

**Minutes of the meeting of the 14<sup>th</sup> Standing Committee on Transmission system planning of Northern Region held at Jaipur on 30.12.02**

**1. List of the participants is given at Annex-I.**

**2. Confirmation of the minutes of the 13<sup>th</sup> Standing committee meeting**

- 2.1 Welcoming the participants, Chief Engineer (SP&PA), CEA thanked POWERGRID for making excellent arrangements for the meeting and for the hospitality. He welcomed Sh. S.C. Misra, Director (Projects), POWERGRID as a special invitee for the meeting which had very important issues for discussion in the Agenda. He stated that in the 13<sup>th</sup> Standing Committee meeting held at Dehradun, Chairman, Uttaranchal power corporation Ltd.(UPCL) made an appeal to all the members of the standing committee to consider the creation of 220/132 kV S/Ss at Pithoragarh, Kichcha and a touchpoint at 400 kV level in Uttaranchal for absorption of the power from central sector generating stations likely to be commissioned in the state of Uttaranchal. He stated that Uttaranchal, being in a nascent state, required initial infrastructure for growth and emphasized the need to create these substations under central sector so as to provide touchpoint from central sector generation projects located in the state. Considering this, the members of the committee including Punjab and UPPCL agreed unanimously for the creation of the 220/132 kV S/Ss at Pithoragarh, Kichcha and 400/220 kV at Roorkee under central sector. Accordingly the minutes of the meeting were drafted and circulated. Subsequently, Uttar Pradesh Power Corporation Ltd. (UPPCL) changed their views and communicated to CEA regarding their objection for creation of Pithoragarh, Kichcha and Roorkee S/Stations in Uttaranchal under the scope of Central Sector scheme.
- 2.2 CE (SP&PA), CEA stated that since the 13<sup>th</sup> standing committee had agreed for the above works in Uttaranchal and the views of UPPCL were a subsequent development, so the views of the UPPCL could not be included as a part of the minutes of the 13<sup>th</sup> standing committee and as such the minutes might be agreed without any amendment. He stated that since UPPCL had a reservation for the creation of S/Stations in Uttaranchal, the issue could be mutually discussed and sorted out in a separate meeting among CEA, UPPCL and UPCL. The members of the standing committee except UPPCL agreed for the same.
- 2.3 DGM, UPPCL stated that they would like to record their reservation regarding creation of the 220/132 kV S/Ss at Pithoragarh, Kichcha and 400/220 kV Roorkee S/S in Uttaranchal under Central Sector as decided in the 13<sup>th</sup> Standing committee.
- 2.4 CE (SP&PA), CEA asked UPPCL to make up views in the matter within a fortnight's time, so that the meeting for resolving the issue could be held at an early date.

3. **Co-opt of PTC as a member of Standing Committee.**

- 3.1 Chief Engineer (SP&PA),CEA stated that Power Trading Corporation(PTC) under MoP, is a facilitator for trading of power to beneficiary states of different regions. He further added that in the present changed power scenario, the role of PTC had become more important considering the power deficit in Northern & Western Region and availability of surplus power in other regions which could be delivered to deficit states through tripartite agreement among surplus, deficit state and PTC. As such the PTC as a member of the standing committee would provide the information regarding the recent power exchanges and availability of power from future generating stations, enabling members to take their decisions for purchase of power judiciously. He requested the members to give their views on the above matter.
- 3.2 SE (HVPN) questioned the need of inducting PTC as a member of the committee when organizations like NTPC, POWERGRID were already members of the standing committee.
- 3.3 ED (Engg.) POWERGRID stated that induction of the PTC would only help the constituent states to have information regarding the latest power exchanges, rates and the seller/buyer of power within and outside the region. He stated that the available information might be useful for the system planners of the Northern Region for fine tuning their planning activities as a whole.
- 3.4 Director (ORPM), PTC stated that PTC was an organization which not only monitored the power exchanges within the region for a short time period but also for long term basis from other neighbouring countries. He stated that recently PTC had an agreement with HMG, Nepal for importing of 150 MW power from Nepal to Northern Region of India and gradually increasing it to 500 MW within coming 15 years.

After discussions, the members of the committee unanimously agreed for induction of PTC as a member of the standing committee of Northern Region.

4. **Evacuation of power from Barh, Kahalgaon-II, North Karanpura and Maithon (RB) TPS .**

- 4.1 Chief Engineer (SP&PA) stated that NTPC would be commissioning generation of 3x660 MW at Barh, 2x660 MW at Kahalgaon-II and 3x660 MW at North Karanpura. The first stage of generation at Barh and Kahalgaon-II was expected to be commissioned during late 10<sup>th</sup> plan time frame and North Karanpura was expected in the 11<sup>th</sup> plan period. He stated that besides these generations, Maithon (RB) TPS (4x250 MW) was also expected during 10<sup>th</sup> plan time frame. This project was to be developed by DVC and the beneficiaries of the project were the states of the Northern Region. He stated that as Northern Region was a major beneficiary from these projects which were likely to come more or less in the same time frame, a composite transmission system had been evolved for evacuation of power from these projects in Eastern Region to Northern Region.

4.2 Thereafter, Sh. A.K.Asthana, Director (SP&PA), CEA made a presentation of the transmission system evolved for evacuation of power from Barh, Kahalgaon - II, North Karanpura, Maithon TPS and Eastern Region surplus. He stated that the transmission system planned for evacuation of power from these generating stations in Eastern Region to Northern Region was a milestone towards the development of National Grid. This system would be the fourth one in the series of inter-regional network systems being planned in the country. Of the earlier ones, the transmission system from Talcher to Southern Region had already been operationalised and the Tala transmission system connecting the Eastern Region and the Northern Region was in the final stages of investment approval by the GoI. However, the transmission from Hirma TPS to Northern Region and Western Region was getting deferred along with the generation project. He stated that the present transmission system developed from Barh, Kahalgaon-II, North Karanpura and Maithon TPS was most comprehensive one. He made a presentation (enclosed at Appendix-I) highlighting the need of import of power by the Northern Region and the urgency of National Grid transmission system providing strong ER – NR and ER-WR-NR corridors for meeting the transmission needs associated with such import. He stated that as per 16<sup>th</sup> EPS projections, the existing demand of the Northern Region was likely to go up to 35,540 MW by end of 10<sup>th</sup> plan, 40,663 MW by the end of 2008-09 and 49,674 MW by 11<sup>th</sup> plan end. The expected installed capacity during that period in Northern region would be about 40,407 MW, 44,310 and 55,834 MW respectively. As the total generations capacity at Barh, Kahalgaon-II, North Karanpura and Maithon TPS were expected during 2008-09 time frame, the studies had been carried out considering the load and the generation availability during that period. During 2008-09 period there would be an anticipated deficit of 12000 MW of power in Northern region particularly in winters and the same could be met by import of surplus power available in Eastern Region. As per the indication available, Northern Region constituents were in process of tying up of about 6600 MW of generation capacity from projects located in the Eastern Region. This included 600 MW from Barh, 500 MW from Kahalgaon-II, 800 MW from North Karanpura, 2700 MW from Hirma, 1000 MW from Maithon TPS and 1000 MW from Tala related ER surplus capacity. Of this, the status of Hirma was presently uncertain. Neglecting Hirma generation, about 3900 MW of power would be available to Northern Region from central sector projects in Eastern region. The balance gap could be met from the surplus power from state(s)/ NHPC/other DVC projects in Eastern Region. He stated that there was a need for constructing a power highway between Eastern Region and Northern Region to evacuate the power of these generation projects being envisaged in Eastern Region. He presented a sketch of the proposed transmission network at 765 kV, 400 kV as well as HVDC transmission system for providing the required connectivity. The proposal contained provision of pooling point at Ballia and Daltonganj, 400 kV connection from Barh and Kahalgaon to Ballia, 400 kV connection from North Karanpura and Maithon (via Tengughat/Ranchi) to Daltonganj, Balia – Bahadurgarh HVDC bi-pole, 765 kV S/C Balia – Unnao-Agra- Meerut, 765 kV S/C Balia – Unnao- Moradabad- Meerut, 400 kV D/C Agra – Bhiwadi - Bahadurgarh – Moga, 400 kV D/C Meerut - Malerkota and 400 kV S/C Malerkota – Ludhiana – Jullunder lines in NR and 765 kV 2xS/C Daltonganj –

Balia for ER-NR connectivity and 765 kV 2xS/C Malanpur – Agra line for WR-NR connectivity.

- 4.3 Sr. Manager (NEEPCO) stated that there would be a likely availability of around 2000 MW generation in Tripura, South Assam, Manipur and Mizoram being developed by NEEPCO during 11<sup>th</sup> plan time frame. As the power from these projects could not be consumed in North-Eastern Region itself, the same was required to be transferred to the constituents of Northern as well as Western Regions. He stated that transmission system being planned for evacuation of power from Eastern Region to Northern Region might also cover strengthening proposal between NER and ER to deliver the above surplus power.

CE (SP&PA), CEA stated that the transmission system had been planned considering the requirement for transfer of power of around 12000 MW from Eastern Region to Northern Region. The system being proposed between Eastern and Northern Region would not only take care of the system requirement for evacuation of power from Eastern Region to Northern Region but would also cater to the transmission requirement of the future generation projects being contemplated in ER and NER expected in later half of 11<sup>th</sup> plan period. However, NEEPCO would need to tie-up so that the specific time frame and the beneficiaries were identified for examining/planning any further requirement of transmission system between North-Eastern and Eastern Region. In this context he further stated that even if the load growth in NR did not match the 16<sup>th</sup> EPS projections, the deficit in the Northern region during 10<sup>th</sup> as well as 11<sup>th</sup> plan period was so large that NR constituents would remain in need for additional import.

- 4.4 Director (Projects), POWERGRID stated that the construction of the transmission system between Eastern Region and Northern Region would require a huge investment, so a judicious phasing of the transmission system requirement along with each project was needed. He asked NTPC to inform if there was large time lag expected between commissioning of generation at Barh, Kahalgaon -II and North Karanpura TPS so that the early creation of Daltonganj could be avoided.

GM (NTPC) stated that the as per latest information available regarding the revised generation capacity from Kahalgaon-II would be 2x500 MW in first phase and 1x500 MW in Phase II. This was in place of 2x660 MW machines being envisaged earlier. Further he stated that there was an uncertainty regarding the commissioning schedule of North Karanpura generation in view of the dam being built by the Govt. of Jharkhand from where the water for the project was to be obtained. The commissioning schedule for the project could be finalised after the availability/commissioning schedule of dam was available.

- 4.5 CE (SP&PA), CEA requested POWERGRID to make a presentation on the evacuation arrangement between Eastern Region and Northern Region being developed for transfer of power from Barh, Kahalgaon-II, North Karanpura and Maithon TPS.

DGM (Engg) POWERGRID, presented various alternatives considered and studies carried out (copy of the presentation enclosed at Appendix-II). His presentation highlighted that based on the result of the studies and economic analysis, the hybrid system of HVDC and HVAC at 765 kV and 400 kV level were found to be the preferred alternative. DGM (Engg) POWERGRID, stated that the proposal with pooling point arrangement was an optimised system and endorsed that the location of pooling point at Balia was to be selected in such a way that need of 765kV substation at Sultanpur could be avoided. He further stated that with the segregation of the system made, the system with Barh and Kahalgaon-II would require roughly about Rs. 6100 Crs., the system with North Karanpura would require about Rs. 1500 Crs. and the system with Maithon would require about Rs. 900 Crs. In his presentation, the capacity of Ballia-Bahadurgarh HVDC bi-pole was shown as 2500 MW as against 2000 MW as per studies circulated with agenda note.

- 4.6 ED (Engg.), POWERGRID stated that under the present evacuation arrangement, a station in the west of Delhi at Bahadurgarh was being envisaged for terminating the HVDC line from Ballia. However, with the information presently available, Bahadurgarh area was surrounded by brick-kilns and as such having pollution problem, so it would be better if the HVDC station along with other 400 kV lines being envisaged at Bahadurgarh with the above scheme be shifted to Bhiwadi S/S in Rajasthan along with necessary re-arrangement of the lines from Bhiwadi / Bahadurgarh.

CE (SP&PA), CEA stated that the effect of the changes in respect MW capacity and location of terminating station of the HVDC bi-pole line, as suggested by POWERGRID, would need to be further studied.

- 4.7 Director (P&R) RRVPNL stated that phasing of the transmission system along with the generation was to be carried out in a conscious manner, as the construction of the proposed transmission system required a huge investment.

CE (SP&PA), CEA stated that phasing would depend on the commissioning schedule of the project and since the projects at Barh, Kahalgaon- II and Maithon TPS were being envisaged more or less in the same time frame, the transmission system from these projects had been segregated accordingly. He further stated that in the event of droppage of any project, the transmission system proposed to be associated with the project, if required, would be built with the other projects.

GM (NTPC) stated that sensitivity studies for phasing out the system from each generation project needed to be carried out considering the non-commissioning of any of the proposed generation.

CE (SP&PA), CEA stated that phasing of the transmission system had already been carried out and the projects like Barh, Kahalgaon-II which are more certain to be commissioned, could be taken up now and their transmission system might be frozen in first stage. Subsequently the system identified with Maithon and North Karanpura generation projects could be finalised depending upon firming up of their beneficiaries & commissioning schedule.

4.8 CE (SP&PA), CEA invited the views of the constituents on the proposed transmission system.

4.8.1 Director (P&R) RRVPN intimated their agreement on the transmission proposal.

4.8.2 DGM (UPPCL) stated that since the load growth in UP was more or less stagnant, so they did not need any power from these projects and as such did not have any comments. Responding to this, GM, NTPC stated that UPPCL had sent a formal request seeking for allocation of 186 MW from Kahalgaon-II and 241 MW from North Karanpura TPS. CE (SP&PA), CEA stated that if UP did not require any power from these projects then they might intimate the same to NTPC so that they could find a new buyer for the power from these projects.

DGM, UPPCL stated that since U.P. was not willing to be a part of the proposed transmission system so the cost of the same might not be borne by U.P.

CE (SP&PA), CEA stated that since tariff was presently a subject matter under the jurisdiction of CERC, the same could be discussed in that forum. He asked UPPCL to take up the matter with CERC separately.

DGM (Planning) UPPCL stated that they would like to review the transmission proposal and would come out with their comments at the earliest.

CE (SP&PA), CEA stated that UPPCL might sent their comments if any, on the above transmission proposal within a months time, otherwise, it would be presumed that they had no comments to offer.

4.8.3 SE (HVPN) agreed with the transmission proposal.

4.8.4 Add. SE (Planning), PSEB stated that studies being conducted indicated high loading of Muzaffarpur – Gorakhpur D/C line which could create serious problem under contingency outage of one of the circuit.

Director (SP&PA), CEA stated that the line was planned with Quad conductor and outage of Gorakhpur - Muzaffarpur D/C line had already been studied and the system as proposed was found to meet the contingency satisfactorily.

Additional SE (Planning) PSEB enquired whether the phasing for the transmission system had been identified or not.

CE(SP&PA), CEA stated that work-wise phasing had been identified by POWERGRID in the presentation made by them. He further stated that initial cost of the transmission system being planned would be high, however with the implementation of the total system along with their generation, the pooled cost of the transmission system in the region would come down.

Add. SE (Plg.) PSEB agreed 'in principal' with the proposed system, however he stated that if they had any additional comments, the same would be intimated within a month's time.

- 4.8.5 GM, NTPC stated that as per the TEC available for Barh TPS only 6 nos. of bays were planned at Barh, whereas in the studies presented by POWERGRID, 8 nos. of bays had been indicated.

Director (SP&PA), CEA stated that in the study of POWERGRID a direct circuit to Patna had been shown. However one of the proposed 400 kV 2xD/C Barh – Balia line could be looped in looped out at Patna rather than giving a direct 400 kV D/C line from Barh to Patna. As such the requirement of bays at Barh would be only six, however NTPC might keep a future space provision for two additional bays.

- 4.9 Summarizing the discussions, CE (SP&PA), CEA stated that the following transmission system was required for evacuation of power from Barh & Kahalgaon-II TPS.

#### TRANSMISSION WORKS

- ◆ Kahalgaon\_II-Barh 400kV D/C Quad MOOSE
- ◆ Barh-Patna 400kV D/C Quad MOOSE
- ◆ Barh-Balia 400kV D/C Quad MOOSE
- ◆ Patna-Balia 400kV D/C Quad MOOSE
- ◆ Balia-Unnao 765kV 2xS/C line-1 & line-2 (400kV operation)
- ◆ Creation of 765/400 kV Balia S/S (initially to be operated at 400 kV)
- ◆ LILO of the 400 kV Unnao - Agra line of UPPCL at Mainpuri S/S of POWERGRID
- ◆ Unnao-Agra 765 kV S/C (400kV operation)
- ◆ Agra-Bhiwadi 400kV D/C Quad MOOSE
- ◆ Balia-Bahadurgarh or Bhiwadi 2000 MW HVDC bi-pole (Decision on POWERGRID proposal for adopting higher capacity of 2500 MW to be taken based on revised study)
- ◆ LILO of both Bawana-Hissar and Bawana-Bhiwani-Hissar 400kV lines at Bahadurgarh
- ◆ Bhiwadi-Bahadurgarh 400kV D/C Twin MOOSE
- ◆ Bhiwadi or Bahadurgarh -Moga 400 kV D/C Twin MOOSE
- ◆ Malerkotla-Ludhiana-Jullundur 400kV S/C Twin MOOSE
- ◆ Agra-Malanpur 765kV S/C line-1 (400kV operation)
- ◆ Creation of 400/220 kV S/S at Ludhiana

(Note: The 400 kV Ludhiana S/S would be tied up either with Koldam HEP, Barh or Kahalgaon TPS, whichever comes earlier)

Location of Balia pooling stations to be selected in such a way so that the lengths of 765kV Balia-Unnao lines are in the range of about 300 km and need of additional 765 kV substation between Balia and Unnao is avoided.

Regarding the termination of the HVDC line at Bahadurgarh vis-à-vis Bhiwadi, it was decided that the studies be conducted to examine this proposal and accordingly the above-mentioned system be fine-tuned.

All the constituents except for UPPCL by and large agreed 'in-principal' with the above transmission proposal. UPPCL also did not make any observation on the scope of proposed works but wanted some time for sending their comments. It was decided that if they had any comments, the same should be sent to CEA within a month's time. Other constituents also may intimate if they had any further observation.

- 4.9 As regards the transmission system from North Karanpura and Maithon (RB) TPS, it was decided that, prime facie, the proposal as discussed in the meeting, that is 400kV system in ER upto Daltonganj pooling point, 765kV 2xS/C Daltonganj-Balia lines, 765kV 2xS/C Daltonganj-Sipat lines, 765kV S/C Unnao-Moradabad-Meerut-Agra lines, 400kV D/C Meerut-Malerkotla line, second 765kV S/C Agra-Malanpur line and 400kV D/C Jamshedpur-Rourkela-Sipat line, was in order. However the same would be reviewed depending upon the beneficiaries as well as the time frame of these projects. CE (SP&PA), CEA requested NTPC to intimate the time frame of North Karanpura to CEA.

## **5. Transmission system associated with Parbati St –II (4x200 MW) and Koldam (4x200 MW) HEPs.**

- 5.1 Chief Engineer (SP&PA) stated that Parbati- II HEP had been taken up by NHPC in Parbati basin. The project was expected to be commissioned during 11<sup>th</sup> plan period. He stated that power from this project was planned to be evacuated to Nalagarh through narrow Parbati Valley. He mentioned that Koldam HEP being taken up by NTPC was also expected in the same time frame of Parbati II. The project was en-route to the corridor of Parbati HEP. He requested Shri A K Aggarwal, Director (SP&PA) to give his presentation on the evacuation system from Parbati and Koldam HEPs.
- 5.2 Director (SP&PA) stated that there was serious space and R-O-W constraints at Parbati-II power house site. Accordingly, GIS switchyard had been planned with 2nos. of line bays at 400 kV level. He stated that following evacuation systems had been proposed with Parbati-II & Koldam HEPs.

### **Parbati-II HEP**

- ◆ 400 kV Parbati - Nalagarh D/C line

### **Koldam HEP**

- ◆ 400 kV Koldam - Ludhiana D/C line
- ◆ LILO of one ckt of Parbati II – Nalagarh D/C line at Koldam



- ◆ Augmentation of Ludhiana S/s by 315 MVA, 400/220 kV ICT(3<sup>rd</sup>) or establishment of 400/220 kV Ludhiana S/S with 3x315 MVA ICTs in case Hirma MPP is delayed.

Director(SP&PA), CEA stated that Parbati - III HEP was also to be taken up by NHPC down stream of Parbati - II in the Sainj valley. Both Parbati - II as well as Parbati-III HEPs would require the same corridor for evacuation of power. He informed that there would be serious R-O-W constraints to plan evacuation system separately from either stage of Parbati, so a consolidated evacuation system had been planned for Parbati St- II &III HEPs. Accordingly, the following evacuation system was proposed from Parbati III HEP.

- ◆ Creation of Parbati pooling point matching with the commissioning of generation at Parbati-III HEP or Allain Duhangan HEP whichever comes earlier
- ◆ LILO of one line of 400 kV Parbati II – Nalagarh D/C at Parbati pooling point.
- ◆ Parbati III – Parbati P.P. 400 kV D/C (tentative- depending upon location Parbati Pooling Point).
- ◆ Parbati Pooling Point – Amritsar 400 kV D/C line

Director (SP&PA), CEA mentioned that a team of Engineers from POWERGRID & CEA visited the site of Parbati II HEP for identifying the site suitable for the pooling point. It was found that the site for the pooling point could be made available only in the down stream of Parbati - III HEP. He stated that Power of Allain Duhangan HEP (192 MW) and additional 200 MW power of Malana II and small HEPs of Himachal also needed to be evacuated through the same corridor. So it was planned to pool the power from Allain Duhangan HEP and Malana-II HEP at Parbati pooling point.

Director (SP&PA), CEA stated that since the location of Parbati pooling point would likely be between Bhunter and Parbati-III HEP and due to R-O-W constraints, the Parbati II - Parbati pooling point line would need to be constructed with Quad conductors and one ckt of this line might be LILOed at Parbati- III HEP.

- 5.3 CE (SP&PA), CEA stated that with the taking up of Baspa HEP and Karcham Wangtoo HEP in the upstream of Nathpa Jhakri, the evacuation system from these projects had to be planned through the Nathpa Jhakri system/through the corridor of Nathpa Jhakri. As such, Koldam project which was earlier associated with Nathpa Jhakri had been delinked and associated with Parbati –II system.
- 5.4 CE (NHPC) stated that the Parbati II – Nalagarh line D/C (quad) being proposed to be LILOed with Parbati III HEP line could lead to evacuation constraint of power generated from Parbati- II as well as Parbati –III HEPs, in the event of tower failure. He therefore suggested for additional line between Parbati III HEP – Parbati pooling point.

- 5.5 Director (Projects) POWERGRID said possibility of Koldam HEP coming before Parbati II HEP also need to be considered. He stated in that event, the transmission line between Koldam and Nalagarh might be constructed with Koldam HEP. As and when Parbati – II HEP would be commissioned, the ckt of the Koldam – Nalagarh could be opened from Koldam end and connected to one circuit of Parbati II – Koldam, so as to form Parbati II – Nalagarh one circuit and Parbati II – Koldam – Nalagarh another circuit. He also suggested to construct Parbati -II to Nalagarh line with Triple AAAC conductor.
- 5.6 DGM POWERGRID enquired that in case Allain Duhangan HEP comes before Parbati - III, then POWERGRID would require mandate for building Parbati pooling point for pooling Allain power.
- 5.7 CE (SP&PA), CEA stated, that in the event of Allain Duhangan coming before Parbati III then POWERGRID would need to construct the Parbati pooling point for pooling Allain power and the cost of the same had to be borne by the beneficiary of Allain power. However as and when the Parbati HEP would be commissioned, then the pooling point would be treated as a regional project.
- 5.8 After detailed discussions, the following transmission systems were agreed for Parbati II, Koldam and Parbati III HEP's.

***Parbati II HEP***

- ◆ **400 kV 2xS/C line from Parbati II to Koldam with triple AAAC 520 sq.mm/Quad @ conductor and from Koldam to Nalagarh on D/C tower**

***Koldam HEP***

- ◆ **400 kV, Koldam – Nalagarh D/C line with Triple AAAC, 520 sq.mm/Quad @ conductor (in case Koldam HEP come up prior to Parbati II HEP).**
- ◆ **Ckt one of the Koldam-Nalagarh D/C line to be opened at Koldam end and connected to one circuit of Parbati-II - Koldam line so as to form 400 kV Parbati II -Nalagarh one circuit and 400 kV Parbati II - Koldam -Nalagarh 2<sup>nd</sup> circuit**
- ◆ **400 kV, Koldam – Ludhiana D/C with Twin AAAC 520 sq.mm conductor**
- ◆ **400/220 kV S/S at Ludhiana with 3x315 MVA 400/220 kV ICTS**

***Parbati III HEP***

- ◆ **Creation of Parbati pooling point at down stream of Parbati III HEP.**
- ◆ **LILO of one 400 kV S/C line from Parbati II –Koldam at Parbati III**

- ◆ **Parbati III – Parbati pooling point S/C line with Triple AAAC/Quad conductor**  
(in case R-O-W was not available for 2<sup>nd</sup> line, then LILO of both the ckt of Parbati II – Koldam line at Parbati Pooling point so as to form a triangle between Parbati II, Parbati III and Parbati pooling point).
- ◆ **Parbati pooling point – Amritsar 400 kV D/C line with Twin AAAC 520 sq.mm conductor**

*Allain Duhangan HEP (192MW), Malana II and small HEPs of H.P.*

- ◆ **Creation of Parbati pooling point if the generation materializes before Parbati III HEP**
- ◆ **220kV, Allain Duhangan – Parbati pooling point D/C line with twin AAAC, 520 mm<sup>2</sup> conductor**  
(in case Allain Duhangan HEP etc comes prior to Parbati –II & Koldam HEPs, lines to be constructed by the project promoter upto pooling point. From pooling point to Nalagarh lines to be constructed by POWERGRID for which wheeling charges to be paid)
- ◆ **400 kV Parbati pooling point – Koldam 2xS/C line with triple AAAC 520 mm<sup>2</sup>/Quad @ conductor (initially to be operated at 220 kV) .**
- ◆ **400kV, Koldam – Nalagarh D/C with triple AAAC, 520 mm<sup>2</sup> /Quad @ conductor (initially to be operated at 220 kV).**

*(Note: 1. \$ The 400 kV Ludhiana S/S would be tied up either with Koldam HEP, Barh or Kahalgoan TPS, whichever comes earlier)  
2. @ The decision regarding triple AAAC vis-à-vis Quad conductor would be based on the techno economic analysis and the availability of ROW between Parbati Projects and the pooling point.*

The members of the standing committee agreed with the above proposed transmission system.

- 5.9 Chief Engineer (SP&PA), CEA concluding the discussions stated that in case there was space constraints for Parbati pooling point, the option of considering GIS switchyard might be considered as the cost of GIS equipments had reduced substantially in the recent past.

## **6 Absorption of power from Monarchak GBPP (500 MW) in Tripura by states of Northern Region**

- 6.1 Chief Engineer (SP&PA), CEA stated that about 600 MW power was proposed to be transferred to NR states from Monarchak GBPP and other hydro projects of M/s. NEEPCO. He mentioned that the evacuation system for connecting generated power of Monarchak HEP to NER grid was agreed 'in principal' by CEA and it would be available at 220 kV Misa S/S, beyond which power transmission to Eastern and Northern grid would take place through Kathalguri and Tala transmission system. He also mentioned that as per POWERGRID, the connectivity charges for connecting generation to NER grid would be around 30 paise/unit. In addition to above charges, incremental wheeling charges would be payable by the beneficiary states for using Kathalguri and Tala transmission system in proportion to utilization. He also stated that transmission charges would be as per the notification of CERC.
- 6.2 Additional SE (Plg.) PSEB, SE (Plg.) HVPN and DGM (Plg) UPPCL informed that since the cost of transmission charges as intimated by POWERGRID was coming out to be very high so they would like to review their decision to buy power from above projects of M/s. NEEPCO.
- 6.3 CE(SP&PA), CEA stated that in case the constituents decided for not availing the power from the NEEPCO projects then they should intimate the same to NEEPCO so that they could find new buyers for power from their project.

## **7 Transmission system for evacuation of power from RAPP 'C' & 'D'**

- 7.1 Director (SP&PA), CEA stated that transmission system associated with the evacuation of power from RAPP C&D was earlier discussed and agreed in the 13<sup>th</sup> standing committee meeting held on 24.5.02 at Dehradun. It was decided to step up the generation of RAPP C&D at 400 kV and evacuated through 400 kV lines. The proposed evacuation system was making use of 400 kV Kota – Kankroli S/C line of RRVPNL. He explained that RRVPNL now had proposed to construct 2xS/C Kota- Kankroli 400 kV line (initially operated at 200 kV) and Kankroli – Bhinmal (near Sarohi) 400 kV S/C line (initially to be operated at 220 kV) as a part of evacuation system of Kota generating unit- 6. He mentioned that it was proposed to charge these lines at 400 kV and create associated 400 kV S/Ss at Kota, Kankroli, Bhinmal as a part of evacuation system of RAPP 'C' & 'D'.

After detailed discussions, constituents of NR, agreed with the proposed changes, the agreed power evacuation system with RAPP 'C' & 'D' would be as under:-

### **RAPP 'C' (2x220 MW)**

- a) RAPP – Kankroli 400 kV D/C line
- b) RAPP – Kota 400 kV S/C line
- c) Establishment of 400/220 kV Kota S/S (2x315 MVA)
- d) Establishment of 400/220 kV Kankroli S/S (3 x315 MVA)
- e) Operation of Kota – Kankroli 2xS/C lines at 400 kV

### **RAPP 'D' ( 2x 700 MW)**

- a) RAPP – Jaipur 400 kV D/C line
- b) Kankroli – Bhinmal 400 kV, 2<sup>nd</sup> S/C line
- c) Bhinmal – Jodhpur 400 kV S/C line ( M/s. RRVPNL would establish 400/220 kV Jodhpur S/S matching with the commissioning of RAPP 'D' generation
- d) Opening of one circuit of RAPP – Kankroli and Kankroli – Bhinmal from Kankroli end and connecting them to make 400 kV RAPP – Bhinmal S/C line
- e) Establishment of 400/220 kV Bhinmal S/S(2x315 MVA)
- f) Augmentation of 400/220 kV Kankroli S/S by 4<sup>th</sup> ICT of 315 MVA
- g) Operation of Kankroli – Bhinmal S/C line of M/s. RRVPNL at 400 kV

## **Additional Agenda**

### **1. 400/220 kV Bhiwadi S/S under Central Sector**

CE (SP&PA), CEA stated that Bhiwadi S/S was envisaged as a part of Auraiya transmission system. Later on with the uncertainty of Auraiya, the same was considered as a part of Hirma transmission system. Since RRVPN had indicated their willingness to construct the Bhiwadi S/S, so it was decided that the transmission charges of the Bhiwadi S/S would solely be borne by RRVPN till the Hirma generation was commercialized. Now, the commissioning of Hirma generation was also uncertain and under that circumstance, RRVPN had requested to cover the Bhiwadi S/S under Rihand II transmission system. He stated that Rihand II scheme had already received PIB approval and if the Bhiwadi S/S had to be covered under Rihand II transmission system, then its cost had to be added up with the transmission cost of the Rihand II system.

Director (Projects), POWERGRID stated that till the time Rihand II system was commercialised, RRVPN had to pay the transmission charges for the Bhiwadi S/S as per bilateral agreement between POWERGRID and RRVPN.

Since all the constituents agreed to the proposal, so it was decided to cover Bhiwadi S/S as a part of Rihand II transmission system and till the commercialization of the Rihand II system, RRVPN had to solely bear transmission charges of Bhiwadi S/S.

### **2. Tehri Pooling point**

CE (SP&PA), CEA stated that a pooling point near Tehri/Koteshwar PSP was envisaged as a part of the consolidated evacuation proposal from Tehri/Koteshwar HEPs. He stated that evacuation system from Tehri St- I had been approved as 765 kV 2xS/C from Tehri – Meerut (initially to be operated at 400 kV). It was proposed to operate the line at 765 kV with the commissioning of generations at Koteshwar and Tehri PSP (Tehri St-II). He stated that line from Tehri – Meerut was more or less ready, but the location of the pooling point was yet to be identified. He stated that THDC had furnished a DPR for Tehri II HEP(PSP), the same had already been cleared by CEA and it was likely to obtain investment approval very soon. He also informed that a team comprising of CEA and POWERGRID engineers had visited the site for identifying the location for 765/400 kV pooling point near Tehri/Koteshwar HEPs. He stated that recently ED (POWERGRID) had also visited the site for locating adequate space for the pooling point. He asked ED (POWERGRID) to furnish his views on the same.

ED (POWERGRID) stated that the space around Tehri comprised of high hills and as such it was not possible to obtain the adequate space for a 765/400 kV pooling station. He stated that a location for the pooling point across the river from Koteshwar site was earlier identified by the Soviets when they were executing the Tehri Project. The site was still laying vacant, but needed a bridge to cross the river for transporting men and material for construction of pooling point. He stated that possibilities were being explored for cutting the hills and also constructing a bridge for transportation. He

informed that another survey team would soon visit the location of the proposed site and the final report regarding the pooling station could be obtained from them.

CE (SP&PA), CEA asked the representative from THDC to furnish the status regarding the commissioning of generation at Tehri complex.

DGM (THDC) intimated that as per the official information available, the first unit of Tehri was likely to be commissioned by March 2003 and subsequently other units were expected by December 2003. At Koteshwar HEP, civil works were under progress and tender evaluation process was nearing completion. He stated that Koteshwar as well as Tehri II were expected to be available by 2006-7 time frame.

### **3. LILO of existing 400 kV line from Lucknow – Moradabad line of POWERGRID at Bareilly S/S of UPPCL.**

CE (SP&PA), CEA stated that earlier the work for LILO of Lucknow – Moradabad at Bareilly was agreed, but somehow the same could not be associated with any generation project. As such the work was still pending. He stated that with the commissioning of the transmission system associated with Tala HEP, there was a need to take up the work on urgent basis. He asked POWERGRID to take up the scheme as a part of strengthening scheme of the Northern Region under the approval of Board of POWERGRID. All the members including the POWERGRID agreed for the same.

Director(P&R), RRVPNL stated that in the event of LILO of 400 kV Lucknow-Muradabad S/C line at Bareilly being covered as a System Strengthening Scheme of Northern Region, RRVPN would also like to cover the work for creation of Bhiwadi S/S in the same scheme instead of with Rihand II system as had been agreed earlier in the meeting. Since there was no comments from any of the members on the above issue so it was decided to cover the work for creation of Bhiwadi S/S in the System Strengthening Scheme of Northern Region instead of with Rihand II system.

### **4. Singrauli – Vindhyachal Corridor**

CE (SP&PA), CEA stated that presently with rearranged Rihand transmission system, there was a 400 kV interconnection between Singrauli – Vindhyachal and another 400 kV circuit was from Vindhyachal – Kanpur. He stated that POWERGRID had intimated that the load on Vindhyachal - Kanpur line was of the order of 300-400 MW and when export of 500 MW was made to WR through HVDC back to back link, the loading on 400 kV Singrauli – Vindhyachal line increased to about 900 MW. This was creating operational problem as well problem for grid security. He stated that presently NTPC had indicated availability of one bay at Singrauli and as such the Vindhyachal – Kanpur line could be opened from Vindhyachal end and fed from Singrauli. With this the problem of overloading of Singrauli – Vindhyachal line could be avoided.

Director (SP&PA), CEA suggested that for providing reliable exchange 500 MW of power between NR & WR, it would be better if a second bay was also made available at Singrauli, so that the bay to be vacated at Vindhyachal could be utilized by constructing a second circuit from Singrauli to Vindhyachal which would render adequate security to the grid in the event of outage of one circuit of Singrauli – Vindhyachal line. The members of the committee agreed with the proposal.

GM (NTPC) stated that they would explore the possibility of getting additional bay at Singrauli. But in that event POWERGRID should also look for additional corridor between Singrauli & Vindhyachal for additional 400 kV circuit.

After detailed discussion, it was decided to open Vindhyachal – Kanpur line from Vindhyachal end and connect it from Singrauli. Further, the possibility for an additional 400 kV circuit between Singrauli and Vindhyachal would be explored subject to confirmation by NTPC and POWERGRID regarding the availability of 2<sup>nd</sup> bay at Singrauli and corridor between Singrauli Vindhyachal respectively. This would result into following transmission system:

- i) Rihand - Singrauli 400 kV D/C line
- ii) Singrauli - Kanpur 400 kV T/C line
- iii) Singrauli - Vindhyachal 400 kV D/C line

Concluding the meeting, Chief Engineer (SP&PA), CEA specially thanked Director (Projects), POWERGRID for attending the meeting and taking special interest in the proceedings of the meeting. He thanked POWERGRID for the excellent arrangement made for the meeting. He also appreciated the participants for their views and lively deliberation and for facilitating very path breaking decisions in the meeting, which had helped to make the 14<sup>th</sup> Standing Committee meeting a success.



**List of Participants of the 14<sup>th</sup> Standing Committee meeting held at Jaipur on 30.12.2002**

**S/SHRI**

<b><u>Name</u></b>	<b><u>Designation</u></b>
<b><u>CEA</u></b>	
V. Ramakrishna	Chief Engineer
A.K. Asthana	Director
A.K. Aggarwal	Director
B.K. Sharma	Dy. Director
Gautam Roy	Dy. Director
Naveen Seth	Dy. Director

**POWERGRID**

S.C. Misra	Director (Projects)
R.N. Nayak	E.D. (Engg.)
N.R. Chanda	E.D. (NRI)
Y.K. Sehgal	DGM

**NREB**

Prahlad	Exec. Engineer
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**NTPC**

N.N. Misra	G.M. (Elect.)
A.K. Gupta	DGM (PE-E)

**NHPC**

Raj Kumar	Chief Engineer
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**THDC**

M. Mani	DGM
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**PTC**

S.K. Dube	Director (ORPM)
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**NPCIL**

NSM Rao	GM
Rajesh Laad	DGM

**BBMB**

S.C. Verma	Chief Engineer
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**NEEPCO**

R.P. Singh	Senior Manager
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**RVPN Ltd.**

K.L. Vyas Director (P&R)

Y.K. Raizada S.E. TA to CMD  
L.N. Nimawat Exec. Engineer (PSS)  
Ms. Sona Shishodia Asstt. Engineer (PSS)

**PSEB**

I.S. Anand Addl. S.E./Plg.

**HVPN**

S.K. Malik S.E./Plg.

**UPPCL**

L.G.P. Singh DGM (Plg.)  
Vijai Kumar E.E. (Plg.)  
V.P. Tewari E.E. (Plg.)

**Delhi Transco Ltd.**

Raj Bhartiya DGM (400kV) S/S  
Nirmal Singh Exec. Engineer

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**CENTRAL ELECTRICITY AUTHORITY  
SYSTEM PLANING AND PROJECT APRAISAL DIVISION**

F. No.1/9/03-SP&PA/

Dated : /03/03

**-As per List enclosed-**

**Sub: Summary Records of the minutes of the 14<sup>th</sup> meeting of the Standing Committee on Transmission System Planning of Northern Region.**

Sir,

Kindly recall the discussion of the 14<sup>th</sup> Standing Committee Meeting held at Jaipur, Rajasthan on 30/12/02. In the meeting SE (Plg.) HVPNL put up the issue of creation of 400/220 kV Fatehabad S/S in Harayana and requested that due to uncertainty in the timeframe of commissioning of Hirma TPS, the 400/220 kV S/S at Fatehabad which was earlier agreed as a part of transmission system associated with Hirma TPS may be covered under strengthening of transmission system under Northern Region instead of Hirma as was decided earlier.

The matter was discussed in details and it was decided by the standing committee that due to low voltage problem being faced in and around Fatehabad area, Creation of 400/220 kV S/S at Fatehabad could be taken up as a part of strengthening of transmission system under Northern Region.

The above decision was somehow inadvertently missing in the minutes of the standing committee send vide this office letter No. 1/9/02-SP&PA/55-72 dated 15/01/03. As such it is requested that the above decision of the standing committee may be treated as an addendum to the minutes of the 14<sup>th</sup> standing committee meeting.

Yours faithfully,

**(A.K.AGGARWAL)  
DIRECTOR SP&PA)**