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
सेवा भवन आरण केण पुरम नई दिल्ली–110066
Sewa Bhawan, R. K. Puram, New Delhi-110066 [ISO: 9001:2008]

No. 1/9/37th /PSP&PA-2015 /33-51 Dated: 7th January, 2016

सेवा मे/

- सुची अनुसार / As per list enclosed-

Sub: 37th Standing Committee Meeting of Power System Planning of Northern Region to be held on 20.1.2016- Agenda for the meeting

महोदय/ महोदया

Sir/ Madam,

The 37th meeting of the Standing Committee on Power System Planning of Northern Region is scheduled to be held on 20.1.2016 (Wednesday) at 11 A.M. at NRPC conference Room, NRPC Katwaria Sarai, New Delhi under the Chairmanship of Shri S.D. Dubey, Member (Power System), CEA.

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

आपका विश्वसी/ Yours faithfully,

Chandra 7/1/2016

(चन्द्र प्रकाश/ Chandra Prakash)
निदेशक/ 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 Corperation 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 Sarabahai 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 37th Standing Committee Meeting (SCM) on Power System Planning of Northern Region to be held on 20.1.2016 (Wednesday) at 11 A.M. at NRPC conference Room, NRPC Katwaria Sarai, New Delhi

1.0 Confirmation of the Minutes of the 36th meeting of the Standing Committee on Power System Planning of Northern region held on 13th July, 2015.

1.1 The minutes of 36th meeting of the Standing Committee on Power System Planning of Northern Region were issued vide CEA letter No. 1/9/2015/SP&PA/4-22 dated 20th August 2015. Subsequently, observations/ comments have been received from PGCIL, HVPNL and RRVPNL. Accordingly, a corrigendum to the Minutes of the 36th meeting was issued vide CEA letter No. 1/9/2015/PSP&PA-I dated 30 October 2015, copy of which is given at **Annexure-I**.

1.2 Further, UPPTCL vide their letter No. 877 /C.E.(Trans. Plan.) / CEA/TWC Quarries/13th Plan dated 09.12.2015 has given the following observations on the minutes of the 36th meeting of the Standing Committee on Power System Planning of Northern Region (SCPSPNR).

1.3 **Para 4.6: WR- NR 765 kV Strengthening Transmission Corridor:**

UPPTCL vide their letter dated 09.12.2015 has proposed modifications in Para 4.6 of the minutes of 36th SCPSPNR meeting. As such, Para 4.6 may be read as under:

> *4.6 CE, UPPTCL stated that they do object to the proposed WR- NR corridor, however, the ER-NR corridor which is lying underutilized should be put to use before proposing any new corridor in along WR-NR. He pointed out that due to operational problems such as over voltage during peak period and loop flows, there is under-utilization of existing ISTS assets and efforts may be made for proper utilization of the existing assets rather than making huge investments creating new transmission infrastructure. So, UPPTCL stated that the proposed Vindhyachal – Allahabad (New) 765 kV network are subject to review of utilization of existing and already approved network. In fact it was suggested by UPPTCL for connecting Vindhyachal to Eastern Region through 765 kV, 400 kV PGCIL substations say at Balia, Sasaram, etc. to provide source from eastern side.*

1.4 **Evacuation network of Ghatampur (Kanpur) 3x660 MW TPS : -**

UPPTCL vide their letter vide their letter No. 877/C.E.(Trans. Plan.)/ CEA/TWC Quarries/13th Plan dated 09.12.2015 has given the observations that following may be corrected in evacuation system of Ghatampur (Kanpur) 3x660 MW TPS:

(a) Agra – Ghatampur 765 kV S/C line length is 240 km with 189 MVAR line reactors on each side instead of 320 km S/C line with similar reactors.

(b) To include 330 MVAR, 765 kV and 125 MVAR, 400 kV Bus Reactors at Ghatampur TPS.

Accordingly, **the modified Evacuation system of Ghatampur is as under:**

(i) 21/765 kV Generator Transformers, 2x1500MVA, 765/400kV & 3x200MVA, 400/132kV ICTs at Ghatampur TPS along with 6-8 Nos. of 132 kV outlets.

(ii) Ghatampur TPS -Agra(UP) 765kV S/C Line- 240 km (with Line reactors of 189 MVAR at both ends)

(iii) Agra(UP) -Greater Noida(UP) 765kV S/C Line - 200 km (with Line reactor of 240 MVAR at Agra end)

(iv) Ghatampur TPS -Hapur 765kV S/C Line - 400 km with line reactors of 330MVAR at both end.

(v) Ghatampur TPS- Kanpur(PG) 400kV D/C line- 60km

(vi) 330 MVAR, 765 kV and 125 MVAR, 400 kV Bus Reactors at Ghatampur TPS

1.5 **Modifications in the evacuation system for Lalitpur 3x660 MW TPS :-**

UPPTCL vide their letter dated 09.12.2015 stated that Long term solution for radial connection of Lalitpur TPS was approved earlier as per CTU proposal in 32th standing committee as LILOing Jabalpur – Orai 765 kV S/C line at Lalitpur TPS in 2018-19 horizon. UPPTCL also mentioned that a new proposal for creating 400 kV level and connecting Parichha- Orai 400 kV line by LILO at Lalitpur TPS has been approved in 36th SCM. Horizon year 2018-19 was not mentioned in MoM for 400 kV system may therefore kindly be noted.

1.6 As no other suggestion for the modification to the minutes of meeting has been received thereafter, so the Minutes of the 36th Standing Committee Meeting on Power System Planning in Northern along with the corrigendum and the above modifications suggested by UPPTCL may be confirmed.

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

2.1 The LILO of the 220 kV Hiranagar – Sarna S/C line at Samba (PG) was agreed in the 32nd and 33rd meeting of the Standing Committee of Power system planning of Northern region and the line is under advanced stage of implementation by POWERGRID. This would be commissioned in March 2016. JKPDD had requested POWERGRID to carry out LILO of 220kV S/C Gladini-Hiranagar section at Samba (Jatwal) S/S instead of LILO of 220kV S/C Sarna- Hiranagar section of 220kV S/C Sarna- Hiranagar – Gladini ISTS line.

2.2 CEA while giving the observations on the DPR for System Strengthening for Jammu Region during 12th and 13th Five Year Plan Jammu and Kashmir Region had submitted that JKPDD had proposed 220/33 kV Chowadhi Substation by LILO of the 220 kV Gladini- Hirangar S/C line. Also, two more 220/33 kV substations Ramgarh and Samba-II are proposed by LILO of 220 kV Hiranagar–Bishnah line. Due to these new substations, the 220 kV Hiranagar – Samba (PG) S/C line section is getting overloaded. To relieve this overloading, it is proposed to either LILO Gladini- Hirangar 220 kV S/C line at Samba (PG) or LILO Hiranagar – Bishnah 220 kVD/C line at line Samba (PG). Both the options are relieving the overloading of 220kV Hiranagar –Samba (PG) S/C line.

2.3 JKPDD vide their letter dated 19-10-2015 had submitted that the proposed 220/33kV Chowadhi, Ramgarh and Samba-II S/S would take time as it was subject to approvals and subsequent funding for which even the source is not defined. Therefore, in order to remove the present transmission constraints, JKPDD had requested POWERGRID to carry out LILO of 220kV S/C Gladini-hiranagar section of 220kV S/C Sarna- Hiranagar – Gladini ISTS line at Samba (PG) S/S.

Members may like to deliberate.

3.0 Loading at Raebareli 220/132 kV S/Station

3.1 During the 34th Standing Committee meeting of NR held on 3/11/2014, the issue of overloading of all three 100 MVA transformers at Raebareli was discussed and PGCIL proposed to replace two nos. of 100 MVA, 220/132 kV ICTs with two nos. of 200 MVA ICTs as space is not available for providing additional ICT. However, UPPTCL had committed to divert the loads from Raebareli S/Stn.

3.2 UPPTCL vide their letter 725/CE(Trans Plan)/TWC Quarries dated 9/10/2015 has informed PGCIL that due to delayed availability of the land for new Bachhrawan (Raebareli) substation (already approved as apart of intra-State sub-station), the construction may take 1-2 year from now and nearly 100-150 MW load may be shifted. Hence, UPPTCL requested PGCIL to augment the Raebareli S/s suitably as per the loading pattern.

3.3 PGCIL vide their letter no. C/CTU/N/Plg dated 29/10/2015 stated that the load diversion would be the desired option suggested by UPPTCL earlier, as no investment would be required under ISTS. The replaced ICTs need to be de-capitalized and hence replacement of ICTs is not a good option, especially when life of ICTs is still remaining.

Members may like to deliberate.

4.0 400/220/132kV Hardoi Road Substation of UPPTCL

4.1 UPPTCL vide their letter 537/CE(Trans Plan)/TWC Quarries/ISTS dated 20/8/2015 has informed that 2x500 MVA(400/220kV), 2x200 MVA (220/132kV) Hardoi Road AIS Substation was earlier planned by UPPTCL by LILO of existing 400 kV Lucknow – Unnao D/C line. However, due to non availability of the land at selected place, it is proposed to implement substation as GIS instead of AIS. UPPTCL had also proposed to LILO both circuits of 400 kV Lucknow – Unnao D/C line at Hardoi Road Substation.

4.2 Studies were carried out by PGCIL regarding the proposal of UPPTCL to LILO both circuits of 400kV Lucknow – Unnao D/C line at Hardoi Road Substation. High loading of the lines were observed under n-1 condition. Hence, it was proposed to LILO Lucknow (PG) –Kanpur 400kV D/C line at Hardoi Substation.

4.3 Further, UPPTCL has informed that due to non – availability of land, the substation is now decided as GIS with new connectivity. Permission was sought from PGCIL to LILO existing both PGCIL lines i.e. Unnao - Lucknow PG 400 kV DC at Hardoi Road (GIS) as land for substation is very near to these lines (LILO-15km) . Other probable 400 kV lines of PGCIL or UPPTCL for LILO at this substation are far off from the land. Load flow study indicates normal flows and reduced losses.

4.4 UPPTCL has requested for approval of LILO of Unnao-Lucknow PG 400 kV DC ISTS line at Hardoi Road (GIS) 400 kV UPPTCL S/stn.

Members may like to deliberate.

5.0 Construction of 400/220/132kV Landhora Substation by PTCUL

5.1 PTCUL vide their letter no. 1420/Dir (P)/PTCUL/CEA dated 11/8/2015 proposed a 400/220/132kV Landhora Substation to cater to the exponential growth of industrial and load demand in Roorkee area. The proposed capacity of the Substation is 2x240 MVA (400/220kV) and 2x100 MVA (220/132kV) and will be connected through LILO of one circuit of 400kV D/C Kashipur – Puhana line. The proposed interconnections are as follows:

(i) LILO of one circuit of 400kV D/C Kashipur – Puhana line at Landhora substation. (1.3km)

(ii) LILO of 220kV Ramnagar(Roorkee) – Nara line at Landhora substation (19.67km)

(iii) LILO of 132kV Manglore – Nehtaur line at Landhora substation(6km)

(iv) LILO of 132kV Laksar – Nehtaur line at Landhora substation (21.5km)

(v) Construction of 132kV S/C Landhora – Chilla line via Sultanpur. In future 2x40 MVA, 132kV Sultanpur Substation is also proposed which will cater to the load demand in the area.

5.2 Studies have been carried out for the above proposal. The study results are given at **Annexure-II (A)**. It was observed that the transformers at 220/132kV, 2x100 MVA Landhora substation are getting overloaded and the Landhora- Manglore 132 kV S/C line and Landhora –

Laksar 132kV S/C line are critically loaded. **In view of above, the studies were carried out considering the following modification:**

(i) 400/220kV, 2x500 MVA Landhora Substation with LILO of one circuit of 400kV D/C Kashipur – Puhana line in stages

(ii) LILO of 220kV Ramnagar (Roorkee) – Nara line at Landhora substation (19.67 km)

(iii) 220/66kV or 220/33kV, 2x50MVA new substation to feed the loads in Laksar and Manglore Area.

(iv) To construct Sultanpur substation as 220/66 kV or 220/33kV, 2x 50 MVA instead of 2x40, 132 MVA in order to cater the growing load demand of Sultanpur Area.

Load flow study results are given at **Annexure-II (B).** The system was found adequate with incorporation of above modifications

Members may like to deliberate.

6.0 Re-conducting of 220kV Badarpur – Ballabhgarh D/C line

6.1 DTL vide their letter dated 30.10.2015 has informed that 220kV Badarpur – Ballabhgarh D/C line experiences high loading in the order of 160 MW/ckt. Under n-1 condition the other circuit becomes critically loaded. Hence, DTL has proposed to upgrade the line by replacing with HTLS conductors.

DTL may present.

Members may like to deliberate.

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

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

7.2 Secretary (Power), MoP took a meeting on 30/11/2015 regarding allotment of the land to PGCIL for constructing these four substations. As per the discussion in the meeting, the issues are as under:

(i) **Rajghat**: DTL to provide land at the existing IP Power Substation so that proposed Rajghat can be shifted. DTL and PGCIL to update.

(ii) **Tuglakabad**: Alternate site at Okhla S/Stn was suggested by CEA. DTL and PGCIL to update.

(iii) **Dwarka**: DTL and PGCIL to update.

(iv) **Karmpura**: A meeting was held on 08.10.2015 in CEA on the matter related to connectivity of proposed Karampura Substation. In the meeting, Member (Power System), CEA viewed that alternate substation site to feed central Delhi or the option of using the combination of overhead and underground ac line may be explored. The possibility for getting permission from Flood Control Authority for erecting the towers of the 400kV Transmission line along the drain may also be explored by a team comprising of CEA, CTU and DTL. Subsequently, in the meeting taken by Secretary (Power), MoP it was decided to look for alternate site so that corridor for laying of the transmission line does not pose any constraints.

Members may like to deliberate.

8.0 Transmission system for Ultra Mega Solar Power Park in Jalaun, UP (270MW)

8.1 In the 36th meeting of SCPSPNR, based on the inputs provided by the MNRE, transmission system for Solar Power Parks in Jalaun, UP (370 MW) was discussed. In principle clearance subject to optimisation for establishing 132/400kV pooling station along with 400 kV grid interconnection given. Subsequently, M/s Lucknow Solar Power Development corp. Ltd. (LSPDCL) submitted the application for Connectivity and LTA in ISTS for revised capacity (270 MW) of Jalaun Solar Power Park to CTU as per the CERC regulations.

8.2 PGCIL also informed that Ministry of Power, vide letter dated 08.01.15 assigned them to take up the construction of transmission lines including pooling station from nine (9) solar parks being set up in seven (7) States including Jalaun solar park in Uttar Pradesh in compressed time schedule.

8.3 To discuss the transmission system for Solar Power Parks in Jalaun (270 MW), a meeting was held in UPPTCL office at Lucknow with PGCIL, UPPTCL and LSPDCL and joint studies were carried out. The minutes of the meeting along with the study results are enclosed at **Annexure-III.**

8.4 Based on above, following alternative was agreed by the UPPTCL and POWERGRID as transmission system for Jalaun Solar Park (270 MW):

(i) Establishment of 400/132kV, 3x200 MVA Pooling station at Jalaun along with1x125MVAr bus reactor

(ii) LILO of one circuit of 400kV Orai (UP) - Mainpuri (UP) 400kV D/c line- about 20km

(iii) 4 nos. 132kV line Bays at 400/132kV Jalaun Pooling Station

8.5 CEA vide their letter 200/6/2015-PSP&PA-I dated 21st December, 2015 has given the observation that the proposed transmission system of the Solar park is not optimal. It is, therefore proposed that the developer may discuss the scheme with CEA to optimize the evacuation system.

Members may like to deliberate.

9.0 220kV interconnection from Samba and New Wanpoh 2x315 MVA, 400/220kV substations of POWERGRID in Jammu & Kashmir

9.1 The proposal of PDD, J&K was in general not accepted in the 36th SCPSPNR and it was decided that PDD, J&K may be advised to approach the Government of India for funds.

9.2 JK PDD to update.

Members may like to note.

10.0 Creation of 400/220 kV, 2x315 MVA S/S at Akhnoor and Kistwar as ISTS

10.1 In the 36th SCPSPNR it was decided that PDD, J&K should furnish the firm power evacuation plan from Samba and New Wanpoh and should also cover the 220 kV under lying evacuation system under State plan and after that the new proposals of Akhnoor and Kistwar substations would be considered in the next standing committee.

10.2 No further information has been received from PDD, J&K.

Members may like to note.

11.0 Modification of UITP scheme by PTCUL

11.1 PTCUL had earlier proposed that for evacuation of power from Tapovan (Vishnugarh) HEP of NTPC and Pipalkoti HEP of THDC, there is a need for 400kV pooling S/S at Pipalkoti itself and from there power would be taken to Srinagar S/S of PTCUL. However due to agitation 13 by locals, PTCUL was not able to construct 400 kV substation and alternatively requested THDC to provide space in the land acquired by THDC for their generation project. However for construction of sub-station, land proposed by THDC was unsuitable.

11.2 As decided in the 36th SCPSPNR, a committee comprising of THDC, PTCUL, CEA and PGCIL visited Pipalkoti site and other locations viz., Pakhi and near muck disposal site of Pipalkoti HEP and also across the other side of the river. The committee rules out the site at Pakhi and desired that PTCUL should explore the other sites shown during the visit.

PTCUL and THDC may update.

12.0 Connectivity of UPPTCL Muradnagar-II (new) 400/220 kV, 2X240 MVA Substation

12.1 UPPPTCL vide their letter dated 29/9/2015 has informed that due to overloading of the existing 3x315 MVA, 400/220kV Moradnagar UPPTCL substation, 400/220 kV, 2x240 MVA Moradnagar –II (new) substation was planned. CEA vide their letter dated 26/10/2015 has given in- principle approval for shifting of the following circuits to Moradnagar-II Substation (new):

400 kV:

- Dadri TPS – Moradnagar 400kV S/C line (ISTS)
- Agra – Moradnagar 400kV S/C line (UPPTCL)

220 kV:

- Moradnagar – Baraut 220kV S/C line (UPPTCL)
- Moradnagar – Loni 220kV S/C line (UPPTCL)
- Moradnagar – Shamli 220kV S/C line (UPPTCL)

12.2 UPPTCL vide their letter No. 3425/E.T.C./GZB dated 23/10/2015 has informed that the substation had been energized on 30.9.2015 with the following arrangement and the arrangement is running satisfactorily:

- Agra – Moradnagar 400 kV S/C line (UPPTCL) shifted to Muradnagar-II
- Moradnagar – Baraut 220 kV S/C line (UPPTCL)) shifted to Muradnagar-II

12.3 POSOCO vide their letter dated 12-11-2015 has raised the following issues:

1. **Case 1: While Muradnagar (New) substation is connected through only 400 kV Agra line:**
   (a) Stable connectivity between UP west and rest of UP is lost
   (b) During any contingency/shutdown of 400 kV Agra (PG)-Agra (UP) lines, reliability of Agra (UP) {Load approx. 900-1000 MW} and Muradngar (New) {Expected load approx. 400 MW} can't be assured
   (c) Expected loading on Muradnagar (New) may render it N-1 non compliant.

2. **Case 2: While both 400 kV Agra & Dadri lines shifted from Muradnagar (Old) to Muradnagar (New):**

a. Western UP/Uttarakhand system is connected through Delhi/ Haryana system through two lines, 400kV Dadri-Muradnagar & 400 kV Meerut-Muzaffarnagar. These two lines were getting overloaded severely in the recent. Commissioning of Alaknanda HEP & 400kV Muradnagar-Kashipur D/C lines has helped in reducing the loading on these lines.Further, shifting of 400 kV Dadri-Muradnagar to Muradnagar (New) would leave 400 kV Meerut-Muzaffarnagar line as the only connecting line.

b. Loss of connectivity between western UP and rest of UP.

c. Expected loading at Muradnagar (New) may render it N-1 non compliant.

12.4 However, UPPTCL has requested that for maintaining stability, the following arrangement to be carried out at new Muradnagar-II substation

(i) Shifting of Dadri TPS –Moradnagar 400kV S/C line(ISTS) at Muradnagar-II

(ii) Shifting of Moradnagar – Loni 220kV S/C line(UPPTCL) at Muradnagar-II

(iii) Shifting of Moradnagar – Shamli 220kV S/C line(UPPTCL) at Muradnagar-II

12.5 UPPTCL vide their letter no. 877 /C.E.(Trans. Plan.) / CEA/TWC Quarries/13th Plan dated 09.12.2015 stated that 220 kV downstream system to Moradnagar -II S/s namely Baghpat, Baraut shall soon get connected to Baghpat (400) PGCIL S/s nearing completion. Similarly existing 400 kV Moradnagar S/s shall also get connected soon to Hapur (765 kV) S/s of M/s Cobra after LILO of Moradnagar –Moradabad 400 kV S/C ISTS line at Hapur(765kV). All these have already been approved/ concurred by SCM and will further strengthen both Moradnagar and Moradnagar-II substations. System studies were carried out considering the following additional transmission elements:

(i) 2x500 MVA, 400/220kV Bagpat (PG) S/s with LILO of Meerut(PG)- Kaithal 400 kV S/C line at Bagpat(PG)

(ii) 220/132kV, 2x100MVA Baghpat (UP) S/s with LILO of Muradnagar-II –Shamli 220kV S/C line at Baghpat (UP)

(iii) Bagpat(PG)- Baghpat(UP) 220kV D/C line (18km)

(iv) Baghpat (PG)- Baraut 220kV D/C line

(v) 765/400/220 kV Hapur S/s with LILO of Moradnagar –Moradabad 400 kV (PG) S/C ISTS line at Hapur(765kV)

12.6 Regarding the observations made by POSOCO, UPPTCL submitted the following vide e-mail dated 31-12-2015:

(a) No effect of Agra –Agra PG 400 kV Links contingency:-

LILO of existing Shamsabad Road - Ferozabad 220 kV S/C (UP) line at Agra 400/220 kV PGCIL s/s has been commissioned on 29.12.2015. It has already given relief to Agra (UP) 400/220kV S/S and would reduce peak loading further. With the reduced loading, even remote contingency of outage of both lines of Agra (PG)-Agra (UP) 400 kV described by POSOCO, would not cause any critical loading on Dadri –Moradnagar II 400 kV S/C (short line) after shifting. Further, 220 kV connectivity from Baghpat 400 kV (PG) to Moradnagar II would be completed in 2-3 Months time, resulting in relieving of Agra (PG). So shifting of Dadri- Moradnagar-II would be adequately secured.

It is not out of place to mention that Agra-Moradnagr II line is to be LILOed at Math 400 kV s/s and which would be fed by Agra 765 kV (UP).

(b) 400kV Muzaffarnagar Connectivity:

Muzaffarnagar 400kV S/S is also presently connected through Moradnagar- Muzaffarnagar 400 kV line besides Meerut (PG), Roorkee (PG) and Vishnuparyag, Srinagar hydro plants. However, Moradnagar - Muzaffarnagar 400 kV line will soon be LILOed at Ataur (Ghaziabad) 400/220 kV s/s of M/s Cobra. Moradnagar, Ataur (Ghaziabad) 400kV and Muzaffrnagar S/stns would get fed from 765/400 kV Hapur. Hapur 765kV s/s and Greater Noida765 kV s/s would soon get connected Greater Noida 765/400 kV substation, initially by LILO of existing Agra (PG) - Meerut (PG) 765 kV S/C line. All these lines would be in place in 2-3 months at the most.

12.7 The study results are given at **Annexure - IV (A) without above additional transmission elements and Annexure -IV (B) with above additional transmission elements**. It was found that the proposed shifting of the Dadri –Muradnagar line at Muradnagar-II may not create any overloading and that shifting be considered in view of system getting further strengthened due to commissioning of above mentioned transmission elements.

UPPTCL may present.

Members may like to deliberate.

13.0 Reliability issue at Sorang HEP

13.1 NRLDC vide their letter dated 12-11-2015 has informed that Sorang HEP has submitted data to NRLDC, wherein it has been observed that switchgear equipment like isolators, circuit breakers at Sorang HEP are of 2000 Ampere (2kA) rating while Sorang HEP has been connected to the grid with the LILO of 400 kV Karcham Wangtoo - Abdullapur line (Quad Moose). It is also pertinent to mention that the switchgear ratings at Karcham Wangtoo switchyard and Abdullapur substation are of 3000 Ampere (3 kA).

13.2 Karcham Wangtoo HEP - Sorang HEP is one of the important lines for the evacuation of generation from Karcham Wangtoo – Baspa - Nathpa Jhakri - Rampur complex. There have been constraints in the evacuation of power from this complex and System Protection Scheme (SPS) has also been implemented in view of high loading of lines.

13.3 SCPSPNR has already approved series compensation of Karcham Wangtoo - Abdullapur 400 kV D/C (Quad) line alongwith LILO of both circuits at Kala Amb. Further, as per the Master Plan of Evacuation system for Projects in Satluj Basin, power from other HEPs would also be evacuated through these lines in future resulting in the increase in loading of these lines. Therefore, under N-1 security conditions, 2 kA rating of switchgears at Sorang HEP would be the first limiting factor for the power flow. This issue has also been discussed in 116th OCC meeting held at NRPC and members expressed their concern. In view of above, NRLDC impressed upon taking the necessary action and accordingly advised to the concerned for rectification of above issue.

Members may like to deliberate.

14.0 Safe and secure grid operation during forthcoming winter months

14.1 NRLDC vide their letter dated 12-11-2015 to Principal Secretary, J&K with a copy to CEA has informed that presently, Kashmir valley power system is connected through rest of the grid through following 4 transmission lines:

(i) 400 kV Kishenpur-New Wanpoh - Wagoora 1
(ii) 400 kV Kishenpur-New Wanpoh - Wagoora 2
(iii) 220 kV Kishenpur-Ramban-Mirbazar - Pampore
(iv) 220 kV Kishenpur-Mirbazar –Pampore

14.2 Therefore, during winter season and high import requirement, any contingency of lines specially 400 kV ones would create severe bottleneck for power supply to the valley area. These contingencies in the past have resulted in collapse of valley power system at times. One such incident occurred on 6th Jan 2012 wherein power supply to valley remained disrupted for two days and revived by 8th Jan 2012. After the event, CEA approved a System Protection Scheme (SPS) to avoid such tripping of power system in valley.

14.3 In view of above, JKPDD may update the following:

1. Status of 220 kV network at 400/220 kV New Wanpoh substation
2. Status of commissioning of SPS scheme for valley (As approved by CEA)
3. Status of deployment of capacitor banks, under frequency schemes etc.

4. Status of GTs at Pampore at the time of contingency.

5. Readiness for black start capability at all such generating stations.

Members may like to deliberate.

15.0 Construction of 100 MVA, 33/220 kV sub station at Phojal by LILO of one circuit of 220 kV Prini-Nalagam D/C line of M/S ADHPL

15.1 HPPTCL vide their letter No. HPPTCL/Naggar/2015-5066 dated 21-11-2105 informed that in the Naggar (Beas) valley in Distt. Kullu of Himachal Pradesh, about 90 MW of Small HEPs have been identified. In the same valley, M/S ADHPL have constructed 180 km long 220 kV D/C line (ASCR ZEBRA conductor) up to 400/220 kV Nalagarh sub-station (PG) for evacuation of 192 MW power of Allain Dhuangan HEP. Due to severe right of way constraints in the valley, it was planned to evacuate power of other projects through this 220 kV line by LILO at suitable locations.

15.2 In a meeting chaired by Chief Secretary, Himachal Pradesh on 18.11.2008 (copy enclosed), M/S ADHPL agreed for tapping/LILO of their 220 kV line between Prini and Panarsa also. Government of Himachal Pradesh made it mandatory to allow tapping/LILO of 220 kV line while granting its approval for diversion of forest land for construction of the 220 kV line (copy enclosed).

15.3 CEA also allowed 200 MW of capacity to be used for evacuation of Malana-II (100 MW) and Sainj (100 MW) while granting approval under Section – 68 of the Electricity Act on 31/7/2007.

15.4 Since, evacuation arrangement for Sainj HEP (100 MW) has been revised by LILO of 400 kV Parvati – Banala S/C line at Sainj, it was considered prudent to utilize this capacity for evacuation of Small HEPs in Naggar valley by constructing 33/220 kV, 100 MVA sub station at Phojal by LILO of one circuit of 220 kV D/C line of M/S ADHPL. In a meeting taken by Member (PS), CEA on 02.04.2012, HPPTCL had informed about injection of 97 MW of Small HEPs in to 220 kV line of M/S ADHPL.

15.5 HPPTCL has requested for approval of the 33/220 kV, 100 MVA sub station at Phojal by LILO of one circuit of 220 kV Prini-Nalagarh D/C line which is nearing completion. Petition for

determination of tariff is to be filed before CERC for which approval of CEA for construction of the sub station is required. HPPTCL may present.

Members may like to deliberate.

16.0 Augmentation of transformation capacity at 400kV Maharani Bagh Substation (PG)

16.1 DTL vide their letter no F.DT/Dir(O)15-16/F12-/42 dated 22/26-05-2015 has proposed to augment the transformation capacity of 400kV Maharani Bagh Substation from the present 1630 MVA to 2000 MVA by replacing existing 2 Nos. 400/220kV, 315MVA ICTs to 400/220kV, 500 MVA ICTs by 31-03-2017.

16.2 At present, 400kV Maharani Bagh substation (PG) is having 1630 MVA (i.e. 2x315 +2x500) transformation capacity and the existing load being fed/proposed to be fed from this substation is as under:-

Sr. No.	Name of the Circuit	Line termination	Load (MW)	Remarks
Existing System				
1.	220 kV Maharani Bagh – Lodhi Road Ckt No.1	O/H – cum- 630mm2 cable at Maharani Bagh	80	One addl. Trf. 220/33kV, 100MVA is expected by Dec.15 along with conversion of existing conventional 220kV Grid S/Stn. to GIS
2.	220 kV Maharani Bagh – Lodhi Road Ckt No.2	O/H – cum- 630mm2 SC cable at Maharani Bagh	80	
3.	220 kV Maharani Bagh – Elect Lane Ckt No.1	1200mm2 SC cable	40	NDMC has loaded only 60% of the load and expected to put maximum load by Dec.15
4.	220 kV Maharani Bagh – Elect Lane Ckt No.2	1200mm2 SC cable	40	
5.	220 kV Maharani Bagh – Trauma Centre Ckt No.1	1200mm2 SC cable	200	The load of AIIMS, Rid Valley and part of Naraina is met.
6.	220 kV Maharani Bagh – Trauma Centre Ckt No.2	1200mm2 SC cable	200	
7.	220 kV Maharani Bagh – Masjid Moth Ckt No.1	1000mm2 SC cable	90	One Trf. Of 220kV/33kV 100MVA capacity is to be added by Dec.15
8.	220 kV Maharani Bagh – Masjid Moth Ckt No.2	1000mm2 SC cable	90	
9.	220 kV Maharani Bagh – Gajipur Ckt No.1	O/H – cum- 630mm2 SC cable at Maharani Bagh	175	The load of Gajipur and part of Patpar Ganj being fed.
10.	220 kV Maharani Bagh –	O/H – cum- 630mm2	175	

	Gajipur Ckt No.2	SC cable at Maharani Bagh		
PROPOSED SYSTEM				
11.	220 kV Maharani Bagh – Sarita Vihar Ckt No.1	O/H – cum- 1200mm2 cable at Maharani Bagh	100	
12.	220 kV Maharani Bagh – Sarita Vihar Ckt No.2	O/H – cum- 1200mm2 cable at Maharani Bagh	100	
13.	220 kV Maharani Bagh – Pragati Ckt No.1	O/H – cum- 1200mm2 cable at Maharani Bagh	100	
14.	220 kV Maharani Bagh – Pragati Ckt No.2	-do-	100	
Total:			**1570**	
Total present capacity (MVA)			1630	

In view of above, DTL has proposed to replace 2 numbers of 315 MVA transformers with 2 numbers of 500 MVA transformers.

Members may like to deliberate.

17.0 Re-conductoring of 220 kV Narela - Rohtak Road D/C Line and establishment of 220kV GIS Bays at Rohtak Road S/Stn. of BBMB.

17.1 DTL vide their letter F.DTL/Dir (O)/ 2015-16 dated 10.12.2015 has proposed that the conductors of 220kV Narela-Rohtak Road D/C line (commissioned during 1961-62) may be replaced. Therefore, it is required to decide the methodology for accounting the cost involved for re-conductoring of 220kV Narela - Rohtak Road D/C line along with establishment of 9 bays 220kV GIS (6 Fdr + 2 spare + 1 B/C) at Rohtak Road.

17.2 Narela-Rohtak Road 220kV D/C Line is feeding North, West and part of Central Delhi areas. These conductors being Goat cannot be replaced with ACSR Zebra Conductors as the towers can not carry the load. For optimum utilization of R.O.W. of the line, reconductoring could be done with HTLS conductors of same weight to enhance the current carrying capacity of the line. This transmission line passes through few areas where lot of encroachment under the line have been developed over a period of time. The HTLS reconductoring would improve the line clearance to a great extent by way of improving sag of the conductor. For safety reasons, both the circuits are required to be taken under shut down while carrying out reconductoring work. At present, Rohtak

Road 220kV S/Stn. is getting only one feed i.e. from 220kV Narela. In case of outage of Narela-Rohtak Road 220kV D/C Line, the area fed from 220kV Rohtak Road S/Stn. will be required to be fed through alternate sources on 33kV side. The entire 220kV load of Rohtak Road cannot be met through alternate 33kV sources. As such, during the shutdown, alternate sources are required to be arranged at Rohtak Road. It may be mentioned that during the year 2012, BBMB floated tender for reconductoring of the line and already purchased 'Goat' Conductors for reconductoring. But the same could not be matured due to lack of participation in the tender.

17.3 The matter was discussed in CEA on 21.02.2014. The meeting was chaired by Member (GO & D). The following was decided:

(i) Independent joint inspection by DTL and BBMB to identify and if needed, testing of apparently weak towers could be done, at the earliest and if, required this could be changed.

(ii) The work of reconductoring of the line will be taken up by DTL as deposit work of BBMB.

(iii) All the expenses in connection with reconductoring of line including replacement of worn towers members will be borne by BBMB, who will also arrange all the accounts of clearances including those from railways.

(iv) The proposal of setting up of 220kV GIS may be put up by DTL to the Standing Committee on Power System Planning.

17.4 GM (Plg.) DTL took meeting with BBMB on 05.03.2015 in which the following were discussed:

(i) Considering the fact that number of 400/220kV S/Stns. are planned in the vicinity of 220kV Narela-Rohtak Road D/C Line, the proposed reconductoring of Narela-Rohtak Road D/C Line with Goat Conductors be discarded and reconductoring be done with 220kV HTLS Conductors of same weight to handle more power capacity for optimum use of available R.O.W. of Narela-Rohtak Road 220kV D/C Line. The cost may be borne by DTL.

(ii) Considering substantial investment of reconductoring by DTL insisted for the ownership of the line after reconductoring. It was decided to take up the ownership issue with the respective managements.

(iii) BBMB insisted for alternate arrangement of supply during the time of re-conductoring of Narela-Rohtak Road 220kV D/C line as both the circuits need to be

taken under shutdown. They also suggested for LILO of 220kV Peeragarhi-Wazirpur U/G cable which is passing nearby place (Punjabi Bagh). DTL agreed to look into the suggestion, 220 kV LILO Cable portion and 220kV GIS bays to be erected at Rohtak Road S/Stn. would be owned by DTL as the cost towards the same would be borne by DTL.

17.5 In view of above, the State Planning Steering Committee advised DTL to refer the issue in the upcoming Standing Committee Meeting on Power System Planning particularly to decide the methodology for accounting for the cost involved for reconductoring of Narela-Rohtak Road 220kV D/C line which is tentatively Rs.50 Crore and establishment of 9 bays 220kV GIS (6 Feeder + 2 spare + 1 B/C) at Rohtak Road, the tentative cost is about Rs.20 Crore. Through the proposed augmented D/C line, BBMB can also be able to evacuate more power through 66/33kV network available at 220 kV Rohtak Road S/Stn. (BBMB).

Members may like to deliberate.

18.0 Provision of 220kV line bays at 400/220kV Meerut (PG) and Allahabad (PG) substation:

18.1 UPPTCL vide their letter 728/CE(Trans Plan)/TWC Quarries dated 9.10.2015 stated that in 36th SCM CTU has given the time frame of 24-30 months for the construction of 220kV bays at 400/220kV Meerut (PG) and Allahabad (PG) substations, which may delay the strengthening of the downstream systems. Hence, UPPTCL requested PGCIL to either reduce the time frame for construction to 8-10 months or else permit STU to implement construction of bays at PGCIL substation as per standard procedures and practices.

18.2 Powergrid stated that the implementation of bays would take about 24-30 months and in case UPPTCL desires these bays on urgent basis, UPPTCL may take the implementation on their own. UPPTCL agreed with the proposed time frame.

Members may like to deliberate.

19.0 220kV line bays at 400/220kV ISTS Substations in U.P.

19.1 UPPTCL vide their letter no. 877/C.E. (Trans. Plan.)/ CEA/TWC Quarries/13th Plan dated 09.12.2015 has stated that 220 kV Bays are required at following PGCIL substations for UPPTCL lines :

(a) 2 Nos Bays at Fatehpur (765kV) PGCIL S/s for Fatehpur (765kV) – Sarh (Kanpur) 220 kV DC line – 60 km.

Sarh (220) Kanpur is intra-state 220/132/33 kV UPPTCL S/s and is under construction. This substation will provide relief to existing UPPTCL Naubasta (220) Kanpur S/s.

(b) 2 Nos 220 kV Bays at existing 220 kV Raebareilly PGCIL S/s for Sultanpur (400) – Sangipur – Raebareilly (PGCIL) Amawan 220 kV DC line.

Sangipur (Partapgarh) is new intra – State S/s under construction 40 km from Sultanpur and 60km from Amawan. Sangipur S/s is planned to provide relief to 220 kV Partapgarh S/s and new loads in the area.

Members may like to deliberate.

20.0 Evacuation of New Generation Project in 13th Plan (2017-22)

20.1 Peak Demand of U.P. is likely to be 26000 MW by 2022 although CEA forecast is 33000 MW. System need to be developed upto 29000 MW considering adequate redundancy, load forecast variation. Therefore, UPPTCL vide their letter no. 877/C.E. (Trans. Plan.)/ CEA/TWC Quarries/13th Plan dated 09.12.2015 has proposed the transmission system for evacuation of power from **1x660 MW Panki Extension TPS (expected by 2019), 1x660 MW** Harduaganj Extn. **(expected by 2019), 2x660 MW Obra "C" TPS (expected by 2019) and 2x660 MW Jawaharpur (Etah) TPS along with some 765kV and 400kv Substations.**

22.1.1. Evacuation of 1x660 MW Panki Extension TPS Power :-

This state project with all clearances and land acquisition is being constructed by UPRVUNL and **is likely to be available by year 2019**. Following evacuation system is proposed :-

(i) Generation Transformer 21/400 kV.

(ii) Panki TPS – Panki (400) 400 kV DC line – 3km

(iii) Bus Reactor at Panki TPS -125 MVAR

22.1.2. Evacuation of 1x660 MW Harduaganj TPS :-

Harduaganj Extn. 1x660 MW Thermal Power station already all clearances and constructing agency finalised and **is expected by end year 2019.** Following evacuation system is proposed for concurrence of SCM :-

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

(ii) LILO of one ckt of Aligarh-Sikandrabad 400 kV DC line (Isolux line) at Harduaganj TPS- 25 km.

(iii) 400/220 kV 2x315 MVA ICT at Harduaganj Extn.

(iv) 220 kV Spare Bays – 2Nos

(v) 80 MVAR bus Reactor at Harduaganj TPS.

22.1.3. Evacuation of 2x660 MW Obra "C" TPS :-

This state project with its 100% power to state is being constructed by UPRVUNL **and is likely to be available by year 2020**. Following evacuation system is proposed for concurrence:-

(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 SC line at Obra "C" – 40 km.

(iv) Obra "C" – Jaunpur 400 kV DC line – 200 km.

(v) LILO of one ckt of Obra – Jaunpur 400 kV DC line at Obra (Existing) – 15 km.

(vi) Bus Reactor 330 MVAR 765 kV at Obra "C"

22.1.4. Evacuation of 2x660 MW Jawaharpur (Etah) TPS :-

This project is meant for 100% power to state and being constructed by UPRVUNL. Environment clearance, coal linkage and water linkage has already been obtained and land acquired . Followings evacuation system is proposed :-

(i) Evacuation at 765 kV with G.T 21/765 kV

(ii) LILO of Mainpuri – G.Noida 765 kV SC line (M/s Cobra 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 DC line – 80 km

(vii) Firozabad (400) – Agra South (400) 400 kV DC– 40 km

(viii) Etah (220) – Jawaharpur TPS 220 kV DC – 20 km

(ix) Jawaharpur TPS – Sirsaganj 220 kV DC – 40 km

(x) 330 MVAR, 765 kV Bus Reactor at Jawaharpur TPS

20.2 **New 765/400 kV substations :-**

20.2.1 765/400/220 kV substations at Modipuram (Meerut) :-

It is felt that existing Mataur (Meerut) 765/400/220 kV PGCIL substation feeding most of Meerut area shall get fully loaded within 3-4 years and its capacity exhausted. it may require additional 765/400 kV substations in the area. Following is therefore planned :-

(i) Construction of 765/400/220 kV 2x1500, 2x500 MVA Modipuram (Meerut) S/s.

(ii) LILO of Agra (UP) – G.Noida 765 kV - 50 km

Or

(i) Hapur – G.Noida 765kV SC line at Modipuram (Meerut) – 20 km

(ii) Modipuram (765) – Simbholi 400 kV DC line – 40 km

(iii) Modipuram (765) – Shamli (400) – 60 km

(iv) Modipuram – Baghpat 400 kV DC line – 60 km

20.2.2 765/400/220 kV S/s Moradabad :-

Existing 400/220/132 kV S/s Moradabad is heavily loaded in peak hours and load may further increase in 3-4 years needing new 400 kV S/s in the area. 400/132 kV S/s Nehtaur (Bijnor) by M/s Cobra may provide some relief. However 765 kV

Substation may be required to feed the same by creating more 400 kV substations in the area. So following is proposed :-

(i) Creation of 765/400/220 kV 2x1500, 2x500 MVA substation at Moradabad.

(ii) LILO of approved Ghatampur TPS – Hapur 765kV SC line at Moradabad.

(iii) Moradabad (765) – Sambhal 400 kV DC line – 50 km.

(iv) Moradabad (765) – Moradabad (400) DC line – 25km

(v) Creation of 400/220 kV 2x500 MVA S/s Sambhal.

20.3 **New 400/220 kV substations:**

20.3.1 400/220/132 kV 2x500, 2x160 MVA Firozabad :-

(i) Firozabad – Jawaharpur TPS 400 kV DC line – 40 km

(ii) Firozabad (400) – Agra South 400 kV DC line – 50 km

(iii) Firozabad (400) – Tundla 220 kV DC line

(iv) Firozabad (400) – Firozabad (220) DC line.

20.3.2 400/220 kV 2x315 MVA Badaun :-

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

(ii) Badaun – Sambhal 400 kV DC line – 50 km

20.3.3 400/220 kV S/s Jaunpur :-

Existing Varanasi 400/220/132 kV & Azamgarh 400/220/132 kV substations get highly loaded in peak load conditions. Aurai 400/220/132 kV S/s by Isolux to be available in 2016 may provide some relief. However, new 400 kV S/s in future may be require to provide relief to both Varanasi, Azamgarh substations and cater more loads. It may also help in evacuating Obra "C" TPS power . It is proposed as follows :-

(i) Creation of 400/220/132 kV 2x500, 2x160 MVA S/s 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

20.3.4 400/220/132 kV Rasra (Mau) :-

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

(i) 400/220/132 kV 2x500,2x160 MVA Rasra (Mau)

(ii) LILO of one ckt of Balia – Mau 400 kV DC line at Rasra – 15 km

(iii)Balia (PGCIL) – Rasra 400 kV SC line – 35 km

20.3.5 400/220/132 kV Simbholi :-

(i) 400/220/132 kV 2x500,2x160 MVA Simbholi

(ii) Modipuram(765) – Simbholi 400 kV DC line – 40 km

(iii)Simbholi – Moradnagar –II 400 kV DC line – 50 km

20.3.6 400/220/132 kV Sambhal :-

(i) 400/220/132 kV 2x500, 2x160 MVA

(ii) Badaun – Sambhal 400 kV DC line – 90 km

(iii)Moradabad – Sambhal 400 kV DC line – 50 km

20.4 UPPTCL may present the status of the above Generating Stations.

21.0 WR - NR 765 kV Strengthening Transmission Corridor

21.1 During the 36th meeting of the Standing Committee of NR, following transmission system has been identified for strengthening 765 kV WR - NR Transmission Corridor:

Part-A

- Indore(WR) – Chittorgarh(NR) 765kV D/C line

Part-B

- Vindhyachal Pool (WR) – Allahabad (NR) 765kV D/C line
- LILO of Fatehpur – Sasaram 765kV S/C line at Allahabad
- Allahabad - Lucknow 765kV D/C line
- Allahabad (New) – Allahabad (PG) 400 kV D/C (Quad)

- Bareilly – Muzaffarnagar(S/s to be located between Meerut &Muzaffarnagar) 765kV D/C line
- Muzaffarnagar –Aligarh 765kV D/C line
- Shifting of Meerut – Bhiwani 765kV S/C line from Meerut to Muzzaffarnagar to form Muzaffarnagar – Bhiwani 765kV S/C line
- Muzaffarnagar – Meerut(new)(UPPTCL) 400kV D/C (Quad) line
- Muzaffarnagar – Shamli(UPPTCL) 400kV D/C (Quad) line

21.2 Based on the deliberations, the following transmission elements were approved in the 36th meeting :

Part-A

- Indore(WR) – Chittorgarh(NR) 765kV D/C line

Part-B

- Vindhyachal Pool (WR) – Allahabad (NR) 765kV D/C line
- LILO of Fatehpur – Sasaram 765kV S/C line at Allahabad

21.3 Further it was decided that the balance part will form part of agenda for the next SCM. The scheme was also discussed in the 39th meeting of the Standing Committee on Power System Planning of WR held on 30-11-2015 and 22nd meeting of WR constituents regarding Connectivity & Long-Term Access applications in Western Region held on 1-12-2015 and following are the extracts of the discussions of the meeting:

Extracts of the minutes of 39th meeting of the Standing Committee on Power System Planning of WR held on 30-11-2015

In addition to the import requirement of NR of about 23243MW, additional requirement of about 2659 MW power transfer from WR to NR will be incident from following generation projects in WR with beneficiaries in NR.

Sl. No.	Generation Projects	Additional Allocation to NR (MW)	Discussed in
1	MB Power (MP) Ltd.	200 (169MW Firm)	20th WR LTA/Con Meeting on 17.02.2015
2	MB Power (MP) Ltd.	144	

3	DB Power Chhattisgarh Ltd.#	75(Firm)	22nd WR LTA/Con Meeting on 30.11.2015
4	Rewa Ultra Mega Solar td.	300	New application (earlier application discussed in 38th meeting of Standing Committee on Power System Planning in WR held on 17.07.2015)
5	SEI Sunshine Power Pvt. Ltd.	180	New Application
6	Suzlon Power Infrastructure Ltd. (3 applications, location of project in SR)	120	New Application
7	Maruti Clean Coal & Power Ltd *	205 (Firm)	20th WR LTA/Con Meeting on 17.02.2015;
8	TRN Energy Ltd *	240 (Firm)	20th WR LTA/Con Meeting on 17.02.2015;
9	KSK Mahanadi Power Company Ltd	1000 (Firm)	20th WR LTA/Con Meeting on 17.02.2015;
10	Shirpur Power Pvt. Ltd.*	35	21st WR LTA/Con Meeting on 17.07.2015. NOC awaited.
	Grand Total	**2659MW (i.e. 2539 MW from WR & 120 MW from SR)**	

 # DB Power Chhattisgarh Ltd. (DBPCL) vide letter dated 21.08.2015 & 20.10.15 informed that Hon'ble RERC has adopted tariff for purchase of only 250 MW against the PPA quantum of 410 MW with Rajasthan Discom (through PTC India Ltd). Accordingly, DBPCL has requested to regularize 175 MW to Rajasthan in NR region from earlier granted LTA and balance 75 MW may be shifted from WR to Rajasthan for supply of 250 MW to Rajasthan as per the adopted tariff with the condition that the applicant shall pay relinquishment charges as may be decided by CERC in the Petition No: 92/MP/2015

** TRN Energy and Maruti Clean Coal & Power Ltd. had submitted LTA applications against firm PPAs signed with beneficiaries in NR; however same were closed on account of incomplete applications.*

** Application of Shirpur Power Pvt. Ltd. is liable to get closed as NOC from MSETCL is yet to be submitted.*

The above mentioned quantum of power transfer from WR to NR desired by DBPCL, TRN Energy, Maruti Clean Coal & Power Ltd. & Shirpur Power Pvt. Ltd. have been taken in the studies considering that they may apply afresh. In addition to above applications, LTA application of Barethi STPS indicates 871MW power allocation to Northern Region. Therefore, total power transfer requirement towards NR has been assessed as about **26773MW** (23243 + 2659 + 871). With this scenario maximum flow of about 18000MW on WR – NR corridor is observed, which is more than the expected ATC of about 16000MW of WR – NR corridor with commissioning of ongoing / planned system. Accordingly, the following corridor from WR to NR was agreed:

New WR – NR Inter Regional Corridor

(i) Establishment of New 2x15000MVA, 765/400kV Substation at Allahabad
(ii) Vindhyachal Pool – Allahabad (New) 765kV D/c line
(iii) Allahabad (New) – Lucknow 765kV D/c line
(iv)LILO of Sasaram – Fatehpur 765kV S/c line at Allahabad (New)
(v) LILO of Meja – Allahabad 400kV D/c line at Allahabad (New)

Applicants granted LTA to NR on the above WR – NR corridor:

Sl. No.	**Generation Projects**	**Additional Allocation to NR (MW)**
1	MB Power (MP) Ltd.	200 (169MW Firm)
2	MB Power (MP) Ltd.	144
3	Rewa Ultra Mega Solar Ltd	300
4	SEI Sunshine Power Pvt. Ltd.	180
5	Suzlon Power Infrastructure Ltd. (3 applications)	120

6	KSK Mahanadi Power Company Ltd	1000 (Firm)
	Grand Total	**1944MW**

As power from the above LTA applicants would be transferred to NR, the application as well as the new WR – NR corridor shall also be discussed in NR Standing Committee meeting and intimations for grant of Connectivity / LTA to above mentioned applicants can be issued after approval of the system by NR constituents.

In case of relinquishment of LTA already granted to various applicants for power transfer towards Northern Region, the available margin in the already planned transmission system may be re-allocated to new applicants in queue for power transfer towards NR based on system studies, according to relative priority.

Members may like to deliberate.

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

22.1 Following schemes are under implementation through TBCB route :

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**	Bidders short listed on 12.11.2015 RfP issued on 12.11.2015 Submission date for RfP -8th Feb,2016
2	Creation of new 400kV GIS Substations in Gurgaon and Palwal area as a part of ISTS	**PFCCL**	RfQ finalized. RfP issued on 29 Dec 2015, Last date March 1,2016

Members may like to note.

23.0 Reconducting of Existing Lines in Northern region::

23.1 A number of transmission lines have been identified for re-conductoring in a meeting taken in MoP. The lines identified for reconductoring in Northern region are as under:

i. 400kV Singrauli-Anpara S/C
ii. 400kV Dadri-Murandnagar S/C
iii. 400kV Meerut-Muzaffarnagar S/C
iv. 400kV Muzaffarnagar-Roorkee S/C
v. 400kV Anpara-Obra S/C
vi. 400kV Mohindergarh-Bhiwani D/C
vii. 400kV Unnao-Panki S/C
viii 400kV Bassi-Heerapura D/C

23.2 Before taking up the re-conductoring activities (which requires shut down), modalities need to be worked out for meeting the load in these areas. It also needs to be deliberated, which type of HTLS conductor would be beneficial in these lines keeping in view the wide parameter variations in HTLS conductors.

Members may like to deliberate.

Annexure-I

Corrigendum to Minutes of 36th Meeting of
Standing Committee on Power System Planning in Northern Region (SCPSPNR)
held on 13th July 2015 at NRPC, Katwaria Sarai, New Delhi

The Minutes of **36th meeting** of the Standing Committee on Power System Planning of Northern Region were issued vide our letter No. 1/9/2015/SP&PA/4-22 dated 20th August 2015. Following corrigendum is issued based on the observations/Comments received from PGCIL, RRVPNL and HVPNL.

Corrigendum # 1

POWERGRID vide their letter No C/CTU/N/PLG dated 8-9-2015 had mentioned that the Annexure to the minutes for scope of NRSS XXXVII. Based on the POWERGRID's observations, **Annexure II** in the minutes of 36th meeting of the Standing Committee on Power System Planning of Northern Region is thus revised and is as under:

Annexure-II

Phase I: By PTCUL under Uttarakhand Intra-State system

(i) Creation of 220/33kV Jauljivi(PTCUL) substation by LILO of one circuit of 220kV Dhauliganga-Pithoragarh (PG) line at 220kV Jauljivi (PTCUL) substation

Phase II: Part by POWERGRID under ISTS as "NRSS XXXVII"

(i) Creation of 400/220kV, 7X105MVA GIS Substation in Jauljivi area under ISTS by LILO of both ckts. of 400kV Dhauliganga -Bareilly (presently charged at 220kV) at 400/220kV Jauljivi (PG) [Incoming line from Dhauliganga shall be charged at 220kV & outgoing to Bareilly shall be charged at 400kV]

The 400/220 kV Jauljivi substation to have the following provision:

400 kV side

a. 7*105 MVA Single Phase ICTs along with ICT bays
b. 2 nos. of line bays

c. 2X63MVAr switchable line reactors in Bareilly-Jauljivi 400kV D/C at Jauljivi end for providing voltage control under various operating conditions. These 63MVAr line reactors shall be taken up as single phase units, if required.

d. Space provision for 2 future bays

220 kV side

a. 2 nos. of ICT bays

b. 8 nos. of line bays(Pithoragarh-2, Almora-2, Jauljivi-2 & Dhauliganga-2)

c. One no. of 220kV sectionaliser

d. Shifting of 25 MVAr line reactor already available in 220kV Dhauliganga –Bareilly line at Dhauliganga end, to 400/220kV Jauljivi S/s as a bus reactor at 220kV

e. Disconnection of 220 kV LILO of Dhauliganga - Bareilly at Pithoragarh and connection of Pithoragarh line to Jauljivi 400/220 kV S/s at 220kV.

(ii) Diversion of Dhauliganga-Bareilly 400kV D/C line (operated at 220kV) at Bareilly end from Bareilly(UP) to Bareilly(PG) alongwith 2 nos. of 400 kV bays at Bareilly

Phase II: Part by PTCUL under Uttarakhand intraState system

(i) 220kV GIS substation at Almora & associated 220kV Almora–Jauljivi (PG) D/C line

(ii) Existing LILO line of Dhauliganga- Pithoragarh (PG) at 220/33kV Jauiljivi (PTCUL) Substation would be disconnected & 220/33kV Jauiljivi (PTCUL) would be connected to Jauljivi (ISTS) 400/220kV substation through 220kV D/C line.

Corrigendum # 2

POWERGRID vide their letter No C/CTU/N/PLG dated 8-9-2015 proposed that the complete scope of the scheme "Creation of 400/220kV substations in NCT of Delhi during 12th Plan period" may be included as an Annexure to the minutes. PGCIL has also mentioned that LILO of one circuit of Bawana –Mandola 400kV D/C line at Rajghat on M/c tower with Twin/HTLS conductor was inadvertently recorded in the minutes of the 34th Standing Committee Meeting whereas the actual scheme involves LILO of both the circuits of Bawana –Mandola 400kV D/C line at Rajghat. PGCIL has also pointed out that the number of 220 kV bays at Rajghat and Tughlakabad would be 24 instead of 23 and 20 instead of 23 at Dwarka-I , as recorded in the minutes of the 34th Standing Committee Meeting. Accordingly, the complete scope of the scheme "Creation of 400/220kV substations in NCT of Delhi during 12th Plan period" is as under and is appended as Annexure III to the minutes.

Annexure III

"Creation of 400/220kV Substations in NCT of Delhi during 12th Plan Period (Part-A)"

(i) LILO of both circuits of Bawana –Mandola 400kV D/C line at Rajghat on M/c tower with Twin/HTLS conductor

(ii) LILO of one circuit of Bamnauli - Jattikalan 400kV D/C line at Dwarka-I with Twin/HTLS conductor

(iii) Establishment of 4x500MVA, 400/220 kV GIS Substation at Rajghat

400 kV

a. Line bays : 4 nos. (with provision for future expansion)
b. 500 MVA, 400/220 kV ICTs : 4 nos.
c. 125 MVAR Bus Reactor : 1 no.
d. Transformer bay : 4 nos.
e. Reactor Bay : 1 no.

220 kV

a. Line bays : 12 Nos.
b. Transformer bay : 8 Nos. (4 nos. for 400/220kV ICTs & 4 nos. for 220/33kV ICTs)
c. Bus coupler bays : 2 Nos.
d. Bus Sectionalizer bays : 2 Nos.

(iv) Establishment of 4x500MVA, 400/220 kV GIS Substation at Dwarka-I

400 kV

a. Line bays : 2 Nos. (with provision for future expansion)
b. 500 MVA, 400/220 kV ICTs: 4 Nos.
c. 125 MVAR Bus Reactor : 1 No.
d. Transformer bay : 4 No.
e. Reactor Bay : 1 No.

220 kV

a. Line bays : 12 Nos.
b. Transformer bay : 4 Nos.
c. Bus coupler bays : 2 Nos.
d. Bus Sectionalizer bay : 2 Nos.

"Creation of 400/220kV Substations in NCT of Delhi during 12th Plan Period (Part-B1)"

(i) LILO of both circuits of Bamnauli – Samaypur 400kV D/C line at Tughlakabad with Twin HTLS conductor

(ii) Establishment of 4x500MVA, 400/220 kV GIS Substation at Tughlakabad

400 kV

a. Line bays : 4 nos. (with provision for future expansion)
b. 500 MVA, 400/220 kV ICTs : 4 nos.
c. 125 MVAR Bus Reactor : 1 no.

d. Transformer bay : 4 nos.
e. Reactor Bay : 1 no.

220 kV

e. Line bays : 12 Nos.
f. Transformer bay : 8 Nos. (4 nos. for 400/220kV ICTs & 4 nos. for 220/33kV ICTs)

g. Bus coupler bays : 2 Nos.
h. Bus Sectionalizer bays : 2 Nos.

Corrigendum # 3

RRVPNL vide their letter no. RVPN/SE(P&P)/PSS/D 1446 dated 14.09.2015 has intimated a modification regarding **"Development of ISTS system for evacuation of power from new Solar parks and Solar power projects in Rajasthan"** discussed at **S.no 17** in the Minutes of Meeting.

Accordingly, at **S.no. 17.3**, 765 kV D/C Pugal-Bhadla (PG-765 kV GSS) line (initially charged at 400 kV) has to be replaced by 765 kV D/C Pugal-Bikaner (PG-765 kV GSS) (initially charged at 400 kV) in the minutes of 36th meeting of the Standing Committee on Power System Planning of Northern Region.

Further, **as per PGCIL's observation vide their mail dated 09.10.2015**, In para **17.10 (i),** "The ISTS scheme mentioned at **S.No 17.5** for evacuation of 13,700 MW in the identified complex is in-principally agreed by the committee", should be modified and read as "The ISTS scheme mentioned at **S.No 17.3** for evacuation of 13,700 MW in the identified complex is in-principally agreed by the committee."

Corrigendum # 4

HVPNL vide their letter no. Ch/32/HSS-152 dated 09.09.2015 has made observation that As per item **No 1.1.2** in the minutes of 36th meeting of the Standing Committee on Power System Planning of Northern Region, **"Implementation of 220/66kV substation in Chandigarh along with Chandigarh–Panchkula (PG) 220kV D/C line",** the following may be included at the end of the paragraph in the said item of the minutes.

"**Provision for space for two numbers 220kV bays at 400 kV substation Naggal (Panchkula) to be provided for Haryana**"

Corrigendum # 5

As per PGCIL's observation vide their mail dated 09.10.2015, At **S.no 16** in the minutes of 36th meeting

of the Standing Committee on Power System Planning of Northern Region, in the scheme **Modification of Suratgarh Substation Location in Green Energy Corridor, the following may be added as Sl.no 16.5**

16.5 Due to change of S/s location, line lengths of various sections have changed. Therefore, revised reactive compensation is proposed as under:

- **Line Reactors**

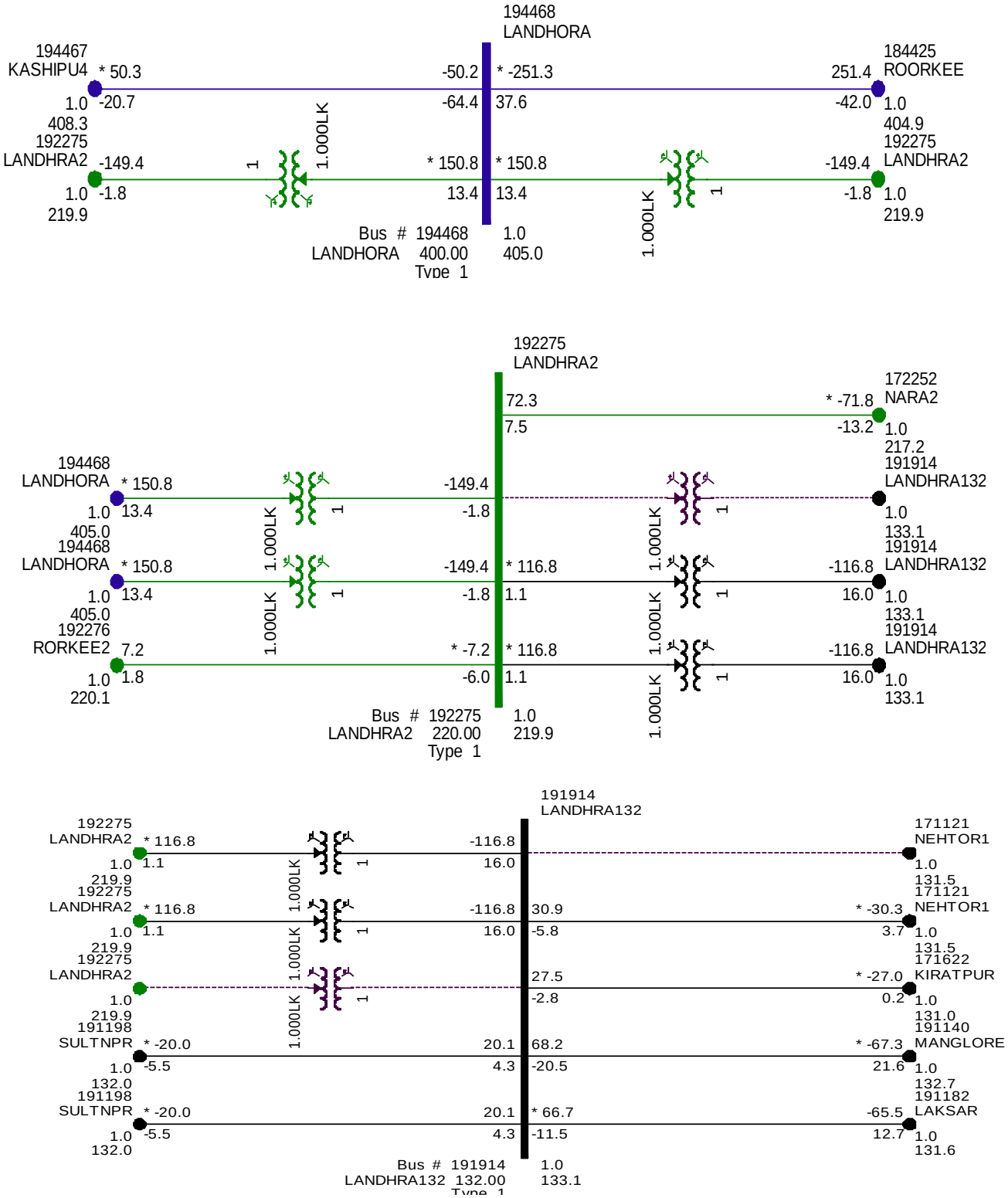
S. No.	Transmission Line	From end (each ckt) MVAr	To end (each ckt) MVAr
(i)	Ajmer(New) – Bikaner(New) 765 kV D/C line -272km	1x240 (switchable) (each ckt.)	1x330 (switchable) (each ckt.)
(ii)	Bikaner(New) – Moga(PG) 765 kV D/C line-350km	1x330 (switchable) (each ckt.)	1x330 (switchable) (each ckt.)

- **Bus Reactors**

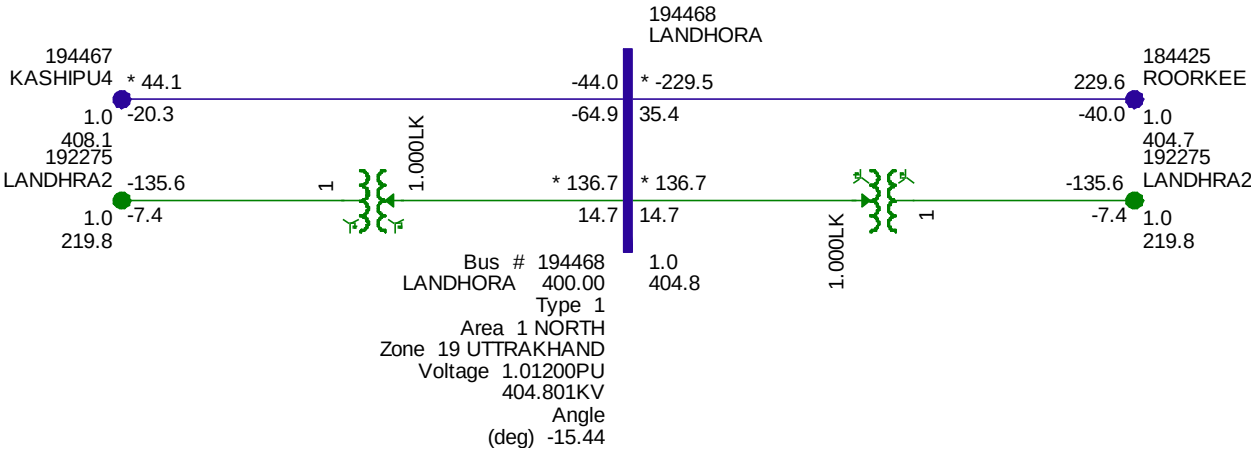
S. No.	Bus	Reactor (MVAR)
(i)	**Bikaner(New)**	**1X330 (765kV bus)** **1x125 (400kV bus)**

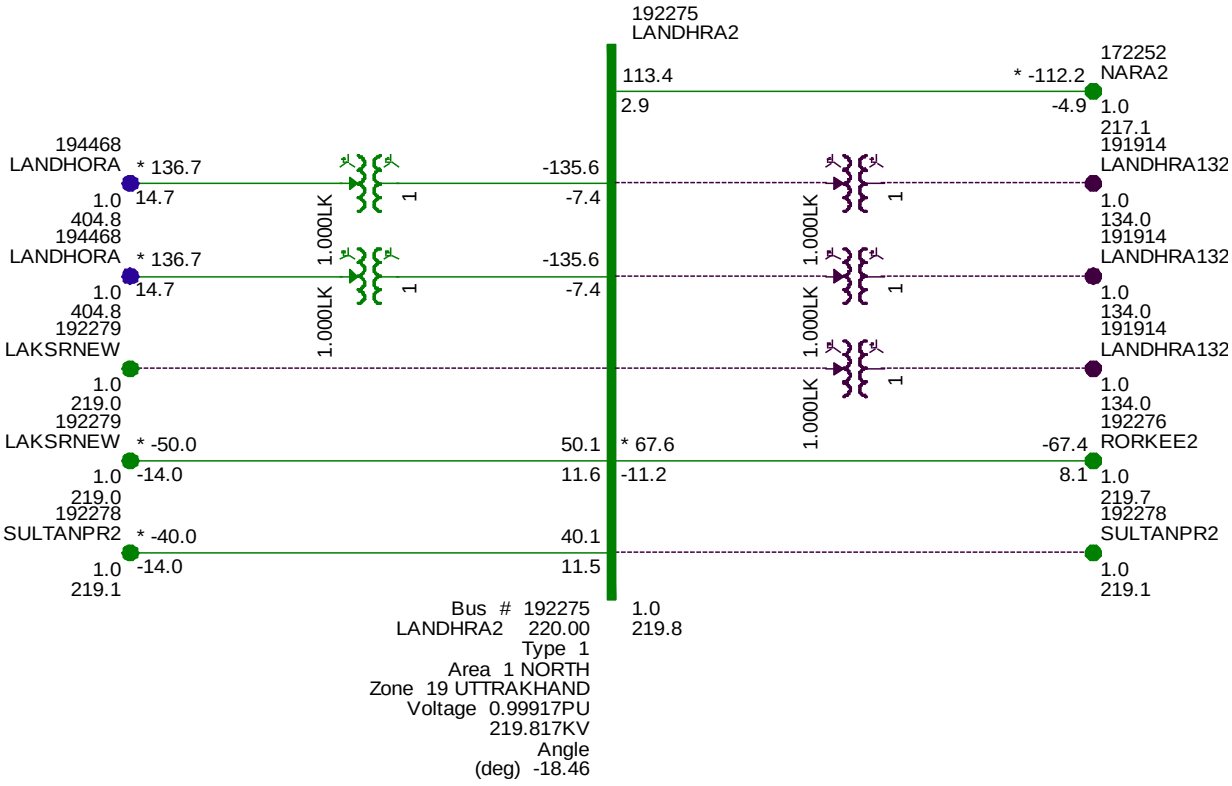
The Standing Committee agreed with the above proposal.

Construction of 400/220/132kV Landhora Substation by PTCUL



Modified Network for Landhora Substation





Annex-III

Transmission system for Ultra Mega Solar Power Park in Jalaun

ANNEX-III

पावर ग्रिड कारपोरेशन ऑफ इंडिया लिमिटेड
(भारत सरकार का उद्यम)
POWER GRID CORPORATION OF INDIA LIMITED
(A Government of India Enterprise)
पावरग्रिड

केन्द्रीय कार्यालय : ''सौदामिनी'' प्लॉट सं. 2, सैक्टर-29, गुडगाँव-122 001, हरियाणा
फोन : 0124-2571700-719, फैक्स : 0124-2571760, 2571761 तार 'नेटग्रिड'
Corporate Office : "Saudamini" Plot No. 2, Sector-29, Gurgaon-122 001. Haryana
Tel. : 0124-2571700-719, Fax : 0124-2571760, 0124-2571761 Gram : 'NATGRID'

संदर्भ संख्या / Ref. No. C/SG/SOLAR/UP/01

05th Oct 2015

Sh. Suman Guchh
Chief Engineer (TP)
UP Power Transmission Corp. Ltd
Shakti Bhawan Extn
3rd floor, 14, Ashok Marg,
Lucknow - 226 001
UP

Sub: Transmission scheme for Jalaun Solar Park (270 MW)

Dear Sir,

We write with reference to the meeting held on 01.10.2015 regarding transmission scheme for upcoming Jalaun Solar Power Park (270 MW). Further, in reference to above meeting as well as discussion at PGCIL office on 05.10.2015, minutes of the meeting in this regard are enclosed for your perusal.

Thanking you,

Yours faithfully,

5/10/15

(Kashish Bhambhani)
Chief Manager (SG)

Minutes of meeting for transmission system of Jalaun Solar Park (270 MW) held on 01.10.2015 at Shakti Bhawan, UPPTCL, Lucknow (UP)

A meeting was held between UPPTCL and POWERGRID to discuss transmission system for upcoming Jalaun Solar park(270 MW) on 01.10.2015 at CE(TP) office, Lucknow, UP. M/s Lucknow Solar Power Development corporation Ltd, Solar Park Developer/Implementing agency also participated in the meeting.

List of participants are enclosed at ***Annexure-1***.

1) POWERGRID informed that in the 36th meeting of NR standing committee meeting, based on the inputs provided by the MNRE, transmission system for Solar Power Parks in Jalaun, UP (370 MW) was discussed. In the meeting, it was decided that a 132/400kV pooling station shall be established along with 400kV grid interconnection. Subsequently, M/s Lucknow Solar Power Development corp. Ltd. (LSPDCL) submitted the application for Connectivity & LTA in ISTS for revised capacity (270 MW) of Jalaun Solar power park to CTU as per the CERC regulations.

2) Considering revised Solar generation capacity of Jalaun, studies were carried out with 220kV as well as 400 kV alternatives along with availability of approved generation and associated transmission system of UP in respective scenarios. As indicated by Director, Lucknow Solar Power Development Corp in the meeting, major beneficiary shall be the UP as procurer out of total generation capacity with target commissioning schedule as Dec'16.

3) In the meeting, Director, LSPDCL indicated that they have applied/granted for connectivity to UPPTCL for about 235 MW Solar generation majorly at three (3) locations viz. Kalpi (100 MW), Lalitpur (40 MW), Mahoba/Panwari (95 MW).

4) Considering short gestation period of generation and time required for development of transmission, 220kV interconnection at 400/220kV Orai (UP), 220/132kV Orai (UP), which is in the vicinity(20-25 kms) as one of the alternative was also explored in the time frame of Jalaun Solar generation.

   POWERGRID indicated that as per studies with 220kV interconnection at 220/132kV Orai(UP), loadings are in order. CE, UPPTCL indicated that based on the available information, 220/132kV Orai(UP) does not have 220kV bays availability for termination.

   POWERGRID stated that since upcoming 400/220kV Orai (UP) have only two (2) nos. 220kV outlets, the line loading on the outlets are observed to be slightly on higher side. The loading shall further increases in 2018-19 scenario (in n-1 contingency) which would need strengthening of 220kV underlying transmission

near Orai complex. It was also enquired whether UPPTCL have any plans for strengthening of 220kV underlying transmission.

CE, UPPTCL informed that in view of the new solar injections at various locations (Kalpi/Lalitpur/Mahoba), they are also studying the alternatives in this regard. CE UPPTCL concurred to the marginal high loading level of 220kV transmission corridor and indicated that due to above reasons injection at 220kV level (400/220kV Orai(UP)) from Jalaun Solar Park is not feasible.

5) CE, UPPTCL advised that studies should include above planned Solar generation also as they shall directly feed the demand at 132 kV/33kV level impacting the 220kV system.

6) CE, UPPTCL suggested that considering high loading levels in nearby 220kV system (Orai etc.) as well as 220kV bay availability constraints, injection at 220kV level may not be feasible and therefore 400kV level at 132/400kV Jalaun PS may be retained. Further for 400kV grid interconnection of Jalaun Pooling station, LILO of 400kV Orai(UP)-Mainpuri(UP) one circuit at 132/400kV Jalaun Pooling Station may be studied. The line shall also be passing near to proposed 132/400kV Jalaun PS location.

   POWERGRID carried out studies with above proposed 400kV alternative and it was observed that line loadings are generally in order. The option is also found to be a techno-economic alternative vis-a-vis other studied alternatives. Study results in this regard are as enclosed at ***Annexure-2***. Further, studies were also repeated with 2018-19 scenario wherein 765/400kV Orai(PG) along with its 400kV interconnection at Orai(UP) is considered, studies in this regard is enclosed at ***Annexure-3***. From the studies, in above alternative, it was observed that with and without Jalaun Solar generation, 220kV underlying UPPTCL line loadings are not significantly changed.

7) Based on above, following alternative was agreed by the UPPTCL and POWERGRID as transmission system for Jalaun Solar Park (270 MW):

   - Establishment of 400/132kV, 3x200 MVA Pooling station at Jalaun along with 1x125MVAr bus reactor
   - LILO of one circuit of 400kV Orai(UP)- Mainpuri (UP) 400kV D/c line- about 20 kms
   - 4 nos. 132kV line Bays at 400/132kV Jalaun Pooling Station

8) Considering the short gestation period of Solar projects, POWERGRID informed that based on the discussions and above agreed transmission alternative, they shall be taking up the same on priority for tendering. Further, the scheme shall be taken up for discussion with stakeholders in the next NR standing committee meeting.

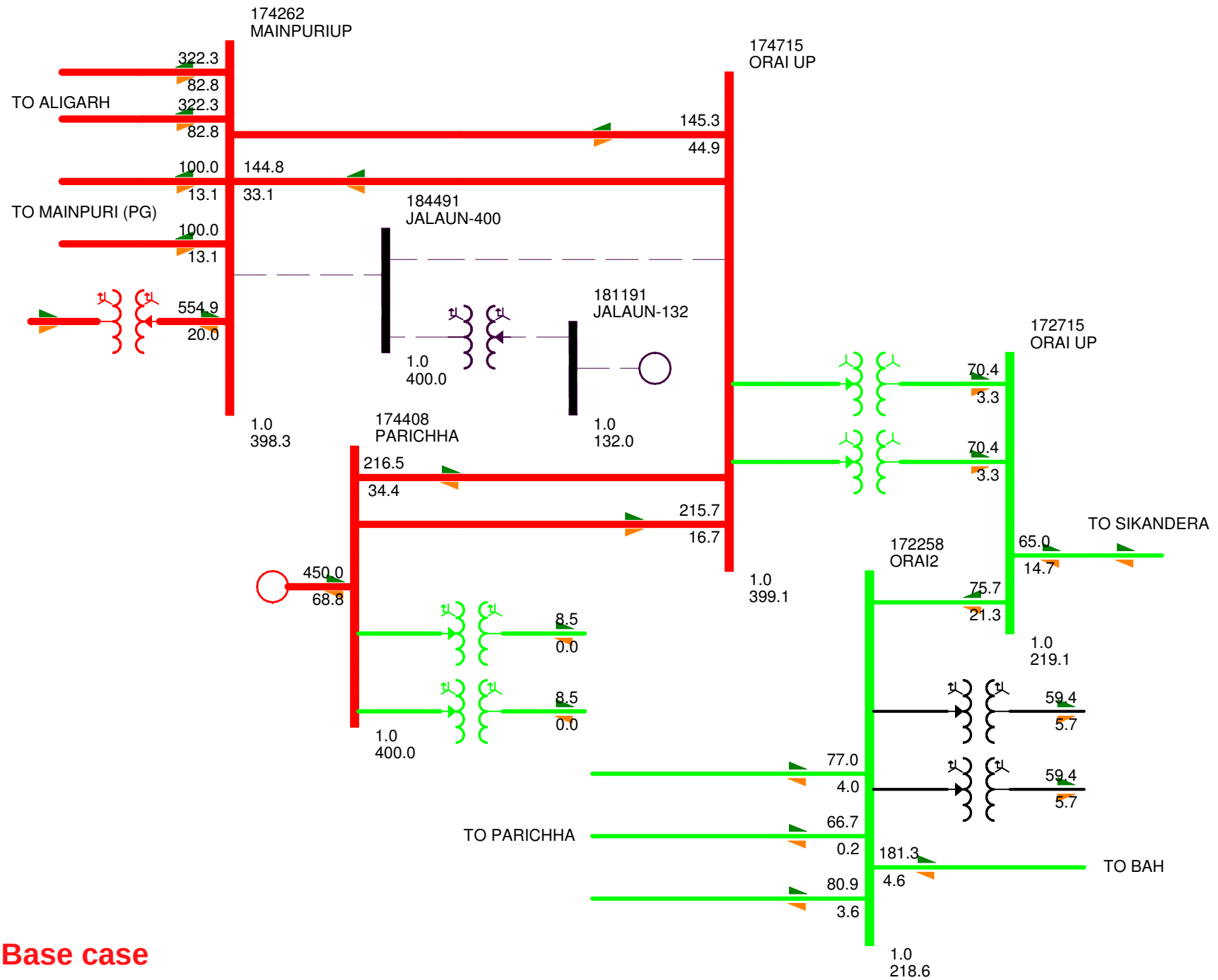
--x--

Annexure-1

List of participants

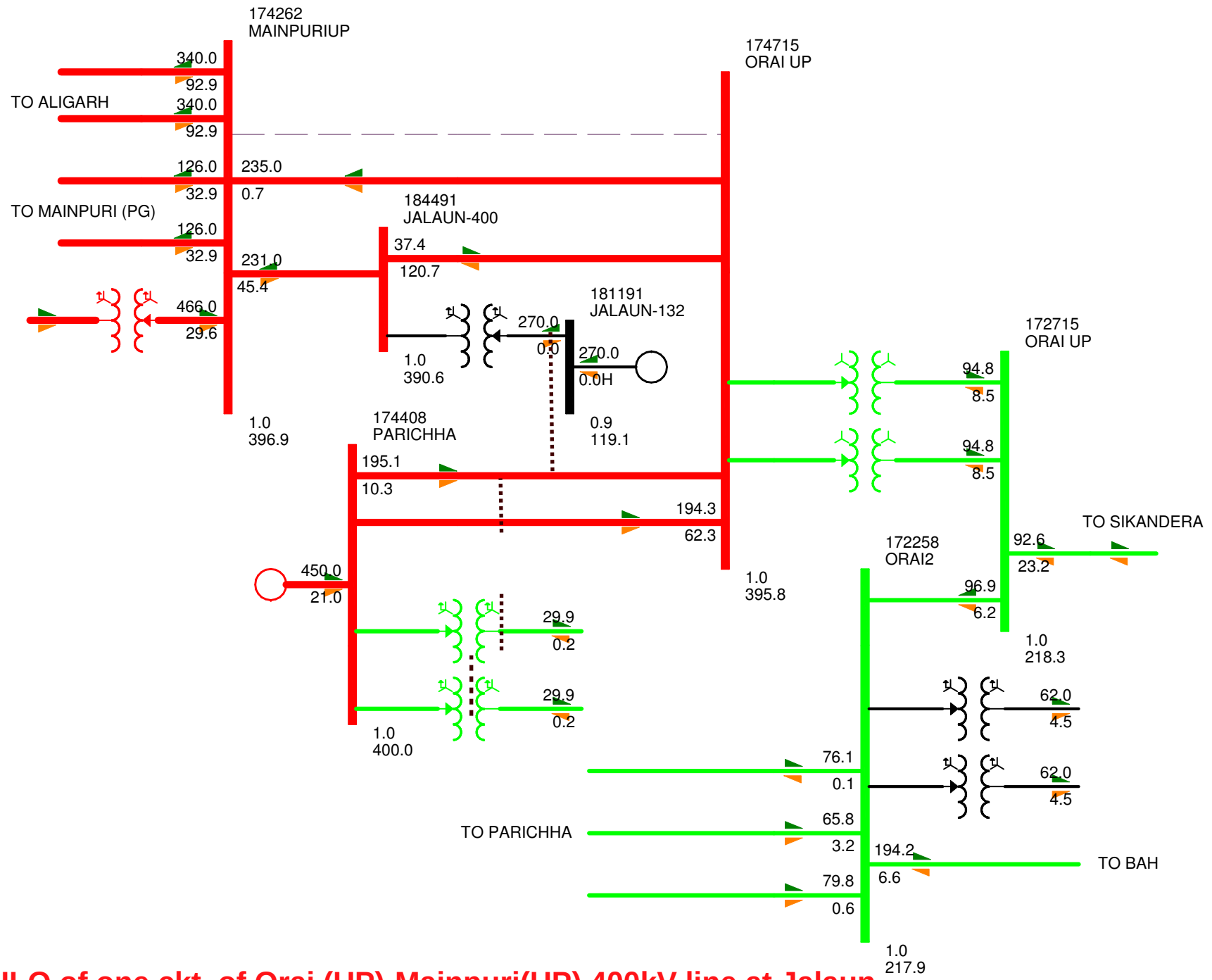
1. Sh. Suman Guchh, CE(TP), UPPTCL
2. Sh. S K Bhattcharya, SE(765kV SS design), UPPTCL
3. Ms. Namrata Kalra, Director, Lucknow Solar Dev. Corp Ltd/UPNEDA
4. Sh. Stayendra Kumar, EE(TP&PSS), UPPTCL
5. Sh. Khalid Siddiqui, AE(TP&PSS), UPPTCL
6. Sh. Kashish Bhambhani, Chief Mgr (SG), POWERGRID
7. Sh. Amit Kumar Singh, Engineer(SG), POWERGRID

JALAUN SOLAR PARK (2016-17)



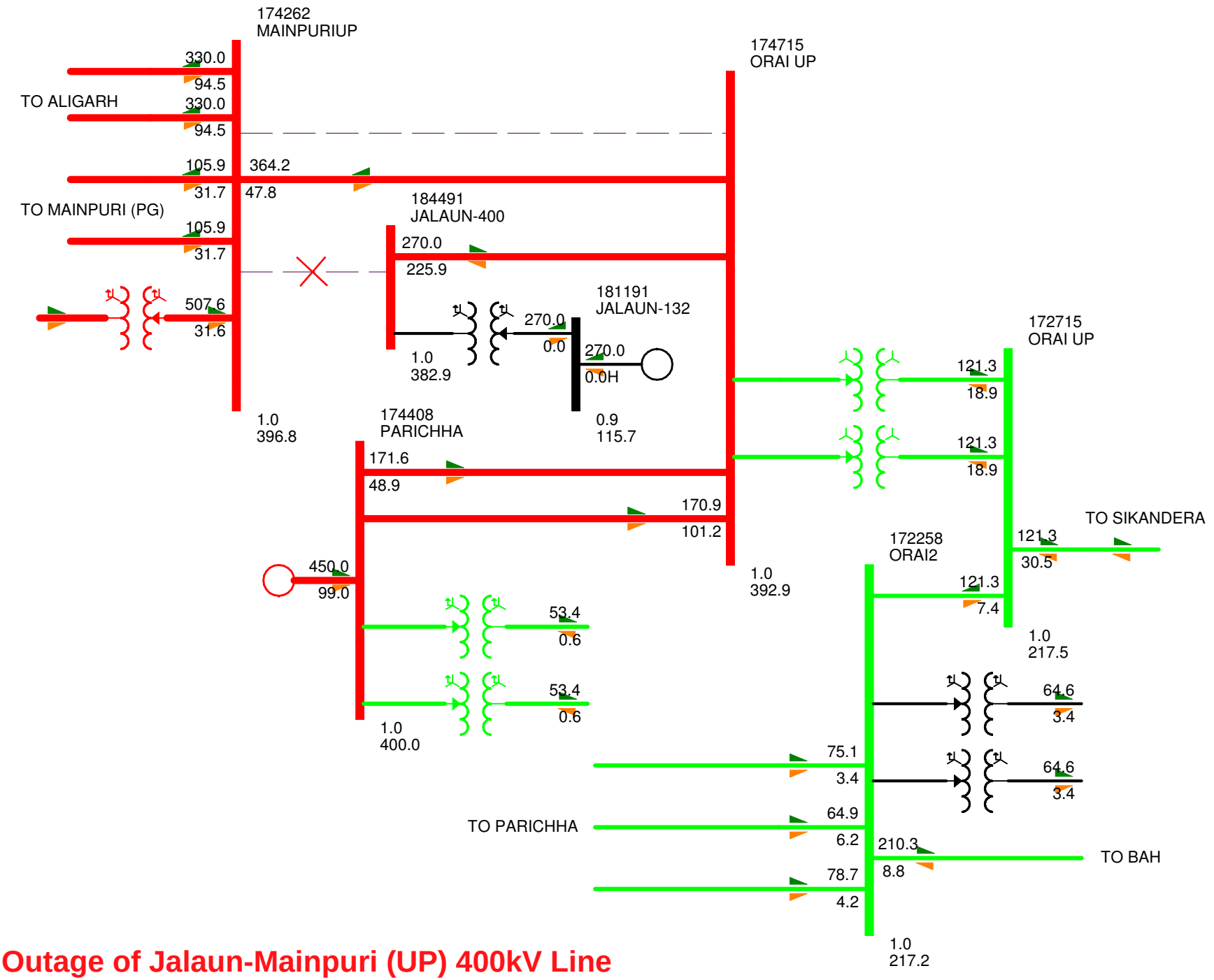
Base case

JALAUN SOLAR PARK (2016-17)



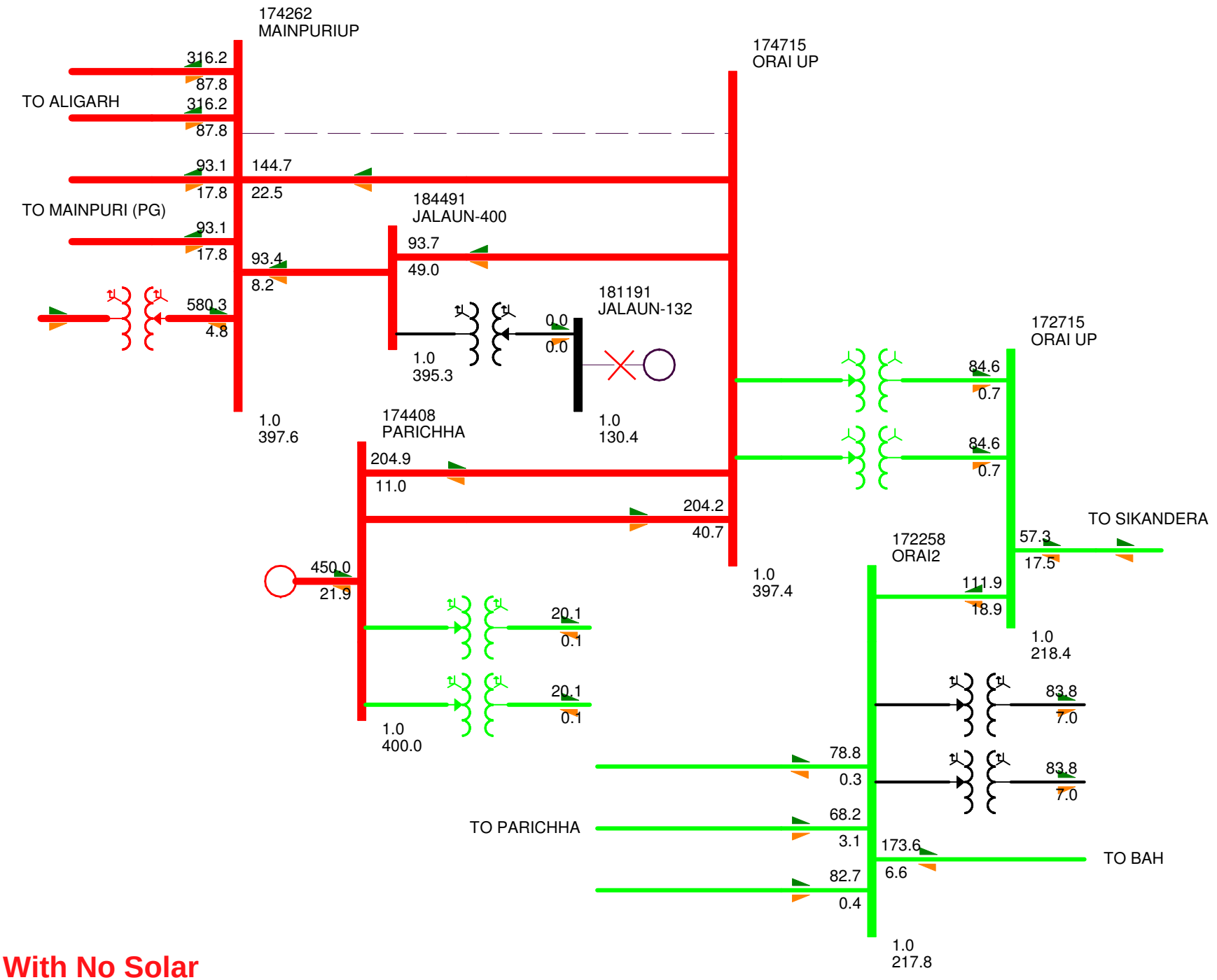
LILO of one ckt. of Orai (UP)-Mainpuri(UP) 400kV line at Jalaun

JALAUN SOLAR PARK (2016-17)



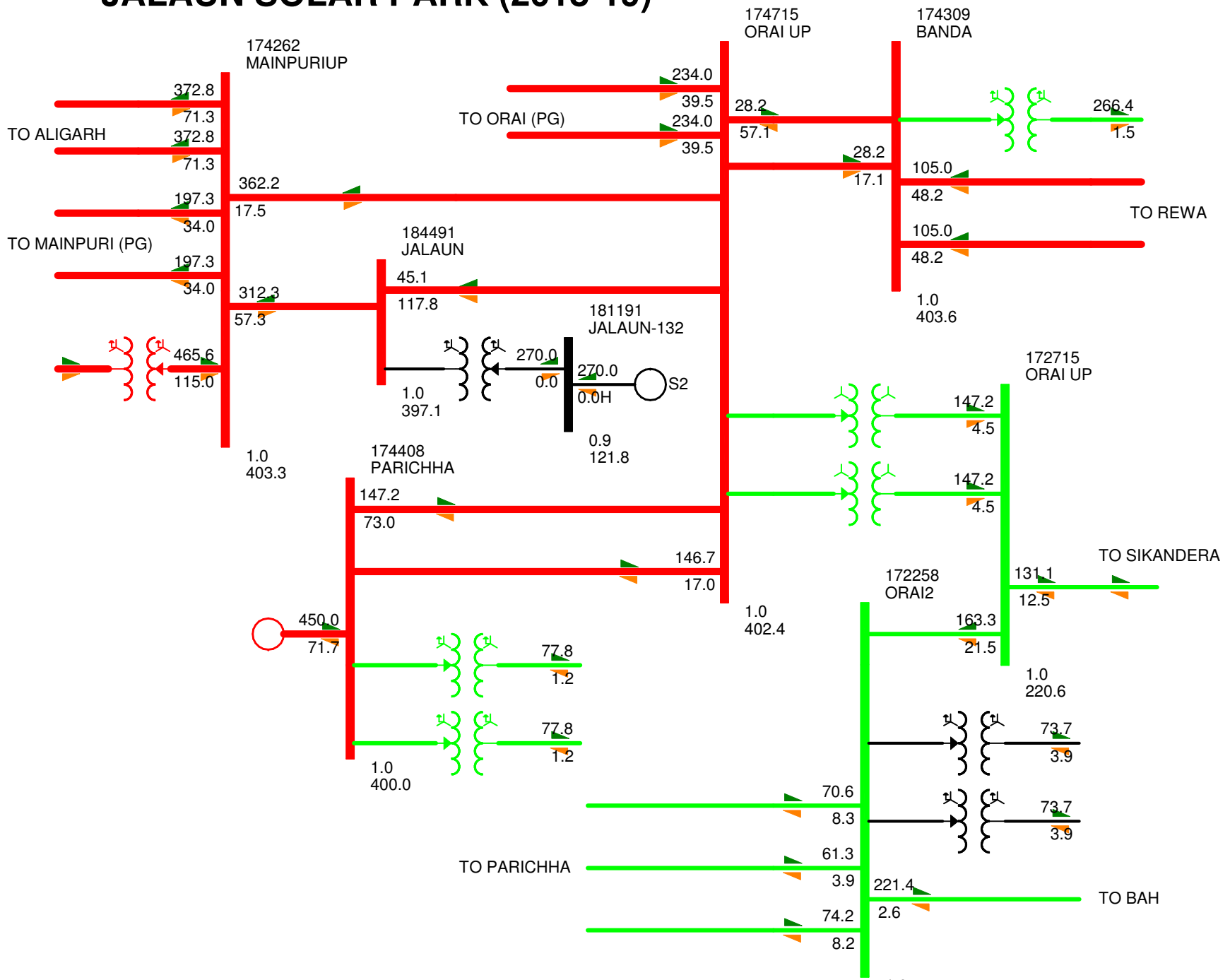
Outage of Jalaun-Mainpuri (UP) 400kV Line

JALAUN SOLAR PARK (2016-17)



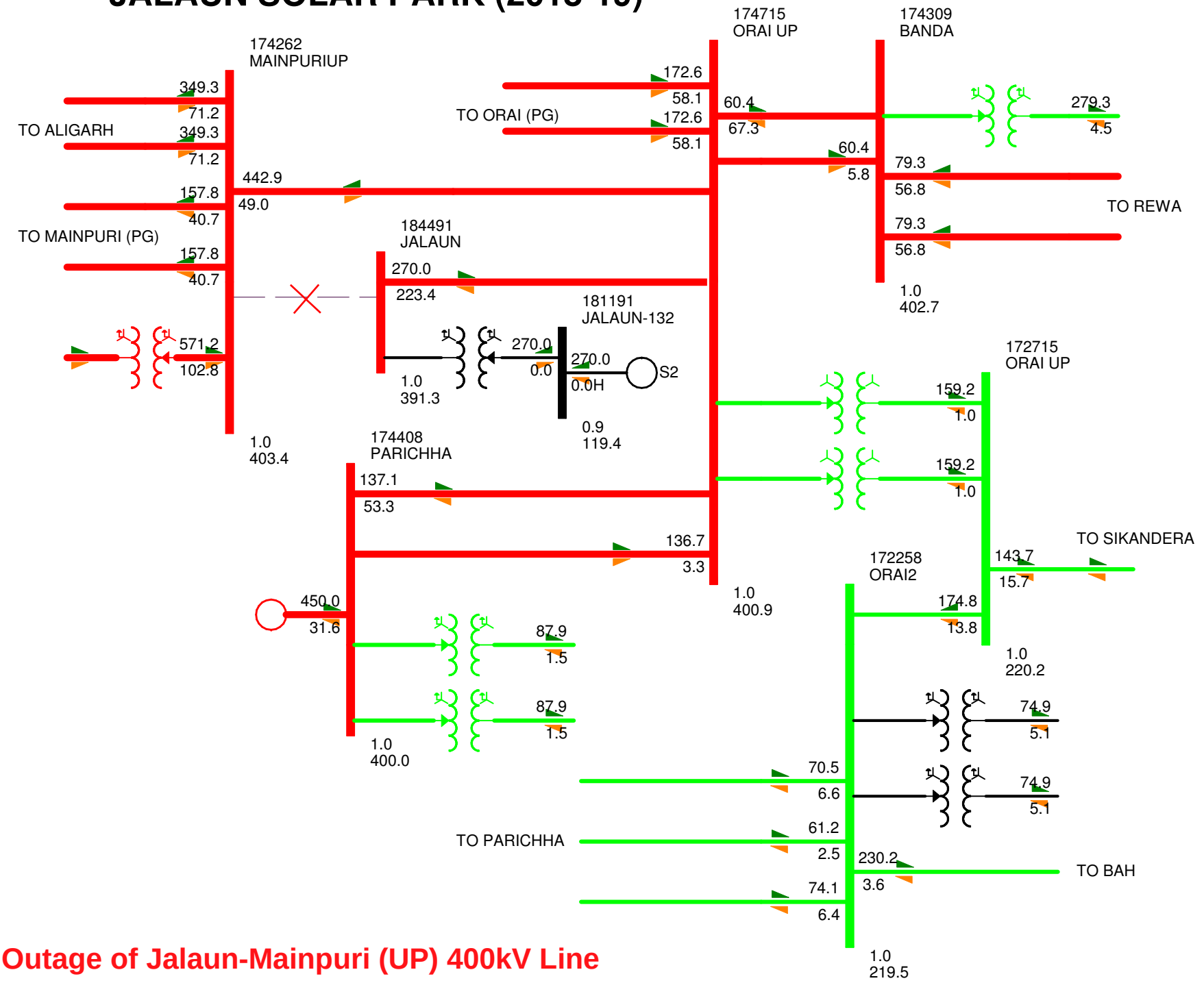
With No Solar

JALAUN SOLAR PARK (2018-19)

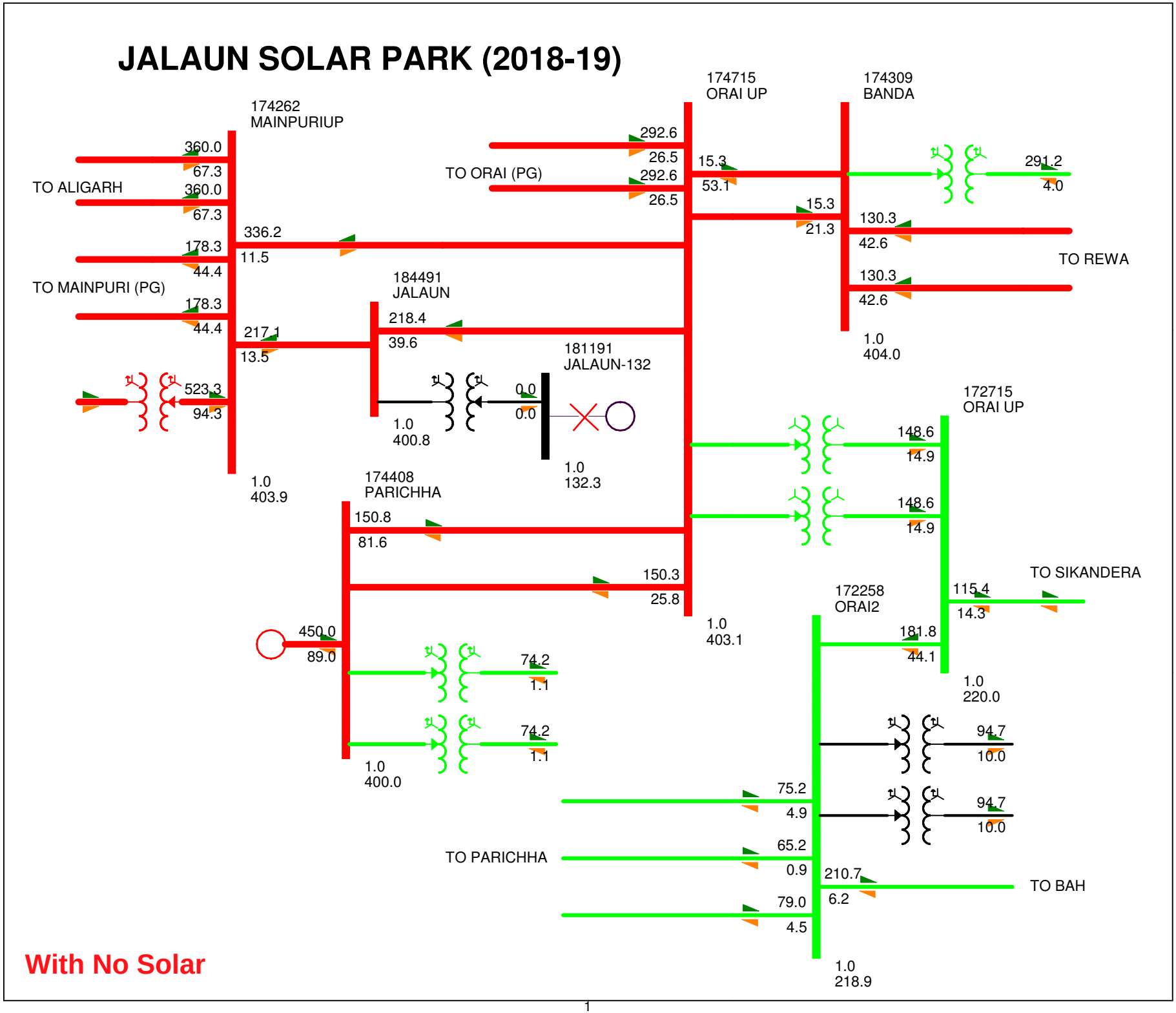


LILO of one ckt. of Orai (UP)-Mainpuri(UP) 400kV line at Jalaun

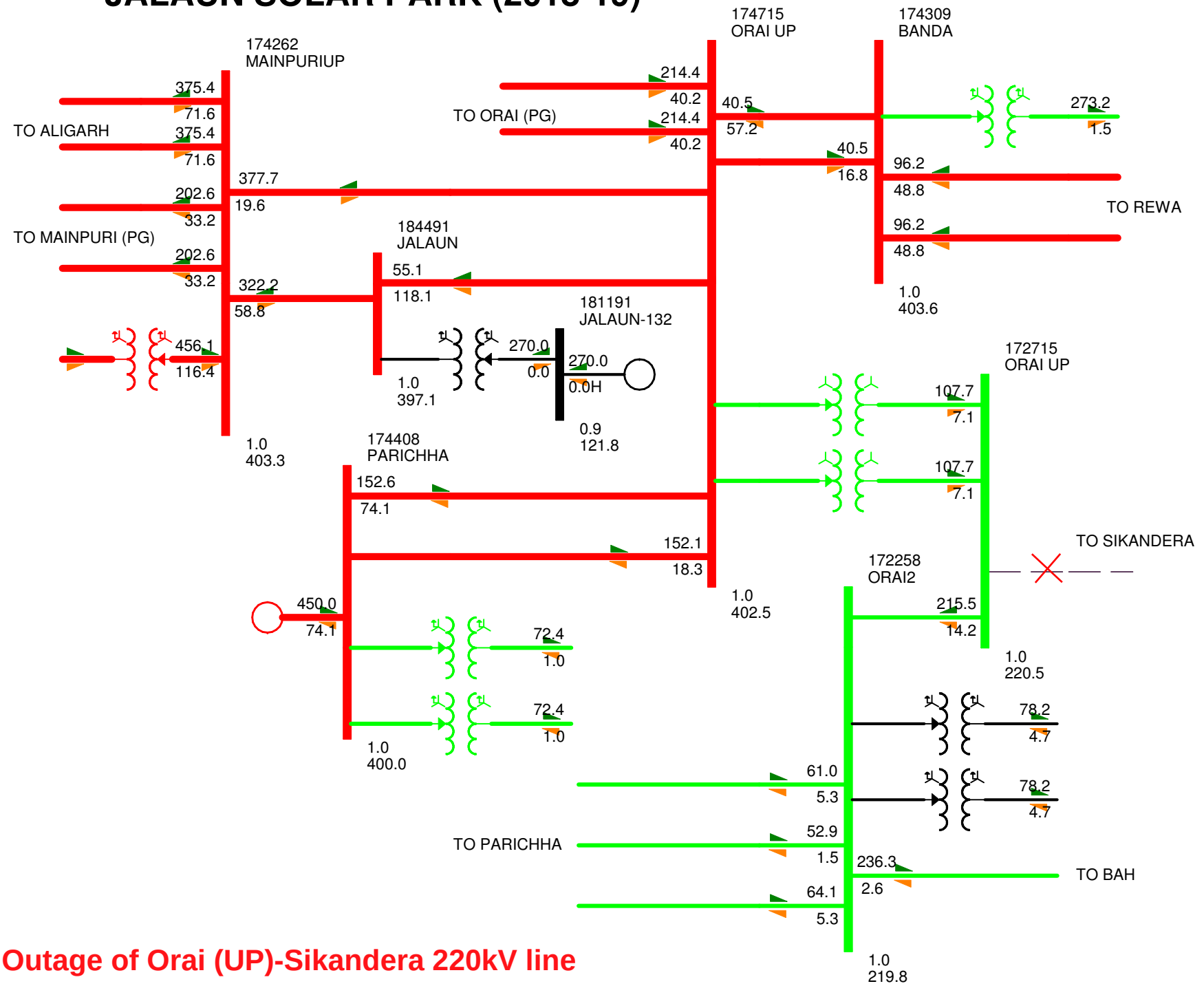
JALAUN SOLAR PARK (2018-19)



Outage of Jalaun-Mainpuri (UP) 400kV Line

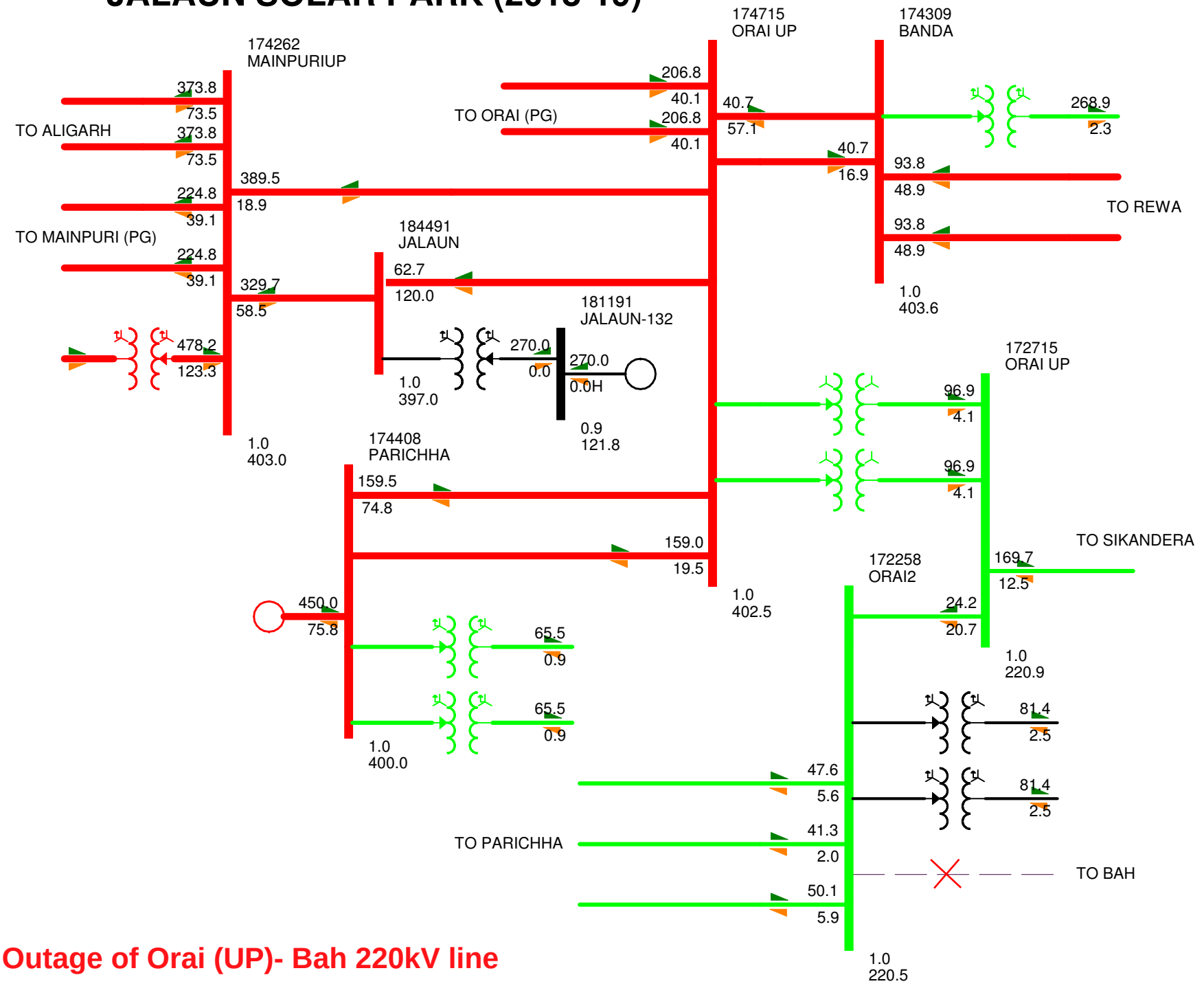

JALAUN SOLAR PARK (2018-19)
174262
MAINPURIUP
360.0
67.3
TO ALIGARH
360.0
67.3
178.3
44.4
TO MAINPURI (PG)
178.3
44.4
336.2
11.5
217.1
13.5
523.3
94.3
1.0
403.9
184491
JALAUN
218.4
39.6
1.0
400.8
181191
JALAUN-132
0.0
0.0
1.0
132.3
174715
ORAI UP
292.6
26.5
TO ORAI (PG)
292.6
26.5
15.3
53.1
15.3
21.3
1.0
403.1
174309
BANDA
291.2
4.0
130.3
42.6
TO REWA
130.3
42.6
1.0
404.0
172715
ORAI UP
148.6
14.9
148.6
14.9
TO SIKANDERA
115.4
14.3
181.8
44.1
1.0
220.0
172258
ORAI2
94.7
10.0
94.7
10.0
1.0
218.9
174408
PARICHHA
150.8
81.6
150.3
25.8
450.0
89.0
74.2
1.1
74.2
1.1
1.0
400.0
75.2
4.9
TO PARICHHA
65.2
0.9
79.0
4.5
210.7
6.2
TO BAH
With No Solar

JALAUN SOLAR PARK (2018-19)



Outage of Orai (UP)-Sikandera 220kV line

JALAUN SOLAR PARK (2018-19)



Outage of Orai (UP)- Bah 220kV line

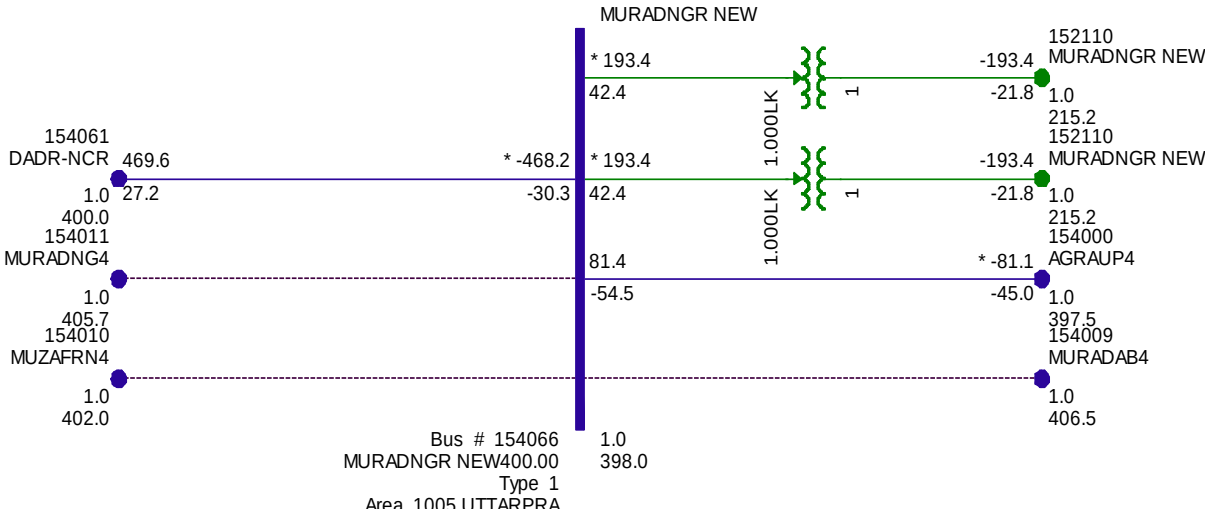
Generation of UP around Orai/Lalitpur					
S. No.	**Plant Name**	**Voltage**	**Generation Type**	**Installed Capacity (MW)**	**Dispatch (MW)**
1	Banda (Mahoba and Panwari)	132	Solar	95	67
2	Lalitpur	132	Solar	40	28
3	Orai (Kalpi)	132	Solar	100	70
4	Jalaun	132	Solar	270	270
5	Matatila	132	Hydro	25	12.5
6	Parichha	220	Thermal	640	542
7	Parichha	400	Thermal	500	450
8	Bara	400	Thermal	1980	1386
9	Meja*	400	Thermal	1320	924
10	Lalitpur	765	Thermal	1980	1386
Total				**6950**	**5135.5**

* Generation at Meja has not been considered in 2016-17 scenario

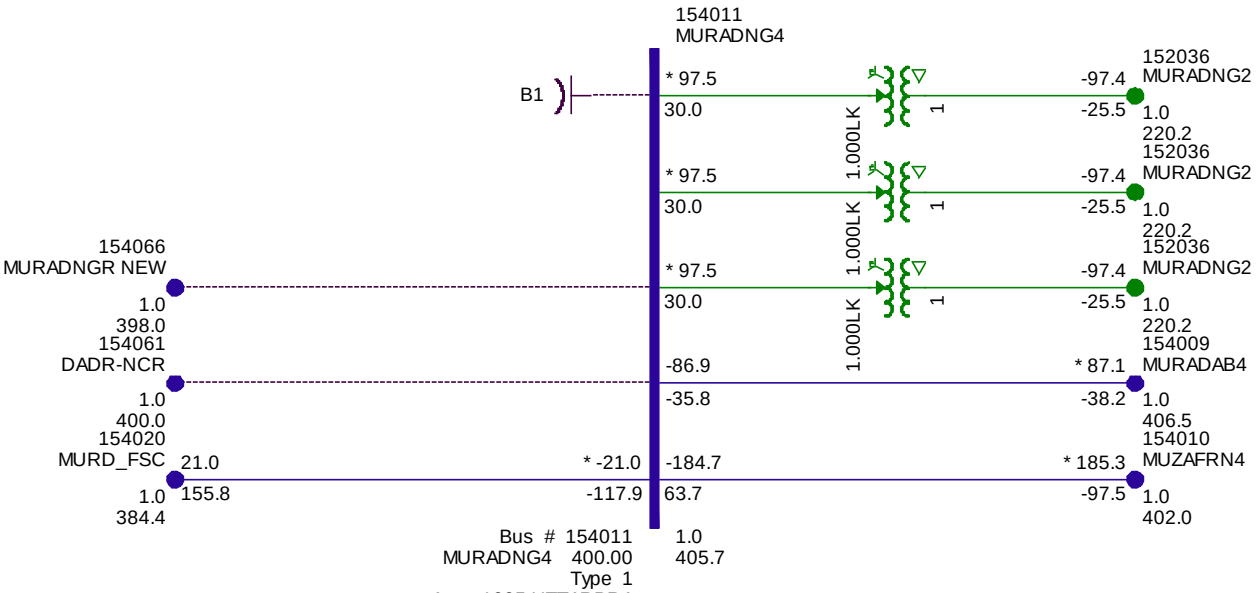
Annex-IV(A)

Case - With shifting 400kV Dadri –Muradnagar line to Muradnagar-II (upcoming Peak load Scenario)

MURAD NAGAR NEW (400kV)



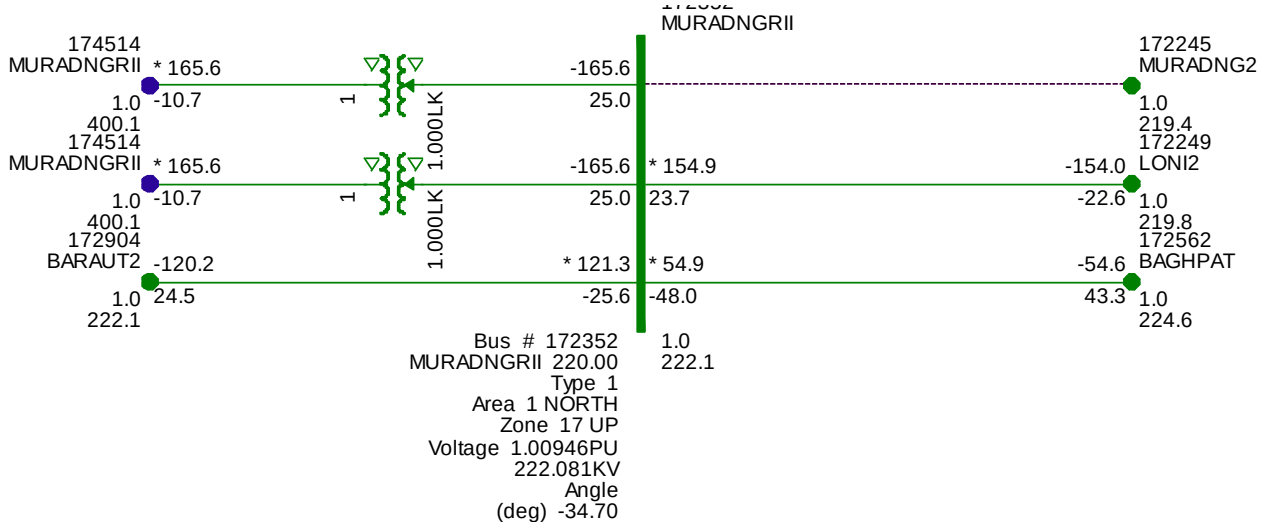
MURAD NAGAR OLD (400kV)



Annex-IV(B)

Case - Shifting 400kV Dadri –Muradnagar line to Muradnagar-II after commissioning of additional transmission elements

MURAD NAGAR NEW (220kV)



MURAD NAGAR OLD (400kV)