

Sub:- Summary record of the 15th meeting of the Standing Committee on power system planning of Northern Region held at Manali on 30.05.03

1. List of participants Annexed
2. GM, NTPC welcomed all the participants of Northern Region to the meeting and requested CE (SP&PA), who was the Chairperson of the meeting to start the deliberations. CE (SP&PA) thanked NTPC for the hospitality extended by them for conducting the meeting at a pleasant location. He stated that the agenda for meeting had already been circulated to all the constituents of Northern Region and additional agenda regarding startup power supply to RAPP units of NPCIL as well as the photocopy of the presentation material had also been handed over to the participants of the meeting. Thereafter the agenda items and also additional agenda were taken up for discussions.
3. **Confirmation of the minutes of the 14th Standing committee meeting**
 - 3.1 CE (SP&PA) stated that the minutes of the 14th meeting of the Standing Committee meeting which had been circulated vide letter dated 13/3/03 may be confirmed.
 - 3.2 SE (Plg.), HVPN stated that in the 14th Standing Committee the issue of the covering the 400/220 kV Fatehabad S/S (which was earlier covered with the Hirma evacuation system) with any upcoming generation project/strengthening schemes in Northern Region was agreed to, but the minutes of the 14th Standing Committee did not reflect the same. He stated that the matter had been intimated to CEA.
 - 3.3 CE (SP&PA) stated that since the letter from HVPN was received from HVPN, after the issue of the agenda for 15th standing committee meeting, the same could not form a part of the agenda note. It was recalled that the issue for covering the 400/220 kV Fatehabad S/S with any other generation project of Northern Region was discussed. Thereafter, the minutes were taken as confirmed with the following insertions at the end of para 4.2 of the already circulated 14th SCM minutes:

“SE (Plg.), HVPN stated that the 400/220 kV Fatehabad S/S which was earlier covered under the Hirma evacuation system. As Hirma transmission system was getting deferred, the 400/220kV Fatehabad S/S was required to be covered with any upcoming generation project/strengthening schemes in Northern Region. This was agreed to.”

3.4 Continuing the discussions on Fatehabad S/S, CE (SP&PA) suggested that the same could be taken up in the 15th Standing committee meeting. He further informed that the 400/220 kV Fatehabad S/S was agreed as a part of transmission system associated with Hirma generation. The Fatehabad substation was envisaged to cater the load demand of nearby areas and specially the western part of Haryana ie, places like Sirsa, Raina etc., where the voltage profile remains perpetually low. Since the time frame of Hirma TPS was presently uncertain so if the members agree then the 400/220 kV Fatehabad S/S could be covered as a part of strengthening scheme of Northern Region.

3.5 The issue was discussed. The members did not have any objection for covering the 400/220 kV Fatehabad S/S of HVPN along with 2 nos. of 315 MVA ICT as a part of system strengthening scheme of Northern Region. Accordingly it was decided to cover the works as a regional scheme.

4. **Provision for 2 nos. of 220 kV bays at Kishenpur for J&K**

4.1 CE (SP&PA) stated that PDD J&K had put up a request for allocation of 2 nos. of 220 kV bays available at 400 kV Kishenpur S/S of POWERGRID to J&K for terminating their 220 kV D/C line from Burn S/S of J&K. CE (SP&PA) informed that 2 nos. of 220 kV bays at Kishenpur was earlier constructed as a part of Dulhasti contingency scheme. The Dulhasti contingency scheme had been dropped and replaced with the evacuation system from Dulhasti at 400 kV. As a part of Dulhasti evacuation system, the existing 220 kV Kistawar – Kishenpur D/C line had been upgraded to 400 kV and as such the 2 nos. of 220 kV bays at Kishenpur were presently unutilized. As such, he stated that the bays could be gainfully utilised by J&K by terminating their 220 kV D/C line from Burn S/S.

- 4.2 Additional SE (Plg.) PSEB stated that PSEB does not have any objection to this. However they feel that the O&M and operation for the bays should be carried out by POWERGRID but the cost for the same should be borne by J&K.
- 4.3 CE (SP&PA) stated that presently there were 2 nos of 315 MVA, 400/220 kV ICT available at Kishenpur S/S of POWERGRID and as per standard provision 4 nos. of 220 kV bays were to be made available. The 2 nos. of 220 kV bays were lying unutilised and none of the state of Northern Region except for J&K had put up any request for terminating lines to Kishenpur S/S. Further, since POWERGRID have already started commercial operation of Kishenpur S/S so, the allocation of the 220 kV bays to J&K would not make any financial impact to any state. As such, the bays would remain a part of regional system and the treatment of O&M cost would continue accordingly and there should not be any objection for utilizing the bays for 220 kV D/C line of J&K from their Burn S/S .
- 4.4 Additional SE (PSEB) and also the other members agreed to the proposal of CE (SP&PA).
- 4.5 Additional SE (PSEB) further stated that PSEB had procured PLCC equipments for both the end of the 220 kV line emanating from Jalandhar S/S of PG to avoid any mismatch. PSEB had put up a request to POWERGRID for the reimbursement of the cost of the PLCC equipment installed at Jalandhar end of the line which they procured on behalf of POWERGRID, however POWERGRID was yet to make the payment.
- 4.6 DD (NR- I) POWERGRID stated that as per general practice installation of equipments upto wave trap end in a POWERGRID S/S lies with the responsibility of POWERGRID. Beyond wave trap, equipments like PLCC had to be provided by the state, utilizing the line.
- 4.7 CE (SP&PA) stated that there were guidelines on the provision of equipments to be installed by POWERGRID at their S/S and the PLCC equipments did not fall within it, so, PSEB have to provide for the cost of PLCC equipments at Jalandhar end of POWERGRID S/S under their scope of work.

5. **400/220 kV ICT along with 2 nos. of 220 kV bays at Wagoora for J&K**

- 5.1 CE (SP&PA) stated that CEA on the request of PDD, J&K had carried out studies for transmission system requirement of J&K during 10th plan condition. In the study results it was found that the loading of 400/220 kV Wagoora ICT was exceeding its rated capacity. He informed that presently 2 nos. of 400/220 kV, 2x315 MVA ICT's were installed at Wagoora as a part of Uri – I transmission scheme. During winter conditions the load of Kashmir valley increases while the generation decreases substantially as a result the existing 220 kV Kishenpur – Pampore line gets critically overloaded. With the commissioning of 400 kV Kishenpur – Wagoora D/C line the winter demand of the valley could be met, provided an additional 400/220 kV, 1x 315 MVA transformer along with 2 nos. of 220 kV bays was agreed at 400 kV wagoora S/S of POWERGRID. CE (SP&PA) requested the participants of the Standing Committee for their views.
- 5.2 Additional CE, RVPNL stated that whether the provision for transformer along with 2 nos. of 220 kV bay at Wagoora should not be treated as exclusively for the use of J&K.
- 5.3 CE (SP&PA) stated that with the construction of Wagoora – Kishenpur 400 kV D/C line J&K could draw its share of power from Central Sector station in Northern Region only through this line. In that circumstances if adequate transformation capacity was not available at 400 kV Wagoora S/S for drawal of the power by J&K from Northern grid, J&K would be deprived of its share of power from Central Sector stations. As such, the provision of Additional ICT along with 2 nos. of 220 kV bays at 400 kV Wagoora S/S was essentially a regional requirement.
- 5.4 CE, RVPNL agreed for the proposal. Since there were no comments from any other constituents so, the provision for 400/220 kV, 1x 315 MVA ICT along with 2 nos. of 220 kV bays at Wagoora was considered as accepted.

6. **Evacuation system from Sewa II HEP (3x40 MW).**

6.1 CE (SP&PA) stated that Sewa II HEP was being constructed by NHPC in J&K. The project had obtained Techno-Economic clearance of CEA and was likely to be commissioned by 2007 time frame. It had been planned to step up the generation at Sewa II at 132 kV. Earlier there was a proposal for 3 nos. of 132 kV bay from Sewa II, but now on the request of CEA, NHPC had confirmed the availability of one additional bay at Sewa II. CE (SP&PA) stated that the major load center near by Sewa II was Hiranagar, where 220 kV as well as 132 kV S/S of J&K were existing. 132 kV Hiranagar was further connected with Khatua S/S of J&K in radial mode. As such considering the prospect of absorption of most of the power from Sewa II at and around Hiranagar S/S, the following evacuation system have been planed from Sewa II.

- (i) Sewa II – Hiranagar 132 kV D/C line
- (ii) Sewa II – Khatua 132 kV D/C line via Mahanpur

6.2 He intimated that POWERGRID had suggested an alternative transmission system for taking one line from Sewa II – Sarna substation of PSEB instead of 132 kV Khatua S/S of J&K. The same had been studied in CEA and it was found that even during high hydro and low load condition the power flow from Sewa II – Sarna was very low. Most of the power flows to Hirangar and from there it was consumed in a nearby area. He informed that presently there was one 220 kV line between Hiranager – Sarna and there was a proposal for construction of 220 kV D/C line from Hiranagar - SahapurKandi. As such there would be adequate capacity available for evacuation of power further from Hiranagar in case of load crash in J&K. He requested the Member of the Standing Committee to convey their comments to the proposal.

Since there was not comments received from any of the participants, the above system was considered to be agreed.

7. **Provision for startup power to RAPP C&D units of NPCIL**

7.1 CE (SP&PA) stated that NPCIL vide their letter dt. April 2003 has requested to construct 220 kV switchyard near RAPP 3 & 4 with the following bus arrangement and bay provision for feeding startup power to RAPP 5 & 6 as well as 7 & 8.

- (i) Two bays for two nos, of 220/6.9 kV startup transformers (SUT)
- (ii) Two bays for two nos, of 220 kV feeders
- (iii) One bay for bus coupler
- (iv) Space provision for two bays for the future two nos. of 220 kV/6.9 kV startup transformer for RAPP 7&8.

7.2 He stated that NPCIL had informed that the existing circuit between RAPP 3&4 to Anta CCGT may be Looped in Looped Out at the proposed 220 kV S/S for obtaining startup power at 220 kV from RAPP 3&4 as well as Anta CCGT and the 220 kV switchyard will not be connected to 400 kV switchyard with RAPP 5 to 8. He stated that proposal of NPCIL was examined in CEA and it was found to be in order

7.3 All the members of the Standing Committee agreed with the above proposal so the same was treated to be agreed.

8. **Koldam – Ludhiana with triple snow bird conductor**

8.1 CE (SP&PA) stated that the 400 kV Koldam – Ludhiana D/C line which forms an part of evacuation system from Koldam HEP was agreed in the 14th Standing committee meeting was proposed to be constructed with Twin moose conductor. However, POWREGRID in their letter had indicated that in the event of outage of any of the circuit between 400 kV Koldam – Ludhiana D/C line, the other circuit would get heavily overloaded. Considering this, the 400 kV Koldam – Ludhiana D/C line needs to be constructed with triple snow bird conductor. Dy. Director (SP&PA), stated that CEA studies with injection of power from Allan Duhangan and other small hydro projects in HP shows that outage of one circuit

between 400 kV Koldam – Ludhiana D/C would create overloading to the tune of 800 MW on the remaining circuit. As such it was advisable to consider the proposal of POWERGRID for construction of 400 kV Koldam – Ludhiana D/C line with higher size conductor. The matter was further deliberated in the meeting and it was decided to construct the 400 kV Koldam – Ludhiana D/C line with triple snow bird conductor instead of twin moose as decided earlier in the 14th Standing Committee Meeting.

9. **Covering of Bhiwadi S/S as a part of Central Sector Scheme**

9.1 Addl. Chief Engineer RVPNL stated that in the 14th Standing Committee meeting it was unanimously agreed that 400/220 kV Bhiwadi S/S was to be covered as a part of strengthening scheme of Northern Grid. He stated that in the agenda for 15th Standing Committee meeting it had been indicated that the Bhiwadi S/S would be covered as a part of Central Sector scheme by April 2004. He requested the members that the substation forms a nodal part of Northern Regional grid and the substation was ready and HVPNL was also conducting the route survey for constructing the 220 kV line from Bhiwadi S/S. He, therefore, requested the members of the Standing Committee to consider the S/S as a regional system scheme of Northern Region being undertaken in the month of May/June 2003.

9.2 Director (SP&PA) stated that since no time frame for covering the S/S with any project was indicated in the 14th standing committee minutes so the same was covered in the system strengthening project of Northern Region to be undertaken during April 2004 condition. He further stated the request of RVPNL, could be considered if the members of the committee agrees for the same. After detailed deliberation it was decided to cover the 400/220 kV Bhiwadi S/S as a part of strengthening scheme of Northern Region from April 2004. All the participants of the Standing Committee agreed for the same.

10. Transmission system for evacuation of power from Kahalgaon-II, Maithon (RB), Barh TPS and Eastern Region surplus from Eastern Region to Northern Region and related transmission system strengthening in the Northern Region.

10.1 Initiating the discussion on this agenda item CE (SP&PA), CEA informed that the issue related to inter-regional power transfer from Eastern region to Northern Region as well as Western Region was discussed in the 14th Standing Committee meeting of Northern Region held at Jaipur on 30/12/02. He stated that due to changes in the schedule of commissioning of generation capacity of the units expected in Eastern Region, the proposed system for evacuation arrangement associated had to be reviewed. Further, the commissioning schedule of few of the generating stations in the Eastern Region from which Northern Region was a major beneficiary had become uncertain, due to which, the system evolved earlier from these generating stations needed to be prioritized/staggered depending upon its time frame uncertainties. Accordingly, necessary exercise had been done and the proposal for taking a decision on the transmission system for regional strengthening and evacuation of Kahalgaon, Maithon and Barh had been circulated with the agenda. Decision was necessary so that POWERGRID could prepare FR for the transmission system and start activities for the building of the transmission system matching with the commissioning of generating stations.

10.2 CE(SP&PA) further stated that the load flow studies had been carried out by CEA to identify various elements of the composite transmission system for evacuation of power from Kahalgaon-II, Maithon (RB) TPS, Barh TPS and Eastern Region Surplus and transmission of the same within the Northern Region. This total transmission system had been divided into project-based transmission system to match with the generation project and system strengthening schemes to be taken up in various phases during tenth plan period. The need for dividing the total system into separate schemes of system strengthening and schemes for generation specific evacuation system has arisen due to uncertainty in the commissioning programme of the specific generation projects. As the works for meeting the transmission needs and strengthening of power delivery system to the load centers within the Northern Region would arise for any additional power, whichever comes first, these works have been packed into number of system strengthening

scheme, each having a requirement based prioritized commissioning programme and the evacuation system for Kahalgaon extn., Maithon and Barh had been separately identified. Members agreed to this methodology.

- 10.3 Informing about the planning criteria adopted for these studies, CE(SP&PA) explained that considering past operational experience of HVDC converter station being out for long time, these studies have been carried out with N – 2 outage contingency. Therefore, system had been tested for outage of single circuit of a 400kV / 765kV (operated at 400kV)/ HVDC one pole with a pre-contingency of outage of one pole of an HVDC line. The various study cases and their findings had been presented for discussion.
- 10.4 Presenting the study cases, findings and planning approach for designing this transmission system, Director (SP&PA), CEA said that generation projects in NR were not coming with the same pace as its load growth, therefore, it was estimated that NR would have peaking deficit of 12000 MW by 2008-09. Thus power would have to be imported from pithead generating stations coming up in ER. However, because of uncertainty of some of the projects viz. Hirma, North Karanpura and Koelkaro etc., it would not be possible to fully meet this deficit from import also. Therefore, a transmission system had been planned for import of 8000 MW of power that could be available by 2008-09. In regard to planning criteria with N – 2 contingency, he elaborated that while the N – 1 contingency criteria aimed at meeting the outage without need of any re-scheduling, in N – 2, re-scheduling after the first contingency was not ruled out.
- 10.5 ACE, RVPN contended that the figure of 40600 MW peak demand taken for NR by 2008-09 appears to be high. CE, CEA explained that the figures had been taken from 16th EPS which could not be disowned and that if not by 2008-09 these projections would be reality in next two years thereafter and the transmission system planned would be valid for the period when that load demand realized.
- 10.6 Continuing his presentation, Director (SP&PA), CEA stated that because of uncertainty in the schedule of North Karanpura, the Daltonganj Pooling point has been deferred. Also, the HVDC receiving station had been shifted from Bahadurgarh to Bhiwadi because of

uncertainty of Hirma project and also because POWERGRID had reported that due to severe pollution caused due to the brick-kiln factories around Bahadurgarh, this location was not conducive for termination of HVDC line.

SYSTEM STRENGTHENING SCHEMES FOR NR

- 10.7 Emphasizing the need for small system strengthening works covered under System Strengthening Schemes of NR, Director (SP&PA) explained that these, apart from providing core system for facilitating utilization of import from ER, also address operational problems of NR. Therefore these should be completed as fast as possible. He also informed that in future, Bareilly would have more important role as a grid point and therefore a separate 400kV Switching Station was required at Bareilly under POWERGRID.
- 10.8 Director, (SP&PA) CEA stated that the two 400kV bays of UP at Saranath had been provided by UPPCL to POWERGRID for terminating the inter-regional line from Sasaram at Saranath, which POWERGRID had now proposed to use by LILO of one circuit of the Sasaram-Allahabad line. The studies carried out by CEA had shown that this LILO work would be helpful to NR as it reduces the total losses and also eases the flow on Singrauli-Kanpur section. The cost of LILO work and utilization charges to be paid to UP would have to be borne by NR constituents. The members agreed to this proposal.
- 10.9 ED(NR-I), POWERGRID inquired that why the 400kV SC lines like Bareilly-Moradabad and Moga-Ludhiana-Jullundur were being planned as against general principle of planning DC lines to save on ROW. Director, PSEB also wanted that the Moga-Ludhiana-Jullundur line should be made as DC line. CE, CEA explained that though generally DC lines were planned at 400kV level from the consideration of optimizing of ROW, but the final decision is taken by studying merits in each case. In the case of Bareilly-Moradabad, there is no space available for terminating more bays at Moradabad and studies show that there is no additional utility of DC line against SC on the Moga-Ludhiana-Jullundur route. Further the 400kV density in Punjab was already on the higher side. SE (Planning), HVPN told that their proposal for LILO of Hissar-Moga 400kV line at Fatehabad and a 400kV S/S at

Fatehabad should be included in the strengthening schemes of NR. After further discussions members agreed to the proposals.

10.10 In regard to the provision of SVC support in NR, Director (SP&PA) explained that to meet the N – 2 contingency criteria, especially the outage of both the poles of Balia-Bhiwadi HVDC line, it was necessary to provide SVC support in the system. Otherwise the import has to be reduced to 6200 MW. Also, for import of 8000 MW with N – 2 criteria, two 765kV circuits between Bina-Malanpur-Agra (operated at 400kV) were needed. However, with only one 765kV circuit between Bina-Malanpur-Agra (operated at 400kV), outage of Bina-Malanpur SC with pre-contingency of outage of one pole of Balia-Bhiwadi HVDC line could be sustained only with support of SVC in the system and under this case the import was required to be restricted to 7000 MW. Considering these findings, SVC support as required was covered in the proposal. However, only one 765kV circuit between Bina-Malanpur-Agra (operated at 400kV) was being proposed at this stage and import restriction/ rescheduling after first order contingency would be the solution. Further system (second Bina-Malanpur-Agra circuit or some other solution), would be considered with some other project. ED(Engineering), POWERGRID suggested that the total amount of SVC support to be provided in NR, its location and size be decided after further studies by CEA and POWERGRID. This was agreed to.

10.11 It was decided that the Gorakhpur-Lucknow 400kV DC line of POWERGRID planned under Tala Transmission System would be designed for higher temperature of 95°C so as to provide increased capacity.

10.12 After further discussions, members agreed for the proposals to segregate the total transmission requirement under five System Strengthening Schemes for NR and Evacuation System for Kahalgaon, Maithon and Barh as given below:

I) SYSTEM STRENGTHENING NR – I, TARGET 2005-06

1. Kanpur-Auraiya 400 DC
2. LILO of Kanpur-Agra 400 SC at Auraiya

3. Bareilly Switching station of PG, 400kV
4. LILO of Lucknow-Moradabad 400kV SC at Bareilly (PG)
5. LILO of Bareilly-Mandola 400kV DC at Bareilly (PG) 2xD/C
6. Bareilly (PG)-Moradabad 400kV SC
7. LILO of Sultanpur-Lucknow 400kV SC at Lucknow PG

II) SYSTEM STRENGTHENING NR-II, TARGET- 2006-07

1. Fixed series compensation of 40% on Allahabad-Mainpuri 400kV DC line designed for 95°C
2. Agra-Jaipur 400kV DC
3. Wagoora 400/220kV, 3rd transformer

III) SYSTEM STRENGTHENING NR-III, TARGET- 2006-07

1. Malerkotla-Ludhiana-Jullundur 400kV S/C
2. Ludhiana 400/220kV S/Stn of PG, 2x315MVA
3. LILO of one circuit of Hissar-Moga 400kV DC line at Fatehabad
4. Fatehabad 400/220kV S/Stn of PG, 2x315MVA

IV) SYSTEM STRENGTHENING NR-IV TARGET- 2006-07

1. Provision of SVC support in NR system. (Total quantum of compensation, their size and location would be identified after further studies.)

V) SYSTEM STRENGTHENING SCHEME NR-V, TARGET- MATCHING WITH
BALIA-BHIWADI HVDC Bi-POLE

1. LILO of Hissar-Jaipur at Bhiwadi
2. Bhiwadi-Agra 400kV DC
3. Bhiwadi-Moga 400kV DC

KAHALGAON TRANSMISSION SYSTEM

10.13 GM(PE), NTPC stated that the unit size at Kahalgaon Stage –II have now been revised from 660MW to 500MW and the project would have two Phases as - Kahalgaon Stage-II Phase-I (2x500MW) and Kahalgaon Stage-II Phase-II (1x500 MW). The first 500MW unit was programmed to be commissioned in 2006-07 and the third in 2008-09. After further discussions, to take care of the wide time gap between the first unit and the last unit at Kahalgaon and the uncertainty about schedule of Sipat STPS and its associated transmission system, Kahalgaon transmission system was split in two phases and the following system was finalized:

VI) KAHALGAON EXTENSION PHASE-I (2x500MW) TRANSMISSION SYSTEM

1. Biharshariff-Balia 400kV QUAD DC
2. Kahalgaon-Patna-Balia 400kV QUAD DC
3. Ballia (PG) switching station
4. Patna (PG) 400/220kV Substation, 2x315MVA
5. Balia-Mau 400kV DC
6. Maithon (PG)-Ranchi 400 DC
7. Ranchi 400/220kV S/s of PG, 2x315MVA
8. Balia-Lucknow (PG) 400 DC (to be designed for higher temperature of 95°C and fixed Series Compensation on both the circuits –quantum of compensation to be decided by further studies)
9. Lucknow (PG)-Bareilly (PG) 400 DC (to be designed for higher temperature of 95°C)
10. Agra-Malanpur 765 kV SC to be operated at 400kV

VII) KAHALGAON EXTENSION PHASE-II (1x500MW) TRANSMISSION SYSTEM

1. Ranchi-Sipat 400 KV DC (in case Sipat Switchyard and 765kV lines from Sipat to Seoni covered under Sipat-II transmission system are delayed, then, instead of Ranchi-Sipat, it would be Ranchi-Rourkela-Raipur 400kV DC with TCSC at Raipur)

MAITHON TRANSMISSION SYSTEM

10.14 Director (SP&PA), CEA presented the proposed transmission system for evacuating power from the Maithon TPS of Damodar Valley Corporation for which the beneficiaries would be the states of NR. ED (Engineering), POWERGRID opined that requirement of the Agra-Meerut 765kV SC line operated at 400kV as a 765kV line was not seen in the presented scenario. CE(SP&PA), CEA explained that utility of this line as a 765kV line had been observed under the long term scenarios when North Karanpura, Koelkaro and other Northeastern Hydro power would be available. He stated that the need for 765kV or 400kV line from Agra to Meerut may also be linked to Tehri transmission and the feasibility of operating Tehri-Meerut 765kV line at 765kV. After further discussions it was decided that further studies would be carried out taking Agra-Meerut as 400kV DC line as another alternative. The following transmission system was decided for the Maithon RB project.

VIII) MAITHON TRANSMISSION SYSTEM

1. Maithon RB TPS- Maithon (PG) 400 DC
2. Maithon RB TPS- Ranchi 400 DC
3. Balia-Unnao 765kV SC, at 400kV operation
4. Unnao-Agra 765kV SC, at 400kV operation
5. Meerut-Malerkotla 400 DC
6. Agra-Meerut 765kV SC (operated at 400kV) or 400kV DC line

BARH TRANSMISSION SYSTEM

10.15 Director (SP&PA), CEA stated that proposal for Barh transmission system included Barh-Balia 400kV QUAD DC, LILO of both circuits of Kahalgaon-Patna 400kV QUAD DC at Barh, 765kV Seoni-Bina SC (400kV operation) and Balia-Bhiwadi HVDC bi-pole line. In regard to HVDC bi-pole line, in the 14th meeting, POWERGRID had proposed capacity of 2500MW instead of 2000MW and had stated that the incremental cost would be only of the order of Rs 150 crore as the line design would not change. In this context studies had been

done by CEA for the alternatives of HVDC bi-pole capacity of 2000MW, 2500MW and 3000MW. The results had been circulate with the agenda. It was found that the increased capacity did not result in reduction of any other requirement in the proposed system. However, enhanced capacity would provide useful margin for future. It was also observed that though the increased HVDC capacity resulted in overall reduction in transmission losses, the losses in HVDC bi-pole would increased substantially if the capacity was enhanced without upgrading the transmission line design. As such, it was necessary to re-optimize the transmission line design corresponding to 2500MW capacity and in that case the cost implication would be of the Rs 500 Crore.

After discussion, it was decided that POWERGRID would carry out the necessary studies with respect to loss optimization/transmission line design up-gradation and send the same for further examination in CEA. Decision in the matter would be taken after that.

10.16 With the above, the following transmission system was agreed for evacuation of power from the Barh TPS.

IX) BARH TRANSMISSION SYSTEM

1. LILO of Kahalgaon-Patna at Barh 2xDC
2. Barh-Balia 400 QUAD DC
3. Balia-Bhiwadi HVDC bi-pole (the capacity of this HVDC line to be decided after further studies)
4. Seoni-Bina 765kV SC, at 400kV operation

List of Participants of the 15th Standing Committee meeting held at Manali (H.P.) on 30.05.2003

S/SHRI

Name **Designation**

CEA

V. Ramakrishna Chief Engineer
A.K. Asthana Director
Gautam Roy Dy. Director
Pardeep Jindal Dy. Director
Naveen Seth Dy. Director

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Prahlad Meena Exec. Engineer

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N.N. Misra G.M. (PE.)
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POWERGRID

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M. Khanna CDE (Engg.)

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NSM Rao GM (Trans.)

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RVPN Ltd.

R.N. Pathak Addl. Chief Engineer
L.N. Nimawat XEN (PSS)

PSEB

J.S. Mahal Director
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HVPN

T.K. Dhingra S.E./Plg.

UPCL

Mahesh Chandra DGM (SO.)

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

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

Dated : /06/03

-As per List enclosed-

Sub: Summary Record of the meeting for the 15th meeting of the Standing Committee on Transmission System Planning of Northern Region.

Sir,

Please find enclosed the minutes of the meeting of the 15th standing committee on Transmission System Planning of Northern Region held on 30/05/03 at Manali, HP for information and further necessary action at your end.

Yours faithfully,

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

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