

## **Agenda note for 26<sup>th</sup> meeting of the Standing Committee on Power System Planning of Northern Region to be held on 13<sup>th</sup> October 2008**

### **1. Confirmation of minutes of 25<sup>rd</sup> meeting held on 10.7.2008.**

Minutes of 25<sup>rd</sup> meeting was circulated vide letters dated 10.3.2008.

Based on comments received from POWERGRID, the following corrigendum is proposed to reflect the discussions/decision on the issues relating to (i) connectivity of Bawana with Grid; (ii) Naredra - Kolhapur HVDC back to back scheme; and (iii) 765 kV proposed ring around Delhi:

- (i) The last lines of para 4.5.1 viz. "Member (PS) clarified that Sonapat- Bahadurgarh is not covered under Karcham Wangtoo system and with the commissioning of the line they would not require to pay any transmission charges for Karcham Wangtoo system until the commissioning of the generation at Karcham Wangtoo HEP. Members concurred with the proposal" may be deleted and the following to be added as para 4.5.2:

4.5.2 POWERGRID stated that the 400kV lines from Bawana 400kV S/S to Bhadurgarh/ Hissar should be shifted to Bawana Generation switchyard side only after completion of the 400kV D/C Abdullapur – Sonapat – Bhadurgarh line. The 400kV D/C Abdullapur – Sonapat line was covered under Karchem Wangtoo scheme and the 400kV D/C Sonapat – Bhadurgarh line was covered under NRSS-XII. In order to shift the lines at Bawana at an early date, both these lines would have to be preponed and the transmission charges payable by the regional constituents from the date of its early commissioning.

- (ii) Para 4.8.1, may be modified and para 4.8.2 added as per following:

4.8.1 Constituent members were not agreeable to the proposal of sharing transmission charges for SR-WR HVDC link . PGCIL stated that incase HVDC b-t-b was not shifted from Sasaram, the same shall continue to operate and there will be need for establishment of a new 765 kV S/S at a new site for terminating 765 kV lines from Gaya/Fethapur proposed as a part of DVC.

4.8.2 It was further discussed that the 500 MW HVDC back-to-back module would become redundant with the bypassing of the HVDC station. Possibility of keeping the equipment in store till such time that this could be gainfully utilized by locating it in some other location

could be examined and PGCIL may review the need of land in view this suggestion.

- iii) Para 4.9.1, may renumbered as para 4.9.2 after adding the following as para 4.9.1:

4.9.1 POWERGRID stated that 765 kV Agra-Delhi line should not be deferred, as otherwise there could be constraint for evacuation of DVC power.

**The MOM of 25<sup>th</sup> meeting may be confirmed with the above amendments.**

## **2. Intra-state Transmission System in Uttar Pradesh**

2.1 Based on proposal given by UPPCL and examination of these proposals in CEA, the following intra-state transmission system has been proposed to be take-up by UPPCL at the own state:

2.2 As per the 17 EPS the load requirement of UP by the end of 11<sup>th</sup> plan and 12<sup>th</sup> plan period has been projected as 13947 MW and 19623 MW respectively. This has to be met from the states own generations and share from the central sector generations and from other tie ups. UP Vidyut Utpadan Nigam Ltd. (UPVNL) the power generation company in UP is contemplating construction of the following generation capacities in U.P of its own and also under IPP/SPV route with a aim to mitigate the long term deficit in the power availability of the state.

	<u>MW</u>
i) Anpara C (1000 MW)	1000
ii) Anpara D (1000 MW)	1000
iii) Bara (3x660MW)	1980
iv) Karchana (2x660MW)	1320
v) Meja Road (3x660MW)	1980
vi) Paricha TPS Extn. (2x250MW)	500
vii) Tanda Extn. (2x500MW)	1000
viii) Harduaganj TPS Extn. (2x250MW)	500
ix) Rosa TPS (2x300MW)	<u>600</u>
Total	9880

For evacuation of power from the above projects and its transmission to various load center in UP, the transmission company of UP i.e. UP Power Corporation Ltd. (UPPCL) has proposed the following transmission system for evacuation of power from the generation projects in UP

## **2.3 Evacuation System for Anpara C (2x500 MW) and Anpara D (2x500MW)**

- i) Step-up of both Anpara-C and Anpara-D generation to 765kV

- ii) Anpara-C and Anpara-D both switchyards to have 765kV and 400kV levels with 1000MVA (4x333 MVA, 1 phase units) 765/400 ICTs at each of Anpara-C and Anpara-D.
- iii) Shifting of Anpara-B – Unnao 765kV S/C line charged at 400kV to Anpara-C 765kV switchyard and charging the line at 765kV.
- iv) Anpara-D – Unnao 765kV S/C line charged at 765kV.
- v) Interconnection of Anpara-C and Anpara-B at 400kV through contiguous 400kV bus.
- vi) Anpara-D – Anpara-B/C 400kV D/C line and/or 765kV S/C.
- vii) Upgrading Unnao substation to 765kV with 2x1000MVA (7x333MVA, 1 phase units) 765kV/400kV ICTs
- viii) Unnao-Mainpur-Hapur S/C 765kV lines
- ix) Hapur 765/400kV substation with 2x1500 MVA (7x500MVA, 1 phase units) 765/400kV ICTs and 400/220kV 2x500 MVA

With the 765/400/220kV substation of UPPCL at Hapur, 400kV Hapur substation of PGCIL under regional scheme agreed in earlier meeting would not be required. This has already been discussed with PGCIL.

Members may take note.

#### 2.4 **Evacuation System for Bara TPS (3x660 MW), Meja TPS (3x660MW) and Karchana TPS(2x660 MW)**

- i) Step-up of Bara generation to 765kV
- ii) Step-up of Karchana and Meja generation to 400kV
- iii) Bara switchyards to have 765kV and 400kV levels with 2x1500MVA (7x500 MVA, 1 phase units) 765/400 ICTs.
- iv) Establishment of 400kV substation at Reewa Road Allahabad with 400/220kV 2x315 MVA ICTs
- v) LILO of 400kV Obra-Panki line at Reewa Road Allahabad
- vi) Meja – Bara 400kV quad D/C line
- vii) Meja – Reewa Road Allahabad 400kV quad D/C line
- viii) Karchana – Bara 400kV quad D/C line
- ix) Karchana – Reewa Road Allahabad 400kV quad D/C line
- x) Bara-Mainpuri 765kV 2xS/C lines
- xi) Mainpuri – Agra (PGCIL) 765kV S/C
- xii) LILO of Agra - Meerut 765 kV S/C line of PGCIL at G. NOIDA
- xiii) Hapur – G.Noida 765kV S/C line
- xiv) New 765/400kV substation at Maipuri with 2x1000MVA ( 7x333 MVA, 1 phase units) ICTs
- xv) Mainpuri 765kV UPPCL – Mainpuri 400kV PGCIL 400kV quad D/C line
- xvi) New 765/400/220kV substation at G.Noida with 2x1500MVA (7x500MVA, 1 phase units) 765/400kV and 2x500MVA 400/220kV ICTs.
- xvii) Reewa Road Allahabad – Banda 400kV quad D/C line
- xviii) Banda – Orai 400kV quad D/C line
- xix) Orai – Mainpuri 765kV UPPCL 400kV quad D/C line

- xx) Establishment of 400kV substation at Banda with 400/220kV 2x315 MVA ICTs
- xxi) Establishment of 400kV substation at Orai with 400/220kV 2x315 MVA ICTs

In the above, works at (xi), (xii) and (xv) require interface with regional network of PGCIL.

Members may take note and concur.

NOTE: Subsequently, UPPCL have intimated that it is proposed to have additional 2x660MW at Bara and 1x660MW at Karchana. In case the additional power is proposed to be utilized outside U.P., evacuation system for this additional 1980 MW would require one more 765kV line from Bara which could go to Fatehpur 765kV PG s/s and further network strengthening beyond Fatehpur. The system could be studied, evolved and firmed-up based on open access application. However, if the additional power is to be utilized within U.P., UPPCL would need to plan additional network.

## **2.5 Evacuation System for Parichha TPS Extn. (2x250MW)**

- Step-up Parichha Extn units at 400kV
- 400/220kV 2x315 MVA ICTs at Parichha extn
- Parichha Extn – Orai 400kV D/C

## **2.6 Evacuation system for Tanda Ext. (2x500MW)**

- Tanda – Gonda 400kV quad D/C line
- Gonda – Shahjahanpur(PG –) 400kV quad D/C line  
A new regional 400kV s/s at Shahjahanpur with 2x315 MVA 400/220kV is being proposed to be established by PGCIL in lieu of Hapur. The s/s is proposed by LILO of both circuits of LucknowPG-BareillyPG 400kV D/C line.
- LILO of Azamgarh – Sultanpur 400kV line at Tanda
- Establishment of 400kV substation at Gonda with 400/220kV 2x315 MVA ICTs

## **2.7 New 400kV substations at Aligarh, Sikandarabad, Lucknow (Sultanpur Road), Nehtaur and Aurai**

- Mainpuri 765kV UPPCL – Aligarh 400kV quad D/C line
- Aligarh – Sikandarabad 400kV quad D/C line
- Sikandarabad – G.Noida 765kV UPPCL 400kV quad D/C line
- LILO of Panki – Muradnagar 400kV line at Aligarh
- LILO of 400kV Sultanpur-Sarojini Nagar line at Lucknow(Sultanpur Road)
- LILO of 400kV Obra-Sultanpur line at Aurai
- LILO of 400kV Kashipur-Rishikesh line at Nehtaur
- Establishment of 400kV substation at Aligarh, Sikandarabad and Lucknow (Sultanpur Road) each with 400/220kV 2x500 MVA ICTs

- Establishment of 400/132kV substation at Nehtaur with 2x200MVA 400/132kV ICTs
- Establishment of 400kV substation at Aurai either with 2x315MVA 400/220kV or 2x200MVA 400/132kV ICTs. UPPCL may choose between 220kV and 132kV depending on their plan for downstream network from Aurai.

## **2.8 Evacuation system for Harduaganj Extn (2x250MW)**

- Harduaganj – Jahangirpur 220kV D/C line
- Jahangirpur – Sikandarabad 220kV D/C line
- Establishment of 220kV substation at Jahangirpur with 2x160 MVA 220/132kV ICTs

## **2.9 400kV ring system for Gaziabad**

- LILO of Moradabad – Muradnagar 400kV line at Hapur with conductor of Muradnagar-Hapur section replaced with new conductor of higher capacity specification
- LILO of Muradnagar-Muzaffarnagar 400kV S/C line to Gaziabad with conductor of Muradnagar-Gaziabad section replaced with new conductor of higher capacity specification
- Hapur – Dasna 400kV quad D/C line
- Dasna – Indirapuram 400kV quad D/C line
- Indirapuram – Gaziabad 400kV quad D/C line
- Establishment of 400kV substation at Dasna with 400/220kV 2x315 MVA ICTs
- Establishment of 400kV substation at Indirapuram with 400/220kV 2x500 MVA ICTs
- Establishment of 400kV substation at Gaziabad with 400/220kV 2x500 MVA ICTs

## **2.10 Transmission network for G.Noida and Noida**

- G.Noida 765kV – G.Noida existing 400kV quad D/C line (using multicircuit towers 400kV towers for entry to G.Noida)
- Additional 2x500MVA 400/220kV ICTs at G.Noida existing substation
- G.Noida 765kV – Noida sector-137 400kV quad D/C line (through river bed)
- Establishment of 400kV substation at Noida sector-137 with 400/220kV 2x500MVA 400/220kV ICTs

## **2.11 Evacuation System for Rosa (2x300MW) TPS**

220kV D/C lines viz (i) Rosa – Shahjahanpur, (ii) Roza – Hardoi, and (iii) Rosa – Badaun

Member may take note and concur the connectivity proposals.

### 3. Intra-state Transmission System in Haryana

3.1 Based on proposal given by HVPNL and discussions/examination of these proposals in CEA, the following intra-state transmission system has been proposed to be take-up by HVPNL at the own cost of Haryana:

3.2 The additional generation within the state and procured directly into the STU grid for which transmission system and strengthening have been evolved are following:

	<u>MW</u>
i) Hissar (1200 MW)	1200
ii) Jhajjar-I (1500 MW), Haryana 50%	750
iii) Jhajjar-II (2x660 MW through case-II bidding)	1320
iv) Adani Power (through case-I bidding) injected at Mohindergarh s/s (Adani has proposed to inject power from 1980 MW(3x660) <i>phase iv, extension of Mundra Project in Gujarat through 2500MW ± 500 kV HVDC Mundra- Mohindergarh transmission line</i> )	1424
Total	----- 4694

For evacuation and transmission of above power to various load center in Haryana, HVPNL's following transmission schemes are proposed (System with Hissar TPS and Jhajjar-I already firmied-up and discussed/informed in earlier meetings) :

#### 3.3 **HVPNL's Transmission system for Jhajjar-I TPS for 50% of 1500MW**

- i) Jhajjar-I – Daulatabad 400 kV D/C line
- ii) Daulatabad – Gurgaon 400 kV quad D/C line
- iii) Daulatabad 400kV substation with 3x315 MVA 400/220kV

#### 3.4 **Evacuation system for Hissar TPS (1200MW)**

- i) Hissar(TPS) – Sirsa 400 kV D/C line
- ii) LILO of one circuit of Hissar(TPS) – Sirsa 400kV line at Fatehabad(PG)
- iii) Hissar(TPS) – Hissar 400kV HVPNL 400kV D/C
- iv) Sirsa 400kV substation with 2x315 MVA 400/220kV
- v) Hissar 400kV HVPNL s/s with 3x315 MVA 400/220kV
- vi) LILO of both ckts of Jind-Hissar IA 220kV D/C at Hissar 400kV HVPNL s/s with a new 220 kV S/S at Masudpur (Hansi) on 400 kV Hisar- Hisar IA section. 220 kV link between 400 kV Hisar- Masudpur shall be with moose conductor'.

**3.5 Establishment of 400kV substations of HVPNL at Mohindergarh(Dhanonda) and Sonipat (Deepalpur)**

- i) LILO of the one circuit of Bhiwadi-Moga 400kV D/C line at Mohindergarh HVPNL (Dhanonda)( the other circuit to be LILoed at Mohindergarh HVDC terminal S/S of Adani )
- ii) Mohindergarh (Dhanonda) 400kV s/s of HVPNL with 3x315MVA 400/220kV
- iii) LILO of the one circuit of Abdullapur-Bawana 400kV D/C line at Sonipat(Deepalpur)
- iv) Sonipat (Deepalpur) 400kV s/s of HVPNL with 2x315MVA 400/220kV

**3.6 Transmission system for with Jhajjar –II (2x660 MW through case-II bidding)**

- i) Jhajjar-II – Mahindergarh 400 kV D/C line
- ii) Jhajjar-II – Rohtak 400 kV quad D/C line
- iii) Rohtak – Sonipat (Deepalpur)400 kV quad D/C line
- iv) Rohtak 400kV substation with 2x315 MVA 400/220kV

**3.7 Interconnecting system for Mohindergarh HVDC terminal sub-station of Adani Power**

Adani Power has proposed 2500MW HVDC station at Mohindergarh.and for delivery of power to HVPNL, Mohindregarh (Adani HVDC) – Mohndergarh (Dhanonda) HVPNL400kV D/C line has been proposed. For delivery of 1424 MW of power, this line should be with triple moose conductors so that outage of one circuit could be met.

For the power over and above the power to be supplied to Haryana, connectivity with CTU network through LILo of one circuit of Bhiwadi-Moga 400kV D/C line could be considered. The LILo should be on the circuit other than the one which would be LILoed at Mohindergarh (Danonda) HVPNL. For tying-up connectivity and open access to CTU network, Adani Power would need to seek open access from CTU.

**3.8 Transmission system of HVPNL for Adani power (1424MW) injected at Mohindergarh s/s of HVPNL**

- i) Mohindergarh(Dhanonda) – Daulatabd 400kV quad D/C
- ii) Daulatabad – Sector 20 Gurgaon 220 quad D/C (O/H line in outer areas and 220kV multi cables in city area where o/h line may not be feasible)
- iii) Enhancing 220/66 kV transformer capacity at Sector 20 Gurgaon substation and underlying 66kV system

It was proposed to have 400kV substation at sector 20. However, due to envisaged RoW problem in entering sector 20 s/s through 400kV tower line, 220kV s/s with 220kV quad D/C line is proposed.

### **3.9 Third 400kV substation for Gurgaon (at Sector 52 by ITP)**

Two 400kV s/s for Gurgaon viz. Sector-72 of PGCIL and Daulatabad are already planned/under construction. There is also an urgent requirement of another 400kV s/s for Gurgaon which is proposed to be provided under North Karanpura Transmission Scheme under process by implementation by private sector through a SPV of REC. HVPLN can spare about six acres of space at their sector-52 220kV substation and this space could be utilized for the proposed 400kV GIS substation with the cost of alteration at HVPNL substation to be borne by the ITP. To economize both cost and space, 220kV output of the 400/220kV transformers should directly feed at existing HVPNL 220kV bus.

HVPNL may confirm.

The transformer capacity at the substation is proposed as 2x500MVA (7x166.7MVA single phase units) 400/220kV with space for future one more 500MVA (3x166.7 MVA single phase units). HVPNL should plan 220kV outlets accordingly.

**Member may take note of HVPNL's transmission system and concur to the proposed interconnectivity with the regional grid.**

## **4. Intra-state Transmission System in Punjab**

4.1 Based on proposal given by PSEB evolved based on their studies done by PGCIL, the following intra-state transmission system has been proposed to be take-up by PSEB at the own cost:

### **4.2 Power evacuation system from Talwandi Sabo (2000 MW) and Rajpura TPS (1320 MW) and system strengthening for Punjab**

PSEB has informed that they are going to install two thermal power projects wholly owned by PSEB one at Talwandi Sabo (2000 MW) at Mansa District and the second 1320 MW thermal power projects at Rajpura to meet the power requirement of the State. It has been intimated that the commissioning schedule of the generation project is August 2011. Talwandi Sabo generation has been planned in vicinity of the already existing GNDTP Bhatinda TPS (440 MW) and GHTP



Lehra Mohabbat TPS(420 MW) of PSEB. It has already been informed that the existing capacity of the Lehra Mohabbat would be augmented by 500 MW. Thus making the total capacity at the station to 920 MW. Considering the amount of power required to be evacuated from Talwandi Sabo as well as Rajpura TPS, evacuation from both these generating stations has been planned at 400 kV. PSEB has proposed the following transmission system from Talwandi Sabo as well as Rajpura generation:

- i) Talwandi Sabo - Muktsar 400 kV D/C line
- ii) Muktsar - Patti - Nakodar 400 kV D/C
- iii) Patti - Amritsar (PGCIL) 400 kV D/C line
- iv) Talwandi Sabo - Nakodar 400 kV D/C (one ckt to be LILoed at Moga 400kV PGCIL s/s)
- v) Talwandi Sabo - Dhuri 400 kV D/C
- vi) Dhuri - Rajpura 400 kV D/C
- vii) Rajpura - Rajpura TPS 400kV D/C
- viii) Rajpura TPS - Nakodar 400kV D/C
- ix) Establishment of 400/220 kV S/S by PSEB at Muktsar, Patt and Nakodar with 2x315 MVA 400/220kV trf at each
- x) Establishment of 400/220 kV S/S by PSEB at Rajpura and Dhuri with 2x500 MVA 400/220kV trf at each

In the above, works at (iii) and (iv) require interface with regional network of PGCIL.

Members may take note and concur.

## **5. 765kV System for the Central part of Northern Grid.**

5.1 Proposal for the 765kV system around Delhi was re-discussed in the last meeting of Standing Committee (25<sup>th</sup> meeting held on 10-7-2008) when it was decided to review the proposal in view of injection of Bawana, Jhajjar and Dadri-II power. Subsequently, Jhajjar-II and injection of Adani Power at Mohindergarh have also necessitated review of the scheme based on further detailed studies.

5.2 Accordingly, studies have been done considering all the additional schemes and also the increased demand that could be met through addition of planned generation. Based on the studies (being sent separately and to be presented in the meeting), the following scheme is proposed:

- Agra-Meerut 765kV S/C (also proposed to be LILoed at G.Noida of UPPCL)
- Agra-Jatikalán(Delhi) 765kV S/C
- Jatikalán-Bhiwani 765kV S/C
- Meerut-Bhiwani 765kv S/C

- Bhiwani-Moga 765kV S/C
- New 765kV substation at Jatikalan (4x1500MVA 765/400kV)
- LILO of both circuits of Mundka-Bamnouli 400kV D/C at Jatikalan
- 400kV bus at Jatikalan to be split in two parts with 2x1500 MVA 765/400kV ICT on the Bamnoui side and 2x1500 MVA 765/400kV ICT on Mundka side.

Mandola 400kV bus also to be split with two circuits to Meerut and two circuits to Bawana on one side and other two circuits to Meerut and Dadri circuits to be on other side.

With the above arrangement, Delhi 400kV ring would become as Dadri-Mandola-Meerut-Mandola-Bawana-Mundka-Jatikalan400kV-Jatikalan765kV-Jatikalan400kV-Bamnoli-Dadri.

With above arrangements, Jhjjhar-Mundka can be connected to 400kV Mundka S/S on 400kV Delhi ring while short circuit /load remaining within limits.

- New 765kV substation at Meerut (2x1500MVA 765/400kV) and Bhiwani (2x1000MVA 765/400kV)
- LILO of both circuits of Bawana/Bahaduragh-Hissar 400kV D/C at Bhiwani
- Augmentation of Meerut and Agra 765kV s/s for bays
- Upgrading Moga s/s to 765kV /400kV 2x1500 MVA, 765/400 kV
- Necessary Reactive Compensation – bus and line reactors

5.3 Studies to be presented.  
Members may discuss and decide.

## 6.0 New Regional Schemes

The following new regional system strengthening schemes are proposed:

- (1) Provision for 3<sup>rd</sup> 400/220 kV ICT at Bhiwadi

Haryana has proposed this to provide connectivity through LILO 2<sup>nd</sup> 200 kV line from Badshapur – Riwari of HVPNL

- (2) 2 nos. of additional 220 kV bays at Panchkula , Sonipat(PG) and Gurgaon sec-72 s/s of PGCIL for HVPNL

Haryana has proposed the above additional 220kV bays in line with the decision taken in the 23<sup>rd</sup> SCM to have 6 bays with first two 400/220 kV , 315 MVA ICT. The bays are to be utilized by HVPNL for meeting load demand of that area.

- (3) With Bhiwani 765/400kV substation

Regional scheme of PGCIL

- Bhiwani-Jind 400kV D/C
- Jind 400/220kV 2x315 MVA substation

To be constructed by HVPNL at their own cost

- Bhiwani-Rohtak 400kV D/C
- Jind-Hissar HVPN 400kV s/s D/C

- (4) 400 kV S/S at Sohawal with 2x315 MVA ICT 2 nos. to be established by LILO of both the circuit of Balia - Lucknow 400 kV D/C line

UPPCL has proposed the above s/s for meeting load demand in Faizabad area.

- (5) Saharanpur 400 kV S/S with 2x315 MVA ICT to be established by LILO of both the ckt of Dehradun - Baghpat 400 kV quad line  
UPPCL has proposed the above s/s for meeting load demand in Saharanpur area.

- (6) Shahjahanpur 400 kV S/S with 2x315 MVA ICT to be established by LILO of both the ckt of Lucknow (PG) – Bareilly (PG) 400 kV D/C line

UPPCL has proposed the above s/s for meeting load demand in Shahjahanpur area. This regional s/s is proposed in lieu of Hapur s/s agreed earlier but not proposed under PGCIL now due to 765/400/220 s/s of UPPCL at Hapur.

- (7) Creation of new 220/400 kV S/S at Jaipur (South) with 2x500 MVA transformer to be created by LILO of Agra - Jaipur line at Jaipur

The new substation at Jaipur would help in mitigating the heavy loading on the existing 400 kV S/S at Jaipur

- (8) Creation of 220/400 kV 2x500 MVA S/S at Ramban by LILO of the proposed 400 kV line from Kishenpur to New Wangpoh - Wagoora

The S/S would be utilized for evacuation of power from Chenab basin project in J&K as well as utilized for disbursement of power at 220 kV in Jammu region.

## 7. Power Evacuation from Parbati and Koldam HEP

- 7.1 M/s Parbati Koldam Transmission Company Limited, PKTCL, a JV of Reliance and PGCIL has been formed by PGCIL for development of part of Evacuation System for Parbati and Koldam. Ms/ PKTCL have stated that they have been entrusted for setting up of Parbati Koldam

transmission system to facilitate evacuation of power from Koldam and Parbati-II HEP to the Northern beneficiaries. The scope of transmission system is :

S. No	Transmission Lines	Voltage Level and line length
1.	<b>Parbati – Koldam</b>	400 kV Quad
a.	Single Circuit line –I	75 km
b.	Double Circuit line	3.5 km
c.	Single Circuit line-II	75 km
2.	<b>Koldam – Ludhiana</b>	400 kV D/C Triple Snowbird, 150 kms.

7.2 The above transmission system was evolved and finalized in the 14th and 15th meeting of the Standing Committee on Power System Planning of Northern Region held on 30th December 2002 and 30th May, 2003 respectively. The scheme was evolved in a composite manner and it was proposed to establish a pooling station at Panarsa where power from Allain Duhangan HEP and Malana - II HEP was also proposed to be pooled. Subsequently, Parbati II/III HEP got delayed whereas ADHEP and Malana-II HEP were progressing for commissioning ahead of Parbati - II/III HEPs. CEA had suggested that part of the Parbati - II transmission system i.e. one of the line from proposed pooling station at Panarsa upto Koldam could be advanced matching with ADHEP. However, this could not materialize as Powergrid, had proposed Parbati - II transmission system to be taken up through joint venture route. The JV route in this case took very long time and it became necessary to review the evacuation system from ADHEP and Malana - II. A 220 kV D/C line from ADHEP which was earlier proposed to be terminated at Panarsa was extended upto Nalagarh. This line, i.e. 220 kV D/C line from ADHEP to Nalagarh is already under construction and is expected to be commissioned by December, 2008. The line would evacuate power of ADHEP as well as Malana II up to Nalagarh.

7.3 In view of the above, the requirement of transmission system which was planned in 2002-03 needs review. In particular the utility of Koldam – Ludhiana 400 kV D/C line and also the necessity of 2 x S/C lines between Parbati and Koldam, vis-à-vis, a D/C line particularly between Panarsa and Koldam section needs consideration.

7.4 Members may discuss and decide. All constituents would need to sign BPTA with M/s PKTCL.

**8. Power evacuation system from Sainj HEP (100 MW) by HPPGCL**  
Sainj HEP would be constructed by Himachal Pradesh Power Generation Company Ltd (HPPGCL). Considering the narrow corridor in Parbati basin construction of independent line for evacuation of

power from Sainj HEP may not be the right solution. It is proposed that for evacuation of power from Sainj HEP, a 400/132 kV sub-station may be created by HPSEB by taking a 400kV line from Parbati-III and Sainj power may be evacuated at 132kV to this s/s through at 132 kV line.

NHPC may therefore confirm provision of space for one additional 400kV bay at their switchyard at Parbati-III.

**9. Proposal for loop in loop out of 220 kV Jullundhur - Hamirpur line near Gagret 220/132 kV S/S of Himachal Pradesh**

HPSEB have planned to set up 220/132 kV, 100 MVA S/S near Gagret in District Una of Himachal Pradesh. The proposed 220 kV S/S at Gagret would meet the upcoming industrial load demand of the surrounding area particularly Tahliwara and Hamirpur area. HPSEB has proposed to LILO of the one ckt of the existing Jullundhur - Hamirpur (Mattansidi) 220kV D/C line of PGCIL at their 220/132 kV Gagret S/S. Considering the requirement for meeting the upcoming industrial load demand of Hamirpur and surrounding area, the above proposal can be agreed. However, HPSEB should LILO both the ckt of Jullundhur - Hamirpur 220kV D/C line at Gagret instead of one ckt as proposed so that loadability is not compromised.

The proposal may be concurred.

**10. Transmission system associated with Dadri II TPS (2x490 MW)**

- 10.1 In the 21<sup>st</sup> and 22<sup>nd</sup> SCM following system with Dadri II was agreed
- (i) NTPC would provide 2 nos. additional 400 kV bays at Dadri
  - (ii) 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
  - (iii) Dadri II – Bamnauli 400 kV D/D line, part of which in Maulti circuit tower in using the ROW of Badarpur Mehrauli 220 kV D/C line.
- 10.2 During route survey for the line from Dadri to Bamnauli, acute difficulties have been noticed in RoW and feasibility of converting the existing line to multicircuit. Injection of Jhajjar power as well as Bawana on the same South/West side of Delhi ring has also necessitated review of the proposal. After analysis, it is observed that instead of Dadri-Bamnauli 400kV D/C line, alternate proposal of having 400kV Dadri-Loni Road D/C line with 400/220kV Loni Raod s/s and also connecting the Loni Road s/s through LILO of one circuit of Dadri-

Panipat 400kV line would work out to be a more feasible solution. Accordingly, the same may be adopted.

**11. Requirement of shifting of Sasaram HVDC module.**

The proposal for NR sharing 25% transmission charges of SR-WR Narendra-Kolhapur HVDC b-t-b scheme has not been agreed by NR constituents. As other regions have agreed for only 75% transmission charges, the scheme is held-up. Consequently, shifting of Sasaram b-t-b HVDC modules is also held-up affecting the works for 765kV s/s at Sasaram which are part of DVC generation related transmission scheme. In case the module are not shifted, additional space adjoining the existing s/s may not be feasible to get and may require a new 765kV s/s.

Members may discuss and decide.