भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
उत्तर क्षेत्रीय विद्युत समिति
Northern Regional Power Committee

सं. उक्षेविस/ वाणिज्यिक/ 209/ आर पी सी (69 वीं)/2023/ दिनांक:22 सितम्बर, 2023

सेवा में / To,

उ.क्षे.वि.स. के सभी सदस्य एवं विशेष आमंत्रित (संलग्न सूचीनुसार)
Members of NRPC & Special Invitees (As per List)

विषय: उत्तर क्षेत्रीय विद्युत समिति की 69 वीं बैठक की कार्यसूची ।
Subject: Agenda for 69th meeting of Northern Regional Power Committee-reg

महोदय / महोदया,

उत्तर क्षेत्रीय विद्युत समिति की 69 वीं बैठक दिनांक **27.09.2023 (10:30 AM)** को वीडियो कॉन्फ्रेंसिंग के माध्यम से आयोजित की जाएगी । बैठक की कार्यसूची संलग्न है ।

कृपया उपस्थिति सुनिश्चित करें । मीटिंग लिंक अलग से साझा किया जाएगा ।

The 69th meeting of Northern Regional Power Committee (NRPC) will be held on 27.09.2023 (10:30 AM) via video conferencing. Agenda for the same is attached.

Kindly make it convenient to attend the same. Meeting link shall be shared separately.

भवदीय
Yours faithfully

VIJAY KUMAR SINGH
Digitally signed by VIJAY KUMAR SINGH
Date: 2023.09.22 16:31:23 +05'30'

(वी.के. सिंह)
(V.K. Singh)
सदस्य सचिव
Member Secretary

प्रतिलिपि: मोहम्मद शायिन, एमडी, एचवीपीएनएल एवं अध्यक्ष, एनआरपीसी (md@hvpn.org.in)

सत्यमेव जयते

उत्तर क्षेत्रीय विद्युत समिति
NORTHERN REGIONAL POWER COMMITTEE

Agenda of
The 69th meeting of
Northern Regional Power Committee

Date: 27th September 2023
Time: 10:30 AM
Via: Video Conferencing

Contents

A.1 Approval of MoM of the 68th NRPC meeting

A.1.1 The Minutes of the 68th NRPC meeting (held on 18.08.2023) was issued vide letter dtd. 11.09.2023. As no comment from any utilities have been received, the same may be approved.

Decision required from Forum:

Forum may consider to approve the above MoM.

A.2 Construction of 220/132 kV, 80/100 MVA Sub Station at Tahliwal (Distt. Una in Himachal Pradesh) by S/C LILO of 220 kV D/c Bhakra to Jamalpur D/c line of BBMB with provision of SPS to restrict drawl at 50 MVA and to ensure no drawl of Power from Jamalpur side in case of outage of Bhakhra - Tahliwal circuit (agenda by HPPTCL)

A.2.1. This is in context of the Construction of 132/220 kV, 80/100 MVA Sub Station at Tahliwal (Distt. Una in Himachal Pradesh) by S/C LILO of 220 kV Bhakra – Jamalpur D/c line of BBMB.

A.2.2. In above matter, HPPTCL has placed the agenda for BBMB constituent's approval in 199th Power Sub-committee meeting held on 29.04.2013, wherein it was agreed that H.P. may LILO 220 kV Bhakra-Jamalpur (Punjab) D/C line of BBMB, which is passing through H.P. and establish 220/132 kV Substation at Tahliwal in Himachal Pradesh. It was further desired by BBMB that the proposal be got concurred by Northern Region Constituents in the meeting of Standing Committee.

A.2.3. The matter was discussed in 33rd meeting of Northern Region Standing Committee held on 23.12.2013 and 36th meeting of Northern Region Standing Committee held on 13.7.2015, wherein it was decided that in case HPSEBL desires to draw 80 MW Power at Tahliwal, the LILO of 220 kV Bhakra (Right) – Jamalpur D/C line at Tahiliwal and re-conductoring of the portion of the line between Bhakra(R) –LILO point with HTLS conductor be carried out by HPSEB at their own cost. HPSEB should restrict the loading on the LILO portion to 80 MW by installing SPS. The proposal was subsequently approved in 123rd Power Subcommittee of BBMB held on 27.07.2015.

A.2.4. Considering that the decisions were taken in 2015 and significant time has passed, before taking up the construction in year 2020 HPPTCL took the matter with BBMB, wherein it was desired to ascertain the present situation and any changes required in the decisions taken in 36th Standing Committee and 123rd Power Subcommittee, the proposal shall again be placed before BBMB constituents for approval. The matter was discussed in 144th, 145th & 146th meeting of Power Subcommittee wherein in 146th meeting of Power Subcommittee, Haryana and Rajasthan intimated no objection to HP proposal but PSTCL informed that they have some reservations and are not in agreement with the proposal of HP, so it was concluded that the HPPTCL shall discuss the matter with PSTCL to explore the possibility of consensus for further progress in the matter.

A.2.5. Subsequently, the matter was again discussed with PSTCL by HPPTCL, wherein after deliberations PSTCL consented for drawl of 50 MVA instead of earlier committed 80 MVA by S/C LILO of 220 KV Bhakra Jamalpur line of BBMB (without HTLS re-conductoring) with provision of SPS to restrict drawl at 50 MVA and to ensure no drawl of Power from Jamalpur side in case of outage of Bhakra - Tahliwal circuit. Accordingly, the scheme has been revised as Construction of 220/132 KV, 80/100 MVA Sub-Station at Tahliwal (Dist. Una in Himachal Pradesh) by S/C LILO of 220 KV D/C Bhakra Jamalpur line of BBMB. The revised plan was placed for discussion in the 148th meeting of Power Subcommittee of BBMB held on 25.08.2023 and was approved by BBMB constituents.

A.2.6. The substation is required on urgent basis to provide construction power to Bulk Drug Pharma Park proposed in Haroli Distt-Una of Himachal Pradesh (A Project of National Importance). The foundation stone laying ceremony of which has been done by Hon'ble Prime Minister in October 2022. Since the overall requirement of BDP (Bulk Drug Park) is to the tune of 120 MVA, HPPTCL has already submitted proposal to CEA for approval of the following elements as long term plan i.e. Construction of 220/132 kV, 220 MVA Substation nearby Una and 220 kV (Twin Zebra) D/C line from 220/132 kV Nehrian Substation to Proposed 220/132 kV, 220MVA Substation near Una. This proposal shall require time frame of 3 years for construction after approval. The area is already facing acute supply shortage irrespective of upcoming BDP (Bulk Drug Pharma Park).

A.2.7. In view of above, it is proposed that forum may approve construction of 220/132 kV, 80/100 MVA Sub Station at Tahliwal (Distt. Una in Himachal Pradesh) by S/C LILO

of 220 kV D/C Bhakra Jamalpur D/C line of BBMB with Provision of SPS to restrict drawl at 50 MVA and to ensure no drawl of Power from Jamalpur side in case of outage of Bhakhra - Tahliwal circuit, in line with approval of Power Subcommittee and BBMB constituents.

The single line diagram of proposal is attached as **Annexure-I.**

Decision required from Forum:

Forum may discuss on the above proposal and approve accordingly.

A.3 Furnishing of Data for finalization of Generation programme 2024-25 (agenda by OPM Division, CEA)

A.3.1 Annual assessment and finalization of the generation program for the year 2024-25 is being undertaken by OPM Division, CEA. In this regard, the deadline provided to the Generating stations for furnishing the data was 31.08.2023.

A.3.2 As on 12.09.2023, only 114 stations have furnished the data for the Generation programme 2024-25.

A.3.3 List of stations in Northern Region whose data for Generation programme 2024-25 has not been received (as on 12-9-2023) is attached as **Annexure-II.**

A.3.4 In view of the mild response from the generating companies and to adhere to the timelines for the finalization of the Generation Programme for 2024-25, it is again requested to furnish the data to CEA at the earliest.

Decision required from Forum:

Forum may deliberate the above matter for facilitating required data to OPM Division, CEA.

A.4 Implementation of 400/220kV Gopalpur substation by DTL (agenda by CTUIL)

A.4.1 In the 39th meeting of the Standing Committee on Power System Planning of Northern Region held on 29-30th May 2017, following intra state transmission scheme was agreed for implementation by DTL

- Establishment of 4x500MVA, 400/220kV GIS Substation at Gopalpur along with 125 MVAR bus reactor - by DTL.
- LILO of Maharanibagh–Bawana 400 kV D/C line at Gopalpur 400/220 kV substation on multicircuit towers.

A.4.2 In view of above, system studies carried out considering Gopalpur substation and a new 765/400kV Narela substation (ISTS) was planned as part of transmission scheme for Rajasthan SEZ Ph-II (8.1GW) transmission scheme considering connectivity with 400/220kV Gopalpur substation. The scheme was agreed in 5th NRSCT meeting held on 13.09.2019 with following transmission elements as part of transmission schemes of Rajasthan SEZ (8.1 GW) under Phase-II

1. LILO of both circuits of Bawana – Mandola 400kV D/c(Quad) line at 765/400kV Narela S/s.
2. Removal of LILO of Bawana – Mandola 400kV D/c(Quad) line at Maharani Bagh/Gopalpur S/s. Extension of above LILO section from Maharani Bagh/Gopalpur upto Narela S/s so as to form Maharanibagh – Narela 400kV D/c(Quad) and Maharanibagh -Gopalpur-Narela 400kV D/c(Quad) lines.

A.4.3 From the studies it emerged that in absence of LILO of Narlea – Maharani Bagh D/c line at Gopalpur S/s, huge power will flow to 400kV Maharanibagh S/s through 400kV Narela -Maharanbagh 2xD/c lines and 400/220kV ICTs at Maharanbagh become overloaded. Goplapur substation will also share some load of downstream of Maharanibagh S/s.

A.4.4 Subsequently, in the 2nd Meeting of Northern Region Power Committee (Transmission Planning) (NRPCTP) held on 01.09.2020, Chairperson, CEA enquired about the status of Gopalpur S/s. DTL replied that the Gopalpur S/s is at tendering stage and will be commissioned by 2023.

A.4.5 The Rajasthan SEZ Ph-II (8.1GW) is under advance stage of implementation (part system commissioned) and 765/400kV Narela substation along with its connectivity to Maharani Bagh (as per Sr.No 1 & 2 above) is expected to be commissioned by Mar 2024.

A.4.6 The issue was also highlighted in the 209th OCC meeting held on 19.07.2023. At present 400/220kV Maharani Bagh S/s has 2x315MVA ICTs in one section (Sec-1) and 2x500MVA ICTs on another section (Sec-2). As per information available, Gopalpur substation is not even yet awarded by DTL. In absence of Gopalpur substation, loadings on 400/220kV ICTs at Maharani Bagh may become critical (on Sec-2) in solar maximized scenario which may impact RE evacuation.

A.4.7 As per information available, there is space constraint for augmentation of new 400/220kV ICTs at both sections of 400/220kV Maharani Bagh S/s. Confirmation is sought from POWERGRID in this regard.

A.4.8 In view of above, DTL is requested to expedite the implementation of 400/220kV Goplapur substation. It is also requested that POWERGRID/DTL may explore the space availability for 400/220kV ICT augmentation at Maharanibagh S/s (Sec-2) as DTL also owned 08 Nos 220kV System at Maharani Bagh S/s.

A.4.9 CTUIL has suggested that in the meantime DTL may explore load segregation at Maharani Bagh substation so as to contain ICT loadings in solar maximized scenario for 2024-25 & beyond till availability of Gopalpur S/s.

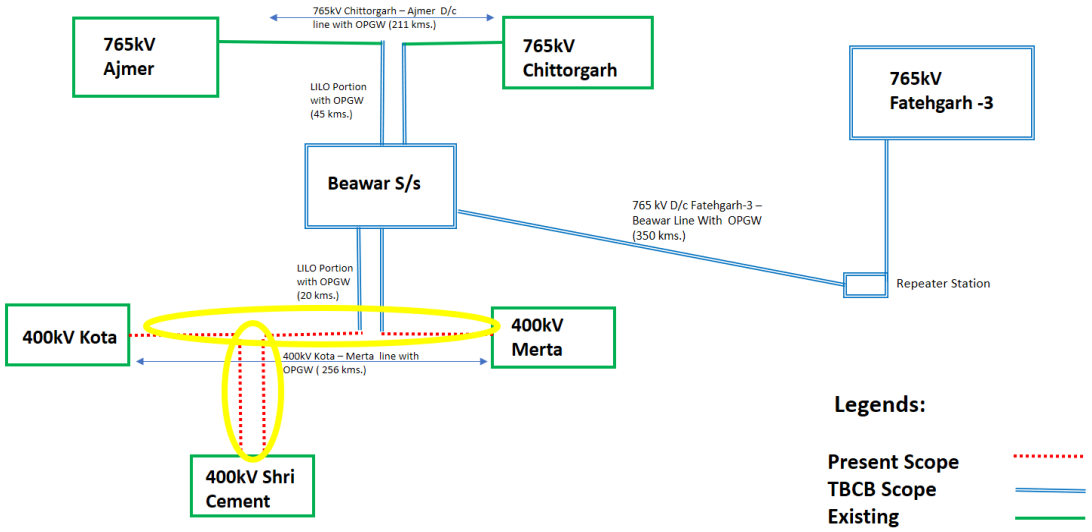
Decision required from Forum:

Forum may deliberate the issue and decide the appropriate action in the matter.

A.5 OPGW installation on existing 400 kV Kota – Merta line which is LILOed at Shri Cement & proposed to be LILOed at 765/400 kV Beawar (ISTS) S/s (agenda by CTUIL)

A.5.1. 400 kV Kota – Merta line (256kms) was constructed without OPGW by POWERGRID and this line is also LILOed at Shri Cement (Captive Merchant Generator). LILO portion of approx. 55 kms. was constructed by M/s Shri Cement. This line is further proposed to be LILOed at 765/400 kV Beawar (ISTS) S/s under TBCB scheme "Transmission system for evacuation of power from REZ in Rajasthan (20 GW) Phase III –Part F", where OPGW has been considered on LILO portion & FOTE at Beawar under TBCB scheme. Connectivity of Shri-Cement and Beawar (ISTS) is as below:

Connectivity diagram of Shri Cement (Generator) to ISTS communication network



A.5.2. As stated by Grid-India, data of Shri Cement is intermittent due to GPRS/ PLCC connectivity at present. Hence Grid-India has requested CTU to plan OPGW based connectivity for the same. Moreover, Grid-India further mentioned that in future PMUs may also be planned for Shri Cement station under URTDSM Ph-II project. As PMU data transmission GPRS/PLCC connectivity is not sufficient therefore OPGW based communication shall also be required to send the PMU/SCADA/AMR data to NRLDC in a secured & reliable manner.

A.5.3. The agenda for OPGW installation on 400 kV Kota – Merta line (256kms.) alongwith OPGW installation on LILO portion of Shri Cement terminal equipment was discussed in the 57th NRPC meeting held on 31.08.2022. In the same meeting, OPGW installation was agreed for the 400 kV Kota – Merta line (256kms.) costing approximately 11.5 Crs. However, no consensus was made for the OPGW installation on LILO portion of Shri Cement (55 kms) costing approx. 2.5 Crs. NRPC forum further stated that decision regarding laying of OPGW in the Sri Cement LILO portion may be taken in the upcoming NRPC meetings after inputs received from Shree Cement.

A.5.4. The proposal was taken up in the 11th NCT meeting held on 28.12.2022 & 17.01.2023, for OPGW installation on 400 kV Kota – Merta line (256kms.) excluding LILO portion of Shri-Cement, wherein NCT opined that implementation of OPGW while bypassing LILO at Shree Cement is not desirable.

A.5.5. The agenda was put up again by CTU in the 64th NRPC meeting held on 24.03.2023, where NRPC forum stated that a separate meeting shall be convened by them with CTU, Sri Cement & NRLDC for reviewing Shri Cement connectivity.

A.5.6. In this regard NRPC Secretariat called the meeting on 01.09.2023 among CTU, NRLDC & Shri Cement. In the meeting Shri Cement stated that as a small generator it is difficult for them to bear OPGW cost. Further they stated that OPGW connectivity for some of the private IPPs e.g. Budhil, Soreng, AD Hydro, Karcham-Wangtoo were previously done under ISTS schemes in sharing tariff mechanism. In similar way Shri Cement connectivity shall also be provided. MS, NRPC requested CTU to put up the agenda in the upcoming NRPC meeting along with the details of approval of OPGW for Budhil, Soreng, AD Hydro, Karcham- Wangtoo generators.

A.5.7. CTUIL has also mentioned that in the 39th & 40th NRPC meeting held on 02.05.2017 & 28.10.2017 respectively, the OPGW system was approved for Budhil, Soreng, AD Hydro, Karcham- Wangtoo IPPs under ISTS in reliable communication scheme of

Northern Region being implemented by POWERGRID in RTM mode (the relevant extracts of MoM of stated NRPC meetings are attached as **Annexure -III**).

A.5.8. CTUIL has presented the agenda again along with required minutes attached for already approved works of various IPPs under ISTS in reliable communication scheme and requested forum to deliberate.

Decision required from Forum:

Forum may kindly discuss the above proposal and approve accordingly.

A.6 Allotment of 315MVA ICT available as regional spare at POWERGRID Ludhiana substation to RVPN's 400kV GSS Jodhpur as interim arrangement and commissioning of ICT at Bhinmal substation of POWERGRID by shifting the ICT available at POWERGRID Bhiwadi Substation (agenda by POWERGRID)

A.6.1. M/s RVPN vide letter dated 06.07.2023 had requested NRPC for allotment of 500MVA ICT available as regional spare at PGCIL's 400kV GSS Jaipur(S) to RVPN's 400kV GSS Jodhpur (Surpura).

A.6.2. Based on the request from RVPN, a meeting was held on 07.07.2023 (MoM attached as **Annexure-IV**) for discussion on allotment of 500MVA ICT for RVPN's 400kV GSS Jodhpur. During deliberations, it was decided that RVPN shall physically check the healthiness of regional spare 400kV 315MVA ICT available at POWERGRID Mandola substation and submit report, based on which next round of discussion shall be held.

A.6.3. During the second round of discussion on 10.07.2023 (MoM attached as Annexure-IV), RVPN informed that the transportation of 315MVA ICT from Mandola Substation towards main highway for Jodhpur is not possible due to ongoing construction work for ring road flyover outside Mandola sub-station due to which proper clearance is not available & shifting of transformer is not possible for at least next 03 months.

A.6.4. Further, it was deliberated that in view of difficulties involved in shifting of transformer from Mandola, 315MVA ICT available at POWERGRID Ludhiana Substation may be allotted to RVPN instead of ICT from Mandola. RVPN was requested to put in their best efforts to get the 500MVA ICT of RVPN's Bhadla S/s repaired at the earliest and return the 315MVA ICT to POWERGRID by Oct'2023.

A.6.5. Meanwhile, for timely commissioning of POWERGRID Bhinmal Substation, POWERGRID checked the feasibility of installation of 315MVA spare ICT available at POWERGRID Mandola Substation and it was found that the orientation of radiator

Bank in Mandola ICT is on the left-hand side (LHS from HV side) and as per the space availability at Bhinmal Substation, this ICT cannot be placed at Bhinmal, since space availability for radiator bank at Bhinmal Substation is on the Right-hand side (RHS from HV side). This opposite orientation of radiator bank will reduce the clearance between upper strung bus (between 400KV side and 220KV) and existing LM tower near the proposed bay.

A.6.6. Therefore, it has been decided to shift the 315MVA ICT (CGL make) available at POWERGRID Bhiwadi Substation to POWERGRID Bhinmal Substation for timely commissioning.

A.6.7. POWERGRID has presented the agenda for information to the forum.

Decision required from Forum:

Forum may kindly note the information of shifting of ICTs of POWERGRID and approve.

A.7 Shutdown of 400kV Kankroli-Jodhpur S/C transmission line for re-conductoring with twin HTLS conductor (agenda by POWERGRID)

A.7.1. The re-conductoring work of 400kV Kankroli-Jodhpur S/C transmission line was approved in the 9th meeting of NCT held on 28.09.2022. Consequent to the approval, the work of re-conductoring was awarded to M/s Apar Industries on 01.03.2023. The length of the 400kV Kankroli-Jodhpur S/C transmission line is 188 kms and agency has fully mobilized at site with all resources.

A.7.2. The work schedule of the said work is 14 months in which retrofitting of switchyard equipment will also take place at both the ends of transmission line. In view of the reliable operation of the grid and to relieve the constraints of power flow in the local network, the work of dismantling of existing conductor and re-conductoring of the said line have been planned on war-footing basis within 04 months with large scale mobilization of manpower and resources. The supply of new conductor (HTLS) and other material has been received at site and manpower has been deployed at site for starting the work.

A.7.3. The request for shutdown of 400kV Kankroli-Jodhpur line from 20th June 2023 has been submitted to NRLDC since 8th June'2023 (email dtd 8th June'23 and letter dtd 16th June 2023 attached as **Annexure-V**).

A.7.4. POWERGRID has requested to facilitate shutdown of the afore-mentioned line so that the re-conductoring work can be started and highlighted that the re-conductoring of 400kV Kankroli-Jodhpur line will help in relieving the transmission constraints on the nearby network and will play an effective role in power evacuation from renewable energy pockets of western Rajasthan.

Decision required from Forum:

Forum may deliberate on above matter and facilitate the required shutdown to POWERGRID.

A.8 Extension of AMC for Hot Line Speech Communication System through M/s ORANGE (agenda by POWERGRID)

A.8.1. The issue was discussed in the 67th NRPC meeting held on 30.06.2023, wherein AMC extension for two (02) years for Hot Line Speech Communication System (comprising EPABX system along with VOIP and Analog phones) was approved at cost of approx. 60 Lac INR per year for which AMC has expired on 31.07.2023.

A.8.2. However, M/s Orange has communicated that to facilitate long term visibility and smooth planning, the AMC extension for all the Control Centre sites shall be planned together.

A.8.3. There are 11 nos. control centre sites for which AMC is currently valid and is expiring on 14.06.2024.

A.8.4. It is proposed to award AMC as below –

i. For 42 sites – wef 01.08.2023 to 31.07.2025
ii. For 11 sites – wef 15.06.2024 to 31.07.2025

A.8.5. The estimated cost of AMC extension for all sites shall be around Rupees 1.72 Cr Crores (excluding GST).

Decision required from Forum:

Forum may discuss and approve the above proposal of POWERGRID.

A.9 Shutdown of 400/220kV buses for commissioning of 500MVA ICT-3 at Kurukshetra substation (agenda by POWERGRID)

A.9.1. The 400/220kV, 500MVA ICT-3 along with associated 400 & 220kV GIS bays are under commissioning stage at Kurukshetra Substation. All non-shutdown activities like erection of ICT, GIS bays & GIB's, other associated equipment along with

standalone testing have already been completed. Accordingly, the shutdowns of 400/220kV buses were sought to integrate the new Bays / ICT-3 with existing 400/220 kV GIS. However, due to non-availability of shutdown of 400& 220kV Buses (rejected in 207th & 209th and approved conditionally in 208th OCC, but not provided by NRLDC), POWERGRID is unable to commission the new Transformer.

A.9.2. The 500MVA 400/220 kV ICT-3 is being installed to augment the existing transformation capacity of 1000MVA at Kurukshetra Substation to cater peak demand in Haryana. The need for new ICT was agreed in 4th NRPC (TP) meeting. Accordingly best efforts are being made to commission ICT-3 as early as possible. Moreover, M/s HVPNL has repeatedly emphasized for early commissioning of this ICT-3 at Kurukshetra substation.

A.9.3. Keeping in view of grid constraints, our earlier proposal for 400kV Bus-3&4 for 5 days each (continuous basis) and 220kV Bus-1&2 was reviewed and accordingly shutdown of both 400kV and 220kV buses split in two ways, was proposed in OCC 210, mentioned as below:

For each of 400 KV Bus-3 and Bus-4

a) 3 days shutdown on continuous basis for interconnection activities i.e. erection of interface module (between existing Bus and new upcoming bay).
b) 2 days shutdown on daily basis for HV test of GIS
c) 2 days shutdown on continuous basis for erection of main conductor and busbar stability testing

For each of 220 KV Bus-1 and Bus-2

a) 1 day shutdown on daily basis for HV test of GIS
b) 2 days shutdown on continuous basis for erection of internal conductor and busbar stability testing.

A.9.4. However, NRLDC has rejected 03 days continuous shutdowns of 400KV Bus-3&4 and approved other daily based shutdowns as per our proposed shutdown requirement in Sept 2023. It is pertinent to mention here that continuous shutdown of each Bus-3 &4 for 03 days is essentially required (i.e. for erection of interface module with existing 400 KV GIS Buses) before availing other approved daily basis

shutdowns. These daily basis shutdowns are required for carrying out HV test and busbar stability test which is a subsequent activity after completion of Busbar erection activities.

A.9.5. In view of the above, it is requested to facilitate shutdown of 400kV Bus-3 and Bus-4 and 220kV Bus-1 and Bus-2 at Kurukshetra substation w.e.f. 01st Oct 2023 for erection of interface modules with existing GIS as per **Annexure-VI.**

Decision required from Forum:

Forum may discuss and facilitate shutdown to POWERGRID.

A.10 Issuance of Trial run certificate for STATCOMs commissioned at POWERGRID Bhadla-2 and Bikaner-2 (PBTSL) substation (agenda by POWERGRID)

A.10.1 POWERGRID has commissioned STATCOM Station-I and Station-II (each 400/34.5kV, 3 X 183.33MVA 1-Ph Coupling Transformer bank, 2 X +/-150MVAr VSC, 2 X 125MVAr MSC and 1 X 125MVAr MSR) at Bhadla-II Substation and STATCOM station at PBSTL Bikaner-2 substation as per following schedule:

STATCOM station-I at POWERGRID Bhadla-II substation:

Item	Mode of Operation	Description	Time	Details
1	STATCOM Operation in Manual control Mode for trial run	Only MSR in operation	24 hrs	22.05.2023, 18:36Hrs
2	STATCOM Operation in Manual control Mode for trial run	Only MSC1 and MSC 2 in operation	24 hrs	23.05.2023, 23:40Hrs
3	STATCOM Operation in Voltage / Automatic control mode	All the branches available for operation	72 hrs	30.05.2023, 22:48Hrs

STATCOM station-II at POWERGRID Bhadla-II substation:

Item	Mode of Operation	Description	Duration	Details/Time
1	STATCOM Operation in Manual control Mode for trial run	Only MSR in operation	24 hrs	29.06.2023, 22:53Hrs
2	STATCOM Operation in Manual control Mode for trial run	Only MSC1 and MSC 2 in operation	24 hrs	30.06.2023, 23:36Hrs
3	STATCOM Operation in Voltage / Automatic control mode	All the branches available for operation	24 hrs	02.07.2023, 00:16Hrs

STATCOM station at PBSTL Bikaner-II substation:

Item	Mode of Operation	Description	Duration	Details/Time
1	STATCOM Operation in Manual control Mode for trial run	Only MSR in operation	24 hrs	20.07.2023, 14:55Hrs
2	STATCOM Operation in Manual control Mode for trial run	Only MSC1 and MSC 2 in operation	24 hrs	21.07.2023, 16:22Hrs
3	STATCOM Operation in Voltage / Automatic control mode	All the branches available for operation	24 hrs	23.07.2023, 19:30Hrs

A.10.2 All relevant data for application of trial run operation of above STATCOMs at Bhadla-2 and Bikaner-2 substations have been submitted, however certificate for successful trial run operation of the same is yet to be issued by Grid-India.

A.10.3 Forum is requested to expedite the issuance of trial run certificates for STATCOMs at Bhadla-2 and Bikaner-2 substations.

Decision required from Forum:

Forum may discuss and facilitate trial run to POWERGRID.

A.11 Disaster Management Plan for Power Sector-Northern Region (agenda by NRPC Secretariat)

A.11.1 As per section 37 of the Disaster Management Act 2005, each Ministry is required prepare a Disaster Management plan related to their sector. Accordingly, MoP in association with CEA has prepared a Disaster Management Plan (January 2021) for Power Sector and the same is available at CEA website.

A.11.2 In the plan, a four–tier institutional structure has been envisaged i.e. at central level, regional level, state level, and local unit/plant level to effectively deal with disaster situations in power sector. The Regional Level Disaster Management Group (RDMG) has been constituted with composition as below:

a) Member Secretary (RPC) - Chairman

b) Representative of Secretary in-charge of Rehabilitation and Relief of the affected State of the Region

c) Representatives of each State Civil Defence

d) Regional HODs CPSUs (NTPC, NHPC, PGCIL etc.)

e) CMDs State TRANSCOs/Power Departments

f) SLDC in charge of each state.

g) Chief Engineer, Central Water Commission (CWC), for floods related early warnings.

h) Deputy Director-General, Indian Metrological Department (IMD), for Earthquake, and Cyclone related early warnings.

i) Group Head, Ocean Information and Forecast Services Group (ISG), for Tsunami related early warnings.

j) Head of RLDC

A.11.3 The group shall be handling following associated responsibilities as below:

a) To interact with CDMG for proper coordination.

b) To ensure that disaster management plans are in place.

c) To provide inter-state emergency & start-up power supply

d) To coordinate the early restoration of the regional grid.

e) To participate in damage assessment.

f) To facilitate resource movement to affected state (s) from other regional states.

A.11.4 Similarly, a group at each state level and plant level has been outlined in Disaster Management Plan for Power Sector.

Decision required from Forum:

Forum may acknowledge the constitution of Regional Level Disaster Management Group (RDMG) as above.

A.12 Restructuring of committee for physical inspection in cases of tower collapse and equipment failure in Northern Region (agenda by NRPC Secretariat)

A.12.1 A committee has been formed in the 59th NRPC meeting held on 31.10.2022 for verification of cause of tower collapse and equipment failure so that it may facilitate monthly availability certification of transmission licensee as report from CEA takes generally years in case of tower collapse and equipment failure.

A.12.2 Following members were approved for the committee:

i. Superintending Engineer, NRPC (dealing availability matters) as Chairperson
ii. Superintending Engineer (Transmission), STU of concerned circle of State/UT

iii. Concerned General Manager or equivalent of concerned licensee/owner of asset
iv. One representative of PSETD Division, CEA
v. Executive Engineer, NRPC (dealing availability matters) as Member Convener
vi. Any other member as considered necessary by Chairperson

A.12.3 Further, it was decided that the committee may submit its preliminary report to Member Secretary, NRPC. Based on preliminary report, availability shall be certified by Member Secretary, NRPC. However, availability certificate may be revised, if required, due to recommendation report of CEA Standing Committees.

A.12.4 It was decided that Licensees/owner of the system (tower/equipment/etc.) has to intimate failure of asset within 24 hours of the incident in prescribed format so that committee can visit the place preferably within next 3 working days.

A.12.5 It has been observed that, arranging a committee for visit within 3 days is non-practicable. Therefore, it is proposed to make small group as below:

i. Representative(s) of NRPC Secretariat; or
ii. Any other member as considered necessary by MS, NRPC such as officers from STU, or any other transmission licensee in region etc.

A.12.6 Licensees/owner of the system (tower/equipment/etc.) may intimate failure of asset within 24 hours of the incident. The committee shall visit site within 3 days (preferably). The inspection report is to be submitted by committee within 2 weeks after site visit. Logistic support for inspection team, is to be provided by concerned utility.

Decision required Forum:

Forum may discuss the proposed reconstituted committee for physical inspection in cases of tower collapse and equipment failure in Northern Region and approve accordingly.

A.13 Details of current rating of terminal equipment for EHVAC lines (agenda by NRLDC)

A.13.1 For conducting studies for assessment of inter control-area transfer capability or any other related simulation studies, thermal ratings of lines as specified in CEA's Manual on Transmission Planning Criteria 2023 are being considered as safe capacity limit of lines based on anticipated ambient temperature.

A.13.2 However, it is being observed in number of cases, especially in RVPN control area that the rating of terminal equipment is lower than thermal capacity of transmission line. This is leading to under-utilisation of line capacity due to limited switchgear rating and even leading to constraints in RE evacuation from Western Rajasthan RE complex.

A.13.3 Some of the lines in RVPN control area wherein this issue was observed are listed below:

- 400kV Bikaner(PG)-Bikaner(RJ) D/C : Issue in ISTS-RE evacuation in Dec 2022 and SPS logic had to be implemented to avoid RE curtailment.
- 400kV Bhadla(PG)-Bhadla(RJ) D/C: N-1 non-compliance observed. SPS proposal under discussion, difficult to provide shutdown in the RE complex.

For these lines, thermal capacity is 1700MVA for design @ 75deg & 2180MVA for design @85deg. However, equipment rating is only 2kA which translates to 1.732*400*2= 1385MVA only, thus limiting line power transfer capacity to 1385MVA only.

Similar issues were earlier observed at 400kV Mahendragarh, Dhanonda and Nawada substation in HVPN control area.

A.13.4 The issue of lower line equipment rating has also been discussed in the past in 2018 in NRPC-OCC level wherein NPC had asked RPCs to furnish such details. It was requested that the terminal equipment ratings of STUs' and other transmission licensees' transmission lines in region, may be compiled and furnished to Grid-India with a copy to NPC Division, CEA on priority basis. Communication is attached as **Annexure-VII.**

A.13.5 Subsequently, the agenda was discussed in number of OCC meetings and transmission utilities were asked to submit the data. Latest status as available with Grid-India is attached as **Annexure-VIII.**

A.13.6 Given the issues arising due to limited switchgear rating in lines which have higher thermal capacity, it is requested that forum may:

i. Advise all utilities to furnish the details to Grid-India /CTUIL/NRPC for consideration in future studies and planning of actions well in advance.

ii. Discuss requirement of uprating switchgear ratings in 400kV Bhadla(PG)-Bhadla(RVPN) D/C line to avoid issues in RE evacuation/ facilitating shutdowns during high solar generation period.

iii. Advise for special attention by transmission utilities & CTUIL in this regard so as to avoid such issues in future, including for the cases of conductor upgradation.

Decision required from Forum:

Forum may deliberate the issue and take necessary steps accordingly.

A.14 System Protection Scheme (SPS) in Western Rajasthan ISTS RE Complex (agenda by NRLDC)

A.14.1 Significant number of grid events (over 30 incidents) involving RE generation loss have occurred between January 2022 and May 2023. The most severe event resulted in a maximum RE generation loss of 7120 MW, which took place on 15th May 2023. Such substantial losses in RE generation pose a serious threat to grid security, as they have the potential to trigger cascade tripping and lead to electricity supply disruptions over wide areas.

A.14.2 To evacuate the mentioned ~12.4 GW of ISGS RE generation, the Northern Region relies on 16 number of 765kV lines. These transmission lines play a critical role in transferring the renewable energy from the generating sources to the consumption centers. Ensuring the reliability and proper functioning of these lines is of utmost importance to maintain grid stability and meet the increasing demand for renewable energy in the region.

A.14.3 In 209th OCC meeting, NRLDC representative addressed the recent outage of 400kV and above transmission lines due to tower collapses and proposed several measures to enhance the reliability and resilience of the grid, especially in the context of the Rajasthan RE complex. The proposed suggestions are as follows:

a. Review of Wind Zones
b. Single Circuit Lines in Critical Corridors
c. n-2 Reliability Criteria for Prone Areas

A.14.4 However, while these long-term suggestions are being implemented on the field, NRLDC representative proposed a SPS Scheme logic for the ISTS RE complex to ensure n-1-1/n-2 compliance during events like tower collapse. NRLDC representative also briefed the forum about the basecase assumptions considered while doing the study for SPS requirement.

Assessment of Generation backdown of n-2 SPS requirement for 765kV lines of Rajasthan RE pocket

Basecase assumption

400kV Bhadla(RS)-Bikaner(RS) D/C	in service
400kV Bikaner(PG)-Bikaner_2(PG) D/C	in service
STATCOM -1 and 2 @ Bhadla_2	in service
STATCOM-1 @ Bikaner_2	in service
All 400kV lines presently out in Rajasthan	in service
Rajasthan demand	15500 MW
Raj Solar	3400 MW
Raj Wind	1500 MW

Result :

Contingency / Line Loading	Loading of 765kV Fatehgarh2-Bhadla2 D/C > 2000 MW and < 2200 MW	[Loading of 765 kV Fatehgarh2-Bhadla D/C > 1350 and < 1450] or [Loading of 765kV Fatehgarh2_Bhadla2 D/C > 2200 And < 2400]	[Loading of 765 kV Fatehgarh_2-Bhadla D/C > 1450] or [Loading of 765kV Fatehgarh2_Bhadla2 D/C > 2400] or [Loading of 765kV Bhadla2-Ajmer D/C > 3200]
765kV Fatehgarh2-Bhadla D/C	no SPS required	200 MW generation backdown at Fatehgarh-1/2	500 MW backing at Fatehgarh-1/2
765kV Fatehgarh2-Bhadla2 D/C	100 MW backing at Fatehgarh_1	500 MW backing at Fatehgarh-1/2	800 MW backing at Fatehgarh-1/2
765kV Bhadla-Bikaner D/C	no SPS required	no SPS required	no SPS required
765kV Bhadla2-Bikaner D/C	no SPS required	no SPS required	no SPS required
765kV Bhadla2-Ajmer D/C	no SPS required	400 MW backing at Bhadla_2 (due to overloading of Jodhpur-Kankroli/ Bhadla-Jodhpur)	500 MW backing at Bhadla_2 (due to overloading of Jodhpur-Kankroli/ Bhadla-Jodhpur)
765kV Bikaner- Moga D/C	no SPS required	no SPS required	no SPS required
765kV Bikaner- Khetri D/C	no SPS required	no SPS required	no SPS required

A.14.5 The matter has been discussed in 209, 210 & 211 OCC meetings.

A.14.6 CTUIL has also provided their comments in this regard suggesting that with commissioning of STATCOMs at Fatehgarh-II S/s and Transmission Scheme Phase-II Part –A i.e. Establishment of 400kV Fatehgarh-III PS (Sec-1) along with its interconnection to Fatehgarh-II PS and Jaisalmer (RVPN), there will not be requirement of SPS for contingency of 765kV Fatehgarh2-Bhadla D/C and 765kV Fatehgarh2-Bhadla2 D/C.

A.14.7 POWERGRID representative agreed that the logics can be implemented without any issues as decided in NRPC/OCC forum.

A.14.8 Accordingly, following was agreed in 211 OCC meeting (held on 19.09.2023):

- No requirement of SPS for 765kV Fatehgarh2-Bhadla D/C and 765kV Fatehgarh2-Bhadla2 D/C lines given the commissioning of new transmission elements in Sep-Oct 2023.
- SPS may be implemented for 765kV Bhadla2-Ajmer D/C contingency as follows:

Contingency / Line Loading	**Antecedent loading of 765kV Bhadla2-Ajmer D/C > 3200**
765kV Bhadla2-Ajmer D/C	400-500 MW backing/generation tripping at Bhadla_2

A.14.9 NTPC Kolayat(400MW) is connected at 765kV Bhadla2 (through 400kV line) which is evacuating power under short term arrangement. In case of above contingency, 400kV Bhadla2-Kolayat line may be tripped to achieve the desired loading relief.

A.14.10 The above SPS will be reviewed based on further network commissioning and its need will be once again deliberated after commissioning of 765kV Sikar-II and its interconnections.

A.14.11 The proposed SPS will be implemented by POWERGRID at the earliest given that Bhadla-2 is SAS based substation.

Decision required from Forum:

Forum may deliberate the SPS approved in 211st OCC meeting and may accord approval for implementation.

A.15 Supply and installation of OPGW on 400kV Fatehgarh I (Adani) - Fatehgarh-II (PG) line (6.5 kms), (Fatehgarh-I (Adani) – Bhadla(PG) line LILOed at Fatehgarh-II) as redundant communication for Fatehgarh-I (Adani) (agenda by CTUIL)

A.15.1 At present Fatehgarh-I (Adani) is connected with Bhadla (PG) via LILO point at Fatehgarh-II (PG) with 24F OPGW on one E/W peak of Fatehgarh-I – Bhadla (PG) line. Further on the other E/W peak OPGW (24F) is also installed from Fatehgarh-II (PG) up to the LILO point of Fatehgarh-I (Adani) – Bhadla (PG) line, which is being used for earth wire functionality only as it is not continued up to Fatehgarh-I (Adani) end.

A.15.2 As per the inputs received from Adani & POWERGRID, present connectivity is shown in the figure-1 below where 12 nos. of fibre are used for LILO of Fatehgarh-I (Adani) – Bhadla at Fatehgarh-II and 12 nos. of fibre bypassed towards Bhadla (PG) station.

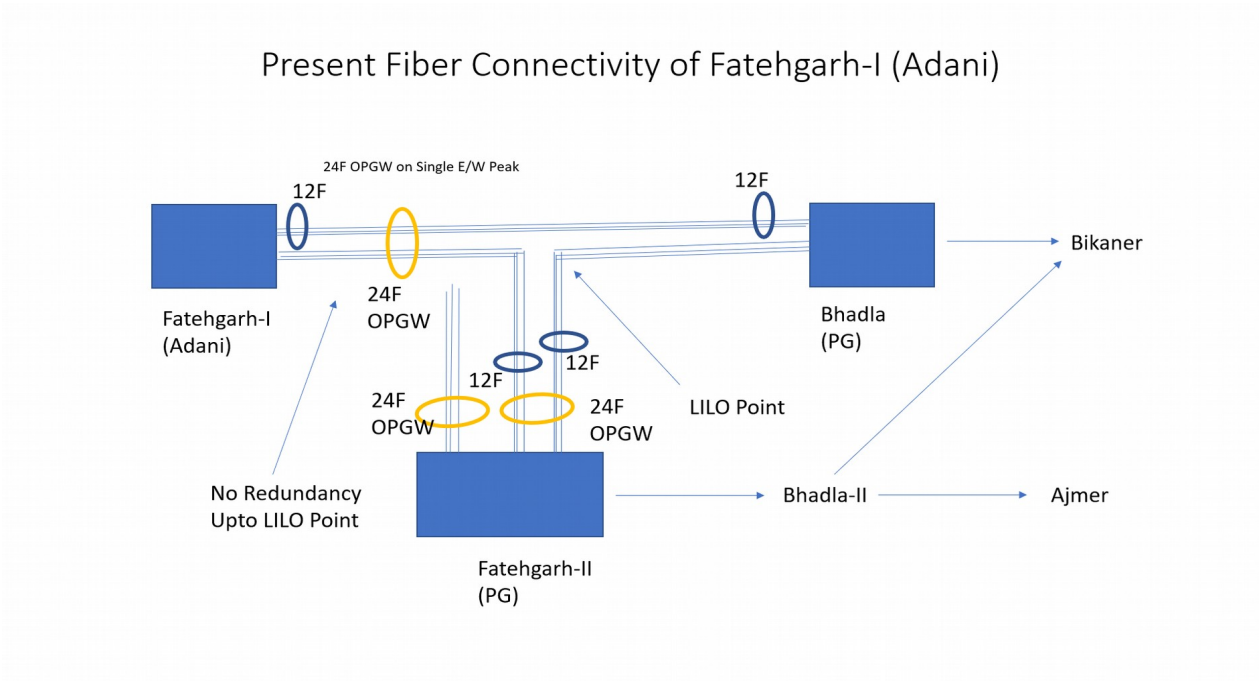


Figure-1

A.15.3 It is proposed that 6.5kms 24F OPGW may be installed on the second peak of 400kV Fatehgarh I - Fatehgarh-II line by replacing the earthwire with OPGW in live line condition upto LILO point of Fatehgarh-II (PG) shown in figure-2 below:

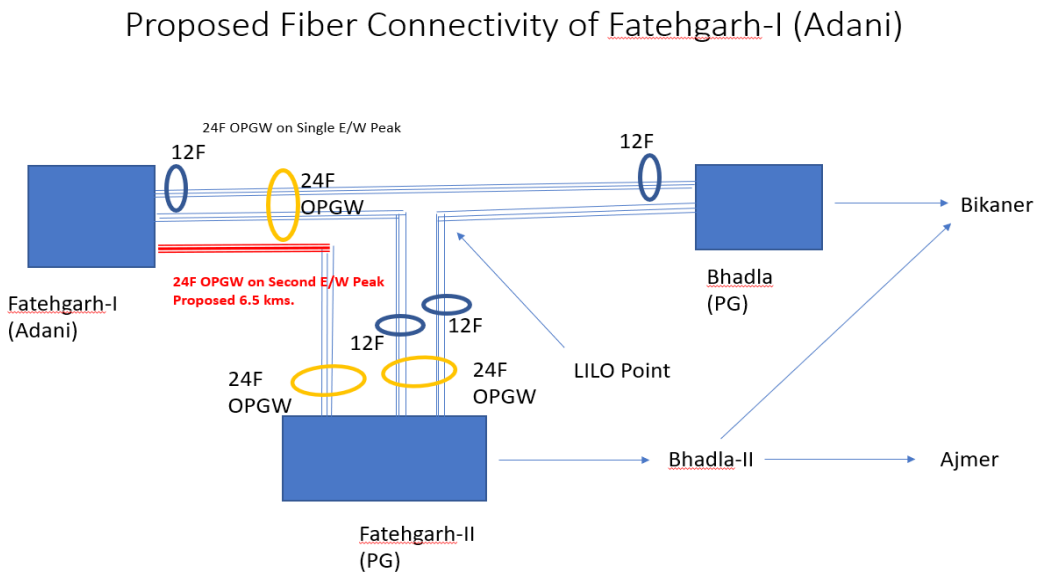


Figure-2

A.15.4 This shall provide redundant communication for Fatehgarh-I (Adani) station up to Fatehgarh-II (PG). Additional FOTE are not required for this configuration as existing FOTE shall be used. Further as Fatehgarh-II (PG) & Bhadla (PG) are connected with other ISTS wideband nodes and thus provides two redundant paths.

A.15.5 The scheme has already been deliberated in the 22nd & 23rd TeST meeting of NRPC held on 24.05.2023 & 21.09.2023 respectively.

A.15.6 Adani Transmission Limited on RTM mode will implement the work with in time frame of 18 months from the date of allocation.

A.15.7 The estimated cost of the project is Rs. 32.5 Lakhs (approx.) (excluding taxes and duties).

Decision required from Forum:

Forum may deliberate on the above proposal and approve accordingly.

A.16 Supply and Installation of 12 nos. FOTE and additional ethernet (125 nos.) cards for existing FOTE in view of resource disjoint and critical locations (agenda by CTUIL)

A.16.1 As per CEA Manual of communication Planning which states that communication resources like FOTE and Media should be resource disjoint. Inputs for such locations where additional FOTE and ethernet cards for existing FOTE are required, have been provided by POWERGRID for NR. Details of the locations are given at **Annexure-IX**.

A.16.2 This agenda was also discussed in the 2nd & 4th CPM of northern region & 23rd TeST meeting held on 21.09.2023.

A.16.3 POWERGRID on RTM mode will implement the work with in time frame of 12 months from the date of allocation.

A.16.4 The estimated cost of the project is Rs. 5.2 Crore (approx.) (excluding taxes and duties).

A.16.5 CTUIL has proposed for the supply and Installation of 12 nos. FOTE and additional ethernet cards in view of grid operation.

Decision required from Forum:

Forum may deliberate on the above proposal and approve accordingly.

A.17 Supply and Installation of 11 nos. FOTE Equipment at Backup SLDCs in NR & Backup NRLDC (agenda by CTUIL)

A.17.1 Grid-India vide letter dated 18.07.2023 requested for planning communication system for upcoming Backup NRLDC at Guwahati and ICCP communication from Main & Backup SLDCs to Backup NRLDC.

A.17.2 As per the new architecture proposed by Grid-India, backup NRLDC is proposed at NER – Guwahati and backup SLDCs in the region. Further, Main and backup SLDC shall report to main and backup RLDC respectively. This agenda was discussed in the 4th CPM of northern region and 23rd TeST meeting. Based on the discussion in 4th CPM of NR and inputs received from POWERGRID & STUs, locations are finalized where additional FOTE are required. Locations along with FOTE requirement are given at **Annexure-X**.

A.17.3 POWERGRID on RTM mode will implement the work with in time frame of 12 months from the date of allocation.

A.17.4 The estimated cost of the project is Rs. 3.3 Crore (approx.) (excluding taxes and duties).

A.17.5 CTUIL has proposed for the supply and Installation of 11 nos. FOTE to meet communication requirements for the Backup RLDC & SLDCs.

Decision required from Forum:

Forum may deliberate the above proposal for installation of FOTE at 11 nos. locations and may approve the same.

A.18 Hosting of physical TCC & NRPC meeting (agenda by NRPC Secretariat)

A.18.1 A roster for hosting of meetings, was agreed in the 40thTCC/43rdNRPC meetings held on 29th/30thOctober, 2018. The roster is as below:

1.Member IPP	9. Punjab	17. Member Trader/PTC
2.NPCIL	10.Member IPP	18. Delhi
3.J&K	11. Rajasthan	19.Member IPP
4.THDC	12. POWERGRID	20. BBMB
5.Member IPP	13. UT of Chandigarh	21. Uttarakhand
6. Haryana	14.Member IPP	22. HP
7. SJVN	15. NHPC	
8. NTPC	16. UP	

Roster for Members IPP is as followed:

1.Adani Power	6.LPGCL
2.APCPL	7.NPL
3.CLP	8.PPGCL
4.JSW Power	9.RPSCL
5.LAPL	10.TSPCL

A.18.2 It has been observed that utilities need some time to prepare for hosting the meeting. Accordingly, based on previous meetings conducted by utilities, it is proposed to make a meeting plan upto FY 2024-25. The same is attached as **Annexure-XI**.

Decision required Forum:

Forum may deliberate and approve the meeting plan as above so that concerned utilities may plan accordingly in advance.

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List of addressee (via mail)

NRPC Members for FY 2023-24

S. No.	NRPC Member	Category	Nominated/ Notified/Delegated Member	E-mail
1	Member (GO&D), CEA	Member (Grid Operation & Distribution), Central Electricity Authority (CEA)	Member (GO&D), CEA	member.god@cea.nic.in
2	Member (PS), CEA	Nodal Agency appointed by the Government of India for coordinating cross-border power transactions	Member (PS), CEA	memberpscea@nic.in
3	CTUIL	Central Transmission Utility	Chief Operating Officer	pcgarg@powergrid.in
4	PGCIL	Central Government owned Transmission Company	Director (Operations)	tyagir@powergrid.in
5	NLDC	National Load Despatch Centre	Executive Director	scsaxena@grid-india.in
6	NRLDC	Northern Regional Load Despatch Centre	Executive Director	rk.porwal@grid-india.in
7	NTPC	Central Generating Company	Director (Finance)	jaikumar@ntpc.co.in
8	BBMB		Chairman	cman@bbmb.nic.in
9	THDC		ED (PSP&APP)	lpjoshi@thdc.co.in
10	SJVN		CMD	sectt.cmd@sjvn.nic.in
11	NHPC		Director (Technical)	ykchaubey@nhpc.nic.in
12	NPCIL		Director (Finance)	df@npcil.co.in
13	Delhi SLDC	State Load Despatch Centre	General Manager	gmsldc@delhisldc.org
14	Haryana SLDC		Chief Engineer (SO&C)	cesocomm@hvpn.org.in
15	Rajasthan SLDC		Chief Engineer (LD)	ce.ld@rvpn.co.in
16	Uttar Pradesh SLDC		Director	directorsldc@upsldc.org
17	Uttarakhand SLDC		Chief Engineer	anupam_singh@ptcul.org
18	Punjab SLDC		Chief Engineer	ce-sldc@punjabsldc.org
19	Himachal Pradesh SLDC		Chief Engineer	cehpsldc@gmail.com
20	DTL	State Transmission Utility	CMD	cmd@dtl.gov.in
21	HVPNL		Managing Director	md@hvpn.org.in
22	RRVPNL		CMD	cmd.rvpn@rvpn.co.in
23	UPPTCL		Managing Director	md@upptcl.org
24	PTCUL		Managing Director	md@ptcul.org
25	PSTCL		CMD	cmd@pstcl.org
26	HPPTCL		Managing Director	md.tcl@hpmail.in
27	IPGCL	State Generating Company	Managing Director	md.ipgpp@nic.in
28	HPGCL		Managing Director	md@hpgcl.org.in
29	RRVUNL		CMD	cmd@rrvun.com
30	UPRVUNL		Managing Director	md@uprvunl.org
31	UJVNL		Managing Director	md@ujvnl.com
32	HPPCL		Managing Director	md@hppcl.in
33	PSPCL	State Generating Company & State owned Distribution Company	CMD	cmd-pspcl@pspcl.in
34	DHBVN	State owned Distribution Company (alphabetical rotaional basis/nominated by state govt.)	Director (Projects)	directorprojects@dhbvn.org.in
35	Jaipur Vidyut Vitran Nigam Ltd.		Managing Director	md@jvvnl.org
36	Madhyanchal Vidyut Vitaran Nigam Ltd.		Managing Director	mdmvvnl@gmail.com
37	UPCL		Managing Director	md@upcl.org
38	HPSEB		Managing Director	md@hpseb.in
39	Prayagraj Power Generation Co. Ltd.	IPP having more than 1000 MW installed capacity	Head (Commercial & Regulatory)	sanjay.bhargava@tatapower.com
40	Aravali Power Company Pvt. Ltd		CEO	SRBODANKI@NTPC.CO.IN
41	CLP Jhajjar Power Ltd.,		CEO	rajneesh.setia@apraava.com
42	Talwandi Sabo Power Ltd.		COO	Vibhav.Agarwal@vedanta.co.in
43	Nabha Power Limited		CEO	sk.narang@larsentoubro.com
44	Lanco Anpara Power Ltd		President	sudheer.kothapalli@lancogroup.com
45	Rosa Power Supply Company Ltd		Station Director	Hirday.tomar@relianceada.com
46	Lalitpur Power Generation Company Ltd		Managing Director	vksbankoti@bajajenergy.com
47	MEJA Urja Nigam Ltd.		CEO	hopmeja@ntpc.co.in
48	Adani Power Rajasthan Limited		COO, Thermal, O&M	jayadeb.nanda@adani.com
49	JSW Energy Ltd. (KWHEP)		Head Regulatory & Power Sales	jyotiprakash.panda@jsw.in
50	RENEW POWER	IPP having less than 1000 MW installed capacity (alphabetical rotaional basis)	CEO	sumant@renew.com

51	UT of J&K	From each of the Union Territories in the region, a representative nominated by the administration of the Union Territory concerned out of the entities engaged in generation/ transmission/ distribution of electricity in the Union Territory.	Chief Engineer, JKPTCL	sojpdd@gmail.com
52	UT of Ladakh		Chief Engineer, LPDD	cepdladakh@gmail.com
53	UT of Chandigarh		Executive Engineer, EWEDC	elop2-chd@nic.in
54	BYPL	Private Distribution Company in region (alphabetical rotaional basis)	CEO	Amarjeet.Sheoran@relianceada.com
55	Bikaner Khetri Transmission Limited	Private transmission licensee (nominated by cetral govt.)	Vice-President	nihar.raj@adani.com
56	Adani Enterprises	Electricity Trader (nominated by central govt.)	Head Power Sales & Trading	anshul.garg@adani.com
57	Ajmer Vidyut Vitran Nigam Ltd.	Special Invitee	Managing Director	md.avvnl@rajasthan.gov.in
Special Invitees:				
RE Holding companies in NR with installed capacity of more than 1000 MW (provsional members as decided in 59th NRPC meeting)				

Special Invitees:

1. Shri. Chowna Mein, Hon'ble Dy. Chief Minister and I/C Power, Govt. of Arunachal Pradesh, Block No.2, 5th Floor, A.P. Civil Secretariat, Itangar-791111. [Email: chowna.mein@gov.in]Tel -03602212671
2. Shri Ginko Lingi, Chairman, TCC, NERPC & Chief Engineer (P), TPMZ , Department of Power, Govt. of Arunachal Pradesh, Vidyut Bhawan, zero Point, Itanagar-791111. [Email: ginko.lingi@gmail.com] Tel -9612153184
3. Shri K Vijayanand, Chairperson, SRPC, Chairman & Managing Director , Transmission Corporation of Andhra Pradesh Limited, Vidyut Soudha, Gunadala, Eluru Rd, Vijayawada, Andhra Pradesh 520004. [Email: cmd.aptransco@aptrandco.in ; vjanand@nic.in] Tel -08662429201
4. Shri AKV Bhaskar, Chairperson TCC, SRPC, Director (Trasmission & Grid Management), Transmission Corporation of Andhra Pradesh Limited, Vidyut Soudha, Gunadala,Eluru Rd, Vijayawada, Andhra Pradesh 520004. [Email: kannanvenkatabhaskar.angulabharanam@aptransco.co.in] Tel -.08662429209
5. Sri Nikunja Bihari Dhal, IAS, Chairman, ERPC, Additional Chief Secretary to Govt., Department of Energy, Govt. of Odisha, Bhubaneswar. [Email-chairman@gridco.co.in] Tel -06742540098
6. Shri Trilochan Panda, Managing Director, GRIDCO, Chairperson TCC, ERPC, GRIDCO Limited, Regd. Office: Janpath, Bhubaneswar – 751022. Tel -06742540877 [Email- md@gridco.co.in]
7. Shri Sanjay Dubey, Chairman, WRPC & Principal Secretary(Energy), GoMP, VB-2, Vallabh Bhawan Annex, Mantralay, Bhopal: 462 001 (M.P.), Email: psenergyn@gmail.com, Tel. 0755-2708031
8. Shri Raghuraj Rajendran, Chairman-TCC, WRPC & Managing Director MPPMCL, Block No-15, Shakti Bhawan, Vidyut Nagar, Rampur, Jabalpur-482008. [Email-mdofmppmcl@gmail.com]
9. Smt. Rishika Saran, Member Secretary, NPC, Sewa Bhawan, R. K. Puram, New Delhi-66 [Email-cenpc-cea@gov.in]
10. Shri Deepak Kumar, Member Secretary, WRPC, Plot No- F-3, MIDC Area, Marol, Opp. SEEPZ, Central Road, Andheri (East), Mumbai-40093.[email: ms-wrpc@nic.in] Tel - 02228221636
11. Shri Asit Singh, Member Secretary, SRPC, No.29, Race Course Cross Road, Bengaluru-560009. [Email: mssrpc-ka@nic.in] Tel -08022287205/9449047107
12. Shri N.S. Mondal, Member Secretary, ERPC,14,Golf Club Road, ERPC Building, Tollygunje,Kolkata-700033. [Email: mserpc-power@nic.in]- Tel 03324239651/9958389967
13. Shri K B Jagtap, Member Secretary, NERPC, NERPC Complex, Dong Parmaw, Lapalang, Shillong-793006. [Email: ms-nerpc@gov.in] Tel -03642534077/ 8652776033
14. Shri Chandra Prakash, Chief Engineer, GM Division, CEA, Sewa Bhawan, R. K. Puram, New Delhi-66 [Email: cp_cea@nic.in]

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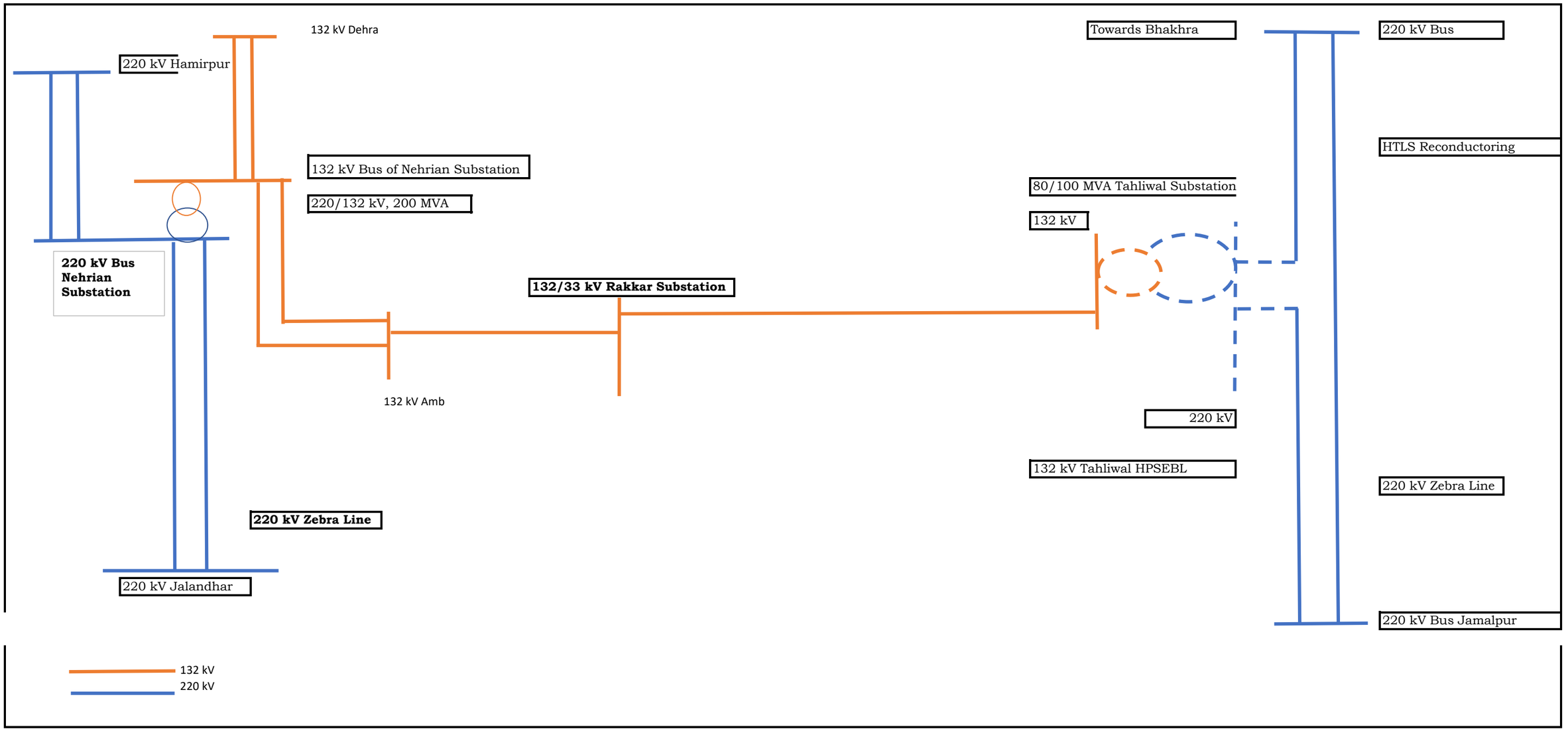
Annexure-I


132 kV Dehra
Towards Bhakhra
220 kV Bus
220 kV Hamirpur
HTLS Reconductoring
132 kV Bus of Nehrian Substation
80/100 MVA Tahliwal Substation
220/132 kV, 200 MVA
132 kV
220 kV Bus Nehrian Substation
132/33 kV Rakkar Substation
132 kV Amb
220 kV
132 kV Tahliwal HPSEBL
220 kV Zebra Line
220 kV Zebra Line
220 kV Jalandhar
220 kV Bus Jamalpur
132 kV
220 kV

List of generating stations in NR having pendancy

STATION ID	STATION NAME	CAP	STN_TYPE_ID	SECTOR_TYPE	REGION_NM	ST_NM	SH_NM	FUEL_NM
100137	ANPARA C TPS	1200	THERMAL	IPP SECTOR	Northern	Uttar Pradesh	LAPPL	COAL
100030	ANPARA TPS	2630	THERMAL	STATE SECTOR	Northern	Uttar Pradesh	UPRVUNL	COAL
100663	ANTA CCPP	419.33	THERMAL	CENTRAL SECTOR	Northern	Rajasthan	NTPC Ltd.	NATURAL GAS
100664	AURAIYA CCPP	663.36	THERMAL	CENTRAL SECTOR	Northern	Uttar Pradesh	NTPC Ltd.	NATURAL GAS
100313	BARSINGSAR LIGNITE	250	THERMAL	CENTRAL SECTOR	Northern	Rajasthan	NLC	LIGNITE
100778	BETA CCPP	0	THERMAL	IPP SECTOR	Northern	Uttarakhand	BIPL	NATURAL GAS
100726	DADRI CCPP	829.78	THERMAL	CENTRAL SECTOR	Northern	Uttar Pradesh	NTPC Ltd.	NATURAL GAS
100152	DADRI (NCTPP)	1820	THERMAL	CENTRAL SECTOR	Northern	Uttar Pradesh	NTPC Ltd.	COAL
100669	DAE (RAJASTHAN)	100	NUCL	CENTRAL	Northern	Rajasthan	DAE	NUCLEAR

			EAR	SECTOR				
100727	FARIDABAD CCPP	431.59	THERMAL	CENTRAL SECTOR	Northern	Haryana	NTPC Ltd.	NATURAL GAS
100843	GHATAMPUR TPP	0	THERMAL	CENTRAL SECTOR	Northern	Uttar Pradesh	NUPPL	COAL
100156	HARDUAGANJ TPS	1265	THERMAL	STATE SECTOR	Northern	Uttar Pradesh	UPRVUNL	COAL
100842	JAWAHARPUR STPP	0	THERMAL	STATE SECTOR	Northern	Uttar Pradesh	UPRVUNL	COAL
100797	MEJA STPP	1320	THERMAL	CENTRAL SECTOR	Northern	Uttar Pradesh	MUNPL	COAL
100841	OBRA-C STPP	0	THERMAL	STATE SECTOR	Northern	Uttar Pradesh	UPRVUNL	COAL
100148	OBRA TPS	1000	THERMAL	STATE SECTOR	Northern	Uttar Pradesh	UPRVUNL	COAL
100711	PAMPORE GPS (Liq.)	175	THERMAL	STATE SECTOR	Northern	Jammu and Kashmir	JKSPDC	HIGH SPEED DIESEL
100850	PANKI TPS EXT	0	THERMAL	STATE SECTOR	Northern	Uttar Pradesh	UPRVUNL	COAL

List of generating stations in NR having pendancy

100317	PARICHHA TPS	1140	THERMAL	STATE SECTOR	Northern	Uttar Pradesh	UPRVUNL	COAL
100616	PRAYAGRAJ TPP	1980	THERMAL	IPP SECTOR	Northern	Uttar Pradesh	PPGCL (Jaypee)	COAL
100422	RIHAND STPS	3000	THERMAL	CENTRAL SECTOR	Northern	Uttar Pradesh	NTPC Ltd.	COAL
100423	SINGRAULI STPS	2000	THERMAL	CENTRAL SECTOR	Northern	Uttar Pradesh	NTPC Ltd.	COAL
100440	TANDA TPS	1760	THERMAL	CENTRAL SECTOR	Northern	Uttar Pradesh	NTPC Ltd.	COAL
100441	UNCHAHAR TPS	1550	THERMAL	CENTRAL SECTOR	Northern	Uttar Pradesh	NTPC Ltd.	COAL

Annexure-III

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भारत सरकार
विद्युत मंत्रालय
उत्तर क्षेत्रीय विद्युत समिति
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नई दिल्ली- 110016
Government of India
Ministry of Power
Northern Regional Power Committee
18-A, S. Jeet Singh Marg, Katwaria Sarai,
New Delhi-110016

सं. उक्षेविस/ वाणिज्यिक/ 209/ आर पी सी (39 वीं)/2017/8010 - 8098 दिनाँक : 14 जुलाई, 2017
No. NRPC/ Comml/ 209/ RPC (39th)/2017/ Dated: 14th July, 2017

सेवा में,
To,

उत्तरी क्षेत्रीय विद्युत समिति तथा तकनीकी समंवय उप-समिति के सदस्य
(संलग्न सूची के अनुसार)

Members of Northern Regional Power Committee and TCC
(As per list attached)

विषय: उत्तरी क्षेत्रीय विद्युत समिति की 39 वीं तथा तकनीकी समंवय उप-समिति की 35 वीं बैठक का कार्यवृत्त।

Subject: 39th meeting of Northern Regional Power Committee and 35th meeting of TCC – Minutes.

महोदय,
Sir,

उत्तरी क्षेत्रीय विद्युत समिति की 39 वीं बैठक दिनांक 02 मई, 2017 को तथा तकनीकी समंवय उप-समिति की 35 वीं बैठक दिनांक 01 मई, 2017 को चायल (शिमला), हिमाचल प्रदेश में आयोजित की गयी थी। इन बैठकों के कार्यवृत उत्तर क्षेत्रीय विद्युत समिति की वेबसाइट पर उपलब्ध है।

The 39th meeting of Northern Regional Power Committee was held on 02nd May, 2017 and 35th meeting of TCC was held on 01st May, 2017 at Chail (Shimla), Himachal Pradesh. The minutes of the meetings are available on Northern Regional Power Committee website.

भवदीय/Yours faithfully,

(एम.ए.के.पी. सिंह)
(M.A.K.P. Singh)
सदस्य सचिव
Member Secretary

15	Chittorgarh(PG)	RAJASTHAN	125
16	Suratgarh(PG)	RAJASTHAN	125
17	Parichha	UP	125
18	Allahabad(PG)	UP	125
19	Mainpuri	UP	125
20	Unnao	UP	125
21	Gonda	UP	125
22	Meerut(PG)	UP	125
23	Kashipur	UTTRAKHAND	125
24	Srinagar	UTTRAKHAND	125

B.5.3 He informed that the progress on action taken in the matter was being deliberated in monthly OCC meetings. States were requested to submit the action plan for installation of the approved reactors. However, none of the states has submitted the action plan.

B.5.4 Member Secretary, NRPC stated that the matter was discussed in 134th OCC meeting held on 24th April, 2017, wherein, Rajasthan informed that they have carried out study for requirement of reactors and there was difference in Reactor requirement as per their study and that carried out by POWERGRID. OCC suggested that Rajasthan should approach CEA and POWERGRID. Rajasthan had informed in the OCC meeting that they have written to POWERGRID for clarification on the issue. It was also noted that requirement for Delhi was also to be reviewed.

B.5.5 OCC recommended that the report by POWERGRID and study by Rajasthan may be referred to Standing Committee on Power System Planning. After approval in standing committee the proposal may again be put up before TCC and NRPC.

B.5.6 TCC agreed with the recommendation of OCC to refer the report of the POWERGRID as well as study by Rajasthan to Standing Committee on Power System Planning of NR.

B.5.7 TCC opined that to avoid error in studies by different utilities there should be a common database for the system studies.

NRPC Deliberations

B.5.8 NRPC approved the proposal of TCC for referring the studies to standing committee on Power System Planning of NR and the decision therein would be put up before TCC and NRPC for concurrence.

B.6 Reliable Communication Scheme under Central Sector for Northern Region

TCC Deliberation

B.6.1 POWERGRID representative informed that as desired by Ministry of Power, DPR for OPGW based Reliable Communication scheme for substations of 132 KV and above was prepared by POWERGRID for all the regions. Further, as per directives of Ministry of Power, State Sector of the Scheme was to be taken up by respective states for their portion and Central Sector portion was to be implemented by POWERGRID. Accordingly, Fiber Optic connectivity along with Communication Equipment and associated items was required to be established from different stations under Central Sector scheme for data and voice communication to NRLDC for efficient grid management, as per details given below in Table - 4:

Table 4

Sl. No.	Name of Stations	Link Name	Approx. Line Length (km)
1	Baspa HEP (JP)	1. 400kV D/C Baspa HEP –KarchamWangtoo	18
2	Karcham Wangtoo	1. 400kV D/C Karcham Wangtoo - Kala Amb (Excluding LILO portion)	100
3	Kala Amb	2. 400kV D/C Kala Amb -Abdullapur (Excluding LILO portion)	100
4	Shongtong HEP (HPCL)	1. 400kV D/C Shongtong HEP -Wangtoo Pooling Station	50
		2. 400kV D/C Karcham Wangtoo-Wangtoo Pooling Station (LILO portion)	25
		3. 400kV D/C Wangtoo Pooling Station - Abdullapur (LILO portion)	25
5	Kashang HEP (HPCL)	1. 220kV D/C Kashang HEP -Jhangi Pooling Station.	75
		2. 400kV S/C Shongtong-Jhangi (LILO Portion)	80
		3. 400kV S/C Jhangi- Wangtoo (LILO portion)	
6	Ratle HEP (GVKHEPL)	1. 400kV S/C Dulhasti- Ratle HEP (LILO Portion)	65

Sl. No.	Name of Stations	Link Name	Approx. Line Length (km)
		2.400kV S/C Ratle HEP-Kishenpur (LILO Portion)	65
7	Kotlibehl HEP (NHPC)	1. 220kV D/C Kotlibehl HEP-Rishikesh	100
8	Allain Duhagan HEP (ADHEPL)	1. 220kV D/C ADHEPL-Nalagarh	150
9	Chhaur PS (Malana II Everest Power Private Ltd)	1. 220 KV D/C ADHEP- Chhaur Pooling Station (LILO portion)	50
		2. 220 KV D/C Chhaur Pooling Station - Nallagarh (LILO portion)	50
10	Budhil HEP (Greenko)	1. 220kV Budhil HEP - Chamera -III	50
11	Tapovan Vishnugarh HEP (NTPC)	1. 400kV TapovanVishnugarh - Pipalkotti 2. 400kV PipalKotti- Muzzafarnagar	250
12	Sorang HEP (HSPL)	1. 400kV D/C KarchamWangtoo- Sorang HEP	250
		2. 400kV D/C Sorang HEP-Abdullapur	
13	Jhajjar TPS (NDPL)	1. 400kV D/C Jhajjar(TPS) - Mundaka	66
		2. 400kv D/C Mundaka-Bawana	20
		3. 400kV D/C Bawana-Dipalpur	26
14	Sawra-Kuddu HEP (HPCL)	1. Sawara Kuddu-Gumma (HEP)	20
		2.400kV D/C Abdullapur - Gumma HEP (LILO portion)	30
		3.400kV D/C Gumma - NathpaJhakari (LILO portion)	30

Sl. No.	Name of Stations	Link Name	Approx. Line Length (km)
15	RAPP VII & VIII NPS (NPCIL) Kota	1. 400kV S/C RAPP VII & VIII NPS –Kota (LILO portion)	50
		2. 400kV S/C Kota- Jaipur(South) (LILO portion)	50
16	Baglihar HEP	1. 400kV D/C Baghlihar-Kishenpur	150
17	Vishnuprayag HEP	1. 400kV S/C Vishnuprayag (HEP) –Srinagar HEP	109
18	Srinagar HEP	2. 400kV S/C Srinagar HEP-Muzaffarnagar	189
19	Parbati II HEP	400kV S/C Parbati II (HEP) - Parbati III	20
20	Parbati III HEP	400kV S/C Parbati III (HEP) - Parbati Pooling	20
21	Rosa TPS (RSPCL) Reliance	Rosa - Bareily	116
22	Parbati Pooling	400kV S/C Parbati Pooling (Banala) - Koldam	80
23	Meja TPS	400kV D/C Meja-Allahabad	30
		Total Length (in Km.):	**2509**

B.6.2 He further informed that Connectivity along with Communication Equipment and associated items was also required by establishing following OPGW links of Central Sector to provide redundancy in the system for connectivity with NRLDC as per details given in Table -5 :

Table 5

Sl.No.	Node	Name of Link	Line Length (Km.)
1	Fatehpur 765	400kV Fatehpur - Mainpuri	260
2	Auraiya (NTPC)	400kV Auraiya-Agra	166

3	Kanpur 765	765kV Kanpur 765 - Varanasi 765	320
4	Aligarh 765 kV	765kV Orai - Aligarh 765	300
5	Tanakpur 220kV	220kV Tanakpur-Bareily	106
6	Rosa TPS	400kV Rosa TPS - Lucknow 400kV	170
7	Lucknow New 765kV	765kV Lucknow New- Bareily New	255
8	RAPP B	RAPP B - Chittorgarh	129
9	Chamera-I	400kV Chamera I - Jallandhar	162
10	Rae bareilly 400kV	220kV Raebareilly - Lucknow	1
11	Rihand STPS	400kV Rihand-Allahabad	279
12	Bairasiul	220kV Bairasiul-Jassore	150
13	Moga-Kishenpur Link	765kV S/C Moga-Kishenpur	275
14	Vishnuprayag	400kV S/C Vishnuprayag - Muzaffarnagar	280
15	Karcham Wangtoo HEP (JP)	400kV D/C Karcham Wangtoo – Naptha Jhakari	17
16	Amargarh	400kV Uri –Amargarh (Excluding LILO)	95
		400kV Amargarh - Wagoora (Excluding LILO)	
		Total=	**2965**

B.6.3 He stated that considering above, POWERGRID has worked out 5474 kms. OPGW based Communication Scheme. The estimated cost of the scheme was ₹137 Crs., which was proposed for implementation on cost plus basis. Tariff for the investment made was to be shared by all constituents as per CERC notification. He proposed that the scheme would become part of existing Commercial Agreement signed for ULDC Project.

B.6.4 It was deliberated that state portion was being implemented through 30% funding from PSDF. It was noted that only few states e.g. UP and Rajasthan had put up proposal for PSDF funding. TCC advised other States also to put

up schemes of OPGW for state portion for PSDF funding. On a request for increase in PSDF funding, NPC representative informed that enhancement of funding from existing 30% was under consideration.

B.6.5 Representative of Himachal Pradesh expressed concern over delay in implementation of earlier scheme by POWERGRID. He requested TCC to fix a definite timeline for implementation of the proposed scheme. Replying to a query, POWERGRID representative informed that scheme would be completed in 30 months after issuance of NIT.

B.6.6 TCC recommended the proposal by POWERGRID for installation of 5474 kms. of OPGW based communication scheme, at an estimated cost of 137 Crs. for the approval of NRPC and advised POWERGRID to implement the scheme within 30 months.

NRPC Deliberations

B.6.7 NRPC approved the proposal by POWERGRID for installation of 5474 kms. of OPGW based communication scheme, at an estimated cost of 137 Crs. with the time line of 24 months from placing the Letter of Award. It was also decided that the award would be placed by Nov, 2017.

B.6.8 Regarding the State portion, it was noted that UP and Rajasthan had already submitted DPRs and Punjab was in process of submitting the DPR. It was also noted that there was no need for additional OPGW in Himachal Pradesh and Delhi. Haryana representative stated that it would submit DPR for additional communication system, if funding is increased up to 90% from PSDF. J&K representative informed that for OPGW scheme, the proposal would be submitted for PSDF funding.

B.7 Downstream network by State Utilities from ISTS Stations

TCC Deliberation

B.7.1 POWERGRID representative informed that the following sub-stations (new and augmentation), as given in Table-6, were planned under various transmission schemes and the same were implemented /under implementation:

Table- 6

Sl.	Name of Substation	MVA Capacity	Expected Schedule	Remarks
Down Stream network by State utilities from ISTS Station being ready shortly				
1	400/220kV Parbati Pooling Station	2x315	April 2017	Downstream system for 6 Nos 220 kV bays to be matched. State (Himachal Pradesh) Line (18 Kms) work

सत्यमेव जयते

भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
उत्तर क्षेत्रीय विद्युत समिति
Northern Regional Power Committee

सं. उक्षेविस/ वाणिज्यिक/ 209/ आर पी सी (40 वीं)/2018/ 455-543 दिनाँक : 11 जनवरी, 2018
No. NRPC/ Comml/ 209/ RPC (40th)/2018/ Dated: 11th January, 2018

सेवा में / To,

उ.क्षे.वि.स. के सभी सदस्य
Members of NRPC/TCC

विषय: उत्तरी क्षेत्रीय विद्युत समिति की 40 वीं तथा तकनीकी समंवय उप-समिति की 37 वीं बैठक का कार्यवृत्त ।

Subject: 40th meeting of Northern Regional Power Committee and 37th meeting of TCC – Minutes.

महोदय / Sir,

उत्तरी क्षेत्रीय विद्युत समिति की 40 वीं बैठक दिनांक 28 अक्तूबर, 2017 को तथा तकनीकी समंवय उप-समिति की 37 वीं बैठक दिनांक 27 अक्तूबर, 2017 को श्रीनगर, जम्मू-कश्मीर में आयोजित की गयी थी । इन बैठकों के कार्यवृत की एक प्रति आपकी सूचना व आवश्यक कार्यवाही हेतु इस पत्र के साथ संलग्न है।

The 40th meeting of Northern Regional Power Committee was held on 28th October, 2017 and 37th meeting of TCC was held on 27th October, 2017 at Srinagar, Jammu & Kashmir. A copy of the minutes of the meetings is enclosed herewith for favour of information and necessary action.

भवदीय/Yours faithfully,

11/1/18

(एम.ए.के.पी. सिंह)
(M.A.K.P. Singh)
सदस्य सचिव
Member Secretary

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a) TCR of capacity 500 MVAr at Kurukshetra 400 kV bus.

b) Bus Reactors at 30 Nos. 220 kV sub-stations and 18 Nos 400 kV level sub-stations subject to the availability of space (Annexure II to the Agenda note)**.** It was also agreed that these reactors shall be provided by the owner of the substations.

B.3.3 Member Secretary, NRPC briefed that the TCR of 500 MVAr at 400 kV Kurukshetra bus had been approved by the standing Committee in view of the prevailing high voltage conditions at Kurukshetra which leads to curtailing power transfer capability through Champa- Kurukshetra HVDC.

B.3.4 NRPC requested POWERGRID to commission TCR of capacity 500 MVAr at Kurukshetra 400 kV bus at the earliest as apart from providing voltage relief it would also help in stabilization of Champa –Kurukshetra HVDC.

B.3.5 NRPC advised all the utilities to commission the reactors as given in Annexure II to the Agenda note at the earliest and to submit the detailed action plan with the timeline in the next OCC meeting. NRPC further pointed that these reactors are essential for maintaining the voltage level of the grid and needs to be commissioned within 26 months.

B.3.6 POWERGRID informed that the reactors proposed at the ISTS stations would be done under Tariff Based Competitive Bidding (TBCB) and the timeline for the same cannot be provided. However, POWERGRID assured of commissioning the TCR at Kurukshetra at the earliest.

B.4 Reliable Communication Scheme under Central Sector for NR.

TCC Deliberations

B.4.1 Member Secretary, NRPC informed the Committee that 39th NRPC had approved, implementation of following Communication Schemes:

1) Reliable Communication Scheme under Central Sector for Northern Region comprising 5474 Km of OPGW along with communication equipments and associated items at an estimated cost of Rs. 137 Cr.

2) Replacement of OPGW along with communication equipments installed under ULDC phase-I at an estimated cost of Rs. 59 Crs as a part of Reliable Communication Scheme under Central Sector for Northern Region.

B.4.2 He further mentioned that, based on NRPC approval POWERGRID has prepared the Detailed Project Report. As per DPR, quantities along with cost of the project are as under:

a) Reliable Communication Scheme under Central Sector for Northern Region consisting of 5428 Km of OPGW along with communication equipments and associated items at a cost of Rs. 177 Cr.

b) Replacement of OPGW along with communication equipment and associated items installed under ULDC project Phase-I consisting of 1820 Km of OPGW along with communication equipments and associated items at a cost of Rs. 60 Crs. The same is taken up as a part of Reliable Communication Scheme under Central Sector for Northern Region.

B.4.3 POWERGRID submitted that the Implementation of "Reliable Communication Scheme under Central Sector for Northern Region" consisting of 7248 Km (5428 Km + 1820 Km) of OPGW along with communication equipment and associated items was planned at a total cost of Rs. 237 Cr (Rs. 177 Crs + Rs. 60 Crs). Implementation schedule for this project would be 28 months from the date of Investment Approval.

B.4.4 POWERGRID informed that the actual cost would be discovered only after bidding process and implementation of the project. Tariff for the investment made is to be shared by all constituents as per CERC notification. The scheme would become part of existing Commercial Agreement signed for ULDC Project.

B.4.5 On a query regarding increase in cost, in spite of reduction in quantity, POWERGRID representative informed that the increase in price was due to following factors:

i) Increase in basic cost on account of revised Schedule of rates at the price level of June, 2017, while earlier it was based on Feb, 2017 price level.

ii) Inclusion of IDC, IEDC

B.4.6 He added that the present Cost estimate of Rupees 177 Cr. comprises of: Basic Cost- Rs. 146.5 Cr., IEDC- Rs.15.5.Cr, IDC- Rs.10 Cr. and Contingency- Rs.5 Cr.

It was also informed that DPR had been approved and NIT process would be completed in Nov, 2017. The time line for completion is 28 months from the date of investment approval say 1st Dec., 2017.

B.4.7 TCC noted the information. Member Secretary, NRPC informed that for State portion, UP, Rajasthan, Punjab and Uttarakhand had submitted proposal for Communication schemes for PSDF funding. He informed that latest status of PSDF funding of these schemes was enclosed at Annexure-III of the agenda.

B.4.8 Member Secretary, NRPC apprised the Committee that decision of increasing the PSDF funding from 30% to 50%. Haryana representative informed that the scheme for their State would be submitted for PSDF funding shortly.

B.4.9 TCC advised all the States to submit their proposal for PSDF funding and implement the schemes in a time bound manner.

NRPC Deliberations

B.4.10 NRPC noted the deliberations held in TCC regarding reliable communication scheme under central sector in Northern Region and advised POWERGRID to take action as decided in the TCC meeting.

File No.CEA-GO-17-11(17)/3/2023-NRPC

I/28888/2023

सत्यमेव जयते

भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
उत्तर क्षेत्रीय विद्युत समिति
Northern Regional Power Committee

विषय: **Minutes of the meeting for discussion on the RVPN's request for allotment of 500 MVA ICT available as regional spare at PGCIL's 400 kV GSS Jaipur South to RVPN's 400 kV GSS Jodhpur (Surpura)-reg.**

Kindly find attached minutes of the meeting held on **07.07.2023** for discussion on the RVPN's request for allotment of 500 MVA ICT available as regional spare at PGCIL's 400 kV GSS Jaipur South to RVPN's 400 kV GSS Jodhpur (Surpura).

Signed by Santosh Kumar
Date: 12-07-2023 16:54:50
Reason: Approved

(संतोष कुमार)
अधीक्षण अभियंता (प्रचालन)

SDGM(Ams) Sh Rajeev
for record P/.
12/7/23

18-ए, शहीद जीत सिंह मार्ग, कटवरिया सराय, नई दिल्ली दूरभाष:011-26513265 ई-मेल: seo-nrpc@nic.in वेबसाईट: www.nrpc.gov.in
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Minutes of the meeting held on 07.07.2023 for discussion on the RVPN's request for allotment of 500 MVA ICT available as regional spare at PGCIL's 400 kV GSS Jaipur South to RVPN's 400 kV GSS Jodhpur (Surpura)

MS, NRPC welcomed all the participants.

1. MS, NRPC informed that a letter (**attached at Annexure-I**) has been received from RVPN for allotment of 500 MVA ICT available as regional spare at PGCIL's 400 kV GSS Jaipur South to RVPN's 400 kV GSS Jodhpur (Surpura). He further informed that earlier RVPN's request for allotment of 500 MVA, 400/220 kV ICT available as regional spare at PGCIL's 400kV GSS Jaipur (South) to RVPN for utilization at RVPN's 400 kV GSS Chittorgarh, was discussed in the 208th OCC meeting held on 20.06.2023. RVPN has informed that they do not require regional spare for 400 kV GSS Chittorgarh as they are able to meet out the requirement on their own.
2. RVPN informed that recently, 315 MVA ICT at 400 kV GSS Jodhpur (Surpura) has failed and problems are being faced in supply and load management. Therefore, they have requested for allotment of 500 MVA ICT available as regional spare at PGCIL's 400 kV GSS Jaipur South to RVPN's 400 kV GSS Jodhpur (Surpura) so that existing supply crisis may be resolved.
3. NRLDC informed that currently there are 2x315 MVA ICT's at 400 kV GSS Jodhpur. As per previous years loading pattern, combined loading of more than 500 MW is observed on these ICT's during the period of September to March. Therefore, these ICT's are N-1 non-compliant. Accordingly, SPS has also been implemented for these ICT's. Further, if any 500 MVA ICT fails in Rajasthan it may lead to curtailment of RE generation. He asked Powergrid to share the availability of spare ICT's.
4. Powergrid informed that only one 500 MVA regional spare is available for Rajasthan. Further, since 315 MVA ICT has failed it would be better to replace it with 315 MVA ICT.
5. SE NRPC enquired about the availability of 315 MVA ICTS, as regional spare.
6. Powergrid informed that regional spare 315 MVA ICT is available at Bhiwadi S/s but ICT-1 and ICT-2 at Bhiwadi S/s are running at high DGA therefore spare ICT is required at Bhiwadi S/s for contingency. Regional spares are also available at Mandola S/s and Gorakhpur S/s.

7. CTU informed that one 315 MVA ICT was also to be shifted from Ludhiana S/s to Bhinmal S/s. However, it is linked with the commission of Bhinmal S/s. CTU suggested that states should also have spares to meet emergency conditions. Further, CTU requested RVPN to conform timeline by which they will be able to return the ICT to replenish the regional spare.
8. SE, NRPC suggested that since Mandola is closer to Jodhpur, ICT available at Mandola S/s may be allotted to RVPN.
9. RVPN stated that they will have to check whether it is feasible to install ICT available at Mandola S/s in their 400 kV GSS Jodhpur. Further, one 500 MVA ICT failed at Bhadla S/s is to be repaired in the next 3-4 months. They would be able to return the ICT after repair of this ICT.
10. MS, NRPC stated that as only one 500 MVA ICT is available as regional spare for Rajasthan, it is not advisable to allot it to RVPN as it may cause problems in evacuation of RE generation in case any other 500 MVA ICT fails in RE pocket. He suggested RVPN to physically check Mandola ICT and submit report immediately. He stated that another round of discussion may be held after the submission of report by RVPN.

Deliberations on 10.07.2023

11. RVPN informed that during physical inspection it was found that transportation of 315 ICT from Mandola S/s towards main highway for Jodhpur is not possible due to ongoing construction work for Ring road flyover outside Mandola sub-station due to which proper clearance is not available till the temporary structures are removed from under construction flyover. As per progress seen at flyover site, the obstruction may not be clear for transportation for at least 3 months. Therefore shifting of transformer from logistics point of view seems not feasible immediately as per requirement at Jodhpur. Report submitted by RVPN is attached as **Annexure-II**.
12. SE, NRPC suggested that in view of the issue of transportation of ICT from Mandola S/s, 315 MVA spare ICT available at Ludhiana S/s may be allotted to RVPN. He also requested Powergrid to share the likely date for commissioning of ICT at Bhinmal S/s.
13. Powergrid informed that ICT at Bhinmal S/s is likely to be commissioned by November 2023.

14. RVPN informed that they will not be able to return the ICT before December, 2023.
15. MS, NRPC suggested that 315 MVA ICT available at Ludhiana S/s may be allotted to RVPN for 400 kV GSS Jodhpur (Surpura). He suggested RVPN to give their best efforts to get the 500 MVA ICT of Bhadla S/s repaired at the earliest and return the 315 MVA ICT to Powergrid by October, 2023 for commissioning at Bhinmal S/s. Further, if required another meeting may be held in August 2023 for discussion on this matter.

Decision taken during the Meeting

I. 315 MVA ICT available at Ludhiana S/s to be allotted to RVPN for 400 kV GSS Jodhpur (Surpura).
II. RVPN to give their best efforts to get the 500 MVA ICT of Bhadla S/s repaired at the earliest and return the 315 MVA ICT to Powergrid by October, 2023 for commissioning at Bhinmal S/s.
III. If required another meeting may be held in August 2023 for discussion on this matter.

Meeting ended with vote of thanks to the Chair.

*****

Annexure-I

आशुतोष ए.टी. पेडणेकर, भा.प्र.से.
Ashutosh A.T. Pednekar, I.A.S.

अध्यक्ष एवं प्रबन्ध निदेशक
Chairman & Managing Director
राजस्थान राज्य विद्युत प्रसारण निगम लि., जयपुर
Rajasthan Rajya Vidyut Prasaran Nigam Ltd., Jaipur

The Chairman (NRPC),
18-A, Shaheed Jeet Singh Marg,
Katwaria Sarai,
New Delhi-110016.

Sub: Regarding allotment of 500 MVA, 400/220 kV ICT available as regional spare at PGCIL's 400 kV GSS Jaipur (South) to RVPN for utilization at RVPN's 400 kV GSS, Jodhpur (Surpura).

Ref: Letter No. D.96 dated 23.05.2023 written to Member Secretary (NRPC).

Vide the above referred letter, RVPN had requested the allotment of 500 MVA, 400/220 kV ICT available as regional spare at PGCIL's 400 kV GSS Jaipur (South) for utilization at 400 kV GSS, Chittorgarh due to extreme difficulty being faced in load catering in the area, which was discussed as an agenda in 208th OCC meeting on 20.06.2023. Since, RVPN was able to meet out the above requirement on its own; PGCIL's 500 MVA regional spare was not required.

Recently, 315 MVA transformer at 400 kV GSS, Jodhpur (Surpura) has also failed and problems are being faced in supply & load management. Since, Jodhpur area is agriculturally & industrially very important and is a crucial link for RE evacuation, it becomes vital to replace the new ICT to resume the normal supply operations in that area at the earliest.

In this context, you are requested to kindly arrange to allot the 500 MVA ICT lying at PGCIL's 400 kV Jaipur (South) as regional spare to RVPN's 400 kV GSS, Jodhpur (Surpura) so that the existing supply crisis may be resolved.

(Ashutosh A.T. Pednekar)
Chairman & Managing Director

Copy forwarded to the following for information:-

1. The Member Secretary (NRPC), 18-A, Shaheed Jeet Singh Marg, Katwaria Sarai, New Delhi110016
2. The Chief Engineer (PP&D), RVPN, Jaipur.

Chairman & Managing Director

Signature valid
Digitally signed by Ashutosh A.T. Pednekar
Designation : Chairman And Managing Director
Date: 2023.07.06 10:20:08 IST
Reason: Approved

#105,1st Floor, Vidyut Bhawan, Janpath, Jaipur-302005, Tel : 0141-2740118 (O), E-mail : cmd.rvpn@rvpn.co.in

Annexure-II

RAJASTHAN RAJYA VIDYUT PRASARAN NIGAM LTD.,

(Corporate Identity Number (CIN): L40109RJ2000SGC016485)

OFFICE OF THE EXEUCTIVE ENGINEER (T&C),RVPNL, JODHPUR

No.RVPN/XEN(T&C)/Jodhpur/Tech./D 361. Dt 10-7-2023

The Chief Engineer (PPD),
Raj. Rajya Vidyut Prasaran Nigam Ltd.,
Jaipur.

Sub : Feasibility assessment Report on Shifting of 400/220kV, 315 MVA Power Transformer from 400kV GSS, PGCIL Mandola (U.P.) to 400kV GSS, RVPN, Jodhpur.

Ref : Your office order Rajkaj Ref. No.4233756 dt. 7.7.2023.

Undersigned visited vide above nomination at 400kV GSS PGCIL Mandola (UP) on dt. 8.7.2023 for Inspection/ accessing feasibility of 400/220kV, 315MVA BHEL Auto Transformer at Mandola Sub-station, findings are as below:-

i. The transformer do not have any number plate for detailing. However enquiry from BHEL revealed that it is manufactured in 1996 and repaired in 2020 by them.

ii. In this transformer provision for cooling system is available on both side, so the transformer may be utilized after some modification in structure of mounting of RVT at 400kV GSS, Jodhpur.

iii. The transportation of above 400/220kV, 315MVA transformer from PGCIL Sub-station Mandola towards Main Highway for Jodhpur is not possible due to construction work is going-on for Ring Road Flyover outside Mandola Sub-station due to which proper clearance is not available till the temporary structures are removed from the under construction Flyover. As per progress seen at Flyover site with PGCIL representative, the obstruction may not be clear for transportation for at least 3 months.

iv. No any latest test report of transformer is made available by PGCIL to adjudge the current condition of transformer. The last factory test report of March' 20 is however obtained from BHEL directly.

The Photos are enclosed for ready reference.

In view of above, the shifting of transformer from logistic point of view seems not feasible immediately as per requirement at Jodhpur.

Encl: As above.

10-7-2023

(K.L. Gajraj)
Executive Engineer (T&C),
R.V.P.N.L.,Jodhpur
Camp: Jaipur.

Sandeep Yadav {संदीप यादव}

From: Rajeev Kumar {राजीव कुमार}
Sent: 07 August 2023 13:02
To: Sandeep Yadav {संदीप यादव}
Subject: Fwd: POWERGRID AGENDA OCC -208; Regarding Outage for reconductoring work of 400KV Kankroli-Jodhpur Line
Attachments: Monthly Progress Reports PGCIL OH 01.pdf; Apar_request_letter_Shutdown.pdf; L2 _OH01_Apar_Reconductoring_Bypassing.pdf; 09th_NCT_MoM.pdf; SD-REQUEST 208th OCC Jun -2023-765KV_ HVDC_ 400kv - BELOW Format 01.06.23.xlsx; Request_Approval_of_Shutdown-16062023.pdf

Get Outlook for iOS

From: rtamc.nr1 <rtamc.nr1@powergrid.in>
Sent: Friday, June 16, 2023 5:46:07 PM
To: Santosh Kumar <seo-nrpc@nic.in>; Vipul Kumar <vipul.cea@gov.in>; nrldcoutage@grid-india.in <nrldcoutage@grid-india.in>
Cc: NARESH BHANDARI <ms-nrpc@nic.in>; alok.kumar@grid-india.in <alok.kumar@grid-india.in>; mahavir@grid-india.in <mahavir@grid-india.in>; bikaskjha@grid-india.in <bikaskjha@grid-india.in>; somara.lakra@grid-india.in <somara.lakra@grid-india.in>; Vishal Roy {विशाल रॉय} <vishal.roy@powergrid.in>; Omprakash Meena {ओमप्रकाश मीणा} <omprakash@powergrid.in>; A K Behera {ए.के. बेहरा} <akbehera@powergrid.in>; Ravindra Nath Gupta {आर.एन. गुप्ता} <ravindrangupta@powergrid.in>; Rajeev Kumar {राजीव कुमार} <Rajivkumar@powergrid.in>; Atanu Bagchi {अटानू बागची} <atanubagchi@powergrid.in>; rk.porwal@grid-india.in <rk.porwal@grid-india.in>; Gyaneshwar Prasad Payasi {जी.पी. पयासी} <gppayasi@powergrid.in>; A K Mishra {ए.के. मिश्रा} <akmishra2@powergrid.in>; Kumar Gautam {कुमार गौतम} <kumar.gautam@powergrid.in>
Subject: Fw: POWERGRID AGENDA OCC -208; Regarding Outage for reconductoring work of 400KV Kankroli-Jodhpur Line

Respected Sir,

Please include in OCC 208 agenda for outage for reconductoring work of 400KV Kankroli-Jodhpur line as per attachments.

सादर धन्यवाद,
पाली-प्रभारी
आर. टी. ए. एम. सी. उत्तरी क्षेत्र-1
मानेसर, गुरुग्राम - हरियाणा।
Hotline: 20112153 & 20110041
मो.: 9650493332, 8860093391, 9717772649 & 9205599593
फोन: 0124-2863303, 0124-2863326 & 0124-2863368
VoIP (NTAMC): 6019951, 6019952 & 6019953

Kindly Note : RTAMC -NR1 email ID changed from 'rtamc.nr1@powergrid.co.in' to 'rtamc.nr1@powergrid.in'.

It is requested to send email to 'rtamc.nr1@powergrid.in' for future communication.

From: rtamc.nr1 <rtamc.nr1@powergrid.in>
Sent: Friday, June 9, 2023 3:59 PM
To: nrldcoutage@grid-india.in <nrldcoutage@grid-india.in>; Santosh Kumar <seo-nrpc@nic.in>
Cc: nrldcoutage@grid-india.in <nrldcoutage@grid-india.in>; bikaskjha@grid-india.in <bikaskjha@grid-india.in>; alok.kumar@grid-india.in <alok.kumar@grid-india.in>; mahavir@grid-india.in <mahavir@grid-india.in>; somara.lakra@grid-india.in <somara.lakra@grid-india.in>; Vishal Roy {विशाल रॉय} <vishal.roy@powergrid.in>; Sumit Gaur {सुमित गौड़} <sumitgaur@powergrid.in>; Atanu Bagchi {अटानू बागची} <atanubagchi@powergrid.in>; Rakesh Kumar Agrawal {राकेश कुमार अग्रवाल} <rkagrawal83@powergrid.in>; Kumar Gautam {कुमार गौतम} <kumar.gautam@powergrid.in>; Vipul Kumar <vipul.cea@gov.in>; Omkishor <omkishor.sahu@gov.in>; bikaskjha@grid-india.in <bikaskjha@grid-india.in>; NARESH BHANDARI <ms-nrpc@nic.in>; Sukumar Mishra {सुकुमार मिश्रा} <sukumarmishra@powergrid.in>; Rajeev Kumar {राजीव कुमार} <Rajivkumar@powergrid.in>; A K Behera {ए.के. बेहरा} <akbehera@powergrid.in>; Ravindra Nath Gupta {आर.एन. गुप्ता} <ravindrangupta@powergrid.in>; Gyaneshwar Prasad Payasi {जी.पी. पयासी} <gppayasi@powergrid.in>; se.ldrvpnl@rvpn.co.in <SE.LDRVPNL@RVPN.CO.IN>; ldshutdown@rvpn.co.in <LDSHUTDOWN@RVPN.CO.IN>; ldshutdown@gmail.com <ldshutdown@gmail.com>
Subject: Fw: Regarding Outage for reconductoring work of 400KV Kankroli-Jodhpur Line

Dear Sir,

In reference to trailing mail and attachments, It is again requested to kindly issue Shutdown approval of 400 KV Kankroli-Jodhpur Line for **15 days starting from 12-06-2023, 08:00 AM to 26-06-2023, 19:00 PM on continuous basis** for reconductoring work.

The reconductoring work is awarded on M/s APAR industries limited. The party has submitted the shutdown request letter mentioning that they are ready to start the reconductoring work.

All necessary documents have been attached.

सादर धन्यवाद,
पाली-प्रभारी
आर. टी. ए. एम. सी. उत्तरी क्षेत्र-1
मानेसर, गुरुग्राम - हरियाणा।
Hotline: 20112153 & 20110041
मो.: 9650493332, 8860093391, 9717772649 & 9205599593
फोन: 0124-2863303, 0124-2863326 & 0124-2863368
VoIP (NTAMC): 6019951, 6019952 & 6019953

Kindly Note : RTAMC -NR1 email ID changed from 'rtamc.nr1@powergrid.co.in' to 'rtamc.nr1@powergrid.in'.
It is requested to send email to 'rtamc.nr1@powergrid.in' for future communication.

From: rtamc.nr1 <rtamc.nr1@powergrid.in>
Sent: Thursday, June 8, 2023 5:31 PM
To: nrldcoutage@grid-india.in <nrldcoutage@grid-india.in>; bikaskjha@grid-india.in <bikaskjha@grid-india.in>; Santosh Kumar <seo-nrpc@nic.in>
Cc: alok.kumar@grid-india.in <alok.kumar@grid-india.in>; mahavir@grid-india.in <mahavir@grid-india.in>; somara.lakra@grid-india.in <somara.lakra@grid-india.in>; Vishal Roy {विशाल रॉय} <vishal.roy@powergrid.in>; Sumit Gaur {सुमित गौड़} <sumitgaur@powergrid.in>; Atanu Bagchi {अटानू बागची} <atanubagchi@powergrid.in>; Rakesh Kumar Agrawal {राकेश कुमार अग्रवाल} <rkagrawal83@powergrid.in>; Kumar Gautam {कुमार गौतम} <kumar.gautam@powergrid.in>; Vipul Kumar <vipul.cea@gov.in>; Omkishor <omkishor.sahu@gov.in>
Subject: Regarding Outage for reconductoring work of 400KV Kankroli-Jodhpur Line

Dear Sir,

In reference to trailing mail and attachments, kindly issue shutdown approval of 400 KV Kankroli-Jodhpur Line **for 15 days starting from 12-06-2023,08:00 AM to 26-06-2023,19:00 PM on continuous basis** for reconductoring work.

The reconductoring work is awarded on M/s APAR industries limited. The party has submitted the shutdown request letter mentioning that they are ready to start the reconductoring work.

All necessary documents has been attached.

सादर धन्यवाद,
पाली-प्रभारी
आर. टी. ए. एम. सी. उत्तरी क्षेत्र-1
मानेसर, गुरुग्राम - हरियाणा।
Hotline: 20112153 & 20110041
मो.: 9650493332, 8860093391, 9717772649 & 9205599593
फोन: 0124-2863303, 0124-2863326 & 0124-2863368
VoIP (NTAMC): 6019951, 6019952 & 6019953

Kindly Note : RTAMC -NR1 email ID changed from 'rtamc.nr1@powergrid.co.in' to 'rtamc.nr1@powergrid.in'.
It is requested to send email to 'rtamc.nr1@powergrid.in' for future communication.

From: Bhagwan Sahay Meena {भगवान सहाय मीना} <b.meena@powergrid.in>
Sent: Thursday, June 8, 2023 2:37 PM
To: rtamc.nr1 <rtamc.nr1@powergrid.in>
Cc: Sukumar Mishra {सुकुमार मिश्रा} <sukumarmishra@powergrid.in>; Ravindra Nath Gupta {आर.एन. गुप्ता} <ravindrangupta@powergrid.in>; Umesh Chandra Chaudhary {यू.सी. चौधरी} <ucchaudhary@powergrid.in>; Vishal Roy {विशाल रॉय} <vishal.roy@powergrid.in>; Atanu Bagchi {अटानू बागची} <atanubagchi@powergrid.in>; Ramkrapal Meena {रामकृपाल मीना} <ramkrapalmeena@powergrid.in>
Subject: Re: Regarding Outage for reconductoring work of 400KV Kankroli-Jodhpur Line

Dear Sir,

This has reference to trailing mail regarding outage of 400 KV Kankroli-Jodhpur Line for reconductoring work.
The reconductoring work is awarded on M/s APAR industries limited. The party has submitted the shutdown request letter mentioning that they are ready to start the reconductoring work.
You are therefore requested to arrange for **continues shutdown of Kankroli-Jodhpur line for 15 days starting from 12-06-2023,08:00 AM to 26-06-2023,19:00 PM**. Further requirement of line shutdown shall be proposed 7 days prior to required time schedule.

Regards,
BS Meena,
Dy. Manager, Kankroli

Annexure-A

List of shutdown required for commissioning of ICT-3 at Kurukshetra Substation

S.N.	NAME OF THE ELEMENT	Owner	Daily/ Continuous	DURATION				Reason
				FROM		TO		
				DATE	TIME	DATE	TIME	
2	400kV Bus-3	POWERGRID	Continuous	01.10.2023	07:00	03.10.2023	20:00	For Erection of interface module for connection of ICT-3 tie bay with existing Bus-3. After erection, internal conductor link will be removed and corona shield applied on both ends to isolate existing & new GIS. Internal conductor will be connected after HV test.
4	400kV Bus-3	POWERGRID	Daily	04.10.2023	07:00	05.10.2023	20:00	For HV Test of GIS Extension bay of Bus-3
1	400kV Bus-4	POWERGRID	Continuous	06.10.2023	07:00	08.10.2023	20:00	For Erection of interface module for connection of ICT-3 main bay with existing Bus-4. After erection, internal conductor link will be removed and corona shield applied on both ends to isolate existing & new GIS. Internal conductor will be connected after HV test.
3	400kV Bus-4	POWERGRID	Daily	9.10.2023	07:00	10.10.2023	20:00	For HV Test of GIS Extension bay of Bus-4
8	220kV Bus-1	POWERGRID	Daily	11.10.2023	07:00	11.10.2023	20:00	For HV TEST OF 220 KV BUS-1 GIS EXTENSION
9	220kV Bus-2	POWERGRID	Daily	12.10.2023	07:00	12.10.2023	20:00	For HV TEST OF 220 KV BUS-2 GIS EXTENSION
5	400kV Bus-4	POWERGRID	Continuous	13.10.2023	07:00	14.10.2023	20:00	For connection of internal conductor of new ICT-3 GIS bay with Existing GIS Bus-4 after HV test and busbar relay testing
6	400kV Bus-3	POWERGRID	Continuous	15.10.2023	07:00	16.10.2023	20:00	For connection of internal conductor of new ICT-3 GIS bay with Existing GIS Bus-3 after HV test and busbar relay testing.
7	400kV Kurukshetra-Jind-2 line	POWERGRID	Daily	16.10.2023	07:00	16.10.2023	20:00	For current injection point for Bus-3 for Busbar Relay Testing after HV test of ICT-3 bays.
10	220kV Bus-1	POWERGRID	Continuous	17.10.2023	07:00	18.10.2023	20:00	For connection of internal conductor of new ICT-3 GIS bay with Existing GIS Bus-1 and Busbar Relay Testing
12	220kV Bus-2	POWERGRID	Continuous	19.10.2023	07:00	20.10.2023	20:00	For connection of internal conductor of new ICT-3 GIS bay with Existing GIS Bus-2 & Busbar Relay Testing

Annexure-VII
Annexure-32/B

सत्यमेव जयते

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

राष्ट्रीय विद्युत समिति प्रभाग/National Power Committee Division

सं.: 3/NRCE/NPC/CEA/2018/ ९५१ - ९५८ दिनांक:20.09.2018

To

1. Member Secretary, NRPC, 18-A, SJSS Marg, Katwaria Sarai, New Delhi-110016
2. Member Secretary, WRPC, MIDC Area Marol, Andheri(East), Mumbai - 400093
3. Member Secretary, SRPC, No. 29, Race Course Cross Road, Bengaluru - 560009
4. Member Secretary, ERPC, 14, Golf Club Road, Tolly Gunge, Kolkata-700033
5. Member Secretary, NERPC, Dong Parmaw, Lapalang Shillong-793006

विषय: Ambient temperature adjusted TTC –Reg.

संदर्भ: NLDC letter No. NLDC/SO/NPC/TempadjustedTTC/222 dated 31.08.2018

Sir,

In line with the decisions in the meetings of Sub-Group of NRCE for finalizing the methodology for computation of TTC/ATC/TRM, PGCIL vide letter dated 18.04.2018 has submitted the details of current rating of terminal equipment for high capacity 400kV lines owned by POWERGRID.

In response to the NPC Division letter dated 17.08.2018, seeking status report regarding compliance/implementation of ambient temperature adjusted TTC for all the transmission corridors of the country, POSOCO vide letter dated 31.08.2018 (copy enclosed) has informed that the terminal equipment rating of both ends for the lines were available only for 99 Nos. of 400 kV lines, out of 183 lines as per the data submitted by PGCIL. Therefore, we are again taking up with PGCIL to send the complete information.

POSOCO has further requested that terminal equipment ratings of the STU and other transmission licensees would also be required for full implementing of temperature adjusted TTC.

It is, therefore, requested that the terminal equipment ratings of STUs' and other transmission licensees' transmission lines in your region, may please be compiled and furnished to POSOCO with a copy to NPC Division, CEA on priority basis.

Encl.: As Above.

20/9/2018

(प्रदीप जिंदल/Pardeep Jindal)
मुख्य अभियन्ता / Chief Engineer

Copy to:

ED, NLDC, New Delhi- With request that while calculating the TTC for Short Term Transactions the terminal equipment rating as available may please be considered.

Copy for kind information to:

Member (GO&D), CEA, New Delhi

पावर सिस्टम ऑपरेशन कॉर्पोरेशन लिमिटेड
(भारत सरकार का उद्यम)
POWER SYSTEM OPERATION CORPORATION LIMITED
(A Govt. of India Enterprise)

पंजीकृत एवं केन्द्रीय कार्यालय : प्रथम तल, बी-9, कुतुब इंस्टीट्यूशनल एरिया, कटवारिया सराय, नई दिल्ली-110016
Registered & Corporate Office : Ist Floor, B-9, Qutab Institutional Area, Katwaria Sarai, New Delhi -110016
CIN : U40105DL2009GOI188682, Website : www.posoco.in, E-mail : posococc@posoco.in,Tel.: 011- 41035696, Fax : 011- 26536901

Ref: NLDC/SO/NPC/TempadjustedTTC/222

Date: 31st August 2018

Annexure-32/A

To
The Chief Engineer,
National Power Committee (NPC),
NRPC Building, 18-A,
Shaheed Jeet Singh Marg, Katwaria Sarai,
New Delhi – 110016

Sub: Review of Ambient temperature adjusted TTC

Ref:

1. **NPC letter 3/NRCE/NPC/CEA/2017/827-834 dtd. 17.08.2018**
2. **PGCIL letter no. C/CTU/N/01/NRCE dtd. 18.04.2018**

Sir,

I. This is in reference to the above communication from NPC. In the meetings of sub-group of NRCE, it was decided to finalise the methodology for computation of TTC/ATC/TRM, taking into account variations in thermal capability of lines with respect to variations of ambient temperature.

II. Examining the details furnished by POWERGRID vide letter dtd. 18.04.2018, it was observed that details of terminal equipment ratings of both ends for the line were available for 99 nos. of 400 kV lines, out of total 183 lines. Regionwise summary is given at ***Annexure-I***. Details of lines for which terminal equipment ratings of both ends are available is given at ***Annexure-II***.

III. For conducting studies in PSSE for assessment of inter control-area transfer capability, POSOCO considers thermal ratings of lines as specified in CEA's Manual on Transmission Planning Criteria 2013. These ratings are considering ambient temperature of 45^0 C.

IV. Amongst the lines in Annexure-II, 20 nos. of lines had terminal equipment rated higher than the thermal ratings considered by POSOCO in studies. The list of lines are indicated as per ***Annexure – III***. Consequently there is scope for considering temperature adjusted thermal ratings in these lines. POSOCO is in the process of populating the temperature adjusted thermal rating for these lines in the PSSE study cases. It is also to mention that most of the lines were not found to be in the path of inter-regional transfer.

V. NPC may take up with POWERGRID, STUs and other transmission licensees to furnish terminal equipment ratings at all transmission lines at 400 kV and above to ensure that there is no gap in security assessment.

Thanking you,

Yours faithfully,

(S.R.Narasimhan) 31/8/2018
Executive Director, NLDC

Copy To: Executive Director, WRLDC / ERLDC / NERLDC / NRLDC / SRLDC

Annexure - I

Summary of details of terminal equipment ratings of 400 kV lines furnished by POWERGRID

Region	No. of lines for which data furnished	No. of lines with terminal equipment ratings of both ends	No. of lines requiring review
NR	65	31	8
WR	32	14	4
SR	38	26	2
ER	34	16	4
NER	2	2	0
Inter-regional	12	10	2
Total	**183**	**99**	**20**

Annexure - II

400 kV transmission lines with information of terminal equipment ratings at both ends

Name of the Transmission Line	Length in Ckt KM	Voltage Level in kV	Type of Conductor	Configura t ion	Temp Deg C	End-1Rating (MVA)	End-2 Rating (MVA)	Line rating (MVA)	Line rating as per CEA Tx Planning Criteria (MVA)
Ballabhgarh-M. Bagh	60.68	400	Bersimis	Quad	75	1385.6	2078.4	1385.6	2029
Lucknow(Old)-Lucknow(New)-I	2.862	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
Lucknow(Old)-Lucknow(New)-II	2.862	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
Sikar-Agra-1	386	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
Sikar-Agra-2	386	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
Bareilly (New) - Bareilly (Old) I	1.7	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
Bareilly (New) - Bareilly (Old) I	1.7	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
Roorkee-Saharanpur-I	36.535	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
Roorkee-Saharanpur-II	36.535	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
Varanasi-Sarnath I	107.577	400	ACSR Moose	Quad	85	2182.32	2182.32	2182.32	2211
Varanasi-Sarnath II	107.577	400	ACSR Moose	Quad	85	2182.32	2182.32	2182.32	2211
Kanpur-Kanpur GIS I	21.233	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
Kanpur-Kanpur GIS II	21.233	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
Hissar-Kaithal I	113.12	400	ACSR	Tripple	75	1385.6	1385.6	1385.6	1270
Hissar-Kaithal I	113.12	400	ACSR	Tripple	75	1385.6	1385.6	1385.6	1270
Kaithal- Patiala I	126	400	ACSR	Tripple	75	1385.6	1385.6	1385.6	1270
Kaithal- Patiala II	126	400	ACSR	Tripple	75	1385.6	1385.6	1385.6	1270
Nalagarh- Patiala I	93.78	400	ACSR	Tripple	75	1385.6	1385.6	1385.6	1270
Nalagarh- Patiala II	93.78	400	ACSR	Tripple	75	1385.6	1385.6	1385.6	1270
Bahadurgah- Sonepat I	53.4	400	ACSR	Tripple	75	1385.6	1385.6	1385.6	1270
Bahadurgah- Sonepat II	53.4	400	ACSR	Tripple	75	1385.6	1385.6	1385.6	1270
Baghpat-Kaithal-2	153.672	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
Baghpat-Kaithal-2	153.672	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
Merrut-Baghpat-1	70.976	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
Merrut-Baghpat-2	70.976	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
Abdullapur-Kurukshetra- I	51.65	400	ACSR	Tripple	85	1385.6	1385.6	1385.6	1623
Kurukshetra- Sonepat I	124.66	400	ACSR	Tripple		2078.4	1385.6	1385.6	1623
Abdullapur-Kurukshetra- II	51.65	400	ACSR	Tripple	85	1385.6	1385.6	1385.6	1623
Kurukshetra- Sonepat I	124.66	400	ACSR	Tripple		2078.4	1385.6	1385.6	1623
Abdullapur-Panchkula- I	63	400	ACSR	Tripple	85	1385.6	1385.6	1385.6	1623
Abdullapur-Panchkula- II	63	400	ACSR	Tripple	85	1385.6	1385.6	1385.6	1623
Nalagarh-Parbati PS	47.264	400	ACSR Moose	Quad	85	1385.6	2182.32	1385.6	2211
400kV Kurukshetra- Jalandhar	267	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
Gooty - Raichur-I (PG)	128.7	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
Raichur (PG) - Raichur-I	22.219	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
Gooty - Raichur-II (PG)	128.7	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
Raichur (PG) - Raichur-II	22.219	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
Nellore - Nellore PS I	3.65	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
Nellore - Nellore PS II	3.65	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
Nellore PS - SEPL	3.83	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
Nellore PS - MEPL	3.85	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
Neylore PS - Gooty I	289.004	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
Neylore PS - Gooty Ii	289.004	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
Neylore PS - TPCIL I	32.488	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
Neylore PS - TPCIL II	32.73	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
Kurnool - Nannoor (Kurnool) I	9.881	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
Kurnool - Nannoor (Kurnool) II	9.881	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
Nellore - Tiruvellum-I	172.964	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
Nellore - Tiruvellum-II	172.964	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
Nellore PS - NCC I	33.58	400	ACSR Moose	Quad		2078.4	2078.4	2078.4	2211
Nellore PS - NCC II	33.58	400	ACSR Moose	Quad		2078.4	2078.4	2078.4	2211
Thirunelveli - Kudankulam I	72.489	400	ACSR Moose	Quad	85	2182.32	2182.32	2182.32	2211
Tuticorin PS - Madurai I	94.924	400	ACSR Moose	Quad	85	2182.32	2182.32	2182.32	2211
Tuticorin PS - Madurai II	94.924	400	ACSR Moose	Quad	85	2182.32	2182.32	2182.32	2211

S. No.	Name of the Transmission Line	Length in Ckt KM	Voltage Level in kV	Type of Conductor	Configura t ion	Temp Deg C	End-1Rating (MVA)	End-2 Rating (MVA)	Line rating (MVA)	Line rating as per CEA Tx Planning Criteria (MVA)
94	Kochi - Trichur I	78.197	400	ACSR Moose	Quad	85	2182.32	2182.32	2182.32	2211
95	Kochi - Trichur II	78.197	400	ACSR Moose	Quad	85	2182.32	2182.32	2182.32	2211
97	Tiruvelam - Chitoor II	21.022	400	ACSR Moose	Quad	85	2182.32	1385.6	1385.6	2211
100	Jeypore - Gazuwaka-I	220	400	AAAC	Twin	75	1385.6	1385.6	1385.6	874
101	Jeypore - Gazuwaka-II	220	400	AAAC	Twin	75	1385.6	1385.6	1385.6	874
106	Narendra - Kudgi I	176.13	400	Zebra	Quad	85	2078.4	2182.32	2078.4	1948
107	Narendra - Kudgi II	176.13	400	Zebra	Quad	85	2078.4	2182.32	2078.4	1948
108	Aurangabad(PG) - Aurangabad I	52.563	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
109	Aurangabad(PG) - Aurangabad II	52.563	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
110	Wardha - Parli I	336.939	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
111	Wardha - Parli II	336.939	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
120	Jabalpur - Itarsi-I	232	400	ACKC	Twin	75	1385.6	1385.6	1385.6	874
121	Jabalpur - Itarsi-II	232	400	ACKC	Twin	75	1385.6	1385.6	1385.6	874
122	Seoni - Khandwa-I	351.729	400	AAAC	Quad	75	2182.32	2182.32	2182.32	1680
123	Seoni - Khandwa-II	351.729	400	AAAC	Quad	75	2182.32	2182.32	2182.32	1680
128	Indore - Indore II (MP)	49.73	400	ACSR Moose	Quad	85	2182.32	2182.32	2182.32	2211
129	Indore - Indore I (MP)	49.73	400	ACSR Moose	Quad	85	2182.32	2182.32	2182.32	2211
132	Jabalpur PS - Jabalpur I	15.456	400	ACSR Moose	Quad	85	2182.32	2182.32	2182.32	2211
133	Jabalpur PS - Jabalpur II	15.456	400	ACSR Moose	Quad	85	2182.32	2182.32	2182.32	2211
134	Pirana - Vadodara I	131.549	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
136	Pirana - Vadodara II	131.549	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
142	Ballia-Biharshariff I	241.79	400	ACSR	Quad	85	2078.4	2078.4	2078.4	2211
143	Ballia-Biharshariff II	241.79	400	ACSR	Quad	85	2078.4	1385.6	1385.6	2211
144	Patna-Ballia I	195.323	400	ACSR	Quad	85	2078.4	2078.4	2078.4	2211
145	Patna-Ballia II	195.323	400	ACSR	Quad	85	2078.4	2078.4	2078.4	2211
148	Patna-Ballia III	185	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
149	Patna-Ballia IV	185	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
150	Biharshariff - Sasaram III (now purnea-I)	324.185	400	ACSR Moose	Quad	85	1385.6	1385.6	1385.6	2211
151	Biharshariff - Sasaram IV(now purnea-II)	324.185	400	ACSR Moose	Quad	85	1385.6	1385.6	1385.6	2211
158	Ranchi (New) - Ranchi I	78.617	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
159	Ranchi (New) - Ranchi II	78.617	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
160	Ranchi (New) - Ranchi III	78.542	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
161	Ranchi (New) - Ranchi IV	78.542	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
162	Patna-Kishanganj I	346.72	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
163	Patna-Kishanganj II	346.72	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
166	New Ranchi - Chandwa I	68	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
168	New Ranchi - Chandwa II	68	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
172	New Purnea - New Siliguri I	168	400	HTLS	Twin	75	2078.4	2078.4	2078.4	1748
173	New Purnea - New Siliguri II	168	400	HTLS	Twin	75	2078.4	2078.4	2078.4	1748
174	Newpurnea - Kishanganj-I (LILO portion)		400	ACSR Moose	Quad		1385.6	2078.4	1385.6	2211
176	Newpurnea - Kishanganj-II (LILO portion)		400	ACSR Moose	Quad		1385.6	2078.4	1385.6	2211
78	Durgapur-Maithon I	70.77	400	ACSR	Twin	85	1385.6	1385.6	1385.6	1106
79	Durgapur-Maithon II	70.77	400	ACSR	Twin	85	1385.6	1385.6	1385.6	1106
82	Balipara- Bongaingaon III	309	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211
83	Balipara- Bongaingaon IV	309	400	ACSR Moose	Quad	85	2078.4	2078.4	2078.4	2211

Note : Sl.Nos. in this document are as per Annexure to letter received from POWERGRID on 18.04.18

Annexure - III

400 kV Transmission lines with need for review considering variation in ambient temperature

Sl.No.	Line	Thermal rating as per limitations on terminal equipment	Thermal rating as per CEA's Manual on Tx Planning criteria (45^0C ambient temperature)
1	400 kV Hissar - Kaithal I	1386	1270
2	400 kV Hissar - Kaithal II	1386	1270
3	400 kV Kaithal - Patiala I	1386	1270
4	400 kV Kaithal - Patiala II	1386	1270
5	400 kV Nalagarh - Patiala I	1386	1270
6	400 kV Nalagarh - Patiala II	1386	1270
7	400 kV Bahadurgarh - Sonepat I	1386	1270
8	400 kV Bahadurgarh - Sonepat II	1386	1270
9	400 kV Jeypore - Gazuwaka I	1386	874
10	400 kV Jeypore - Gazuwaka II	1386	874
11	400 kV Narendra - Kudugi I	2078	1948
12	400 kV Narendra - Kudugi II	2078	1948
13	400 kV Jabalpur - Itarsi I	1386	874
14	400 kV Jabalpur - Itarsi II	1386	874
15	400 kV Seoni - Khandwa I	2182	1680
16	400 kV Seoni - Khandwa II	2182	1680
17	400 kV New Purnea - New Siliguri I	2078	1748
18	400 kV New Purnea - New Siliguri II	2078	1748
19	400 kV Durgapur-Maithon I	1386	1106
20	400 kV Durgapur-Maithon II	1386	1106

Annexure-VIII

TERMINAL EQUIPMENT DETAILS FOR HIGH CAPACITY 400kV LINES

S. No.		Name of the Transmission Line	Length in Ckt KM	Voltage Level in kV	Type of Conductor	Configuration	Temp Deg C	One End (Current Rating)	One and half Breaker scheme			DMT Scheme	Double main Scheme	Remote End (Current Rating)	One and half Breaker scheme			DMT Scheme	Double main Scheme
									Line Bay Equipments	Main bay equipments	Tie bay equipments	All equipments	All equipments		Line Bay Equipments	Main bay equipments	Tie bay equipments	All equipments	All equipments
1	NR-I	B'Garh-Navada (Upto LILO point)	12.55	400	Bersimis	Quad	75	Isolators	3150	3150	2000			Isolators					
								CT		3000	3000			CT					
								Breakers		3150	3150			Breakers					
								Wave Traps	3150	-	-			Wave Traps					
2	NR-I	Dadri-M. Bagh	54.36	400	Bersimis	Quad	75	Isolators						Isolators					4000
								CT						CT					3000
								Breakers						Breakers					4000
								Wave Traps						Wave Traps					3150
3	NR-I	Ballabhgarh-M. Bagh	60.68	400	Bersimis	Quad	75	Isolators	2000	2000	2000			Isolators					4000
								CT		2000	2000			CT					3000
								Breakers		3150	3150			Breakers					4000
								Wave Traps	3150	-	-			Wave Traps					3150
4	NR-I	Mandola-Dadri-1	46.3	400	Bersimis	Quad	75	Isolators	3150	2000	2000			Isolators					
								CT		2000	2000			CT					
								Breakers		3150	3150			Breakers					
								Wave Traps	2000					Wave Traps					
5	NR-I	Mandola-Dadri-2	46.3	400	Bersimis	Quad	75	Isolators	3150	2000	2000			Isolators					
								CT		2000	2000			CT					
								Breakers		3150	3150			Breakers					
								Wave Traps	2000					Wave Traps					
6	NR-III	Lucknow(Old)-Lucknow(New)-I	2.862	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators	3150A	3150A	3150A		
								Current Transformers	NA	3000	3000			Current Transformers	NA	3000A	3000A		
								Breakers		3150	3150			Breakers	NA	3150A	3150A		
								Wave Traps	3150	NA	NA			Wave Traps	3150A	NA	NA		
7	NR-III	Lucknow(Old)-Lucknow(New)-II	2.862	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators	3150A	3150A	3150A		
								Current Transformers	NA	3000	3000			Current Transformers	NA	3000A	3000A		
								Breakers		3150	3150			Breakers	NA	3150A	3150A		
								Wave Traps	3150	NA	NA			Wave Traps	3150A	NA	NA		
8	NR-I	Gurgaon-Manesar-1	16.9	400	ACSR Moose	Quad	85	Isolators					3150	Isolators					3150
								CT					3000	CT					3000
								Breakers					3150	Breakers					3150
								Wave Traps					3150	Wave Traps					3150
9	NR-I	Gurgaon-Manesar-2	16.9	400	ACSR Moose	Quad	85	Isolators					3150	Isolators					3150
								CT					3000	CT					3000
								Breakers					3150	Breakers					3150
								Wave Traps					3150	Wave Traps					3150
10	NR-I	Jhatikara-Bamnauli-1	6.106	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators					
								CT		3000	3000			CT					
								Breakers		3150	3150			Breakers					
								Wave Traps	3150	-	-			Wave Traps					
11	NR-I	Jhatikara-Bamnauli-2	6.106	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators					
								CT		3000	3000			CT					
								Breakers		3150	3150			Breakers					
								Wave Traps	3150	-	-			Wave Traps					
12	NR-I	Jhatikara-Mundka-1	6.782	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators					
								CT		3000	3000			CT					
								Breakers		3150	3150			Breakers					
								Wave Traps	3150	-	-			Wave Traps					
13	NR-I	Jhatikara-Mundka-2	6.782	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators					
								CT		3000	3000			CT					
								Breakers		3150	3150			Breakers					
								Wave Traps	3150	-	-			Wave Traps					
14	NR-I/ NR-3	Sikar-Agra-1	386	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators	3150	3150	3150		
								CT		3000	3000			CT		3000	3000		
								Breakers		3150	3150			Breakers		3150	3150		
								Wave Traps	3150	-	-			Wave Traps	3150	-	-		
15	NR-I/ NR-3	Sikar-Agra-2	386	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators	3150	3150	3150		
								CT		3000	3000			CT		3000	3000		
								Breakers		3150	3150			Breakers		3150	3150		
								Wave Traps	3150	-	-			Wave Traps	3150	-	-		
16	NR-I	Bassi-Jaipur(RVPNL) I	47.3	400	ACSR Moose	Quad	85	Isolators	3150	3000	3150			Isolators					
								CT		3150	3000			CT					
								Breakers		3150	3150			Breakers					
								Wave Traps	3150					Wave Traps					
17	NR-I	Bassi-Jaipur(RVPNL) I	47.3	400	ACSR Moose	Quad	85	Isolators	3150	3000	3150			Isolators					
								CT		3150	3000			CT					
								Breakers		3150	3150			Breakers					
								Wave Traps	3150					Wave Traps					

18	NR-3	Bareilly (New) - Bareilly (Old) I	1.7	400	ACSR Moose	Quad	85	Isolators	3150A	3150A	3150A			Isolators	3150A	3150A	3150A		
								CT	NA	3000A	3000A			CT	NA	3000A	3000A		
								Breakers	NA	3150A	3150A			Breakers	NA	3150A	3150A		
								Wave Traps	3150A	NA	NA			Wave Traps	3150A	NA	NA		
19	NR-3	Bareilly (New) - Bareilly (Old) I	1.7	400	ACSR Moose	Quad	85	Isolators	3150A	3150A	3150A			Isolators	3150A	3150A	3150A		
								CT	NA	3000A	3000A			CT	NA	3000A	3000A		
								Breakers	NA	3150A	3150A			Breakers	NA	3150A	3150A		
								Wave Traps	3150A	NA	NA			Wave Traps	3150A	NA	NA		
20	NR-3/NR-I	Bareily Kashipur-I	101.23	400	ACSR Moose	Quad	85	Isolators	3150 A	3150 A	3150 A			Isolators					
								CT		3000 A	3000 A			CT					
								Breakers		3150 A	3150 A			Breakers					
								Wave Traps	3150 A					Wave Traps					
21	NR-3/NR-I	Bareily Kashipur-II	101.23	400	ACSR Moose	Quad	85	Isolators	3150 A	3150 A	3150 A			Isolators					
								CT		3000 A	3000 A			CT					
								Breakers		3150 A	3150 A			Breakers					
								Wave Traps	3150 A					Wave Traps					
22	NR-3/WR-II	Rihand III - Vindhyachal PS I	30.702	400	ACSR Moose	Quad	85	Isolators						Isolators	3150A	3150A	3150A		
								CT						CT	NA	3000A	3000A		
								Breakers						Breakers	NA	3150A	3150A		
								Wave Traps						Wave Traps	3150A	NA	NA		
23	NR-3/WR-II	Rihand III - Vindhyachal PS II	31.159	400	ACSR Moose	Quad	85	Isolators						Isolators	3150A	3150A	3150A		
								CT						CT	NA	3000A	3000A		
								Breakers						Breakers	NA	3150A	3150A		
								Wave Traps						Wave Traps	3150A	NA	NA		
24	NR-I	Roorkee-Kashipur-1	150.832	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators					
								CT		3000	3000			CT					
								Breakers		3150	3150			Breakers					
								Wave Traps	3150	-	-			Wave Traps					
25	NR-I	Roorkee-Kashipur-2	150.832	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators					
								CT		3000	3000			CT					
								Breakers		3150	3150			Breakers					
								Wave Traps	3150	-	-			Wave Traps					
26	NR-I	Roorkee-Saharanpur-I	36.535	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators	3150	3150	3150		
								CT		3000	3000			CT		3000	3000		
								Breakers		3150	3150			Breakers		3150	3150		
								Wave Traps	3150	-	-			Wave Traps	3150	-	-		
27	NR-I	Roorkee-Saharanpur-II	36.535	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators	3150	3150	3150		
								CT		3000	3000			CT		3000	3000		
								Breakers		3150	3150			Breakers		3150	3150		
								Wave Traps	3150	-	-			Wave Traps	3150	-	-		
28	NR-3/ER-I	Varanasi-Sarnath I	107.577	400	ACSR Moose	Quad	85	Isolators	NA	3150A	3150A			Isolators	NA	3150A	3150A		
								CT	NA	3150A	3150A			CT	NA	3150A	3150A		
								Breakers	NA	3150A	3150A			Breakers	NA	3150A	3150A		
								Wave Traps	3150A	NA	NA			Wave Traps	3150A	NA	NA		
29	NR-3/ER-I	Varanasi-Sarnath II	107.577	400	ACSR Moose	Quad	85	Isolators	NA	3150A	3150A			Isolators	NA	3150A	3150A		
								CT	NA	3150A	3150A			CT	NA	3150A	3150A		
								Breakers	NA	3150A	3150A			Breakers	NA	3150A	3150A		
								Wave Traps	3150A	NA	NA			Wave Traps	3150A	NA	NA		
30	NR-3	Kanpur-Kanpur GIS I	21.233	400	ACSR Moose	Quad	85	Isolators	3150A	3150A	3150A			Isolators					3150
								CT	NA	3000A	3000A			CT					3000
								Breakers	NA	3150A	3150A			Breakers					3150
								Wave Traps	3150A	NA	NA			Wave Traps					3150
31	NR-3	Kanpur-Kanpur GIS II	21.233	400	ACSR Moose	Quad	85	Isolators	3150A	3150A	3150A			Isolators					3150
								CT	NA	3000A	3000A			CT					3000
								Breakers	NA	3150A	3150A			Breakers					3150
								Wave Traps	3150A	NA	NA			Wave Traps					3150
32	NR-1/NR-II	Abdullapur-Bawana-I	166.64	400	ACSR Snowbird	Tripple	75	Isolators	2000	2000	2000			Isolators					
								CT	N.A	2000	2000			CT					
								Breakers	N.A	2000	3150			Breakers					
								Wave Traps	2000	--	--			Wave Traps					
33	NR-II	Abdullapur - Depalpur (upto LILO point)	140.547	400	ACSR Snowbird	Tripple	75	Isolators	2000	2000	2000			Isolators					
								CT	N.A	2000	2000			CT					
								Breakers	N.A	2000	2000			Breakers					
								Wave Traps	2000	--	--			Wave Traps					
34	NR-1	Depalpur - Bawana (upto LILO point)	26.095	400	ACSR Snowbird	Tripple	75	Isolators	3000	3000	3000			Isolators					
								CT	N.A	3000	3000			CT					
								Breakers	N.A	3150	3150			Breakers					
								Wave Traps	0	--	--			Wave Traps					
35	NR-1	Hissar-Kaithal I	113.12	400	ACSR Snowbird	Tripple	75	Isolators	2000	2000	2000			Isolators	2000	2000	2000		
								CT		2000	2000			CT		2000	2000		
								Breakers		2000	3150			Breakers		2000	2000		
								Wave Traps	2000					Wave Traps	2000				
36	NR-1	Hissar-Kaithal I	113.12	400	ACSR Snowbird	Tripple	75	Isolators	2000	2000	2000			Isolators	2000	2000	2000		
								CT		2000	2000			CT		2000	2000		
								Breakers		2000	3150			Breakers		2000	2000		
								Wave Traps	2000					Wave Traps	2000				

37	NR-1/NR-II	Kaithal- Patiala I	126	400	ACSR Snowbird	Tripple	75	Isolators	3150A	3150A	3150A			Isolators	3150A	3150A	3150A		
								CT	N.A	3000A	3000A			CT	N.A	3000A	3000A		
								Breakers	N.A	3150A	3150A			Breakers	N.A	3150A	3150A		
								Wave Traps	2000A	N.A	N.A			Wave Traps	2000A	N.A	N.A		
38	NR-1/NR-II	Kaithal- Patiala II	126	400	ACSR Snowbird	Tripple	75	Isolators	3150A	3150A	3150A			Isolators	3150A	3150A	3150A		
								CT	N.A	3000A	3000A			CT	N.A	3000A	3000A		
								Breakers	N.A	3150A	3150A			Breakers	N.A	3150A	3150A		
								Wave Traps	2000A	N.A	N.A			Wave Traps	2000A	N.A	N.A		
39	NR-II	Nalagarh- Patiala I	93.78	400	ACSR Snowbird	Tripple	75	Isolators	2000	2000	2000			Isolators	2000	2000	2000		
								CT	N.A	2000	2000			CT	N.A	2000	2000		
								Breakers	N.A	2000	2000			Breakers	3150A	3150A	3150A		
								Wave Traps	2000					Wave Traps	2000				
40	NR-II	Nalagarh- Patiala II	93.78	400	ACSR Snowbird	Tripple	75	Isolators	2000	2000	2000			Isolators	2000	2000	2000		
								CT	N.A	2000	2000			CT	N.A	2000	2000		
								Breakers	N.A	2000	2000			Breakers	3150A	3150A	3150A		
								Wave Traps	2000	N.A	N.A			Wave Traps	2000	N.A	N.A		
41	NR-II	Nalagarh- Rampur I	126.481	400	ACSR Snowbird	Tripple	75	Isolators	2000	2000	2000			Isolators					
								CT	N.A	2000	2000			CT					
								Breakers	N.A	2000	2000			Breakers					
								Wave Traps	2000					Wave Traps					
42	NR-II	Nalagarh- Rampur II	126.481	400	ACSR Snowbird	Tripple	75	Isolators	2000	2000	2000			Isolators					
								CT	N.A	2000	2000			CT					
								Breakers	N.A	2000	2000			Breakers					
								Wave Traps	2000					Wave Traps					
43	NR-I/NR-II	Bahadurgah- Sonepat I	53.4	400	ACSR Snowbird	Tripple	75	Isolators	3150A	3150A	3150A			Isolators	2000	2000	2000		
								CT		2000	2000			CT		2000	2000		
								Breakers		3150A	3150A			Breakers		2000	2000		
								Wave Traps						Wave Traps	2000				
44	NR-I/NR-II	Bahadurgah- Sonepat II	53.4	400	ACSR Snowbird	Tripple	75	Isolators	3150A	3150A	3150A			Isolators	2000	2000	2000		
								CT		2000	2000			CT		2000	2000		
								Breakers		3150A	3150A			Breakers		2000	2000		
								Wave Traps						Wave Traps	2000				
45	NR-I	Baghpat-Kaithal-2	153.672	400	ACSR Moose	Quad	85	Isolators	3150A	3150A	3150A			Isolators	3150A	3150A	3150A		
								CT	N.A	3000A	3000A			CT	N.A	3000A	3000A		
								Breakers	N.A	3150A	3150A			Breakers	N.A	3150A	3150A		
								Wave Traps	3150A	N.A	N.A			Wave Traps	3150A	N.A	N.A		
46	NR-I	Baghpat-Kaithal-2	153.672	400	ACSR Moose	Quad	85	Isolators	3150A	3150A	3150A			Isolators	3150A	3150A	3150A		
								CT	N.A	3000A	3000A			CT	N.A	3000A	3000A		
								Breakers	N.A	3150A	3150A			Breakers	N.A	3150A	3150A		
								Wave Traps	3150A	N.A	N.A			Wave Traps	3150A	N.A	N.A		
47	NR-I	Merrut-Baghpat-1	70.976	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators					3150
								CT		3000	3000			CT					3000
								Breakers		3150	3150			Breakers					3150
								Wave Traps	3150	-	-			Wave Traps					3150
48	NR-I	Merrut-Baghpat-2	70.976	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators					3150
								CT		3000	3000			CT					3000
								Breakers		3150	3150			Breakers					3150
								Wave Traps	3150	-	-			Wave Traps					3150
49	NR-II	Abdullapur-Kurukshetra- I	51.65	400	ACSR Snowbird	Tripple	85	Isolators	2000	3150	3150			Isolators	2000	3150	3150		
								CT	N.A	3000	3000			CT	N.A	3000	3000		
								Breakers	N.A	3150	3150			Breakers	N.A	3150	3150		
								Wave Traps	2000	N.A	N.A			Wave Traps	3150	N.A	N.A		
50	NR-II	Kurukshetra- Sonepat I	124.66	400	ACSR Snowbird	Tripple		Isolators	3150A	3150A	3150A			Isolators	2000	2000	2000		
								CT	NA	3000A	3000A			CT		2000	2000		
								Breakers	NA	3150A	3150A			Breakers		2000	2000		
								Wave Traps	3150A	NA	NA			Wave Traps	2000				
51	NR-II	Abdullapur-Kurukshetra- II	51.65	400	ACSR Snowbird	Tripple	85	Isolators	2000	3150	3150			Isolators	2000	3150	3150		
								CT	N.A	3000	3000			CT	N.A	3000	3000		
								Breakers	N.A	3150	3150			Breakers	N.A	3150	3150		
								Wave Traps	2000	N.A	N.A			Wave Traps	3150	N.A	N.A		
52	NR-II	Kurukshetra- Sonepat I	124.66	400	ACSR Snowbird	Tripple		Isolators	3150A	3150A	3150A			Isolators	2000	2000	2000		
								CT	NA	3000A	3000A			CT		2000	2000		
								Breakers	NA	3150A	3150A			Breakers		2000	2000		
								Wave Traps	3150A	NA	NA			Wave Traps	2000				
53	NR-II	Abdullapur-Panchkula- I	63	400	ACSR Snowbird	Tripple	85	Isolators	2000	2000	2000			Isolators	2000	2000	2000		
								CT	N.A	2000	2000			CT	N.A	2000	2000		
								Breakers	N.A	2000	2000			Breakers	N.A	2000	2000		
								Wave Traps	2000	N.A	N.A			Wave Traps	2000	N.A	N.A		
54	NR-II	Abdullapur-Panchkula- II	63	400	ACSR Snowbird	Tripple	85	Isolators	2000	2000	2000			Isolators	2000	2000	2000		
								CT	N.A	2000	2000			CT	N.A	2000	2000		
								Breakers	N.A	2000	2000			Breakers	N.A	2000	2000		
								Wave Traps	2000	N.A	N.A			Wave Traps	2000	N.A	N.A		
55	NR-II	Panchkula-Naptha Jhakri I	165	400	ACSR Snowbird	Tripple	85	Isolators	2000	2000	2000			Isolators					
								CT	N.A	2000	2000			CT					
								Breakers	N.A	2000	2000			Breakers					
								Wave Traps	2000	N.A	N.A			Wave Traps					

56	NR-II	Panchkula-Naptha Jhakri II	165	400	ACSR Snowbird	Tripple	85	Isolators	2000	2000	2000			Isolators					
								CT	N.A	2000	2000			CT					
								Breakers	N.A	2000	2000			Breakers					
								Wave Traps	2000	2000	2000			Wave Traps					
57	NR-II	Nalagarh-Parbati PS	47.264	400	ACSR Moose	Quad	85	Isolators	3150	3150	2000			Isolators					3150
								CT	N.A	3000	2000			CT					3150
								Breakers		3150	2000			Breakers					3150
								Wave Traps	3150					Wave Traps					3150
58	NR-II	Nalagarh-Koldam II	46.381	400	ACSR Moose	Quad	85	Isolators	3150	3150	2000			Isolators					
								CT	N.A	3000	2000			CT					
								Breakers		3150	2000			Breakers					
								Wave Traps	3150					Wave Traps					
59	NR-II	Parbati III-Parbati PS(LILO portion)	3.184	400	ACSR Moose	Quad	85	Isolators						Isolators					3000 A
								CT						CT					420kV, 3000A
								Breakers						Breakers					420kV, 3150A
								Wave Traps						Wave Traps					400kV, 3150A
60	NR-II	Nalagarh-Parbati PS(LILO portion)	0.845	400	ACSR Moose	Quad	85	Isolators						Isolators					3000 A
								CT						CT					420kV, 3000A
								Breakers						Breakers					420kV, 3150A
								Wave Traps						Wave Traps					400kV, 3150A
61	NR-II	Parbati III-Parbati PS(LILO portion)	3.114	400	ACSR Moose	Quad	85	Isolators						Isolators					3000 A
								CT						CT					420kV, 3000A
								Breakers						Breakers					420kV, 3150A
								Wave Traps						Wave Traps					400kV, 3150A
62	NR-II	Parbati PS-Koldam I(LILO portion)	0.884	400	ACSR Moose	Quad	85	Isolators					3000 A	Isolators					
								CT					420kV, 3000A	CT					
								Breakers					420kV, 3150A	Breakers					
								Wave Traps					400kV, 3150A	Wave Traps					
63	NR-II	Parbati II-Parbati PS(LILO portion)	0.886	400	ACSR Moose	Quad	85	Isolators						Isolators					3000 A
								CT						CT					420kV, 3000A
								Breakers						Breakers					420kV, 3150A
								Wave Traps						Wave Traps					400kV, 3150A
64	NR-II	Parbati PS-Koldam II(LILO portion)	0.886	400	ACSR Moose	Quad	85	Isolators					3000 A	Isolators					
								CT					420kV, 3000A	CT					
								Breakers					420kV, 3150A	Breakers					
								Wave Traps					400kV, 3150A	Wave Traps					
65	NR-II	400kV Kurukshetra- Jalandhar	267	400	ACSR Moose	Quad	85	Isolators	3150A	3150A	3150A			Isolators	3150A	3150A	3150A		
								CT	NA	3000A	3000A			CT	NA	3000A	3000A		
								Breakers	NA	3150A	3150A			Breakers	NA	3150A	3150A		
								Wave Traps	3150A	NA	NA			Wave Traps	3150A	NA	NA		
66	NR-II	400kV Kurukshetra- Nakodar	234	400	ACSR Moose	Quad	85	Isolators	3150A	3150A	3150A			Isolators					
								CT	NA	3000A	3000A			CT					
								Breakers	NA	3150A	3150A			Breakers					
								Wave Traps	3150A	NA	NA			Wave Traps					
67	NR-II	400kV Jalandhar- Nakodar	42	400	ACSR Moose	Quad	85	Isolators	3150A	3150A	3150A			Isolators					
								CT	NA	3000A	3000A			CT					
								Breakers	NA	3150A	3150A			Breakers					
								Wave Traps	3150A	NA	NA			Wave Traps					
68	SR-I	Gooty - Raichur-I (PG)	128.7	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators	3150	3150	3150		
								CT	NA	3000	3000			CT	NA	3000	3000		
								Breakers	NA	3150	3150			Breakers	NA	3150	3150		
								Wave Traps	3150	NA	NA			Wave Traps	3150	NA	NA		
69	SR-I	Raichur (PG) - Raichur-I	22.219	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators	3150	3150	3150		
								CT	NA	3000	3000			CT	NA	3000	3000		
								Breakers	NA	3150	3150			Breakers	NA	3150	3150		
								Wave Traps	3150	NA	NA			Wave Traps	3150	NA	NA		

70	SR-I	Gooty - Raichur-II (PG)	128.7	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators	3150	3150	3150		
								CT	NA	3000	3000			CT	NA	3000	3000		
								Breakers	NA	3150	3150			Breakers	NA	3150	3150		
								Wave Traps	3150	NA	NA			Wave Traps	3150	NA	NA		
71	SR-I	Raichur (PG) - Raichur-II	22.219	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators	3150	3150	3150		
								CT	NA	3000	3000			CT	NA	3000	3000		
								Breakers	NA	3150	3150			Breakers	NA	3150	3150		
								Wave Traps	3150	NA	NA			Wave Traps	3150	NA	NA		
72	SR-I	Nellore - Nellore PS I	3.65	400	ACSR Moose	Quad	85	Isolators	3000A	3000	3000			Isolators	3000A	3000	3000		
								CT	NA	3150	3150			CT	NA	3150	3150		
								Breakers	NA	3150	3150			Breakers	NA	3150	3150		
								Wave Traps	3150	NA	NA			Wave Traps	3150	NA	NA		
73	SR-I	Nellore - Nellore PS II	3.65	400	ACSR Moose	Quad	85	Isolators	3000A	3000	3000			Isolators	3000A	3000	3000		
								CT	NA	3150	3150			CT	NA	3150	3150		
								Breakers	NA	3150	3150			Breakers	NA	3150	3150		
								Wave Traps	3150	NA	NA			Wave Traps	3150	NA	NA		
74	SR-I	Nellore PS - SEPL	3.83	400	ACSR Moose	Quad	85	Isolators	3000A	3000	3000			Isolators	3000A	3000	3000		
								CT	NA	3150	3150			CT	NA	3150	3150		
								Breakers	NA	3150	3150			Breakers	NA	3150	3150		
								Wave Traps	3150	NA	NA			Wave Traps	3150	NA	NA		
75	SR-I	Nellore PS - MEPL	3.85	400	ACSR Moose	Quad	85	Isolators	3000A	3000	3000			Isolators	3000A	3000	3000		
								CT	NA	3150	3150			CT	NA	3150	3150		
								Breakers	NA	3150	3150			Breakers	NA	3150	3150		
								Wave Traps	3150	NA	NA			Wave Traps	3150	NA	NA		
76	SR-I	Neylore PS - Gooty I	289.004	400	ACSR Moose	Quad	85	Isolators	3000A	3000	3000			Isolators	3000A	3000	3000		
								CT	NA	3150	3150			CT	NA	3150	3150		
								Breakers	NA	3150	3150			Breakers	NA	3150	3150		
								Wave Traps	3150	NA	NA			Wave Traps	3150	NA	NA		
77	SR-I	Neylore PS - Gooty Ii	289.004	400	ACSR Moose	Quad	85	Isolators	3000A	3000	3000			Isolators	3000A	3000	3000		
								CT	NA	3150	3150			CT	NA	3150	3150		
								Breakers	NA	3150	3150			Breakers	NA	3150	3150		
								Wave Traps	3150	NA	NA			Wave Traps	3150	NA	NA		
78	SR-I	Neylore PS - TPCIL I	32.488	400	ACSR Moose	Quad	85	Isolators	3000A	3000	3000			Isolators	3000A	3000	3000		
								CT	NA	3150	3150			CT	NA	3150	3150		
								Breakers	NA	3150	3150			Breakers	NA	3150	3150		
								Wave Traps	3150	NA	NA			Wave Traps	3150	NA	NA		
79	SR-I	Neylore PS - TPCIL II	32.73	400	ACSR Moose	Quad	85	Isolators	3000A	3000	3000			Isolators	3000A	3000	3000		
								CT	NA	3150	3150			CT	NA	3150	3150		
								Breakers	NA	3150	3150			Breakers	NA	3150	3150		
								Wave Traps	3150	NA	NA			Wave Traps	3150	NA	NA		
80	SR-I	Kurnool - Nannoor (Kurnool) I	9.881	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators	3150	3150	3150		
								CT	NA	3000	3000			CT	NA	3000	3000		
								Breakers	NA	3150	3150			Breakers	NA	3150	3150		
								Wave Traps	3150	NA	NA			Wave Traps	3150	NA	NA		
81	SR-I	Kurnool - Nannoor (Kurnool) II	9.881	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators	3150	3150	3150		
								CT	NA	3000	3000			CT	NA	3000	3000		
								Breakers	NA	3150	3150			Breakers	NA	3150	3150		
								Wave Traps	3150	NA	NA			Wave Traps	3150	NA	NA		
82	SR-I	Nellore - Tiruvellum-I	172.964	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators	3150	3150	3150		
								CT	NA	3000	3000			CT	NA	3000	3000		
								Breakers	NA	3150	3150			Breakers	NA	3150	3150		
								Wave Traps	3150	NA	NA			Wave Traps	3150	NA	NA		
83	SR-I	Nellore - Tiruvellum-II	172.964	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators	3150	3150	3150		
								CT	NA	3000	3000			CT	NA	3000	3000		
								Breakers	NA	3150	3150			Breakers	NA	3150	3150		
								Wave Traps	3150	NA	NA			Wave Traps	3150	NA	NA		
84	SR-I	Nellore PS - NCC I	33.58	400	ACSR Moose	Quad		Isolators	3150	3150	3150			Isolators	3150	3150	3150		
								CT	NA	3000	3000			CT	NA	3000	3000		
								Breakers	NA	3150	3150			Breakers	NA	3150	3150		
								Wave Traps	3150	NA	NA			Wave Traps	3150	NA	NA		
85	SR-I	Nellore PS - NCC II	33.58	400	ACSR Moose	Quad		Isolators	3150	3150	3150			Isolators	3150	3150	3150		
								CT	NA	3000	3000			CT	NA	3000	3000		
								Breakers	NA	3150	3150			Breakers	NA	3150	3150		
								Wave Traps	3150	NA	NA			Wave Traps	3150	NA	NA		
86	SR-II	Thirunelveli - Kudankulam I	72.489	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators	3150	3150	3150		
								CT	NA	3150	3150			CT					
								Breakers	NA	3150	3150			Breakers					
								Wave Traps	3150	NA	NA			Wave Traps					
87	SR-II	Thirunelveli - Kudankulam II	72.489	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators					
								CT	NA	3150	3150			CT					
								Breakers	NA	3150	3150			Breakers					
								Wave Traps	3150	NA	NA			Wave Traps					
88	SR-II	Thirunelveli - Kudankulam III	79.534	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators					
								CT	NA	3150	3150			CT					
								Breakers	NA	3150	3150			Breakers					
								Wave Traps	3150	NA	NA			Wave Traps					

89	SR-II	Thirunelveli - Kudankulam IV	79.534	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators						
								CT	NA	3150	3150			CT						
								Breakers	NA	3150	3150			Breakers						
								Wave Traps	3150	NA	NA			Wave Traps						
90	SR-II	Tuticorin PS - Madurai I	94.924	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators	3150	3150	3150			
								CT	NA	3150	3150			CT	NA	3150	3150			
								Breakers	NA	3150	3150			Breakers	NA	3150	3150			
								Wave Traps	3150	NA	NA			Wave Traps	3150	NA	NA			
91	SR-II	Coastal Energen - Tuticorin PS	36.003	400	ACSR Moose	Quad	85	Isolators						Isolators	3150	3150	3150			
								CT						CT	NA	3150	3150			
								Breakers						Breakers	NA	3150	3150			
								Wave Traps						Wave Traps	3150	NA	NA			
92	SR-II	Tuticorin TPS - Tuticorin PS	61.586	400	ACSR Moose	Quad	85	Isolators						Isolators	3150	3150	3150			
								CT						CT	NA	3150	3150			
								Breakers						Breakers	NA	3150	3150			
								Wave Traps						Wave Traps	3150	NA	NA			
93	SR-II	Tuticorin PS - Madurai II	94.924	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators	3150	3150	3150			
								CT	NA	3150	3150			CT	NA	3150	3150			
								Breakers	NA	3150	3150			Breakers	NA	3150	3150			
								Wave Traps	3150	NA	NA			Wave Traps	3150	NA	NA			
94	SR-II	Kochi - Trichur I	78.197	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators	3150	3150	3150			
								CT	NA	3150	3150			CT	NA	3150	3150			
								Breakers	NA	3150	3150			Breakers	NA	3150	3150			
								Wave Traps	4000	NA	NA			Wave Traps	3150	NA	NA			
95	SR-II	Kochi - Trichur II	78.197	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators	3150	3150	3150			
								CT	NA	3150	3150			CT	NA	3150	3150			
								Breakers	NA	3150	3150			Breakers	NA	3150	3150			
								Wave Traps	4000	NA	NA			Wave Traps	3150	NA	NA			
96	SR-II	Tiruvelam - Chitoor I	21.022	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators						
								CT	NA	3150	3150			CT						
								Breakers	NA	3150	3150			Breakers						
								Wave Traps	3150	NA	NA			Wave Traps						
97	SR-II	Tiruvelam - Chitoor II	21.022	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators						
								CT	NA	3150	3150			CT						
								Breakers	NA	3150	3150			Breakers						
								Wave Traps	3150	NA	NA			Wave Traps	2000	NA	NA			
98	SR-I	Ramagundam - Malakaram (upto LILO point)	166.212	400	AAAC	Twin	75	Isolators						Isolators						
								CT						CT						
								Breakers						Breakers						
								Wave Traps						Wave Traps						
99	SR-I	Malakaram - Hyderabad-II (upto LILO point)	27.87	400	AAAC	Twin	75	Isolators						Isolators	2000	2000	2000			
								CT						CT		2000	2000			
								Breakers						Breakers		2000	2000			
								Wave Traps						Wave Traps	2000	2000	2000			
100	Odisha/SR-I	Jeypore - Gazuwaka-I	220	400	AAAC	Twin	75	Isolators	2000	2000	2000			Isolators	2000	2000	2000			
								CT		2000	2000			CT		2000	2000			
								Breakers		2000	3150			Breakers		2000	2000			
								Wave Traps	2000					Wave Traps	2000					
101	Odisha/SR-I	Jeypore - Gazuwaka-II	220	400	AAAC	Twin	75	Isolators	2000	2000	2000			Isolators	2000	2000	2000			
								CT		2000	2000			CT		2000	2000			
								Breakers		2000	2000			Breakers		2000	2000			
								Wave Traps	2000					Wave Traps	2000					
102	SR-II	Kolar - Hoody-I	51.067	400	Bersimis	Quad	75	Isolators						Isolators				3150		
								CT						CT				3150		
								Breakers						Breakers				3150		
								Wave Traps						Wave Traps				3150		
103	SR-II	Kolar - Hoody-II	51.067	400	Bersimis	Quad	75	Isolators						Isolators				3150		
								CT						CT				3150		
								Breakers						Breakers				3150		
								Wave Traps						Wave Traps				3150		
104	SR-II	Kaiga - Narendra-I	107.662	400	AAAC	Twin	75	Isolators						Isolators	2000	2000	2000			
								CT						CT	NA	2000	2000			
								Breakers						Breakers	NA	2000	2000			
								Wave Traps						Wave Traps	2000	NA	NA			
105	SR-II	Kaiga - Narendra-II	107.662	400	AAAC	Twin	75	Isolators						Isolators	2000	2000	2000			
								CT						CT	NA	2000	2000			
								Breakers						Breakers	NA	2000	2000			
								Wave Traps						Wave Traps	2000	NA	NA			
106	SR-II	Narendra - Kudgi I	176.13	400	Zebra	Quad	85	Isolators	3150A	3150A	3150A			Isolators	3150	3150	3150			
								CT	NA	3000A	3000A			CT	NA	3150	3150			
								Breakers	NA	3000A	3000A			Breakers	NA	3150	3150			
								Wave Traps	3150A	NA	NA			Wave Traps	3150	NA	NA			
107	SR-II	Narendra - Kudgi II	176.13	400	Zebra	Quad	85	Isolators	3150A	3150A	3150A			Isolators	3150	3150	3150			
								CT	NA	3000A	3000A			CT	NA	3150	3150			
								Breakers	NA	3000A	3000A			Breakers	NA	3150	3150			
								Wave Traps	3150A	NA	NA			Wave Traps	3150	NA	NA			

108	WR-I	Aurangabad(PG) - Aurangabad I	52.563	400	ACSR Moose	Quad	85	Isolators	3000	3000	3000			Isolators				3000	
								CT	NA	3000	3000			CT				3000	
								Breakers	NA	3150	3150			Breakers				3150	
								Wave Traps	3150	NA	NA			Wave Traps				3150	
109	WR-I	Aurangabad(PG) - Aurangabad II	52.563	400	ACSR Moose	Quad	85	Isolators	3000	3000	3000			Isolators				3000	
								CT	NA	3000	3000			CT				3000	
								Breakers	NA	3150	3150			Breakers				3150	
								Wave Traps	3150	NA	NA			Wave Traps				3150	
110	WR-I	Wardha - Parli I	336.939	400	ACSR Moose	Quad	85	Isolators	3150 A	3150 A	3150 A			Isolators	3150 A	3150 A	3150 A		
								CT	NA	3000 A	3000 A			CT	NA	3000 A	3000 A		
								Breakers	NA	3150 A	3150 A			Breakers	NA	3150 A	3150 A		
								Wave Traps	3000 A	NA	NA			Wave Traps	3000 A	NA	NA		
111	WR-I	Wardha - Parli II	336.939	400	ACSR Moose	Quad	85	Isolators	3150 A	3150 A	3150 A			Isolators	3150 A	3150 A	3150 A		
								CT	NA	3000 A	3000 A			CT	NA	3000 A	3000 A		
								Breakers	NA	3150 A	3150 A			Breakers	NA	3150 A	3150 A		
								Wave Traps	3000 A	NA	NA			Wave Traps	3000 A	NA	NA		
112	WR-I	Mauda - Wardha I	123.841	400	ACSR Moose	Quad	85	Isolators	3150 A	3150 A	3150 A			Isolators					
								CT	NA	3000 A	3000 A			CT					
								Breakers	NA	3150 A	3150 A			Breakers					
								Wave Traps	3000 A	NA	NA			Wave Traps					
113	WR-I	Mauda - Wardha II	123.841	400	ACSR Moose	Quad	85	Isolators	3150 A	3150 A	3150 A			Isolators					
								CT	NA	3000 A	3000 A			CT					
								Breakers	NA	3150 A	3150 A			Breakers					
								Wave Traps	3000 A	NA	NA			Wave Traps					
114	WR-I	Wardha - Raipur I	370.565	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators					
								CT	3000	3000	3000			CT					
								Breakers	-	3150	3150 (2000 not as indicated by AM)			Breakers					
								Wave Traps	3000	-	-			Wave Traps					
115	WR-I	Wardha - Raipur II	370.565	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators					
								CT	3000	3000	3000			CT					
								Breakers	-	3150	3150			Breakers					
								Wave Traps	3000	-	-			Wave Traps					
116	WR-I	Solapur - Solapur I	11.2	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators					
								CT	NA	3150	3150			CT					
								Breakers	3150	3150	3150			Breakers					
								Wave Traps	3150	NA	NA			Wave Traps					
117	WR-I	Solapur - Solapur II	11.2	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators					
								CT	NA	3150	3150			CT					
								Breakers	3150	3150	3150			Breakers					
								Wave Traps	3150	NA	NA			Wave Traps					
118	WR-II	Vindhyachal - Jabalpur-I	360	400	ACKC	Twin	75	Isolators						Isolators	2000A	2000A	2000A		
								CT						CT	-	2000A	2000A		
								Breakers						Breakers	-	2000A	2000A		
								Wave Traps						Wave Traps	2000A	-	-		
119	WR-II	Vindhyachal - Jabalpur-II	360	400	ACKC	Twin	75	Isolators						Isolators	2000A	2000A	2000A		
								CT						CT	-	2000A	2000A		
								Breakers						Breakers	-	2000A	2000A		
								Wave Traps						Wave Traps	2000A	-	-		
120	WR-II	Jabalpur - Itarsi-I	232	400	ACKC	Twin	75	Isolators	2000A	2000A	2000A			Isolators	2000A	2000A	2000A		
								CT	-	2000A	2000A			CT	-	2000A	2000A		
								Breakers	-	2000A	2000A			Breakers	-	2000A	2000A		
								Wave Traps	2000A	-	-			Wave Traps	2000A	-	-		
121	WR-II	Jabalpur - Itarsi-II	232	400	ACKC	Twin	75	Isolators	2000A	2000A	2000A			Isolators	2000A	2000A	2000A		
								CT	-	2000A	2000A			CT	-	2000A	2000A		
								Breakers	-	2000A	2000A			Breakers	-	2000A	2000A		
								Wave Traps	2000A	-	-			Wave Traps	2000A	-	-		
122	WR-I / WR-II	Seoni - Khandwa-I	351.729	400	AAAC	Quad	75	Isolators	3150	3150	3150			Isolators	3150	3150	3150		
								CT	NA	3150	3150			CT	NA	3150	3150		
								Breakers	3150	3150	3150			Breakers	3150	3150	3150		
								Wave Traps	3150	NA	NA			Wave Traps	3150	NA	NA		
123	WR-I / WR-II	Seoni - Khandwa-II	351.729	400	AAAC	Quad	75	Isolators	3150	3150	3150			Isolators	3150	3150	3150		
								CT	NA	3150	3150			CT	NA	3150	3150		
								Breakers	3150	3150	3150			Breakers	3150	3150	3150		
								Wave Traps	3150	NA	NA			Wave Traps	3150	NA	NA		
124	WR-II	Mundra - Bhachau I	99.468	400	ACSR Snowbird	Tripple	85	Isolators						Isolators	3150	3150	3150		
								CT						CT	NA	3000	3000		
								Breakers						Breakers	3150	3150	3150		
								Wave Traps						Wave Traps	3150	NA	NA		
125	WR-II	Mundra - Bhachau II	99.468	400	ACSR Snowbird	Tripple	85	Isolators						Isolators	3150	3150	3150		
								CT						CT	NA	3000	3000		
								Breakers						Breakers	3150	3150	3150		
								Wave Traps						Wave Traps	3150	NA	NA		

126	WR-II	Bachau - Ranchodpura I	282.856	400	ACSR Snowbird	Quad	85	Isolators	3150	3150	3150			Isolators					
								CT	NA	3000	3000			CT					
								Breakers	3150	3150	3150			Breakers					
								Wave Traps	3150	NA	NA			Wave Traps					
127	WR-II	Bachau - Ranchodpura II	282.856	400	ACSR Snowbird	Triplle	85	Isolators	3150	3150	3150			Isolators					
								CT	NA	3000	3000			CT					
								Breakers	3150	3150	3150			Breakers					
								Wave Traps	3150	NA	NA			Wave Traps					
128	WR-II	Indore - Indore II (MP)	49.73	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators				3150	
								CT	NA	3600	3600			CT				3600	
								Breakers	NA	3150	3150			Breakers				3150	
								Wave Traps	3150	NA	NA			Wave Traps				3150	
129	WR-II	Indore - Indore I (MP)	49.73	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators				3150	
								CT	NA	3600	3600			CT				3600	
								Breakers	NA	3150	3150			Breakers				3150	
								Wave Traps	3150	NA	NA			Wave Traps				3150	
130	WR-II	Vindhyachal IV - Vindhyachal PS I	28.55	400	ACSR Moose	Quad	85	Isolators	3150A	3150A	3150A			Isolators					
								CT	NA	3000A	3000A			CT					
								Breakers	NA	3150A	3150A			Breakers					
								Wave Traps	3150A	NA	NA			Wave Traps					
131	WR-II	Vindhyachal IV - Vindhyachal PS II	28.55	400	ACSR Moose	Quad	85	Isolators	3150A	3150A	3150A			Isolators					
								CT	NA	3000A	3000A			CT					
								Breakers	NA	3150A	3150A			Breakers					
								Wave Traps	3150A	NA	NA			Wave Traps					
132	WR-II	Jabalpur PS - Jabalpur I	15.456	400	ACSR Moose	Quad	85	Isolators	3150 Amp	3150 Amp	3150 Amp			Isolators	3150 Amp	3150 Amp	3150 Amp		
								CT		3150 Amp	3150 Amp			CT		3150 Amp	3150 Amp		
								Breakers		3150 Amp	3150 Amp			Breakers		3150 Amp	3150 Amp		
								Wave Traps	3150 Amp					Wave Traps	3150 Amp				
133	WR-II	Jabalpur PS - Jabalpur II	15.456	400	ACSR Moose	Quad	85	Isolators	3150 Amp	3150 Amp	3150 Amp			Isolators	3150 Amp	3150 Amp	3150 Amp		
								CT		3150 Amp	3150 Amp			CT		3150 Amp	3150 Amp		
								Breakers		3150 Amp	3150 Amp			Breakers		3150 Amp	3150 Amp		
								Wave Traps	3150 Amp					Wave Traps	3150 Amp				
134	WR-II	Pirana - Vadodara I	131.549	400	ACSR Moose	Quad	85	Isolators	3150A	3150A	3150A			Isolators					3150
								CT	NA	3000A	3000A			CT					3000
								Breakers	NA	3150A	3150A			Breakers					4000
135	WR-II	Asoj - Vadodara I	11.99	400	ACSR Moose	Quad	85	Isolators						Isolators					3150
								CT						CT					3000
								Breakers						Breakers					4000
136	WR-II	Pirana - Vadodara II	131.549	400	ACSR Moose	Quad	85	Isolators	3150A	3150A	3150A			Isolators					3150
								CT	NA	3000A	3000A			CT					3000
								Breakers	NA	3150A	3150A			Breakers					4000
								Wave Traps	3150A	NA	NA			Wave Traps					3150
137	WR-II	Asoj - Vadodara II	11.99	400	ACSR Moose	Quad	85	Isolators						Isolators					3150
								CT						CT					3000
								Breakers						Breakers					4000
								Wave Traps						Wave Traps					3150
138	WR-II	Jabalpur PS - Annupur I	246.409	400	ACSR Snowbird	Tripple	85	Isolators	3150 Amp	3150 Amp	3150 Amp			Isolators					
								CT		3150 Amp	3150 Amp			CT					
								Breakers		3150 Amp	3150 Amp			Breakers					
								Wave Traps	3150 Amp					Wave Traps					
139	WR-II	Jabalpur PS - Annupur II	246.409	400	ACSR Snowbird	Tripple	85	Isolators	3150 Amp	3150 Amp	3150 Amp			Isolators					
								CT		3150 Amp	3150 Amp			CT					
								Breakers		3150 Amp	3150 Amp			Breakers					
								Wave Traps	3150 Amp					Wave Traps					
140	ER-I	Barh - Patna-I	93.113	400	ACSR Moose	Quad	85	Isolators						Isolators	3150A	3150A	3150A		
								CT						CT		3000A	3000A		
								Breakers						Breakers		3150A	3150A		
								Wave Traps						Wave Traps	3150A				
141	ER-I	Barh - Patna-II	93.113	400	ACSR Moose	Quad	85	Isolators						Isolators	3150A	3150A	3150A		
								CT						CT		3000A	3000A		
								Breakers						Breakers		3150A	3150A		
								Wave Traps						Wave Traps	3150A				
142	ER-I/NR-III	Ballia-Biharshariff I	241.79	400	ACSR	Quad	85	Isolators	3150A	3150A	3150A			Isolators	3150	3150	3150		
								CT		3000A	3000A			CT	3000	3000	3000		
								Breakers		3150A	3150A			Breakers		3150	3150		
								Wave Traps	3150A					Wave Traps	3150				
143	ER-I/NR-III	Ballia-Biharshariff II	241.79	400	ACSR	Quad	85	Isolators	3150A	3150A	3150A			Isolators	3150	3150	2000		
								CT		3000A	3000A			CT	3000	3000	3000		
								Breakers		3150A	3150A			Breakers		3150	2000		
								Wave Traps	3150A					Wave Traps	3150				
144	ER-I/NR-III	Patna-Ballia I	195.323	400	ACSR	Quad	85	Isolators	3150A	3150A	3150A			Isolators	3150A	3150A	3150A		
								CT		3000A	3000A			CT		3000A	3000A		
								Breakers		3150A	3150A			Breakers		3150A	3150A		
								Wave Traps	3150A					Wave Traps	3150A				

145	ER-I/NR-III	Patna-Ballia II	195.323	400	ACSR	Quad	85	Isolators	3150A	3150A	3150A			Isolators	3150A	3150A	3150A		
								CT		3000A	3000A			CT		3000A	3000A		
								Breakers		3150A	3150A			Breakers		3150A	3150A		
								Wave Traps	3150A					Wave Traps	3150A				
146	ER-I	Barh-Patna-III	68.651	400	ACSR Moose	Quad	85	Isolators						Isolators	3150A	3150A	3150A		
								CT						CT		3000A	3000A		
								Breakers						Breakers		3150A	3150A		
								Wave Traps						Wave Traps	3150A				
147	ER-I	Barh-Patna-IV	68.651	400	ACSR Moose	Quad	85	Isolators						Isolators	3150A	3150A	3150A		
								CT						CT		3000A	3000A		
								Breakers						Breakers		3150A	3150A		
								Wave Traps						Wave Traps	3150A				
148	ER-I/NR-III	Patna-Ballia III	185	400	ACSR Moose	Quad	85	Isolators	3150A	3150A	3150A			Isolators	3150A	3150A	3150A		
								CT		3000A	3000A			CT		3000A	3000A		
								Breakers		3150A	3150A			Breakers		3150A	3150A		
								Wave Traps	3150A					Wave Traps	3150A				
149	ER-I/NR-III	Patna-Ballia IV	185	400	ACSR Moose	Quad	85	Isolators	3150A	3150A	3150A			Isolators	3150A	3150A	3150A		
								CT		3000A	3000A			CT		3000A	3000A		
								Breakers		3150A	3150A			Breakers		3150A	3150A		
								Wave Traps	3150A					Wave Traps	3150A				
150	ER-I	Biharshariff - Sasaram III (now purnea-I)	324.185	400	ACSR Moose	Quad	85	Isolators	3150	2000	2000			Isolators	3150	3150	3150		
								CT	3000	3000	3000			CT		3000	3000		
								Breakers		2000	2000			Breakers		3150	3150		
								Wave Traps	3000					Wave Traps	2000				
151	ER-I	Biharshariff - Sasaram IV(now purnea-II)	324.185	400	ACSR Moose	Quad	85	Isolators	3000	2000	3000			Isolators	3150	3150	3150		
								CT	3000	3000	3000			CT		3000	3000		
								Breakers		3000	3000			Breakers		3150	3150		
								Wave Traps	3000					Wave Traps	2000				
152	ER-I	Nabinagar - Sasaram I	81.65	400	ACSR Lapwing	Twin	85	Isolators						Isolators	3150	3150	3150		
								CT						CT		3000	3000		
								Breakers						Breakers		3150	3150		
								Wave Traps						Wave Traps	2000				
153	ER-I	Nabinagar - Sasaram II	81.65	400	ACSR Lapwing	Twin	85	Isolators						Isolators	3150	3150	3150		
								CT						CT		3000	3000		
								Breakers						Breakers		3150	3150		
								Wave Traps						Wave Traps	2000				
154	ER-I/ER-II	Koderma-Gaya I	125.512	400	ACSR Moose	Quad	85	Isolators						Isolators	3150	3150	3150		
								CT						CT		3000	3000		
								Breakers						Breakers		3150	3150		
								Wave Traps						Wave Traps	3150				
155	ER-I/ER-II	Koderma-Gaya II	125.512	400	ACSR Moose	Quad	85	Isolators						Isolators	3150	3150	3150		
								CT						CT		3000	3000		
								Breakers						Breakers		3150	3150		
								Wave Traps						Wave Traps	3150				
156	ER-I/ER-II	Gaya - Maithon I	274.943	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators					
								CT		3000	3000			CT					
								Breakers		3150	3150			Breakers					
								Wave Traps	3150					Wave Traps					
157	ER-I/ER-II	Gaya - Maithon II	274.943	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators					
								CT		3000	3000			CT					
								Breakers		3150	3150			Breakers					
								Wave Traps	3150					Wave Traps					
158	ER-I	Ranchi (New) - Ranchi I	78.617	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators	3150	3150	3150		
								CT		3000	3000			CT		3000	3000		
								Breakers		3150	3150			Breakers		3150	3150		
								Wave Traps	3150					Wave Traps	3150				
159	ER-I	Ranchi (New) - Ranchi II	78.617	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators	3150	3150	3150		
								CT		3000	3000			CT		3000	3000		
								Breakers		3150	3150			Breakers		3150	3150		
								Wave Traps	3150					Wave Traps	3150				
160	ER-I	Ranchi (New) - Ranchi III	78.542	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators	3150	3150	3150		
								CT		3000	3000			CT		3000	3000		
								Breakers		3150	3150			Breakers		3150	3150		
								Wave Traps	3150					Wave Traps	3150				
161	ER-I	Ranchi (New) - Ranchi IV	78.542	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators	3150	3150	3150		
								CT		3000	3000			CT		3000	3000		
								Breakers		3150	3150			Breakers		3150	3150		
								Wave Traps	3150					Wave Traps	3150				
162	ER-I	Patna-Kishanganj I	346.72	400	ACSR Moose	Quad	85	Isolators	3150A	3150A	3150A			Isolators					4000 A
								CT		3000A	3000A			CT					3000 A
								Breakers		3150A	3150A			Breakers					4000 A
								Wave Traps	3150A					Wave Traps					3150 A

163	ER-I	Patna-Kishanganj II	346.72	400	ACSR Moose	Quad	85	Isolators	3150A	3150A	3150A			Isolators					4000 A
								CT		3000A	3000A			CT					3000 A
								Breakers		3150A	3150A			Breakers					4000 A
								Wave Traps	3150A					Wave Traps					3150 A
164	ER-I/NR-III	Barh II - Gorakhpur I	349.177	400	ACSR Moose	Quad	85	Isolators						Isolators	3150A	3150A	3150A		
								CT						CT		3000A	3000A		
								Breakers						Breakers		3150A	3150A		
								Wave Traps						Wave Traps	3150A				
165	ER-I/NR-III	Barh II - Gorakhpur II	349.177	400	ACSR Moose	Quad	85	Isolators						Isolators	3150A	3150A	3150A		
								CT						CT		3000A	3000A		
								Breakers						Breakers		3150A	3150A		
								Wave Traps						Wave Traps	3150A				
166	ER-I	New Ranchi - Chandwa I	68	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators					3150
								CT		3000	3000			CT					3000
								Breakers		3150	3150			Breakers					3150
								Wave Traps	3150					Wave Traps					3150
167	ER-I	Chandwa- Gaya I	117	400	ACSR Moose	Quad	85	Isolators					3150	Isolators	3150	3150	3150		
								CT					3000	CT		3000	3000		
								Breakers					3150	Breakers		3150	3150		
								Wave Traps					3150	Wave Traps	3150				
168	ER-I	New Ranchi - Chandwa II	68	400	ACSR Moose	Quad	85	Isolators	3150	3150	3150			Isolators					3150
								CT		3000	3000			CT					3000
								Breakers		3150	3150			Breakers					3150
								Wave Traps	3150					Wave Traps					3150
169	ER-I	Chandwa- Gaya II	117	400	ACSR Moose	Quad	85	Isolators					3150	Isolators	3150	3150	3150		
								CT					3000	CT		3000	3000		
								Breakers					3150	Breakers		3150	3150		
								Wave Traps					3150	Wave Traps	3150				
170	ER-I/ER-II	Farakka-Malda-I	40	400	HTLS	Twin	75	Isolators						Isolators		3000	3000		
								CT						CT		3000	3000		
								Breakers						Breakers		3000	3000		
								Wave Traps						Wave Traps		3000	3000		
171	ER-I/ER-II	Farakka-Malda-II	40	400	HTLS	Twin	75	Isolators						Isolators		3000	3000		
								CT						CT		3000	3000		
								Breakers						Breakers		3000	3000		
								Wave Traps						Wave Traps		3000	3000		
172	ER-I/ER-II	New Purnea - New Siliguri I	168	400	HTLS	Twin	75	Isolators	3150A	3150A	3150A			Isolators	3150A	3150A	3150A		
								CT		3000A	3000A			CT		3000A	3000A		
								Breakers		3150A	3150A			Breakers		3150A	3150A		
								Wave Traps	3150A					Wave Traps	3150A				
173	ER-I/ER-II	New Purnea - New Siliguri II	168	400	HTLS	Twin	75	Isolators	3150A	3150A	3150A			Isolators	3150A	3150A	3150A		
								CT		3000A	3000A			CT		3000A	3000A		
								Breakers		3150A	3150A			Breakers		3150A	3150A		
								Wave Traps	3150A					Wave Traps	3150A				
174	ER-I	Newpurnea - Kishanganj-I (LILO portion)		400	ACSR Moose	Quad		Isolators	3150 A	3150 A	3150 A			Isolators					4000 A
								CT		2000 A	2000A			CT					3000 A
								Breakers		3150 A	3150 A			Breakers					4000 A
								Wave Traps	3150 A					Wave Traps					3150 A
175	ER-I	Kishanganj-New Siliguri (LILO portion)		400	ACSR Moose	Quad		Isolators					4000 A	Isolators	3150A	3150A	3150A		
								CT					3000 A	CT		3000A	3000A		
								Breakers					4000 A	Breakers		3150A	3150A		
								Wave Traps					3150 A	Wave Traps	3150A				
176	ER-I	Newpurnea - Kishanganj-II (LILO portion)		400	ACSR Moose	Quad		Isolators	3150 A	3150 A	3150 A			Isolators					4000 A
								CT		2000A	2000 A			CT					3000 A
								Breakers		3150 A	3150 A			Breakers					4000 A
								Wave Traps	3150 A					Wave Traps					3150 A
177	ER-I/ER-II	Kishanganj-New Siliguri II (LILO portion)		400	ACSR Moose	Quad		Isolators					4000 A	Isolators	3150A	3150A	3150A		
								CT					3000 A	CT		3000A	3000A		
								Breakers					4000 A	Breakers		3150A	3150A		
								Wave Traps					3150 A	Wave Traps	3150A				
178	ER-II	Durgapur-Maithon I	70.77	400	ACSR Lapwing	Twin	85	Isolators	2000	2000	2000			Isolators	2000	2000	2000		
								CT		2000	2000			CT		2000	2000		
								Breakers		3150	3150			Breakers		3150	3150		
								Wave Traps	2000	2000	2000			Wave Traps	2000	2000	2000		
179	ER-II	Durgapur-Maithon II	70.77	400	ACSR Lapwing	Twin	85	Isolators	2000	2000	2000			Isolators	2000	2000	2000		
								CT		2000	2000			CT		2000	2000		
								Breakers		3150	3150			Breakers		3150	3150		
								Wave Traps	2000	2000	2000			Wave Traps	2000	2000	2000		
180	ER-II	Baharampur-Sagardighi I	26.297	400	HTLS	Twin	85	Isolators	3150A	3150A	3150A			Isolators					
								CT	NA	3000A	3000A			CT					
								Breakers	NA	3150A	3150A			Breakers					
								Wave Traps	3150A	NA	NA			Wave Traps					
181	ER-II	Baharampur-Sagardighi II	26.297	400	HTLS	Twin	85	Isolators	3150A	3150A	3150A			Isolators					
								CT	NA	3000A	3000A			CT					
								Breakers	NA	3150A	3150A			Breakers					
								Wave Traps	3150A	NA	NA			Wave Traps					

182	NER	Balipara- Bongaingaon III	309	400	ACSR Moose	Quad	85	Isolators	3150A	3150A	3150A			Isolators	3150A	3150A	3150A		
								CT	NA	3000A	3000A			CT	NA	3000A	3000A		
								Breakers	NA	3150A	3150A			Breakers	NA	3150A	3150A		
								Wave Traps	3000A	NA	NA			Wave Traps	3000A	NA	NA		
183	NER	Balipara- Bongaingaon IV	309	400	ACSR Moose	Quad	85	Isolators	3150A	3150A	3150A			Isolators	3150A	3150A	3150A		
								CT	NA	3000A	3000A			CT	NA	3000A	3000A		
								Breakers	NA	3150A	3150A			Breakers	NA	3150A	3150A		
								Wave Traps	3000A	NA	NA			Wave Traps	3000A	NA	NA		

The information regarding terminal equipment ratings of 400 KV Lines

Sr. No	Name of Line	Voltage (KV)	Tower Configuration (S/C or D/C)	Line Length (Km)	Type of Conductor	Conductor Configuration	End 1 and End 2 Rating
1	Talwandi Sabo-Dhuri	400 KV	Double Circuit	88	Moose	Twin	CB - 2000A,40 KA CT - 2000A, 40 KA CVT- 4400 pF Isolator-2000A,40KA Line Trap-2000A, 0.5 mH, 40 KA
2	Talwandi Sabo- Muktsar			100.3			
3	Talwandi Sabo- Nakodar			155			
4	LILO of Talwandi Sabo-Nakodar at Moga			11.347			
5	Muktsar- Makhu			95			
6	Makhu- Balachak			64			
7	Rajpura TPS- Nakodar			137			
8	Rajpura TPS- Rajpura			9			
9	Rajpura-Dhuri			84			
10	Nakodar-Makhu			52.72			

S.No.	Name of Line	Circuit ID	Tower Configuration(S/C or D/C)	Line Length (in km)	Type of conductor	O&M by	Agency at		Thermal Capability of Breaker and Isolators	Thermal Capability of Other SwitchGears such as CT,PT, etc.	Thermal Capability of Line
							End-I	End-II			
4. 400kV HVAC Transmission Line											
G. HVPNL											
1	CLP Jhajjar -Dhanonda	1	D/C	20	Twin Moose	KT Jhajjar	CLP Jhajjar	HVPNL	2000A @ 50 DEG C	2500A@50 DEG C	728A @ 40 DEG AMBIENT TEMPERATURE
2	CLP Jhajjar -Dhanonda	2	D/C	20	Twin Moose	KT Jhajjar	CLP Jhajjar	HVPNL	2000A @ 50 DEG C	2500A@50 DEG C	728A @ 40 DEG AMBIENT TEMPERATURE
3	CLP Jhajjar- Kabulpur	1	D/C	35	Quad Moose	KT Jhajjar	CLP Jhajjar	HVPNL	3150 A @ 50 deg C	3000 A @ 50 deg C	714 A @ 50 deg C ambient temp
4	CLP Jhajjar- Kabulpur	2	D/C	35	Quad Moose	KT Jhajjar	CLP Jhajjar	HVPNL	3150 A @ 50 deg C	3000 A @ 50 deg C	714 A @ 50 deg C ambient temp
5	Deepalpur-Kabulpur	1	D/C	64	Quad Moose	KT Jhajjar	KT Jhajjar	KT Jhajjar	3150 A @ 50 deg C	3000 A @ 50 deg C	714 A @ 50 deg C ambient temp
6	Deepalpur-Kabulpur	2	D/C	64	Quad Moose	KT Jhajjar	KT Jhajjar	KT Jhajjar	3150 A @ 50 deg C	3000 A @ 50 deg C	714 A @ 50 deg C ambient temp
7	Dhanoda-Daultabad	1	D/C	73	Quad Moose	HVPNL	HVPNL	HVPNL	2000A @ 50 DEG C	2500A@50 DEG C	728A @ 40 DEG C AMBIENT TEMP
8	Dhanoda-Daultabad	2	D/C	73	Quad Moose	HVPNL	HVPNL	HVPNL	2000A @ 50 DEG C	2500A@50 DEG C	728 A @ 40 Deg C AMB. TEMP.
9	Gurgaon-Daultabad	1	D/C	24	Quad Moose	HVPNL	POWERGRID	HVPNL	3150 A @ 50 deg C	2000 A @ 50 deg C	714A each conductor@ 50 deg C ambient temp
10	Gurgaon-Daultabad	2	D/C	24	Quad Moose	HVPNL	POWERGRID	HVPNL	3150 A @ 50 deg C	2000 A @ 50 deg C	714A each conductor@ 50 deg C ambient temp
11	Jhajjar-Daulatabad	1	D/C	64	Twin Moose	HVPNL	APCPL	HVPNL	3150 A @ 50 deg C	2000 A @ 50 deg C	714A each conductor@ 50 deg C ambient temp
12	Jhajjar-Daulatabad	2	D/C	64	Twin Moose	HVPNL	APCPL	HVPNL	3150 A @ 50 deg C	2000 A @ 50 deg C	714A each conductor@ 50 deg C ambient temp
13	Khedar-Fathehabad	1	D/C	40	Twin Moose	HVPNL	HPGCL	POWERGRID	3150 A @ 50 deg C	3000 A @ 50 deg C	714 A @ 50 deg C ambient temp
14	Khedar-Kirori	1	D/C	6	Twin Moose	HVPNL	HPGCL	HVPNL	3150 A @ 50 deg C	3000 A @ 50 deg C	714 A @ 50 deg C ambient temp
15	Khedar-Kirori	2	D/C	6	Twin Moose	HVPNL	HPGCL	HVPNL	3150 A @ 50 deg C	3000 A @ 50 deg C	714 A @ 50 deg C ambient temp
16	Jind Kirori 1	1	D/C	50	Twin Moose	HVPNL	PGCIL	HVPNL	3150 A @ 50 deg C	3000 A @ 50 deg C	714 A @ 50 deg C ambient temp
17	Jind Kirori 2	2	D/C	50	Twin Moose	HVPNL	PGCIL	HVPNL	3150 A @ 50 deg C	3000 A @ 50 deg C	714 A @ 50 deg C ambient temp
18	Khedar-Nuhiawali	1	D/C	114	Twin Moose	HVPNL	HPGCL	HVPNL	2000 A @ 45 deg C	2000A @ 45 deg C	1670A @ 45deg C Ambiant temp.
19	Nuhiawali-Fathehabad	1	D/C	78	Twin Moose	HVPNL	HVPNL	POWERGRID	2000 A @ 45 deg C	2000A @ 45 deg C	1670A @ 45deg C Ambiant temp.

Additional Equipment for resource disjoint and critical Locations in Northern Region

Sr No.	Name	Directions at critical nodes	Available Equipment	Required equipment
1	Mandola	4	1	1
2	DTL Bawana	4	1	1
3	Muradnagar	4	1	1
4	SLDC, RRVPNL (Jaipur)	2	1	1
5	SLDC, HVPNL (Panipat)	5	1	1
6	SLDC, BBMB (Chandigarh)	3	1	1
7	SLDC, DTL (New Delhi)	2	1	1
8	SLDC, HPSEBL (Shimla)	1	1	1
9	SLDC J&K PDD (Jammu)	1	1	1
10	SLDC Lucknow (UPPTCL)	2	1	1
11	SLDC PSTCL (Patiala)	2	1	1
12	SLDC PTCUL (Dehradun)	1	1	1

Annexure-X

Locations for FOTE requirement

Sr No.	Name	Backup CC location	FOTE
1	Backup NRLDC	Guwahati	2
2	SLDC, RRVPNL (Jaipur)	Sub-LDC Bhilwara	1
3	SLDC, HVPNL (Panipat)	HW, Shakti Bhawan Panchkula	1
4	SLDC, BBMB (Chandigarh)	SLDC, Patiala, Punjab	0
5	SLDC, DTL (New Delhi)	400kV Bamnauli (ALDC Bldg)	2
6	SLDC, HPSEBL (Shimla)	Sub-LDC Hamirpur	1
7	SLDC J&K PDD (Jammu)	Backup SLDC Srinagar	2
8	SLDC Lucknow (UPPTCL)	SLDC Modipuram (UPPTCL)	1
9	SLDC PSTCL (Patiala)	SLDC, BBMB (Chandigarh)	0
10	SLDC PTCUL (Dehradun)	Kashipur	1
		Total	11

Meeting Plan for FY 2023-24

S.N.	Month	Meeting	Host	Mode
1	Apr-2023	65th NRPC	SJVN	Physical
2	May-2023	66th NRPC	NRPC Secretariat	VC
3	June-2023	67th NRPC	NRPC Secretariat	VC
4	Jul-2023	-	-	-
5	Aug-2023	68th NRPC	NTPC	Physical
6	Sep-2023	69th NRPC	NRPC Secretariat	VC
7	Oct-2023	70th NRPC	NRPC Secretariat	VC
8	Nov-2023	71st NRPC & 48th TCC	NHPC	Physical
9	Dec-2023	72nd NRPC	NRPC Secretariat	VC
10	Jan-2024	73rd NRPC	NRPC Secretariat	VC
11	Feb-2024	74th NRPC & 49th TCC	Combined by CLP Jhajjar & Lanco Anpara Power Ltd	Physical
12	Mar-2024	75th NRPC	NRPC Secretariat	VC

Meeting Plan for FY 2024-25

S.N.	Month	Meeting	Host	Mode
1	Apr-2024	76th NRPC	NRPC Secretariat	VC
2	May-2024	77th NRPC & 50th TCC	UPPTCL	Physical
3	June-2024	78th NRPC	NRPC Secretariat	VC
4	Jul-2024	79th NRPC	NRPC Secretariat	VC
5	Aug-2024	80th NRPC & 51st TCC	Member Trader	Physical
6	Sep-2024	81st NRPC	NRPC Secretariat	VC
7	Oct-2024	82nd NRPC	NRPC Secretariat	VC
8	Nov-2024	83rd NRPC & 52nd TCC	DTL	Physical
9	Dec-2024	84th NRPC	NRPC Secretariat	VC
10	Jan-2025	85th NRPC	NRPC Secretariat	VC
11	Feb-2025	86th NRPC & 53rd TCC	Adani Power Ltd	Physical
12	Mar-2025	87th NRPC	NRPC Secretariat	VC