



भारत सरकार / Government of India
विद्युत मंत्रालय / Ministry of Power
केन्द्रीय विद्युत प्राधिकरण / Central Electricity Authority



विद्युत प्रणाली योजना एवं परियोजना मूल्यांकन प्रभाग - I
Power System Planning & Project Appraisal Division-I

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[ISO: 9001:2008]

No. 1/9/38th /PSP&PA-2016 /

Dated: 12.5.2016

-As per list enclosed-

Sub: 38th Standing Committee Meeting of Power System Planning of Northern Region to be held on 30.5.2016- Agenda for the meeting

Sir/ Madam,

The 38th meeting of the Standing Committee on Power System Planning of Northern Region is scheduled to be held on 30.5.2016 (Monday) at 10:30 A.M. at NRPC conference Room, NRPC Katwaria Sarai, New Delhi.

The Agenda for the meeting has been uploaded on CEA website: www.cea.nic.in (path to access – Home Page -Wing specific document/power system related reports/ Standing Committee on Power System Planning/ Northern region).

It is requested to kindly make it convenient to attend the meeting

Yours faithfully,

Chandra
(Chandra Prakash) 12/5/2016
Director

Copy to:

PPS to Member (PS), CEA

1.	Member, Secretary, NRPC, 18-A Shajeed Jeet Singh Sansanwal Marg, Katwaria Sarai, New Delhi - 110016 (Fax-011-26865206)	2.	Director (W &P) UPPTCL, Shakti Bhawan Extn,3rd floor, 14, Ashok Marg, Lucknow - 226 001 (Fax:0522-2287822)	3.	Director (Projects) PTCUL, Urja Bhawan Campus, Kanawali Road Dehradun-248001. Uttrakhand Fax-0135-276431
4.	Director (Technical), Punjab State Transmission Corporation Ltd. (PSTCL) Head Office The Mall Patiala -147001 Fax-0175-2304017	5.	Member (Power) BBMB, Sectot-19 B Madhya Marg, Chandigarh-1 60019 (Fax-01 72-2549857	6.	Director (Operation) Delhi Transco Ltd. Shakti Sadan, Kotla Marg, New Delhi-110002 (Fax-01123234640)
7.	Director (Technical) RRVPNL, Vidut Bhawan, Jaipur-302005. Fax:-0141-2740794	8.	Director (Technical) HVPNL Shakti Bhawan, Sector-6 Panchkula-134109 Fax-0172-256060640	9.	Director (Technical) HPSEB Ltd. Vidut Bhawan, Shimla -171004 Fax-0177-2813554
10.	Managing Director, HPPTCL, Barowalias, Khalini Shimla-171002 Fax-0177-2623415	11.	Chief Engineer (Operation) Ministry of Power, UT Secretariat, Sector-9 D Chandigarh -161009 Fax-0172-2637880	12.	Development Commissioner (Power), Power Department, Grid Substation Complex, Janipur, Jammu, Fax: 191-2534284
13.	Chief Engineer (Transmission) NPCIL, 9-S-30, Vikram Sarabhai Bhawan, Anushakti Nagar, Mumbai-400094 Fax-022-25993570	14.	Director (T&RE) NHPC Office Complex, Sector-33, NHPC, Faridabad-121003 (Fax-0129-2256055)	15.	Director (Projects) NTPC, NTPC Bhawan, Core 7, Scope Complex-6, Institutional Area, Lodhi Road. New Delhi (Fax-011-24361018)
16.	Director (Technical) THDC Ltd. Pragatipuram, Bypass Road, Rishikesh-249201 Fax: 0135-2431519)	17.	Director (Projects) POWERGRID Saudamini Plot no. 2, Sector - 29. Gurgaon-122 001 (Fax-0124-2571809)	18.	CEO, POSOCO B-9, Qutab Institutional Area, Katwaria Sarai New Delhi – 110010 (Fax:2682747)
19.	COO (CTU) POWERGRID, Saudamini, Plot no. 2, Sector -29, Gurgaon-122 001 (Fax-0124-2571809)				

Agenda of the 38th Standing Committee Meeting (SCM) on Power System Planning of Northern Region to be held on 30.5.2016 (Monday) at 10:30 A.M. at NRPC conference Room, NRPC Katwaria Sarai, New Delhi

1.0 Confirmation of the Minutes of the 37th meeting of the Standing Committee on Power System Planning of Northern region held on 20th January, 2016.

1.1 The minutes of 37th meeting of the Standing Committee on Power System Planning of Northern Region were issued vide CEA letter No. 1/9/37th SCM/2015-PSP&PA-I/162-181 dated 11th Feb, 2016.

1.2 Powergrid vide their letter C/CTU/N/PLG dated 14.2.2016 had given the observations regarding the connectivity of Bilhaur TPS (NTPC) wherein instead of Bilhaur –Kanpur 400kV D/C Quad line, Bilhaur –Kanpur 400kV D/C line has been mentioned.

Hence, point no 1.2.2.3 of the minutes is modified as follows:

Connectivity of Bilhaur TPS (NTPC):

- Bilhaur –Kanpur 400kV D/C (Quad) line

1.3 The minutes of the 37th meeting along with above modification may be confirmed subject to the observation by the members.

2.0 New WR- NR 765 kV Inter-regional corridor

2.1 A new WR - NR 765 kV Strengthening Transmission Corridor was discussed in the 39th meeting of the Standing Committee on Power System Planning of Western Region held on 30th November, 2015 with the following proposed transmission elements:

- Establishment of New 2x1500MVA, 765/400kV Substation at Allahabad
- Vindhyachal Pool – Allahabad (New) 765kV D/C line
- Allahabad (New) – Lucknow 765kV D/C line
- LILO of Sasaram – Fatehpur 765kV S/C line at Allahabad (New)
- LILO of Meja – Allahabad 400kV D/C line at Allahabad (New)

2.2 The proposal was later discussed in the 37th Standing Committee Meeting of Power System Planning of NR held on 20/1/2016. UPPTCL raised the issue of utilisation of ER-NR corridor before finalising the strengthening of NR-WR corridor, as the already constructed corridors are not getting utilised and instead resulting in loop flows. Accordingly, it was

decided that a sub-committee comprising of CEA, CTU and UPPTCL would be formed to discuss and finalize the transmission strengthening scheme between WR and NR. After finalisation of the strengthening scheme, LTA applications would be considered.

2.3 Study was carried out by Powergrid in consultation with UPPTCL and CEA. UPPTCL proposed that in view of certain upcoming generation in Allahabad and adjoining area, it would be better to connect WR to 765 kV Varanasi (PG) substation instead of 765/400kV Allahabad (New). In this way, construction of a new 765/400kV substation at Allahabad along with 400kV connectivity can be avoided. Further, the study was revised to 2019-20 time frame anticipating that the process of award and completion of the project would take around four years. Considering the above inputs, Vindhyachal Pooling Station - Varanasi 765kV D/C line was agreed by the sub-committee to be implemented as 765 kV NR-WR Strengthening corridor. The corridor shall provide strong connectivity of NR and WR and would facilitate flow of power under various contingencies of line outage, economic despatch of power market operation etc. Study results are enclosed at **Exhibit-1** to **Exhibit-4**.

- **Exhibit – 1:** Basecase
- **Exhibit – 2:** Basecase N-1, (1 ckt of 765kV Agra – Gwalior D/C line)
- **Exhibit – 3:** With Proposed System
- **Exhibit – 4:** With Proposed System N-1 (1 ckt of 765kV Agra – Gwalior D/C line)

2.4 Further, in order to facilitate charging of the line and maintaining voltage within stipulated limits under various network operating conditions, a 330 MVAR line reactor in both circuits of Vindhyachal Pooling Station- Varanasi 765kV D/C line is proposed at Varanasi end as a part of Inter-Regional system strengthening scheme for NR. Thus the proposed system for **WR- NR 765kV Inter-regional corridor** is:

1. 765kV Vindhyanchal Pooling Station – Varanasi D/C line.
2. 330 MVAR line reactor in both lines at Varanasi end.

Members may deliberate.

3.0 Evacuation of New Generation Project in 13th Plan (2017-2022):

3.1 The proposal of UPPTCL on the transmission system for evacuation of power from 1x660 MW Panki Extension TPS, 1x660 MW Harduaganj Extn., 2x660 MW Obra “C” TPS and 2x660 MW Jawaharpur (Etah) TPS along with some 765 kV and 400kV Substations was discussed in the 37th SCSPNR, wherein it was agreed that a joint study would be carried out with UPPTCL, CEA and CTU and the study results would be taken up for discussions in the next SCSPNR.

3.2 UPPTCL had submitted that these generation projects are likely to be commissioned by 2019-2022. The generation from these projects are meant for the State of Uttar Pradesh as these being constructed by UPRVUNL. Along with the evacuation system of these projects, they have also proposed the strengthening of the transmission system in Uttar Pradesh. UPPTCL had also submitted the study results for the proposed transmission elements under the DPR for World Bank funding in CEA for 13th Plan. The study results are enclosed at **Exhibit – 5**.

3.3 Subsequently, CEA carried out the studies for the transmission elements under the proposal and the proposed transmission network is generally in order. No overloading is observed on the existing as well as proposed transmission elements. The study file has been uploaded on CEA website. The following transmission elements including the generation projects are considered in the studies:

3.3.1 Evacuation System for the following Generation Projects:

(A) 1x660 MW Panki Extension TPS Power (2020-21):

The evacuation system is as under:

- (i) Generation Transformer 21/400 kV
- (ii) Panki TPS – Panki 400 kV D/C line – 3km
- (iii) Bus Reactor at Panki TPS -125 MVAR

(B) 1x660 MW Harduaganj TPS (2019-20):

The evacuation system is as under:

- (i) G.T 21/400 kV at Harduaganj Extn.

- (ii) LILO of one ckt of Aligarh-Sikandrabad 400 kV D/C line (Isolux line) at Harduaganj TPS- 25 km.
- (iii) 400/220 kV 2x315 MVA ICT at Harduaganj Extn.
- (iv) 220 kV Spare Bays – 2 nos
- (v) 80 MVAR bus Reactor at Harduaganj TPS.

(C) 2x660 MW Obra “C” TPS (2019-20):

The evacuation system is as under:

- (i) G.T. 21/765 kV at Obra “C”
- (ii) 2x1500 MVA 765/400 kV ICT at Obra “C”
- (iii) LILO of Anpara “D” – Unnao 765 kV S/C line at Obra “C” – 40 km.
- (iv) Obra “C” – Jaunpur 400 kV D/C line – 200 km.
- (v) LILO of one ckt of Obra – Jaunpur 400 kV D/C line at Obra (Existing) – 15 km.
- (vi) Bus Reactor 330 MVAR 765 kV at Obra “C”

(D) 2x660 MW Jawaharpur (Etah) TPS (2021-22):

The evacuation system is as under:

- (i) Evacuation at 765 kV with G.T. 21/765 kV
- (ii) LILO of Mainpuri – Greater Noida 765 kV S/C line at Jawaharpur TPS - 30 km
- (iii) 765/400 kV 2x1500 MVA ICT at Jawaharpur TPS
- (iv) 400/220 kV 2x500 ICT at Jawaharpur TPS
- (v) Creation of Firozabad 400/220/132 kV 2x500, 2x160 MVA substation
- (vi) Jawaharpur TPS – Firozabad 400 kV D/C line – 80 km
- (vii) Firozabad – Agra South 400 kV D/C– 40 km
- (viii) Etah – Jawaharpur TPS 220 kV D/C – 20 km
- (ix) Jawaharpur TPS – Sirsaganj 220 kV D/C – 40 km
- (x) 330 MVAR, 765 kV Bus Reactor at Jawaharpur TPS

3.3.2 New 765/400 kV substations:

(A) 765/400/220 kV substations at Modipuram (Meerut):

As the existing Matur (Meerut) 765/400/220 kV PGCIL substation feeding most of Meerut area would fully get loaded within 3-4 years and its capacity would be exhausted. Accordingly, the transmission elements are:

- (i) Construction of 765/400 kV, 2x1500 MVA; 2x500 MVA, 400/220 kV Modipuram (Meerut) S/S
- (ii) Hapur – G.Noida 765kV S/C line at Modipuram (Meerut) – 20 km
- (iii) Modipuram (765) – Simbholi 400 kV D/C line – 40 km
- (iv) Modipuram (765) – Shamli (400) D/C– 60 km
- (v) Modipuram – Baghpat 400 kV D/C line – 60 km

(B) 765/400/220 kV S/s Moradabad:

The existing 400/220/132 kV S/s Moradabad is heavily loaded in peak hours and load would further increase in 3-4 years requiring new 400 kV S/s in the area. 400/132 kV S/s Nehtaur (Bijnor) would provide some relief. However, 765 kV Substation may be required to feed the same by creating more 400 kV substations in the area. Accordingly, the transmission elements are:

- (i) Construction of 765/400 kV, 2x1500 MVA; 2x500 MVA, 400/220 kV substation at Moradabad.
- (ii) LILO of approved Ghatampur TPS – Hapur 765kV S/C line at Moradabad.
- (iii) Moradabad (765) – Sambhal 400 kV D/C line – 50 km.
- (iv) Moradabad (765) – Moradabad (400) D/C line – 25km
- (v) Creation of 400/220 kV 2x500 MVA S/s Sambhal.

3.3.3 New 400/220 kV substations:

(A) 400/220/132 kV 2x500MVA(400/220kV), 2x160 MVA(220/132kV) Firozabad:

- (i) Firozabad – Jawaharpur TPS 400 kV D/C line – 40 km
- (ii) Firozabad (400) – Agra South 400 kV D/C line – 50 km
- (iii) Firozabad (400) – Tundla 220 kV D/C line
- (iv) Firozabad (400) – Firozabad (220) D/C line

(B) 400/220 kV 2x315 MVA Badaun:

- (i) Roza TPS – Badaun 400 kV DC line - 90 km
- (ii) Badaun – Sambhal 400 kV DC line – 50 km

(C) 400/220 kV S/s Jaunpur:

Existing Varanasi 400/220/132 kV and Azamgarh 400/220/132 kV substations get highly loaded in peak load conditions. Aurai 400/220/132 kV S/s would to be available in 2016 which would provide some relief. However, new 400 kV S/s in future would be required to provide relief to both Varanasi and Azamgarh substations. This would also help in evacuating Obra “C” TPS power.

- (i) Construction of 765/400 kV, 2x1500 MVA; 2x500 MVA, 400/220 kV substation at Jaunpur.
- (ii) Obra”C” – Jaunpur 400 kV DC line – 200 km.
- (iii) Varanasi (765) PGCIL – Jaunpur 400 kV DC line – 60 km.
- (iv) Construction of 400 kV Bays at Varanasi (765) PGCIL S/s – 2Nos

(D) 400/220/132 kV Rasra (Mau):

Existing 400/132 kV Mau substation is likely to be fully loaded within 2-3 years. A new S/s at Rasra is proposed:

- (i) Construction of 2x500 MVA, 400/220 kV; 2X160 MVA, 220/132 kV substation at Rasra (Mau)
- (ii) LILO of one ckt of Balia – Mau 400 kV DC line at Rasra – 15 km
- (iii) Balia (PGCIL) – Rasra 400 kV S/C line – 35 km

It was observed that for Rasra S/s LILO of one circuit of 400kV Balia – Mau 400 kV D/C line at Rasra would meet the present demand. The provision of Balia (PGCIL) – Rasra 400 kV S/C line may be kept for future.

(E) 400/220/132 kV Simbholi:

- (i) Construction of 2x500 MVA, 400/220 kV; 2X160 MVA, 220/132 kV substation at Simbholi
- (ii) Modipuram (765) – Simbholi 400 kV D/C line – 40 km
- (iii) Simbholi – Moradnagar –II 400 kV D/C line – 50 km

(F) 400/220/132 kV Sambhal:

- (i) Construction of 2x500 MVA, 400/220 kV; 2X160 MVA, 220/132 kV substation at Sambhal
- (ii) Badaun – Sambhal 400 kV DC line – 90 km
- (iii) Moradabad – Sambhal 400 kV DC line – 50 km

Members may like to deliberate.

4.0 Overloading on Singrauli - Anpara 400kV S/C line

- 4.1** Due to high generation in Rihand- Singrauli complex, 400 kV Singrauli - Anpara S/C line often gets overloaded. The overloading conditions were also discussed in 36th Standing Committee Meeting of Power System Planning of NR wherein Powergrid proposed Rihand - Anpara 400kV D/c line for relieving the constraint. However, UPPTCL raised their reservations due to the high short circuit current contribution at Anpara from Singrauli complex. Short circuit studies have been carried out and it has been observed that the fault level at Singrauli and Anpara is 41 kA and 44 kA, respectively. Short circuit studies were carried out with a 12 ohm series reactor on the Singrauli- Anpara 400kV S/C line. From the study results, it is observed that the fault level at Singrauli and Anpara gets reduced to 35 kA and 39 kA respectively, with series reactor in service.

Members may like to deliberate.

5.0 Evacuation System for Tapovan Vishnugarh HEP & Pipalkoti HEP and finalisation of land for the proposed substation at Pipalkoti under UITP

- 5.1** During the 37th Standing committee meeting of Power System Planning of NR, it was decided that a meeting would be convened under the chairmanship of Member (PS), CEA with representatives from CTU, PTCUL, NTPC and THDC for finalising the evacuation system for Tapovan Vishnugarh HEP and Pipalkoti HEP as well as for the finalisation of land for the proposed Pipalkoti 400/220 kV substation under UITP to implemented by PTCUL. Accordingly, meetings were held in CEA on 18/2/16 and 10/03/2016.
- 5.2** During the meetings, NTPC informed that Tapovan Vishnugarh is likely to come up by September 2018, and Pipalkoti HEP by December, 2019. It was decided that Pipalkoti substation should first be constructed as a switching station for evacuating Vishnugad HEP (NTPC) and Pipalkoti HEP (THDC) with the provision of installing 400/220kV ICTs in future for evacuating other HEPs in Alaknanda basin as and when they are cleared by Hon'ble Supreme Court.
- 5.3** It was also decided that for evacuation of power from Tapovan Vishnugad HEP, PTCUL shall construct 400 kV D/C line with twin conductor from Tapovan Vishnugad HEP to the proposed Pipalkoti substation and 400 kV quad line from the proposed Pipalkoti substation

to Srinagar. Accordingly, there would be a direct connectivity between twin moose and quad moose lines at the proposed Pipalkoti substation and hence switching station would not be required till September 2018 when Tapovan Vishnugad HEP is scheduled to be commissioned.

5.4 As Pipalkoti HEP would be commissioned in December, 2019, the same shall be evacuated by constructing a 400kV switching station at Pipalkoti. Subsequently, 400/220 kV ICTs would be required at Pipalkoti switching station as per the timelines for commissioning of the HEPs in Alaknanda valley.

5.5 Accordingly, the scope for evacuation of power from Vishnugad HEP (NTPC) and Pipalkoti HEP (THDC) may be considered as under:

Tapovan Vishnnugad HEP:

- (i) Tapovan Vishnugad HEP –Pipalkoti 400kV S/s 400kV D/C (Twin Moose) line
- (ii) Proposed site of Pipalkoti 400kV S/s-Srinagar 400kV D/C (Quad Moose) line

Pipalkoti HEP:

- (i) Establishment of 400 kV Pipalkoti switching station in timeframe of Pipalkoti HEP
- (ii) Pipalkoti HEP– 400kV Pipalkoti switching station 400kV D/C (Twin Moose) line
- (iii) Realignment of Tapovan Vishnugad HEP–Pipalkoti 400 kV S/s 400kV D/C (Twin Moose) line at Pipalkoti switching station
- (iv) Realignment of Pipalkoti 400kV Substation– Srinagar 400kV D/C (Quad) line to Pipalkoti switching station.

Members may like to deliberate.

6.0 Construction of four 400/220kV Substations in Delhi:

6.1 Four 400/220kV substations have been envisaged to be constructed by PGCIL in Delhi as STS works at Rajghat, Tuglakabad, Dwarka and Karampura (to be completed by 2016-17).

6.2 A meeting was taken by Hon’ble Minister of State (I/C) for power on 18/4/2016 wherein the issue of land for construction of these substations was also discussed. The gist of the discussions is as under:

Tuglakabad and Dawarka S/S: PGCIL informed that handing of the land for Tuglakabad and Dawarka S/Ss was yet to be completed. The placement of the award was ready but they have not been able to issue the LoA due to non-possession of the land. Govt. of NCT, Delhi

informed that Powergrid may take possession of the land for both substations at any time as all the matters have been sorted out.

Rajghat: As earlier agreed location for Rajghat S/S was shifted to IP Extn. premises, which involves some RoW issues for re-routing of two 220kV lines and some other issues, therefore, it was decided that Govt. of NCT, Delhi and Powergrid would discuss and resolve the issues with regard to allotment of land at IP Extn.

Karpura: Powergrid informed that due to non –feasibility of the line corridor, site for Karampura substation could not be finalized and it was agreed to explore the possibility of this substation through use of some alternative method or use of technology.

PGCIL may please update, if any.

7.0 Connectivity & LTA to GHAVP Nuclear power plant (2X700MW) of M/s NPCIL in Haryana.

7.1 The following evacuation system for Nuclear power generator (2X700MW) of M/s NPCIL for Gorakhpur Haryana Anu Vidyut Pariyojna (GHAVP) located at Fatehabad, Haryana was agreed in during the 37th SCPSNR held on 20/01/2016

Connectivity:

- Fatehabad - NPCIL generation 400kV D/C line

Long Term Access:

- LILO of second circuit of Moga-Hisar 400kV D/C line at Fatehabad
- LILO of both circuits of Moga-Hisar 400kV D/C line at NPCIL generation switchyard

7.2 During the meeting it was also decided that that a suitable scheme for power evacuation should be planned taking implementation of the capacity of 4x700 MW in a phased manner as the final capacity of the plant would be 4x700 MW. Thus, CTU would carry out studies considering the plant capacity as 4x700 MW. Further, the short circuit levels shall be indicated for the proposed LILO of Moga- Hisar 400 kV D/C line as well as other nodes in Haryana.

PGCIL may please update.

8.0 LILO of 220 kV Sarna –Hiranagar –Gladini S/C line at Samba (PG):

8.1 In the 37th SCM meeting, it was decided that LILO of 220kV S/C Gladini – Hiranagar at Samba may be carried out instead of LILO of Sarna – Hiranagar 220 kV S/C line.

PGCIL may please update.

9.0 Status of the Projects in Northern region under implementation through TBCB route:

9.1 The following transmission schemes are under implementation through TBCB route in the Northern Region:

S. No.	Name of Scheme	BPC	Status
1	System Strengthening Scheme in Northern Region (NRSS-XXXVI)” along with LILO of Sikar-Neemrana 400kV D/C line at Babai (RRVPNL)	RECTPCL	Letter of Intent has been placed to the successful bidder M/s Essel Infrastructure Limited on 29/03/2016
2	Creation of new 400kV GIS Substations in Gurgaon and Palwal area as a part of ISTS	PFCCCL	Letter of Intent has been placed to the successful bidder M/s Sterlite Grid on 29/02/2016

Members may like to note.

10.0 Operational Feedback on Transmission Constraint: April 2016

10.1 The operational feedback by NLDC on Transmission constraints in Northern Region for the quarter January to March 2016 is given below:

S. No	Corridor	Season/ Antecedent Conditions	Description of the constraints	Suggestions /Comments/Delibrations in 37 th SCM held on 20/1/2016
I. Transmission line constraints				
1	400 kV Dadri-Muradnagar	February	High MW loading	Due to commissioning of Kashipur –Roorkee 400kV D/C line and Muradnagar-II substation, the loading has reduced considerably. Additional substations such as

				Hapur and Greater Noida 765 kV (Planned by UPPTCL) are expected and their connectivity with the existing network will further relieve this constraint.
2	400kV Dadri-Greater Noida	All time	High MW loading	The UPPTCL is commissioning a new 765400 kV substation at Greater Noida which would relieve the loading. The scheduled commission was February, 2016. UPPTCL to update.
3	400kV Singrauli-Anpara		Full generation at Singrauli/Rihand and with Rihand stage-3 Unit#5 & 6 is also evacuating through the same complex, loading of Singrauli-Anpara become very high. Sometime due to low generation at Anpara –A, B &C and high generation at Rihand-Singrauli Complex, 400kV Singrauli-Anpara often get overloaded.	Severe Right Of Way constraints and availability of bays at Singrauli and Anpara. It was proposed to study installation of the series reactor in the line so as to reduce the high loading
4	400 kV Anpara-Mau and Anpara –Obra		Connected to generating station. (Anpara-B & C)	
5	Mohindergarh Bhiwani 400kV D/C		Already two more 400kV Mohindergarh-Bhiwani D/C lines have been approved.	Commissioning of this line needs to be expedited
6	Phagi - Bassi 400kV D/C	All time	High MW loading.	After the commissioning of 765kV Phagi - Bhiwani 2nd ckt, loading of 400 kV Phagi-Bhiwani would be reduce.
7	400kV Chhabra - Hindaun	All time	Loading is in the range of ~600MW and line length is apporx. 300 km. Under n-1 contingency of 400kV lines from Chhabra TPS would be cause high loading and low voltages.	
8	Underlying 220kV		400/220kV Bhiwadi has three ICTs (3×315 = 945	In the last SCM, RRVPNL stated that the load at Bhiwadi would soon

	network of Bhiwadi		<p>MVA). Though 220kV network connectivity at Bhiwadi is;</p> <ol style="list-style-type: none"> 1. 220kV Bhiwadi-Bhiwadi Raj D/C 2. 220kV Bhiwadi-Kushkhera D/C 3. 220kV Bhiwadi-Rewari (Bus split) & 220kV Bhiwadi-Mau. <p>Both circuits connected to Haryana and import of power from Haryana is restricted through bus split. 220kV Bhiwadi-Bhiwadi Raj D/C is always loaded ~200 MW each. Any N- 1 contingency at 220kV network would cause further tripping at 220kV Bhiwadi.</p>	be diverted to Neemrana & Alwar which are going to be commissioned.
9	Underlying network of following substation is not available		<p>220kV network not available;</p> <ol style="list-style-type: none"> 1. Bhiwani (Haryana) 2. Jind (Haryana) 3. Sohawal (Uttar Pradesh) 4. New Wanpoh (J&K) 5. Samba (Jammu & Kashmir) 6. Shahjahanpur 7. Bagpat (PG) 8. Kurukshetra (PG) 9. Sikandrabad (UP) 	<p>Haryana: Bhiwani and Jind (lines to be commissioned in 1 year) UP: Sohawal (Sohawal 1 year, Tanda Oct 15, Barabanki 1 year), Shahjahanpur (Oct. 15) Delhi: Mundka (additional drawal required) Haryana: Sonapat (partly being utilised due to less load) Punjab: Makhu (partly commissioned) Samba: to be commissioned by April 2016. Powergrid to update.</p>

II. ICT Constraints

S. No	ICT	Season/ Antecedent Conditions	Description of the constraints	Suggestions /comments
1.	400/220kV 2x315 MVA Mainpuri	Winter	Two ICTs of 315 MVA each loaded in the range of ~240 MW and not N-1 compliant.	New ICT would be commissioned in 20 months time.
2.	400/220kV,	Security	Four ICTs of 315MVA each loaded in	JKPDD to update

S. No	ICT	Season/ Antecedent Conditions	Description of the constraints	Suggestions /comments
	4 x 315 MVA Wagoora	issues of 220KV Network at Wagoora, only 4 ckts are there	200-225MW. 4 Ckts of 220kV level; 220kV Wagoora Pampore D/C, 220kV Wagoora-Zainkote D/C. All four lines are critically loaded.	
3.	765/400kV ICTs of Unnao (2X1500 MVA)	Security issues of 765kV Anpara-Unnao on n-1 contingency of Unnao ICT	Evacuation of Anpara C thermal power station through 765kV Anpara-Unnao. Unnao ICTs are loaded more than ~1100MW and not N-1 compliant.	The third ICT is expected to be commissioned in May, 2017.
4.	765/400kV Phagi 2 x 1500 MVA	All time	Phagi has two ICTs of 1500 MVA each and 765kV Phagi-Bhiwani S/C. Power flow over the ICTs is more than 900 MW, which is not N-1 compliant.	
5.	400/220kV Azamgarh 2 x 315 MVA	All time	Azamgarh had two ICTs of 315MVA and 240MVA and 400kV AzamgarhSarnath, 400kV Azamgarh-Sultanpur, 400kV Azamgarh-Gorakhpur (UP) & 400kV Azamgarh-Mau. Power flow over the ICTs is more than 350 MW, which is not N-1 compliant. At present 240MVA ICT has been replaced with 315MVA ICT.	3 rd ICT is expected to be commissioned by May 2016
5	Single ICTs at following 400kV Nodes:		<ol style="list-style-type: none"> 1. Bikaner (Rajasthan)– 1 x 315 MVA 2. Chhabra(Rajasthan)– 1 x 315 MVA 3.Kalisindh(Rajasthan)–1 x 315 MVA 4. Rajwest(Rajasthan)–1 x 315 MVA 5. Dehar (BBMB) – 1 x 250 MVA 6. Bhiwani (BBMB) – 1 x 500 MVA 7.Gorakhpur(UPPTCL)–1x 315 MVA 8.Agra(PG) – 1 x 315 MVA 9. Aligarh(UP) – 1 x 500 MVA 	In the last SCM following was deliberated: No problem at Bikaner. Feasibility studies being done for Chabra Kali Sindh Rajwest commissioning of new ICTs at these places would take 2 – 3 years from now. ICT at Deharadun (BBMB) would be commissioned

S. No	ICT	Season/ Antecedent Conditions	Description of the constraints	Suggestions /comments
				by December, 2016.

III. Nodes Experiencing Low Voltage

S. No	Nodes	Season/ Antecedent Conditions	Description of the constraints	Deliberations in the meeting
1.	Wagoora In J&K,	Winter	400kV Wagoora is continuously experiencing low voltage.	JKPDD to update
2.	Bhilwara	winter	In Rajasthan, 400kV Bhilwara is continuously experiencing low voltage. In September voltage profile has slightly improved after tap changing..	RRVPNL to install suitable capacitor banks.
3.	Alwar	Winter/ January	In Rajasthan, 400kV Alwar is continuously experiencing low voltage. In March voltage profile has slightly improved	

IV. Nodes Experiencing High Voltage:

S. No	Nodes	Season/ Antecedent Conditions	Description of the constraints
1.	765kV Jhatikara	All time/Winter	High Voltage
2.	765kV Meerut	All time/Winter	High Voltage
3.	Agra(PG)	All time/Winter	High Voltage
4.	Amritsar	All time/Winter	High Voltage
5.	Ballabgarh	All time/Winter	High Voltage
6.	Bhiwadi	All time/Winter	High Voltage
7.	Bhiwani	All time/Winter	High Voltage
8.	Parbati Pool	All time/Winter	High Voltage

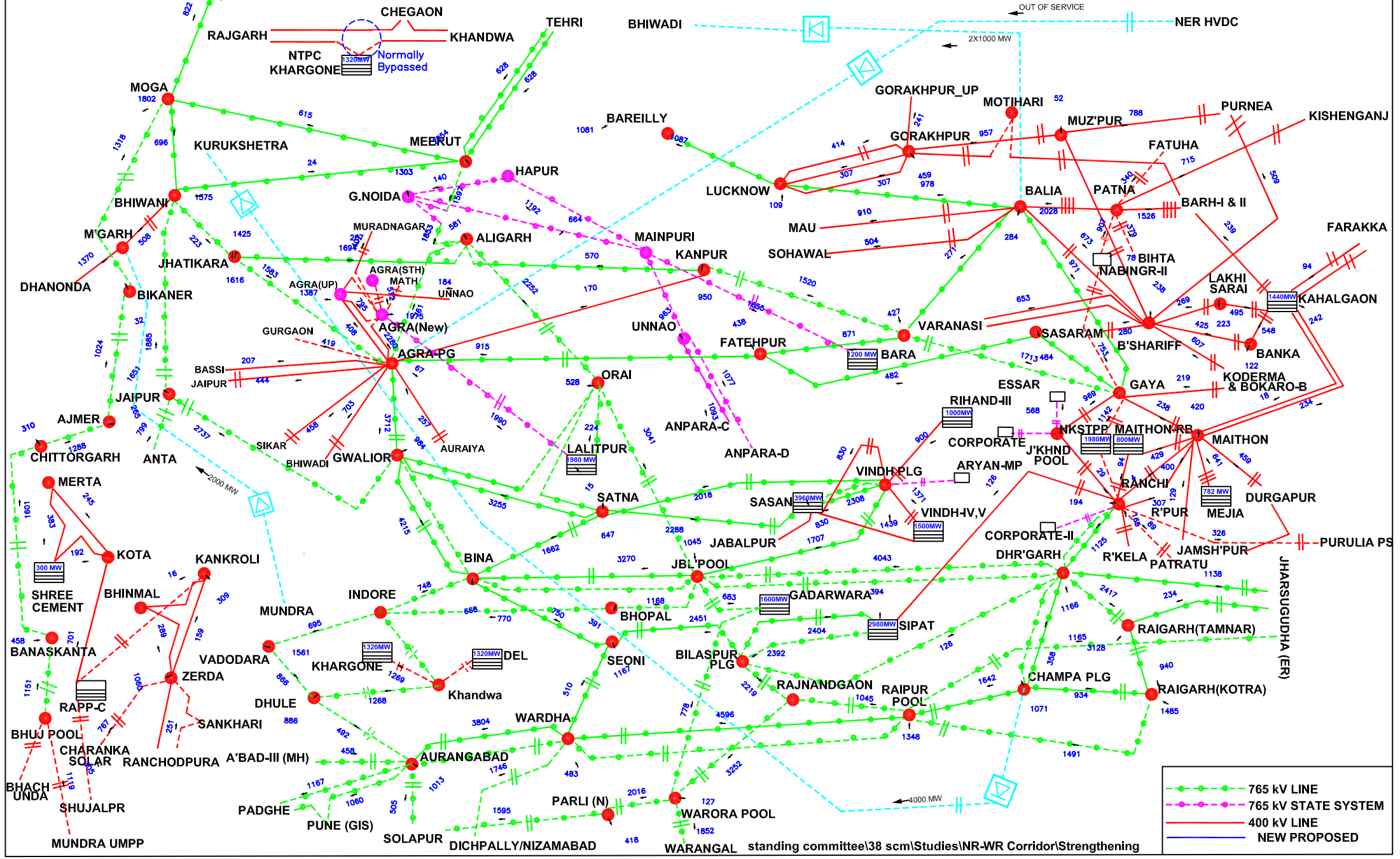
S. No	Nodes	Season/ Antecedent Conditions	Description of the constraints
9.	Gurgaon	All time/Winter	High Voltage
10.	Jalandhar	All time/Winter	High Voltage
11.	Kaithal	All time/Winter	High Voltage
12.	Mandola	All time/Winter	High Voltage
13.	Mahendragarh	All time/Winter	High Voltage
14.	Nallagarh	All time/Winter	High Voltage
15.	Patiala	All time/Winter	High Voltage
16.	Rampur	All time/Winter	High Voltage
17.	Sonepat	All time/Winter	High Voltage
18.	Dehar(BBMB)	All time/Winter	High Voltage
19.	Koldam (NTPC)	All time/Winter	High Voltage
20.	Parbati-III (NHPC)	All time/Winter	High Voltage
21.	Koteshwar	All time/Winter	High Voltage
22.	Naptha Jhakri	All time/Winter	High Voltage
23.	Deepalpur	All time/Winter	High Voltage
24.	Dhanonda	All time/Winter	High Voltage
25.	Bawana	All time/Winter	High Voltage
26.	Dhuri	All time/Winter	High Voltage
27.	Makhu	All time/Winter	High Voltage
28.	Jodhpur	All time/Winter	High Voltage
29.	Parichha	All time/Winter	High Voltage
30.	Suratgarh	All time/Winter	High Voltage

Members may like to deliberate.

11.0 Any other agenda item –with the permission of chair.

NEW INTER-REGIONAL CORRIDOR : WR - NR

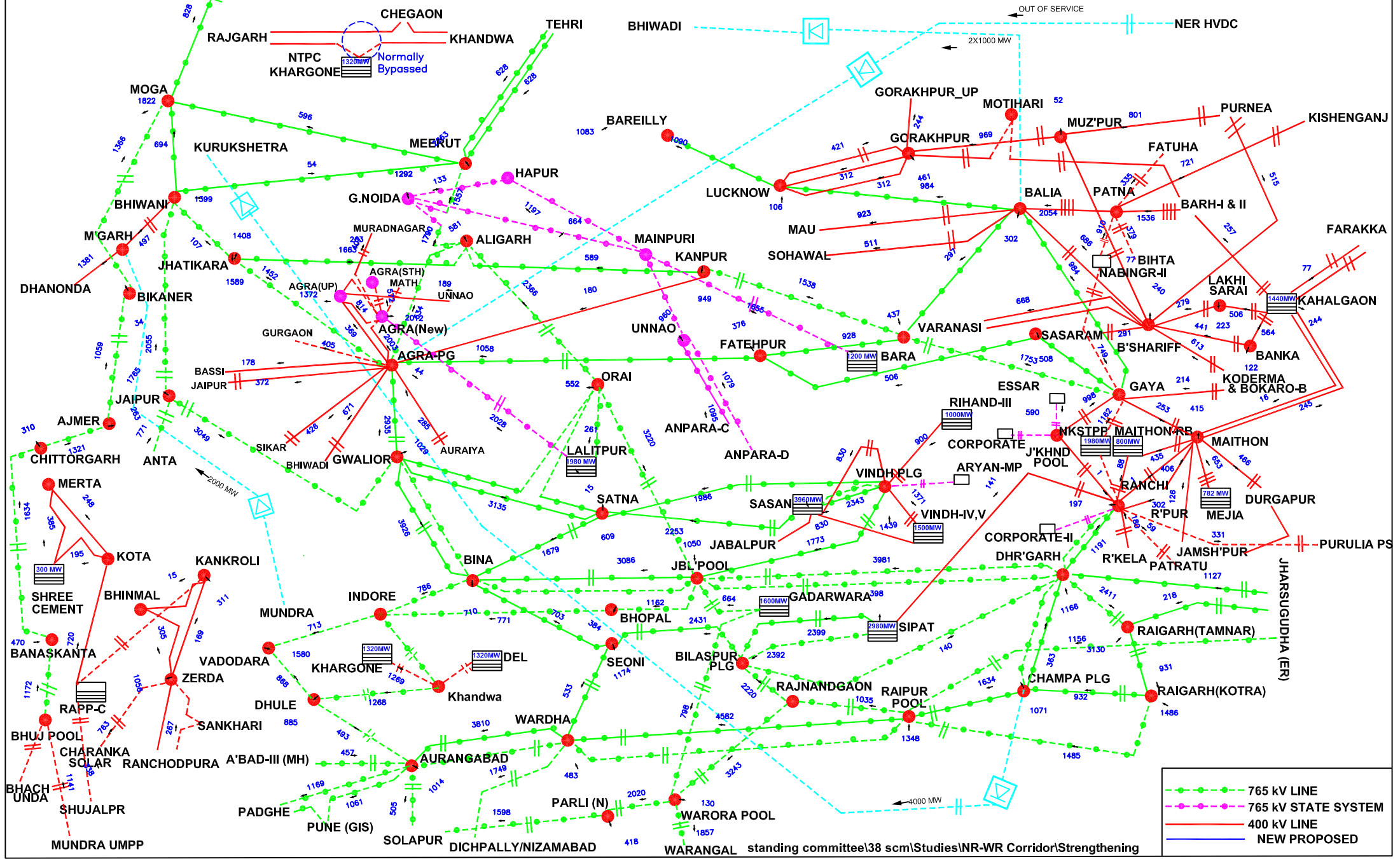
(2019-20 TIME FRAME)



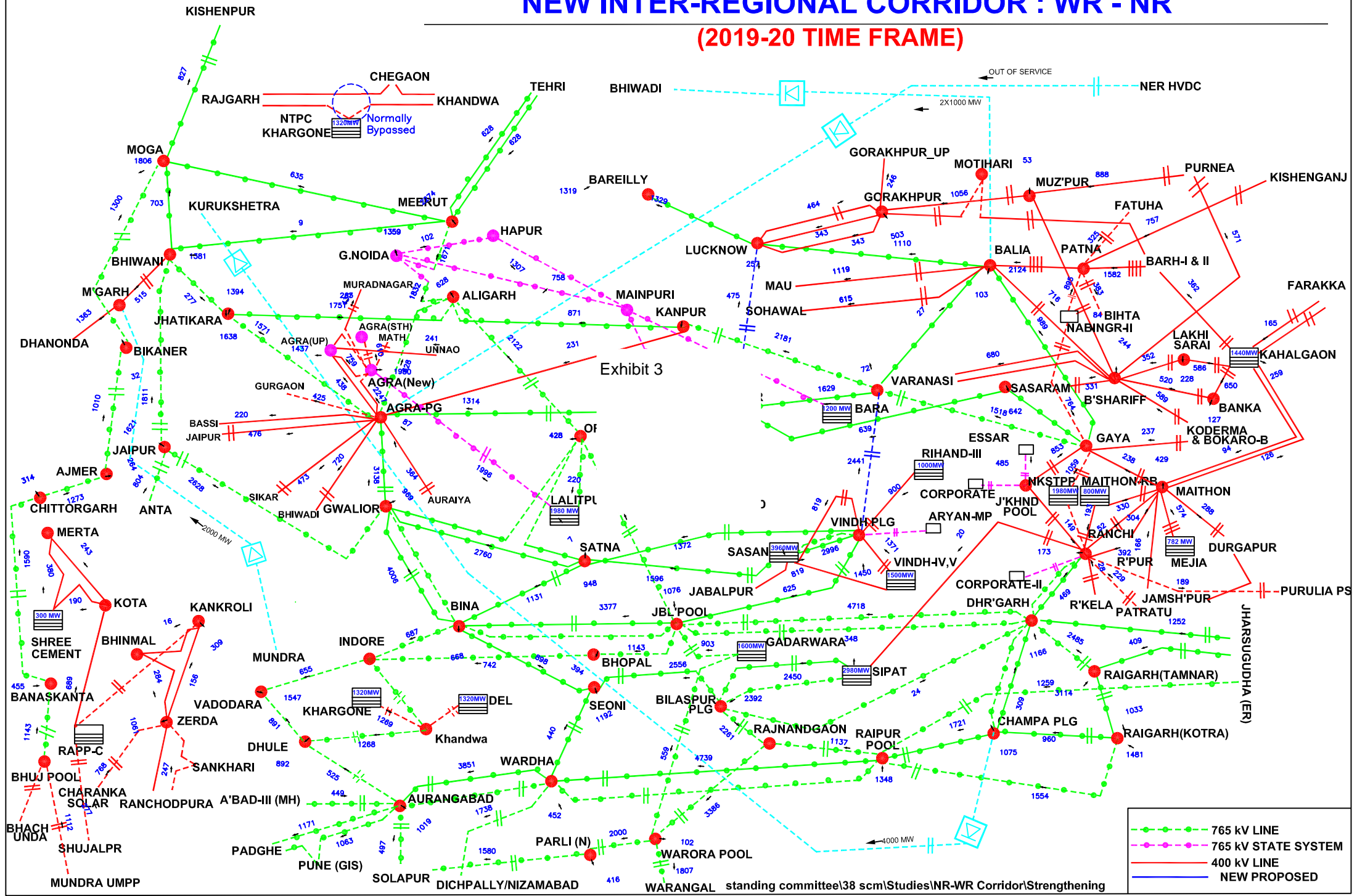
- 765 kV LINE
- 765 kV STATE SYSTEM
- 400 kV LINE
- NEW PROPOSED

NEW INTER-REGIONAL CORRIDOR : WR - NR

(2019-20 TIME FRAME)



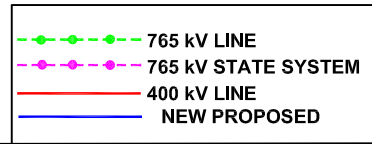
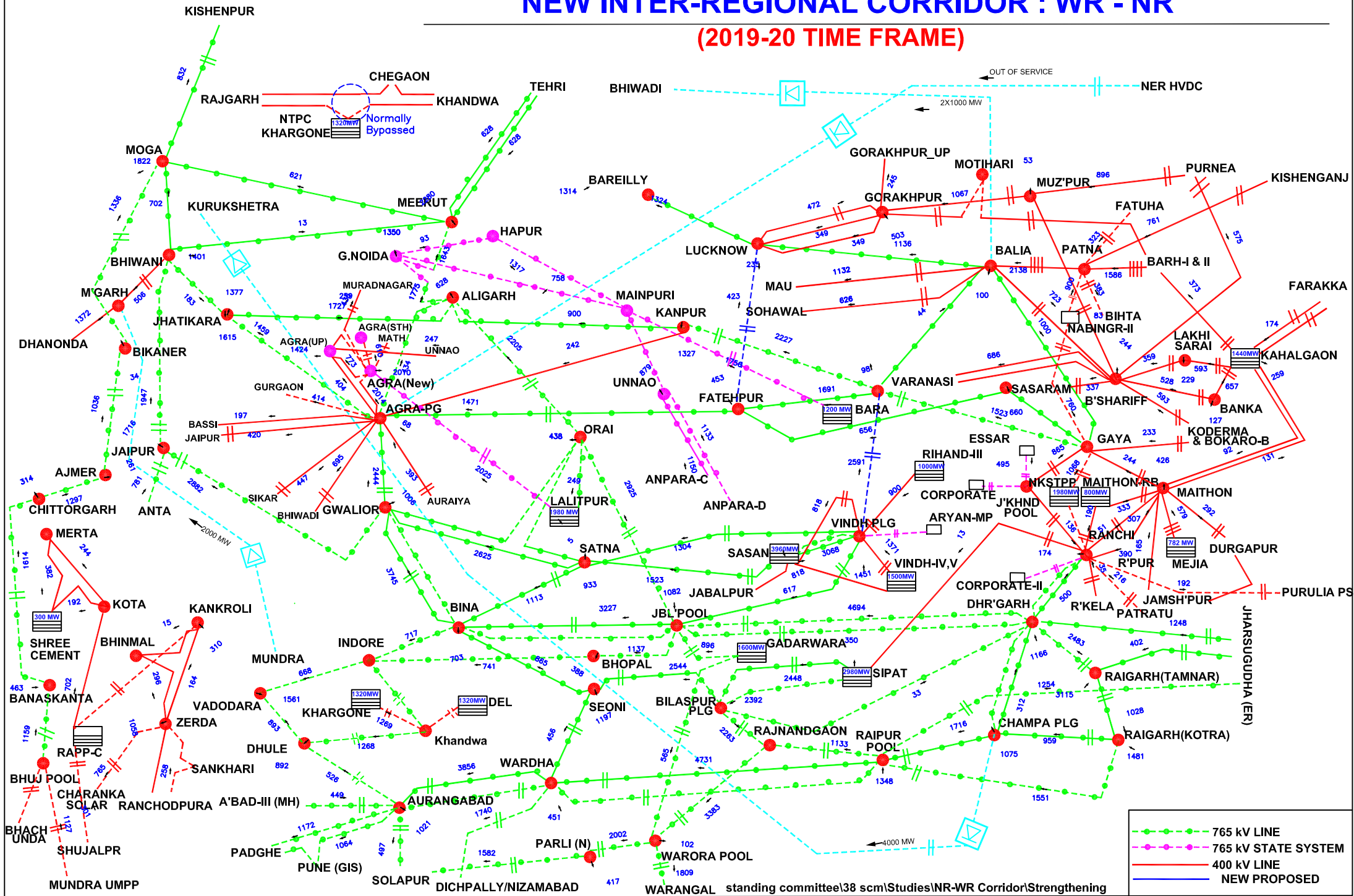
NEW INTER-REGIONAL CORRIDOR : WR - NR (2019-20 TIME FRAME)



- 765 kV LINE
- 765 kV STATE SYSTEM
- 400 kV LINE
- NEW PROPOSED

NEW INTER-REGIONAL CORRIDOR : WR - NR

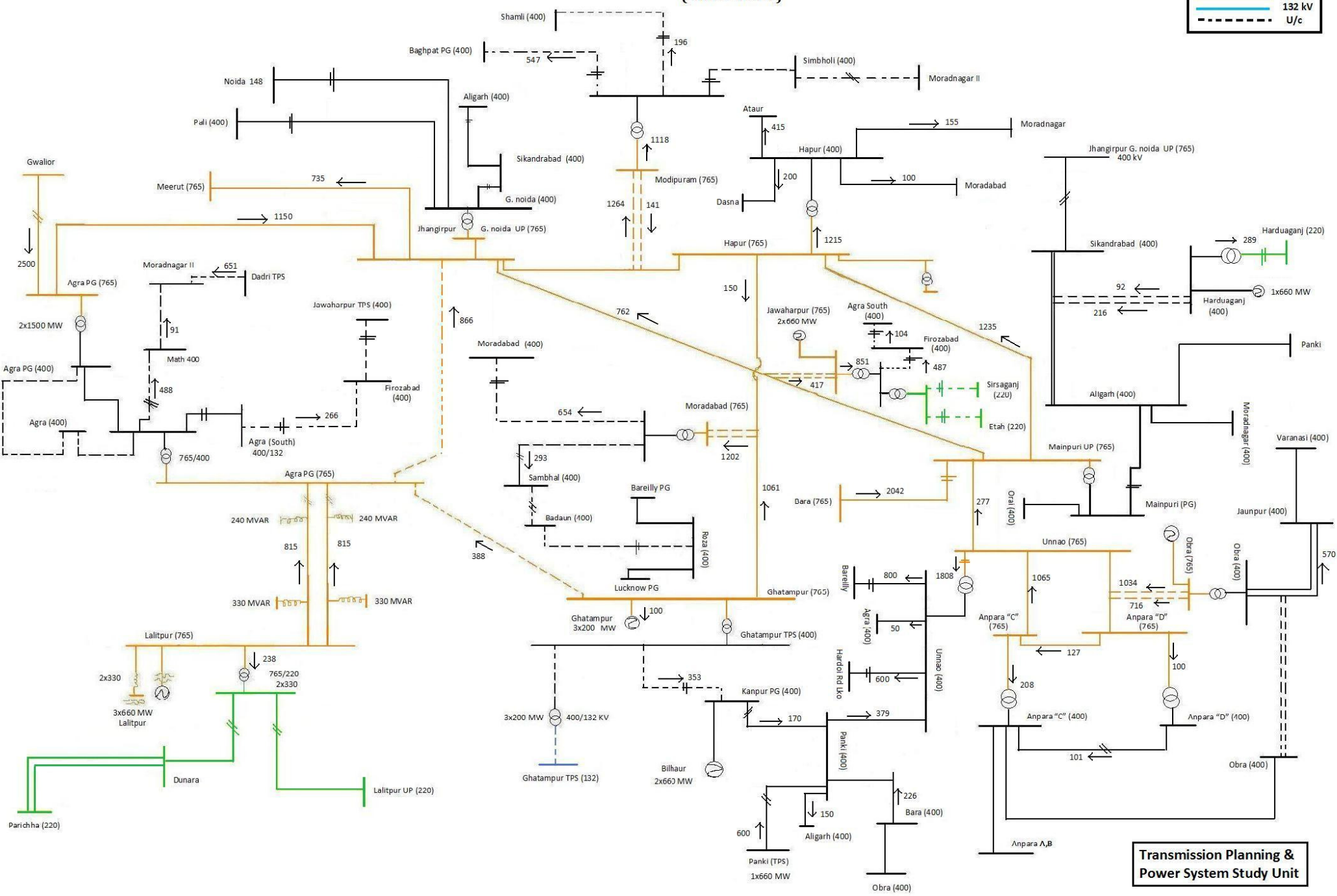
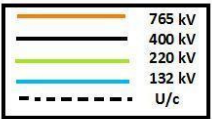
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standing committee\38 scm\Studies\NR-WR Corridor\Strengthening

Evacuation of Projects in 13th Plan

(Flows in MW)



Transmission Planning & Power System Study Unit