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: 25th August, 2014

-As per List Enclosed-

Sub: Minutes of 34th Meeting of the Standing Committee on Power System Planning of Northern Region held on 8th August 2014 at NRPC, Katwaria Sarai, New Delhi.

Sir,

Please find enclosed the minutes of the 34th Meeting (MoM) of the Standing Committee on Power System Planning of Northern Region held on 8th August 2014, at NRPC, Katwaria Sarai, New Delhi. The MoM has also been uploaded in the CEA website www.cea.nic.in (path to access-Home page-wing specific documents/Power System wing/Standing Committee/ Northern Region). You are requested to further necessary action at your end.

Yours Sincerely,

(Goutam Roy)
Director SP&PA

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

1. Member Secretary NRPC, 18-A Shajeed Jeet Singh Sansanwal Marg, Katwaria Sarai, New Delhi - 110016 (Fax-01 1-26865206)	**2. Director (Projects) NTPC, NTPC Bhawan, Core 7,Scope complex-6,Institutional Area, Lodhi Road, New Delhi- (Fax-01 1-24361018)**	**3. CEO, POSOCO B-9,Qutab Institutional Area, Katwaria Sarai New Delhi - 110016. (Fax : 26852747)**
4. Director (T&RE) NHPC Office Complex, Sector - 33, NHPC, Faridabad - 121 003 (Fax-0129-2256055)	**5. Director (Projects) POWERGRID, Saudamini, Plot no. 2, Sector - 29, Gurgaon-122 001 Fax-0124-2571932'**	**6. Member (Power) BBMB, Sectot-19 B Madya Marg, Chandigarh-1 60019 (Fax-01 72-2549857)**
7. Director (W&P) UPPTCL,Shakti Bhawan Extn,3rd floor, 14, Ashok Marg, Lucknow - 226 001 (Fax-0522-2287822)	**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) PTCUL, Urja Bhawan, Campus, Kanwali Road Dehradun- 248001. Uttarakhand (Fax-0135-2763431)	**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) (Fax-01 77-2623415**	**15.Managing Director, HP Power Transmission Corporation Ltd., Barowalias, Khalini, SHIMLA-171002**
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)		

Summery record of the minutes of 34th Meeting of the Standing Committee on Power System Planning in Northern Region held on 8/08/2014 at 1100 Hrs. in conference room of Northern Regional Power Committee, Katwaria Sarai

List of participants is **Annexed**

Member (Power System), CEA welcomed the participants of 34th Standing Committee Meeting (SCM) on Power System Planning of Northern Region(NR). 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 finalized on priority. He requested Director CEA to take up the agenda items for discussion.

CE (SP&PA) stated that some proposals have been received from HVPNL and UPPTCL for inclusion in the agenda of the 34th SCM of NR. He stated that the present meeting is being called with a short notice and the of proposals of HVPNL and UPPTCL needed further study. Therefore the same could be taken up in next meeting of Standing Committee on Power System Planning in Northern Region likely to be held shortly.

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

Director(SP&PA), CEA stated that the minutes of the 33rd SCM of Northern Region held on 23rd December, 2013 at Delhi at NRPC, Katwaria Sarai, New Delhi, was circulated vide CEA letter No. No. 1/9/SP&PA-2013 /117-135 dated 20.01.2014. Since no observation/comments on the Minutes of the Meeting were received from any of the constituents, so the minutes of the 33rd SCM of Northern Region is taken as confirmed.

The members agreed with the proposal.

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

Director(SP&PA), CEA informed that LILO of RAPP – Kankroli 400 kV D/C line at Chittorgarh, under NRSS-XXXII, was agreed in the 31st Standing Committee Meeting and subsequently during 32nd Standing Committee Meeting of Northern Region it was agreed to provide Chittorgarh (765/400 kV) S/S– Chittorgarh (RVPN) 400 kVD/c (Quad) interconnection under Green Energy Corridor. He further stated that as per the information from POWERGRID, it was observed that at Chittorgarh (RVPN) substation 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 Chittorgah instead of Double circuit line, so that space for two nos. bays is available at Chittorgarh (RVPN) substation for Chittorgarh (765/400 kV) S/s – Chittorgarh 400kV D/c (Quad) interconnection.

AGM, POWERGRID stated that integration of 765/400 kV Chittorgarh substation with existing Chittorgarh substation of RVPN is required for providing anchoring to this new Chittorgarh 765/400 kV substation.

RVPN opined that the LILO of 2nd circuit of RAPP – Kankroli 400 kV D/c line may be carried out at new 765/400 kV Chittorgarh substation. AGM, POWERGRID stated that the proposal of the RVPNL might be studied and if found suitable, the same will be taken up in the subsequent Standing Committee Meeting .

After detailed deliberations the proposal of LILO of one circuit of RAPP – Kankroli 400 kV D/C line at Chittorgarh instead of two circuits was agreed.

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

Director(SP&PA), CEA informed that transmission system associated with Kishenganga HEP (330 MW) of NHPC was agreed during the 33rd Standing Committee Meeting which comprised of following elements:

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

He further stated that POWERGRID has informed that construction of two nos. of Separate D/C lines from Kishenganga side, for a distance of about 29 km, is very difficult as both the lines viz. Kishenganga - Wagoora and Kishenganga - Amargarh share a common corridor of approximately 30 kms from the emanating point (Bandipore) to Sopore and 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. The area is also having dense apple orchards and by taking two lines adjacent to one other will create ROW problems.

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

DTL opined that reliability of power evacuation may get hampered in case of tower outage. CTU, POWERGRID stated that since ROW is not available for constructing two lines so Multicircuit towers for a stretch of 29 km is the only option.

Considering the physical constraints in implementation of two separate lines, the proposal of constructing Multi-circuit line for a distance of about 29 km was agreed by the Committee.

Item – 4 : Extension of 400 kV Malerkotla under NRSS-XXXI (Part-B).

Director(SP&PA), CEA informed that Kurukshetra – Malerkotla – Amritsar 400 kV line was planned as a part of system strengthening (NRSS-XXXI (B)) in the 31st Meeting of the Standing Committee on Power System Planning of Northern Region. The line is being implemented under tariff based competitive bidding and associated 400 kV bays are to be implemented by POWERGRID. The Letter of Interest (LoI) for the line under tariff based competitive bidding has already been issued. CTU, POWERGRID while taking up the implementation of the 400 kV bays at Makerkotla, has observed that adequate space is not available for accommodating 4 nos. of AIS bays at Malerkotla switchyard and for accommodating the same, outdoor GIS bays shall have to be provided. Accordingly, they have proposed to implement 4 nos. of GIS bays at Malerkotla, required for the subject transmission scheme.

The Committee agreed with the proposal of extension of 4 nos of bays as GIS at Malerkotla.

Item – 5 : 765/400 kV Substation at Orai

Director (SP&PA), CEA stated that during the 31st SCM for NR, 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, POWERGRID has proposed to construct the 765kV substation at Orai as a GIS substation.

SE UPPTCL stated that now a day many of substations are being proposed as GIS in the guise of non availability of land and the new Land Acquisition Act. He was of the view that POWERGRID should not have sticked to Orai town for obtaining land and also could have looked on either side of Orai for the suitable land. CEA opined that even though the capital cost of GIS substations is little higher as compared to AIS substations but considering the difference in land cost, short installation time and low maintenance, the cost on GIS substations in long run is more or less comparable with AIS. CTU, POWERGRID stated that many options have been explored and substantial time has been spent and only then the GIS substation has been proposed. The present identified location of GIS substation is approximately 20 km from Orai town on Orai – Jhansi highway.

After detailed deliberations the proposal of implementation of Orai substation as GIS was agreed by the constituents.

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

Director (SP&PA) stated during the 33rd SCM meeting of NR, reactive compensation of Agra – Sikar D/c line was discussed and it was decided that the 50 MVAR line reactors of Agra – Sikar line at Agra end may be replaced by 80 MVAR reactor. The 50 MVAR line reactors getting spared at Agra S/s may be diverted for gainful utilization under any ongoing or future scheme. He further informed that the 80MVAR line reactors at Agra end of Agra-Sikar 400kV D/c line are being included in ±800kV, 6000MW HVDC Multi Terminal NER/ER-NR/WR interconnector-I scheme.

Members noted the same**.**

Item – 7 : Gorakhpur & Sultanpur Bus reactors

Director(SP&PA), CEA stated that as per the request from NRPC, CTU carried out studies for identifying reactive compensation required in intra-state network at 220kV level and these studies were discussed in the 32nd SCM and various reactors at 400 kV as well as at 220 kV level were proposed. Regarding reactors at 220 kV level, POSOCO, during the 32nd SCM suggested that the requirement of reactors at 220 kV level needs to be analyzed critically. Accordingly, it was agreed that the requirement of 220 kV reactors may be reviewed with the states, however 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 29th NRPC for approval. During the meeting UPPTCL was of the view that the high voltage was being created 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 33rd 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. In a meeting convened in NRPC on 11/07/2014, UPPTCL had stated that three new substations one each at Gonda, Aurai and Sultanpur Road were 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. As such a total of 427 MVAr reactors would be added in the vicinity of Gorakpur and Sultanpur instead of 375 MVAr as identified in CTU study and accordingly, bus reactors at Sultanpur and Gorakhpur, would not be required.

SE UPPCL again reiterated that further reactive requirement at their 400 kV S/S at Sultanpur and Gorakhpur would not be required as UPPCL is having a reactor installation programme which would be adequate to arrest any voltage excursion in this area. CEA and CTU requested UPPTCL to expedite the installation of proposed bus reactors.

CTU, POWERGRID informed that two nos. of 80 MVAr line reactors at Gorakpur for Barh – Gorakhpur 400 kV D/c line, are almost ready whereas the completion of transmission line would take about six months and therefore proposed that these two line reactors may be used as bus reactors till the time line is commissioned and in the meanwhile the bus reactors planned by UPPTCL would also start materializing. Members agreed to the proposal.

CTU, POWERGRID stated that although the issue of providing reactors at 400 kV level has been discussed and agreed however the issue of providing reactors at 220 kV level also need to be addressed as 220 kV lines also generate MVAR

under light load conditions. CEA suggested that the STUs may plan visit in the CTU/CEA office and see the studies carried out by CTU. CEA requested that NRLDC may also participate in the studies.

RVPNL informed that they have already planned 15 nos. of 25 MVAR 220 kV reactors in the renewable generation pockets. UPPTCL raised their apprehensions about the requirement of 220 kV reactors as their 220 kV system remains fully loaded. NRLDC stated that during off-peak hours reactive compensation would be required.

After discussions, it was agreed that STUs shall plan and visit the CTU/CEA office and analyze the requirement the requirement based on the studies carried out by CTU. NRLDC shall also be present during finalisation of reactors at 220 kV level. Members agreed with the proposal.

Item – 8 : Bairasuil - Sarna 220 kV Double Circuit line

Director (SP&PA), CEA stated that the issue of providing alternate evacuation path was discussed in 30th SCM of NR. It was then decided that an additional 220 kV D/c evacuation line from Bairasuil HEP to Sarna may be implemented, however looking into the estimated cost of the line and forest area of about 208 Ha. enroute the line, it was decided in the 33rd SCM of NR that the Bairasuil – Sarna 220 kV D/c line may be dropped and some alternative solution like LILO of the existing 2nd circuit of the 220 kV Barasuil – Pong D/C line at Jassore and additional 220 kV S/C line from Barasuil –Jassore may be explored. In this regard discussions were held with HPPTCL and HPSEBL and it was informed that land is not available at their Jessore 220 kV substation and they proposed an additional 220 kV GIS substation. Looking into the higher cost HPPTCL was asked to look into the possibility of providing one additional 220 kV path from Bairasuil - Jessore S/S, wherein the existing Jessore S/S need to extended for accommodating one additional bay. HPPTCL had informed the

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 for constructing one bays.

Constituents were of the opinion Bairasuil is about 38 year old hydro plant and operates on full load only for 2-3 months in a year. Till date it is being evacuated through one 220 kV D/c line without any major problem. As such the proposal for providing additional line may be dropped.

After detailed deliberations it was agreed that the proposal may be dropped. However, POWERGRID may carry out the necessary strengthening of existing line as per the requirement, which has been agreed in the 33rd Meeting of the Standing Committee of Northern Region.

Item – 9: Augmentation of Transformation Capacity

a) Mainpuri 400/220 kV substation:

Director Chittorgarh (SP&PA), CEA informed 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. Constituents agreed with the proposal.

b) Raebareli 220/132 kV substation:

Director(SP&PA), CEA stated that Raebareli 220/132 kV substation was established alongwith Unchahar-II transmission system and present transformation capacity at Raebareli is 3x100MVA. All the three transformers at Raebareli remains critically loaded in the range of 90 MW each. He further stated that CTU, POWERGRID has proposed to replace two nos. of 100 MVA ICTs with 200 MVA ICTs.

SE UPPTCL informed that they are planning to shift the load from existing Raebareli 220/132 kV substation to 220 kV Aurai S/S of UPPCL and incase CTU

desires they can replace one ICT. AGM, POWERGRID stated that the proposal of replacement of ICTs came from UPPTCL and now UPPTCL is opposing the same. The replacement of one ICT would not meet the contingency of outage of one ICT and would not be beneficial however, as informed by UPPTCL, they should carry out the load shifting at the earliest so as to ensure that contingency of outage of one ICT is met.

After detailed deliberations it was agreed that replacement of ICTs would not be carried out and UPPTCL will divert the loads from Raebareli substation at the earliest.

c) Varanasi 765/400 kV substation:

Director (SP&PA), CEA stated that 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 500MVA, 400/220 kV ICTs at Varanasi 765/400 kV substation.

Representative of UPPTCL stated that they have already planned the system for providing reliable supply to Varanasi area and problem of critical loading of ICTs at Sarnath shall alleviate in next 6 months to one year time and therefore 400/220 kV ICTs at Varanasi (POWERGRID) are not required.

d) Sikar 400/220 kV substation:

CTU, POWERGRID stated that as per the recent feedback the transformers at Sikar 400/220 kV substation are critically loaded and therefore proposed the augmentation of transformation capacity at Sikar (POWERGRID) substation by 1x500 MVA. RVPNL endorsed the views of CTU, POWERGRID. After discussions it was agreed to augment the transformation capacity at Sikar 400/220 kV substation of POWERGRID by 1x500 MVA capacity. RVPNL stated

that details regarding the requirement of two nos. of 220 kV line bays would be confirmed by them with in fothnight time.

Concluding the discussions following systems was agreed :

Augmentation of Transformation Capacity at Mainpuri and Sikar

a) Augmentation of Transformation Capacity at Mainpuri 400/220 kV substation of POWERGRID by 1x500 MVA capacity along with associated bays.
b) Augmentation of Transformation Capacity at Sikar 400/220 kV substation of POWERGRID by 1x500 MVA capacity along with associated bays and 2 nos. of 220 kV line bays(requirement to be intimated by RRVPNL).

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

Director (SP&PA), CEA stated that 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 2nd 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 30th SCM, it was agreed to explore the possibility of providing additional strengthening and feasibility of connecting Rihand with Anpara. 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. CTU, POWERGRID had informed that preliminary examination of the corridor has been done and prima facie it appears that the 400 kV D/c line from Rihand to Anpara is feasible and

now NTPC and UP need to confirm the availability of space for two nos. of 400 kV bays each at Rihand and Anpara respectively.

SE, UPPCL stated that they are of the view that the interconnection between Rihand and Anpara would not be required as generation at Anpara D is expected with in six months time. With generation at Anpara D in operation the problem of overloading of Singrauli – Anpara would be a things of past. He further stated that with the commissioning of Anpara D, UPPTCL would rather like to open the Singrauli – Anpara line from Anpara end as it would unnecessary overload the lines from Obra/ Anpara complex.

Reacting to the view of UPPTCL the members stated that the Singrauli – Anpara 400 kV line interconnects two important generation complexes i.e Anpara/Obra and Rihand/Singrauli is very important for reliable system operation. As such, UPPTCL should not open the line from their end, NRLDC stated that the new proposal is good and would improve system reliability.

UPPTCL did not agree to the proposal, although other constituents were of the opinion that Rihand – Anpara 400 kV D/C line should be taken up. However, considering the disagreement of UPPCL, the committee opined the proposal may be deferred for time being.

Item – 11 : Setting up of 400KV Inter State Grid Sub-Stations in Delhi.

Director (SP&PA) stated that Delhi is presently 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 12th & 13th Plan in Delhi would be about 7396 MW and 10373MW respectively. Delhi has a very limited generation capacity and as on date and also no plan to add generation capacity within the state in near future, the increasing demand in Delhi 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.

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 12th. DTL has now proposed to set up four Inter State 400KV Grid Sub-Stations alongwith associated 400KV transmission network at the following locations under ISTS network strengthening scheme to facilitate import of power from various sources outside Delhi:

i) <u>Creation of 400 kV Rajghat S/S</u>

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 with the following provisions

9 nos. 400 kV bays (4 incomer, 4 ICT, 1 B/C), with provision for future expansion

23 nos 220KV bays (220 kV split bus with12 bays on each side = 2 incomer, 6 feeder bay, 1 B/C, 1 B/S(only one), 2 ICT)

Since the line from Rajghat to Wazirabad Water Treatment plant has to pass through the Yamuna river bed/bank area so there will be severe ROW constraint and as such to conserve the ROW the line of about 11 kilometres line length has to be constructed on 400KV M/C tower. For the rest 14 kilometres from Wazirabad Water Treatment plant to LILO point at Tiggipur Village in P-II zone in North Delhi it would be on 400KV D/C tower line length

ii) <u>Creation of 400 kV Tuklakabad S/S</u>

Creation of 400 kV, 4x500 MVA Tuklakabad S/S by LILO of Bamnauli – Samaypur 400 kV D/C line at Tughlakabad with the following provisions.

9 nos. of 400KV bays bays (4 incomer, 4 ICT, 1 B/C) with provision for future expansion

23 nos 220KV bays (220 kV split bus with 12 bays on each side = 2 incomer, 6 feeder bay, 1 B/C, 1 B/S (only one), 2 ICT)

400KV M/C tower line length = 15 kilometres (from 400KV Tughlakabad to Dera Mandi Delhi Border)

400KV D/C tower line length = 12 kilometres (from Dera Mandi Delhi Border to LILO point at Alampur Village, Haryana)

Since the 400 kV line from Tughlakabad to Dera Mandi Delhi Border has to pass through the dense human habitation/coloney so there will be severe ROW constraint and as such to conserve the ROW the line of about 15 kilometres line length has to be constructed on 400KV M/C tower. For the rest 12 kilometres from Dera Mandi Delhi Border to LILO point at Alampur Village, Haryana, it would be on 400KV D/C tower line length

iii) <u>Creation of 400 kV Karampura S/S</u>

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 with the following provisions.

9 nos. of 400KV bays bays (4 incomer, 4 ICT, 1 B/C) with provision for future expansion

23 nos 220KV bays (220 kV split bus with 12 bays on each side = 2 incomer, 6 feeder bay, 1 B/C, 1 B/S (only one), 2 ICT)

400KV M/C tower line length = 45 kilometres (from 400KV Karmapura to 765KV Jhatikalan D/C line)

400KV D/C tower line length = 28 kilometres (from 400KV Karmapura to 400KV Bawana)

Since the 400 kV line from Karmapura to 765KV Jhatikalan has to pass through the dense human habitation/coloney and 400 kV as well as 220 kV line has to be taken from the same corridor so foe judicious utilization of the available corridor the line of about 45 kilometres line length has to be constructed on 400KV M/C

tower. For the other line will be constructed along the Nala(drain) 28 kilometres from Dera Mandi Delhi Border to LILO point at Alampur Village, Haryana, it would be on 400KV D/C tower line length

iv) Creation of 400 kV Papankalan 1 S/S

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 due to scarce ROW, the existing route of the 220 kV Papankalan I- Bamnauli D/C has to be converted to Multi Circuit tower. The 400 kV substation at Papankalan 1 would be created the following provisions

7 nos. of 400KV bays bays (2 incomer, 4 ICT, 1 B/C) with provision for future expansion

23 nos 220KV bays (220 kV split bus with 12 bays on each side = 2 incomer, 6 feeder bay, 1 B/C, 1 B/S (only one), 2 ICT)

22 kilometres 400KV D/C tower line length from Dwarka (existing 220KV Papankalan-I) to 765KV Jhatikalan

With the creation of the above four 400 kV S/S there would be a strong in-feed Substations around Delhi which can take care and reliably meet the existing and future 400 kV and 220 kV load demand of Delhi network**.**

The representatives of U.P, Punjab, Rajasthan, Uttarakhand, Chandigarh indicated their agreement with the proposal.

CE Plg. HVPNL intimated that HVPNL also do not have any objection with the proposal and in-principally agrees with it. He was of the view that the provision of 4x500 MVA ICT at each of this substation is on the higher side and initially may be considered with 2x500 MVAR at each Substations. He stated that HVPNL is also contemplating construction of substations in

Faridabad area. The feed for the substations would likely to be taken from 400 kV Samaypur. As such, creating the provision for drawl of 8000 MVA from Samaypur could overload the system behind Samaypur S/S and can also cause drawl constraint for HVPNL from Samaypur S/S.

DTL informed that the substations have been planned after a detailed study carried out by CEA, wherein a provision for 765 kV ring around Delhi have been considered. Presently a part of the 765 kV ring between Bhiwani to Agra (PG) via J.More is operational. With the availability of the 765 kV ring around Delhi the loading on the existing 400 kV line would reduce. The proposed 400 kV S/S has been planned at four different locations of Delhi and the load of 400 kV Tuklakabad S/S would mainly be incident on 400 kV Samaypur S/S. Further, to contain the Short circuit level in Delhi system, The 220 kV S/Ss planned in Delhi are to be operated in split bus mode, with two ICT would be in one bus and two in the other. The proposal of HVPNL for initial capacity of 2x500 MVAR at each S/S would not be adequate proposition as with split bus arrangement supply of power with contingency outage of one ICT cannot be met reliably.

Director CEA stated that the 400 kV S/S has been planned for commissioning by 2016-17 to take care of the load of Delhi by 12th plan end and also to meet load requirement by the early 13th plan period. As such the provision of the Transformer proposed is justified. However, as suggested by HVPNL, requisite studies would be carried to examine the system strengthening requirement behind Samaypur S/S.

The Committee agreed with the proposal for creation of the four nos. of 400/220 kV S/S in Delhi as indicated above and also for looking into the system strengthening requirement beyond Samaypur.

Item – 12: **LILO of 220 KV Dhauliganga-Pithoragarh (Chandak) PGCIL line for construction of Proposed 220KV GIS S/s at Jauljibi, Pithoragarh**

Item – 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.**

Item – 14: **Re-planning of UITP Network for Alaknanda Basin**

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

Director (SP&PA), CEA stated that PTCUL is planning to construct 220KV GIS Substation at Jauljibi for meeting the future load demand & for reliability of power supply in Pithoragarh region. PTCUL has informed that 220 KV Dhauliganga-Pithoragarh (PGCIL) line is passing from ½ Kms. from the proposed Jauljibi area. PTCUL is planning to construct 220KV GIS Substation at Jauljibi by LILO of one circuit of the existing 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 the Jauljibi S/S with 220 KV substation Pithoragarh (PGCIL). Accordingly, 1 No. 220 KV bay will be required by PTCUL at 220 KV Pithoragarh (PGCIL) substation.

AGM PGCIL stated that the existing 400/220 kV S/S at Pithoragarh is in 6-7 layers in hill slope and space for only one bay exists in the S/S. PTCUL has also requested for 2 nos. of additional bays at Pithoragarh for taking out 220 kV D/C line to Almora. Since there is space constraint beside some technical problem in accommodating 3 nos. of bays so it would be prudent to study the proposal and discuss it further with PTCUL and CEA for some alternative acceptable solutions. He further stated that for the other proposal of PTCUL at agenda no. 14 & 15 PGCIL feels the need for further study.

CE (SP&PA) stated that since all the above proposals of PTCUL involves work in PGCIL S/S and if they feel the need for further technical study, then the proposals might be taken in the next SCM of Northern Region after carrying out the requisite study/discussion between PTCUL, CEA and POWERGRID.

GM PTCUL stated that they have no objection with the proposal and requested CEA and PGCIL to come to Dehradun in the 3rd week of August for further necessary study/ discussions.

The Committee agreed with the proposal.

Item – 16: Reactive compensation associated with ISTS under Green Energy Corridors

Director (SP&PA), CEA stated that 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 and Andhra Pradesh in 12th Plan period. A comprehensive scheme comprising Intra State as well as Interstate 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 36th SCM of power system planning in Western Region & 32nd SCM of power system planning in Northern Region. In order to maintain the voltage within stipulated limits, 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**
A	**Gujarat**		
(i)	Bhuj Pool – Banaskantha 765kV D/c	1x330 (**switchable**)	1x330 (**switchable**)
(ii)	Banaskantha – Chittorgarh 765kV D/c	1x330 (**switchable**)	1x240 (**switchable**)
B	**Rajasthan**		
(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**)
❖ **Bus Reactors**			
Sl. No.	**Bus**	**Reactor (MVAR)**	
A	**Gujarat**		
(i)	Banaskantha	1x330 (765kV Bus) 1x125 (400kV Bus)	
(ii)	Bhuj Pool	1x330 (765kV Bus) 1x125 (400kV Bus)	
B	**Rajasthan**		
(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)	

The proposed compensation are subject to change in case of change in line length of any of transmission line.

The proposal for the compensation was discussed in details and was agreed by the members.

Item – 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 a inter state line.**

Director (SP&PA), CEA stated that 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 a inter state line was discussed and agreed in principle in the 31st SCM of NR. In that meeting it was also decided that scheme may be fine tuned later after discussion with Chandigarh, HVPNL and CTU so in this regard a meeting was held on 08/11/2013 at Panchkula with officials of CEA, CTU, HVPNL and CED and also visited proposed both the site at Hallomajra and Raipur Kalan. In the meeting it was decided that scheme will be take up in the next Standing Committee Meeting of Northern Region.

CE (Plg.) HVPNL stated that since the line would be passing through Punchkula area so UT Chandigarh may intimate them the details of the walk over survey carried out for the 220kV D/C line from Sector 47 to 400/220kV Panchkula substation of POWERGRID so that if required, HVPNL can LILO the line for creation of 220 kV S/S for meeting the increased load demand of Punchkula area.

After detailed discussion the Committee agreed with the proposal for creation 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.

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

Director (SP&PA), CEA stated that the proposal was also discussed in the 32nd SCM of NR, wherein it was decided that the utility of proposed LILO needs to be further studied by POWERGRID. 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 the following works which would enhance the reliability of power supply to NCR region adjoining Delhi.

- LILO of the 400kV Sikar- Neemrana PGCIL D/C line at 400 kV GSS at Babai.

- 400 kV D/C line to connect Babai to Mohindergarh.

The issue was discussed in details and the members were of the view that Mohindergarh would not be proper location for interconnection with Babai as very little power would flow that line. It was decided that the proposal needs to be studied further and would be taken up in the next meeting of the Standing Committee of the Northern Region.

Additional agenda put up by POWERGRID in the meeting

Item – 19: Provision of 400/220 kV ICTs at Parbati Pooling Station

AGM, POWERGRID stated that the issue of evacuation of power from Malana-II was discussed in the 31st SCM of NR and for reliable evacuation of power from the project the following were agreed:

- HPPTCL to construct Chhaur – Parbati Plg Station 220 kV D/c line as STU network
- POWERGRID to provide 2 nos. of 400/220 kV, 315 MVA ICTs (7x105 MVA single phase units) alongwith 2 nos. of 220 kV line bays.

- HPPTCL to take up the ownership of 132/220 kV Chhaur S/s from M/s EPPL to make it a part of their STU system.

POWERGRID has already gone ahead for providing the transformers and required bays, confirmation from HPPTCL on the status of the downstream network is required so that the ICTs installed by POWERGRID are utilized.
Since there was no participation from HPPTCL, so the agenda was deferred for the next SCM.

Item – 20: Establishment of 400/220 kV substation at Greater Noida

AGM, POWERGRID stated that the Noida Power Company Ltd. (NPCL)'s application for connectivity for drawl of 500 MW power for distribution in Greater Noida area in Uttar Pradesh was discussed in the 31st SCM of Northern region. 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. CTU had already granted LTA 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 are heavily loaded. To meet the future power demand following system was agreed as system strengthening scheme NRSS-XXXIII to be implemented through TBCB 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.

Subsequently, PPA of NPCL with M/s Essar Power had gone in dispute and presently being heard in UPERC and the implementation of NRSS-XXXIII transmission scheme was put on hold. During the 33rd SCM of NR, 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.

POWERGRID during the 33rd SCM meeting had informed that NPCL has now applied for Long Term Access for 500 MW with target source from Western Region (400 MW) and Eastern Region (100 MW). It was decided that additional Connectivity to NPCL could not be provided as it is already connected to STU grid. As, 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.

UPPTCL was requested for early processing of NOC to M/s NPCL. However, UPPTCL vide their letter dated 11/03/2014 informed that M/s NPCL is not a consumer as it is a distribution Licensee operating at Greater Noida U.P. which does not qualify the condition of applicant for connectivity as per the conditions of connectivity of CERC regulations.

Based on the observations of UPPTCL, the matter was revisited. However, as per the regulations on connectivity, there is no specific mention, that Distribution Licensee can or cannot apply for connectivity and UPPTCL had stated that Distribution Licensee is not a consumer. From the above it may be seen that there are certain issues for constructing a line and substation under ISTS for providing connectivity to distribution licensee. However, LTA of Noida Power Company can be processed subject to NOC from Uttar Pradesh as till date Noida Power Company is an intra-state entity.

SE, UPPTCL again reiterated their stand that the establishment of 2x500 MVA, 400/220 kV GIS substation at Greater Noida (New) is not required as 765/400/220 kV UPPTCL S/S at Greater Noida is expected soon and the requirement of NPCL could easily be met from the new 765/400/220 kV Noida S/s of UPPTCL. The issue was discussed in details and members were of the

view that since UPPTCL is not agreeing for the creation of New Noida S/S under ISTS and is declining to give NOC to NPCL for LTA from POWERGRID, so NPCL may take up the issue with CERC.

Item – 21: Transmission Line Constraints in Northern Region

S. No	Corridor	Remarks	Gist of Discussions
1	400kV Dadri-Muradnagar	Additional substations such as Hapur and Greater Noida 765 kV (Planned by UPPTCL) are expected and their connectivity with the existing network will relieve this constraint. UPPTCL may inform the status.	UPPTCL informed that Hapur and Greater Noida substation would be progressively commissioned from March 2015 to August 2015.
2	400 kV Dadri-Greater Noida	Issue has been discussed in 31st NR Standing Committee Meeting (SCM) of Northern Region on 2/1/13. Members agreed for construction of 400kV Ballabgarh -Greater Noida (New)D/c (on Multi circuit towers) and 2x500MVA, 400/220 kV GIS substation at Greater Noida (New). UPPTCL had stated that additional 400/220 kV substation at Greater Noida is not required. UPPTCL may respond.	UPPTCL has stated that they are constructing 765/400/220kV substation at Greater Noida (Pali) which would be commissioned by March 2015 and hence LILO of Ballabhgarh - Greater Noida 400kV D/c line alongwith 400/220kV substation at Greater Noida (New) would not be required.
3	400kV Meerut-Muzaffarnagar	400 kV Bareilly- Kashipur-Roorkee-Saharanpur have been taken up by POWERGRID under NRSS-XXI and expected to be March 2015.	POWERGRID stated that Bareilly – Kashipur – Roorkee 400 kV line (bypassing Kashipur) is expected by March 2015 and line termination at Kashipur is expected by June ’15. NRLDC stated that it is likely that some constraints may remain even after commissioning of this line & a new substation need to be planned in this area. UPPTCL

			stated that they have already planned Muradnagar-II substation which would be available by end of 2015. UPPTCL was requested to send the details of 400 & 220kV connectivity planned for this substation to CEA & CTU
4	400kV Singrauli-Anpara	Severe Right Of Way constraints and availability of bays at Singrauli and Anpara. Rihand-Anpara 400kV D/c line being planned for relieving the constraint.	CTU proposed Rihand Anpara 400kV D/c line to improve the connectivity of two generation complexes i.e. Rihand/ Singrauli & Anpara/ Obra. The proposal was not agreed by UPPTCL.
5	400kV Unnao-Panki	A strong 400kV D/c inter-connection between Kanpur and Lucknow has been planned under NRSSXXXII.	CTU informed that Lucknow-Kanpur 400kV D/c line is expected by June 2016.
6	400kV Rosa-Bareilly	Commissioning of Shahjahanpur S/s will relieve the constraint.	CTU informed that the bays at Shahjahanpur for Rosa shall be completed by Dec.2014. It was also informed that Shahjahanpur substation has already been commissioned.
7	Underlying 220kV network of Bhiwadi	The issue has been discussed in 33rd SCM of NR held on 23/12/13. RVPN stated that the load at Bhiwadi would soon be diverted to Neemrana & Alwar which are going to be commissioned. RVPN may respond.	RVPNL explained that they are carrying out plan to reconfigure the 220kV works to draw power from Neemrana & Alwar. It was requested that RVPN may send the details to CEA & CTU through email along with the commissioning schedule of these works.
8	Non availability of down stream network of the listed substations and	STUs may respond	HVPNL informed that the LILO of 220 kV Badshapur – Mau D/C at Panchgaon (Manesar) (PG) would be completed by Oct. 2014, LILO of 220 kV Narwana – Mundh D/C at Jind would be completed by Aug. 2015 and LILO of 220 kV Bahadurgarh – Bhiwani D/C at Kaboolpur would be completed by Aug. 2015.

	under utilization of ICTs		HVPNL also informed that the system for abosorption of power from 3rd ICT at Kabulpur is already in place. The offtake from Deepalpur would be ready by the end of 2015. HVPNL may inform the status of offtake from Sonepat sub-station to CEA/CTU. DTL informed that off take from Mundka would be ready by Oct. 2014. PSTCL informed that off take from Makhu towards Dharampur and Raishian would be ready by March 2015. Link to Igoan would not be possible due to RoW problem. It was agreed that UPPTCL, RRVPNL and PDD, J&K shall send the details to CEA & CTU through email along with the commissioning schedule. CTU informed that LILO of Sarna - Hiranagar 220kV S/c line at Samba was agreed as ISTS in 32nd Standing Committee meeting. The scheme is yet to be discussed in Empowered committee meeting for TBCB.
9	400kV Singrauli-Lucknow	LILO of Singrauli-Lucknow at proposed Unchahar substation decreases the line length of Singrauli-Lucknow and also enhance the connectivity ofUnchahar.	NTPC informed that space is not available at their coming up Unchahar generating station. It was decided that the matter would be discussed by CEA with NTPC, CTU, and UPPTCL.
10	400kV Nallagarh - Patiala	400 kV Panchkula-Patiala planned to reduce the skewed loading Series compensation on 400kV KarchamWangtoo- Kala Amb D/c line would also help.	CTU stated that the Panchkula-Patiala 400 kV D/c line is expected by June 2016. CEA informed that Kala Amb substation and series compensation on Kala Amb

			substation are being developed through TBCB and is expected by July 2017. NRLDC stated that Koldam – Ludhiana and Nalagarh lines are ready and they should be utilized to provide a parallel corridor from Nalagarh. CTU informed that it has been gathered that switchyard at Koldam is ready and may be charged. It was also informed that the line from Parabti Pooling station to Koldam, being constructed by PKTCL is also nearing completion. In case the Koldam switchyard is charged the original envisaged connections from Koldam could be made and that would provide reliability to Parbati-III as well as provide an additional corridor from Nalagarh. NTPC informed that pre-commissioning activities at Koldam Switchyard are being carried out and thereafter clearance from Electrical Inspectorate shall be taken and after that the switchyard can be charged in about one month's time. The above proposal was agreed by the members.
12	400 kV Amritsar-Jallandhar	400kV Kurukshetra-Malerkotla-Amritsar D/c line has been planned as an additional in-feed to Amritsar.	CEA informed that line has already been awarded to the successful bidder. Completion is expected by September 2016.
13	400 kV Jhakri-Nallagarh & 400kV Rampur-	Series compensation at Karcham Wangtoo-Abdullapur D/c line has been approved in the31st SCM of NR on 2/1/13 to relieve the constraint.	CEA informed that scheme has already been awarded to the successful bidder. Completion is expected by July 2017

	Nallagarh		
14	Section of a line crossing another line leading to multiple trippings in case of tower collapse		It was deliberated that crossing of lines cannot be avoided. It was suggested that matter may be taken up with transmission line department of CTU/ STUs by respective organisations

S. No	Corridor	Remarks	Gist of Discussions
1	Allahabad	1x315 MVA planned under Augmentation of Transformers in NR – Part A' anticipated by Oct.'14	CTU informed that the ICT augmentation is expected by October 2014.
2	Ballabhgarh	Augmentation of transformation capacity at 400/220 kV Ballabhgarh substation by replacing existing 4x315 MVA ICTs with 4x500 MVA ICTs planned under NRSS-XXXII	CTU stated that NRSS XXXII has been awarded in August 2014 & is expected by June 2016.
3	Bassi	1x500 MVA planned under 'Augmentation of Transformers in NR – Part A' anticipated by Oct.'14. Need for commissioning of 220 kV outlets from Jaipur South	CTU informed that the ICT augmentation is expected by October 2014.
4	Bhiwadi	The issue has been discussed in 33rd SCM of NR held on 23/12/13. RVPN stated that the load at	RVPNL explained that they are carrying out plan to reconfigure the 220kV works to draw power from Neemrana & Alwar. It was

		Bhiwadi would soon be diverted to Neemrana & Alwar which are going to be commissioned.	requested that RVPN may send the details to CEA & CTU through email along with the commissioning schedule of these works.
5	Jallandhar	1x500 MVA planned under 'Augmentation of Transformation capacity in NR for 2016-17 Conditions'	CTU informed that the ICT would be available by Dec 2016.
6	Mandola	Augmentationof transformation capacity at 400/220 kV Mandola substation by replacing existing 4x315 MVA ICTs with 4x500 MVA ICTs planned under NRSS-XXXII	CTU stated that NRSS XXXII has been awarded in August 2014 & is expected by June 2016. Possibility is being explored to commission it at the earliest.
7	Moga	Matter discussed in 30th& 31st SCMs of NR. Commissioning of Patran and Rajpura400/220 kV substations would alleviate this constraint.	CEA informed that Patran substation is expected by May 2016. CEA requested PSTCL to plan & commission 220kV network from Patran in the matching time frame. Regarding Rajpura, PSTCL informed that Rajpura substation along with down below 220kV network shall be available by Dec 2014.
8	Meerut	Need for commissioning of additional substations at Saharanpur and Hapur etc. in Western UP.	CTU informed that additional ICT at Meerut is likely to be commissioned by October 2014. Associated lines with Saharanpur substation are getting delayed due to R-O-W constraints. Hapur substation would be commissioned by March 2015.
9	Mainpuri		Augmentation of 1x 500 MVA transformer at Manipuri agreed in the present meeting.
10	Kaithal	1x315 MVA, 400/220 kV transformer at 400kV substation Kaithal planned under NRSS XXXIV	CTU informed that 1x315 MVA, 400/220 kV transformer at 400kV substation Kaithal planned under NRSS XXXIV. HVPNL requested that considering the load growth in

			the Kaithal area, one additional ICT of 1x 500 MVA may be provided at Kaithal. It was decided that the proposal to be taken up in the next SCM.
11	Bamnoli	STU may respond	DTL stated that they have proposed to replace two nos. existing ICTs of 2x315 MVA with 2x500 MVA ICTs by POWERGRID on their behalf.
12	Agra UP	1X315 MVA, 400/220 kV ICT at Agra (PG) planned under NRSS XXXIV.	CTU informed that 1x315 MVA, 400/220 kV transformer at 400kV substation Agra has been planned under NRSS XXXIV.
13	Muradnagar	Need for commissioning of additional substations at Saharanpur, Hapur etc. in Western UP	CTU stated that the associated lines with Saharanpur substation in Western UP are getting delayed due to R-O-W constraints. UPPTCL stated that they have already planned Muradnagar-II substation which would be available by end of 2015.
14	Varanasi		UPPTCL stated that they have already planned a new substation near Varanasi which would relieve the present overloading. CEA requested UPPTCL to provide the details of planned works.
15	Greater Noida	400kV Ballabgarh-Greater Noida (New) D/C (on Multi circuit towers) and 2x500MVA, 400/220 kV GIS substation at Greater Noida(New) has been planned & agreed. There are certain issues in implementation. Separate agenda item for this meeting.	Already discussed in the present meeting under separate agenda.
16	Merta	STU may respond	RVPN informed that 2nd transformer is going to be commissioned at Bikaner by Sept. 2014 and loading of

			Merta transformer shall be relieved.
17	Muzaffarnagar	STU may respond	UPPTCL stated that a substation has been planned at Shamli. CEA requested UPPTCL to provide the details of planned works.
18	Obra TPS	STU may respond	UPPTCL informed that the transformers have been put into service after repair.
19	765/400kV ICTs of Unnao	STU may respond	UPPTCL informed that 3rd ICT would be commissioned by Sept. 2015.
20	400/220kV Dhuri ICTs	STU may respond	PSTCL informed that 3rd 500MVA ICT is being planned.
21	Single ICTs at following 400kV Nodes:	STU may respond	RVPN informed that 2nd transformer is going to be commissioned at Bikaner by Sept. 2014. RVPN informed that 2nd ICT at Barmer would be commissioned shortly. 2nd ICT at Bhilwara & Hindaun have already been commissioned. Regarding 2nd ICT at Chhabra & Kalisindh, RVPNL shall respond. Dehar: Space for 2nd ICT not available. Bhiwani: BBMB stated that requirement need to be studied. Gorakhpur: UPPTCL informed that 2nd ICT has been planned and would be commissioned in one & half years time.

Item – 22: Establishment of new 400/220 kV substations in NR

AGM POWERGRID stated that following new substations are under implementation, which were planned under various transmission schemes:

Sl No.	Name of the Substation	Expected to be Commissioned by
a	Kurukshetra 2x500 MVA (400/220 kV system)	March 2015
b	Parbati Pooling (provision of 2 nos. of 315 MVA ICTs on existing 400 kV switching station)	commissioned
c	Dehradun 2x315 MVA	March 2015
d	Bagpat 2x500 MVA	2015-16
e	Saharanpur 2x315 MVA	2015-16

It has been observed that implementation of down stream 220 kV system, to be implemented by STUs, gets delayed. For utilization of the system it is necessary that 220 kV system is also commissioned in the matching time frame. He requested the members to intimate the status of commissioning of the down stream 220 kV network from these substations.

a) CE, HVPNL stated that the 220 kV underlying system from 400 KV Kurushetra is in progress. However, a mismatch of about 9 months is expected and the 220 kV system is expected to be available by December 2015.

b) CTU, POWERGRID stated that Parbati Pooling station is commissioned However, HPPTCL need to implement their 220 kV system matching with the commissioning of 2x315 MVA ICT which are expected for commissioning by June 2016. Since HPPTCL was not represented in the meeting so it was decided that they may be asked to intimate their schedule for bringing the underlying 220 kV system.

c) GM, PTCUL stated that their 220 system from 400 kV Dehradun would be available by March 2015 matching with the commissioning of the substation.

d) & e) SE UPPCL intimated that UPPCL has not planned any underlying system from 400 kV Bagpat and Saharanpur S/S of POWERGRID. In fact they do not require these interconnection as their existing system would be adequate to take care of the load demand of these areas.

CTU and CEA stated that this is a grave situation wherein the National assets are created on the request from the state and when the substation is almost ready the state is informing that they do not require the substation. This would be huge wastage of scarce national resources.

CE HVPNL stated that the committee should take a view that hence forth the request from the state for any new proposal under central sector in their state would be considered only when it is accompanied with identified underlying network along with undertaking for bringing the network matching with the commissioning of the Central Sector substation.

After detailed discussion it was decided that since both the substations were created on the request from UPPTCL (erstwhile UPCL) so they should plan the underlying network both from Bagpath and Saharanpur and ensure its availability matching with the commissioning of the S/Ss and intimate same to CTU and CEA immediately.

Item – 23: Reactive compensation associated with Inter-Regional system strengthening scheme for WR and NR part-B

During the 31st Standing Committee Meeting of Northern Region held on 02/01/2013 the Inter-regional System Strengthening Scheme for NR & WR system was discussed and agreed. In order to facilitate charging and maintaining the voltage with in stipulated limits under various network condition, following reactive compensation at Interstate transmission system

as part of Inter-Regional system strengthening scheme for WR and NR part-B has been proposed

S. No.		Approx Line length	Line Reactor- From bus	Line Reactor- To bus
	Line Reactors			
1.	Jabalpur Pooling station - Orai 765 KV D/c	360km	330 MVAR	330 MVAR
2.	Orai – Aligarh 765kV D/c line	280km	240 MVAR	240 MVAR
3.	Orai – Orai(UPPTCL) 400kV D/c (Quad	30km	-	-
4.	LILO of one circuit of Satna-Gwalior 765 KV D/c at Orai	60 km		
	Existing Satna-Gwalior 765kV S/c	360km	240 MVAR (Switchable)- (to be converted into bus reactor)	240 MVAR
	Satna-Orai 765kV S/c	180km		240 MVAR
	Orai-Gwalior 765kV S/c	300km	240MVAR	240 MVAR (Switchable)
5.	LILO of Agra-Meerut 765 kV S/c line at Aligarh	30km		
	Existing Agra-Meerut 765kV S/c	270 km		240 MVAR (Switchable)
	Agra-Aligarh 765kV S/c	130km	-	-
	Aligarh-Meerut 765kV S/c	200km		240 MVAR (Switchable)

6.	LILO of Kanpur – Jhatikara 765 kV S/c at Aligarh S/s	30km		
	Existing Kanpur-Jhatikara 765kV S/c	465 km	330 MVAR (Switchable)	330 MVAR (Fixed)
	Kanpur-Aligarh 765kV S/c	330km	330 MVAR (Switchable)	330 MVAR (Switchable)
	Aligarh-Jhatikara 765kV S/c	190km		330 MVAR (Presently fixed to be made Switchable)

The proposal for installation of Line reactor was discussed and agreed by Members.

Item – 24: Koldam – Ludhiana 400 kV D/C and Parbati – Koldam (excluding Parbati – II to Parbati – III section)

NRLDC stated that Koldam – Ludhiana and Nalagarh lines are ready and they should be utilized to provide a parallel corridor from Nalagarh. CTU informed that it has been gathered that switchyard at Koldam is ready and may be charged. It was also informed that the line from Parabti Pooling station to Koldam, being constructed by PKTCL is also nearing completion. In case the Koldam switchyard is charged the original envisaged connections from Koldam could be made and that would provide reliability to Parbati-III as well as provide an additional corridor from Nalagarh. NTPC informed that pre-commissioning activities at Koldam Switchyard are being carried out and thereafter clearance from Electrical Inspectorate shall be taken and after that the switchyard can be charged in about one month's time.

The above proposal was agreed by the Committee.

The Meeting ended with vote of thanks to the Chair

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