The Summary record of the 21st meeting of Standing Committee held at NRPC Conference Room, Katwaria Sarai, Delhi on 03rd November 2006.

(1) List of the participants is annexed.

CE SP&PA, CEA welcomed the participants at 21st meeting of Standing Committee held at NRPC Conference Room, Katwaria Sarai, Delhi. He thanked MS, NRPC hosting the meeting and excellent arrangement. The committee congratulated Shri Y.K. Raizada on his elevation as Director (Technical), RVPNL. CE(SP&PA), CEA informed that Member (PS), CEA, the Chairman of the Standing Committee could not be present in the meeting due to some preoccupation. He requested Director (RVPNL) to Chair the meeting.

Director (Technical), RVPNL accepted to Chair the meeting and also thanked the members of the committee for the honour. He asked CE (SP&PA), CEA to take up the agenda for the meeting.

Thereafter, the agenda items were taken up.

(2) Confirmation of the minutes of 20th meeting of the Standing Committee held on 22.04.2006 at Nainital, Uttaranchal.

CE(SP&PA), CEA stated that, the minutes of the 20th meeting of Standing Committee on Power System Planning in Northern Region held on 22.04.2006 at Nainital Uttaranchal, were circulated vide CEA letter No. 1/9/2004-SP&PA/ 368-83 dated 26.05.2006. No Comments from any constituent states on the minutes had been received so far. As such the minutes of the 20th standing committee may be taken as confirmed.

The minutes of the 20th standing committee was confirmed.

(3) Evacuation of power from Allain Dhuhangan HEP.

CE (SP&PA), CEA stated that the evacuation system for Allain Dhuhangan HEP in H.P. was discussed in the 16th meeting of the Standing Committee

and it was decided to the pre-pone Panarsa pooling station covered under Parbati-III transmission system to match with ADHP and establish 220/400kV step-up at Panarsa so that 220kV evacuation line from ADHP could be connected to Panarsa and the 400kV Panarsa-Koldam-Nalagarh line covered under Koldam/Parbati-II/Parbati-III could be utilized for evacuation of ADHP power also. However, the execution of Panarsa pooling station and the 400kV line had not yet started and as such the schedule of ADHP was ahead of the schedule of the 400kV line. As the execution of the work for construction of the line from Parbati pooling to Koldam had not started, M/S AD Hydro power Ltd. had requested to allow them connectivity to 220kV Nalagarh and to construct their 220 D/C line from their generation plant up to Nalagarh as per the original proposal at the time of TEC of the generation project. As the need for construction of the evacuation system from Allain Dhuagan HEP was urgent, this had worked out to be the only feasible solution. With this, the revised evacuation system for ADHP would be independent of Panarsa pooling station and they would have their Allain Dhuagan HEP – Nalagarh 220 kV D/C line.

Advisor PSEB stated that PSEB was the beneficiary of the power from Malana-II (100 MW), project which was located in the same area and power from which was also to be evacuated from the same corridor. He stated that considering the severe right of way constraint in this corridor, the pooling station near Panarsa be expedited and evacuation system for Malana II HEP may also be evolved in a comprehensive transmission scheme.

Chief Engineer, HPSEB stated that the HPSEB was also to have projects like Sainj, coming in the same area, power from which would also be required to be evacuated through the same corridor. As such, before construction of the proposed 220 kV line to Nalagarh, ADHPL should also interact with them in order to optimize the corridor.

ED (Engg), PGCIL stated that the corridor already earmarked by PGCIL for construction of 400 kV 2xS/C line from Parbati II and III to Koldam and there on 400 kV D/C line to Nalagarh should not be disturbed in process of ADHPL constructing their 220 kV line to Nalagarh.

CE (SP&PA), CEA stated that PGCIL should resolve the issue relating to execution of Parbati II and Parbati III transmission system and time schedule of Panarsa Pooling Station matching with Malana II or Sainj, which ever was earlier. The matter was further deliberated and it was decided that HPSEB would take up the issue with project authorities of Allain Duhangan HEP and Malana II HEP and a meeting would be convened in about a fortnight time and CEA, PGCIL and PSEB would also be appraised.

(4) Providing 2 nos 220kV bays to HP at Nalagarh s/s of PGCIL

CE(SP&PA), CEA stated that two nos. 400 kV bays at Nalagarh were earmarked for enabling HPSEB for taking out 400 kV D/C outlet to Kunihar. However, in the 19th meeing, HPSEB informed that they have deferred construction of the Nalagar-Kunihar 400kV line by 4 to 5 years. It was decided that these 2 nos. of 400kV line bays at Nalagarh would be utilized for terminating 400 kV lines from Parbati II/ Koldam HEP and POWERGRID would provide two bays to HPSEB whenever they require the same and for that HPSEB would inform POWERGRID at least two years in advance.

CE (SP&PA), CEA further stated that HPSEB had also requested for providing 2 nos. of 220kV bays at Nalagarh. It was discussed that out of 4 nos. of 220 kV bays only 1 no. of 220 kV bays had been utilized by Chandigarh and the same could be transferred to HPSEB. The issue was discussed in 19th meeting of the standing committee for NR and it was noted that the bays allotted to Punjab and Chandigarh were not utilized. Subsequently in a meeting taken by CE(SP&PA), CEA with utility from POWERGRID, HPSEB, UT of Chandigarh and PSEB in November, 2005, it was discussed that PSEB and UT of Chandigarh should programme to

complete construction of their transmission lines from Nalagarh by March 2006 and if there was no firm schedule, the allocation of the bays would be reviewed. Since then, UT of Chandigarh had given their program of utilizing their 220kV bays, PSEB was yet to respond.

Advisor, PSEB stated that PSEB had inadvertently not intimated the schedule for construction of their line to Mohali. He informed that the works for their line to Mohali had been awarded on April 2006 and it was scheduled for completion by July 2007.

CE, HPSEB stated that their requirement was getting urgent and was pending since earlier meetings.

After further discussions it was agreed that for terminating HPSEB's 220 kV transmission line at Nalagarh, two nos of 220 kV line bays would be provided by POWERGRID at their Nalagarh S/S as a part of regional system strengthening work.

(5) Transmission System of Northern Region for import of power from NER - 400 KV Bongaigaon - Siliguri D/C Quad and Purnea-Biharsharif D/C line as part of system strengthening scheme of Northern Region.

CE(SP&PA), CEA stated that transmission system from Tripura Gas project (Palatana by ONGC) was discussed in the 20th standing committee meeting of NR and it was agreed that the transmission system from delivery point of Tripura gas power onwards would be provided as NR strengthening. Subsequently, ONGC had informed that the generation capacity of their plant would be only 740 MW and their transmission system would be up to Bongaigaon. Accordingly, the injection point for open access would be Bongaigaon and NR beneficiaries would need to arrange the transmission beyond Bongaigaon up to NR grid. Accordingly, based on system evolved as per studies, it was proposed to construct 400 kV D/C quad lines between Bongaigaon-Siliguri and Purnea-Biharsharif as part of system strengthening

scheme of Northern Region with transmission charges for the proposed 400 kV line to be borne by NR constituents. For the transmission between Siliguri-Purnea, two 400 kV D/C lines were existing, out of which one was with quad conductor and the other with twin conductor which was already being upgraded by providing higher capacity INVAR conductor. This would provide sufficient transmission capacity and the NR constituents can seek short-term open access (STOA) from ER grid. Beyond Biharsharif, the already provided transmission system would be adequate corresponding to this proposal. The proposed system could also be used for wheeling of additional power out of surplus from NER which could be imported by NR constituents, The above-proposed AC system would also provide backup for the ±800kV, 6000MW Bishwanath Chariyali-Siliguri-Agra HVDC bi-pole line. From reliability consideration and to take care of single pole contingency of Bishwanath Chariyali-Siliguri-Agra HVDC bi-pole line, it would be a technical requirement to provide a parallel 400kV transmission corridor beyond Bongaigaon.

Addl. SE (PSS), RVPNL stated that they were generally in agreement with the technical aspect of the proposal. However, as ER grid would also benefit from the proposed system, ER constituents should also be asked to partly share the transmission charges. Further, as the proposed transmission strengthening proposals would also provide back up for ±800kV Bishwanath Charyeli-Siliguri-Agra HVDC bi-pole line which was to be also shared by WR, the WR constituents should also share part of the transmission charges for the proposed system strengthening.

CE(SP), HPSEB stated that they agree with the views of the RVPNL representative on the issue of transmission charges. He further stated that only those constituents who were having allocation in upcoming projects should bear the increased transmission charges on account of new transmission system and strengthening works within the region as well in other regions and inter-regional systems. The states that do not have allocation in such upcoming projects should not be required to bear the additional/increased transmission charges.

MD PTCUL, stated that they were generally in agreement with the proposal, however, they also share their concern with HPSEB that the non beneficiary states should not be burdened with the cost of the strengthening proposals within or outside the region. XEN(Plg.), UPPCL agreed with the views of PTCCUL.

Advisor PSEB stated that they are in full agreement with the proposal as in the agenda. SE(Plg.), HVPNL and GM(Plg), DTL also agreed with the proposal as in the agenda.

CE (SP&PA), CEA stated that for ensuring transmission of power from Tripura gas delivered to NR constituents at Bongaigaon, the 400 kV D/C quad Bongaigaon – Siliguri and Purnea – Biharsarif lines were required. The implementation of these lines was to be taken up matching with the time frame of Tripura gas. The process of taking up the issue of transmission charges sharing by ER and WR would delay the take off of the scheme. Further based on the experience in earlier cases, agreement of ER constituents or WR constituents on sharing the transmission charges for the proposed system was less likely to materialise. As the constituents of NR who had share in Tripura gas power would be the most affected one and as they would be the direct beneficiary of the proposed system for meeting their transmission needs of Tripura gas power to be purchased by them, it was for the beneficiaries of Tripura gas power provide the necessary agreement for sharing the transmission charges for these lines so that the execution of works could be taken up. In this context, he also informed the members that the whole issue of transmission tariff was under consideration of CERC.

After further discussion the following was concluded: -

(i) All the NR constituents were by and large in agreement with the technical aspect of the proposal

(ii) CEA would convene a separate meeting with the constituents having PPA for Tripura gas power, so as to come up with a suitable transmission charges sharing proposal which would be discussed in the next Standing Committee meeting.

(6) Evacuation system for Dadri Thermal Extn. (2x490MW).

CE(SP&PA), CEA stated that NTPC was putting-up extension at Dadri Thermal by adding 2 more unit of 490MW each. Expected commissioning was 2009-10. Evacuation system for this extension project had been tentatively evolved keeping in view the short circuit level in the grid. Studies had shown the need of following transmission from Dadri together with bus splitting at Dadri:

(1) Using Dadri LILO of Muradnagar-Panipat 400kV line to extend it up to Bawana so as to have Dadri-Bawana 400kV D/C line and restore 400kV Muradnagar-Panipat S/C line as per original construction

(2) Bus splitting at Dadri so as to have thermal units of stage-I, Dadri-Panipat and Dadri-Bawana lines on one section and gas plant units, stage-II thermal units, HVDC, Dadri-Mandola, Dadri-G-Noida/Samaypur and Dadri-Malerkotla lines on the other section.

To address the issue of short circuit level, short circuit study has been done with a case considering Bawana-Bahadurgarh 400kV D/C and Abdullapur-Bawana 400kV D/C disconnect from Bawana and connected to form a direct 400kV D/C line from Abdullapur to Bahadurgarh and including tentative evacuation system for Jhajjhar (1500MW) as Jhajjhar-Bahadurgarh

400kV D/C and Jhajjhar-Mundka 400kV D/C with 400/220kV Mundka S/S not connected to Delhi ring system and directly feeding to Delhi loads radially – interconnection at lower voltages for alternate supply to kept normally in open. The case shows short circuit levels are up to 39kA.

UPPCL stated that the Dadri - Muradnagar 400kV line should be retained as it provided connectivity of Dadri with UPPCL system.

AGM, POWERGRID stated that alternate option of taking a 400 kV D/C line from Dadri to Bamnauli should also be studied before firming up the evacuation system. AGM, NTPC confirmed availability of space and agreed to arrange for two nos. of bays for taking out lines to Bawana/Bamnauli

After further discussion it was decided that :-

(i) Dadri LILO from Muradnagar – Panipat 400 kV line would be continued

(ii) NTPC would provide 2 nos. additional 400 kV bays at Dadri

(iii) The 400 kV bus at Dadri would be split to have thermal units of Stage-I, Dadri-Panipat, Dadri – Muradnagar and the 2 additional 400 kV bays on one side and gas plant units, thermal units of stage-II, HVDC, Dadri-Mundra, Dadri-G.Noida/Samaypur and Dadri-Mallihotta lines on the other section

(iv) Further studies with generation added at Bawana, Faridabad and Hissar etc. were required. Provision of series reactor and/or bus splitting at Samaypur/other places may be necessary which also required to be studied. A proposal in this context would be discussed in the next meeting.

(7) Transmission system for power evacuation from Sasan and Mundra Ultra Mega Projects

CE(SP&PA) stated that Government of India, in a major imitative, is facilitating development of very large size ultra mega generation projects at coal pit-head and coastal location in order to bridge the gap between demand and supply. The capacity of each of these projects was 4000 MW, with 5x800 MW units. Efforts were on to have one unit during the 11th plan period by 2011-12 and

full capacity was expected to be commissioned by 2013-14. Ultra Mega projects in the Western Region at Sasan in Madhya Pradesh and Mundra in Gujarat were on fast track. Accordingly, transmission system planning studies had been carried out considering Sasan and Mundra to evolve the evacuation system. The studies had been furnished in the agenda note. Based on the study cases focusing the transmission system in Western Region, the transmission schemes as associated transmission system of Sasan and Mundra in WR was evolved, discussed and agreed in the Western Region. The details of the associated transmission system agreed had been indicated in the agenda note. Further studies focused in transmission system in the Northern region had been done and the system for NR evolved.

Studies had shown that the transmission of Sasan and Mundra power to the load centers of Northern region would take place through displacement. As such, additional transmission system for Sasan and Mundra in the Northern region would be required by providing necessary system strengthening in East-West corridors of Northern Region and augmentation of the network to supply the received power to the load centers.

CE(SP&PA), CEA further stated that the sharing of transmission charges was discussed and agreed by WR constituents and any of the following two options were agreeable by WR constituents:

Option-1: Transmission charges for Sasan and Mundra transmission system in WR be pooled in to WR regional pooled transmission charges and NR beneficiaries sharing the same based on their total allocation from WR pool including Sasan and Mundra power. And transmission charges for Sasan and Mundra transmission system in NR shared by NR beneficiaries.

Option-2: Total transmission charges for Sasan and Mundra transmission system in WR as well as in NR be divided in to NR and WR in ratio of their allocation from Sasan and Mundra and pooled in to regional pooled transmission charges of the respective regions.

As both the above options were acceptable to WR constituents, the option to be adopted was to be decided by NR constituents.

He stated that studies focused on Northern region had been done to evolve the transmission system for Sasan and Mundra in NR. Based on the strengthening needs, the following alternatives had been considered.

Alt.-1: Additional transmission system:

- Gorakhpur-Lucknow 400kV D/C (second line)
- Sasaram-Fatehpur 765kV S/C second line
- Fatehpur-Gwalior 765kV S/C
- Gwalior-Jaipur 765kV S/C
- New 765/400kV, 2x1500MVA s/s at (near) Jaipur
- Jaipur New-Jaipur PG 400kV D/C
- Jaipur New-Reengus(or Alwar) 400kV D/C
- New 400/220kV 2x315 MVA s/s at Reengus(orAlwar) with 220kV D/C line interconnecting to 220kV s/s
- Reengus(or Alwar) – Ratangarh 400kV D/C
- LILO of both circuits of Nathpajahkri-Abdullapur 400kV D/C at Panchkula with 2x315MVA 400/220kV s/s at Panchkula

Alt.-2: Additional transmission system:

- Gorakhpur-Lucknow 400kV D/C (second line)
- Sasaram-Fatehpur 765kV S/C (second line)
- Fatehpur-Agra 765kV S/C (second line)
- Agra-Reengus(or Alwar) 400kV D/C quad
- New 400/200kV 2x315MVA s/s at Reengus (or Alwar) with 220kV D/C line interconnecting to 220kV s/s
- Reengus (or Alwar) - Jaipur PG 400kV D/C
- Reengus(or Alwar) – Ratangarh 400kV D/C

- LILO of both circuits of Nathpajahkri-Abdullapur 400kV D/C at Panchkula with 2x315MVA 400/220kV s/s at Panchkula

Both the above options were comparable from technical suitability as well as cost economics. Estimated cost in both cases were of the order of Rs 2000 crores. From long-term consideration when Agra HVDC terminal capacity would be increased to 6000 MW, Option-2 might work out to be advantageous. Accordingly, Alt.-2 was recommended.

ED (Engg.) POWERGRID proposed that considering the immediate need for strengthening of the section between Lucknow and Gorakhpur the proposal for Lucknow – Gorakhpur 2nd D/C line be taken up as strengthening scheme of NR. He further stated that beside this, the section between Kanpur to Ballabgarh and Meerut – Kaithal also need strengthening as such the works be taken up as strengthening scheme of NR.

CE (SP&PA), CEA stated that HVPNL had earlier indicated their requirement for creation of 400/220 kV S/S at Sonepat and Panchkula under region scheme to cater the growing load demand in this areas. 400/220 kV S/S at Panchkula had been proposed under the transmission system for Sasan and Mundra TPS. 400/220 kV S/S at Sonepat might also be included under the scheme. The 400/220 kV Sonepat S/S could be created by taking 400 kV D/C feed from Bhadurgarh.

Advisor PSEB stated that they apprehend that with the transmission of the share of the power of Sasan and Mundra by displacement to NR through ER, the capacity created for transmission of power from the projects located in ER as well as NER would be eaten up causing transmission constraint in that corridor. He suggested that instead of utilizing the existing ROW another transmission corridor through Gujarat –Rajasthan –Moga in Punjab be crated for transmission of the share of power from Mundra TPP to the states of Northern region.

Addl. SE (PSS), RVPNL, stated that corridor through Gujarat – Rajasthan – Moga at Punjab would strengthen the Western part of NR and help in reducing loading in the heavily loaded east-west corridor of the Northern Region.

ED (Engg.), POWERGRID, stated that, with the inter-regional transmission system created and being created with Tala HEP, Barh TPS, Kahalgoan Extn., North Karanpura TPS, Mithon RB, Palatna CCGT, lower Subernsri HEP etc. and additional inter-regional transmission system proposed with Sasan and Mundra UMPS, adequate transmission capacity would be available. CE(SP&PA), CEA also endorsed this.

After further discussions, The proposals for the strengthening of transmission system in Northern Region and the associated transmission system for Sasan and Mundra in NR was generally agreed by the constituents and the following Schemes were concurred:-

- **NR Strengthening Scheme IX required at the earliest**
  400 kV Kanpur – Ballabgargh S/C line with Series compensation
- **NR Strengthening Scheme X required at the earliest**
  400 kV Lucknow – Gorakhpur 2nd D/C line with Series compensation. Accordingly the work would be deleted from the scope of the transmission system required for absorption of power from Sasan and Mundra TPS
- **NR Strengthening Scheme XI required with Loharinagpala HEP or Sasan UMTP or Mundra UMTP whichever is earliest.**
  400 kV Meerut – Kaithal D/C line
- **Associated transmission system for Sasan and Mundra in NR**
  - Sasaram-Fatehpur 765kV S/C (second line)
  - Fatehpur-Agra 765kV S/C (second line)
  - Agra-Reengus(or Alwar) 400kV D/C quad
  - New 400/200kV 2x315MVA s/s at Reengus (or Alwar) with 220kV D/C line interconnecting to 220kV s/s
  - Reengus (or Alwar) - Jaipur PG 400kV D/C

- Reengus(or Alwar) – Ratangarh 400kV D/C
- LILO of both circuits of Nathpajahkri-Abdullapur 400kV D/C at Panchkula with 2x315MVA 400/220kV s/s at Panchkula
- Creation of 400/220 kV, 315 MVA S/S at Sonepat
- Bhadurgarh – Sonepat 400 kV D/C quad line with 2x315 MVA 400/220 kV S/S at Sonepat

Further discussions took place regarding proposal for sharing of transmission charges for Sasan and Mundra transmission system.

Regarding sharing of transmission charges between NR and WR, option -2 was preferred by the NR constituents and the same was therefore agreed.

CE(SP), HPSEB stated that recovery mechanism should be such that constituents not having allocation from these generation projects were insulated from these transmission charges.

MD, PTCUL Uttranchal also expressed similar views and stated that the total amount of NR component should not be pooled in the Northern regional pooled transmission charges.

After detailed discussion, it was agreed that a suitable methodology would be evolved and discussed in the next Standing Committee of NR.

It was also agreed that the members would further go through the studies focusing on their state specific requirement and would communicated to CEA and the same would be studied depending upon the feedback from the NR constituents and would be taken up in the next standing committee meeting.

(8) Transmission system for power evacuation from hydro projects in Uttranchal

PTCUL made a presentation of their proposal, which basically highlighted the proposed new approach for development of transmission system by PTCUL that would be for intra-state as well as inter-state transmission. The master plan based on which PTCUL had formulated their schemes was prepared by CEA in 2003-04 and may need updating. It was informed that if the new methodology was agreed by the RPC, the master plan would be updated and schemes identified and discussed/firmed-up in Standing Committee before taking-up for implementation.

The meeting ended with a note of thanks to the chair.