



भारत सरकार  
Government of India  
विद्युत मंत्रालय  
Ministry of Power  
केन्द्रीय विद्युत प्राधिकरण

Central Electricity Authority

प्रणाली योजना एवं परियोजना मूल्यांकन प्रभाग

System Planning & Project Appraisal Division

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[ISO: 9001:2008]

No. 1/9/SP&PA-2013/648-666

Dated: 17.12.2014

-As per list enclosed-

**Sub: Minutes of 35<sup>th</sup> Standing Committee Meeting on Power System Planning of Northern Region held on 3<sup>rd</sup> November, 2014 at Dehradun, Uttarakhand.**

Sir,

The Minutes of 35<sup>th</sup> Standing Committee Meeting on Power System Planning of Northern Region have been uploaded on CEA website: [www.cea.nic.in](http://www.cea.nic.in) (path to access- Home Page- Wing specific document/ power system related reports/ Standing Committee Meeting on Power System Planning / Northern Region) for information and necessary action please.

Yours faithfully,

  
(Goutam Roy) 17/12

Director

**-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) 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 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)		

## **Summery record of the minutes of 35<sup>th</sup> Meeting of the Standing Committee on Power System Planning in Northern Region held on 3/11/2014 at Dehradun.**

List of participants is **Annexed**

1. Member (Power System), CEA welcomed the participants of 35<sup>th</sup> Standing Committee Meeting (SCM) on Power System Planning of Northern Region (NR). He thanked PTCUL for arranging the meeting in such a short notice and for the excellent arrangement nice environment in. He stated that the agenda items for the meeting are small and so members should take this opportunity for a detailed fruitful discussion.

2. CMD PTCUL expressed his happiness and stated that PTCUL is privileged to host the 35<sup>th</sup> SCM in Dehradun. He stated that the he would like to welcome the committee to hold more meeting in the picturesque state of Uttarakhand, which would enable the committee members to know the state and the problem it is facing. CMD PTCUL stated that Uttarakhand being a landlocked state deserve better dispensation from the member state and center. He stated that Uttarakhand with little help in terms of availability of gas for its generation project, stronger interconnection with the grid and commissioning of the Hydro projects in the state would not only be in a position to ensure 24x7 power supply to the consumers but would also be an engine towards reducing the power deficit in the region and nation as a whole.

3. Director (operation) PTCUL thanked CEA for considering the agenda of PTCUL in the meeting. He stated that the agenda was discussed in the 34<sup>th</sup> SCM and was deferred for the want of further study and investigation. The officers from CEA, POWERGRID subsequently came to Dehradun for discussion with PTCUL and the present agenda considered for the SCM is a result of the deliberation and common understanding of the team.

4. CE (SP&PA) stated that the most of the agenda being considered in the present standing committee were discussed and deferred in the 34<sup>th</sup> SCM. After that detailed studies and deliberation were made by CEA, CTU with the concern state and as decided in the last SCM this meeting has been called with in 2 months time. He further stated that the meeting of all the Regional Standing Committee was held on 29/10/14 at NRPC Conference Katwaria Sarai New Delhi to discuss the issues pertaining to the 20 years prospective transmission plan, wherein all the states were requested to furnish

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 34<sup>th</sup> Meeting of the Standing Committee on Power System Planning in Northern Region held on 8/8/2014

Director(SP&PA), CEA stated that the minutes of the 34<sup>th</sup> SCM of Northern Region held on 8<sup>th</sup> August, 2014 at Delhi at NRPC, Katwaria Sarai, New Delhi, was circulated vide CEA letter No. No. 1/9/SP&PA-2013 /1513-1534 dated 25.08.2014. POWERGRID had indicated that the reactive compensation associated with Inter-Regional system strengthening scheme for WR and NR part-B had some inadvertent errors. The same has been corrected and is given as below.

		<b>Approx Line length</b>	<b>Line Reactor- From bus</b>	<b>Line Reactor- To bus</b>
	<b>Line Reactors</b>			
1.	Jabalpur Pooling station - Orai 765 KV D/c	419km	330 MVAR	330 MVAR
2.	Orai – Aligarh 765kV D/c line	300km	240 MVAR	240 MVAR
3.	Orai – Orai(UPPTCL) 400kV D/c (Quad	38km	-	-
4.	LILO of one circuit of Satna-Gwalior 765 KV 2XS/c at Orai	80 km		
	<b>Existing Satna-Gwalior 765kV S/c</b>	350km	<i>240 MVAR (Switchable)</i>	<i>240 MVAR*</i>
	Satna-Orai 765kV S/c	320km	240MVAR (Switchable to be retained)	<i>240 MVAR</i>
	Orai-Gwalior 765kV S/c	130km	-	-
5.	LILO of Agra-Meerut 765 kV S/c line at Aligarh	35km		
	<b>Existing Agra-Meerut 765kV S/c</b>	270 km		<i>240 MVAR (Switchable)</i>
	Agra-Aligarh 765kV S/c	130km	-	-
	Aligarh-Meerut 765kV S/c	200km		<i>240 MVAR (Switchable)</i>
6.	LILO of Kanpur – Jhatikara 765 kV S/c at Aligarh S/s	35km		
	<b>Existing Kanpur-Jhatikara 765kV S/c</b>	465 km	<i>330 MVAR (Switchable)</i>	<i>330 MVAR (Fixed)**</i>
	Kanpur-Aligarh 765kV S/c	330km	<i>330 MVAR</i>	<i>330 MVAR</i>

		<b>Approx Line length</b>	<b>Line Reactor- From bus</b>	<b>Line Reactor- To bus</b>
			<i>(Switchable)</i>	<i>(Switchable)</i>
	Aligarh-Jhatikara 765kV S/c	190km		330 MVAR <i>(Presently fixed to be made Switchable)</i>
	<b>Bus Reactors</b>			
7.	2x1000MVA, 765/400KV substation at Orai GIS S/s	2x330MVAR bus reactor		
8.	765KV Switching Station at Aligarh (GIS)	2x330MVAR bus reactor		

\*\* Existing non-switchable Line reactor at Gwalior end of Satna-Gwalior line which is to be LILoed at Orai shall be converted into switchable line reactor

\* Existing non-switchable Line reactor at Jhatikara end of Kanpur-Jhatikara line which is to be LILoed at Orai shall be converted into switchable line reactor along with a spare unit.

No observations on any other items of the Minutes of the Meeting have been indicated by any of the constituents, so the minute of the 34<sup>th</sup>SCM of Northern Region with the above modifications is taken as confirmed.

## **2. 220kV lines for connectivity of new 400/220kV ISTS substations under ISTS strengthening**

Director(SP&PA), CEA stated that in the 34<sup>th</sup> SCM it came to the notice of the committee that some states are not planning/constructing the 220 kV outlets from the new 400/220kV substations coming under center sector, with the result the some 400 kV substation already constructed by POWERGRID remains unutilized/under-utilized and the construction of 220 kV outlets from other 400 kV Substations are not matching with their commissioning schedule. The issue was discussed in details in the 34<sup>th</sup> meeting of the Standing Committee of NR, wherein Members were of the view that when ever any state brings up any proposal for construction of S/S under ISTS in their respective state or any proposal for 400 kV substation is put up to the committee, it

must be accompanied by planned 220 kV systems to be constructed by the STU so that the detailed construction schedule for the 220 kV underlying system can be discussed by the Standing Committee while taking up the proposal for the 400 kV network and the underlying 220 kV STU network is also available matching with the commissioning of the ISTS substation for drawl of power. Members from PSTCL and HVPNL stated that route of the 220kV line might also be surveyed and identified and intimated to the committee so that the problem of line crossing is minimal while allocating the 220 kV bays in the 400 kV S/S.

**The SCM concurred the proposal.**

**3. LILO of Koteshwar Pooling Station- Meerut 765 KV D/c line at proposed 765/400 KV Substation Rishikesh:**

Director(SP&PA), CEA stated that the issue was discussed in the 34<sup>th</sup> SCM of NR but the same was deferred as POWERGRID had requested the need for further study. PTCUL had proposed to upgrade the existing 400/220kV Substation at Rishikesh to 765kV voltage level through LILO of one ckt. of Koteshwar Pooling Station- Meerut 765kV D/c line. It was indicated that upgrading the existing 400 kV Rishikesh Substation to 765/400kV would improve reliability and improve the power supply to Uttarakhand & will also remove the power transfer constraint on 400kV Roorkee -Muzaffarnagar line during low hydro generation condition.

He further stated that load flow studies had been carried with the above proposal and it is seen that there are unbalanced loading in the lines from Rishikesh with 765kV Rishikesh - Meerut line section would be underutilized. The proposal for upgrading the existing 400 kV Rishikesh S/s of PTCUL to 765 kV would also not be a cost effective proposition. As such, considering the power requirement of the Garhwal Hills, it is now proposed to construct Koteshwar Pooling Station- Rishikesh 400kV D/c (Quad) line instead of the above proposal. It would provide additional outlet from Tehri/ Koteshwar complex and independent feed for providing reliable and quality power supply to Rishikesh area.

AGM, PGCIL stated that 400kV D/C with quad conductor the tower weight is heavy and as such difficult in the hilly area so it will be better to construct the Koteshwar Pooling Station- Rishikesh 400kV D/c line with HTLS (High temperature and low Sag) conductor instead of Quad conductor.

Director(Operation)PTCUL stated that:-

- a) Construction of 400 KV Srinagar-Koteshwar line has been sanctioned in past.
- b) Also power from proposed projects in Bhagirathi Valley was to be evacuated by construction of 400 KV lines up to Koteshwar. As such the Proposal would also be useful in evacuation of future Hydro power Projects in The above be also considered.

He further intimated that there is space constraint at Rishikesh 400kV S/s and only two nos. 400kV line bays could only be accommodated at Rishikesh for Koteshwar Pooling Station- Rishikesh 400kV D/c line.

Director (Operation) PTCUL stated that it is not impossible to take out further 220 KV overhead lines from 400 KV (Puhana) Roorkee ISTS Substation due to sever ROW issue. Presently, only 2 no. 220 KV circuit has been constructed. He stated that PTCUL required 3 additional 220 KV circuit from 400 KV Puhana. Two no. 220 KV Bays are available at Puhana (Roorkee). One no. more 220 KV Bay to be constructed at 400 KV Puhana (Roorkee) under ISTS. Also, considering sever ROW issues in 400 KV Puhana, 220 KV cable will be required to be laid in PGCIL premises for which PTCUL would require permission from PGCIL. **Accordingly he requested for 3 Nos. 220kV line bays for cable connection at Roorkee 400kV S/s (PG). AGM PGCIL agreed with the proposal.**

**The SCM agreed with the above proposal.**

4. **LILO of 220kV Dhauliganga- Pithoragarh(PG) for construction of Proposed 220kV GIS S/s at Jauljibi, Pithoragarh & Proposed 2x100 MVA, 220/132kV GIS s/s at Almora in Kumaon region:**

Director(SP&PA), CEA informed that this issue was discussed in the 34<sup>th</sup>SCM of NR and was deferred as POWERGRID had requested the need for further study. PTCUL had proposed to construct 220kV GIS Substation at Jauljibi for meeting the future load demand & reliability of power supply in Pithoragarh and nearby region. The proposal for creation of 220KV GIS Substation at Jauljibi(PTCUL) has been studied and discussed in details with the engineers from CEA POWERGRID and PTCUL and accordingly, now it is proposed that 220KV GIS Substation at Jauljibi(PTCUL) would be created by LILO of one circuit of 220kV Dhauliganga-Pithoragarh(PG) line under **Phase I** and under Phase II 400/220 KV GIS Substation at Jauljibi(under central Sector) would be created and the the 220kV Dhauliganga - Bareilly would be upgraded to 400kV level, PTCUL would connect the substation at 220kV S/S of Pithoragarh (PG).

Later when the Dhauliganga-Bareilly line would be upgraded to 400kV level and to meet the growing load demand of Jauljibi, Almora area, the 400/220kV, 2X315MVA GIS Substation at Jauljibi in Pithoragarh area would be constructed under ISTS by LILO of one line of 400 kV Dhauliganga-Bareilly (PGCIL) at Jauljibi(ISTS) as a **Phase II**. Dhauliganga HEP and Bareilly (PG) would feed Jauljibi 400/220kV substation. Under Phase II, the existing link of Dhauliganga-Pithoragarh (PGCIL) line at 220KV S/s Jauljibi (PTCUL) under Phase I would be disconnected and the S/S would now be connected to Jauljibi 400/220kV substation through 220 kV D/C line. As such Jauljibi 400/220kV substation would be the feeding point for supply of power to 220kV Jauljibi, Almora and other loads of the Kumaon region.

AGM, PGCIL informed that the Dhauliganga-Bareilly 400kV line is Opt. at 220kV. Dhauliganga HEP is stepped-up at 220 so both the circuit of Dhauliganga-Bareilly line is to be LILOed at Jauljibi 400/220kV substation. From Jauljibi 400/220kV substation the Dhauliganga-Bareilly line would be charged at 400 kV with a provision for at 8 nos. of line bays( two for the line from Dhauliganga, two for Jauljibi 220 kV, two for Almora 220 kV S/S of PTCUL and two for Pithoragarh/Sitarganj S/S. The 400/220kV S/S at Jauljibi would improve the voltage, reliability and quality of power supply in Kumaon hills while catering to future load growth.



Director (Operation) PTCUL stated that the proposed Almora S/S would further be connected to 220 kV Karanpryag S/S of PTCUL, there by linking the Garwal Hills with the Kumaon hills of Uttarakhand.

After detailed deliberation the following proposal were agreed by the constituents of NR.

**Phase I.**

- i) Creation of 220/33KV S/s Jauljivi by PTCUL by LILO of one circuit of 220KV Dhauliganga-Pithoragarh (PGCIL) line at 220KV S/s Jauljivi (PTCUL).

**Phase II.**

- ii) Creation of 400/220kV, 2X315MVA GIS Substation in Jauljibi area under ISTS by LILO of both ckt. of 400 kV Dhauliganga-Bareilly (PGCIL) line charged at 220 kV at Jauljibi(ISTS). The 400 kV Jauljibi S/S should have the following provisions:

400 kV side

- i) 4 nos. of 400 kV line bays
- ii) 2 nos. of 400 kV ICT bays
- iii) Space provision for 2 future bays

220 kV side

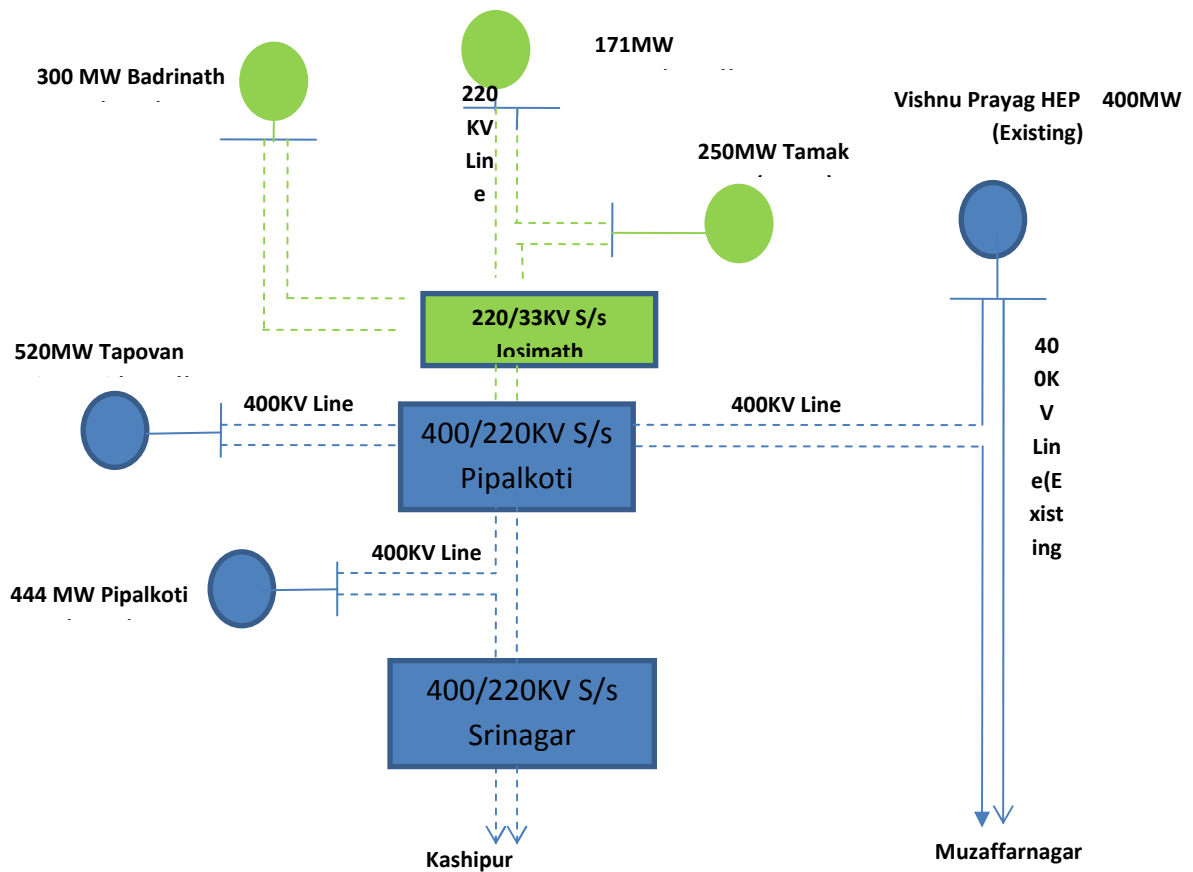
- i) 6 nos. of 220 kV line bays
- iii) 220 kV Jauljibi (PTCUL) under Phase I would be connected to Jauljibi (ISTS)400/220kV substation through 220 kV D/C line. (line and the S/S under PTCUL scope)
- iv) The existing link of Dhauliganga-Pithoragarh (PGCIL) line at 220KV Jauljibi S/s would be disconnected.
- v) 220KV GIS substation at Almora and its associated 220KV D/C Almora-Jauljibi 400/220kV GIS Substation.

**The Standing Committee agreed with the above proposal.**

## 5. Re-planning of UITP Network for Alaknanda Basin

Director, CEA stated that CERC vide its Order dated 31-01-2013 has declared the UTIP (Urratakhand Integrated Transmission Projects) as Deemed interstate Transmission Scheme with CTU as a Nodal Agency for vetting of the comprehensive transmission scheme in accordance of the Connectivity Regulation. The Proposed UITP Network in Alaknanda Basin (Approved by CEA) is as under

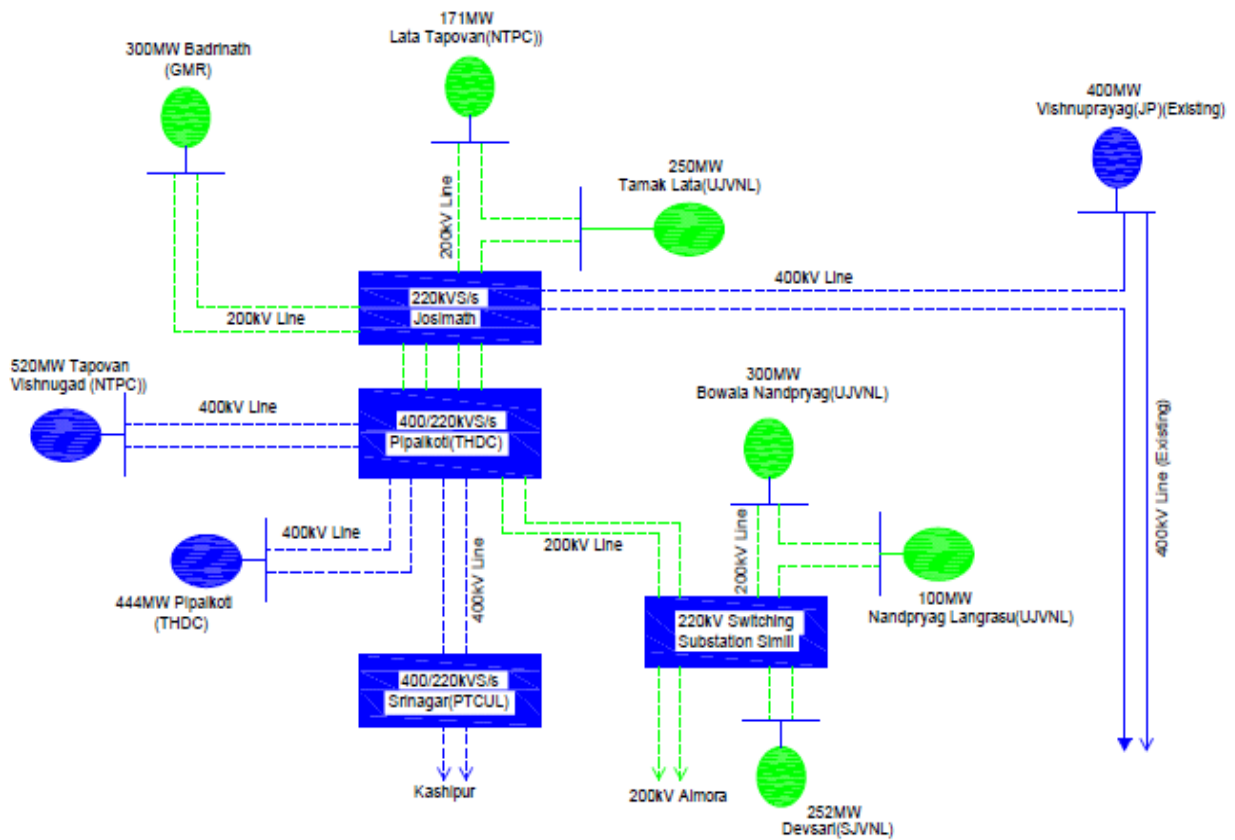
### Proposed UITP Network in Alaknanda Basin (Approved by CEA)



PTCUL have informed that due to extra ordinary circumstances & local resistance at the site, construction of 400kV S/s at Pipalkoti could not materialize. Accordingly, some proposal was given in the agenda for evacuation of power from NTPC Tapovan Vishnugad project. However, PTCUL has now brought out some new proposal for evacuation of power from Alaknanda Basin.

Director (Operation) PTCUL stated that due to Auli ropeway crossing it would not be possible to take out 400 kV line from that area. Beside this the valley is narrow and the proposed interconnection with Vishnupryag would not be possible. As such the proposal for upgrading Joshimath at 400/220 kV would not be possible. He stated that one possibility is that THDC having 19 Acers of land at Pipalkoti HEP and out of this if they can transfer 6 Acers of land to PTCUL for establishment of 400/220 kV Pipalkoti (THDC) substation then all the issues for evacuation of power in Alaknanda Basin would resolved and there will be no delay in completion of works. They requested THDC and CEA to help in resolving this issue. The detailed proposal is as under:

### Proposed UIIP Network in Alaknanda Basin



CMD, PTCUL also requested for early approval of the revised proposal of PTCUL.

Addl. GM THDC stated that the issue needed to be discussed with their higher authorities before giving any view. They suggested that it would be appropriate if PTCUL could take up matter with THDC management. Member (PS), CEA advised that PTCUL to take up matter with THDC.

AGM NTPC emphasized the need for resolving the issue as early as possible as their plant at Tapovan Vishnugad (502 MW) is planned to be commissioned by 2018

AGM, PGCIL recommended the proposal and suggested that for evacuation of power from Alaknanda Basin, interconnection between Joshimath switching station with 400 kV Pipalkothi (THDC) S/S should be constructed as 220kV, 2xD/C line instead of D/C line as proposed by PTCUL. As in the event of outage of circuit of 220kV D/C line, nearly 700MW of power in the upstream of Alaknanda basin would be bottled up.

The proposal of AGM, PGCIL, for 220kV, 2xD/C line between Joshimath switching station and 400 kV Pipalkothi (THDC) S/S was agreed by the constituents; however, it was suggested to implement the 2<sup>nd</sup> D/C line in phased manner.

Accordingly, the following Re-Planning proposal for UITP Network in Alaknanda Basin were agreed to be constructed by PTCUL as deemed ISTS scheme:

1. Construction of 400/220 kV, 2x315 MVA Pipalkoti (THDC) substation
2. Construction of 400kV D/C (twin Moose) Tapovan Vishnugad HEP - Pipalkoti (THDC) substation line.
3. Construction of 400kV D/C (twin Moose) Pipalkoti HEP - Pipalkoti (THDC) S/S line.
4. Construction of proposed 400kV D/C (Quad) Pipalkoti (THDC) HEP – Srinagar line.
5. LILO of one circuit of 400kV Vishnuprayag-Muzaffarnagar line at Pipalkoti (THDC) substation.
6. 8 Nos. 400kV line bays in Pipalkoti substation.

**The Standing Committee agreed and concurred the proposal.**

## 6. Evacuation of Ghatampur TPS (3x660 MW), Uttar Pradesh.

Director(SP&PA) stated that Ghatampur Thermal Power Station is an intra-state project being constructed as a Joint Venture of Neyveli Lignite Corporation and Uttar Pradesh Rajya Vidyut Utpadan Nigam Ltd.(UPRUVNL). The 3x660MW Ghatampur TPS is located at Kanpur in Uttar Pradesh. UPPTCL has proposed following transmission system for its evacuation:

- 21/765KV Generator Transformers, 2x 1500MVA, 765/400kV & 3x200MVA, 400/132kV ICTs at Ghatampur TPS along with 6-8 Nos. of 132 kV outlets
- Ghatampur TPS -Agra(UP) 765kV S/c Line- 240 km
- Line reactors of 189 MVAR at either end
- Agra(UP) -Greater Noida(UP) 765kV S/c Line - 200 km
- Line reactor of 189 MVAR at Agra end
- Ghatampur TPS -Hapur 765kV S/c Line -400 km
- line reactors of 330 MVAR at either end
- Ghatampur TPS- Kanpur(PG) (400 or 765kV) 400kV D/c line

The evacuation Plan was discussed with CEA & CTU in a meeting recently held in CEA. The evacuation system was found to be generally in order.

AGM Powergrid stated that that with the above proposal, the outage of the 765 kV Agra – Hapur / Greater Noida line the loading in the 400 kV D/C line from Ghatampur TPS- Kanpur(PG) increases by 225 MW on each circuit. He stated that the study has also not considered the NTPC generation at Billore, so under the above condition and also with Billore generation, the line beyond Kanpur (PG) would likely to get overloaded. Further, with the commissioning of the generation projects at Orissa, Jharkhand and Chattisgarh, the problem of overloading could aggravate further. As such the system proposed from Ghatampur would need to be revisited further.

S. E, UPPCL stated that they have also carried out studies with the proposed system and there is no overloading problem in the evacuation even under outage Condition. He stated that at Ghatampur provision has been kept for 400/220/132 ICT through which around 500 MW of the generation could be dropped down at 220 or 132 kV level. As such the power flow towards Kanpur from Ghatampur will not be that high.

Director (SP&PA) stated that with the commissioning of Billore and other generation in Eastern Region, the associated transmission system will also be in place with these generation projects, however, as being intimated by SE UPPCL, the studies for the evacuation of power from Ghatampur would be revisited considering the 400/220/132 kV ICT at Ghatampur and Billore Generation. He further intimated that CTU may plan Billore evacuation system and put up to the Standing Committee for approval. The Proposal for power evacuation from Ghatampur TPS (3x660 MW), Uttar Pradesh was deferred for the next SCM of NR.

**The Standing Committee agreed and concurred with the proposal.**

## **7. 220 kV Underlying system from the Central Sector 400 kV S/S proposed in UP**

Director(SP&PA) stated that in the 34<sup>th</sup> meeting of the Standing Committee of the Northern Region, the readiness 220 kV underlying transmission lines from the proposed 400 kV central Sector S/S, which are likely to be commissioned in the 2015-17 timeframe was reviewed. In that meeting, UPPTCL was not ready with the details of their 220 kV line for absorption of power from the 400 kV central Sector S/S in UP, which are likely to be commissioned in the 2015-17 timeframe. UPPCL was accordingly advised by the Standing Committee to firm up the details and intimate the Committee in the subsequent meeting. UPPTCL has now intimated the details which are as under:

### **i) Bagpath PG 400/220 kV S/S U/C**

- Bagpath (PG) 400 KV – Bagpath 220 kV D/C -18 KM
- Bagpath (PG) 400 KV – Baraut 220 kV D/C - 25 KM

- ii) **Saharanpur PG 400/220 kV S/S U/C**
  - Saharanpur (PG) 400 KV – Behat 220 kV D/C -50 KM
  - LILO of Saharanpur (220 kV)– Nanauta 220 kV S/C at Saharanpur (PG)
- iii) **Sohawal PG (Faizabad)400/220 kV S/S (Existing)**
  - Sohawal (PG) 400 KV – Tanda 220 kV D/C -80 KM
  - Sohawal (PG) 400 KV – Barabanki 220 kV D/C -70 KM
- iv) **Shahjahanpur PG 400/220 kV S/S U/C**
  - Shahjahanpur (PG) 400 KV – Hardoi 220 kV D/C -60 KM
- v) **Gorakhpur PG 400/220 kV S/S (Existing)**
  - Gorakhpur (PG) 400 KV – Gola 220 kV D/C -60 KM
- vi) **Bhaunti PG 400/220 kV S/S (Existing)**
  - LILO of one Ckt. of Panki –Bhauti 220 kV D/C line at Rania

UPPCL has indicated that more 220 kV feeders are being planned from the above 400kV S/S after examining the load growth and ROW feasibility.

**The Standing Committee took note of the proposal.**

#### **8. Transmission works at 765, 400 and 220kVundertaken by UPPTCL**

Director (SP&PA) intimated that UPPCL is implementing transmission system at 765, 400 and 220 kV level with the connectivity. The works are proposed to be commissioned by 2017. These works are in addition to the ongoing transmission projects. The details of the works as proposed by UPPCL are as under.

### **Additional Proposed New 765,400 kV Substations & Lines in XII Plan 2014- 2017**

S.N.	Name of Substations & Lines	ckt (km)	Remarks
1	2	3	4
	<b><u>765kV Substations &amp; Lines</u></b>		
1	<b>Agra UP-765/400kV S/S 2x1500 MVA</b>		Under Construction
	i.Agra UP(765) -Lalitpur 765kV,2xSC line - 378km	756	

	ii. Agra UP(765) - Meerut PG or Gnoida (765) 765kV SC line -200km	200	<b>New Proposed</b>
2	<b>Ghatampur TPS Evacuating 765kV Lines (Ghatampur TPS 765/400/</b>		
	<b>132 kV 2x1500,3x200 MVA)</b>		
	i. Ghatampur TPS -Agra UP (765) 765kV SC line-238km	238	<b>New Proposed</b>
	ii. Ghatampur-Hapur 765 Kv SC line-400km	400	<b>New Proposed</b>
	<b><u>400kV Substations &amp; Lines</u></b>		
1	<b>Agra (South) 400/132 kV S/S ,3x200 MVA</b>		
	Agra UP (765) -Agra (South) DC line - 71 kV	142	Under Construction
2	<b>Math 400/220 kV S/S , 2x315 MVA</b>		
	i. LILO of Agra - Moradnagar 400 kV SC line at Math - 27 km	54	Under Construction
	ii. Agra UP (765) - Math SC line -141 km	141	Under Construction
3	<b>Karelibagh 400/132 kV S/S, 3x200 MVA</b>		<b>New Proposed</b>
	LILO of one ckt of Meja - Rewa Road 400 kV DC line (Q) at Karelibagh - 20 km (Q)	40	
4	<b>Hardoi Road 400/220/132 kV S/S , 2x500+2x160 MVA</b>		<b>New Proposed</b>
	LILO of Unnao - Sarojininagar 400 kV SC line at Hardoi Road - 25 km	50	
5	<b>Shamli 400/220/132 kV 2x500+2x160 MVA</b>		<b>New Proposed</b>
	i. Shamli - Aligarh (400) 400kV DC line - 180 km	360	
	<b><u>Other 400 kV Lines</u></b>		
i	LILO of one ckt of Agra - Agra (PG) 400 kV DC line at Agra UP (765) -35km	70	Under Construction
ii	LILO of Agra - Moradnagar 400 kV SC line at Agra UP (765)-79km	158	Under Construction
iii	Ghatampur - Kanpur(PG) 400 kV DC line -30km	60	<b>New Proposed</b>



**Additional Proposed 220 kV New Substations & Lines in XII Plan ( 2014- 2017)**

<b>S.No.</b>	<b>Name of Substations &amp; Lines</b>	<b>Ckt. Kms.</b>	<b>Remarks</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
<b>I</b>	<b>Etah-II or Sikandrarao 220/132 kV 2x160 MVA</b>		<b>New Proposed</b>
1	Etah-II -Aligarh(400) DC	140	
2	Etah-II-Etah (Existing) DC	80	
<b>II</b>	<b>Raja Ka Talab 220/132/33 kV,2x160+2x40 MVA</b>		<b>New Proposed</b>
1	Raja Ka Talab (220)-Aurai (400) DC	60	
2	Raja Ka Talab(220)-Sahupuri(220)	80	
<b>III</b>	<b>Azamgarh II 220/132/33 kV,2x160+2x40 MVA</b>		<b>New Proposed</b>
1	LILO of Sarnath(400)-Azamgarh(II) 220 kV SC	50	
2	Azamgarh II - Aurai (400) 220 kV SC	60	
<b>IV</b>	<b>Gola 220/132/33 kV, 2x160+2x40 MVA</b>		<b>New Proposed</b>
1	Gorakhpur PGCIL-Gola (220) DC	120	
<b>V</b>	<b>Partapur(Meerut) 220/132/33 kV,2x160+2x40 MVA</b>		<b>New Proposed</b>
1	Partapur-220(Meerut)-Hapur(765) DC	100	
<b>VI</b>	<b>Shamli-II 220/132/33 kV, 2x160+2x40 MVA</b>		<b>New Proposed</b>
1	Shamli-II(220)-Shamli(400) DC	60	
2	Baikala(Muzaffarpur-II)-Shamli-II(220) DC	80	
<b>VII</b>	<b>Modipuram-II 220/132/33 kV, 2x160+2x40 MVA</b>		<b>New Proposed</b>
1	Modipuram-II(220)-Shamli(400) -DC	100	
<b>VIII</b>	<b>Hapur 220/132,220/33 kV, 2x160+3x60 MVA</b>		<b>New Proposed</b>
1	Hapur(220)-Hapur(765)- DC	30	
2	LILO of Simbholi-Shatabdinagar 220 kV SC at Hapur 220	50	
<b>IX</b>	<b>New Bus Adda Ghaziabad 220/33 kV, 2x60 MVA</b>		<b>New Proposed</b>
1	LILO of Moradnagar(220)-Partab Vihar(220) at New Bus Adda (Ghaziabad)-220	10	

<b>X</b>	<b>Moradabad-II 220/132/33 kV, 2x160+2x40 MVA</b>		<b>New Proposed</b>
1	LILO of Moradabad(220)-Nehtaur(220) at Moradabad-II (220)	30	
<b>XI</b>	<b>Baikala(Muzaffarnagar-II) 220/132/33 kV,2x160+2x40 MVA</b>		<b>New Proposed</b>
1	Baikala -220 (Muzaffarnagar)-Shamli (400) DC	80	
2	LILO of Muzaffarnagar(New)-Nanauta(220) at Baikala (220)	40	
<b>XII</b>	<b>Chandausi 220/132/33 kV, 2x160+2x40 MVA</b>		<b>New Proposed</b>
1	Badaun-Sambhal LILO 220 kV SC at Chandausi	40	
<b>XIII</b>	<b>Noida-45 - 220/33, 220/132 kV,1x160,2x60 MVA</b>		<b>New Proposed</b>
1	Noida(148)-Noida-45 - DC	40	
<b>XIV</b>	<b>Inderprasth 220/33 kV - (Deposit) 3x60 MVA</b>		<b>New Proposed</b>
1	Ataur(400)Ghaziabad -Inderprasth(Ghaziabad)-220 kV DC	30	
2	Loni(220)-Inderprasth-220 kV -DC	30	
<b>XV</b>	<b>Barabanki 220/132/33 kV, 2x160+2x40 MVA</b>		<b>New Proposed</b>
1	Sohawal(400)-Barabanki(220) - DC	150	

<b>XVI</b>	<b>Chakgajaria (Lucknow)220/132/33,220/33 kV - (Deposit) 2x100+2x40+1x60 MVA</b>		<b>New Proposed</b>
1	Sultanpur Road(400)-Chakgajaria (Lucknow) 220 kV- DC	20	
<b>XVII</b>	<b>Awas Vikas 220/33 kV - (Deposit) 5x60 MVA</b>		<b>New Proposed</b>
1	Sultanpur Road(400)-Awas Vikas (Lucknow) 220 kV -DC	4	
<b>XVIII</b>	<b>Faridpur 220/132/33 kV 2x160+2x40 MVA</b>		<b>New Proposed</b>
1	LILO of Roza-Dohna(220)- SC line at Faridpur(220)	20	

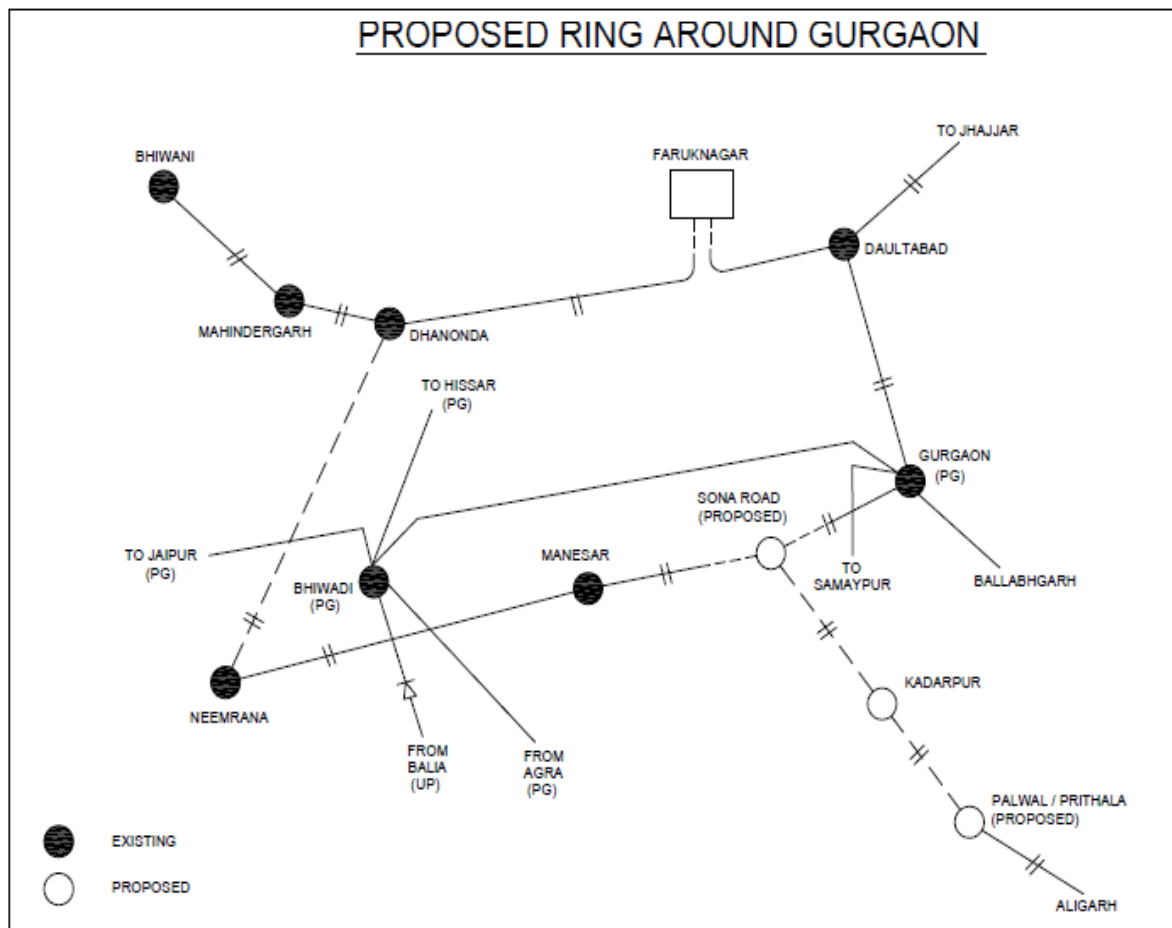
<b>XIX</b>	<b>Jagrti Vihar 220/132/33 kV (Deposit) 2x160+2x40 MVA</b>		<b>New Proposed</b>
1	Hapur (765)-Jagrti Vihar - DC	60	
2	Partapur(220)-Jagrti Vihar - DC	40	
<b>XX</b>	<b>Phoolbagh 220/33 kV, 3x60 MVA</b>		<b>New Proposed</b>
1	Unnao-RPH(Kanpur) LILO SC line	20	
<b>XXI</b>	<b>Lalitpur 220/132 kV</b>		Under Construction
1	Lalitpur TPS-Lalitpur(220) DC	30	
<b>XXII</b>	<b>Hardoi Road 400/220/132 kV</b>		
<b>1</b>	Hardoi Road(400)-Hardoi Road(220)- DC	30	<b>New Proposed</b>
<b>Others 220 kV Lines</b>			
1	Shahjahanpur(400) PGCIL-Hardoi(220) SC Line	60	<b>New Proposed</b>
2	LILO of Gokul-Hathrus 220 kV SC at Math(400)	30	Under Construction
3	Math(400)-Chatta DC	60	Under Construction
4	LILO of Firozabad-Shamsabad 220 kV SC Agra PG	4	Under Construction

**The Standing Committee took note of the information.**

**9. Creation of new 400kV substations in Gurgaon area and Palwal area as a part of ISTS- Agenda by HVPN.**

Director(SP&PA) stated that HVPNL has requested for creation of new three 400kV substation one at Kadarapur & other at Sohna Road in Gurgaon area and one 400kV substation at Prithla in Palwal area as a part of Inter State Transmission System (ISTS). The first two S/S has been proposed to cater the load demand of sector 58 to sector 67 and sector 68 to sector 80 sectors of Gurgaon respectively. The creation of Prithala S/S would meet the power demand of the area to be developed under Prithala Development Plan. Beside this it will also act as a main feeding source to Palwal, Rangla Rajpur and Meerpur Kurli.

HVPNL has furnished the district wise load projections of Haryana for 13<sup>th</sup> Plan (2021-22). Looking at the load growth in Prithala and around Gurgaon areas, bigger ring around Gurgaon with 400 kV Quad conductor, connecting the existing 400 kV S/S of **Dhonanda – Faruk Nagar (to be created by LILO of Dhonda- Daulatabad D/C line)-Daulatabad- Gurgaon(PG) –Sona- Manasher –Neemrana- Dhonanda** is proposed. The proposed 400 kV S/S at Prithala, Kadarpur and Sona Road is to be connected through 400 kV Quad D/C line. The 400kV Sona road as well as Kadarpur S/S would be created as 400/220 kV, 2x500 MVA. 400 kV Prithla Substation in Palwal area is proposed to be created as 2x500MVA, 400/220kV with 400 kV Quad D/C feed from Agra / Aligarh S/S.



Load flow studies were carried out by CEA& CTU. The load flow result indicates normal loading in the Gurgaon ring.

Director SP&PA stated that HVPNL has already planned the 220 kV connectivity from the proposed 400 kV S/S. The proposed S/S at Kadarpur S/S would feed load to sector 58 to 67 of Gurgaon and 220 kV Badshapur and pali. HVPNL has envisaged the following network to evacuate power from 400 kV Kadarpur S/S

- a) LILO of 220kV Badshapur – Pali D/C line at Qudarpur on M/C tower
- b) One 220 kV M/C line (four ckt.) with twin moose conductor to feed the 220 kV S/S envisaged at sector 59,61, 63 & 65 of Gurgoan.
- c) One 220 kV D/C line with twin moose conductor to feed the 220 kV S/S envisaged in sector 64, 65 & 67

Similarly the proposed S/S at Sona Road S/S would feed load to sector 68 to 80 of Gurgoan and 220 kV Kankerheri(Sona) – Rangala Rajpur. HVPN has envisaged the following network to evacuate power from 400 kV Sonar S/S

- a) One 220 kV M/C line (four ckt.) with twin moose conductor to feed the 220 kV S/S envisaged at sector 69,70,75,75A,76 Gurgoan.
- b) Provision for 220 KV D/C line with twin conductor for future.

AGM POWERGRID stated that there would be space constraint at Agra as such Aligarh would be a better option. However, Aligarh presently is a switching station and need to be have 765/400 kV transformation for feeding power to Prithala. He emphasized the need for bus reactor at all the proposed new Substations.

Dy. Director BBMB stated that the fault level at 400 kV Samaypur is already high and adding new lines may further increase the fault level at Samaypur.

Director SP&PA stated that the increase in the fault level with the development in the grid is unavoidable, however, there is need is to find a suitable solution to this problem. Earlier while confronting with the similar problem in Delhi system it was decided that the 400 kV systems around Delhi would be operated in split bus mode. However, the proposal was later dropped as it adds up to the instability in the grid and it was decided that installing series reactor would be a better alternative. Similar practice is also being adopted elsewhere in the world. Accordingly, he requested POWERGRID to study the bus reactor requirements as well as the requirement for series reactor to compensate the increase in the fault level.

CE HVPNL as well as SE UPPCL stated that the feed to Prithala from Aligarh would be a better solution as number of lines from Agra S/S are coming to Gurgoan area and the 765 kV Aligarh switching st. may be changed as 765/400 S/S by

adding 2x1500 MVA ICT. They further stated that to take care of the increasing problem of short circuit level, all 400 kV S/S should be designed to handle 50 KA fault current.

After detailed deliberation the following proposals were agreed by the Standing Committee with the following scope of works:

- i) Creation of 400 kV level at Aligarh S/S by adding 2x1500 MVA 765/400 kV ICT
- ii) Aligarh – Prithala, 400 kV D/C Quad line
- iii) Prithala – Kadarapur 400 kV D/C Quad line
- iv) Kadarapur – Sona Road 400 kV D/C Quad line
- v) LILO of Gurgaon – Manesar D/C line at Sona Road S/S
- vi) Neemrana – Dhonanda(HVPNL) 400 kV D/C Quad line
- vii) Creation of 400/220kV , 2\*500MVA substations at Kadarapur in Gurgaon area
- viii) Creation of 400/220kV, 2\*500MVA substations at Sona Road in Gurgaon area
- ix) Creation of 400/220kV , 2\*500MVA substations at Prithala in Palwal area
- x) To cater to the future load growth of the area, space provision for capacity augmentation by 2\*500MVA transformation at all these substations may be kept.

**The Standing Committee agreed and concurred with the proposal.**

#### **10.LILO of Sikar-Neemrana 400kV D/c line at Babai(RRVPNL) :**

Director SP&PA stated that Sikar is an existing 400/220kV substation of POWERGRID. Presently it is connected to the grid through Bhiwadi- Neemrana-Sikar 400kV D/c & Agra –Sikar 400kV D/c (Quad) lines. Further, following lines have already been approved for connectivity of Sikar:

- Sikar-Jaipur (PG) 400kV D/c
- Sikar-Ratangarh 400kV D/c

During the last Standing Committee meeting, RRVPNL had submitted the studies for the proposal of LILO of one/two ckts of Sikar- Neemrana 400kV line at Babai". The 400kV S/S at Babai of RRVPNL is under construction under associated transmission system for Suratgarh Super Critical TPS (2x660MW) and is to be connected to Suratgarh through 400kV D/c line.

The proposal of RVPNL for LILO of one/two ckts of Sikar- Neemrana 400kV line at Babai was studied by POWERGRID and they were of the view that the proposed LILO of one circuit causes unbalanced loadings on Sikar- Neemrana lines and LILO of both circuits of Sikar- Neemrana at Babai results in off-loading of Sikar-Babai section of this line. In view of this, proposed LILO of Sikar- Neemrana line at Babai was not found appropriate.

The issue was discussed in details in the 34<sup>th</sup> SCM, wherein there was a proposal for construction of one line from Babai to Mohindergarh in addition to the LILO of one circuit at Babai. The proposal was also not agreed by the committee as the committee was of the opinion that the connection between Babai to Mohindergarh would not serve any fruitful purpose and the proposal was dropped.

POSOCO is of the view that LILO of Sikar- Neemrana line at Babai would add up to the stability of the power supply to the North Eastern part of Rajasthan. Accordingly the committee considered the following proposal

- i) LILO of one ckt. of Sikar- Neemrana line at Babai
- ii) Babai – Bhiwani D/C line

The Babai – Bhiwani D/C line would give strong connection to Babai with the Hydro Generation.

**After detailed deliberation the proposal was agreed and concurred by the Standing Committee**

## **11. Requirement of 2 nos. 220 kV bays at PGCIL's 400/220kV GSS Sikar-**

### **Agenda by RRVPNL**

Director SP&PA stated that during the 34<sup>th</sup> Standing Committee Meeting held on 8-8-2014, augmentation of transformation capacity at 400/220kV Sikar(PG) substation by 1x500 MVA along with 2 nos. of 220 kV line bays has been agreed and a confirmation of RVPN was required regarding requirement of 2 nos. 220 kV line bays. In this regard RRVPNL has intimated that additional 2 nos. of 220 kV line bays are required along with 1x500 MVA (3" transformer) at Sikar for termination of a 220 kV D/c line to nearby 220 kV GSS or nearby 220kV line(s) after getting the technical feasibility examined as per the field conditions.

**The Standing Committee noted the same.**

### **Additional Agenda:**

#### **1. Koldam – Ludhiana 400 kV D/C and Parbati – Koldam (excluding Parbati – II to Parbati – III section)**

AGM NTPC stated that the pre-commissioning activities at Koldam Switchyard was agreed in the 34<sup>rd</sup> SCM of NR. In this regard it is mentioned that up gradation of subject line bay at Koldam generation switchyard will be done by NTPC at their cost depending upon future requirement as per direction of SCM/NRPC. He stated that Koldam HEP is a regional project and power from the project is allocated to regional beneficiaries by MoP/GOI, and the tariff is determined by CERC. Accordingly, any cost incurred by NTPC on account of subject up gradation work (in future) would be capitalized to the project in line with CERC tariff guidelines. Considering adequacy of power evacuation requirement from the Koldam project and 400 KV Nallagarh /Parvati line bay already installed by NTPC in their generation switchyard the subject line bay rating of 2000A were accepted in NR SCM. Since the up-gradation requirement of subject 400KV bays (from 2000A to 3000A for Nallagarh/Parvati quad line) would be arising in future primarily due to addition of new generations/network elements in the nearby complex, any cost to be incurred on



account of above bay up-gradation work should be under the head of such additional network element for which it would be required in future.

**The Standing Committee agreed and concurred with the proposal.**

## **2. Stringing of second circuit of Dulhasti-Kishenpur Line in Forest Stretches.**

AGM NTPC stated that presently Dulhasti (390MW) generation of NHPC is being evacuated over Dulhasti-Kishenpur-400kV S/c line. The issue of reliable power evacuation from Dulhasti HEP was discussed and during the 28th SCM of NR held on 23/2/2010 it was decided that “initially, POWERGRID might take up the implementation Dulhasti – Kishenpur 400 kV D/c Quad line and string only one ckt. from Dulhasti to Kishenpur. For Ratle HEP, J&K may apply for Connectivity and Long Term Access to the CTU, after which, stringing of 2nd ckt can be planned. The 2nd ckt may be strung from Kishenpur and terminated at Ratle. This 2nd ckt. will be extended to the project coming up in the upstream of Dulhasti project bypassing Dulhasti HEP”. In line with above Dulhasti – Kishenpur 400 kV D/c Quad line (with initially string only one ckt only) has been approved and is under construction. Presently the forest approval for Dulhasti – Kishenpur 400 kV D/c transmission line is under process and is expected shortly.

Here it may be mentioned that connectivity and LTA has been granted for Ratle HEP and as intimated by them the project is expected by January’2019. At the time of stringing of second circuit for Ralle HEP revised approval of forest authorities shall have to be obtained again. As the Ratle HEP is already under construction, it is proposed that stringing of both circuits may be taken up in forest stretch under NRSS-XXIV. The remaining portion can be strung matching Ratle HEP.

Further as outlet beyond Dulhastii is Dulhasti-Kishenpur 400kV line is a single circuit the amount of power that can be exported/imported is limited. Hence Dulhasti-Ratle section would be optimised to the extent possible.

**The Standing Committee agreed and concurred with the proposal.**

### **3. Power evacuation from 2x50 MW Sainj HEP**

Director SP&PA stated that the power evacuation system from Sainj was discussed in the 31<sup>st</sup> and 32<sup>nd</sup> meeting of the Standing Committee of Northern Region. In the 32<sup>nd</sup> meeting of the standing Committee following decisions were taken.

- i. For evacuation of Sainj HEP power, LILLO of 2<sup>nd</sup> direct circuit from Parbati II HEP to Parbati Pooling Station (Barnala) shall be implemented by HPPTCL.
- ii. HPPTCL shall install suitable SPS scheme at Sainj HEP generation station to ensure that the current flowing through Parbati III generation 400 kV bus does not exceed 2400 amperes. This SPS scheme will back down the Sainj HEP generation accordingly.
- iii. In case of permanent nature outage of Sainj switchyard 400 kV bus, bypass of LILLO arrangement will be done by HPPTCL for evacuation of Parbati II HEP generation.
- iv. The above proposed should be implemented expeditiously by HPPTCL as the generation of Sainj HEP is expected to be commissioned by December 2014.

HPPCL has now indicated that their GIS substation at Sainj has been located outdoor and connected to GIS pot head yard through GIS bus duct. The distance between pothead yard and tapping tower is small so chance of failure is remote.

The 400 kV switchyard is capable of handling nearly 4000 A of current. Further the failure rate of GIS is remote and there is space constraint for installation of 400 kV Isolators. HPPCL have indicated that the condition at Parbati II & III switchyard would be same, however no bypass arrangement has been provided in both these generation switchyard. The issue was further debated in the 32<sup>nd</sup> SCM and the members were of the view that the issue has already been settled and as indicated in the meeting HPPCL must provide provision for SPS as well as bypass switch in the Sainj generation switchyard.

**Standing Committee agreed and concurred with the proposal.**

**List of the participants for the 35th Meeting of the Standing Committee on Power System Planning in Northern Region held on 3/11/2014 at Dehradun.**

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