the situation at site, PTCUL would now like to construct the proposed 220/33 kV Joshimath S/S as 400/220/33 kV instead of creation of 400 KV Substation at Pipalkoti. However for the time being PTCUL would take the line from Tapovan Vishnugad HEP (520 MW) directly to 400/220 kV Srinagar S/S of PTCUL (with Quad Conductor) bypassing the proposed 400 KV Pipalkoti Substation. As and when the 400 kV Joshimath is constructed, one circuit of Tapovan Vishnugad TPS (520 MW) to 400/220 kV Srinagar S/S would be LILoed at Joshimath (As per diagram Annexed).

**Members may please deliberate and concur**

**15. LILO of 765 KV D/C Tehri-Meerut PGCIL line at proposed 765/400 KV Substation Rishikesh (PTCUL)**

PTCUL has proposed to upgrade the existing 400 KV Substation Rishikesh at 765 KV Voltage level. It has intimated that 765 KV D/C Tehri-Meerut line is passing through Rishikesh. Therefore, 765/400 KV Substation at Rishikesh is planned to be energized through LILO of one ckt. of 765 KV D/C Tehri-Meerut PGCIL line. Proposed 765/400 KV Substation Rishikesh will provide reliable and quality power supply to Uttarakhand and will cater to future load growth requirement. Further this substation fed through LILO of one ckt. of 765 KV D/C Tehri-Meerut PGCIL line will remove power transfer constraint at 400 KV level (on 400 KV Puhana-Muzaffarnagar line) during low hydro generation condition also.

**16. Reactive compensation associated with ISTS under Green Energy Corridors**

- About 33GW capacity is envisaged in eight (8) nos. Renewable Energy (RE) rich states viz Rajasthan, Himachal Pradesh, J&K, Gujarat, Maharashtra, Tamil Nadu, Karnataka & Andhra Pradesh in 12<sup>th</sup> Plan period. A comprehensive scheme comprising Intra State as well as Inter-state transmission strengthening(s) and other related infrastructure to address challenges associated with large scale renewable integration was evolved as a part of “**Green Energy Corridors**”.
- Inter-state transmission scheme under Green Energy Corridors was discussed and agreed in 36<sup>th</sup> meeting of standing committee meeting of power system planning in Western region & 32<sup>nd</sup> meeting of standing committee meeting of power system planning in Northern region.
- In order to maintain the voltage within stipulated limits under various network operating conditions including off-peak periods, suitable reactive power compensation needs to be provided in EHV system. In this regard, reactive compensation studies have been carried out by POWERGRID to evolve requirement of reactive compensation in the form of reactors (Bus reactor/line reactor) of suitable size at appropriate location for the identified ISTS system as part of the Green Energy Corridors.
- Accordingly, following reactive compensation at Inter state transmission system as part of Green Energy Corridor is proposed:

❖ Line Reactors			
S. No.	Transmission Line	From end (each ckt) MVar	To end (each ckt) MVar
<b>A</b>	<b>Gujarat</b>		
(i)	Bhuj Pool – Banaskantha 765kV D/c	1x330	1x330

		(switchable)	(switchable)
(ii)	Banaskantha – Chittorgarh 765kV D/c	1x330 (switchable)	1x240 (switchable)
<b>B</b>	<b>Rajasthan</b>		
(i)	Chittorgarh – Ajmer(New) 765kV D/c	1x240 (switchable)	1x240 (switchable)
(ii)	Ajmer(New) – Suratgarh(New) 765kV D/c	1x330 (switchable)	1x330 (switchable)
(iii)	Suratgarh(New) –Moga (PG) 765kV D/c	1x240 (switchable)	1x240 (switchable)
❖	<b>Bus Reactors</b>		
<b>Sl. No.</b>	<b>Bus</b>	<b>Reactor (MVAR)</b>	
<b>A</b>	<b>Gujarat</b>		
(i)	Banaskantha	1x330 (765kV Bus) 1x125 (400kV Bus)	
(ii)	Bhuj Pool	1x330 (765kV Bus) 1x125 (400kV Bus)	
<b>B</b>	<b>Rajasthan</b>		
(i)	Chittorgarh (new)	1x240 (765kV Bus) 1x125 (400kV Bus)	
(ii)	Ajmer (New)	1x240 (765kV Bus) 1x125 (400kV Bus)	
(iii)	Suratgarh (New)	1x330 (765kV Bus) 1x125 (400kV Bus)	

**Note:** In case of change in line length of any of transmission line, reactive compensation may be changed after taking in-principle clearance from CEA.

**Member may deliberate and concur.**

**Members may deliberate and concur.**

**17. Establishment of 220/66kV, 2x160MVA GIS S/s at Sector 47, UT Chandigarh along with 220kV D/C line from Sector 47 to 400/220kV Panchkula substation of Powergrid as an inter state line.**

Establishment of 220/66kV, 2x160MVA GIS S/s at Sector 47, UT Chandigarh along with 220kV D/C line from Sector 47 to 400/220kV Panchkula substation of Powergrid as an inter state line was discussed and agreed in principle in the 31<sup>st</sup> Standing Committee Meeting of NR held on 2<sup>nd</sup> January, 2013. In that meeting it was also decided that the scheme may be fine tuned later after discussion with Chandigarh, HVPNL and CTU so in this regard a meeting was held on 8-11-2013 at Panchkula with officials of CEA, CTU, HVPNL and CED and also visited proposed both the sites at Hallomajra & Raipur Kalan. In the meeting it was decided that the scheme will be taken up in the next Standing Committee Meeting of NR.

**Members may deliberate and concur.**

**18. LILO of one circuit of 400kV Sikar- Neemrana PGCIL D/c line at Babai(RVPN) substation.**

The proposal was also discussed in the 32<sup>nd</sup> Meeting of the Standing Committee of NR held on 31<sup>st</sup> August, 2013 wherein it was decided that the utility of proposed LILO needs to be further studied by POWERGRID in consultation with Rajasthan/ Haryana and there is a need to provide more interconnections from Rajasthan towards Haryana / Punjab side. RVPN has intimated that 400kV Sikar - Neemrana PGCIL D/c line is crossing RVPN's 400kV GSS Babai at a distance of 1 km and have now proposed for LILO of the 400kV Sikar- Neemrana PGCIL D/c line at 400 kV GSS at Babai. Further, 400 kV D.C line to connect Babai to Mohindergarh. The LILO of the POWERGRID line at Babai and its interconnection with Mohinergarh would to enhance the reliability of power supply to NCR region adjoining Delhi.

**Members may discuss and decide.**

Proposed UITP Network in Alakhnada Basin (Approved by CEA)

