



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 (46 वीं)/2019/
No. NRPC/ Comml/ 209/ RPC (46th)/2019/ 10457-10504

दिनांक : 16 सितम्बर, 2019
Dated: 16th September, 2019

सेवा में / To,

उ.क्षे.वि.स. और तकनीकी समन्वय समिति के सभी सदस्य (संलग्न सूचीनुसार)
Members of NRPC and TCC (As per List)

विषय: उत्तर क्षेत्रीय विद्युत समिति की 46 वीं तथा तकनीकी समन्वय उप-समिति की 43 वीं बैठक की कार्यसूची ।

Subject: 46th meeting of Northern Regional Power Committee and 43rd meeting of TCC– Agenda.

महोदय / Sir,

उत्तर क्षेत्रीय विद्युत समिति की 46 वीं बैठक 24 सितम्बर, 2019 को 1000 बजे होटल लीला राविज़ कोवलम, थिरुवानाथापुरम में आयोजित की जाएगी । एन आर पी सी की बैठक से पहले तकनीकी समन्वय उप-समिति की 43 वीं बैठक दिनांक 23 सितम्बर, 2019 को 1000 बजे उसी स्थान पर आयोजित होगी ।

बैठकों की कार्यसूची उत्तर क्षेत्रीय विद्युत समिति की वेबसाइट, www.nrpc.gov.in पर उपलब्ध है । इसे आप डाउनलोड कर सकते हैं । आप से अनुरोध है कि बैठक में सम्मिलित होकर अनुग्रहीत करें । कृपया अपनी सहभागिता की पुष्टि पावरग्रिड द्वारा नियुक्त नोडल अधिकारियों को करें ।

The 46th meeting of Northern Regional Power Committee (NRPC) will be held at 1000 Hrs on 24th September, 2019 at The Leela Raviz Kovalam, Thiruvanathapuram. NRPC meeting shall be preceded by 43rd meeting of Technical Coordination Sub-committee (TCC) at 1000 Hrs on 23rd September, 2019 at the same venue. Agenda for the meetings is attached herewith.

A copy of the agenda for the meetings is available on NRPC website, www.nrpc.gov.in. The same may kindly be downloaded. You are requested to make it convenient to attend the meeting. Kindly confirm your participation to the nodal officers deputed by POWERGRID.

भवदीय

Yours faithfully,

(नरेश भण्डारी) 16/9/19
(Naresh Bhandari)

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49. Representative of BRPL (Delhi Private Discom)
50. Representative of Bajaj Energy Pvt Ltd (Member IPP < 1000 MW)
51. Representative of Kreate Energy Pvt Ltd (Member Trader)

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48. Representative of Prayagraj Power Generation Co. Ltd.
49. Representative of BRPL (Delhi Private Discom)
50. Representative of Bajaj Energy Pvt Ltd (Member IPP < 1000 MW)
51. Representative of Kreate Energy Pvt Ltd (Member Trader)

Special Invitee:

- i. Member Secretary, WRPC, Mumbai-400 093.
- ii. Member Secretary, SRPC, Bangalore-560 009
- iii. Member Secretary, ERPC, Kolkata-700 033.
- iv. Member Secretary, NERPC, Shillong-793 003.

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उत्तरक्षेत्रीयविद्युतसमिति

NORTHERN REGIONAL POWER COMMITTEE

AGENDA

FOR

43rd MEETING OF TECHNICAL COORDINATION SUB-COMMITTEE

&

46th MEETING OF NORTHERN REGIONAL POWER COMMITTEE

Time & Date of TCC meeting: 10:00 Hrs. on 23.09.2019

Time & Date of NRPC meeting: 10.00 Hrs. on 24.09.2019

Venue: The Leela Raviz Kovalam, Thiruvananthapuram

C O N F I R M A T I O N O F M I N U T E S (T C C)

A.1 Minutes of 42nd meeting of TCC

Minutes of 42nd meeting of TCC held on 07th June, 2019, were circulated vide letter No. NRPC/Comml/209/RPC(45th)/2019/ 7152-7246 dated 09th July, 2019.

RVPNL vide email dated 10.07.2019 has submitted the following comments:

B.32 Real time data telemetry from Renewable Generators:

B.32.2 (i). The telemetry data figure of Wind Generation may be read as 4226 MW instead of 4246 MW.

B.32.2 (ii) The statement "He also informed that 2500MW wind data telemetry is not available due to payment issue between wind generators and lease line owner." should be removed from the minutes as It is a private work between Wind Generators and Wind Association Group.

Members may kindly discuss and confirm the minutes.

C O N F I R M A T I O N O F M I N U T E S (N R P C)

A.2 Minutes of 45th meeting of NRPC

Minutes of 45th meeting of NRPC held on 08th June, 2019, were circulated vide letter No. NRPC/Comml/209/RPC(45th)/2019/ 7152-7246 dated 09th July, 2019.

RVPNL vide email dated 10.07.2019 has submitted the following comments:

B.32 Real time data telemetry from Renewable Generators:

B.32.2 (i). The telemetry data figure of Wind Generation may be read as 4226 MW instead of 4246 MW.

B.32.2 (ii) The statement "He also informed that 2500MW wind data telemetry is not available due to payment issue between wind generators and lease line owner." should be removed from the minutes as It is a private work between Wind Generators and Wind Association Group.

Members may kindly discuss and confirm the minutes.

B. OPERATIONAL ISSUES

B.1 System Study for Capacitor Requirement in NR for the year 2019-20

B.1.1 38th TCC and 41st NRPC approved the proposal of getting CPRI to conduct the capacitor requirement study for NR at 11/33 kV level so as to obtain more practical requirement of capacitor in the region.

B.1.2 39th TCC and 42nd NRPC approved the Techno Commercial offer of CPRI at Rs. 32 lakhs (Rs. 20 lakhs for previous study and Rs. 12 lakhs for additional assignment) excluding taxes for conducting the capacitor study. In the meeting, format for data submission was shared with the members and they were requested to ensure timely submission of the data so that the study may be carried out in the stipulated time frame.

B.1.3 In the subsequent NRPC/TCC and OCC meetings, utilities had been regularly pursued for the submission of data; however, data received from the utilities were mostly not in line with the requirement of CPRI. This issue was also discussed in the 41st TCC/44th NRPC meeting, wherein utilities agreed that sample data would be submitted by the end of March, 2019.

B.1.4 Further, in the 42nd TCC and 45th NRPC, members expressed concerns over non-submission of even sample data by the states. In the meeting all member states were requested to submit the data in a time bound manner latest by 30.06.2019. For the States which would not be able to submit the data by 30.06.2019, CPRI would be approached for collection of data of their states (based on the acceptance of CPRI) and the expenditure would be booked to the respective states.

B.1.5 In 160th OCC meeting, UP representative stated that they were not being able to collect the data as per the format of CPRI and were of the view that for UP state, CPRI may be asked to collect the data as per the decision of 42nd TCC and 45th NRPC meeting.

- B.1.6 In 161st OCC meeting, it was informed that as per the request of UPPTCL, a letter was sent to CPRI requesting them to take up the task of data collection in respect of UP (at additional cost to be borne by UP) citing UP's inability to collect the same in the prescribed format. However, in reply CPRI expressed its inability to take up the task citing their other commitments, and accordingly the same vide letter dated 26.07.2019 was communicated to UPPTCL.
- B.1.7 So far, complete data has been submitted by Haryana, Delhi and Punjab. Further, sample data has been submitted by HP, UP and Rajasthan.

Members are requested to deliberate for early submission of complete data by the concerned utilities.

B.2 Database of protection settings

- B.2.1 Based on the recommendations of Enquiry Committee on grid disturbance of 30th & 31st July 2012, 'Task Force on Power System Analysis under Contingencies' was constituted by Ministry of Power in December 2012, which inter-alia recommended for **creating and maintaining database of relay settings** (to be compiled by CTU and STUs) and furnished to RLDC, SLDC and RPCs.
- B.2.2 In the 29th PSC meeting dt. 09.02.2015, POWERGRID suggested a format for preparing a database of protection relays which was acceptable to all constitutes and it was decided that database (password protected) will be available on NRPC website for reference and record.
- B.2.3 Protection setting data (for 400kV and 220kV S/S) was sought from the utilities as per the decision taken in 34th TCC/38th NRPC meeting held on 24th / 25th October 2016 and data was received from thirteen utilities (Annex-VI of MoM of 33rd PSC dt. 22.02.2017).
- B.2.4 In the 39th NRPC meeting dt. 02.05.2017, approval was given for engaging a third party for protection database creation as the requisite data was not timely submitted by all utilities. Subsequently, based on the presentation and budgetary proposal of a vendor, detailed scope of work along with estimated cost was prepared for initiating PSDF funding.
- B.2.5 Grant from PSDF towards Development of Protection Data Base Management System was sanctioned vide NLDC letter dated 01.08.2018 and thereafter open tender was floated on 30.08.2018, wherein only two bids were received. On account of insufficient competition, retendering was done on 17.10.2018, wherein two out of three bidders were found to be not meeting pre-qualification criteria of the tender.

- B.2.6 Retendering for the second time was done on 10.12.2018 without any modified condition, in which only two bidders participated. Technical evaluation of bids showed disqualification of both bidders on account of non-fulfillment of tender condition(s). Third call of tender was finally cancelled on 10.05.2019 in view of the outcome of technical evaluation process and the absence of competition in ongoing tendering process.
- B.2.7 While analysing three calls of tender which failed to indicate healthy competition, it is also noted that project components like web-based DBMS, hardware & associated software, database collection & building activities, AMC of hardware & software and data updation services had major share in the total budgetary quotation and there may not be more than only one or a few vendor(s) to provide these services/components.
- B.2.8 In the 8th NPC meeting, held on 30.11.2018, the efforts of WRPC for in-house development of the database was appreciated and NRPC was suggested to seek assistance of WRPC in case no bidders come up after retendering.
- B.2.9 In the 42nd TCC and 45th NRPC meeting, two options viz., collection of relay setting data by respective Transmission Utilities AND engaging any central agency like CPRI for the work were deliberated. TCC was of the view that protection settings are already available with the substation personnel and any third party engaged would also require their help for extracting the settings from the relay. Also, in case of some changes in the setting, the substation personnel shall have the responsibility of reflecting the changes accordingly in the centralized database and for that he should be well aware of how to extract the settings and get it reflected in the centralized database. NRPC forum was of the view that work may be completed in a professional manner by engaging third party; however, all utilities need to go forward for the collection of the data and appoint their nodal officers for coordination.
- B.2.10 Based on the assessment of past tendering outcomes and work involved, it is proposed that entire project may be executed through two independent contracts – (A) Capacity building of state/central utilities for collecting & updating relay setting data; design & setup of database (facilitating data retrieval in open standard format) with web based application for data updation on NIC Cloud and 6 years post-warranty comprehensive maintenance support, and (B) Setup of customized 'Protection Setting Calculation tool' having interface with database established in (A) along with 5 years post-warranty software support services.
- For both works/contracts, third party may be selected through open tendering processes as per extant government guidelines & rules. Tender for setting up the customized 'Protection Setting tool' can be floated after the successful establishment of database and web based application.

Members may kindly deliberate.

B.3 Downstream network by State Utilities from ISTS Stations

B.3.1 Augmentation of transformation capacity in various existing substations as well as addition of new substations along with line bays for downstream network are under implementation at various locations in Northern Region. For utilization of these transformation capacities, implementation of downstream 220kV system needs to be commissioned:

Sl. No.	Substation	Downstream network bays	Commissioning status of S/s / Transformer	Planned 220 kV system and Implementation Status
1	400/220kV, 3x315 MVA Samba	2 nos. bays utilized under ISTS. Balance 4 nos. to be utilized	Commissioned (1 st & 2 nd –Mar'13 3 rd –Oct'16) Bays-Mar'13	<ul style="list-style-type: none"> • LILO of 220 kV Bishnha –Hiranagar D/c line. Target completion -Nov, 2019. • 220 kV D/c Samba (PG) – Samba (JKPDD) approved in 1st NRSCT. PDD, J&K to update.
2	400/220kV, 2x315 MVA New Wanpoh	6 Nos. of 220 kV bays to be utilized	Commissioned in Jul'14 Bays-Jul'14	<ul style="list-style-type: none"> • 220 kV New Wanpoh - Mirbazar D/c line. • 220 kV Alusteng - New Wanpoh Line. PDD, J&K to update.
3	400/220 kV, 2x315 MVA Parbati Pooling Station (Banala)	2 Nos. of 220 kV bays to be utilized.	Commissioned in Dec'17	220 kV Charor- Banala D/c line (18 km). Line charged in July '19 from Banala end. HPSEBL to update.
4	400/220kV, 2x500 MVA Kurukshetra (GIS)	8 nos. of 220 kV bays to be utilized	Commissioned in Mar'17.	<ul style="list-style-type: none"> • LILO of one circuit of Kaul-Pehowa 220 kV D/c line at Bhadson (Kurukshetra). Commissioned on 07.03.2019 • LILO of one circuit of Kaul- Bastara 220 kV D/c line Bhadson(Kurukshetra). Work awarded on 12.03.2018. Contractual completion date is 11.10.2019.

Sl. No.	Substation	Downstream network bays	Commissioning status of S/s / Transformer	Planned 220 kV system and Implementation Status
				<p>PSTCL to update.</p> <ul style="list-style-type: none"> 220kV D/c Bhadson (Kurukshetra) – Salempur with HTLS conductor equivalent to twin moose. <p>P.O. issued on 15.10.18. Contarct agreement signed on 30.11.18. Likely date of completion is 30.04.2020.</p>
5	400/220 kV, 2x500 MVA Bagpat GIS	8 nos. of 220 kV Downstream lines commissione d. Balance 3 Nos. of 220 kV bays to be utilized.	Commissioned in Mar/Jun'16	<ul style="list-style-type: none"> Bagpat(PG) - Modipuram-II 220kV D/c line. <p>Target completion – Under planning.</p> <ul style="list-style-type: none"> LILO of 220kV S/c Muradnagar II –Baghpat (PG) at Baghpat SS. <p>Commissioned.</p>
6	400/220 kV, 2x315 MVA Saharanpur	All 6 nos. 220 kV bays utilised.	Commissioned in May'16	<ul style="list-style-type: none"> LILO of Khara-Shamli 220 kV S/C line at SRN(PG). 220 kV SRN(PG)-Sarasawa D/C Line. LILO of SRN-Nanauta 220 kV S/C line at SRN(PG). <p>UPPTCL to update.</p>
7	400/220 kV, 2x315 MVA Dehradun	Out of 6 bays, only two bays used. Balance 4 bays to be utilised.	Commissioned in Jan'17	<ul style="list-style-type: none"> 220 kV Dehradun-Jhajra line. <p>Target completion: Nov, 2021</p> <p>PTCUL to update.</p>
8	400/220 kV, 2x315 MVA Sohawal	4 Nos 220 kV bays utilized. 2 Nos 220 kV bays to be utilized.	Commissioned in Jun'12	<ul style="list-style-type: none"> 220 kV D/C Sohawal (PG) – Gonda. 220 kV D/C Sohawal (PG) – Gonda. <p>Target completion- Nov,</p>

Sl. No.	Substation	Downstream network bays	Commissioning status of S/s / Transformer	Planned 220 kV system and Implementation Status
				2019. UPPTCL to update.
9	Shahjahanpur, 2x315 MVA 400/220 kV	Partially utilized. Balance 5 Nos. of 220 kV bays to be utilized.	Commissioned in Jun/Sep'14	<ul style="list-style-type: none"> 220 kV D/C Shahjahanpur (PG) - Azizpur D/C line. Target completion - Dec, 2020. <ul style="list-style-type: none"> 220 kV D/C Shahjahanpur (PG) - Gola Lakhimpur line. Target completion - Dec, 2019. UPPTCL to update.
10	Hamirpur 400/220 kV 2x 315 MVA Sub-station (Augmentation by 3x105 MVA ICT)	2 nos. bays utilized under ISTS. Balance 6 nos to be utilized	1 st -Dec'13, 2 nd – Mar'14 & 3 rd Mar'19. 4 bays-Dec'13, 2 bays-Mar'14 2 bays-Mar'19	<ul style="list-style-type: none"> 220 kV D/C Hamirpur-Dehan line. Target completion - Apr, 2020. HPPTCL to update.
11	Kaithal 400/220 kV 1x 315 MVA Sub-station	July 2017 (Shifting of transformer from Ballabgarh)	Commissioned	<ul style="list-style-type: none"> 220 kV Kaithal(PG)-Neemwala D/c line. Target completion - 31.01.2020. HVPNL to update.
12	Sikar 400/220kV, 1x 315 MVA S/s	2 Nos. of 220 kV bays	Commissioned	RVPNL had earlier requested to allocate the 220 kV bays for solar / wind developers but now have planned to utilize them with cable termination to overcome ROW issue. PGCIL to facilitate cable termination at their substation. RRVNL to update.
13	Bhiwani 400/220kV S/s	6 nos. of 220kV bays	Commissioned	<ul style="list-style-type: none"> 220kV Bhiwani (PG) - Isherwal (HVPNL) D/c line. Target completion -

Sl. No.	Substation	Downstream network bays	Commissioning status of S/s / Transformer	Planned 220 kV system and Implementation Status
				31.06.2020.HVPNL to update.
14	Jind 400/220kV S/s	6 nos. of 220kV bays	Commissioned	<ul style="list-style-type: none"> LILO of both circuits of 220kV D/c Narwana – Mund line at Jind (PG). Target completion - 31.06.2020.HVPNL to update.
15	400/220kV Tughlakabad GIS (6 no of bays utilized out of 8 no of 220kV bays)	4x 500	Commissioned	<ul style="list-style-type: none"> RK Puram – Tughlakabad (UG Cable) 220kv D/c line. Target completion – 2020-21.DTL to update.
16	400/220kV Kala Amb GIS (TBCB) (6 nos. of 220kV bays)	7x105	Commissioned (Jul'17)	HPSEBL has planned one no. of 220kV D/c line from Kala Amb 400/220kV S/s to 220/132kV Kala Amb S/s. Details for remaining 4 nos. of line bays may be provided. Target completion – 2021 HPPTCL to update.

Members may kindly update the status and expedite the downstream system.

B.3.2 Establishment of new 400/220kV substations in Northern Region

Sl. No.	Name of Substation	MVA Capacity	Expected Schedule	Downstream connectivity furnished by States in 40 th SCSPNR
1	400/220kV Dwarka-I GIS (8 nos. of 220kV bays)	4x 500	Sep'19	DTL to update.
2	220/66kV Chandigarh GIS (8 nos. of 66kV bays)	2x 160	Jun'19	Chandigarh to update.

3	<p>400/220kV Jauljivi GIS</p> <p>Out of these 8 nos. 220kV Line Bays, 4 nos. (Pithoragath-2, & Dhauliganga-2) would be used by the lines being constructed by POWERGRID and balance 4 nos. (Almora-2, Jauljivi-2) bays would be used by the lines being constructed by PTCUL.</p>	2x315	Dec'2019	<ul style="list-style-type: none"> • 220kV Almora-Jauljivi line. • 220kV Brammah-Jauljivi line <p>PTCUL to update.</p>
4	<p>400/220kV Sohna Road Sub-station (TBCB)</p> <p>(8 nos. of 220kV bays)</p>	2x500	Sep'19	<ul style="list-style-type: none"> • LILO of both circuits of 220kV D/c Sector-69 - RojKaMeo line at 400kV Sohna Road. • LILO of both circuits of 220kV D/c Badshahpur-Sec77 line at 400kV Sohna Road. <p>Target completion: 31.05.2020 HVPNL to update.</p>

Sl. No.	Name of Substation	MVA Capacity	Expected Schedule	Downstream connectivity furnished by States in 40 th SCSPNR
5	<p>400/220kV Prithla Sub-station (TBCB)</p> <p>(8 nos. of 220kV bays)</p>	2x500	Deemed commissioned w.e.f. 06/08/19	<p>-LILO of both circuits of 220kV D/c Sector-69 - RojKaMeo line at 400kV Sohna Road.</p> <p>-LILO of both circuits of 220kV D/c Badshahpur-Sec77 line at 400kV Sohna Road.</p> <p>Target completion – 31.05.2020. HVPNL to</p>

Sl. No.	Name of Substation	MVA Capacity	Expected Schedule	Downstream connectivity furnished by States in 40 th SCSPNR
				update.
6	400/220kV Kadarpur Sub-station (TBCB) (8 nos. of 220kV bays)	2x500	Sep'19	NIT floated on 05.03.2019 with due date of submission on 22.04.2019 (opened on 23.04.2019 and under evaluation). Target completion: 31.12.2020 HVPNL to update.

States are requested to kindly update the details of planned downstream network along with implementation status for utilisation of the ISTS substation.

B.4 Follow up of Major Decisions of NRPC

Sl. No.	Name of the project / decision taken	Meeting in which approval was granted/ decision was taken	Updated Status
1.	Provision of Bus Reactors in Northern Region to Control Over Voltages	Provision of Bus Reactors in Northern Region to Control Over Voltages	<p>Out of 17 no. reactors at 15 locations, 15 no. reactors at 13 locations have been commissioned. The status of reactors was as under:</p> <ul style="list-style-type: none"> • <u>Parbati-II (1x125 MVar) and Parbati-III (1x80 MVar):</u> <p>NHPC informed that there is no space at Parbati-III and as such reactors will be installed at Parbati- II.</p> <p>Reactors at Parbati-II will be commissioned along with the commissioning of the project. The case for purchase of reactor is under tendering process.</p>
2.	Transmission system associated with Kishenganga HEP. Kishenganga – Wagoora 220kV D/C	33 rd Standing Committee Meeting held On 23/12/2013	<p>POWERGRID had informed that completion schedule of Transmission system associated with Kishenganga HEP had been delayed due to unrest in Kashmir.</p> <p>The revised schedule was:</p> <p>Kishenganga – Wagoora 220kVD/c line - Stringing pending for 1.5- 2Km because of RoW issue.</p>

Sl. No.	Name of the project / decision taken	Meeting in which approval was granted / decision was taken	Updated Status
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3.	Unified Real Time Dynamic State Measurement (URTDSM) Scheme.	Approved in 27 th NRPC meeting held on 13 th July 2012 & 30 th Nov 2012	<ul style="list-style-type: none"> • Supply: Completed (114 Sub-stations). • PMUs at 112 S/S have been installed and 102 S/S are integrated with NRLDC/SLDCs. • WAMS System Commissioned in NRLDC & SLDCs of Northern Region. • Out of 6 Analytic Software which are being developed by IIT Bombay, 4 have been deployed at NRLDC, Prototype for one application is being tested and remaining one is under development. • In 41st TCC/44th NRPC, NRLDC informed that bugs are being observed in software and they are still in testing version. • POWERGRID informed that software was rectified in SR and 5 out of 6 are expected to be functional in NR by April, 2019. • Installation of Line Parameter Estimation, Vulnerability Analysis of Distance Relay, Supervised Zone-3 Distance Protection, Linear State Estimator is done for NRLDC & Delhi, installation at SLDCs under progress.
4.	Third party Protection audit of intra-state system / balance system not covered in Basic Protection Audit	27 th NRPC meeting held on 30 th November 2012.	<p>UPPTCL: 68 nos. 220kV substations work awarded to CPRI and work at 14 substations completed.</p> <p>Rest to be completed by Nov 2019.</p>

5.	Fiber Optic based communication system in NR and Additional	18 th NRPC meeting held on 27 th November 2010 and 28 th NRPC meeting	<p>Fibre Optic Connectivity under Central sector has been completed with the deletion of Uri-Uri-II link from the scheme.</p> <p>OPGW connectivity under State Sector & Additional requirement of Central Sector is</p>
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	OPGW connectivity in Northern Region under Fiber optic expansion project	held in 22 nd March 2013.	under progress and same shall be completed progressively. NR-I & NR-III : State Sector Completed – 1362 Kms out of 2071 Kms Central Sector (Addi. Req): 1800 Kms out of 1920 Kms completed. In 42 nd TCC/45 th NRPC meetings, PSTCL representative stated that even though POWERGRID is stating that they have completed the fibre optic connectivity but it shall not be interpreted as “ Commissioned ”. PGCIL stated that by completion means that the MUX has been commissioned and thereafter it was the responsibility of the state concerned to make further connections for flow of the data. In the last TCC/NRPC meeting also PSTCL had raised this issue and PGCIL agreed to depute their engineers at any two locations for demonstration of the same. It was successfully demonstrated that links have been commissioned. In this meeting also, PGCIL was requested to make the connections in any two of the locations of PSTCL and thereafter the same would be done by PSTCL themselves and if any problem would be encountered PGCIL would be approached for the same.
6.	Planning, procurement and deployment of Emergency Restoration System	In the 34 th NRPC meetings 20 th held on March, 2015	<ul style="list-style-type: none"> • DTL, PSTCL, UPPTCL and J&K - 02 nos. of ERS procured. • RRVNL - Rajasthan informed that NIT has been floated on 10.01.2019 for procuring ERS and bids were opened on 10.03.2019 for technical evaluation. TO be awarded by July`19 • HVPNL – Under Tendering. To be awarded by June`19. • PTCUL - DPR finalization is under process. NIT likely to be done by 21st June 2019. • HPSEBL - Matter under consideration regarding fund availability.

B.5 Training Programme/Workshop on Protection system Auditors from CPRI

- B.5.1 In 36th PSC meeting held on 19.09.2018, a proposal from Power System Division of Central Power Research Institute for conducting 03 days Training Programme/Workshop at Bangalore on Protection Audit for Protection System Engineers was discussed. They have proposed training at Rs.10,500 per participant exclusive of taxes. Participants have to make their own boarding and lodging arrangements. PSC recommended the training programmed to be organized by CPRI.
- B.5.2 The proposal of training programmes was also deliberated in 40th TCC/43rd NRPC meeting held on 29th /30th October 2018 wherein NRPC approved the proposal of carrying out 03 days Training programme on Protection audit at Bangalore through CPRI for 60 nos of participants from utilities of NR. The expenditure on training will be booked in NRPC fund.
- B.5.3 Thereafter, NRPC Sectt. has conveyed the acceptance of offer letter for training programmes to CPRI. Further, CPRI proposed to organize training in 02 batches of 30 participants. Accordingly, training programme for 1st and 2nd batch of participants has been held successfully from 27th to 29th March 2019 and 21st August to 23rd August 2019 at CPRI, Bengaluru.

Members may kindly take note of the information.

B.6 Cyber Security Preparedness Monitoring

- B.6.1 In the 37th TCC and 40th NRPC meeting Chief Information Security Officer (CISO), MoP gave a detailed presentation on potential cyber threats for power sector along with cyber incidences and shared the desired action points to counter cyber threat. All utilities were also requested to monitor actions being taken in regard to the following points and report the status:
- Appointment of organization-wise Chief Information Security Officers and its status.
 - Identification of organization-wise Critical Infrastructure and its status.
 - Preparation of organization-wise Crisis Management Plan and its status.
 - Status of Cyber Security Mock Drill activity in coordination with CERT-In.
 - Status of Training / Workshops on Cyber Security organized / participated by power sector entities.
 - Status of action taken on CERT-In / NCIIPC advisories.
- B.6.2 The status on aforementioned cyber security action points is as per Annexure- I.

All utilities kindly take note of the same and update the status.

B.6.3 In the 156th OCC meeting, it was mentioned that inherent vulnerability in the ICT infrastructure or website or web applications shall be accessed and remedial action thereon shall be taken by all utilities by conducting Vulnerability Assessment & Penetration Test (VAPT) of their respective ICT infrastructure, websites and web applications. The status of VAPT and cyber security audit is as per Annexure-II.

All other utilities are requested to intimate the status of VAPT conducted in their respective organization and VAPT plan for the future.

B.7 Construction of 2 Nos. of 400 kV bays under ISTS at 765/400 kV PGCIL substation, Varanasi (Agenda by POWERGRID)

B.7.1 2 nos. of 400 kV bays (GIS) at 765/400 kV Varanasi (PGCIL) substation for Jaunpur-Varanasi (PGCIL) 400 kV D/c line

Note: Above work also involves construction of new GIS building along with GIS bays.

B.7.2 GIS Bay Extension at Varanasi (PG) has been discussed and agreed in 4th meeting of Standing Committee of Transmission held on 25.07.2019. It was agreed to implement the above works by January, 2021 under ISTS.

Members may kindly approve.

B.8 Additional 1x500 MVA, 400/220kV (4th) transformer at Balachak (Amritsar) along with associated bays under ISTS (Agenda by POWERGRID)

B.8.1 Additional 1x500 MVA, 400/220kV (4th) transformer at Balachak (Amritsar) along with associated bays.

B.8.2 Augmentation of transformation capacity at Amritsar (PG) has been discussed and agreed in 4th meeting of Standing Committee of Transmission held on 25.07.2019. PSTCL requested that implementation to be carried out by June 2020 in compressed time schedule to ensure its availability in the next paddy season. CTU informed that implementation of transformer in such a short time period may not be feasible as the same has to be agreed in NCT & ECT wherein mode of implementation shall be decided. It was also discussed that the timeline for implementation may be decided by NCT/ECT.

Members may kindly approve.

B.9 220kV two Feeder bays at Saharanpur (400) PGCIL (Agenda by POWERGRID)

B.9.1 220 kV two Feeder bays at Saharanpur (400) PGCIL for Saharanpur (400) PGCIL-Deoband (Saharanpur) 220 kV D/C line.

B.9.2 Bay extension at Saharnpur (PG) has been discussed and agreed in 4th meeting of Standing Committee of Transmission held on 25.07.2019 for implementation under ISTS.

Members may kindly approve.

B.10 Transmission scheme for controlling high loading and high short circuit level at Moga substation (Agenda by POWERGRID)

B.10.1 In order to resolve the issues of high short circuit levels of Moga(PG) 400kV bus & high loading of 765/400kV transformers & 400/220kV transformers at Moga S/s, bus split arrangement was agreed in 4th meeting of Standing Committee of Transmission held on 25/07/2019 under ISTS.

400kV Bus splitting at Moga to be carried out in order to resolve the issues of high short circuit level and high loading levels

400kV Bus Section-1

- 400kV Kishenpur D/c feeders
- 400kV Hisar D/c feeders
- 2 nos. 765/400kV transformers
- 1 No. 50 MVAR

400kV Bus Section-2

- 400kV Jalandhar D/c feeders
- 400kV Bhiwani feeder
- 400kV Fatehabad feeder
- 400kV Nakodar feeder
- 400kV Talwandi Sabo/Malkana Feeder
- 4 nos. 400/220kV transformers
- 1 No. 125 MVAR

B.10.2 The above bus splitting would be taken up as Supplementary System strengthening scheme associated Bikaner-Moga line under ISTS.

Note: Bus splitting would involve running parallel GIS bus (Main-I/Main-II) to the existing bus. The proposed bus section – I arrangement would be transferred to GIS bus. Further, bus sectionalisers between AIS and GIS would be required. To accomplish the same, for Nakodar and ICT-II (765/400kV) feeders, one additional GIS bay module would be required and it shall be double breaker switching scheme. This arrangement would also avoid dismantling of existing buildings.

Members may kindly approve.

B.11 Modifications in the Transmission schemes for Solar Energy Zones (SEZs) in Rajasthan (8.9 GW) (Agenda by POWERGRID)

B.11.1 Transmission system for Solar Energy Zones (SEZs) in Rajasthan (8.9 GW) under Phase-I, was technically agreed in the 2nd meeting of Northern Region Standing Committee on Transmission (NRSCT) held on 13.11.2018. The scheme has also been approved in 45th NRPC meeting held on 08.06.2019.

B.11.2 The scheme inter-alia includes Fatehgarh II –Bhadla II 765 kV D/c line, length of which was estimated to be approx 100 km. Hence no reactive compensation was proposed for this line. Also, as per the survey done by BPC, route length of Fatehgarh-II – Bhadla-II 765 kV D/c line is now envisaged as 187 km. Therefore reactive compensation needs to be provided for Fatehgarh II –Bhadla II 765 kV D/c line.

B.11.3 Further, LILO of Fatehgarh –Bhadla 765 kV D/c line (operated at 400 kV) at Fatehgarh II substation has already been agreed as a part the subject scheme. Earlier route length of Fatehgarh –Bhadla 765 kV D/c (being implemented under TBCB separately) was envisaged to be approx 100 km. However, route length of the above line is now envisaged as 145 km. This LILO would result in formation of Fatehgarh – Fatehgarh II 765 kV D/c line (to be operated at 400 kV) and Fatehgarh II-Bhadla 765 kV D/c line. Earlier no reactors were provided in Fatehgarh - Bhadla 765 kV line (operated at 400 kV level) as its length was anticipated to be around 100 kms. After its LILO at Fatehgarh-II, length of Fatehgarh-II – Bhadla 765 kV D/c line is expected to be more than 150 kms, therefore there is need to provide switchable line reactors at Fatehgarh-II end of the Fatehgarh-II- Bhadla 765 kV D/C line.

B.11.4 Also, provision of 240 MVAR, 765 kV bus reactors with GIS bay at Phagi (RVPN) was agreed as a part of above scheme. It was also agreed that the spare 1x80 MVAR reactor of the existing 240 MVAR bus reactor at Phagi (RVPN) would also be used for proposed 240 MVAR bus reactors under ISTS. Subsequently, RVPN had intimated that no spare bus reactor is available at Phagi (RVPN) S/s. Therefore, there is need to include the 1x80 MVAR (single phase) spare unit along with 240 MVAR bus reactor at Phagi under ISTS.

B.11.5 After deliberations, following modifications in the already agreed transmission scheme for evacuation of 8.9GW RE power from SEZ in Rajasthan was agreed in 4th NR SCT meeting held on 25.07.2019:

Sl.No	Name of the scheme	Scope agreed in the 3 rd NRSCT/45 th NRPC	Modified scope agreed in the 4 th NRSCT
1.	Transmission system associated	1. LILO of Fatehgarh (TBCB) – Bhadla (PG) D/c (765kV line op. at	1. LILO of Fatehgarh (TBCB) – Bhadla (PG) D/c (765kV line op. at

Sl.No	Name of the scheme	Scope agreed in the 3 rd NRSCT/45 th NRPC	Modified scope agreed in the 4 th NRSCT
	with LTA applications from Rajasthan SEZ Part-A(RTM)	<p>400kV) line at Fatehgarh-2 so as to establish Fatehgarh (TBCB) – Fatehgarh -II 400kV D/c line (765kV line op. at 400kV) and Fatehgarh -II-Bhadla 400kV D/c line (765kV line op. at 400kV)*</p> <p>Charging of Fatehgarh-II –Bhadla section at 765kV level</p> <p>2. 2 no of 765kV bays at Bhadla for charging of Fatehgarh-II –Bhadla section at 765kV level</p>	<p>400kV) line at Fatehgarh-2 so as to establish Fatehgarh (TBCB) – Fatehgarh -II 400kV D/c line (765kV line op. at 400kV) and Fatehgarh -II-Bhadla 400kV D/c line (765kV line op. at 400kV)*</p> <p>Charging of Fatehgarh-II –Bhadla section at 765kV level</p> <p>1X240 MVAR switchable line reactor in each circuit at Fatehgarh-II end of the Fatehgarh-II- Bhadla 765 kV D/C line</p> <p>2. 2 no of 765kV bays at Bhadla for charging of Fatehgarh-II –Bhadla section at 765kV level</p>
2.	Transmission system associated with LTA applications from Rajasthan SEZ Part-B	<p>1. Fatehgarh-II – Bhadla -II 765kV D/c line</p> <p>2. 2 no of 765kV bays at both Fatehgarh-II & Bhadla -2 for Fatehgarh-II –Bhadla-II 765kV D/c line</p>	<p>1. Fatehgarh-II – Bhadla -II 765kV D/c line alongwith 1x240 MVAR switchable line reactor in each ckt at Fatehgarh-II end.</p> <p>2. 2 no of 765kV bays at both Fatehgarh-II & Bhadla -2 for Fatehgarh-II –Bhadla-II 765kV D/c line</p>
3.	Construction of Ajmer (PG)-Phagi 765 kV D/c line along with associated bays for	<p>1. Ajmer (PG)– Phagi 765kV D/c line 110km</p> <p>2. 765kV bays at Ajmer(PG) and Phagi for Ajmer (PG)– Phagi 765kV D/c line</p> <p>3. 1X240MVAR, 765 kV Bus</p>	<p>1. Ajmer (PG)– Phagi 765kV D/c line</p> <p>2. 765kV line bays (AIS) - 3 (2 bays at Ajmer (PG) S/stn and 1 bay at Phagi (RVPN) S/stn</p>

Sl.No	Name of the scheme	Scope agreed in the 3 rd NRSCT/45 th NRPC	Modified scope agreed in the 4 th NRSCT
	Rajasthan SEZ	Reactor with GIS bay at Phagi 765/400 kV S/stn	<p>3. 1 complete GIS DIA 765kV (2 main breakers and 1 tie breaker at Phagi (RVPN) S/stn</p> <p>4. 765kV reactor bay (GIS) -1 (2nd main bay of new DIA being created for termination of 765kV D/c line from Ajmer)</p> <p>5. 1X240MVA, 765 kV Bus Reactor (including 1X80 MVAR spare unit) with GIS bay at Phagi 765/400 kV S/stn</p>

Members may kindly note and approve.

B.12 Replacement of Old transformers/reactors (age more than 25 years) in the Northern Region (Agenda by POWERGRID)

B.12.1 Many of Transformers and Reactors in POWERGRID system are in service for more than 25 years and have completed their useful lives. The condition assessment of 57 equipment of Northern Region was carried out by POWERGRID and test results of 24 equipment which were found critical were reviewed by CPRI.

B.12.2 At present, CPRI has recommended for 08 nos. (02 ICTs & 06 reactors) for replacement. (List enclosed at Annexure – III) POWERGRID will approach CERC for their replacement under O&M add Cap. Other are under close monitoring for further review.

B.12.3 The following is proposed by POWERGRID for replacement:

- i. As power transfer through ICTs is continuously increasing and 500 MVA, 400/220kV transformers are generally being installed. It is proposed that the old 315 MVA ICT shall be replaced by 500 MVA ICTs to meet future requirement.
- ii. Further, as grid has grown very large, nowadays 125 MVAR Bus Reactors are mostly being installed to control Bus Voltage. It is proposed that replacement of old 50/63/80 MVAR Bus Reactor will be done by 125 MVAR reactor for better voltage control/ reactive power support.

Members may kindly deliberate and approve.

B.13 Cold Spare transformer requirement for Northern Region (Agenda by POWERGRID)

B.13.1 CERC had set up a Committee on dated 15.03.2018 consisting of representatives from CERC, NLDC, CEA & POWERGRID under the Chairmanship of the Chief (Engineering) of the CERC to assess the requirement of regional spares including bus reactors, line reactors, ICTs, etc. This would ensure reliability of the grid and reduce downtime in case of any failure/outage.

B.13.2 As per CERC Committee recommendation, the following spares transformers will be needed for Northern Region:

MVA Rating and Phase	Voltage Rating	Qty Required as per norms	Available Regional Spare	Qty. proposed for procurement
1Ø-500MVA	765/400	4	3	1
1Ø-333MVA	765/400	2	1	1
3Ø-500MVA	400/220	5	0	5
3Ø-315MVA	400/220	9	6	0**
1Ø-105MVA	400/220	3	0	3
3Ø-200MVA	220/132	1	0	1
3Ø-100MVA	220/132	1	0	1
Total		25	10	12

** The 3Ø-315MVA spare requirement will be met through proposed 3Ø-500MVA transformer. The requirement of reactor is being worked out.

Mambers may kindly approve 12 nos of cold spare transformers of various ratings as per CERC committee recommendation. The Tariff for the investment made is to be shared by all constituents as per CERC notification.

B.14 Frequent tripping of 220kV Sohawal-Tanda-I & II line (UPPTCL) (Agenda by POWERGRID)

B.14.1 As you may be aware that the 220 kV Sohawal - Tanda -I &II have been charged in May 2019. These lines are frequently tripping due to faults in the transmission lines(owned by UPPTCL). Due to the same, heavy faults currents are being fed from 400/220 KV transformers installed at Sohawal substation (POWERGRID). The flow of fault currents frequently through transformer is detrimental to the health of transformer and may lead to premature failures. So far 18 tripping have occurred in last three months.(Details enclosed at Annexure – IV)

B.14.2 It is therefore requested that UPPCL may be advised to rectify the line defects of the transmission lines to prevent such faults in future.

Mamebrs may kindly deliberate.

B.15 Reliable Communication Scheme (Additional) under Central Sector for Northern Region (Agenda by POWERGRID)

B.15.1 During 39th & 40th NRPC meetings, implementation of Reliable Communication Scheme envisaging 5474km approved for implementation by POWERGRID to provide connectivity of substation of 132 kV and above under central sector as per directive of MOP, GOI.

B.15.2 POWERGRID informed that in order to provide reliability and redundancy in ISTS communication system in line with draft ‘Manual of communication planning in power system operation, 2019 (CEA)’, and also Communication Regulation 2017, following additional Central Sector fibre optic links are to be established for building path redundancy and route diversity for reliable data & voice connectivity:

S.No.	Name of Link	Route Length(km)	Purpose
1	400kV Panchkula-Patiala	66	Physical Path Redundancy & route diversity for Panchkula S/s

S.No.	Name of Link	Route Length(km)	Purpose
2	400kV Nalagarh-Patiala	94	Reliable ICCP link between HP, Punjab and NRLDC
3	400kV JalandharMoga	85	Physical Path Redundancy & route diversity for Jalandhar (PG) through Central Sector links.
4	400kV Parbati PS(Banala) - Amritsar	250	Path Redundancy & route diversity of Parbati PS (Banala) & Hamirpur through Central sector network.
5	LILO of Parbati(Banala)- Amritsar at Hamirpur	7	
6	400kV Kurukshetra-Malerkotla PG	180	Path Redundancy of Malerkotla (PG) through central sector network.
7	765kV Meerut - Moga	337	Route diversity of Moga S/S & creation of reliable ICCP link between Punjab, Rajasthan (through upcoming 765kV Bikaner Moga under GEC Part D & NRLDC).
8	400kV Bassi-Sikar	170	Redundancy of Sikar S/S
9	400kV Dehradun-Bagpat	165	Physical path Redundancy & for route diversity of Bagpat S/S
10	400kV RAPP B -Jaipur South with LILO at Kota	300	Redundancy of Kota & RAPP through Central Sector network
11	400kV Allahabad-Singrauli	200	Redundancy of Singrauli
12	400kV Allahabad-Fatehpur 765	130	Strengthening of Inter regional Connectivity(WR-NR). (400kV Fatehpur –Mainpuri is under implementation under Reliable Communication scheme)
13	400kV Patna-Ballia	200	Strengthening of Inter regional connectivity ER –NR.
14	400kV Kanpur-Ballabgarh	370	Redundancy of old Agra-Kanpur link which has reached the end of its useful life of 15 years.

S.No.	Name of Link	Route Length(km)	Purpose
15	Chittorgarh 400kV RVPN to Chittorgarh 220 RVPN	52	Redundancy of Chittorgarh 220/132 through central sector network
16	400kV Lucknow – Kanpur	156	Redundancy of network and avoiding multiple sub-stations
	TOTAL(Km)	2762 km	

B.15.3 Further, POWERGRID informed that estimated cost for above proposal is Rs 92 Cr. However, the actual quantity/cost shall be discovered only after implementation. The Tariff for the investment made is to be shared by the constituents as per CERC notification. The scheme shall become part of existing Commercial Agreement signed for ULDC Project and can be implemented as part of approved 'Reliable Communication Scheme of Northern Region'.

B.15.4 After detailed discussion in the 15th Test Committee of Northern region held on 07.08.2019, members agreed for additional requirement of 2762Kms of Fiber Optic Communication System proposal and its implementation as part of approved 'Reliable Communication Scheme of Northern Region'.

Members may deliberate the same and consider for approval.

B.16 Establishment of State-of-the-Art Unified Centralized Network Management System U-NMS for ISTS and State Utility Communication Network.(Agenda by POWERGRID)

B.16.1 In line with discussions in 45th NRPC meeting, project for establishment of State-of-the-Art Unified Centralized network Management System U-NMS for ISTS and State Utility Communication Network was discussed in 15th TeST Committee meeting of Northern Region held on 07.08.19 at NRPC New Delhi.

B.16.2 POWERGRID briefed the committee about the CERC notified Communication Regulation May 2017 which envisages Centralized Supervision System for ISTS Communication.

As per the regulation clause no 7.2 (vii):

“CTU shall be the Nodal Agency for supervision of communication system in respect of inter-State communication system and will implement centralized supervision for quick fault detection and restoration.”

- B.16.3 POWERGRID informed that in line with regulation, provisions of Centralized NMS and Centralized Monitoring by integrating its NMS with other users NMS, has been kept in the documents of Technical standard & Manual of Communication Planning Criteria being finalized by CEA. In addition to this, guideline on availability of Communication system for ISTS has been submitted to CERC by CEA for which centralized NMS/OSS is considered essential.
- B.16.4 POWERGRID made a detailed presentation on Unified Network Management System (U-NMS) Project to be implemented for managing ISTS Communication System at Regional and National level. Presentation covered various technical aspects of U-NMS, configuration at Regional and National level, integration of existing NMSs and Network Elements not having visibility in NMSs etc.
- B.16.5 It was informed that U-NMS configuration proposed at Regional and National levels shall provide graphical representation of topology of nodes and links, auto discovery and rediscovery of Network Elements and sub-systems, Facility of end to end provisioning of bandwidth centrally, Fast fault resolution and reduced restoration times, Proactive maintenance and Customer support and working out channel availability etc., apart from analytics for predictive maintenance etc.
- B.16.6 POWERGRID informed that U-NMS Project is conceived to facilitate Centralized Supervision for ISTS Communication in compliance to CERC Regulation for Communication System notified in May'17 as present NMSs do not have visibility of entire network and are not capable to support the requirements envisaged for ISTS Communication in CERC Regulation. Proposed U-NMS configuration at regional level shall also consider integration of NMSs of State Communication Network to facilitate STUs monitor and maintain their network with the help of Work Station provided at their location having direct access of Regional Server.
- B.16.7 U-NMS Project implementation Schedule is considered as 24 months and estimated cost for National and Regional U-NMS is Rs. 99.93 Crs for each Regional and Rs. 99.93 Crs for National U-NMS excluding AMC cost which is estimated as Rs. 2.6 Crs for 6 years after Warrantee period. However, the actual cost shall be discovered only after implementation. The Tariff for the investment made is to be shared by all constituents as per CERC notification. The scheme shall become part of existing Commercial Agreement signed for ULDC Project.
- B.16.8 TeST Committee members deliberated on U-NMS proposal. The need of implementation of U-NMS at Regional and National level was agreed by all members considering provisions of Communication Regulation.

Members may deliberate the project for Establishment of State of the Art Unified Centralized Network Management System U-NMS for ISTS and State Utility Communication Network and consider approval of the same. The Tariff for the investment made is to be shared by all constituents as per CERC notification. The scheme shall become part of existing Commercial Agreement signed for ULDC Project.

B.17 UPPTCL Communication issues (Agenda by POWERGRID)

B.17.1 UPPTCL had requested POWERGRID in 15th TeST Sub-committee of NRPC to arrange PDH in place of Nokia equipment at 18 locations. POWERGRID has agreed and confirmed that requirement of PDH at these locations would be considered under the ongoing reliable communication scheme.

B.17.2 It is requested that arrangement of PDH equipments through POWERGRID may kindly be approved in NRPC meeting.

B.18 Signing of MoU between POWERGRID & HVPNL for HVPNL owned bays in POWERGRID Gurgaon & Jind substations (Agenda by POWERGRID)

B.18.1 Following HVPNL owned bays have been commissioned in POWERGRID Gurgaon and Jind substations:

(i) Details of HVPNL owned bays at POWERGRID Jind SS

<u>Bay no.</u>	<u>Type of bay</u>	<u>Date of commissioning</u>
1) Bay 401 (Kirori Ckt-1)	Line Main bay	31/12/2013
2) Bay 404 (Kirori Ckt-2)	Line Main bay	31/12/2013
3) Bay 402 (Kirori Ckt-1)	Line Tie bay	31/12/2013

(ii) Details of HVPNL owned bays at POWERGRID Gurgaon SS

<u>Bay no.</u>	<u>Type of bay</u>	<u>Date of commissioning</u>
1) Bay 408 (Dadulatabad Ckt-I)	Line Main bay	27/06/2013
2) Bay 409 (Dadulatabad Ckt-II)	Line Main bay	27/06/2013

B.18.2 For smooth operation and maintenance of these bays, a MoU has to be signed between HVPNL and POWERGRID as per prevailing practice & rates. POWERGRID has been pursuing HVPNL for signing of MoU for maintenance of above-mentioned bays since 2014.

B.18.3 NRPC may suitably advise M/s HVPNL for signing of MOU at the earliest for better service and reliability of above mentioned bays.

HVPNL may kindly update the status.

B.19 Long Term Access (LTA) for Tehri PSP (1000 MW) and VishnugadPipalkoti HEP (444 MW) (Agenda by THDCIL)

B.19.1 Tehri Pumped Storage Plant (1000 MW)

- Tehri Pumped Storage Plant (PSP) involve construction of an underground Machine Hall housing 04 reversible pump turbine units of 250 MW each on left bank of river Bhagirathi.
- The operation of Tehri PSP is based on the concept of recycling of water between upper reservoir and lower reservoir. The Tehri Dam reservoir shall function as the upper reservoir and Koteshwar reservoir as lower balancing reservoir.
- The allocation of power from the TehriPSP has been done by MoP (Gol) and PPAs for the project have been signed with all the concerned beneficiaries.
- The Connectivity and Long Term Access (LTA) has been granted to Tehri PSP by PGCIL vide letter dtd.18.12.2015.
- THDCIL has been perusing the beneficiaries for signing of LTAA with PGCIL, but the beneficiaries are refusing to sign the LTAA, although they have already signed the long term PPA with THDCIL.

B.19.2 VishnugadPipalkoti HEP (444 MW)

- THDC India Limited is implementing the VishnugadPipalkoti Hydro Electric Plant (444 MW) in the State of Uttarakhand.
- The allocation of power from the VPHEP has been done by MoP (Gol) and PPAs for the project have been signed with all the concerned beneficiaries of Northern Region.
- The power from VPHEP is to be supplied through the Inter State Transmission System (ISTS) being laid down by the PTCUL and Power Grid Corporation of India Limited.
- The Connectivity has been granted by PGCIL vide letter no. C/CTU-Plg/CON/N/THDC/VishnugadPipalkoti HEP, dtd.09.08.16.
- The beneficiaries are required to apply for Long Term Access (LTA) and sign Long Term Access Agreement (LTAA) with PGCIL which is laying the transmission system in association with PTCUL for VPHEP, in accordance with clause 23.1 & 24.1(b) of the applicable Connectivity Regulations, 2009 of the Hon'ble CERC.
- The beneficiaries were persuaded to apply for LTA & sign LTAA with PGCIL, but most of the beneficiaries were having lackadaisical approach.
- THDCIL applied for LTA on behalf of the beneficiaries as advised by TCC and later concurred by NRPC in the meetings held on 27.10.2017 & 28.10.2017 at Srinagar, J&K.

- LTA application No. 1200001113 was submitted online successfully on 13.4.2018 by THDCIL along with the requisite statutory fee, on the LTA-2 Format available online at PGCIL website.
- THDCIL application was rejected by PGCIL vide letter dated 06.06.2018 on the ground that the application has not been submitted properly as screen shot of the application was submitted instead of pdf and for want of NOC from the concerned STUs
- The matter has been taken up with PGCIL vide our letter no.734 dtd. 14.6.2018 and 1311 dtd 13.8.2018 to review and reconsider our application and accord LTA at the earliest.
- VPHEP being an inter-state generating station for which PPAs have been signed with all the beneficiaries and transmission line being part of Inter State Transmission System, THDCIL is not required to submit the NOC from STU. This was also agreed by PGCIL in the meeting held on 24.04.2017 at PTCUL office Dehradun.

B.19.3 Since, as per CERC guidelines all the beneficiaries are required to sign Long Term Access Agreement (LTAA) with PGCIL within one month from the date of accord of LTA otherwise the LTA shall be liable for revocation, THDCIL sought consent of all the beneficiaries in this regard vide letter dtd. 17.12.2018. In spite of persuasion by THDCIL, only three beneficiaries namely Uttarakhand Power Corporation Ltd., U.P. Power Corporation Ltd., and Punjab State Power Corporation Ltd. have given their consent till date.

B.19.4 The non signing of the LTAA by the beneficiaries is resulting in PTCUL / PGCIL's inability to proceed for implementation of the transmission network. After due execution of the PPA, wherein the beneficiaries have duly agreed to purchase the power, there is no cause or justification for them, not to undertake the consequential actions of signing the LTAA for evacuation of the power from the bus bar of the projects. The above inaction of the beneficiaries is against public interest and throwing the entire scheme of development of the power projects and the development of the evacuation system out of gear. Therefore, THDCIL, requests immediate intervention of TCC and NRPC in the matter.

Members may kindly deliberate.

B.20 Revision in scope or works of 400KV Dhanansu (Agenda by PSTCL)

B.20.1 The amended scope of work as agreed upon in the NRSCT meeting is as follows:

- a. Establishment of 2*315 MVA, 400/220 S/s at Dhanansu. One 315 MVA, 400/220 KV ICT spared from 400 KV Nakoder shall be installed at 400KV Dhanansu. The 2nd 315 MVA, 400/220KV ICT shall also be a spared ICT from the existing 400KV network of PSTCL.

- b. LILO of one circuit of 400 KV Jalandhar-Kurukshetra D/c line at Dhanansu (Quad Moose).
- c. 220KV outlets from Dhanansu 400/220 KV substation:
 - * Dhanansu – Kohara 220KV D/c line Appx. Line length – 12km(0.4sq")
 - * Dhanansu – Ikohara 220KV D/c line Appx. Line length – 10km(0.4sq")
 - * Doraha (Dhanansu) – Doraha 220KV D/c line Appx. Line length – 10 Km (0.4sq")

Members may kindly deliberate and approve.

B.21 Creation of new 400 KV S/s, 2*500 MVA ICTs at Ropar in the premises of existing 220 KV Guru Gobind Singh Super Thermal Plant (GGSSTP) Ropar (Agenda by PSTCL)

B.21.1 Creation of a new 2*500 MVA, 400/220 kv substation at Ropar with the following connectivity:

- a. Creation of 400 KV S/s Ropar with installed capacity of 2*500 MVA, 400/220 kv ICT's.
- b. LILO of both circuits of 400 KV Ludhina PGCIL-Koldam at proposed 400 KV S/s Ropar, LILO Length = 15 km (approx.).

Members may kindly deliberate and approve.

B.22 Additional 1*500 MVA 400/220 KV Transformer at Amritsar substation. Balachak(Agenda by PSTCL)

B.22.1 1 No. additional 500 MVA, 400/220KV (4th) transformer at Balachak be provided under ISTS scheme to meet N-1 contingency.

Members may kindly deliberate and approve.

B.23 Certification of 220KV D/C Charor-Banala line under construction by HPPTCL as Deemed ISTS (Agenda by HPPTCL)

B.23.1 In 42nd TCC/45th NRPC meetitngs, it was clarified by HPPTCL that 220kV Charor-Banala line under implementation by HPPTCL is not having any intra-state drawl point and is purely carrying inter-state power. Hence, requested for early certification of the line as deemed ISTS.

- B.23.2 HPPTCL submitted that both circuits of 220kV Charor-Banala D/c line were energized on 24.07.2019 from Banala 220/400kV substation of PGCIL in open circuit condition at Charor end. Requisite shutdown for shifting of connectivity of Malana – II HEP to 220kV Charor-Banala line from 220kV ADHPL Prini – Nalagarh line has been discussed in the OCC meeting on 16th September 2019, wherein it was decided that shutdown may be taken after the availability of telemetry at Malana-II.
- B.23.3 HPPTCL opined that power of Malana-II HEP can be evacuated through 220kV Charor-Banala line of HPPTCL. HPPTCL is going to file petition in CERC for tariff determination within a month and CERC insists for certification on the line as deemed ISTS before petition can be taken up.
- B.23.4 In view of the above, HPPTCL request that certification of 220KV D/C Charor-Banala line as Deemed ISTS may be issued without waiting for data of four/two quarters.

Members may kindly deliberate.

B.24 Status telemetry of TCSC / FSC(Agenda by NRLDC)

- B.24.1 NRLDC has been continuously requesting utilities to ensure reliable telemetry at the control centre. However, it is being observed that FSC/ TCSC status is not available from following locations.

S. No.	Station	Line	FSC Data Status
1	Unnao	Bareilly (UP)	Not reporting

- B.24.2 UPPTCL and POWERGRID are requested to arrange for integration of telemetry of FSC/TCSC at the earliest. This matter was also discussed in 42nd TCC Meeting, wherein UPPCL was requested to procure the AI/DI card or take help from Haryana / HP and after that FSC/TCSC status can be made available.

UPPTCL/POWERGRID to update the status.

B.25 Telemetry from Kurukshetra HVDC as per agreed in the separate meeting (Agenda by NRLDC)

B.25.1 In meeting held at Kurukshetra, POWERGRID had agreed to provide telemetry of additional data of HVDC as shown below which is still to be completed.

Sl. No.	Description	Clause in MoM dated 12-07-2018
1	Extinction angle (<i>inverter and rectifier stations</i>) and Firing angle (<i>inverter and rectifier stations</i>)	17
2	Telemetry of "real-time mode (<i>bi-polar with both DMR, bi-polar with one DMR, etc.</i>) of operation" and "instance of changeover"	20

B.25.2 Matter was discussed in 42nd TCC Meeting & 45th NRPC Meeting also in which NRPC requested POWERGRID to take up the matter with OEM once again.

B.25.3 Further, POWERGRID vide letter no. CC/AM/HVDC/CK/NRPC dated 13.08.2019 has informed that issue was pursued with OEM, however OEM has reiterated the constraint that the firing and extinction angle are part of control strategy which comes under proprietary solution of the contractor and expressed inability to share the same on telemetry data. Hence, POWERGRID requested that issue may be dropped. Copy of the letter enclosed as Annexure-V.

Members may kindly deliberate.

B.26 Winter Preparedness (Agenda by NRLDC)

B.26.1 At the onset of winter in Northern region (NR), necessary planned and agreed actions have to be ascertained beforehand for issues experienced during last winter seasons in NR. Majority of the issues faced during winters used to be on account of the following:

i. Large difference in 'peak and off-peak hours' load

During winter, Northern region load is less in comparison to Summer and Monsoon period. There is also huge difference in Peak and other than peak hour load in Winters compared to Summer and Monsoon period. Due to less load and large variation in peak and other than peak hours' load, inadvertent change in voltage and frequency has been experienced if generation ramping couldn't be commensurate with load ramping or if load generation balance has not been planned or forecasted properly. During lean load period i.e. during night hours, high voltages is also prominent throughout the winter. To avoid frequency, voltage and line loading excursion, following has been agreed and again suggested:

- a. Demand forecast and ramp forecast
- b. Ramping of generation commensurate with load ramp
- c. Load generation balancing/Portfolio management
- d. Optimization of Hydro resources
- e. Avoid sudden connection/disconnection of large load (Staggering of load group)

ii. High voltages

High voltages have become common phenomenon during winter and it becomes more severe during night hours when load of the major states of NR is almost ~40-50% of day time load. In case of Punjab, Haryana and Delhi, load during night remains only ~ 30% of the peak load. Due to such scenario, voltages become very high during night hours on many locations in NR. Various studies and solutions have been deliberated in various OCC/TCC meetings to counteract the high voltages in such situation and same is represented below:

- a. Monitoring of Reactive power resources through SCADA displays for optimal use of reactive resources
 - Updated SCADA displays for Bus reactor status and voltage
 - Displays for Line reactor that can be used as Bus Reactor (BR) and its real time status
 - Displays for HVDC filter bank, SVC, STATCOMs etc.
 - Displays for Generator real time response vis-à-vis capability curve comparison to explore the margin available
 - Displays for generator having synchronous condenser capability and its real time status
- b. Ensure switch-off capacitor banks

It is general practice that as the demand starts decreasing on start of winter season, capacitor banks should be switched off as per the voltage profile. However, there is no real time monitoring for capacitor bank switching at SLDC level. This issue has been discussed in previous OCC/TCC meetings, that a mechanism should be devised by which smooth real time monitoring of status of capacitor bank can be done at SLDC level and the same may be shared to RLDC/RPC for information.

- c. Line Reactor switched as Bus reactor -Real Time Issues:

It has been observed that line reactor that can be switched - as bus reactor couldn't be utilized during real time operation due to various issues i.e. lack of trained manpower during hours of need, non-availability of manpower (in case of un-manned substations), inadequate switching arrangement etc. The same issues have been highlighted in OCC/TCC meetings and again it is being requested that all possible switching arrangements shall be ensured for all those line reactors that can be taken as bus reactor for containing high voltages in case line is not in service. List of all line reactor that can be switched as BR is enclosed as Annex-VI. Moreover, trained and adequate manpower shall be ensured at all control centres especially during night hours for carrying out the switching operation i.e. opening of EHV line, switching of LR as BR, taking line back in service during morning hours etc. During winter nights hrs, it has been observed that, switching of reactor/lines takes long time due to lack of experienced/trained resource person.

d. Tap optimization

Tap optimization studies has been carried out by NLDC/RLDCs at 765/400 & 400/220kV level on the basis of Simulation studies, Real time scatter plots of HV & LV side of ICTs, NRPC Reactive power account, etc. The same has been presented at various OCC/TCC meetings including the improvement in voltage profile before and after tap change exercise. It has been requested to all the SLDCs also to carry out the same exercise at 220kV and below ICTs to minimize the reactive power exchange from HV to LV Grid. In fact, it has been observed that reactive power at various location injected into HV side and all these location need check and actions. By observing the SCADA data of ICTs, NRPC reactive account, historical trend etc. one would be able to locate the problem and respective solution thereof. SLDCs are yet to share action plan in this regard. This exercise is very important and it is again requested that SLDCs should do tap optimization studies and utilize it for better system operation.

e. Dynamic response by Generators

Northern Region has been experiencing very high voltages during winter nights. The high voltage used to be prominent in Punjab, Haryana, Delhi, eastern UP, HEPs etc. As per practice, all static and possible reactive power resources used to be utilized optimally for containing high voltages. Despite all the efforts and even after opening of various EHV lines, high voltage at various locations persist for considerable period of time. To further combat high voltage scenario especially during night, it has been emerged from the discussion in various OCC/TCC meetings that adequate dynamic response from generating station is desirable which is missing since long.

Thereafter, it has been decided in OCC/TCC meetings that all the generator

S.No.	Agency	400kV & above	Capability Curve unit wise at 0.95*p.f. (MVAR)	Response plant as whole as per SCADA	Remarks
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would actively participate in delivering the dynamic response in line with various CERC/CEA regulation for grid safety and reliability. Hence, it has been agreed in various fora, that dynamic reserves in the system should be explored during this hour of need i.e. generator capability to absorb reactive power, HEPs to operate in condenser mode, old/retired thermal/gas station need to explore to operate in condenser mode for containing the high voltages. However, the status of generator response vis-à-vis capability curve and condenser operation mode is given below:

Table-1: Reactive Power absorption by Major thermal stations

S.No.	Agency	400kV & above	Capability Curve unit wise at 0.95*p.f. (MVAR)	Response plant as whole as per SCADA (MVAR)	Remarks
1.	NTPC	Dadri Stage-II	~ (-)175	~(-)100	Absorption when vol> 415kV
		Singrauli 500 MW	~ (-)180	~ (-)200	Scope for improvement as per capability curve and data issues at CLP Jhajjar
		Rihand-I/ II / III	~ (-)180	~ (-)300	
		Jhajjar	~ (-)175	~ (-)300	

2.	Punjab	Rajpura	~ (-)375	~ (-)400MVA _r	Scope for improvement as per capability curve and data issues at CLP Jhajjar
		Talwandi Saboo	~ (-)240	~ (-)400MVA _r	
3.	Haryana	Khedar	~ (-)210	~ (-)150)MVA _r	Data issues at CLP Jhajjar
		CLP Jhajjar	~ (-) 210	~ (-)300MVA _r	
4.	Rajasthan	Suratgarh	~ (-)250	~ (-)40MVA _r	Telemetry issues
		Kawai	~ (-)210	~ (-)150MVA _r	Scope for improvement
		Kalisindh	~ (-)200	~ (-)150MVA _r	
		Chhabra Stage-I	~ (-)60	~ (-)50MVA _r	Data not reliable
		Chhabra Stage-II	~ (-)220	~ (-)230MVA _r	Scope for improvement

S.No.	Agency	400kV & above	Capability Curve wise unit at 0.95*p.f.	Response plant as whole as per SCADA	Remarks
5.	Uttar Pradesh	Anpara-B	~ (-)175	~(±)100MVA _r	Data need check
		Anpara-C	~ (-)230	~(+)100MVA _r	Need check
		Anpara-D	~ (-)175	~(±)100MVA _r	Need check
		Lalitpur	~ (-)250	~ (-)100MVA _r	Data not reliable
		Bara	~ (-)250	~ 100MVA _r	Need data check
		Rosa	~ (-)100	~ (-10)MVA _r to 50 MVA _r	Data not reliable

* As per CEA connectivity regulation, A1, para 5, 'Generating Units located near load center, shall be capable of operating at rated output for power factor varying between 0.85 lagging (over-excited) to 0.95 leading (under-excited) and Generating Units located far from load centres shall be capable of operating at rated output for power factor varying between 0.9 lagging (over-excited) to 0.95 leading (under-excited).

Provided that all generating units commissioned on or after 01.01.2014, shall be capable of operating at rated output for power factor varying between 0.85 lagging (over-excited) to 0.95 leading (under-excited)'

Monitoring of reactive power response of major generating station is being shown by NRLDC at monthly OCC meetings and it has been observed that after lot of persuasion, significant response from many generator is yet to come. It has been requested in OCC meeting that every state/SLDC should start focus on big generator sequentially to resolve all the SCADA/telemetry/plant reactive response if any so that desirable response can be achieved for better system operation.

Table-2: Synchronous condenser mode of operation

S.No.	Agency	Station trial tested	Status of other station/trial testing schedule	Remarks
1.	NHPC HEPs of NR	Chamera-1 Unit #2 and Chamera-2 unit #3	NHPC shared that synchronous condenser operation is possible only in Chamera-II HEP, other NHPC plants have design limitations	MoM of 42 nd TCC & 45 th NRPC meeting
2.	Tehri HEPs	Tehri Unit #1 & 2	Tehri Unit # 3 & 4	
3.	Punjab HEPs	OEM has confirmed capability of RSD to operate in condenser	Punjab may update the plan for trial schedule	

		mode.		
4.	Rajasthan HEPs	JawaharSagar HEPs and Rana PratapSagar can't operate in synchronous condenser mode due to old age	SLDC Rajasthan may like to confirm	
5.	Uttar Pradesh HEPs		SLDC UP may like to confirm	

S.No.	Agency	Station trial tested	Status of other station/trial testing schedule	Remarks
6.	Uttarakhand HEPS		SLDC Uttarakhand may like to confirm	
7.	Himachal Pradesh HEPs	Larji Unit #3	SLDC HP may update the status	
8.	Jammu & Kashmir HEPs		SLDC J&K may p update the status	
9.	BBMB HEPs	Pong HEPs	BBMB may update for other stations	
10.	NTPC Gas station	NTPC informed that due to clutch arrangement issue the gas stations Anta, Auraiya, Dadri, Bawana are not capable of running in Condenser mode.		(MoM of 139 th OCC)
11.	Delhi Gas station		Delhi may update regarding exploring of Old	

			GTs for operation in condenser mode	
12.	Uttarakhand Gas stations	Shrvanti expressed its inability to operate in condenser mode	SLDC Uttarakhand may Update of other gas station	142 nd OCC

It is to be highlighted again that as per discussion in 156th OCC meeting, MS, NRPC stated that all hydro generators are generally capable of running as synchronous condenser mode, therefore, all the hydro generators were directed to show the capability to operate in synchronous condenser mode and if any hydro generator is showing inability for the same, a certificate from OEM needs to be submitted to NRPC/NRLDC along with valid reasons. However, TCC (42nd TCC & 45th NRPC) suggested that if any hydro generator is showing inability for synchronous condenser operation than its written submission will suffice, a separate certificate from OEM needs not to be submitted to NRPC/ NRLDC. Accordingly, all are requested to update the status of respective station regarding their ability to operate in condenser mode and submit either the trial schedule or written submission for plant wise with relevant reasons in case of any issues in operating the condenser mode.

f. EHV line opening

EHV line opening has been the last resort to contain the high voltages in the Grid. It is practice that simulation studies should be exercised first to check the MVA_r/Voltage relief before opening EHV lines. Therefore, based on studies, a list of lines should be kept ready that can be opened to contain HV and its effectiveness should be monitored. It is advisable to ensure the parallel path or reliability of parallel corridors to avoid any loadings/contingency issue. Timely return of lines shall also be check before demand hours.

iii. Tripping of EHV line during fog/Smog conditions

It has been observed since long that many EHV line tripped during winter due to weather condition e.g. fog/smog. Various actions have been deliberated in previous OCC/TCC meeting to effectively reduce such tripping are as:

- Locate the fog dominate area and line crossing these location:
It has been decided that line which has been tripped frequently during winter in such weather conditions should be analyzed and checked whether insulator cleaning or polymer replacement is to be done.
- Based on above list, prioritize the insulator cleaning and polymer replacement beforehand so that any unusual tripping can be avoided during winters

- Status of polymer replacement of line is enclosed in Annex-VII, members are requested to please update and share the schedule for insulator cleaning and insulator replacement if any.

B.27 Reliability Issues (Agenda by NRLDC)

B.27.1 As per CERC procedure of congestion management, each SLDC have to assess its transfer capability in co-ordination with RLDC. It has been requested since long, that each SLDC should start its control area transfer capability studies and share it with NRLDC/NRPC. It is encouraging to share that some of the states i.e. Punjab, Uttar Pradesh, Delhi etc. have started working on its network database updation and respective simulation studies on it. Rajasthan, Haryana has initiated network database updation though simulation studies are yet to start. Other states e.g. Uttarakhand, Himachal Pradesh, Jammu & Kashmir are requested to actively participate in simulation studies.

B.27.2 Moreover, it has been highlighted that ATC/TTC study is dynamic in nature and it should be computed on regular basis i.e. on monthly basis. It has been observed that Punjab, UP, Delhi are doing simulation study during high load conditions only i.e. during summer, however as already mentioned that such simulation studies should be done and shared on regular monthly basis. With the integration of renewable energy, it would become more important to study the various generation scenario for computing the transfer capability and other studies. Therefore, it is requested to all the states to start the network updation in off-line/online simulation tools and share the simulation studies. In addition, reactive/Voltage studies has also become equally important with changing scenario of load/generation pattern and integration of large renewables in the system. It has been requested to all the SLDCs to practice steady state study first, then PV/QV and next level for dynamic studies. For all the above studies, foremost thing is to update and model the network of respective control area. Hence, all the SLDCs should maintain updated network database along with the dynamic models and start the steady state & dynamic studies. NRLDC would be pleased to extend any help regarding simulation tools and other related issues.

B.27.3 As per the data available at NRLDC, transfer capabilities study for NR states is tabulated below:

S.No.	States	ATC (MW)	Constraints	Remarks
1.	Punjab	6400	N-1 of 400/220kv Amritsar, Rajpura,	In co-ordination with Punjab SLDCs

			Muktsar ICTs	
2.	Haryana	6900	N-1 of Deepalpur, Panipat ICTs	Haryana may update

S.No.	States	ATC (MW)	Constraints	Remarks
3.	Rajasthan	Under study (Large network change, requesting SLDC Rajasthan to co-ordinate)	N-1 of Phagi, Bhadla, Akal is being observed as per SCADA data	-SPS for Kawai-Kalisindh-Chhabra complex pending -N-1 non-compliance at Akal and Bhadla ICTs - Low voltage at Bhadla during high solar generation
4.	Delhi	6500	N-1 of Mundka and Bamnoli	In co-ordination with Delhi SLDCs
5.	Uttar Pradesh	12100	N-1 of Agra PG, May, Sarnath, Allahabad etc	In co-ordination with UP SLDCs

In view of winter scenario, hilly states i.e. Uttarakhand, HP, J&K are requested to co-ordinate the TTC/ATC studies of respective control area in advance.

B.28 Requirement of model data for simulation of power system stability and dynamics(Agenda by NRLDC)

B.28.1 As we all are aware that reliabilities studies are utmost important for large and complex grid. Further, in view of large renewable integration, it become more challenging to study the various generation scenarios, reactive power study and dynamics of the system. Therefore, in view of all these envisaging challenges, it is again requested to model the network data accurately. Further, it is being advised to all the states to formulate a procedure to collect all the network related data for the existing element as well as for upcoming new element. NLDC/POSOCO has formulated a guideline for collecting data for generator/exciter/governor/stabilizer/HVDC/FACTS/SVC/STATCOMs/WTG/PV etc. and available at given link (NRLDC website-> Documents-> Dynamic data modeling template) <https://nrlc.in/download/dynamic-data-modeling-templates/?wpdmdl=7337>. States may also adopt same guidelines for compiling data for their control area network element. Hence, it is requested to strictly adhere to ensure all the steady and dynamic model data for new element as per various guideline of CEA/CERC.

B.28.2 Further, status of dynamic model data of the generators of all the control area of NR is enclosed in Annex-VIII. All are advised to submit the remaining data as per the guideline attached in above link.

C. COMMERCIAL ISSUES

C.1 Default in payment of outstanding dues and surcharge by beneficiaries

C.1.1 The details of outstanding dues are as under:

THDC (as on 31.08.19)

Discoms	Principal Outstanding (Rs. in Cr.)	Principal due for more than 45 days (Rs. in Cr.)	Late Payment Surcharge	Remarks
BRPL, Delhi	16.75	10.87	125.58	(A) Payment due for the bills raised in the months For LPSC bills - Aug'13 to Aug'19 (B) BRPL is deducting TDS on LPS bills but not releasing balance payment.
BYPL, Delhi	113.33	113.33	152.10	(A) Payment due for the bills raised in the months (i) For Energy bills- Mar'15 to Aug'19 (ii) For LPSC bills - Mar'11 to Aug'19 (B) BYPL is deducting TDS on LPS bills but not releasing balance payment
PDD, J&K	212.78	204.69	24.96	Payment due for the bills raised in the months (i) For Energy bills - June'18 to Aug'19 (ii) For LPSC bills - June'18 to Aug'19

Discoms	Principal Outstanding	Principal due for more than 45 days	Late Payment Surcharge	Remarks
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	(Rs. in Cr.)	(Rs. in Cr.)		
UPPCL, UP	1153.42	1105.59	166.21	<p>(A) Payment due for the bills raised in the months</p> <p>(i) For Energy bills - Oct'18 to Aug'19</p> <p>(ii) For LPSC bills - Apr'18 to Aug'19</p> <p>(B) UPPCL has stopped verification of LPS bills since Oct'18. Matter has been discussed in various meetings but the same is still to be resolved.</p>
PSPCL, Punjab	8.19	0	0.89	<p>(A) Payment due for the bills raised in the months</p> <p>(i) For Energy bills - May'19 to Aug'19</p> <p>(ii) For LPSC bills - Jul'16 to Feb'17, Jan'19 to Aug'19</p> <p>(B) They have not resolved the issue regarding release of old LPS payment of Rs. 74 Lakh from long time.</p>
JdVVNL, Rajasthan	12.19	9.35	0.55	<p>Payment due for the bills raised in the months</p> <p>(i) For Energy bills - May'19 to Aug'19</p> <p>(ii) For LPSC bills - Jun'19 to Aug'19</p>
AVVNL, Rajasthan	8.22	5.85	0.07	<p>Payment due for the bills raised in the months</p> <p>(i) For Energy bills - Jun'19 to Aug'19</p> <p>(ii) For LPSC bills - Jul'19 to Aug'19</p>

SJVNL (as on 10.09.19)

S.No.	Beneficiary	Total Dues (in Rs Cr.)	Remarks
1.	Govt. of HP/HPSEB	22.39 + 314.94 (LPS)	GoHP has agreed to release Rs. 8.39 Crore alongwith Rs. 3.51 Crore (through PTC) out of the long pending outstanding in April 2019, which has still not been released.
2.	PDD, J&K	235.03	The notice for regulation of power issued on 11.01.2019 was withdrawn by SJVN on the assurance from PDD, J&K to release the outstanding amount. PDD, J&K may please be pursued to release the outstanding amount at the earliest.
3.	UPPCL, Uttar Pradesh	141.06 + 164.48(LPS)	UPPCL is requested to release the outstanding on priority.
4.	AVVNL	20.49	Rajasthan Discoms are requested to clear the outstanding dues at the earliest failing which SJVN will left with no option except to regulate the power.
5.	JdVVNL	26.57	
6.	JVVNL	5.71	
7.	PSPCL	19.64 + 4.24(LPS)	PSPCL is requested to release the outstanding on priority.
8.	UPCL	47.81 + 0.45(LPS)	UPCL is requested to release the outstanding on priority failing which SJVN will left with no option except to regulate the power.

NHPC (as on 10.09.19) (Rs. in Cr.)

Sl. No.	Beneficiary	Principal Dues	Outstanding Dues of more than 60 days	Surcharge up to 31.08.2019	Total Dues including Surcharge
1.	PDD, J&K	1227.55	1012.80	147.44	1374.99
2.	UPPCL, UP	1163.97	875.47	104.24	1268.21
3.	PSPCL, Punjab	224.49	88.45	6.58	231.07
4.	JdVVNL, (Hydro Power) Jodhpur	108.64	69.10	2.88	111.52
5.	JdVVNL (Wind Power), Jodhpur	15.83	12.57	2.13	17.97
6.	AVVNL, Ajmer	73.34	40.38	1.67	75.01
7.	UPCL, Uttarakhand	114.05	56.45	2.45	116.50

POWERGRID (as on 16.08.19) Rs. in Cr.

SI No.	DIC	45-90 days dues	>90 Days dues
1	UP	280.21	0.00
2	TRN ENERGY (UP)	22.24	96.66
3	KSK Mahanadi(UP)	73.83	316.73
4	RKM POWERGEN (UP)	14.14	0.67
5	HARYANA	25.40	0.00

SI No.	DIC	45-90 days dues	>90 Days dues
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6	PUNJAB	22.21	0.56
7	JAMMU AND KASHMIR	36.15	151.58
8	GMR KEL	16.66	23.76
9	UTTARAKHAND	44.42	59.89
10	RAJASTHAN (JODHPUR) JDVVN	51.46	93.89
11	RAJASTHAN (AJMER) AVVN	42.04	53.58
12	LANCO BUDHIL HYDRO	0.14	8.59
13	LANCO BUDHIL (PTC)	0.00	25.08
14	PTC	0.00	2.19
15	LANCO ANPARA	0.00	1.02
16	MB POWER	22.97	29.29
17	JITPL West Central Railway (Raj.)	0.00	0.59
18	National Fertilizers Ltd.	0.00	0.48
19	DB POWER (RAJ)	12.82	0.00

C.2 Opening of Letter of Credit (LC)(Agenda By POWERGRID)

C.2.1 As per mutually signed Power Purchase Agreement, beneficiaries have to submit a confirmed, revolving, irrevocable Letter of Credit. This matter had been discussed regularly in various Commercial Sub-committee meetings as well as TCC and NRPC meetings. However, the following beneficiaries are yet to submit the requisite LoC for the FY 2019-20.

POWERGRID

Rs. in Cr.		
DIC Name	LC Required	LC Available
BRPL	85.09	0.00

Rs. in Cr.		
DIC Name	LC Required	LC Available
BYPL	49.71	0.00
PDD J&K	30.43	0.00
Punjab	176.85	100.62
TRN Energy	32.91	13.29
RKM Power (UP)	23.49	22.70
DB Power (Raj.)	25.94	21.76
Maruti Clean Coal and Power Ltd(Raj)	21.80	20.09
Chandigarh	6.38	3.71
NDMC	4.51	2.55
JITPL-West Central Railway(Rajastan)	5.63	4.89
Dhariwal Infra (UP)	15.28	13.69

Members may kindly discuss.

C.3 Maintaining the Letter of Credit for power supplied from NJHPS & RHPS (Agenda By SJVNL)

C.3.1 Ministry of Power, GOI order no. 23/22/2019-R&R dated 28-06-2019 read with (I) Corrigendum has made it mandatory for the discoms to open unconditional Letter of credit, failure to comply with its order may result into non-injection of power to state utility as well as denial of Short term/long term access from the energy market.

C.3.2 As per the Power Purchase Agreement, Beneficiaries is to submit a confirmed, revolving, irrevocable Letter of Credit in favour of SJVN for an amount equivalent to 105% of average monthly billing of preceding 12 months with appropriate bank as mutually acceptable to parties. The LC shall be kept valid at all the time during the validity of the Power Purchase Agreement.

C.3.3 Beneficiaries are requested to renew their LC at least on week prior to the expiry of the Letter of credit, so that in compliance to MOP's order status of LC can be forwarded to NRPC for their further action.

C.4 Non-payment of LPS by the beneficiaries (Agenda by SJVNL)

C.4.1 It is to point out that while releasing the amount of energy bill raised by SJVN Limited, the amount of late payment surcharge is being excluded by the beneficiaries while releasing the payments.

C.4.2 It is reiterated that the LPS is an integral part of energy bills which is imposed/charged in view of CERC regulation and provision contained in the Power Purchase Agreement for non-payment of dues. Hence, the non-payment of LPS is violation of Power Purchase Agreement and CERC guidelines on the subject.

C.4.3 It is, therefore, requested that the beneficiaries may be advised to make payment of energy bill including the amount of LPS in future while making the payments.

C.5 Implementation of Payment security mechanism based scheduling of power (Agenda By NRLDC)

C.5.1 The Ministry of Power (MoP), Govt. of India vide its OM no. 23/22/2019-R&R dated 28/06/19, 17/07/19, 23/07/19, 31/07/19 and 09/08/19 has directed implementation of Payment Security Mechanism (PSM) based scheduling of power in the country w.e.f. 01/08/2019 and has also directed to give regular status update on the implementation of the same at Inter-state as well as at Intra-state level.

C.5.2 At inter-state level the mechanism has been implemented w.e.f. 01st August 2019 through operationalization of web based payment security administration portal wherein inter-state generating stations/SLDCs for their DISCOMs are furnishing the status of payment security on day ahead basis.

C.5.3 Since the status of the implementation of the scheme at intra-state level was also to be furnished to the Ministry of Power, NRLDC vide letter no. NRLDC\SO-1\151\ dated 10/08/19, 16/08/19 and NRLDC\SO-1\164\1302\1312 dated 5/9/19 has requested Northern Regional SLDCs to furnish the status of Implementation of Payment Security Mechanism based scheduling of power at Intra-state level. In this respect, SLDC Punjab and SLDC Himachal Pradesh are furnishing the status of implementation of PSM based scheduling of power at Intra-state level on weekly basis in compliance of MoP directives while the same is pending from other SLDCs/State control Areas in Northern Region.

C.5.4 As per the direction of the MoP, Govt. of India, status of the implementation of the mechanism at inter-state as well as intra-state level is to be furnished to MoP on weekly basis. Therefore, all SLDCs are required to furnish the status of the implementation of payment security mechanism for intra-state generators to respective RLDCs on weekly basis. Thus, all NR SLDCs have to furnish this status to NRLDC for onward submission to MoP.

C.5.5 In view of above, members may like to impress upon the SLDCs to implement the MoP directed mechanism as well as for sending regular weekly update to NRLDC for onward submission to MoP.

C.6 Modus Operandi for payment of Interest due to delay in payment of Compensation Charges on account of SCED Schedule (Agenda by APCPL)

C.6.1 The SCED Pilot Project was put into operation from 01st April 2019 as per the Procedure approved by CERC in order dated 31st January 2019 in Petition No. 02/SM/2019 (Suo-Motu) in the matter of Pilot on Security Constrained Economic Dispatch (SCED) of Inter-State Generating Stations (ISGS) Pan India.

C.6.2 The objective of SCED is to optimize the despatch of the generation resources at inter-state level which are participating in the SCED Pilot and reduce the overall variable charges for production of electricity. The implementation of SCED is a step towards introduction of optimization techniques in the despatch processes at inter-state level in the Indian Power System.

C.6.3 As per the SCED Procedure clause 9.13 pg 11 wherein it is mentioned that the Compensation Statement due to Part Load Operation on Account of SCED will be issued by the respective RPC on monthly basis. Further the payment would be made to the respective Generators from the National pool Account within 07 working days.

C.6.4 The relevant extract from the SCED Operating Procedure is as follows

C.6.5 Quote

“The RPCs would issue monthly "Statement of Compensation due to Part Load Operation on Account of SCED" (Format SCED4). The compensation for heat rate degradation to the SCED generators as per the statement issued by the RPCs would be payable from the National Pool Account (SCED) within seven (07) working days of the issue of the monthly statement by the respective RPCs.
“

Unquote

C.6.6 But the Monthly statement of Compensation has not yet been issued by the RPC since April 2019.

- C.6.7 As per our calculation the Total Compensation amount receivable by APCPL IGSTPS Jhajjar till Aug-2019 on account of degradation in Heat Rate and APC due to SCED decrement Schedule is Rs 1,97,86,796 (Rs One Crore Ninety Seven Lakh Eighty Six Thousand Seven Hundred Ninety Six Only).
- C.6.8 Further, due to absence of modus operandi in the SCED Operating Procedure regarding the payment of interest due to delay in payment of compensation charges, the Inter State Generating Stations are losing interest.
- C.6.9 Members please deliberate

C.7 Modus Operandi for payment of Interest due to delay in receipt of Payment already made by the Inter State Generating Station to SCED NR Pool account from the Beneficiaries (Agenda by APCPL)

- C.7.1 The payment of SCED charges on account of decrement schedule are to be made by the ISGS as per the weekly SCED account issued by the RPC in accordance with the SCED Operating Procedure approved by CERC in order dated 31st January 2019 in Petition No. 02/SM/2019 (Suo-Motu) in the matter of Pilot on Security Constrained Economic Dispatch (SCED) of Inter-State Generating Stations (ISGS) Pan India.

The relevant extract from the SCED Operating Procedure is as follows

C.7.2 Quote

“The concerned SCED Generator would pay the indicated charges for SCED decrement within seven (07) working days of the issue of statement of SCED by the RPC to the ‘National Pool Account (SCED)’. Payments against SCED shall not be adjusted against any other payments by the SCED Generator.”

“If payments by the SCED Generator, due under the SCED, are delayed beyond seven (7) working days from the date of issue of the "Regional SCED Weekly Statement" by the RPCs, the defaulting SCED Generator shall pay simple interest @ 0.04% for each day of delay.”

C.7.3 Unquote

The payment that has already been made by the Inter State Generating Station to the SCED pool on account of SCED Decrement Schedule is recovered from the beneficiaries within a time period 45 days from the issuance of Monthly Energy Bills as per CERC Tariff regulations, 2019.

- C.7.4 Due to this methodology there is an inherent delay/gap of approx. 46 nos of days when the payment is made by the generator and when the payment is recovered from the beneficiaries.

- C.7.5 Therefore, the Inter State generating Stations are losing interest of approx. 46 nos of days.

- C.7.6 Detailed explanation of the above is as below:

Week	Date			Payment Date	REA based Energy Billing Date	Payment due date by Beneficiaries	Gap
1	01-04-2019	to	07-04-2019	03-05-19	08-05-2019	22-06-2019	50
2	08-04-2019	to	14-04-2019	03-05-19	08-05-2019	22-06-2019	50
3	15-04-2019	to	21-04-2019	10-05-19	08-05-2019	22-06-2019	43
4	22-04-2019	to	28-04-2019	16-05-19	08-05-2019	22-06-2019	37
5	29-04-2019	to	05-05-2019	28-05-19	08-06-2019	23-07-2019	56
6	06-05-2019	to	12-05-2019	03-06-19	08-06-2019	23-07-2019	50
7	13-05-2019	to	19-05-2019	08-06-19	08-06-2019	23-07-2019	45
8	20-05-2019	to	26-05-2019	12-06-19	08-06-2019	23-07-2019	41
9	27-05-2019	to	02-06-2019	22-06-19	08-06-2019	23-07-2019	31
10	03-06-2019	to	09-06-2019	29-06-19	08-07-2019	22-08-2019	54
11	10-06-2019	to	16-06-2019	06-07-19	08-07-2019	22-08-2019	47
12	17-06-2019	to	23-06-2019	13-07-19	08-07-2019	22-08-2019	40
13	24-06-2019	to	30-06-2019	20-07-19	08-07-2019	22-08-2019	33
14	01-07-2019	to	07-07-2019	27-07-19	08-08-2019	22-09-2019	57
15	08-07-	to	14-07-	03-08-19	08-08-2019	22-09-2019	50

	2019		2019				
16	15-07-2019	to	21-07-2019	10-08-19	08-08-2019	22-09-2019	43
17	22-07-2019	to	28-07-2019	20-08-19	08-08-2019	22-09-2019	33
18	29-07-2019	to	04-08-2019	27-08-19	08-09-2019	23-10-2019	57
19	05-08-2019	to	11-08-2019	31-08-19	08-09-2019	23-10-2019	53
20	12-08-2019	to	18-08-2019	07-09-19	08-09-2019	23-10-2019	46
Average nos of days after which the generators receives the payment from the Beneficiaries							46

Members please deliberate.

C.8 Availability of SEM data on real-time basis and DSM charges(Agenda by PSTCL)

- C.8.1 It is a matter of fact that SEM meters are being managed by PGCIL and the SEM data is being communicated to NRLDC and based on the same, the DSF account is prepared.
- C.8.2 It is matter of fact that the grid can be managed based on the real time data available to any SLDC/NRLDC and cannot be managed on the basis of dump data. Since the data is being communicated form SEM meters to NRLDC and the communication links are already established between NRLDC and state SLDC, it is urgently required that PGCIL be entrusted on the job to *make this SEM data available in real time terms to SLDCs* so that SLDCs can manage their grid based on this real time data which shall be uniform for NRLDC and SLDC.
- C.8.3 Further the *DSM charges should also be charged based on this real time data records* and not on dump data records as the same are misleading and have no relevance at all. In view of the above, it is requested that members may approve the bold-italicized items in the above agenda items and others may not.

C.9 Status of DSM Charges (Agenda By NRLDC)

C.9.1 Northern Region Deviation Pool Account is being maintained & operated by NRLDC, in accordance with the CERC Regulations. As per proviso (1) of Regulation 10 of CERC (Deviation Settlement Mechanism and related matter) Regulations, 2014, the payment of charges for Deviation shall have a high priority and the concerned constituents shall pay the indicated amounts within 10 days of issue of statement of Charges for Deviation including Additional Charges for Deviation by the Secretariat of the respective Regional Power Committee in to the “Regional Deviation Pool Account Fund” of the concern region.

C.9.2 DSM Charges payable to pool status as on 10th Sep 2019 considering week no-19 (due date of which is 02nd Sep 2019) is indicated below: -

S. No.	Constituents	DSM Charges Payable / Receivable (Rs. Lakh)	Remarks
1	JAMMU AND KASHMIR	3749.11841	Outstanding amount includes the amount pending beyond 90days
2	UTTARAKHAND	758.63152	
3	POWERGRID-NR	414.86271	Outstanding amount includes the amount pending beyond 90days

C.9.3 Upon continuous persuasion from NRLDC for settlement of the payments, PDD J&K vide letter Ref No. CE/C&S/J/T-4LU)1177/79, Dt:30/08/2019 intimated that, they are in the process of clearing all the outstanding dues, but payments are delayed due to some unavoidable reasons i.e. non-availability of internet services, and the same shall be released on priority as soon as the internet services are restored in J&K.

C.9.4 Punjab was paying only the Charges excluding the charges on account of Zero Crossing Violation since implementation of 4th amendment of DSM Regulation. NRLDC intimated Punjab to settle the deviation charges as per the Regulations of CERC. Upon continuous persuasion from NRLDC for settlement of the payments, Punjab Vide Letter Dt: 30/08/2019 have given commitment for settlement of the all outstanding against deviation charges by 10/09/2019.

C.9.5 Based on the commitment made by PDD J&K and Punjab, NRLDC has withdrawn the notice for invoking Section 25A of CERC Regulation for denial of Sort Term Open Access.

- C.9.6 POWERGRID is not paying the deviation charges since implementation of 4th Amendment of DSM regulation. NRLDC is continuously pursuing with POWERGRID for settlement of the deviation charges as per the accounts issued by NRPC in line with the CERC Regulations.
- C.9.7 Further, in the 39th CSC meeting held on 21/05/2019 the issues pertaining to additional charges for sustained duration in the DSM account issued by RPCs (as per the 4th Amendment of the CERC Regulation) was deliberated. It was intimated that the issue is sub-judice in the Hon'ble High Court. Committee agreed that payments on account of Deviation charges needs to be settled in line with prevailing CERC Regulation as per the DSM account issued by RPCs.
- C.9.8 In the 42nd/45th meeting of TCC/NRPC meeting held on 7th/8th June, 2019 at Gangtok, Sikkim, the issue was deliberated and all constituents were requested to honor the CERC Regulations and make timely payment and avoid any further interest surcharges.
- C.9.9 Therefore, all payable utilities are requested to clear the outstanding's at the earliest in accordance with CERC Regulations and to avoid further increase of Delay Payment Interest.
- C.9.10 Members may please deliberate

C.10 Status of LC against Deviation Charges delayed payment (Agenda By NRLDC)

- C.10.1 The proviso (4) of Regulation 10 of CERC (Deviation Settlement Mechanism and related matter) Regulations, 2014 is quoted below:
- C.10.2 "All regional entities which had at any time during the previous financial year failed to make payment of Charges for Deviation including Additional Charges for Deviation within the time specified in these regulations shall be required to open a Letter of Credit (LC) equal to 110% of its average payable weekly liability for Deviations in the previous financial year, in favour of the concerned RLDC within a fortnight from the date these Regulations come into force.
- C.10.3 Provided that –
- (i) if any regional entity fails to make payment of Charges for Deviation including Additional Charges for Deviation by the time specified in these regulations during the current financial year, it shall be required to open a Letter of Credit equal to 110% of weekly outstanding liability in favour of respective Regional Load Despatch Centre within a fortnight from the due date of payment.
 - (ii) LC amount shall be increased to 110% of the payable weekly liability for Deviation in any week during the year, if it exceeds the previous LC amount by more than 50%."

C.10.4 In accordance with CERC Regulations, NRLDC vide its letter dated 13.05.2019 has informed to all the defaulting entities regarding the opening of LC and the amount for which the LC is to be opened along with LC format.

Sl. No	Name of NR Pool members	LC Amount (Rs. in Lakh.)	Status	No of defaults in Deviation Payment	
				FY 18-19	FY 19-20
1	UT Chandigarh	509.00	LC of Rs.509 Lakhs opened & Valid up to 31.03.2020	9	2
2	GreenkoBudhil	40.13	LC of Rs.17.19 Lakhs opened & Valid up to 29.05.2020. LC needs to be enhanced	4	9
3	Uttar Pradesh	768.05	LC not opened	24	
4	Uttarakhand	501.45	LC not opened	10	17
5	Himachal Pradesh	395.72	LC not opened	1	
6	PDD,J&K	954.05	LC not opened	34	12
7	EPPL	1.39	LC not opened	10	
8	Punjab	719.46	LC not opened	27	15
9	POWERGRID	25.22	LC not opened	15	17
10	Rajasthan	619.25	LC not opened	4	
11	NFL	1.28	LC not opened	4	
12	Nepal (PTC)	29.53	LC not opened	2	
13	Azure Power	49.87	LC not opened	0	8
14	Renew Power	12.02	LC not opened	0	2

C.10.5 Defaulting entities are requested to open the LC against Deviation Charges (as per Format issued by NRLDC) in accordance with CERC Regulations.

Members may please deliberate.

C.11 Reactive Energy charges status (Agenda By NRLDC)

C.11.1 Reactive Pool Account Fund of NR is being maintained & operated by NRLDC, in accordance with clause 11 of complementary commercial mechanism (annexure-I) of IEGC 2016.

C.11.2 Reactive Energy Charges status as on 10th Sep 2019 considering week no-20 (due date of which is 09th Sep 2019) is indicated here in below: -

S. No	UTILITY	OPENING BALANCE FROM PREVIOUS YEAR	AMOUNT PAYABLE TO POOL	AMOUNT RECEIVABLE FROM POOL	AMOUNT PAID TO POOL	AMOUNT DISBURSED FROM POOL	PRINCIPAL OUTSTANDING
1	JAMMU AND KASHMIR	526.00	950.64	0.08	526.00	0.00	950.56
2	CHANDIGARH	-6.15	0.00	7.66	0.00	8.78	-5.02
3	UTTARAKHAND	-4.89	17.50	13.01	17.50	6.64	-11.25
4	PUNJAB	1.89	123.52	65.51	116.12	39.54	-16.68
5	HIMACHAL PRADESH	-37.09	11.16	33.70	11.16	52.64	-18.15
6	DELHI	80.16	199.34	89.75	265.22	18.64	-56.83
7	HARYANA	-137.00	0.00	242.46	0.00	224.53	-154.93
8	RAJASTHAN	-80.57	13.65	255.15	13.65	143.60	-192.12
9	UTTAR PRADESH	-435.62	0.00	608.48	0.00	682.73	-361.38

Note: (+) ve figure are Payable to Pool and (-) ve figures are receivable from Pool

C.11.3 Upon continuous persuasion from NRLDC for settlement of the payments, PDD J&K vide letter Ref No. CE/C&S/J/T-4LU)1177/79, Dt:30/08/2019 intimated that, they are in the process of clearing all the outstanding dues, but payments are delayed due to some unavoidable reasons i.e.; non-availability of internet services, and the same shall be released on priority as soon as the internet services are restored in Kashmir Valley.

C.11.4 Only PDD J&K has to pay to the Reactive Energy Charge Pool Account and is requested to clear outstanding RE charges payments at the earliest so that, receivable parties will be paid and to avoid further increase of Delay Payment Interest.

Members may please deliberate

C.12 Capacitor Installation in Jammu and Kashmir Region (Agenda By NRLDC)

C.12.1 NRPC in its 6th meeting had approved the proposal for reimbursement of Rs. 2200 Lakh to PDD J&K for installation of shunt capacitors. As such Rs.2200 Lakh was retained by NRLDC in Reactive Pool Account. Total amount of Rs.1949.19 Lakhs has been released to PDD J&K against the installation of shunt capacitor as per NRPC advisory. PDD J&K vide letter dated 10.04.18 has refunded an amount of Rs.18.03 Lakhs as a balance out of Rs.1949.19 Lakhs.

C.12.2 The balance amount of Rs.250.81 Lakhs (i.e. Rs.2200 Lakhs -1949.19 Lakhs) was earlier retained in the Reactive Pool Account and now balance amount of Rs.18.03 Lakhs refunded by J&K is also available in Reactive pool account. It is now proposed to transfer the balance amount i.e.; Rs.268.84 lakhs to PSDF account.

C.12.3 The above has been deliberated in the 36th Commercial Sub-Committee meeting of NRPC which was held on 11th June, 2018 at NRPC, New Delhi, for concurrence from members for transfer of this balance fund to PSDF account wherein the Committee in principle agreed for the same, however advised to take up the matter in next TCC/NRPC meeting.

C.12.4 Accordingly, the issue has been taken up in the 39th/42nd TCC/NRPC meetings held on 27th/28th June, 2018 at Himachal Pradesh wherein representative of PDD, J&K stated that they would utilize the balance amount of Rs.2.68 Crore as per the scheme within 6 months and TCC recommended that PDD, J&K may utilize the balance amount and NRLDC may not transfer the money to PSDF account till further communication from PDD, J&K.

C.12.5 NRLDC has not received any communication from PDD J&K in this regard.

C.12.6 Therefore, PDD J&K is requested to provide information regarding their plan. Pending confirmation from PDD J&K the amount will be withheld in Northern Region Reactive Energy Pool account.

C.13 NRLDC Fee & Charges (Agenda By NRLDC)

C.13.1 NRLDC is sending the hard copies of bills to all the users regularly on monthly basis. The bills are also being mailed to all users on the day of billing and soft copies of bills are also available to the link "<https://nrlcdc.in/commercial/bill-details/>".

C.13.2 Status of Outstanding against NRLDC Fee & Charges upto June 19 (Due Date of which is 15/08/2019)

All Figures in Rs.

Sl. No.	User	Outstanding Amount up to Jun-19	Remarks
1	J&K Control Area	29,59,162	Feb-19 (Partial), Mar-19, Apr-19 & Jun-19 Bill payment pending
2	SORANG HEP	1,10,294	Outstanding of PLI 2016-17 and Provisional PLI 2017-18 issued on Feb - 19
3	Delhi Control Area	92,092	Jun-19 (PPCL payment pending)
4	NRSS XXXVI Transmission Ltd.	1,517	Apr-19 (Partial), May-19 & Jun-19
5	POWERGRID KALA AMB Transmission Ltd.	146	Jun-19 Bill payment pending (Partial payment made)
6	Punjab Control Area	11,941	Surcharge Outstanding against PLI Bills issued on Feb-19
7	Rajasthan Control Area	48,428	Outstanding (Rebate related issues)
8	Uttrakhand Control Area	25,973	Surcharge Outstanding
9	Haryana Control Area	12,819	Outstanding (Rebate related issues)
10	Chandigarh Control Area	10,754	Outstanding (Rebate related issues)
11	POWERGRID	1,05,034	Outstanding (Rebate related issues)
12	UP Control Area	1,44,059	Surcharge Outstanding

It is requested to the above users to clear all the outstanding at the earliest.

NRLDC is requesting all the Users that while making the payment please provide the payment details in the prescribed format, as provided below:

C.13.3 NRLDC Fee & Charges Format for Payment made /TDS Deduction is as under:

USER Name									
BILLING DETAILS			SETTLEMENT DETAILS						
BILL MONTH AND YEAR -	DATE of Bill issue	Billed AMOUNT	Date of Bill Receipt by Users	Mode of Payment RTGS/NEFT/Others	Date of Clearing of Payment from Users Bank A/c	Amount Paid into POSOCO Fee & Charge A/c by Users	TDS- deducted by Users if any	Rebate- deducted by Users if any	Amount-Admitted (Paid+TDS +Rebate) by Users
			(1)	(2)	(3)	(4)	(5)	(6)	(7)=(4)+(5)+(6)

C.13.4 However, it is observed that most of the Users are not providing the details as per the enclosed formats.

C.13.5 All Users are requested to make timely payment of RLDC Fees and Charges and also provide the information as per above mentioned Format for easy reconciliation.

C.14 Reconciliation of NRLDC Fee and charges (Agenda By NRLDC)

C.14.1 NRLDC vide letter dated 31/07/2019 has sent the reconciliation statements of NRLDC Fee and Charges for the quarter -I, 2019-20 to all the users. The users were requested to send the duly signed and verified copy of reconciliation statement as a token of acceptance by 30-08-2019. Reconciliation from ADHPL, Koteshwar, Meja (UP Seller), NAPS, Tanakpur (NHPC) & NTPC (for all stations) has been received only.

C.14.2 Entities are requested to verify the Reconciliation statements and send the duly signed copy as a normal practice. In case non receipt of any communication with in one week from commercial sub-committee meeting, it will be presumed that statement stands reconciled.

C.15 Reconciliation of Pool Accounts (Apr-19 to June-19) (Agenda By NRLDC)

C.15.1 Reconciliation statement of Deviation Charges and Reactive Energy Charges has been forwarded to entities and uploaded on website by NRLDC on 09.07.2019. The constituents are requested to verify /check the same & comments if any on the same were to be reported to NRLDC by 31.07.2019. In case of non-receipt of any communication, it will be presumed that reconciliation statement stands reconciled.

C.15.2 However, except ADHPL, NTPC, THDC, APCPL, Azure Power, SJVNL, Nepal & Rajasthan (only RE Charges) no one has sent any communication to NRLDC. Therefore, it is requested once again to send the signed reconciled statement within a week from the date of CSM. In case of non-receipt of any communication, it will be presumed that reconciliation statement stands reconciled.

C.16 Status of Outstanding STOA Delay Payment Interest (Agenda By NRLDC)**C.16.1 STOA Delay Payment Interest:**

As per Regulations 19(2) of Open Access Inter State Regulations 2008, the person committing default in payment shall pay simple interest @ of 0.04% for each day of default. The applicant wise the outstanding interest amount (computed till 31.08.2019) is attached at Annexure-IX.

NRLDC is regularly monitoring the payment defaults, if any by any applicant. It has been noticed that some parties are regularly delaying the payment of principal and hence their interest is being accrued on a regular basis viz. Arunachal Pradesh Power Corp. Pvt. Ltd.(APPCPL), Kreate Energy Pvt, Ltd., Northern Railways (Both UP and Delhi Division).

The STOA punching portal of Northern Railways (Delhi Division) is blocked since 8th May'19 due to non-payment of Interest. Similarly, the STOA punching portal of APPCPL has been blocked six times since March'2019 for non- payment of interest which was unblocked only after receiving the payment.

All members are requested to kindly make the payment as per schedule and defaulting applicants are requested to clear the outstanding at the earliest.

C.17 STATUS of AMR as on 04.09.2019 (Agenda By NRLDC)

C.17.1 As per the information provided by M/s Kalkiteck, number of locations from where AMR data are received in totality and used for energy accounting for last 04 weeks have been given below:

S No.	Week (From-To)	Total no of locations Where SAT is completed	Total No of locations data received in totality	Total No of locations data received in totality by Tuesday	Total No of locations received after Tuesday
1	290719-040819	257 (1506 meters)	209(1198 meters)	195(1154 meters)	14(44meters)
2	050819-110819	257 (1506 meters)	210(1174 meters)	197(1134 meters)	13(40 meters)
3	120819-180819	257 (1506 meters)	210(1197 meters)	199(1163 meters)	11(33 meters)
4	190819-	257(1506)	211(1186)	200(1148)	11(38 meters)

	250819	meters)	meters)	meters)	
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C.17.2 There is some improvement in data submission to NRLDC by Tuesday particularly after switching over of 52 locations to OPGW. However, data from all locations are required for calculation of losses and preparation of weekly regional energy account. Non-availability of data from any station is making it difficult for NRLDC to process the meter data for loss calculation and timely submission of data to NRPC for preparation/issuance of weekly energy accounts.

C.17.3 M/s POWERGRID may coordinate with M/s Kalkitech to ensure that meter data from all sites are regularly provided to NRLDC by Tuesday.

C.18 Integration of AMR System with Elster Meters (Agenda By NRLDC)

C.18.1 At present only L&T make meters are integrated with AMR system and Elster make meters are yet to be integrated. The issue of integration of Elster make meter with AMR has been long debated in various CSC meeting and TCC/NRPC meeting. Since M/s Kalkitech was not able to integrate despite various follow up, the said work has now been given to M/s Synergy System & Solutions, Faridabad as informed by POWERGRID in CSC meeting held in May 2019. Chronology of Events regarding integration of Elster make meters by M/s Synergy:

S.No	Correspondence on integration of Elster make meters	Date of implementation/ correspondence
1	POWERGRID informed that testing of AMR integration work of Elster make meter has been completed at Ballabgarh SS and forwarded .npc files to NRLDC for verification	17.07.19
2	NRLDC checked the NPC files and intimated the discrepancy observed to POWERGRID for rectification	18.07.19
3	POWERGRID again shared the NPC files after necessary correction	29.07.19
4	NRLDC checked the updated NPC files and found ok. The same was informed to POWERGRID for integration of all Elster make meters.	30.07.19

C.18.2 POWERGRID may apprise the present status and the time period by which integration of all Elster make meters will be completed.

C.19 AMR data through Fibre Optic Network (Agenda By NRLDC)

C.19.1 As informed by M/s Kalkitech, AMR communications through optical fibre link at 52 locations of POWERGRID have been configured till date and balance shifting work on OPGW is in progress to connect around 70 locations of POWERGRID. In the last TCC/NRPC meeting, POWERGRID was requested to provide

- The present status and plan for the switching over of other stations on OPGW link.
- Cost estimates and schedule for transfer the data link from GPRS to fibre Optics.

C.19.2 POWERGRID informed that certain information from as per the format circulated by POWERGRID is required from Utilities to work out the same. TCC requested all utilities to submit the information sought by POWERGRID at the earliest for cost estimation of shifting of AMR data on OPGW as per the format attached with the minutes of 37th CSC meeting. All utilities agreed to provide the data by 30.06.19. POWERGRID informed that they shall migrate data of AMR (on wideband locations) by 31.12.19, if data from all utilities are received by 30.06.19.

POWERGRID may update the status.

C.20 Status regarding procurement of DCD/Meters (Agenda By NRLDC)

C.20.1 NRLDC vide its letter Ref. No. NRLDC/MO/Metering/1606-1613 dated 01.10.18 has intimated POWERGRID regarding estimated nos. of DCDs and meters required for next 1-2 years. Further, POWERGRID vide its email in June-19 informed NRLDC that huge quantity of meters is required for upcoming solar parks in Northern Region and its present availability is not sufficient to meet the requirement.

C.20.2 For estimation of DCD/Meter requirement, NRLDC requested POWERGRID to provide the present availability of DCDs and meters available in POWERGRID store. Based on the information provided by POWERGRID on 13.06.19, NRLDC vide its letter ref. no. NRLDC/MO/Metering/10/986 dated 12.07.19 informed POWERGRID regarding procurement of estimated quantity of DCDs and Meters.

C.20.3 POWERGRID may update the status on procurement of DCD/meters.

C.21 Time drift Correction in Interface Energy Meters (Agenda By NRLDC)

C.21.1 There is a significant improvement in Time drift correction in Interface Energy Meters from the last CSC Meeting due to efforts taken by all the utilities.

C.21.2 Time Drift Report summary of various utilities for last two weeks is given below:

S.No	Utility		Nos. of Meters on which Time-drift has been observed	
			Week 12.08.19 - 18.08.19	Week 19.08.19 - 25.08.19
1	BBMB		7	5
2	CHANDIGARH		2	2
3	DTL		9	10
4	HPSEB		7	6
5	HVPNL		19	17
6	J&K		4	4
7	NHPC		6	6
8	NPCIL		1	1
9	NTPC		2	3
10	PGCIL	NR-1	3	3
		NR-2	29	29
		NR-3	1	1
11	PSPTCL		1	1
12	PTCUL		24	25
13	RAILWAYS		2	2
14	RVPNL		12	9
15	SAINJ		1	1
16	UPPTCL		8	6
Total			138	131

C.21.3 There is a significant improvement and at present only 5-6% of meters have time drift as per NRLDC record. NRLDC is regularly uploading the discrepancy report on weekly basis indicating the time drift in meters and also replacement/rectification required in special energy meters. All constituents in whose premises the meters are installed are required to take corrective action for time correction based on the weekly discrepancy report of NRLDC.

C.22 Scheduling, accounting and other treatment of the legacy shared projects in Northern Region (Agenda By NRLDC)

C.22.1 States in Northern Region have had shares in some of intra-state generating stations. Some of these, shares transactions are being scheduled at Inter-State level through proper 'access' in Inter-State Transmission System (ISTS) from Central Transmission Utility (CTU) while some are based on legacy scheduling process. The legacy scheduling transactions also invariably had associated transmission lines for delivery of these shares. The details of some of such transactions are given below:

Sl. No.	Plant Name	State in which Plant is embedded	State whose entities have share in the plant	Share in %	Share in MW	Transaction ID for Schedule in Inter-state
1	Bawana	Delhi	Haryana	10	137	SH-07
	Bawana	Delhi	Punjab	10	137	SH-06
	CLP-Jhajjar	Haryana	Delhi	10	124	LT-05
2	Rihand hydro	UP	MP	13.75	41.25	LT-01
	Matatila	UP	MP	45	13.75	LT-02
3	Vishnu Prayag	UP	Uttarakhand	12	60	SH-01
	Alaknanda	UP	Uttarakhand	12	40	LT-38
	Rajghat	MP	UP	25	11.25	LT-13
4	Khara	UP	HP	20	14.4	SH-02
	RSD	Punjab	HP		22	SH-04
	Chibro	Uttarakhand	HP	25	60	SH-05
	Khodri	Uttarakhand	HP	25	30	
	Dhalipur	Uttarakhand	HP	25	12.75	
	Dhakrani	Uttarakhand	HP	25	8.43	
	Kulhal	Uttarakhand	HP	20	6	

C.22.2 These transactions can be categorized in following broad divisions considering the payment of transmission charges and RLDC fee payments as well as scheduling.

- i. The transactions at Sl No 1 in above table are scheduled under proper Long Term Access (LTA) or Medium Term Open Access (MTOA) from the Central Transmission Utility (CTU) as the same started much after proper mechanism for 'access' in transmission got implemented. These LTA/MTOA are included in Regional Transmission as well as RLDC fee and charges. Schedule changes are done ex-ante as per the established procedure of the Indian Electricity Grid Code (IEGC).

- ii. The transactions at SI No. 2 are considered under deemed LTA (without formal LTA/MTOA issuance from CTU). These transactions are considered for transmission charges and not considered for NRLDC fee and charges. Schedule changes are done ex-ante as per the established procedure of the IEGC.
- iii. The transactions at SI No. 3 are considered under deemed LTA (without formal LTA/MTOA issuance from CTU). These transactions are neither considered for transmission charges nor for RLDC fee and charges. Schedule changes are done ex-ante as per the established procedure of the IEGC.
- iv. The transactions at SI No. 4 are considered under deemed LTA (without formal LTA/MTOA issuance from CTU). These transactions are neither considered for transmission charges nor for RLDC fee and charges. Schedule of these transactions are changed post-facto based on actual generation as per legacy.

C.22.3 The schedule of the above interstate share from some intrastate generators is being carried out through contracts created in NRLDC WBES and punching access has been assigned to host state SLDC.

C.22.4 Since, there are many difference in scheduling of some of these legacy transactions. It is important that uniformity in accordance to prevailing scheduling norms/regulations is brought at the earliest and therefore following is proposed:

- i. All these transactions wherein specific LTA has not been granted shall be either considered under deemed LTA or specific LTA may be granted by the CTU.
- ii. The transactions shall be subjected to transmission charges as well as RLDC fee and charges.
- iii. Revisions in schedules of these transactions should be done ex-ante as applicable to any other transactions under the respective category.
- iv. Post-facto revisions of some of these transactions which happening today shall be stopped.

The members may like to discuss and decide a date for operationalization of the above.

D. ITEMS FOR NRPC

D.1 Reimbursement of Expenditure of NRPC Sectt. for FY 2019-20 by the members of NRPC

D.1.1 In the 45th NRPC meeting, Rs. 10 Lakh per member was approved as the contribution for the financial year 2019-20.

D.1.2 In the 42nd NRPC meeting held on 28.06.2018, it was decided to contribute the amount of Rs. 10.0 Lakh per member for the year 2018-19 toward reimbursing NRPC expenditure to Gol for the year 2018-19, for meeting the expenditure for meetings at Secretariat and other expenditure as approved by Chairperson, NRPC.

D.1.3 In the 45th NRPC meeting All members have agreed to make their payments for current year as well of the past years (if due). But for current FY 2019-20, Contribution received from 01 member (Aravali Power) only and is still awaited from 41 members .

D.1.4 Since two quarters of FY 2019-20 is also almost over, members are requested to expedite the contribution at the earliest.

D.2 Reimbursement of Expenditure of NRPC Sectt. by the members of NRPC for the previous years

D.2.1 For reimbursing NRPC expenditure to Gol and meeting the expenditure for meetings at Secretariat and other expenditure as approved by Chairperson, NRPC, constituent members are to pay annual contribution as decided at NRPC meetings from time to time.

D.2.2 The contribution for previous years is still awaited from following members:

Sl. No.	Constituent Member	Amount (Rs.)
Financial Year 2018-2019		
1	Uttar Haryana BijliVitaran Nigam Ltd.	10.0Lakh
2	Jaipur VidyutVitrان Nigam Ltd.,	10.0Lakh
3	J&K Power Development Department,	10.0Lakh
4	J&K State Power Development Corp. Ltd.	10.0Lakh
5	DakshinanchalVidyutVitrان Nigam Ltd., Agra	10.0Lakh

6	Uttarakhand Power Corporation Ltd.,	10.0Lakh
7	Nuclear Power Corpn. of India Ltd,	10.0Lakh
8	Prayagraj Power Generation Co Ltd.	10.0Lakh
9	Manikaran Power	10.0Lakh
Sl. No.	Constituent Member	Amount (Rs.)
Financial Year 2017-2018		
1	Dakshin Haryana BijliVitaran Nigam Ltd., Hisar	10.0Lakh
2	J&K Power Development Department, Srinagar	10.0Lakh
3	J & K State Power Development Corp. Ltd., Srinagar	10.0Lakh
4	Madhyanchal VidyutVitrان Nigam Ltd., Lucknow	10.0Lakh
5	Uttarakhand Power Corporation Ltd., Dehradun	10.0Lakh
6	Rosa Power Supply Company Ltd., Shahjahanpur	10.0Lakh
7	LancoAnpara Power Ltd., Gurgaon	10.0Lakh
8	Prayagraj Power Generation Co Ltd., Allahabad	10.0Lakh

Financial Year 2016-2017		
1.	J&K PDD, Srinagar	7.0 Lakh Each
2.	PVVNL, Varanasi	
Financial Year 2015-2016		
1	J&K State Power Development Corp. Ltd., Srinagar	11.0 Lakh Each
2	Paschimanchal VVNL, Meerut	
3	GMR Energy Trading Limited, New Delhi	
Financial Year 2014-2015		
1	J&K State Power Development Corp. Ltd., Shrinagar	11.0 Lakh Each
2	Dakshinanchal VVNL, Agra	
3	Bajaj Energy Pvt. Ltd., Noida	
Financial Year 2012-2013		
1	Purvanchal VVNL, Varanasi	10.0 Lakh

Members are requested to expedite the contribution at the earliest.

D.3 Capacity Building Program for Northern Regional Constituents (proposed to be funded 100% through PSDF)

D.3.1 During last 45th NRPC meeting held on 8th June, 2019, a proposal on capacity building program, to study the power exchange of Nordic countries to assist the development of a commercially viable and vibrant power market in India, to be carried out for Northern Region Constituents, was placed before Northern Regional Power Committee. The Program is to be executed through PSDF funding exclusively. Members appreciated the proposal and authorized Member Secretary, NRPC to prepare the DPR, attend PSDF meetings on behalf of NRPC and do needful for getting PSDF grant for the Program.

D.3.2 Salient features of the Capacity Building Program are as under:

- Understanding market design in Nordic countries and Europe
- Power market model in Nordic countries (Norway, Sweden, Denmark and Finland)

- Regulatory environment
- Power flow management
- Re-dispatch and other congestion management strategies
- Financial as well as physical power trading
- Imbalance handling mechanism.
- Integration of power market, market coupling.
- Surveillance and transparency in power market
- Role of transmission system operator-TSO/ISO models
- Effect of renewable energy in power trading
- EV Integration with Grid
- Hydrogen usage in power vehicles
- Unmanned Operation of one of the largest hydro station
- Innovative approaches for renewable handling

D.3.3 The program would benefit the participants from the Central Transmission Utility (CTU), State Transmission Utilities (STUs), Distribution Companies, State Load Dispatch Centers (SLDCs), Generators (including ISGS) of Northern Region, Power System Operation Corporation (POSOCO) and Northern Regional Power Committee (NRPC) Secretariat. Participation from Central Electricity Authority (CEA) and Ministry of Power is also envisaged.

D.3.4 It is proposed that NRPC will engage any Power Sector PSU / government organization in line with the provisions of GFR 2017 for executing the program. The program can have 4 batches of 15 participants each (five days for each batch). The tentative tenure of the program is for one year w.e.f. 1/4/2020.

Members may kindly deliberate on selection of executing agency so that DPR may be prepared.

D.4 HOSTING OF NEXT MEETINGS OF NRPC / TCC

As per agreed roster for hosting of meetings, the next meetings of TCC (44th) & NRPC (47th), would be held on 10th & 11th December, 2019 respectively at Jaisalmer and are to be hosted by Rajasthan.

Annexure-I

S. No.	Utilities	Appointment of organization-wise Chief Information Security Officers and its status	Identification of organization-wise Critical Infrastructure and its status	Preparation of organization-wise Crisis Management Plan and its status	Status of Cyber Security Mock Drill activity in coordination with CERT-In	Status of Training / Workshops on Cyber Security organized / participated by power sector entities	Status of action taken on CERT-In / NCIIPC advisories
1	PSTCL	√	Identified at SLDC	√	×	×	Cyber Security audit at Punjab SLDC is carried out in line with CERT-In advisories
2	DTL	√	×	×	×	Attended round the clock conference.	×
3	Adani Power Ltd.	√	The SCADA systems across all the locations have been identified as the critical infrastructure	A detailed & elaborate Crisis Management plan is under preparation.	×	√	Adani Power is regularly updating the Cyber Security devices and review the applicability of the advisories to its infrastructure.
4	BBMB	√	The identification of critical infrastructure is under process.	The documentation of Crisis Management Plan for SCADA/EMS System is under process.	×	The officers/officials of BBMB regularly participate in the Training/Workshops on Cyber Security organized by external agencies. In house training calendar is being prepared.	The cyber security advisories received from CERT-In/NCIIPC are being implemented regularly on SCADA/EMS System.
5	NTPC	√	The identification of Critical Information Infrastructure (CII) is under process	√	√	√	√
6	NPCIL RAPS, NAPS	√	√	√	√	√	√
7	PTCUL	√	Critical infrastructure identification is under process.	Under process	Under process	Under process	√
8	THDC	√	The Identification of Critical infrastructure is yet to be identified.	√	×	√	√
9	SJVNL	√	×	Crisis Management plan is being drafted in line with the Crisis Management Plan of CERT- Hydro	√	The HR/Training Department will organize the training programme	√

Annexure-I

S. No.	Utilities	Appointment of organization-wise Chief Information Security Officers and its status	Identification of organization-wise Critical Infrastructure and its status	Preparation of organization-wise Crisis Management Plan and its status	Status of Cyber Security Mock Drill activity in coordination with CERT-In	Status of Training / Workshops on Cyber Security organized / participated by power sector entities	Status of action taken on CERT-In / NCIIPC advisories
10	Haryana	√	√	×	Mock drill activities related to SCADA/EMS system are being carried out as per the already laid terms of contract & in unison with NRLDC as well as other power utilities of NR Region.	×	×
11	NRLDC	√	√	√	To be done	√	√

Status of Cyber Security Audit and VAPT of ICT infrastructure, website, web application

NPCIL:

VAPT is being conducted. All NPCIL units conduct quarterly cyber security audit of their infrastructure and submit reports. Periodic audits of NPCIL HQ and units are being conducted.

NHPC:

157th OCC meeting: As a pilot location, the auditing of IT infrastructure of IT&C Division and VAPT of two power stations have been done and the audit report has been submitted on 31.12.2018. The compliance of the observations is under progress.

SJVNL:

37th TCC/40th NRPC: CERT-In empanelled auditor has been requested for IT security audit & Vulnerability Assessment Analysis of IT security implementation & IT Network Infrastructure.

POWERGRID:

159th OCC meeting: VAPT of IT equipment has been done. For SCADA system, only VA is being done.

Rajasthan:

159th OCC meeting: Award for complete cyber security layer under ICT infrastructure is already made and execution is being done. The third-party checking/ assessment of the layer is also in the scope of the contractor.

BBMB:

159th OCC meeting: VAPT of ICT network related to BBMB Power System is being done on annual basis. Last VAPT was conducted on 8th January, 2019. Next VAPT is due in January, 2020.

NRPC Secretariat:

The cyber security audit of NRPC website portal has been completed.

NRLDC

161st OCC meeting: VAPT has been completed.

Replacement of Old transformers/reactors (age more than 20 years) in the Northern Region

Annexure-III

S.NO	REGION	STATION	FEEDER	MAKE	SL.NO	CAPACITY	PHASE	VOLTAGE	INSTALL DATE	Age as on 10/07/19 (YEARS)
1	NR-I	BALLABGARH	BUS REACTOR	BHEL	6004915	80	3Ø	400	23-06-1989	30.07
2	NR-II	PANIPAT	ICT-II Y PH	TELK	140053-2	150	1Ø	400	04-05-1985	34.21
3	NR-II	PANIPAT	ICT-1 R PH	TELK	140053-1	150	1Ø	400	04-05-1985	34.21
4	NR-III	AGRA	Bhiwadi-1 L/R-Y	CGL	T-8353/11	16.67	1Ø	400	28-03-1997	22.3
5	NR-III	ALLAHABAD	MAINPURI 1 LR (Fatehpur-1)	BHEL	6004996	50	3Ø	400	02-02-1994	25.45
6	NR-III	ALLAHABAD	MAINPURI 2 LR (Fatehpur-2)	BHEL	6004995	50	3Ø	400	18-08-1993	25.91
7	NR-III	KANPUR	SINGROULI LR	MELCO	8654500104	80	3Ø	400	18-12-1988	30.58
8	NR-III	KANPUR	AGR LR	MELCO	8134160101	50	3Ø	400	10-05-1984	35.19

POWERGRID CORPORATION OF INDIA LIMITED

Tripping Details of 220KV UPPCL line Tanda-1 & 2

Region - NR-3

Annexure-IV

Sl. No.	NAME OF ELEMENTS/Line	TRIPPING		RESTROTION		Category CODE	REASON OF TRIPPING DETAILS
		DATE	TIME	DATE	TIME		
1	220KV Soh-Tanda-I	28-05-2019	3:17 PM	29-06-2019	11:34 AM	LPPT	Y-B Phase to phase fault
2	220KV Soh-Tanda-I	29-05-2019	12:31 PM	29-06-2019	6:05 PM	LEFT	B-N Phase to earth fault
3	220KV Soh-Tanda-I	01-06-2019	11:32 AM	01-06-2019	7:44 PM	LEFT	B-N Phase to earth fault
4	220KV Soh-Tanda-I	02-06-2019	12:13 PM	06-06-2019	10:45 AM	LPPT	Y-B Phase to phase fault
5	220KV Soh-Tanda-I	06-06-2019	11:53 PM	07-06-2019	10:07 AM	LPPT	Y-B Phase to phase fault
6	220KV Soh-Tanda-II	12-06-2019	11:08 AM	12-06-2019	8:12 PM	LPPT	Y-B Phase to phase fault
7	220KV Soh-Tanda-I	12-06-2019	11:20 AM	12-06-2019	8:12 PM	LEFT	B-N Phase to earth fault
8	220KV Soh-Tanda-I	14-06-2019	1:23 PM	14-06-2019	7:58 PM	LEFT	B-N Phase to earth fault
9	220KV Soh-Tanda-I	17-06-2019	6:49 PM	17-06-2019	8:08 PM	LEFT	B-N Phase to earth fault
10	220KV Soh-Tanda-I	26-06-2019	7:10 PM	26-06-2019	1:34 PM	LPPT	Y-B Phase to phase fault
11	220KV Soh-Tanda-I	02-07-2019	10:28 AM	02-07-2019	12:06 PM	LEFT	B-N Phase to earth fault
12	220KV Soh-Tanda-I	02-07-2019	12:18 PM	02-07-2019	5:54 PM	LEFT	B-N Phase to earth fault
13	220KV Soh-Tanda-I	03-07-2019	11:31 AM	05-07-2019	4:00 PM	LEFT	B-N Phase to earth fault
14	220KV Soh-Tanda-I	13-07-2019	21:48 PM	16-07-2019	10:40 AM	LEFT	B-N Phase to earth fault
15	220KV Soh-Tanda-I	17-07-2019	11:15 AM	17-07-2019	11:15 AM	AUTO	B-N Phase to earth fault
16	220KV Soh-Tanda-I	23-07-2019	02:31 PM	24-07-2019	18:44	LEFT	Y-B Phase to earth fault
17	220KV Soh-Tanda-II	06-08-2019	11:03PM	25-08-2019	12:34	LPPT	R-Y Phase to phase fault
18	220KV Soh-Tanda-I	10-08-2019	10.50 PM	10-08-2019	6.55 PM	LPPT	Y-B Phase to phase fault

पावर ग्रिड कारपोरेशन ऑफ इंडिया लिमिटेड

(भारत सरकार का उद्यम)



POWER GRID CORPORATION OF INDIA LIMITED

(A Government of India Enterprise)

पावरग्रिड

केन्द्रीय कार्यालय: "सौदामिनी" प्लॉट सं. 2, सैक्टर-29, गुडगाँव-122 001, (हरियाणा) दूरभाष: 0124-2571700-719, फैक्स : 0124-25717
 "Saudamini" Plot No. 2, Sector-29, Gurgaon-122 001, (Haryana) Tel. : 0124-2571700-719, Fax : 0124-2571762, Web.: www.powergridindia.co

CIN : L40101DL1989GOI03812

CC/AM/HVDC/CK/NRPC

dated 13.08.19

To,
 Member Secretary,
 Northern Region Power Committee,
 18-A, S. Jeet Singh Marg, Katwaria Sarai,
 New Delhi- 110016



Ref: 1) Your letter No NRPC/Comml/209/RPC(45th)/2019/7152-7246 dated 09.07.2019
 2) Our letter No CC/WNIC/NRPC/18/9 dated 26.09.18
 CC/AM/HVDC/CK/NRPC dated 26.02.19

Dear Sir

In reference to minutes of 45th NRPC meeting and 42nd TCC meeting dated 07th & 8th June 2019 regarding telemetry from Kurukshetra HVDC, the issue was pursued with OEM. In response, OEM reiterated the constraint that the firing and extinction angle are part of control strategy which comes under proprietary solution of the contractor and hence unable to share the same on telemetry data. Copy of letter from OEM is attached herewith as Annexure-I.

In view of above, it is proposed that the issue may be dropped.

This is for your information please.

Yours faithfully

Rakesh Kumar
 13/08/19
 (Rakesh Kumar)
 Sr. GM (AM)



GE T&D India Limited

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Letter Ref: **GS/CKL/4337/C/RS/6263**

Date - **12/08/2019**

To,
Power Grid Corporation of India Limited
`Saudamini`, Plot No. 2, Sector-29
Gurgaon-122001. Haryana, India

KIND ATTN: Mr. A. Sensarma (Senior GM - AM)

Dear Sir,

Sub: Regarding sharing of telemetry data of HVDC CK link to RLDC

Ref: CC-CS/156-WR1/HVDC-1489/7/G10/CA-I/4335 dated 21.06.2012
CC-CS/156-WR1/HVDC-1489/7/G10/CA-II/4336 dated 21.06.2012
CC-CS/156-WR1/HVDC-1489/7/G10/CA-III/4337 dated 21.06.2012

±800kV, 3000 MW HVDC Terminal Package associated with Western / Northern Region
Interconnector for IPP Projects in Chhattisgarh under "Nation Grid Improvement Project.

Letter Ref: 1. Our letter ref: **GS/CKL/4337/C/RS/6178** dated 11/01/2019
2. Your letter ref: **CC/AM/HVDC/CK/** dated 29/05/2019

This is with reference to the subject matter.

With regard to repeat request on the firing and extinction angle data to share with RLDC for Champa-Kurukshetra HVDC Link, herewith we are reiterating the constraint that the firing and extinction angle are part of project control strategy which comes under proprietary solution of the contractor. Such sensitive data shall not be shared over the telemetry data.

We remain at your disposal for any further information or clarification that you may need in this regards.

Assuring you of our continued cooperation at all times, we remain.

Yours faithfully,

Rakesh SINGH
Project Director

USAGE OF LINE REACTOR AS BUS REACTOR

Annexure - VI

A. POWERGRID

S.No	Lines	Ckt ID	End-1	MVAr Rating at End-1	End-2	MVAr Rating at End-2	Remarks	SWITCHABLE/FIXED (NOT SWITCHABLE) END 1	SWITCHABLE/FIXED (NOT SWITCHABLE) END 2
765kV Transmission line									
1	Agra-Fatehpur	1	Agra	3*80	Fatehpur	3*110	Can be used as BR at Agra & Fatehpur	F	S
2	Agra-Fatehpur	2	Agra	3*80	Fatehpur	3*110	Can be used as BR at Agra & Fatehpur	S	F
3	Ajmer-Chittorgarh	1	Ajmer	3*80	Chittorgarh	3*80	Can be used as BR at Ajmer & Chittorgarh	S	S
4	Ajmer-Chittorgarh	2	Ajmer	3*80	Chittorgarh	3*80	Can be used as BR at Ajmer & Chittorgarh	S	S
5	Aligarh-Jhatikara	1	Aligarh	-	Jhatikara	3*110	Can be used as BR at Jhatikara	F	F
6	Aligarh-Orai	1	Aligarh	3*80	Orai	3*80		F	F
7	Aligarh-Orai	2	Aligarh	3*80	Orai	3*80		F	S
8	Balia-Gaya	1	Balia	3*80	Gaya	-	Can be used as BR at Balia	S	
9	Balia-Lucknow	1	Balia	3*80	Lucknow	3*80	Can be used as BR at Balia & Lucknow	S	
10	Bhiwani-Meerut	1	Bhiwani	3*80	Meerut	-	Can be used as BR at Bhiwani	S	
11	Chittorgarh-Banaskantha	1	Chittorgarh	3*80	Banaskantha	-		F	F
12	Chittorgarh-Banaskantha	2	Chittorgarh	3*80	Banaskantha	-		F	S
13	Fatehpur-Sasaram	1	Fatehpur	3*80	Sasaram	3*110	Can be used as BR at Sasaram	F	F
14	Gr.Noida-Meerut	1	Gr. Noida	-	Meerut	3*80	Can be used as BR at Meerut	F	F
15	Jabalpur-Orai	1	Jabalpur	3*110	Orai	3*110		F	S
16	Jabalpur-Orai	2	Jabalpur	3*110	Orai	3*110		F	S
17	Kanpur-Aligarh	1	Kanpur	3*110	Aligarh	3*110		S	S
18	Kanpur(GIS)-Varanasi	1	Kanpur(GIS)	3*110	Varanasi	3*80	All of these reactors can be used as BR	F	
19	Kanpur(GIS)-Varanasi	2	Kanpur(GIS)	3*110	Varanasi	3*80		F	
20	Lucknow-Bareilly	1	Lucknow	3*80	Bareilly	3*80	Can be used as BR at Lucknow	S	S
21	Moga-Bhiwani	1	Moga	3*80	Bhiwani		Can be used as BR at Moga	S	S
22	Moga-Meerut	1	Moga	3*80	Meerut	3*80	Can be used as BR at Moga & Meerut	S	S
23	Phagi-Bhiwani(PG)	1	Phagi	3*80	Bhiwani	3*80	Can be used as BR at Phagi(confirmation from utility pending)	F	S
24	Phagi-Bhiwani(PG)	2	Phagi	3*80	Bhiwani	3*80		F	S
25	Phagi-Gwalior	1	Phagi	3*80	Gwalior	3*80	Can be used as BR at Gwalior	F	
26	Phagi-Gwalior	2	Phagi	3*80	Gwalior	3*80		F	S
27	Varanasi-Balia	1	Varanasi	3*80	Balia	-			
28	Varanasi-Fatehpur	1	Varanasi		Fatehpur	3*110	Can be used as BR at Fatehpur		
29	Varanasi-Gaya	1	Varanasi	3*80	Gaya		Can be used as BR at Varanasi		
30	Varanasi-Gaya	2	Varanasi	3*80	Gaya				F
31	Orai - Satna	1	Orai (PG)	3*80	Satna				F

S.No	Lines	Ckt ID	End-1	MVAr Rating at End-1	End-2	MVAr Rating at End-2	Remarks	SWITCHABLE/FIXED (NOT SWITCHABLE) END 1	SWITCHABLE/FIXED (NOT SWITCHABLE) END 2
765kV Transmission line charged at 400kV									F
1	Kishenpur-Moga	1	Kishenpur	63	Moga	63	Can be used as BR at kishenpur & Moga	F	S
2	Kishenpur-Moga	2	Kishenpur	63	Moga	63	Can be used as BR at kishenpur & Moga	F	S
3	Tehri Pooling-Meerut	1	-	-	Meerut	50	Can be used as BR at Meerut		
4	Tehri Pooling-Meerut	2	-	-	Meerut	50	Can be used as BR at Meerut		
400kV Transmission line									
1	Abdullapur-Panchkula	1	Abdullapur	50	-	-	LILO of Jhakri-Abdullapur at Panchkula; Can be used as BR at Abdullapur end	F	
2	Abdullapur-Panchkula	2	Abdullapur	50	-	-		F	F
3	Agra(PG)-Auraiya	1	Agra	50	-	-		F	F
4	Agra(PG)-Auraiya	2	Agra	50	-	-		F	
5	Agra(PG)-Ballabgarh	1	-	-	Ballabgarh	50			
6	Agra(PG)-Bassi	1	Agra	50	Bassi	50		F	F
7	Agra(PG)-Bhiwadi	1	Agra	50	-	-	Bus reactor at Agra (PG) is now used as line reactor	S	F
8	Agra(PG)-Jaipur South	1	Agra	50	Jaipur South	50	LILO of Agra-Bassi at Jaipur South; can be used as BR at Jaipur south end.		S
9	Agra(PG)-Jaipur South	2	Agra	50	Jaipur South	50		F	S
10	Agra(PG)-Kanpur	1	Agra	50	Kanpur	50		F	
11	Agra(PG)-Sikar	1	Agra	80	Sikar	50	Can be used as BR at sikar		
12	Agra(PG)-Sikar	2	Agra	80	Sikar	50			
13	Allahabad-Fatehpur	1	Allahabad	50	Fatehpur	-	Can be used as BR at Allahbad (LILO of 400kV Allahabad-Mainpuri at Fatehpur)	S	
14	Allahabad-Fatehpur	2	Allahabad	50	Fatehpur	-		S	
15	Allahabad-Rihand	1	Allahabad	50	-	-	Can be used as BR at Allahabad	F	S
16	Allahabad-Rihand	2	Allahabad	50	-	-		F	
17	Allahabad-Sasaram	1	-	-	Sasaram BtB	63			
18	Amritsar-Hamirpur	1	-	-	Hamirpur	50			
19	Balia-Biharsharif	1	Balia	50	-	-	Can be used as BR at Balia	F	
20	Balia-Biharsharif	2	Balia	50	-	-		F	
21	Balia-Patna	1	Balia	50	Patna		Can be used as BR at Balia	S	
22	Balia-Patna	2	Balia	50	Patna			S	F
23	Balia-Patna	3	Balia	63	Patna	-	Can be used as BR at Balia	F	F
24	Balia-Patna	4	Balia	63	Patna	-		F	F
25	Balia-Sohawal	1	Balia	63	Sohawal	50	Can be used as BR at Balia & Sohawal	F	F
26	Balia-Sohawal	2	Balia	63	Sohawal	50		F	F
27	Bareilly (PG)-Meerut	1	Bareilly	50	Meerut		LILO of Bareilly-Mandola D/C line at Meerut;	S	
28	Bareilly (PG)-Meerut	2	Bareilly	50	Meerut		Can be used as BR at Bareilly	S	

S.No	Lines	Ckt ID	End-1	MVAr Rating at End-1	End-2	MVAr Rating at End-2	Remarks	SWITCHABLE/FIXED (NOT SWITCHABLE) END 1	SWITCHABLE/FIXED (NOT SWITCHABLE) END 2
29	Bareilly(PG)-Lucknow(UP)	1	Bareilly	50	Lucknow(UP)	50	Lucknow(UP)-Reactor is of UPPTCL; can be used as BR at Bareilly		F
30	Bassi-Bhiwadi	1	Bassi	50	-	-		F	F
31	Bassi-kotputli	2	Bassi	50	-	-	LILO of Bassi-Bhiwadi at Kotputli; can be used as BR at Bassi end.	-	
32	Bhinmal-Zerda	1	-	-	Zerda	50	Zerda is in WR.		
33	Bhiwadi-Hisar	1	-	-	Hisar	50	Can be used as BR at Hisar end.		S
34	Bhiwadi-Hisar	2	Bhiwadi	63	Hisar	-	LILO of Bhiwadi-Moga 2,3 at Hisar Can be used as BR at Bhiwadi	F	F
35	Bhiwadi-Hisar	3	Bhiwadi	63	Hisar	-		F	S
36	Bikaner-Sikar		Bikaner		Sikar	50	Can be used as BR at Jalandhara.		F
37	Bikaner-Sikar		Bikaner		Sikar	50			F
38	Chamera Pool- Jalandhar	1	Chamera Pool	-	Jalandhar	50			F
39	Chamera Pool- Jalandhar	2	Chamera Pool	-	Jalandhar	50			F
40	Dadri-Kaithal	1	Dadri	-	Kaithal	50	LILO of Dadri-Malerkotla at Kaithal		
41	Fatehabad-Moga	1	Fatehabad	63	-	-	Can be used as BR at Fatehabad.	F	
42	Fatehpur-Kanpur	1	Fatehpur	-	Kanpur	80	LILO of Singrauli-Kanpur at Fatehpur		
43	Fatehpur-Mainpuri	1	Fatehpur	-	Mainpuri	80	LILO of 400kV Allahabad-Mainpuri at Fatehpur; can be used as BR at Mainpuri end.		
44	Fatehpur-Mainpuri	2	Fatehpur	-	Mainpuri	80			
45	Gorakhpur-Motihari	1	Gorakhpur	80	Motihari		Can be used as B/R at Gorakhpur	S	
46	Gorakhpur-Motihari	2	Gorakhpur	80	Motihari			S	
47	Gorakhpur(Pg)-Muzzafarpur	1	-	-	Muzaffarpur	63	MUZZAFARPUR End is in Eastern Region		
48	Gorakhpur(Pg)-Muzzafarpur	1	-	-	Muzaffarpur	63			S
49	Gorakhpur-Lucknow	1	Gorakhpur	50	-	-	Can be used as BR at Gorakhpur.	S	S
50	Gorakhpur-Lucknow	2	Gorakhpur	50	-	-		S	
51	Gorakhpur-Lucknow(PG)	3	Gorakhpur	63	Lucknow (PG)	63	Can be used as BR at Gorakhpur & Lucknow ends	S	
52	Gorakhpur-Lucknow(PG)	4	Gorakhpur	63	Lucknow (PG)	63		S	F
53	Hisar-Kaithal	1	Hisar	50	-	-	LILO of Hisar-Patiana at Kaithal, can be used as BR at Hisar	F	F
54	Hisar-Moga	1	Hisar	50	-	-	Can be used as BR at Hisar	F	
55	Hisar-Moga	2	Hisar		Moga	63	Can be used as BR at Moga (LILO of Bhiwadi-Moga 2,3 at Hisar)		
56	Hisar-Moga	3	Hisar		Moga	63			
57	Jaipur- Rapp C	1	Jaipur	50	Rapp C			F	
58	Jaipur- Rapp D	1	Jaipur		Rapp D	63			
59	Jalandhar-Hamirpur	1	Jalandhar		Hamirpur	50			
60	Kaithal(PG)-Bagpat(PG)	1	Kaithal	50	Bagpat	-	Can be used as BR at Kaithal	S	
61	Kaithal(PG)-Bagpat(PG)	2	Kaithal	50	Bagpat	-		S	
62	Kankrauli-Bhinmal	1	Kankrauli	50	Bhinmal	50	Can be used as BR at Kankroli & Bhinmal ends.	F	F

S.No	Lines	Ckt ID	End-1	MVAr Rating at End-1	End-2	MVAr Rating at End-2	Remarks	SWITCHABLE/FIXED (NOT SWITCHABLE) END 1	SWITCHABLE/FIXED (NOT SWITCHABLE) END 2
63	Kankrauli-RAPS-C	1	Kankrauli	50	-	-	Can be used as BR at Kankroli end.	F	F
64	Kankrauli-Zerda	1	Kankrauli	50	Zerda	50	Can be used as BR at Kankroli end.	F	F
65	Kanpur-Ballabgarh	1	Kanpur	80	Ballabgarh	80		F	
66	Kanpur-Ballabgarh	2	Kanpur	80	Ballabgarh	80	Can be used as BR at Kanpur & Balabgarh ends.	F	
67	Kanpur-Ballabgarh	3	Kanpur	80	Ballabgarh	80		F	F
68	Karcham-Kala Amb	1	Karcham	80	Kala Amb	-	LILO of Karcham-Abdullapur D/C at Sorang; at present Sorang station is bypassed		
69	Karcham-Kala Amb	2	Karcham	80	Kala Amb	-			
70	Kota-Merta	1	Kota	50	Merta	50	Can be used as BR at Kota end.	F	
71	Kota-Shree Cement	1	Kota	50	Shree Cement			F	
72	Kurushetra-Jalandhar		Kurushetra		Jalandhar	50	Can be used as BR at Jalandhar end.		F
73	Kurushetra-Nakodar		Kurushetra		Nakodar	50	Can be used as BR at Nakodar end.		F
74	Lucknow(PG) -Shahjahanpur	1	Lucknow(PG)	50	Shahjahanpur	-	LILO of Bareilly-Lucknow 2 at Shahjhanpur; can be used as BR at Lucknow end.		F
75	Lucknow(PG) -Shahjahanpur	2	Lucknow(PG)	50	Shahjahanpur	-			F
76	Meerut-Mandola	3	Meerut		Mandola	50	Can be used as BR at Mandola end.(under diversion to Kanpur SS)		F
77	Meerut-Mandola	4	Meerut		Mandola	50			F
78	Rampur-Nallagarh	1	Rampur	-	Nallagarh	50	Can be used as BR at Nallagarh end.		S
79	Rampur-Nallagarh	2	Rampur	-	Nallagarh	50			S
80	Nathpa Jhakri-Panchkula	1	Nathpa Jhakri		Panchkula	50	Can be used as BR at Panchkula end.		
81	Nathpa Jhakri-Panchkula	2	Nathpa Jhakri		Panchkula	50			F
82	Sasaram-Varansai	1	Sasaram BtB	63	Varanasi	-		F	F
83	Shree Cement-Merta	1	Shree Cement	-	Merta	50	Used as BR at Kota		F
84	Singrauli-Fatehpur	1	Singrauli	80	Fatehpur	80	Singrauli-Reactor is of NTPC; can be used as BR at Fatehpur	F	
85	Wagoora-New Wanpoh	1	Wagoora	50	-	-	Can be used as BR at Wagoora end.		
86	Wagoora-New Wanpoh	2	Wagoora	50	-	-			
87	Varanasi-Biharsharif	1	Varanasi	50	Biharsharif	-	Can be used as BR at Varanasi end.	S	
88	Varanasi-Biharsharif	2	Varanasi	50	Biharsharif	-		S	
400kV Transmission line charged at 220kV									
1	Dhauliganga-Bareilly	1	Dhauliganga	25	Bareilly	-		F	
B. BBMB - 400kV Transmission Line									
1	Dehar-Bhiwani	1	-	-	Bhiwani	50			
2	Panchkula(PG)-Panipat	1	-	-	Panipat	71.66	Damaged		

S.No	Lines	Ckt ID	End-1	MVAr Rating at End-1	End-2	MVAr Rating at End-2	Remarks	SWITCHABLE/FIXED (NOT SWITCHABLE) END 1	SWITCHABLE/FIXED (NOT SWITCHABLE) END 2
C. NTPC - 400kV Transmission Line									
1	Singrauli-Allahabad	1	Singrauli STPS	80	-	-			
2	Singrauli-Allahabad	2	Singrauli STPS	80	-	-			
3	Singrauli-Allahabad	3			Allahabad	50	Owner is POWERGRID		
4	Singrauli-Lucknow (UP)	1	Singrauli STPS	63	Lucknow(UP)	63	Lucknow(UP)-Reactor is of UPPTCL	F	
5	Spare	1	Rihand STPS	40	-	-			
SINGRAULI END LINE REACTOR ON 400kV SINGRAULI-KANPUR IS MENTIONED ABOVE IN POWERGRID									
D. NHPC - 400kV Transmission Line									
1	Chamera-I-Jalandher	1	Chamera-1 HEP	50	-	-		F	
2	Chamera-I-Jalandher	2	Chamera-1 HEP	50	-	-		F	
3	Uri-I-Wagoora	1	Uri HEP	50	-	-		F	
4	Uri-I-Wagoora	2	Uri HEP	50	-	-		F	
E. RRVPNL - 400kV Transmission Line									
765kV Transmission line									
1	Anta-Phagi	1	Anta	3*80	Phagi	3*80	Used as BR at Anta & Phagi	S	F
2	Anta-Phagi	2	Anta	3*80	Phagi	3*80	Used as BR at Anta & Phagi	S	
400kV Transmission line									
1	Akal-Kakani	1	Akal	50	Kakani	-			
2	Akal-Kakani	2	Akal	-	Kakani	50			
3	Akal-Jodhpur	1	Akal	50	Jodhpur	50	Can be used as bus reactor at Jodhpur & Akal end.	F	
4	Bhadla-Bikaner	1	Bhadla	50	Bikaner				
5	Bhadla-Bikaner	2	Bhadla	50	Bikaner				
6	Bikaner-Suratgarh SC	1	Bikaner		Suratgarh SC	50			
7	Bikaner-Suratgarh SC	2	Bikaner		Suratgarh SC	50			
8	Bhadla-Jodhpur	1	Bhadla	50	Jodhpur				
9	Bhadla-Merta	1	Bhadla	50	Merta				
10	Bhadla-Ramgarh	1	Bhadla		Ramgarh	50	Can be used as bus reactor at Ramgarh end.		
11	Bhadla-Ramgarh	2	Bhadla		Ramgarh	50			
12	Bikaner-Merta	1	Bikaner	50	Merta	50	Non switchable reactor		
13	Chhabra-Bhilwara	1	Chhabra	50	Bhilwara	50	Can be used as bus reactor at Chhabra & Bhilwara end.		F
14	Chhabra-Hindaun	1	Chhabra	50	Hindaun	50	Can be used as bus reactor at Chhabra & Hindaun end.		F

S.No	Lines	Ckt ID	End-1	MVAr Rating at End-1	End-2	MVAr Rating at End-2	Remarks	SWITCHABLE/FIXED (NOT SWITCHABLE) END 1	SWITCHABLE/FIXED (NOT SWITCHABLE) END 2
15	Heerapura-Hindaun	1	Heerapura	50	-	-			
16	Rajwest-Jodhpur	1	Rajwest	50	Jodhpur	50	Can be used as bus reactor at Jodhpur & Rajwest end.	F	
17	Rajwest-Jodhpur	2	Rajwest	50	Jodhpur	50		F	S
F. UPPTCL									
765kV Transmission Line									
1	Anpara C-Unnao	1	Anpara C	3*110	Unnao	3*110	Can be used as BR at Anpara C & Unnao	S	
2	Anpara D-Unnao	1	Anpara D	3*110	Unnao	3*110	Charged as BR at Anpara D	S	S
3	Bara-Mainpuri(UP)	1	Bara	3*110	Mainpuri	3*110		S	S
4	Fatehbad(UP)-Lalitpur	1	Fatehbad(UP)	3*80	Lalitpur	3*110	Can be used as Bus Reactor at Fatehbad and Lalitpur		
5	Fatehbad(UP)-Lalitpur	2	Fatehbad(UP)	3*80	Lalitpur	3*110			
6	Gr. Noida-Mainpuri	1	Gr. Noida	3*80	Mainpuri				
7	Unnao-Mainpuri	1	Unnao	-	Mainpuri	3*50	line not charged, reactor in service as BR		
400kV Transmission Line									
1	Agra(UP)-Unnao	1	Agra(UP)	50	Unnao	50			
2	Aligarh-Panki	1	Aligarh	63	Panki	50	LILO of Panki-Muradnagar at Aligarh		
3	Anpara-Mau	1	Anpara TPS	63	Mau	-			
4	Azamgarh-Sarnath	1	Azamgarh	50	Sarnath	50	Line reactor has been damaged at Sarnath		
5	Bareilly(Up)-Unnao	1	Bareilly (UP)	50	Unnao	50			
6	Bareilly(Up)-Unnao	2	Bareilly (UP)	50	Unnao	50			
7	Obra-Rewa road	1	Obra-B TPS	50	Rewa road				
8	Obra-Sultanpur	1	Obra-B TPS	50	Sultanpur	50			
9	Rewa road- Panki	1	Rewa road		Panki	50			
10	Srinagar- Muzzafarnagar	1	Srinagar		Muzzafarnagar	50			
11	Vishnuprayag- Muzaffarnagar	1	Vishnupryag HEP	50	Muzaffarnagar	50			
12	Vishnuprayag- Srinagar	1	Vishnupryag HEP	50	Srinagar				
G. NRSS XXIX									
1	Samba-Amargarh	1	Samba	50	Amargarh	50			
2	Samba-Amargarh	2	Samba	50	Amargarh	50			
3	RAPP -Sujalpur	1	RAPP	50	Sujalpur				
4	RAPP -Sujalpur	2	RAPP	50	Sujalpur				
H. Series Line Reactor									
1	Dadri-Mandola	1	Dadri		Mandola	75	12 ohm , 1-phase	75MVAR at Full Load Current(3000Amp) 3 x 12ohms Series Bus Reactor	
2	Dadri-Mandola	2	Dadri		Mandola	75	12 ohm , 1-phase		
LUCKNOW (UP) END LINE REACTOR ON BAREILLY-LUCKNOW(UP) & SINGRAULI-LUCKNOW (UP) IS MENTIONED ABOVE IN POWERGRID & NTPC respectively									

Annexure - VII

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		Replaced with Polymer Insulator (As a % of Total Line Length)	Remarks
							End-I	End-II		
1. HVDC lines										
A. POWERGRID										
± 800kV HVDC										
1	Agra-Bishwanath Chariali Pole-I	1	Bi-pole	1728	Hexagon Lapwing	POWERGRID	POWERGRID	POWERGRID	Partial (11%)	Interconnection between North East region & Northern Region
2	Agra-Bishwanath Chariali Pole-II	2	Bi-pole	1728	Hexagon Lapwing	POWERGRID	POWERGRID	POWERGRID	Partial (11%)	
3	Kurukshetra-Champa Pole-I	1	Bi-pole	1305	Hexagon Lapwing	POWERGRID	POWERGRID	POWERGRID	Partial (11%)	
4	Kurukshetra-Champa Pole-II	2	Bi-pole	1305	Hexagon Lapwing	POWERGRID	POWERGRID	POWERGRID	Partial (11%)	
± 500kV HVDC										
1	Balia-Bhiwadi Pole-I	1	Bi-pole	790	ACSR Quad Bersimis	POWERGRID	POWERGRID	POWERGRID	Partial (15%)	
2	Balia-Bhiwadi Pole-II	2	Bi-pole	790		POWERGRID	POWERGRID	POWERGRID	Partial (15%)	
3	Rihand-Dadri Pole-I	1	Bi-pole	815	ACSR Quad Bersimis	POWERGRID	POWERGRID	POWERGRID	Partial (62%)	
4	Rihand-Dadri Pole-II	2	Bi-pole	815		POWERGRID	POWERGRID	POWERGRID	Partial (43%)	
B. Adani Power Ltd (Adani Transmission India Ltd.)										
1	Adani Mundra - Mahindergarh Pole-I	1	Bi-pole	990	ACSR Quad Bersimis	ATIL	APL Mundra	APL	Partial (7%)	Interconnection between Western region & Northern Region
2	Adani Mundra - Mahindergarh Pole-II	2	Bi-pole	990		ATIL	APL Mundra	APL	Partial (7%)	
2. 765kV Transmission Line										
A. POWERGRID										
1	Agra-Fatehpur	1	S/C	335	Quad Bersimis	POWERGRID	POWERGRID	POWERGRID	Conventional	Check the status of LILO portion??
2	Agra-Fatehpur	2	S/C	334	Quad Bersimis	POWERGRID	POWERGRID	POWERGRID	Conventional	
3	Agra-Aligarh	1	D/C	123	Quad Bersimis	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
4	Aligarh-Gr.Noida	2	D/C	51	Quad Bersimis	POWERGRID	POWERGRID	WUPPTCL	Polymer Insulator	
5	Agra-Jhatikara	1	S/C	252	Quad Bersimis	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
6	Ajmer-Chittorgarh	1	D/C	211	Hexa Zebra	POWERGRID	POWERGRID	POWERGRID	Not Available	
7	Ajmer-Chittorgarh	2	D/C	211	Hexa Zebra	POWERGRID	POWERGRID	POWERGRID	Not Available	
8	Balia - Lucknow765 (N)	1	S/C	319	Quad Bersimis	POWERGRID	POWERGRID	POWERGRID	Conventional	
9	Jhatikara-Bhiwani (PG)	1	S/C	85	Quad Bersimis	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
10	Jhatikara-Aligarh	1	D/C	158	Quad Bersimis	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
11	Kanpur(GIS)-Aligarh	1	D/C	322	Quad Bersimis	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
12	Lucknow-Bareilly	1	S/C	252	Quad Bersimis	POWERGRID	POWERGRID	POWERGRID	Conventional	
13	Meerut-Bhiwani(PG)	1	S/C	174	Quad Bersimis	POWERGRID	POWERGRID	POWERGRID	Partial (99%)	
14	Meerut-Gr.Noida	1	S/C	119	Quad Bersimis	POWERGRID	POWERGRID	WUPPTCL	Polymer Insulator	LILO of Agra-Meerut (267 KM) line at Gr. Noida
15	Moga- Bhiwani (PG)	1	S/C	273	Quad Bersimis	POWERGRID	POWERGRID	POWERGRID	Partial (96%)	
16	Moga-Meerut	1	S/C	338	Quad Bersimis	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
17	Orai-Aligarh	1	D/C	331	Hexa Zebra	POWERGRID	POWERGRID	POWERGRID	Not Available	
18	Orai-Aligarh	2	D/C	331	Hexa Zebra	POWERGRID	POWERGRID	POWERGRID	Not Available	
19	Phagi-Bhiwani(PG)	1	S/C	272	Quad Bersimis	POWERGRID	RRVNL	POWERGRID	Partial (18%)	
20	Phagi-Bhiwani(PG)	2	S/C	277	Quad Bersimis	POWERGRID	RRVNL	POWERGRID	Partial (16%)	
21	Varanasi-Balia	1	S/C	166	Quad Bersimis	POWERGRID	POWERGRID	POWERGRID	Conventional	
22	Varanasi-Fatehpur	1	S/C	223	Quad Bersimis	POWERGRID	POWERGRID	POWERGRID	Conventional	LILO of Gaya (ER)-Fatehpur at Varanasi
23	Varanasi-Kanpur(GIS)	1	S/C	326	Hexa Zebra	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
24	Varanasi-Kanpur(GIS)	2	S/C	326	Hexa Zebra	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	

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		Replaced with Polymer Insulator (As a % of Total Line Length)	Remarks	
							End-I	End-II			
B. UPPTCL											
1	AnparaC-Unnao	1	S/C	409	Quad Bersimis	UPPTCL	LANCO	UPPTCL	Conventional	AnparaB-Unnao shifted to AnparaC and charged at 765kV	
2	AnparaC-AnparaD	1	S/C	3	Quad Bersimis	UPPTCL	LANCO	UPRVUNL	Not Available		
3	Agra(Fatehbad)-Lalitpur	1	S/C	337	Quad Bersimis	UPPTCL	UPPTCL	LPGL	Not Available		
4	Agra(Fatehbad)-Lalitpur	2	S/C	335	Quad Bersimis	UPPTCL	UPPTCL	LPGL	Not Available		
5	Bara-Mainpuri	1	S/C	377	Quad Bersimis	UPPTCL	UPPTCL	UPPTCL	Not Available		
6	Gr. Noida-Hapur	1	S/C	65	Quad Moose	UPPTCL	UPPTCL	UPPTCL	Not Available		
7	Gr. Noida-Mainpuri	1	S/C	181	Quad Bersimis	UPPTCL	UPPTCL	UPPTCL	Not Available		
C. RRVPNL											
1	Anta-Phagi	1	S/C	214	Quad Bersimis	RRVPNL	RRVPNL	RRVPNL	Not Available		
2	Anta-Phagi	2	S/C	212	Quad Bersimis	RRVPNL	RRVPNL	RRVPNL	Not Available		
3. 765kV Transmission Line charged at 400kV											
A. POWERGRID											
1	Kishenpur-Moga	1	S/C	275	Quad Bersimis	POWERGRID	POWERGRID	POWERGRID	Partial (1%)		
2	Kishenpur-Moga	2	S/C	287	Quad Bersimis	POWERGRID	POWERGRID	POWERGRID	Partial (1%)		
3	Tehri-Tehri pooling	1	S/C	15	Quad Bersimis	POWERGRID	POWERGRID	THDC	Conventional	LILoed at Tehri Pooing, Tehri Pooling-Meerut is 50% series compensated line	
4	Tehri-Tehri pooling	2	S/C	17	Quad Bersimis	POWERGRID	POWERGRID	THDC	Conventional		
5	Tehri Pooling-Meerut	1	S/C	176	Quad Bersimis	POWERGRID	THDC	POWERGRID	Conventional		
6	Tehri Pooling-Meerut	2	S/C	179	Quad Bersimis	POWERGRID	THDC	POWERGRID	Conventional		
7	Rihand-Vindhyachal Pool	1	S/C	31	Quad Bersimis	POWERGRID	NTPC	POWERGRID	Not Available		
8	Rihand-Vindhyachal Pool	2	S/C	31	Quad Bersimis	POWERGRID	NTPC	POWERGRID	Not Available		
4. 400kV HVAC Transmission Line											
A. POWERGRID											
1	Abdullapur- Bawana	1	D/C	167	Triple Snowbird	POWERGRID	POWERGRID	DTL	Partial (99%)		
2	Abdullapur- Deepalpur	1	D/C	141	Triple Snowbird	POWERGRID	POWERGRID	KT Jhajar	Partial (99%)	LILo of Abdullapur-Bawana one ckt at Deepalpur	
3	Abdullapur-Kurukshetra	1	D/C	52	Triple Snowbird	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	LILo of Abdullapur-Sonepat ckts at Kurukshetra	
4	Abdullapur-Kurukshetra	2	D/C	52	Triple Snowbird	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator		
5	Agra-Agra(Fatehbad)	1	S/C	45	Twin Moose	POWERGRID	POWERGRID	UPPTCL	Polymer Insulator		
6	Agra(UP)-Agra(Fatehbad)	1	S/C	56	Twin Moose	POWERGRID	UPPTCL	UPPTCL	Polymer Insulator		
7	Agra-Agra(UP)	1	D/C	30	Twin Moose	POWERGRID	POWERGRID	UPPTCL	Polymer Insulator		
8	Agra-Ballabgarh	1	S/C	181	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator		
9	Agra-Bassi	1	S/C	211	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Conventional	Planned for insulator replacement in 321nos towers under NR3	
10	Agra-Bhiwadi	1	D/C	209	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator		
11	Agra-Bhiwadi	2	D/C	209	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator		
12	Agra-Jaipur South	1	D/C	254	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Partial (4%)	LILo of Agra-Bassi D/C at Jaipur South	
13	Agra-Jaipur South	2	D/C	254	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Partial (4%)		
14	Agra-Sikar	1	D/C	386	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Partial (3%)		
15	Agra-Sikar	2	D/C	386	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Partial (3%)		
16	Ajmer-Ajmer(PG)	1	D/C	66	Quad Moose	POWERGRID	RRVPNL	POWERGRID	Not Available		
17	Ajmer-Ajmer(PG)	2	D/C	66	Quad Moose	POWERGRID	RRVPNL	POWERGRID	Not Available		
18	Allahabad-Fatehpur	3	S/C	154	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	LILo of Allahabad-Kanpur one ckt at Fatehpur	

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		Replaced with Polymer Insulator (As a % of Total Line Length)	Remarks
							End-I	End-II		
19	Allahabad-Fatehpur	1	D/C	140	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Conventional	LILO of Allahabad-Mainpuri (363 KM) D/C at Fatehpur
20	Allahabad-Fatehpur	2	D/C	140	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Conventional	LILO of Allahabad-Mainpuri (363 KM) D/C at Fatehpur
21	Allahabad-Varanasi	1	D/C	99	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Conventional	LILO of Sarnath-Allahabad (144 KM) at 765/400kV Varanasi
22	Allahabad-Kanpur	1	S/C	225	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
23	Allahabad-Kanpur(New 765)	1	D/C	240	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Not Available	
24	Allahabad-Kanpur(New 765)	2	D/C	240	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Not Available	
25	Allahabad-Meja(NTPC)	1	D/C	28	Twin Moose	POWERGRID	POWERGRID	MUNPL	Polymer Insulator	MUNPL is joint venture between NTPC and UPRVUN
26	Allahabad-Meja(NTPC)	2	D/C	28	Twin Moose	POWERGRID	POWERGRID	MUNPL	Polymer Insulator	
27	Amritsar-Jalandhar	1	S/C	60	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
28	Amritsar-Jalandhar	2	D/C	71	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	LILO of 400kV Amritsar-Hamirpur at Jalandhar
29	Amritsar-Parbati Pooling (Banala)	1	D/C	251	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Partial (49%)	
30	Auraiya-Agra	1	D/C	166	Twin Moose	POWERGRID	NTPC	POWERGRID	Partial (86%)	
31	Auraiya-Agra	2	D/C	166	Twin Moose	POWERGRID	NTPC	POWERGRID	Partial (90%)	
32	Bagpat-Kaithal	1	D/C	154	Quad Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
33	Bagpat-Kaithal	2	D/C	154	Quad Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
34	Bagpat-Saharanpur	1	D/C	121	Quad Moose	POWERGRID	POWERGRID	POWERGRID	Partial (41%)	
35	Bagpat-Dehradun	1	D/C	165	Quad Moose	POWERGRID	POWERGRID	POWERGRID	Partial (40%)	
36	Bahadurgarh-Kabulpur	1	S/C	42	Twin Moose	POWERGRID	POWERGRID	HVPNL	Polymer Insulator	LILO of Bahadurgarh-Bhiwani at Kabulpur
37	Bahadurgarh-Sonepat	1	D/C	53	Triple Snowbird	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
38	Bahadurgarh-Sonepat	2	D/C	53	Triple Snowbird	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
39	Balia-Mau	1	D/C	9	Twin Moose	POWERGRID	POWERGRID	UPPTCL	Conventional	
40	Balia-Mau	2	D/C	9	Twin Moose	POWERGRID	POWERGRID	UPPTCL	Conventional	
41	Balia-Sohawal	1	D/C	229	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Conventional	LILO of Balia-Lucknow (316 KM) D/C at Sohawal
42	Balia-Sohawal	2	D/C	229	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Conventional	LILO of Balia-Lucknow (316 KM) D/C at Sohawal
43	Ballabgarh-Gurgaon	1	S/C	43	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
44	Ballabgarh-Maharanibagh	1	D/C	61	Quad Bersimis	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
45	Ballabgarh-Nawada	1	D/C	13	Quad Bersimis	POWERGRID	POWERGRID	HVPNL	Polymer Insulator	Ballabgarh-Gnoida LILOed at Nawada (Faridabad,Haryana)
46	Bareilly PG-Moradabad	1	S/C	93	Twin Moose	POWERGRID	POWERGRID	UPPTCL	Partial (3%)	
47	Bareilly PG-Moradabad	2	S/C	92	Twin Moose	POWERGRID	POWERGRID	UPPTCL	Partial (23%)	
48	Bareilly PG-Bareilly (765kV)	1	D/C	2	Quad Moose	POWERGRID	POWERGRID	POWERGRID	Conventional	
49	Bareilly PG-Bareilly (765kV)	2	D/C	2	Quad Moose	POWERGRID	POWERGRID	POWERGRID	Conventional	
50	Bareilly PG(765kV)-Kashipur	1	D/C	101	Quad Moose	POWERGRID	POWERGRID	PTCUL	Partial (90%)	
51	Bareilly PG(765kV)-Kashipur	2	D/C	101	Quad Moose	POWERGRID	POWERGRID	PTCUL	Partial (90%)	
52	Bassi-Bhiwadi	2	S/C	220	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
53	Bassi-Heerapura	1	S/C	48	Twin Moose	POWERGRID	POWERGRID	RRVNL	Polymer Insulator	
54	Bassi-Heerapura	2	S/C	49	Twin Moose	POWERGRID	POWERGRID	RRVNL	Polymer Insulator	
55	Bassi-Kotputli	1	S/C	106	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	LILO of Bassi-Bhiwadi-2 at Kotputli
56	Bassi-Phagi	1	D/C	48	Quad Moose	POWERGRID	POWERGRID	RRVNL	Partial (26%)	

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		Replaced with Polymer Insulator (As a % of Total Line Length)	Remarks
							End-I	End-II		
57	Bassi-Phagi	2	D/C	48	Quad Moose	POWERGRID	POWERGRID	RRVNL	Partial (26%)	
58	Bassi-Sikar	1	D/C	170	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Partial (16%)	
59	Bassi-Sikar	2	D/C	170	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Partial (17%)	
60	Bawana(CCGT)-Bahadurgarh	1	D/C	49	Twin Moose	POWERGRID	DTL/Pragati CCGT	POWERGRID	Polymer Insulator	
61	Bhinmal-Kankroli	1	D/C	202	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
62	Bhiwadi-Gurgaon	1	S/C	83	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
63	Bhiwadi-Hissar	1	S/C	212	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
64	Bhiwadi-Hisar	2	D/C	144	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	LILO of Bhiwadi-Moga both ckts at Hisar
65	Bhiwadi-Hisar	3	D/C	144	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
66	Bhiwadi-NeemranaPG	1	D/C	48	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
67	Bhiwadi-NeemranaPG	2	D/C	48	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
68	Bhiwani BBMB - Hisar	1	S/C	35	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
69	Bhiwani (PG) - Hisar	1	S/C	64	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	LILO of Bawana-Hisar (132KM) at Bhiwani PG
70	Bhiwani (PG) - Hisar	2	D/C	57	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
71	Bhiwani (PG) - Hisar	3	D/C	57	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
72	Bhiwani PG - Jind	1	D/C	82	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
73	Bhiwani PG - Jind	2	D/C	82	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
74	Bhiwani PG- BawanaCCGT	1	D/C	97	Twin Moose	POWERGRID	POWERGRID	DTL/Pragati CCGT	Polymer Insulator	LILO of Bawana-Hisar (132KM) at Bhiwani PG
75	Bhiwani PG- Bhiwani BBMB	1	S/C	34	Twin Moose	POWERGRID	POWERGRID	BBMB	Polymer Insulator	LILO of Bhiwani (BBMB)- Bahadurgarh (84km) at Bhiwani (PG)
76	Bhiwani PG-Kabulpur	1	S/C	48	Twin Moose	POWERGRID	POWERGRID	HVPNL	Polymer Insulator	LILO of Bahadurgarh-Bhiwani at Kabulpur
77	Chamba pool - Jalandhar	1	D/C	162	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Partial (48%)	
78	Chamba pool - Jalandhar	2	D/C	162	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Partial (48%)	
79	Chamera-II - Chamba Pool	1	S/C	0.38	Twin Moose	POWERGRID	NHPC	POWERGRID	Conventional	Two tower is S/C and one tower is D/C
80	Chamera-II-Chamera-I	1	S/C	36	Twin Moose	POWERGRID	NHPC	NHPC	Conventional	
81	Chamera-II-Kishenpur	1	S/C	135	Twin Moose	POWERGRID	NHPC	POWERGRID	Conventional	
82	Chamera-I-Jalandhar	1	D/C	152	Twin ACAR	POWERGRID	NHPC	POWERGRID	Partial (43%)	
83	Chamera-I-Jalandhar	2	D/C	152	Twin ACAR	POWERGRID	NHPC	POWERGRID	Partial (43%)	
84	Chittorgarh-Chittorgarh(PG)	1	D/C	49	Quad Moose	POWERGRID	RRVNL	POWERGRID	Not Available	
85	Chittorgarh-Chittorgarh(PG)	2	D/C	49	Quad Moose	POWERGRID	RRVNL	POWERGRID	Not Available	
86	Chittorgarh-Kankroli	1	D/C	71	Twin Moose	POWERGRID	RRVNL	POWERGRID	Polymer Insulator	LILO of 400 kV Rapp C-Kankroli at Chhitorgarh
87	Dadri NCTPP-G. Noida	1	D/C	13	Quad Bersimis	POWERGRID	NTPC	UPPCL	Polymer Insulator	
88	Dadri NCTPP-Maharanibagh	1	D/C	54	Quad Bersimis	POWERGRID	NTPC	POWERGRID	Polymer Insulator	
89	Dadri NCTPP-Kaithal	1	S/C	213	Twin Moose	POWERGRID	NTPC	POWERGRID	Polymer Insulator	
90	Dadri NCTPP-Mandola	1	D/C	46	Quad Bersimis	POWERGRID	NTPC	POWERGRID	Polymer Insulator	
91	Dadri NCTPP-Mandola	2	D/C	46	Quad Bersimis	POWERGRID	NTPC	POWERGRID	Polymer Insulator	
92	Dadri NCTPP-Muradnagar New	1	S/C	33	Twin Moose	POWERGRID	NTPC	UPPTCL	Polymer Insulator	Line shifted from Muradnagar to Muradnagar New (UPPTCL)

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		Replaced with Polymer Insulator (As a % of Total Line Length)	Remarks
							End-I	End-II		
93	Dadri NCTPP-Panipat	1	S/C	112	Twin Moose	POWERGRID	NTPC	BBMB	Polymer Insulator	
94	Dadri NCTPP-Panipat	2	S/C	117	Twin Moose	POWERGRID	NTPC	BBMB	Polymer Insulator	
95	Deepalpur-Bawana	1	D/C	26	Triple Snowbird	POWERGRID	KT-Jhajjar	DTL	Polymer Insulator	LILO of Abdullapr-Bawana one ckt at Deepalpur
96	Dehradun-Abdullapur	1	D/C	89	Quad Moose	POWERGRID	POWERGRID	POWERGRID	Not Available	
97	Dehradun-Abdullapur	2	D/C	89	Quad Moose	POWERGRID	POWERGRID	POWERGRID	Not Available	
98	Dulhasti-Kishenpur	1	S/C	120	Quad Moose	POWERGRID	NHPC	POWERGRID	Conventional	
99	Dulhasti-Kishenpur	2	S/C	120	Quad Moose	POWERGRID	NHPC	POWERGRID	Conventional	
100	Fatehbad PG-Hissar	1	D/C	89	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
101	Fatehpur-Kanpur	1	S/C	100	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	LILO of Singrauli-Kanpur at Fatehpur
102	Fatehpur-Kanpur	2	S/C	107	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Partial (64%)	LILO of Allahabad-Kanpur one ckt at Fatehpur
103	Fatehpur-Mainpuri	1	D/C	260	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Conventional	LILO of Allahabad-Mainpuri (363 KM)
104	Fatehpur-Mainpuri	2	D/C	260	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Conventional	D/C at Fatehpur Series
105	G.Noida-Nawada	1	D/C	30	Quad Bersimis	POWERGRID	UPPTCL	HVPNL	Polymer Insulator	Ballabgarh-Gnoida LILOed at Nawada (Faridabad,Haryana)
106	Gorakhpur PG-Gorakhpur UP	1	D/C	46	Twin Moose	POWERGRID	POWERGRID	UPPCL	Polymer Insulator	Partial Planning has been completed
107	Gorakhpur PG-Gorakhpur UP	2	D/C	46	Twin Moose	POWERGRID	POWERGRID	UPPCL	Polymer Insulator	Partial Planning has been completed
108	Gorakhpur PG-Lucknow PG	1	D/C	264	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Partial (3%)	At crossing
109	Gorakhpur PG-Lucknow PG	2	D/C	264	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Partial (3%)	At crossing
110	Gurgaon-Manesar	1	D/C	18	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
111	Gurgaon-Manesar	2	D/C	18	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
112	Hamirpur-Parbati Pooling (Banala)	1	D/C	77	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Conventional	LILO of Amritsar-Banala-1 at Hamirpur
113	Jaipur South-Bassi	1	D/C	84	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	LILO of Agra-Bassi D/C at Jaipur South
114	Jaipur South-Bassi	2	D/C	84	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
115	Jalandhar-Nakodar	1	D/C	42	Quad Moose	POWERGRID	POWERGRID	PSTCL	Polymer Insulator	
116	Jalandhar-Hamirpur	1	D/C	135	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Partial (43%)	LILO of 400kV Amritsar-Hamirpur at Jalandhar
117	Kaithal-Hissar	1	D/C	113	Triple Snowbird	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	LILO of Patiala-Hissar at Kaithal
118	Kaithal-Hissar	2	D/C	113	Triple Snowbird	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	LILO of Patiala-Hissar at Kaithal
119	Kaithal-Malerkotla	1	S/C	135	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
120	Kankroli-Jodhpur	1	S/C	188	Twin Moose	POWERGRID	POWERGRID	RRVNL	Conventional	
121	Kanpur-Agra	1	S/C	240	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Conventional	
122	Kanpur-Auraiya	1	D/C	73	Twin Moose	POWERGRID	POWERGRID	NTPC	Conventional	
123	Kanpur-Auraiya	2	D/C	73	Twin Moose	POWERGRID	POWERGRID	NTPC	Conventional	
124	Kanpur-Ballabgarh	1	S/C	386	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	*Series Compensated,Ckt 1- 35%, Ckt-2 & 3-40%
125	Kanpur-Ballabgarh	2	D/C	371	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	*Series Compensated,Ckt 1- 35%, Ckt-2 & 3-40%
126	Kanpur-Ballabgarh	3	D/C	371	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	*Series Compensated,Ckt 1- 35%, Ckt-2 & 3-40%
127	Kanpur-Panki	1	S/C	6	Twin Moose	POWERGRID	POWERGRID	UPPTCL	Polymer Insulator	

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		Replaced with Polymer Insulator (As a % of Total Line Length)	Remarks
							End-I	End-II		
128	Kanpur-Panki	2	S/C	6	Twin Moose	POWERGRID	POWERGRID	UPPTCL	Polymer Insulator	
129	Kanpur-Kanpur(GIS)	1	D/C	21	Quad Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
130	Kanpur-Kanpur(GIS)	2	D/C	21	Quad Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
131	Kanpur(GIS)-Lucknow(765)	1	D/C	160	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Not Available	
132	Kanpur(GIS)-Lucknow(765)	2	D/C	160	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Not Available	
133	Kishenpur-NewWanpoh	1	D/C	130	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Conventional	
134	Kishenpur-NewWanpoh	2	D/C	130	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Conventional	
135	Kishenpur-NewWanpoh	3	D/C	135	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Not Available	
136	Kishenpur-NewWanpoh	4	D/C	135	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Not Available	
137	Kishenpur-Samba	1	D/C	35	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Conventional	
138	Kishenpur-Samba	2	D/C	35	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Conventional	
139	Kota-Merta	1	D/C	256	Twin Moose	POWERGRID	POWERGRID	RRVPL	Polymer Insulator	
140	Kotputli-Bhiwadi	1	S/C	132	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	LILO of Bassi-Bhiwadi-2 at Kotputli
141	Kurukshetra-Jind	1	D/C	103	Quad Moose	POWERGRID	POWERGRID	POWERGRID	Not Available	
142	Kurukshetra-Jind	2	D/C	103	Quad Moose	POWERGRID	POWERGRID	POWERGRID	Not Available	
143	Kurukshetra-Sonipat	1	D/C	125	Triple Snowbird (Twin HTLS	POWERGRID	POWERGRID	POWERGRID	Partial (99%)	LILO of Abdullapr-Sonepat ckts at
144	Kurukshetra-Sonipat	2	D/C	125	for LILOportion)	POWERGRID	POWERGRID	POWERGRID	Partial (99%)	Kurukshetra
145	Kurukshetra-Jalandhar	1	D/C	267	Quad Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
146	Kurukshetra-Nakodar	1	D/C	234	Quad Moose	POWERGRID	POWERGRID	PSTCL	Polymer Insulator	
147	Lucknow PG-Lucknow UP	1	S/C	63	Twin Moose	POWERGRID	POWERGRID	UPPTCL	Conventional	
148	Lucknow PG-Unnao	1	D/C	74	Twin Moose	POWERGRID	POWERGRID	UPPTCL	Conventional	
149	Lucknow PG-Unnao	2	D/C	74	Twin Moose	POWERGRID	POWERGRID	UPPTCL	Conventional	
150	Lucknow UP-Bareilly PG	1	S/C	279	Twin Moose	POWERGRID	UPPTCL	POWERGRID	Conventional	
151	765 Lucknow (PG) - Lucknow (PG)	1	D/C	3	Quad Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
152	765 Lucknow (PG) - Lucknow (PG)	2	D/C	3	Quad Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
153	LucknowPG-Sohawal	1	D/C	98	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Conventional	LILO of Balia-Lucknow (316 KM) D/C at
154	LucknowPG-Sohawal	2	D/C	98	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Conventional	Sohawal
155	Lucknow PG-Shahjahanpur	1	D/C	170	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Partial (10%)	
156	Lucknow PG-Shahjahanpur	2	D/C	170	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Partial (10%)	
157	Ludhiana-Jalandhar	1	S/C	85	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
158	Ludhiana-Malerkotla	1	S/C	36	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
159	Ludhiana-Patiala	1	D/C	76	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
160	Ludhiana-Patiala	2	D/C	76	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
161	Mainpuri-Ballabgarh	1	D/C	236	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
162	Mainpuri-Ballabgarh	2	D/C	236	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
163	Malerkotla-Patiala	1	S/C	62	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
164	Meerut-Bagpat	1	D/C	71	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
165	Meerut-Bagpat	2	D/C	71	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
166	Meerut-Mandola	1	D/C	60	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
167	Meerut-Mandola	2	D/C	60	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
168	Meerut-MuzzaFarnagar	1	S/C	37	Twin Moose	POWERGRID	POWERGRID	UPPTCL	Polymer Insulator	
169	Moga-Fatehabad	1	D/C	179	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
170	Moga-Hissar	1	D/C	209	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
171	Moga-Hissar	2	D/C	206	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	LILO of Bhiwadi-Moga both ckts at
172	Moga-Hissar	3	D/C	206	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	Hisar

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		Replaced with Polymer Insulator (As a % of Total Line Length)	Remarks
							End-I	End-II		
173	Moga-Jalandhar	1	D/C	85	Twin ACAR	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
174	Moga-Jalandhar	2	D/C	85	Twin ACAR	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
175	Moradabad-Muradnagar	1	S/C	133	Twin Moose	POWERGRID	UPPTCL	UPPTCL	Polymer Insulator	
176	Nallagarh-Koldam	1	D/C	46	Quad Moose	POWERGRID	POWERGRID	NTPC	Conventional	Koldam to Parbati pool section is of PKTCL & rest is of POWERGRID
177	Nallagarh-Patiala	1	D/C	94	Triple Snowbird	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
178	Nallagarh-Patiala	2	D/C	94	Triple Snowbird	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	LILO of Nallagarh-Kaithal at Patiala
179	Nathpa Jhakri-Panchkula	1	D/C	165	Triple Snowbird	POWERGRID	SJVNL	POWERGRID	Partial (17%)	LILO of Jhakri-Abdullapur at Panchkula
180	Nathpa Jhakri-Panchkula	2	D/C	165	Triple Snowbird	POWERGRID	SJVNL	POWERGRID	Partial (17%)	
181	Nathpa Jhakri-RampurHEP	1	D/C	21	Triple Snowbird	POWERGRID	SJVNL	SJVNL	Conventional	LILO of Jhakri-Nallagarh-1 at RampurHEP
182	Nathpa Jhakri-RampurHEP	2	D/C	21	Triple Snowbird	POWERGRID	SJVNL	SJVNL	Conventional	
183	NeemranaPG-Manesar	1	D/C	67	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
184	NeemranaPG-Manesar	2	D/C	67	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
185	NeemranaPG-Babai	1	D/C	85	Twin Moose	POWERGRID	POWERGRID	RRVPNL	Not Available	LILO of 400kV Neemrana-Sikar at Babai by NRSSXXXVI (Essel group): Earlier 29% of Neemrana-Sikar PG
186	Sikar-Babai	1	D/C	95	Twin Moose	POWERGRID	POWERGRID	RRVPNL	Not Available	
187	NeemranaPG-Sikar	2	D/C	176	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Partial (29%)	
188	NewWanpoh-Wagoora	1	D/C	57	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Conventional	
189	NewWanpoh-Wagoora	2	D/C	57	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Conventional	
190	Orai(PG)-Orai	1	D/C	42	Quad Moose	POWERGRID	POWERGRID	UPPTCL	Not Available	
191	Orai(PG)-Orai	2	D/C	42	Quad Moose	POWERGRID	POWERGRID	UPPTCL	Not Available	
192	Panchkula -Abdullapur	1	D/C	63	Triple Snowbird	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	LILO of Jhakri-Abdullapur at Panchkula
193	Panchkula -Abdullapur	2	D/C	63	Triple Snowbird	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	LILO of Jhakri-Abdullapur at Panchkula
194	Patiala-Panchkula	1	D/C	65	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
195	Patiala-Panchkula	2	D/C	65	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
196	Patiala-Patran	1	D/C	79	Triple Snowbird	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	LILO of 400 kV Kaithal-Patiala-D/C at Patran. LILO portion is of Patran Transmission Company Limited
197	Patiala-Patran	2	D/C	79	Triple Snowbird	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
198	Patran-Kaithal	1	D/C	47	Triple Snowbird	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
199	Patran-Kaithal	2	D/C	47	Triple Snowbird	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
200	RampurHEP-Nallagarh	1	D/C	128	Triple Snowbird	POWERGRID	SJVNL	POWERGRID	Conventional	
201	RampurHEP-Nallagarh	2	D/C	128	Triple Snowbird	POWERGRID	SJVNL	POWERGRID	Conventional	LILO of Jhakri-Nallagarh-1 at RampurHEP
202	RAPS-C-Chittorgarh	1	D/C	155	Twin Moose	POWERGRID	NPCIL	RRVPNL	Partial (38%)	LILO of 400 kV Raps C-Kankroli at Chhitorgarh
203	RAPS-C-Kankroli	1	D/C	199	Twin Moose	POWERGRID	NPCIL	POWERGRID	Partial (51%)	
204	RAPS-C-Kota	1	S/C	51	Twin Moose	POWERGRID	NPCIL	POWERGRID	Partial (55%)	400kV RAPS-Jaipur line whose work was completed till Kota section is connected with 400kV Raps-Kota#2 (for antitheft purpose) and hence 400kV RapsC-Kota #2 is now two twin moose lines connected in parallel paths
205	RAPS-C-Kota	2	S/C	55	Twin Moose	POWERGRID	NPCIL	POWERGRID	Not Available	
206	Rihand-Allahabad	1	D/C	279	Twin Moose	POWERGRID	NTPC	POWERGRID	Conventional	
207	Rihand-Allahabad	2	D/C	279	Twin Moose	POWERGRID	NTPC	POWERGRID	Conventional	

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		Replaced with Polymer Insulator (As a % of Total Line Length)	Remarks
							End-I	End-II		
208	Roorkee-Kashipur	1	D/C	151	Quad Moose	POWERGRID	POWERGRID	PTCUL	Partial (72%)	
209	Roorkee-Kashipur	2	D/C	151	Quad Moose	POWERGRID	POWERGRID	PTCUL	Partial (72%)	
210	Roorkee-Saharanpur	1	D/C	36	Quad Moose	POWERGRID	POWERGRID	POWERGRID	Polymer Insulator	
211	Roorkee-Dehradun	1	D/C	80	Quad Moose	POWERGRID	POWERGRID	POWERGRID	Partial (50%)	
212	Sarnath-Varanasi	1	D/C	70	Quad Moose	POWERGRID	UPPTCL	POWERGRID	Partial (52%)	LILO of Sarnath-Allahabad (144 KM) at 765/400kV Varanasi
213	Sarnath-Varanasi	2	D/C	107	Quad Moose	POWERGRID	UPPTCL	POWERGRID	Partial (52%)	
214	Shahjahanpur-Bareilly PG	1	D/C	116	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Conventional	
215	Shahjahanpur-Bareilly PG	2	D/C	116	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Conventional	
216	Shahjahanpur-Rosa	1	D/C	8	Twin Moose	POWERGRID	POWERGRID	UPPCL	Not Available	
217	Shahjahanpur-Rosa	2	D/C	8	Twin Moose	POWERGRID	POWERGRID	UPPCL	Not Available	
218	Shree Cement-Kota	1	D/C	208	Twin Moose	POWERGRID	Sh. Cement	POWERGRID	Polymer Insulator	LILO portion is of Shree Cement
219	Shree Cement-Merta	2	D/C	103	Twin Moose	POWERGRID	Sh. Cement	RRVPNL	Polymer Insulator	LILO portion is of Shree Cement
220	Sikar-Ratangarh	1	D/C	76	Twin Moose	POWERGRID	POWERGRID	RRVPNL	Conventional	
221	Sikar-Ratangarh	2	D/C	76	Twin Moose	POWERGRID	POWERGRID	RRVPNL	Conventional	
222	Singrauli-Allahabd	1	S/C	224	Twin Moose	POWERGRID	NTPC	POWERGRID	Conventional	
223	Singrauli-Allahabd	2	S/C	202	Twin Moose	POWERGRID	NTPC	POWERGRID	Conventional	
224	Singrauli-Anpara	1	S/C	25	Twin Moose	POWERGRID	NTPC	UPPTCL	Partial (91%)	
225	Singrauli-Fatehpur	1	S/C	331	Twin Moose	POWERGRID	NTPC	POWERGRID	Conventional	LILO of Singrauli-Kanpur at Fatehpur
226	Singrauli-LucknowUP	1	S/C	409	Twin Moose	POWERGRID	NTPC	UPPTCL	Conventional	
227	Singrauli-Rihand	1	S/C	42	Twin Moose	POWERGRID	NTPC	NTPC	Conventional	
228	Singrauli-Rihand	2	S/C	44	Twin Moose	POWERGRID	NTPC	NTPC	Conventional	
229	Singrauli-Vindhyachal	1	S/C	3	Twin Moose	POWERGRID	NTPC	POWERGRID	Conventional	
230	Singrauli-Vindhyachal	2	S/C	5	Twin Moose	POWERGRID	NTPC	POWERGRID	Conventional	
231	Tehri pooling-Koteswar	1	D/C	3	Twin Moose	POWERGRID	POWERGRID	THDC	Conventional	
232	Tehri pooling-Koteswar	2	D/C	3	Twin Moose	POWERGRID	POWERGRID	THDC	Conventional	
233	Uri-I - Amargarh	1	D/C	62	Twin Moose	POWERGRID	NHPC	POWERGRID	Conventional	
234	Uri-I - Amargarh	2	D/C	62	Twin Moose	POWERGRID	NHPC	POWERGRID	Conventional	LILO of 400kV Uri-I - Wagoora D/C at Amargarh
235	Amargarh - Wagoora	1	D/C	36	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Conventional	
236	Amargarh - Wagoora	2	D/C	36	Twin Moose	POWERGRID	POWERGRID	POWERGRID	Conventional	
237	Uri-II - Uri-I	1	S/C	10	Twin Moose	POWERGRID	NHPC	NHPC	Conventional	
238	Uri-II - Wagoora	1	S/C	105	Twin Moose	POWERGRID	NHPC	POWERGRID	Conventional	
B. POWERLINK Transmission Ltd										
1	Bareilly PG-Meerut	1	D/C	250	Twin Moose	POWERLINK	POWERGRID	POWERGRID	Conventional	LILO of Bareilly PG-Mandola-1 (241 Km) at Meerut *Series compensated was (30%) at Bareilly
2	Bareilly PG-Meerut	2	D/C	250	Twin Moose	POWERLINK	POWERGRID	POWERGRID	Conventional	
3	Bareilly UP-Bareilly PG	1	D/C	14	Twin Moose	POWERLINK	UPPTCL	POWERGRID	Polymer Insulator	
4	Bareilly UP-Bareilly PG	2	D/C	14	Twin Moose	POWERLINK	UPPTCL	POWERGRID	Polymer Insulator	
5	Gorakhpur PG-Lucknow PG	1	D/C	246	Twin Moose	POWERLINK	POWERGRID	POWERGRID	Conventional	*Series compensated line (30%)
6	Gorakhpur PG-Lucknow PG	2	D/C	246	Twin Moose	POWERLINK	POWERGRID	POWERGRID	Conventional	
7	Meerut-Mandola	3	D/C	102	Twin Moose	POWERLINK	POWERGRID	POWERGRID	Conventional	LILO of Bareilly PG-Mandola-1&2 (241 Km) at Meerut(30%)
8	Meerut-Mandola	4	D/C	102	Twin Moose	POWERLINK	POWERGRID	POWERGRID	Conventional	

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		Replaced with Polymer Insulator (As a % of Total Line Length)	Remarks
							End-I	End-II		
C. Adani Power Ltd (Adani Transmission India Ltd.)										
1	Mahindergarh (APL)-Bhiwani PG	1	D/C	50	Twin Moose	APL/ATIL	APL	POWERGRID	Conventional	ISTS
2	Mahindergarh (APL)-Bhiwani PG	2	D/C	50	Twin Moose	APL/ATIL	APL	POWERGRID	Conventional	
3	MahindergarhHVDC-Dhanoda	1	D/C	5	Quad Moose	APL/ATIL	APL	HVPNL	Conventional	
4	MahindergarhHVDC-Dhanoda	2	D/C	5	Quad Moose	APL/ATIL	APL	HVPNL	Conventional	
D. APCPL (Aravali Power Corporation Pvt Ltd.)										
1	Jhajjar (IGSTPS)-Mundka	1	D/C	66	Twin Moose	APCPL	APCPL	DTL	Conventional	
2	Jhajjar (IGSTPS)-Mundka	2	D/C	66	Twin Moose	APCPL	APCPL	DTL	Conventional	
E. BBMB										
1	Dehar-Rajpura	1	S/C	129	Twin Morkulla in old line & Moose in LILO portion	BBMB	BBMB	PSTCL	Antifog	LILO of Dehar-Bhiwani at Rajpura
2	Bhiwani(BBMB)-Rajpura	1	S/C	213		BBMB	BBMB	PSTCL	Antifog	
3	Dehar-Panchkula	1	S/C	125	Twin Morkulla	BBMB	BBMB	POWERGRID	Antifog	LILO of Dehar-Panipat at Panchkula
4	Panchkula-Panipat	1	S/C	155	Twin Morkulla	BBMB	POWERGRID	BBMB	Antifog	
F. DTL										
1	Ballabgarh-Bamnoli	1	M/C Tower	53	Quad bersimis	DTL	POWERGRID	DTL	Polymer Insulator	Approx 1Km cable section at Bamnoli in each circuit. One ckt. is out and other is in service by means of ERS(Emergency restoration)
2	Ballabgarh-Bamnoli	2	M/C Tower	53	Quad bersimis	DTL	POWERGRID	DTL	Polymer Insulator	
3	Bamnoli-Jhatikara	1	D/C	12	Quad bersimis	DTL	DTL	DTL	Polymer Insulator	
4	Bamnoli-Jhatikara	2	D/C	12	Quad bersimis	DTL	DTL	DTL	Polymer Insulator	
5	Bawana-Mundka	1	D/C	18	Quad bersimis	DTL	DTL	DTL	Polymer Insulator	
6	Bawana-Mundka	2	D/C	18	Quad bersimis	DTL	DTL	DTL	Polymer Insulator	
7	Jhatikara-Mundka	1	D/C	17	Quad bersimis	DTL	DTL	DTL	Polymer Insulator	
8	Jhatikara-Mundka	2	D/C	17	Quad bersimis	DTL	DTL	DTL	Polymer Insulator	
9	Mandola-Bawana	1	D/C	24	Quad bersimis	DTL	POWERGRID	DTL	Polymer Insulator	
10	Mandola-Bawana	2	D/C	24	Quad bersimis	DTL	POWERGRID	DTL	Polymer Insulator	
G. HVPNL										
1	CLP Jhajjar -Dhanonda	1	D/C	20	Twin Moose	KT Jhajjar	CLP Jhajjar	HVPNL	Conventional	
2	CLP Jhajjar -Dhanonda	2	D/C	20	Twin Moose	KT Jhajjar	CLP Jhajjar	HVPNL	Conventional	
3	CLP Jhajjar- Kabulpur	1	D/C	35	Quad Moose	KT Jhajjar	CLP Jhajjar	HVPNL	Conventional	
4	CLP Jhajjar- Kabulpur	2	D/C	35	Quad Moose	KT Jhajjar	CLP Jhajjar	HVPNL	Conventional	
5	Deepalpur-Kabulpur	1	D/C	67	Quad Moose	KT Jhajjar	KT Jhajjar	HVPNL	Conventional	
6	Deepalpur-Kabulpur	2	D/C	67	Quad Moose	KT Jhajjar	KT Jhajjar	HVPNL	Conventional	
7	Dhanoda-Daultabad	1	D/C	73	Quad Moose	HVPNL	HVPNL	HVPNL	Conventional	
8	Dhanoda-Daultabad	2	D/C	73	Quad Moose	HVPNL	HVPNL	HVPNL	Conventional	
9	Gurgaon-Daultabad	1	D/C	21	Quad Moose	HVPNL	POWERGRID	HVPNL	Conventional	Six towers multi-circuit with Bamnoli-Ballabgarh.
10	Gurgaon-Daultabad	2	D/C	21	Quad Moose	HVPNL	POWERGRID	HVPNL	Conventional	
11	Jhajjar-Daulatabad	1	D/C	64	Twin Moose	HVPNL	APCPL	HVPNL	Conventional	
12	Jhajjar-Daulatabad	2	D/C	64	Twin Moose	HVPNL	APCPL	HVPNL	Conventional	
13	Khedar-Fatehabad	1	D/C	40	Twin Moose	HVPNL	HPGCL	POWERGRID	Conventional	
14	Khedar-Kirori	1	D/C	6	Twin Moose	HVPNL	HPGCL	HVPNL	Conventional	
15	Khedar-Kirori	2	D/C	6	Twin Moose	HVPNL	HPGCL	HVPNL	Conventional	
16	Khedar-Nuhiawali	1	D/C	114	Twin Moose	HVPNL	HPGCL	HVPNL	Polymer Insulator	
17	Nuhiawali-Fatehabad	1	D/C	78	Twin Moose	HVPNL	HVPNL	POWERGRID	Antifog	
H. JPVL/JSW (Jaigad Power Transco Limited.)										
1	Abdullapur-Kala Amb	1	D/C	39	Quad Moose	JPVL	POWERGRID	PKATL	Conventional	LILO of 400kV Abdullapur-Karcham Wangtoo D/C at Kala Amb by PKTCL
2	Abdullapur-Kala Amb	2	D/C	39	Quad Moose	JPVL	POWERGRID	PKATL	Conventional	
3	Kala Amb- Karcham Wangtoo	1	D/C	175	Quad Moose	JPVL	PKATL	JSW	Conventional	
4	Kala Amb- Karcham Wangtoo	2	D/C	175	Quad Moose	JPVL	PKATL	JSW	Conventional	

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		Replaced with Polymer Insulator (As a % of Total Line Length)	Remarks
							End-I	End-II		
5	Baspa-Karcham Wangtoo	1	D/C	22	Triple snowbird	JPTL/JSW	JPVL	JSW	Conventional	LILO of Baspa-Jhakri at karcham Wangtoo (LILo Portion is of JPVL)
6	Baspa-Karcham Wangtoo	2	D/C	22	Triple snowbird	JPTL/JSW	JPVL	JSW	Conventional	
7	Karcham Wangtoo-NJPC	1	D/C	34	Triple snowbird	JPTL/JSW	JSW	SJVNL	Conventional	
8	Karcham Wangtoo-NJPC	2	D/C	34	Triple snowbird	JPTL/JSW	JSW	SJVNL	Conventional	
I. PDD (Jammu & Kashmir)										
1	Baglihar(stage 1)-Kishenpur	1	D/C	68	Twin Moose	POWERGRID	JKSPDCL	POWERGRID	Conventional	
2	Baglihar(stage 2)-Kishenpur	2	D/C	68	Twin Moose	POWERGRID	JKSPDCL	POWERGRID	Conventional	
J. PSTCL										
1	Makhu-Amritsar	1	D/C	64	Twin Moose	PSTCL	PSTCL	PSTCL	Partial (10%)	
2	Makhu-Amritsar	2	D/C	64	Twin Moose	PSTCL	PSTCL	PSTCL	Partial (10%)	
3	Muktsar-Makhu	1	D/C	96	Twin Moose	PSTCL	PSTCL	PSTCL	Conventional	
4	Muktsar-Makhu	2	D/C	96	Twin Moose	PSTCL	PSTCL	PSTCL	Conventional	
5	Nakodar-Makhu	1	D/C	52	Twin Moose	PSTCL	PSTCL	PSTCL	Conventional	
6	Nakodar-Makhu	2	D/C	52	Twin Moose	PSTCL	PSTCL	PSTCL	Conventional	
7	Nakodar-Moga	1	S/C	78	Twin Moose	PSTCL	PSPCL	POWERGRID	Not Available	LILo of 400kV Talwandi sabo-Nakodar at Moga
8	Rajpura-Dhuri	1	D/C	86	Twin Moose	PSTCL	PSTCL	PSTCL	Conventional	Lilo of Rajpura th-Dhuri 1 at 400kV Rajpura
9	Rajpura TPS- Rajpura	1	D/C	9	Twin Moose	PSTCL	PSPCL	PSTCL	Conventional	
10	Rajpura-Dhuri	2	D/C	86	Twin Moose	PSTCL	PSTCL	PSTCL	Conventional	Lilo of Rajpura th-Dhuri 2 at 400kV Rajpura
11	Rajpura TPS- Rajpura	2	D/C	9	Twin Moose	PSTCL	PSPCL	PSTCL	Not Available	
12	Rajpura TPS-Nakodar	1	D/C	139	Twin Moose	PSTCL	PSPCL	PSTCL	Conventional	
13	Rajpura TPS-Nakodar	2	D/C	139	Twin Moose	PSTCL	PSPCL	PSTCL	Conventional	
14	Talwandi Saboo- Dhuri	1	D/C	175	Twin Moose	PSTCL	PSPCL	PSTCL	Partial (22%)	
15	Talwandi Saboo- Dhuri	2	D/C	175	Twin Moose	PSTCL	PSPCL	PSTCL	Partial (22%)	
16	Talwandi Saboo- Moga	1	D/C	102	Twin Moose	PSTCL	PSPCL	PSTCL	Not Available	LILo of 400kV Talwandi sabo-Nakodar at Moga
17	Talwandi Saboo- Nakodar	1	D/C	180	Twin Moose	PSTCL	PSPCL	PSTCL	Conventional	
18	Talwandi Saboo- Muktsar	1	D/C	100	Twin Moose	PSTCL	PSPCL	PSTCL	Conventional	
19	Talwandi Saboo- Muktsar	2	D/C	100	Twin Moose	PSTCL	PSPCL	PSTCL	Conventional	
K. PTCUL										
1	Alaknanda(GVK)-Srinagar(PTCUL)	1	D/C	14	Twin Moose	PTCUL	UPPCL	PTCUL	Conventional	
2	Alaknanda(GVK)-Srinagar(PTCUL)	2	D/C	14	Twin Moose	PTCUL	UPPCL	PTCUL	Conventional	
3	Muradabad-Kashipur	1	S/C	108	Twin Moose	PTCUL	UPPTCL	PTCUL	Conventional	
4	Rishikesh-Nehtaur	1	D/C	124	Twin Moose	PTCUL	PTCUL	UPPTCL	Not Available	LILo of 400kV Rishikesh-Kashipur (LILo portion owned by UPPTCL)
5	Nehtaur-Kashipur	2	D/C	80	Twin Moose	PTCUL	UPPTCL	PTCUL	Not Available	
6	Roorkee-Rishikesh	1	S/C	50	Twin Moose	PTCUL	POWERGRID	PTCUL	Not Available	
L. RRVPNL										
1	Ajmer-Bhilwara	1	D/C	160	Twin Moose	RRVPNL	RRVPNL	RRVPNL	Not Available	
2	Ajmer-Bhilwara	2	D/C	160	Twin Moose	RRVPNL	RRVPNL	RRVPNL	Not Available	
3	Akal-Barmer	1	S/C	130	Twin Moose	RRVPNL	RRVPNL	RRVPNL	Conventional	
4	Akal-Jodhpur	1	S/C	245	Twin Moose	RRVPNL	RRVPNL	RRVPNL	Conventional	
5	Akal-Ramgarh	1	D/C	99	Twin Moose	RRVPNL	RRVPNL	RRVPNL	Not Available	
6	Akal-Ramgarh	2	D/C	99	Twin Moose	RRVPNL	RRVPNL	RRVPNL	Not Available	
7	Anta-Chhabra	1	D/C	90	Quad Moose	RRVPNL	RRVPNL	RRVPNL	Not Available	
8	Anta-Chhabra	2	D/C	90	Quad Moose	RRVPNL	RRVPNL	RRVPNL	Not Available	
9	Anta-Kalisindh	1	D/C	80	Quad Moose	RRVPNL	RRVPNL	RRVPNL	Not Available	
10	Anta-Kalisindh	2	D/C	80	Quad Moose	RRVPNL	RRVPNL	RRVPNL	Not Available	

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		Replaced with Polymer Insulator (As a % of Total Line Length)	Remarks
							End-I	End-II		
11	Anta-Kawai	1	D/C	50	Quad Moose	RRVPNL	RRVPNL	RRVPNL	Not Available	
12	Anta-Kawai	2	D/C	50	Quad Moose	RRVPNL	RRVPNL	RRVPNL	Not Available	
13	Barmer-Rajwest	1	D/C	20	Twin Moose	RRVPNL	RRVPNL	RRVPNL	Conventional	
14	Bhilwara-Chhabra	1	S/C	285	Twin Moose	RRVPNL	RRVPNL	RRVPNL	Conventional	
15	Bikaner-Merta	1	S/C	172	Twin Moose	RRVPNL	RRVPNL	RRVPNL	Not Available	
16	Bikaner-Bhadla	1	D/C	180	Quad Moose	RRVPNL	RRVPNL	RRVPNL	Not Available	
17	Bikaner-Bhadla	2	D/C	180	Quad Moose	RRVPNL	RRVPNL	RRVPNL	Not Available	
18	Bikaner-Sikar	1	D/C	171	Twin Moose	RRVPNL	RRVPNL	POWERGRID	Not Available	
19	Bikaner-Sikar	2	D/C	171	Twin Moose	RRVPNL	RRVPNL	POWERGRID	Not Available	
20	Chhabra - Kawai SCTPS	1	S/C	45	Twin Moose	RRVPNL	RVUNL	APRL	Conventional	
21	Heerapura-Hindaun	1	S/C	192	Twin Moose	RRVPNL	RRVPNL	RRVPNL	Conventional	
22	Hindaun-Chhabra	1	S/C	305	Twin Moose	RRVPNL	RRVPNL	RVUNL	Conventional	
23	Merta-Heerapura	1	S/C	180	Twin Moose	RRVPNL	RRVPNL	RRVPNL	Conventional	
24	Merta-Ratangarh	1	S/C	180	Twin Moose	RRVPNL	RRVPNL	RRVPNL	Conventional	
25	Merta-Jodhpur	1	S/C	119	Twin Moose	RRVPNL	RRVPNL	RRVPNL	Conventional	
26	Merta-Jodhpur	2	S/C	120	Twin Moose	RRVPNL	RRVPNL	RRVPNL	Conventional	
27	Phagi-Ajmer(RRVPNL)	1	D/C	109	Twin Moose	RRVPNL	RRVPNL	RRVPNL	Not Available	
28	Phagi-Ajmer(RRVPNL)	2	D/C	109	Twin Moose	RRVPNL	RRVPNL	RRVPNL	Not Available	
29	Phagi-Heerapura	1	D/C	52	Quad Moose	RRVPNL	RRVPNL	RRVPNL	Not Available	
30	Phagi-Heerapura	2	D/C	52	Quad Moose	RRVPNL	RRVPNL	RRVPNL	Not Available	
31	Rajwest-Jodhpur	1	D/C	220	Twin Moose	RRVPNL	RWPL	RRVPNL	Conventional	
32	Rajwest-Jodhpur	2	D/C	220	Twin Moose	RRVPNL	RWPL	RRVPNL	Conventional	
33	Suratgarh-Bikaner	1	S/C	162	Twin Moose	RRVPNL	RVUNL	RRVPNL	Conventional	
34	Suratgarh-Ratangarh	1	S/C	144	Twin Moose	RRVPNL	RVUNL	RRVPNL	Conventional	
35	Suratgarh-Ratangarh	2	S/C	144	Twin Moose	RRVPNL	RVUNL	RRVPNL	Conventional	
M. UPPTCL										
1	Agra (Fatehabad)-Agra South	1	D/C	70	Twin Moose	UPPTCL	UPPTCL	UPPTCL	Not Available	
2	Agra (Fatehabad)-Agra South	2	D/C	70	Twin Moose	UPPTCL	UPPTCL	UPPTCL	Not Available	
3	Agra (UP)-Agra(Fatehabad)	1	S/C	104	Twin Moose	UPPTCL	UPPTCL	UPPTCL	Not Available	LILO of 400 kV Agra(UP)-Muradnagar(N) at Fatehabad(UP)
4	Agra UP-Unnao	1	S/C	279	Twin Moose	UPPTCL	UPPTCL	UPPTCL	Partial (25%)	
5	Agra(Fatehabad)-Mathura	1	S/C	142	Twin Moose	UPPTCL	UPPTCL	UPPTCL	Not Available	
6	Agra(Fatehabad)-Mathura	2	D/C	151	Twin Moose	UPPTCL	UPPTCL	UPPTCL	Not Available	LILO of 400 kV Fatehabad(UP)-Muradnagar at Mathura
7	Aligarh-Mainpuri	1	D/C	93	Quad Moose	UPPTCL	UPPTCL	UPPTCL	Not Available	
8	Aligarh-Mainpuri	2	D/C	93	Quad Moose	UPPTCL	UPPTCL	UPPTCL	Not Available	
9	Aligarh-Muradnagar	1	S/C	177	Twin Moose	UPPTCL	UPPTCL	UPPTCL	Not Available	*Series Compensated line (40%). It would be shifted
10	Aligarh-Sikandrabad	1	D/C	95	Twin Moose	UPPTCL	UPPTCL	UPPTCL	Not Available	
11	Aligarh-Sikandrabad	2	D/C	95	Twin Moose	UPPTCL	UPPTCL	UPPTCL	Not Available	
12	AnparaB-AnparaC	1	D/C	0.05	Quad Moose	UPPTCL	UPRVUNL	LANCO	Conventional	
13	AnparaB-AnparaC	2	D/C	0.05	Quad Moose	UPPTCL	UPRVUNL	LANCO	Conventional	
14	AnparaB-AnparaD	1	D/C	5	Twin Moose	UPPTCL	UPRVUNL	UPPTCL	Not Available	
15	AnparaB-AnparaD	2	D/C	5	Twin Moose	UPPTCL	UPRVUNL	UPPTCL	Not Available	
16	AnparaB-Mau	1	S/C	262	Twin Moose	UPPTCL	UPRVUNL	UPPTCL	Partial (13%)	
17	AnparaB-Obra	1	S/C	40	Twin Moose	UPPTCL	UPRVUNL	UPPTCL	Partial	

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		Replaced with Polymer Insulator (As a % of Total Line Length)	Remarks
							End-I	End-II		
18	AnparaB-Sarnath	1	D/C	158	Twin Moose	UPPTCL	UPRVUNL	UPPTCL	Partial	
19	AnparaB-Sarnath	2	D/C	158	Twin Moose	UPPTCL	UPRVUNL	UPPTCL	Conventional	
20	Ataur-Hapur	1	D/C	52	Twin Moose	UPPTCL	UPPTCL	UPPTCL	Not Available	
21	Ataur-Hapur	2	D/C	52	Twin Moose	UPPTCL	UPPTCL	UPPTCL	Not Available	
22	Ataur-Indirapuram	1	D/C	15	Twin Moose	UPPTCL	UPPTCL	UPPTCL	Not Available	
23	Ataur-Indirapuram	2	D/C	15	Twin Moose	UPPTCL	UPPTCL	UPPTCL	Not Available	
24	Azamgarh-Mau	1	S/C	48	Twin Moose	UPPTCL	UPPTCL	UPPTCL	Partial (79%)	
25	Azamgarh-Sultanpur	1	S/C	126	Twin Moose	UPPTCL	UPPTCL	UPPTCL	Conventional	
26	Banda-Rewa road	1	D/C	177	Quad Moose	UPPTCL	UPPTCL	UPPTCL	Not Available	
27	Banda-Rewa road	2	D/C	177	Quad Moose	UPPTCL	UPPTCL	UPPTCL	Not Available	
28	Bara-Meja	1	D/C	32	Quad Moose	UPPTCL	UPPTCL	MUNPL	Not Available	LILO of 400kV Bara-Rewa road D/C at Meja
29	Bara-Meja	2	D/C	32	Quad Moose	UPPTCL	UPPTCL	MUNPL	Not Available	
30	Bareilly UP-Unnao	1	D/C	271	Twin Moose	UPPTCL	UPPTCL	UPPTCL	Partial (15%)	*Series Compensated line (45%)
31	Bareilly UP-Unnao	2	D/C	271	Twin Moose	UPPTCL	UPPTCL	UPPTCL	Partial (15%)	*Series Compensated line (45%)
32	Gorakhpur UP-Azamgarh	1	S/C	90	Twin Moose	UPPTCL	UPPTCL	UPPTCL	Partial (76%)	
33	Gr. Noida(765)-Sector 148	1	D/C	47	Quad Moose	UPPTCL	UPPTCL	UPPTCL	Not Available	
34	Gr. Noida(765)-Sector 148	2	D/C	47	Quad Moose	UPPTCL	UPPTCL	UPPTCL	Not Available	
35	Gr. Noida-Gr. Noida (765)	1	D/C	45	Quad Moose	UPPTCL	UPPTCL	UPPTCL	Not Available	
36	Gr. Noida-Gr. Noida (765)	2	D/C	45	Quad Moose	UPPTCL	UPPTCL	UPPTCL	Not Available	
37	Gr.Noida-Sikandrabad	1	D/C	17	Quad Moose	UPPTCL	UPPTCL	UPPTCL	Not Available	
38	Gr.Noida-Sikandrabad	2	D/C	17	Quad Moose	UPPTCL	UPPTCL	UPPTCL	Not Available	
39	Hapur-Dasna	1	D/C	14	Quad Moose	UPPTCL	UPPTCL	UPPTCL	Not Available	
40	Hapur-Dasna	2	D/C	14	Quad Moose	UPPTCL	UPPTCL	UPPTCL	Not Available	
41	Mainpuri(UP)-Mainpuri(PG)	1	D/C	25	Twin Moose	UPPTCL	UPPTCL	POWERGRID	Not Available	LILO of 400kV Orai-Mainpuri(PG) at Mainpuri(UP)
42	Mainpuri(UP)-Mainpuri(PG)	2	D/C	26	Twin Moose	UPPTCL	UPPTCL	POWERGRID	Not Available	LILO of 400kV Paricha-Mainpuri(PG) at Mainpuri(UP)
43	Meja-Rewa road	1	D/C	34	Quad Moose	UPPTCL	MUNPL	UPPTCL	Not Available	LILO of 400kV Bara-Rewa road D/C at Meja
44	Meja-Rewa road	2	D/C	34	Quad Moose	UPPTCL	MUNPL	UPPTCL	Not Available	
45	Muradnagar New- Mathura	1	D/C	246	Twin Moose	UPPTCL	UPPTCL	UPPTCL	Not Available	LILO of 400 kV Fatehabad(UP)-Muradnagar at Mathura
46	Muradnagar-Ataur	2	D/C	18	Twin Moose	UPPTCL	UPPTCL	UPPTCL	Not Available	LILO of 400kV Muzaffarnagar-Muradnagar at Ataur (Earlier 95%)
47	Muzaffarnagar-Ataur	1	D/C	121	Twin Moose	UPPTCL	UPPTCL	UPPTCL	Not Available	
48	Muzaffarnagar-Srinagar	1	D/C	189	Twin Moose	UPPTCL	UPPTCL	GVKPIL	Conventional	
49	Muzaffarnagar-Vishnuprayag	1	D/C	280	Twin Moose	UPPTCL	UPPTCL	JPVL	Conventional	
50	Obra-Rewa road	1	S/C	179	Twin Moose	UPPTCL	UPPTCL	UPPTCL	Not Available	
51	Obra-Sultanpur	1	S/C	230	Twin Moose	UPPTCL	UPRVUNL	UPPTCL	Conventional	
52	Orai-Mainpuri(UP)	1	D/C	176	Twin Moose	UPPTCL	UPPTCL	UPPTCL	Not Available	LILO of 400kV Orai-Mainpuri(PG) at Mainpuri(UP)
53	Orai-Paricha	1	D/C	111	Twin Moose	UPPTCL	UPPTCL	UPRVUNL	Not Available	
54	Panki-Aligarh	1	S/C	285	Twin Moose	UPPTCL	UPPTCL	UPPTCL	Partial (24%)	
55	Paricha-Mainpuri(UP)	1	D/C	240	Twin Moose	UPPTCL	UPRVUNL	UPPTCL	Conventional	LILO of 400kV Paricha-Mainpuri(PG) at Mainpuri(UP)
56	Rewa road -Panki	1	S/C	210	Twin Moose	UPPTCL	UPPTCL	UPPTCL	Not Available	LILO of Bara-Panki at 400kV Rewa Road
57	Roorkee-Muzaffarnagar	1	S/C	71	Twin Moose	PTCUL	POWERGRID	UPPTCL	Not Available	

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		Replaced with Polymer Insulator (As a % of Total Line Length)	Remarks
							End-I	End-II		
58	Sarnath-Azamgarh	1	S/C	97	Twin Moose	UPPTCL	UPPTCL	UPPTCL	Conventional	
59	Srinagar-Vishnuprayag	1	D/C	109	Twin Moose	UPPTCL	GVKPIL	JPVL	Conventional	
60	Sultanpur-Lucknow PG	1	S/C	164	Twin Moose	UPPTCL	UPPTCL	POWERGRID	Conventional	
61	Unnao-Lucknow UP	1	S/C	39	Twin Moose	UPPTCL	UPPTCL	UPPTCL	Partial (13%)	
62	Unnao-Panki	1	S/C	49	Twin Moose	UPPTCL	UPPTCL	UPPTCL	Partial (41%)	
N. NTPC JV										
1	Dadri-Loni (Harsh Vihar)	1	D/C	54	Twin Moose	NTPC	NTPC	DTL	Polymer	
2	Dadri-Loni (Harsh Vihar)	2	D/C	54	Twin Moose	NTPC	NTPC	DTL	Polymer	
O. PKTCL (Parbati-Koldam Transmission)										
1	Koldam-Ludhiana	1	D/C	151	Triple Snowbird	PKTCL	NTPC	POWERGRID	Not Available	
2	Koldam-Ludhiana	2	D/C	151	Triple Snowbird	PKTCL	NTPC	POWERGRID	Not Available	
3	Koldam-Banala	1	D/C	62	Quad Moose	PKTCL	NTPC	POWERGRID	Not Available	
4	Nallagarh-Banala	1	D/C	121	Quad Moose	PKTCL	POWERGRID	POWERGRID	Not Available	Powergrid owned 46.38km
5	Parbati-II- Parbati Pooling (Banala)	1	D/C	13	Quad Moose	PKTCL	NHPC	POWERGRID	Not Available	Some portion is of Powergrid
6	Parbati-III- Parbati Pooling (Banala)	2	S/C	4	Quad Moose	PKTCL	NHPC	POWERGRID	Not Available	
7	Parbati II- Sainj	1	D/C	1	Quad Moose	PKTCL	NHPC	HPPCL	Not Available	LILO of 400kV Parbati II-Parbati III at Sainj
8	Parbati III- Sainj	1	D/C	12	Quad Moose	PKTCL	NHPC	HPPCL	Not Available	
P. Adani Transmission India Ltd.(partly with MTACL)										
1	Ajmer-Deedwana	1	S/C	110	Twin Moose	MTACL/ATIL	RRVUNL	MTACL	Not Available	
2	Bikaner-Deedwana	1	S/C	129	Twin Moose	MTACL/ATIL	RRVUNL	MTACL	Conventional	
3	Alwar-Hindaun	1	S/C	96	Twin Moose	ATSL/ATIL	ATSL	RRVUNL	Not Available	Partly owned by Aravali Transmission Services ILtd.
Q. SPTL (Sterlite Power Transmission Limited):NRSS-29 Transmission Company Limited										
1	Jalandhar-Samba	1	D/C	135	Twin Moose	SPTL	POWERGRID	POWERGRID	Not Available	
2	Jalandhar-Samba	2	D/C	135	Twin Moose	SPTL	POWERGRID	POWERGRID	Not Available	
R. Powergrid Unchahar Transmission Ltd.										
1	Fatehpur-Unchahar	1	D/C	54	Twin Moose	PUTL	POWERGRID	NBPPL	Not Available	
2	Fatehpur-Unchahar	2	D/C	54	Twin Moose	PUTL	POWERGRID	NBPPL	Not Available	
S. NRSSXXXI(B)										
1	Amritsar-Malerkotla	1	D/C	149	Twin Moose	NRSSXXXI(B)	POWERGRID	POWERGRID	Not Available	
2	Amritsar-Malerkotla	2	D/C	149	Twin Moose	NRSSXXXI(B)	POWERGRID	POWERGRID	Not Available	
3	Kurukshetra-Malerkotla	1	D/C	139	Twin Moose	NRSSXXXI(B)	POWERGRID	POWERGRID	Not Available	
4	Kurukshetra-Malerkotla	2	D/C	139	Twin Moose	NRSSXXXI(B)	POWERGRID	POWERGRID	Not Available	
5. 400kV Transmission Line charged at 220kV										
A. POWERGRID										
1	Dhauliganga-Bareilly(UP)	1	D/C	235	Twin Moose	POWERGRID	NHPC	UPPTCL	Conventional	
2	Dhauliganga-Pithoragarh	1	D/C	59	Twin Moose	POWERGRID	NHPC	POWERGRID	Conventional	
3	Pithoragarh-Bareilly(UP)	1	D/C	178	Twin Moose	POWERGRID	POWERGRID	UPPTCL	Conventional	
B. RRVPNL										
1	Dholpur-Hindaun	1	S/C	100	Twin Moose	RRVPNL	RRVUNL	RRVPNL	Conventional	
2	Kota-KTPS	1	D/C	7	Twin Moose	RRVPNL	POWERGRID	RRVUNL	Conventional	
3	Kota-KTPS	2	D/C	7	Twin Moose	RRVPNL	POWERGRID	RRVUNL	Conventional	

* - Fixed series capacitor (FSC) is owned by POWERGRID

Annexure - VIII

Dynamic data status of ISGS							
Generator	Type	No. of Units	Mbase (MVA)	Generator	Exciter	Governor	Stabiliser
DADRI_TH 220.00	Thermal	4	247	Submitted	Submitted	Submitted	Submitted
JHAJJAR4 400.00	Thermal	3	588	Submitted	NA	NA	Partial
RIHAND-G 400.00	Thermal	6	588	Submitted	NA	NA	NA
SHRECEM 400.00	Thermal	2	188	NA	NA	NA	NA
SINGRL4 400.00	Thermal	5	235.3	NA	NA	NA	NA
UNCHAHR2 220.00	Thermal	5	247	NA	NA	NA	NA
DADR-NCR 400.00	Thermal	2	588	Submitted	Submitted	Submitted	Submitted
SINGRL4 400.00	Thermal	2	588	NA	NA	NA	NA
NAPP2 220.00	Nuclear	2	260	NA	NA	NA	NA
RAPS_B2 220.00	Nuclear	2	238	NA	NA	NA	NA
RAPS_C4 400.00	Nuclear	2	264	NA	NA	NA	NA
SAINJ 400.00	Hydro	2	65	Partial	NA	NA	NA
ADHYDRO 220.00	Hydro	2	106.67	NA	NA	NA	NA
BAIRASIUL2 220.00	Hydro	3	66.7	Submitted	Partial	NA	NA
BHAKRA_R 220.00	Hydro	5	175	NA	NA	NA	NA
CHAMERA-1 400.00	Hydro	3	200	Submitted	Submitted	NA	Submitted
CHAMERA-2 400.00	Hydro	3	111.1	Partial	NA	NA	NA
DEHAR 220.00	Hydro	6	173.7	NA	NA	NA	NA
DHAULI2 220.00	Hydro	4	78	Submitted	Submitted	Submitted	Submitted
DULHASTI 400.00	Hydro	3	145	Partial	NA	NA	NA
GANGUWAL 132.00	Hydro	3	33.9	NA	NA	NA	NA
KARCHAMW 400.00	Hydro	4	278	Submitted	NA	NA	NA
KOLDAM 400.00	Hydro	4	250	NA	NA	NA	NA
KOTESHWA 400.00	Hydro	4	111.1	Partial	Partial	Partial	Partial
KOTLA 132.00	Hydro	3	35.3	NA	NA	NA	NA
MALAN-II 132.00	Hydro	2	111.11	NA	NA	NA	NA
NATHPA4 400.00	Hydro	6	278	NA	NA	NA	NA
PARBTI-3 400.00	Hydro	4	145	Partial	NA	NA	NA
PARBT-II 400.00	Hydro	4	250	Partial	NA	NA	NA
PONG 220.00	Hydro	6	66.7	NA	NA	NA	NA
RAMPUR 400.00	Hydro	6	81	NA	NA	NA	NA
SALAL2 220.00	Hydro	6	121.1	Partial	NA	NA	Partial
SEWA-II 132.00	Hydro	3	50	Partial	NA	NA	Partial
TANAKPUR2 220.00	Hydro	3	45	Partial	Partial	NA	Partial
TEHRI4 400.00	Hydro	4	278	Submitted	Submitted	Submitted	Submitted
URIG-1 400.00	Hydro	4	136	Partial	NA	NA	NA
URIG-2 400.00	Hydro	4	67	Submitted	NA	NA	NA
CHAMER-3 220.00	Hydro	3	85.56	Partial	NA	NA	Partial
BHAKRA_L 220.00	Hydro	2	113.7	NA	NA	NA	NA
BHAKRA_L 220.00	Hydro	3	120	NA	NA	NA	NA
ANTA2 220.00	Gas	3	97	NA	NA	NA	NA
AURYA2 220.00	Gas	6	141.08	NA	NA	NA	NA
DADRI_G2 220.00	Gas	4	165.5	Submitted	Submitted	Submitted	Submitted
DADRI_G2 220.00	Gas	2	193.1	Submitted	Submitted	Submitted	Submitted

Dynamic data status of state owned generating stations							
Generator	Type	No. of Units	Unit Mbase (MVA)	Generator	Exciter	Governor	Stabiliser
RAJPURA_TH 400.00	Thermal	2	824	Submitted	NA	Partial	NA
LALITPUR-TPS765.00	Thermal	3	777	Partial	NA	NA	NA
KAWAI 400.00	Thermal	2	776.5	Partial	Partial	NA	Partial
TALWANDISABO400.00	Thermal	3	776.47	Submitted	NA	NA	NA
TANDA_EXT 400.00	Thermal	1	776	Partial	NA	NA	NA
BARA-TPS 765.00	Thermal	3	776	Partial	NA	NA	NA
KHEDAR 400.00	Thermal	2	706	Partial	NA	NA	NA
JHAJAR_CLP 400.00	Thermal	2	706	Submitted	NA	NA	NA
KALISI-4 400.00	Thermal	2	706	Partial	NA	NA	Submitted
CHHABRA_SC 400.00	Thermal	2	706	Partial	NA	NA	NA
SURATGARH_SC400.00	Thermal	2	706	Partial	NA	NA	NA
ANPARAC 765.00	Thermal	2	630	NA	NA	NA	NA
ANPARA-D 765.00	Thermal	2	630	NA	NA	NA	NA
ANPARA4 400.00	Thermal	2	589	NA	NA	NA	NA
ROSA-TP1 220.00	Thermal	4	370	Partial	NA	NA	NA
YTPP_2 220.00	Thermal	2	353	NA	NA	NA	NA
SURATH-2 220.00	Thermal	6	294.12	NA	NA	NA	NA
CHABRA-4 400.00	Thermal	4	294.12	Partial	NA	NA	Partial
LEHRAMOHABBA220.00	Thermal	2	294.1	NA	NA	NA	NA
PTPS_5-8 220.00	Thermal	2	294.1	NA	NA	NA	NA
HARDUGN2 220.00	Thermal	2	294	NA	NA	NA	NA
RAJWEST 220.00	Thermal	8	158.82	NA	NA	NA	NA
HARDUGN2 220.00	Thermal	1	125	Submitted	NA	NA	Partial
KTPS_S 220.00	Thermal	2	230	NA	NA	NA	NA
PARICHA 400.00	Thermal	2	294	NA	NA	NA	NA
PTPS_5-8 220.00	Thermal	2	247	NA	NA	NA	NA
OBRA4 400.00	Thermal	5	235.3	NA	NA	NA	NA
HARDUGN2 220.00	Thermal	1	68.8	NA	NA	NA	NA
KTPS 220.00	Thermal	3	247	NA	NA	NA	NA
PARICHA2 220.00	Thermal	2	247	NA	NA	NA	NA
OBRA2 220.00	Thermal	2	58	NA	NA	NA	NA
ANPARA4 400.00	Thermal	3	287	NA	NA	NA	NA
GOINDWAL 220.00	Thermal	2	285	NA	NA	NA	NA
ROPAR 220.00	Thermal	6	247.1	Partial	NA	NA	Partial
LEHRAMOHABBA220.00	Thermal	2	247	NA	NA	NA	NA
GIRALTPS 220.00	Thermal	2	147	NA	NA	NA	NA
BARSINGS 220.00	Thermal	2	147	NA	NA	NA	NA
TANDA2 220.00	Thermal	4	137.5	NA	NA	NA	NA
DHOLPU-4 220.00	Thermal	3	130	NA	NA	NA	NA
KTPS 220.00	Thermal	2	130	NA	NA	NA	NA
PTPS_1-4 220.00	Thermal	4	129.4	NA	NA	NA	NA
PARICHA2 220.00	Thermal	2	125	NA	NA	NA	NA
PANKI2 220.00	Thermal	2	125	NA	NA	NA	NA
OBRA2 220.00	Thermal	2	110	NA	NA	NA	NA
KHAMBAKH 132.00	Thermal	2	70.6	NA	NA	NA	NA
UTRAULA 132.00	Thermal	2	70.6	NA	NA	NA	NA
FARIDABAD_NT220.00	Steam	3	170.12	NA	NA	NA	NA
BHADLA 132.00	Solar		170	NA	NA	NA	NA
RAPS_A2 220.00	Nuclear	2	245	NA	NA	NA	NA

RAPS_A2	220.00	Nuclear	1	100	NA	NA	NA	NA
JOGINDERNAGA1	132.00	Hydro		56	NA	NA	NA	NA
UPPERSIND	132.00	Hydro	3	37.6	NA	NA	NA	NA
ANANDGARH-2	132.00	Hydro	2	35.3	NA	NA	NA	NA
RSD	220.00	Hydro	4	166.7	NA	NA	NA	NA
BAGLIHAR4	400.00	Hydro	6	157	NA	NA	NA	NA
BASPA4	400.00	Hydro	3	122.22	NA	NA	NA	NA
KISHANGANGA	220.00	Hydro	3	115.7	NA	NA	NA	NA
VISHNU4	400.00	Hydro	4	105.3	NA	NA	NA	NA
ALAKHNANDA	400.00	Hydro	4	97	NA	NA	NA	NA
MANERI_2	220.00	Hydro	4	89	NA	NA	NA	NA
KALAGARH	132.00	Hydro	3	77.64	NA	NA	NA	NA
CHIBRO-H	220.00	Hydro	4	70	NA	NA	NA	NA
MALANA1	132.00	Hydro	2	58	NA	NA	NA	NA
RIHND1	132.00	Hydro	6	55.5	NA	NA	NA	NA
MAHI-II	132.00	Hydro		53	NA	NA	NA	NA
LARJI1	132.00	Hydro	3	52	NA	NA	NA	NA
RPS1	132.00	Hydro	4	47.78	NA	NA	NA	NA
CHILLA-H	132.00	Hydro	4	43	NA	NA	NA	NA
BUDHIL	220.00	Hydro	2	41	NA	NA	NA	NA
BHABA2	220.00	Hydro	3	41	NA	NA	NA	NA
KHODRIHE	220.00	Hydro	4	40	NA	NA	NA	NA
GIRI1	132.00	Hydro	2	40	NA	NA	NA	NA
ANANDGARH-2	132.00	Hydro	4	38.2	NA	NA	NA	NA
LOWERJHELUM1	132.00	Hydro	3	36.8	NA	NA	NA	NA
OBRAH1	132.00	Hydro	3	36.7	NA	NA	NA	NA
MANERI_1	220.00	Hydro	3	36	NA	NA	NA	NA
RAMGARH	220.00	Gas	1	125	NA	NA	NA	NA
RAMGARH	220.00	Gas		60	NA	NA	NA	NA
BAWANA-G	400.00	Gas	6	294	NA	NA	Submitted	NA
PRAGATI_BDR	220.00	Gas	2	123.3	NA	NA	NA	NA
GAMA INFRA	220.00	Gas	3	82.35	NA	NA	NA	NA
SHRAVANTI	220.00	Gas	6	82.35	NA	NA	NA	NA
RAMGARH21	132.00	Gas	3	45	NA	NA	NA	NA
RAMGARH	220.00	Gas		60	NA	NA	NA	NA
RAMGARH_GSS	220.00	Wind		125	NA	NA	NA	NA
RAMGARH_GSS	220.00	Wind		125	NA	NA	NA	NA
MADA-SUZ	220.00	Wind		225	NA	NA	NA	NA
RAMGARH_GSS	220.00	Wind		125	NA	NA	NA	NA

OUTSTANDING INTEREST AMOUNT (TILL 31ST AUG'19)

S.No.	Applicant Name	Transaction Months ('2019)	Total Pending Interest Amount
1	Adani Power Limited, Stage-2	August	1176
2	Arunachal Pradesh Power Corporation Pvt Ltd	August	3427164
3	Azure Power India Pvt. Ltd	July & August	1116
4	Baragarh Hydro Power Co. Pvt. Ltd.	July	868
5	Goyal MG Gases UP	August	87
6	Haryana Power Purchase Centre	July	36
7	IA Hydro Energy Private Limited	August	494
8	Indian Energy Exchange	July	241
9	Kreate Energy (I) Pvt Ltd	July & August	160002
10	Manikaran Power Ltd	July & August	701129
11	NANTI HYDRO POWER PRIVATE LIMITED	August	1217
12	Northern Railway, Delhi Division	April & May	22296
13	NORTHERN RAILWAYS (UP)	April & May	58209
14	Punjab State Power Corporation Ltd	July	2514
15	ReNew Solar Power Private Limited	August	258
16	Sarvottam Rolling Mills Private Limited	August	27
17	SB Energy Four Pvt Ltd.	July & August	109
18	Shree Cement Limited TPS-RJ	July	25
	TOTAL		4376968