सत्यमेव जयते

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

No: NRPC/OPR/106/01/2018/13753-94 **Dated:06.12.2018**

विषय: - उत्तर क्षेत्रीय विद्युत समिति की प्रचालन समन्वय उप-समिति की 153 वीं बैठक का कार्यवृत I
Minutes of 153rd OCC meeting of NRPC.

उत्तर क्षेत्रीय विद्युत समिति की प्रचालन समन्वय उप-समिति की 153 वीं बैठक 16.11.2018 को आयोजित की गयी थी। उक्त बैठक का कार्यवृत्त उत्तर क्षेत्रीय विद्युत समिति की वेबसाइट http://www.nrpc.gov.in पर उपलब्ध है। यदि कार्यवृत पर कोई टिप्पणी हो तो कार्यवृत जारी करने के एक सप्ताह के अन्दर दे सकते हैं I

153rd meeting of the Operation Co-ordination Sub-Committee of NRPC was held on 16.11.2018. The Minutes of this meeting have been up-loaded on the NRPC web-site http://www.nrpc.gov.in. Any comments on the minutes may kindly be submitted within a week of issuance of the minutes.

-sd-

(उपेन्द्र कुमार)
अधीक्षण अभियंता(प्रचालन)

संलग्न: उपर्यक्त / Enclosures : As above.

सेवा में,
प्रचालन समन्वय उप-समिति के सभी सदस्य

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Minutes of the 153rd Meeting of the Operation Coordination Sub-Committee (OCC) of NRPC held on 16.11.2018 at NRPC Secretariat, New Delhi.

153rd meeting of OCC of NRPC was held on 16.11.2018 at NRPC Secretariat, New Delhi. The list of participants of the meeting is attached at **Annexure-A**

MS, NRPC welcomed all the members of the sub-committee to the 153rd OCC meeting.

MS, NRPC briefed the OCC members on following issues:

With the successful commissioning of PGCIL Tughlakabad sub-station in Oct18, Delhi power supply reliability issues in the summer month are expected to be resolved.

NPC (National Power Committee) meeting is scheduled to be held on 30.11.18, wherein Open Cycle Certification under RRAS for NTPC Gas Station will be discussed.

MOEF guidelines for faster implementation of environmental related measures in critical and highly populate areas by power stations is binding on all generators and everyone should ensure completion of measures like FGD implementation within stipulate period of time. NTPC has already revised dates in line with the directive and other Generators should also follow the same. He stressed that the deadlines are required to be adhered to .CERC he added had allowed GST exemption as change in law.

Coal position is very critical at most of the stations including central sector due to constraints of coal companies, Railways and mining end issues.

The units under RESERVE SHUT DOWN should be brought at bar.

All OCC members should bring in relevant agenda items to NRPC for overall improvement of grid operation and for sorting out issues being faced by stakeholders.

PART-A: NRPC

1. Confirmation of Minutes:

1.1. Minutes of the 152nd OCC meeting held on 16.10.2018 at New Delhi were issued vide letter of even number dated 26.10.2018.

Sub–Committee confirmed the minutes of the 152nd OCC meeting.

2. Review of Grid operations of October 2018

2.1. Anticipated vis-à-vis Actual Power Supply Position (Provisional) September 2018.

2.1.1. Sub-Committee was informed that there was more than 5.0% variation in the Anticipated vis-à-vis Actual Power Supply Position (Provisional) during the month of October, 2018 in terms of Peak demand and in terms of Energy requirement was reviewed.

It was observed that in general due to rain in the Northern Region variations were observed. Also it was observed by constituents that due to the weather conditions the error in forecasting had occurred, as the demand was reduced.

SE (O), NRPC emphasized the need to improve the demand estimation taking into account weather conditions/ monsoon records for previous years and IMD forecast.

The Sub-Committee requested all SLDCs to furnish the provisional and final power supply position in prescribed formats by 2nd and 15th day of the month respectively in compliance to the provision 5.3 of IEGC.

2.2. Power Supply Position for NCR:

2.2.1. The Sub-Committee was informed that the NCR Planning Board (NCRPB) is closely monitoring the power supply position of National Capital Region. Monthly power supply position for NCR till the month of September, 2018 is placed on NRPC website (www.nrpc.gov.in).

2.3. The highlights of grid operation during October, 2018 are as follows: -

Frequency remained within the IEGC band for 79.19% of the time during October 2018, which is more than that of last year during same month when frequency (within IEGC band) remained 77.39% of the time. The maximum frequency recorded recorded was 50.17Hz (28.10.2018 at 12:00 Hrs).During the month of October 2018 8.76% of the time frequency remained above the band & 12.05% of the time it remained below the band.

Major Frequency profile deviation was observed in the state of HP & Rajasthan. Also deviation was observed in the state of UP in the first week of October 2018.These states were requested to look into the issue and take measures at their end to decrease the deviation. Rajasthan representative stated that due to Rabi crop growing the Over drawl was there All other utilities were requested to take necessary action to further improve the frequency regime viz. by not changing abruptly the loads at block boundaries and assuring primary response from the generators.

Maximum and minimum demand met for the region during October 2018 were 51154 MW (20.10.2018 at 17:20 Hrs) and 33557 MW (29.10.2018 at 04:00 hrs).The details of the maximum demand met during peak hours is given at **Annexure2(A**) for all the states in NR.

The average consumption, of the Northern Region, for October 2018, increased by only 1.79% (17.7 MU per day) with respect to the corresponding month in previous year. The reason for the same attributed to the weather conditions.

The average thermal generation in October, 2018 showed an increase of 10.4% (63 MU/day) with respect to the corresponding month in previous year. The details are enclosed at **Annexure 2 (B).**

The average Hydro generation in October 2018 showed an increase by 14 MU/day with respect to the corresponding month in previous year.

The average Renewable generation in October, 2018 increased by 26.25 MU/Day with respect to the corresponding month in previous year. All utilities were requested to send the data for renewable generation regularly. The reason for the increase was highlighted as capacity addition, better sunshine & wind. Also, it was added that the telemetry of renewable had improved.The state wise break up is as under:

	Wind MU/DAY	Solar MU/DAY	Bio mass MU/DAY
राजस्थान	7.86	13.82	0.51
पंजाब	-----	4.14	8.23
उत्तराखंड	-----	0.66	-----
उत्तर प्रदेश	-----	2.71	----
हरियाणा	-----	0.13	0.43
एनटीपीसी	------	0.12	------

The average nuclear generation in October, 2018 was decreased by 5.22 MU/day per day as compared to corresponding month in previous year.

The net average Inter-Regional, import showed a decrease of 76.73 MU/day during the month of October, 2018 as compared to the corresponding month in previous year.

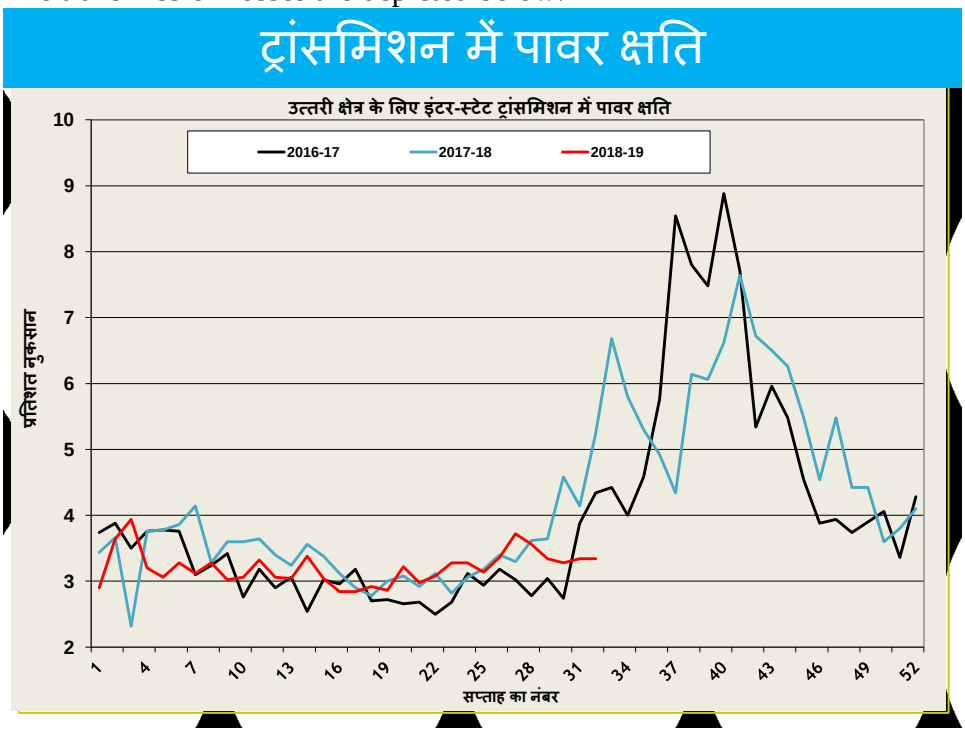
The net average Import from WR showed an increase of 53.62 MU/day during October, 2018 as compared to corresponding month in previous year.

The net average import from ER decreased by approximately 60.88 MU/day during October, 2018 as compared to corresponding month in previous year.

Net average import from NER increased by 2.81 MU/day during October, 2018.

The major reasons for decrease in the import, from other regions was reduced demand in power on account of the weather conditions.

The transmission losses are depicted below:



The details of the variation in data of Drawl by states SEM VS SCADA for the month of October 2018 is given below:

संख्या	राज्य	% अंतर
1	पंजाब	1.12%
2	हरियाणा	0.15%
3	राजस्थान	3.47%
4	दिल्ली	0.09%
5	उत्तर प्रदेश	0.24%
6	उत्तराखंड	1.19%
7	हिमाचल प्रदेश	1.06%
8	जम्मू और कश्मीर	1.86%
9	चंडीगढ़	0.42%

Rajasthan was requested to look into the variation and rectify the same.

Long outages of transmission lines were discussed and all constituents were requested to revive the elements under long outages at the earliest **(Annexure-2 (C)).**

It was intimated by UP representative that Paricha TPS is expected for revival in 14.1.2019.Also it was highlighted that units in reserve shut down should be bought back into the system. POWERGRID representative stated that the Koteshwar FSC is expected to be in the system by March 2019.

The new elements charged during the month were discussed and the list is attached at **Annexure -2 (D).**

Total outages during October 2018 were 792 including planned S/D (560) and forced S/D (Trippings-129+Emergency S/D-103).
The details regarding First Time charging Advisory regarding Documentation and Time line was discussed and deliberated in the meeting **(Annexure 2(E)).**Also the requirements of Trial Run certificate was discussed **(ANNEXURE 2(F)).**

NTPC requested NRLDC to minimize frequent start/stop of Gas Stations operated under RRAS as currently no commercial mechanism is in place for suitably compensating gas stations to counter extra start-up cost & increased maintenance due to frequent start/stops. ED, NRLDC stated that a mark of 50 paise/kwh is given to ISGS stations to take care of fuel price fluctuations & frequent start/stops. NTPC stated that due to US Dollar rise in last few months and sharp increase in Spot RLNG prices, effect on ECR for gas stations is more than Rs.2/kwh which cannot offset the operational loss by 50paise/kwh mark up. NRPC & NRLDC advised NTPC to approach CERC for resolving the difficulty under RRAS.
NTPC informed OCC members about increased availability of Domestic Gas from 16.11.2018 as per information received from GAIL and requested all beneficiaries to fully utilize the same.
On enquiry from NRLDC regarding feasibility of running BTPS Generator under "Condenser Mode of Operation" for controlling high voltages in the grid, NTPC informed that BTPS Generators are not designed to run as "Motor" as per informal discussions with OEM and hence cannot be used for Condenser Mode of Operation. NTPC submitted BTPS decommissioning plan to NRPC.
NTPC raised the issue of constant high voltage in Koldam-Ludhianan-I line. NRLDC advised that NTPC Koldam should check the CVT of the said circuit as voltage cannot be high in one particular line. NRLDC advised NTPC to get back to them in case the issue is not sorted out.
NRLDC directed NTPC to restore auto-reclose facility of Auraiya Malanpur and Mahagaon inter regional lines at the earliest to avoid frequent outage of these lines. NTPC informed that MPPTCL has to provide phase segregated LBB relays for the purpose as line belongs to MPPTCL and NTPC does the maintenance on their behalf on payment basis. NTPC requested NRPC to take up the matter with WRPC to pursue MPPTCL for early procurement of relays. NTPC intimated that MPPTCL has now asked them to procure the relays on their behalf for which NTPC Auraiya has initiated the action.
NRLDC shared that during the grid event on 30.10.2018, at 19:22 Hrs unit # 30, 40 and 50 (830 MW each) of CGPL Mundra UMPP tripped due to generator Class-A2 Protection operation. Total generation loss as per SCADA data was 2240 MW and frequency dropped from 49.94 to 49.79 Hz. **FRC computed from SCADA showed response from NTPC generators as either negative or very poor**. NRLDC stated that some of the hydro stations, including NTPC Koldam were already running at full overload capacity of 10% before the event i.e., higher than the SG. Hence, there was

no margin to respond by these stations during the aforesaid event. NRLDC cautioned that stations should not over generate so as to keep margins to meet such grid contingencies.

MS, NRPC stated that when a station declares DC higher than Ex-bus capacity, NRLDC normally restricts SG to Ex-bus capability. **However**, **in case a Generator declared DC equal or less than Ex-bus installed capacity due to some internal constraints, then Station must inform NRLDC that no over load capability is available with them so that NRLDC can restrict their SG keeping 5% margin for meeting contingencies.**

3. Maintenance Programme of Generating Units and Transmission Lines

3.1. Maintenance Programme for Generating Units.

3.1.1. The maintenance programme for Generating Units for the month of December, 2018 was discussed on 15.11.2018 at NRPC Secretariat, New Delhi. The approved outages of generating units as per deliberations held in OCC has been issued vide letter of even no dated 26 .11.2018.

3.2. Outage Programme for Transmission Elements.

3.2.1. The Outage programme of transmission elements for the month of December, 2018 was discussed on 15.11.2018 at NRPC Secretariat, New Delhi. The approved outages of transmission elements as per deliberations in OCC has been issued vide letter of even no dated 26 .11.2018.

4. Planning of Grid Operation:

4.1. Anticipated Power Supply Position in Northern Region for December, 2018 (As per 15th LGBR Sub-committee meeting)

The Anticipated Power Supply Position in Northern Region for December, 2018 as updated is enclosed at **Annexure 4.**

4.2. Data for the last quarter of 2018-19 required to be submitted by Designated ISTS Customers connected to ISTS.

SE (O) requested all concerned were requested to submit the MW & MVAR Data for injection or drawl at various nodes or a group of nodes shall be submitted for maximum injection/ maximum withdrawal for each application period. Such data it was added should include the power tied in long term contracts and approved medium term open access agreements.

5. Information about variable charges of all the generating units in the Region.

5.1. Sub-Committee was informed that the information of variable charges for different generating units is available on http://meritindia.in/, a Merit Order Portal. All utilities were requested to ensure that the process of scheduling is to be done as per Merit Order Dispatch and in case of variations the same should be informed along with the reasons for the same**.**

6. Reactive compensation at 220 kV/400kV level

In the 38th TCC & 41st NRPC following elements in NR were approved:

a) 500 MVAr TCR at 400 kV bus at Kurukshetra S/S of Powergrid.

b) 30 no. 220 kV bus reactors at 220 kV sub-stations and 18 no. 400 kV bus reactors at 400 kV sub-stations subject to the availability of space.

POWERGRID:

Representative of POWERGRID had informed that for the bids for 500 MVAr TCR at Kurukshetra price bids have been opened and the LOA is expected to be placed by **First week of December 2018** with commissioning schedule of 2 years from the issue of LOA.

Regarding the 125 MVAr reactor being installed at Kurukshetra to compensate for the prevailing high voltage conditions until the TCR gets commissioned, it was informed by POWERGRID that the reactor has been charged on 28.09.2018.

Regarding the installation of the bus reactors at 400 kV ISTS substations which is to be done through TBCB route as per the MoP Gazette Notification dated 08.05.2018, POWERGRID representative was requested to update the progress of the same from CTU.

DTL:

DTL has informed that as per the revised approval of SCPSPNR held on 22.06.2018, DTL will install 7 no. bus reactors, six 25 MVAR, 220 kV bus reactors at Mundka, Harsh Vihar, Peeragarhi, Electric lane, Bamnauli & Indraprastha substation and 1 no. 125 MVAR, 400 kV bus reactor at Mundka substation. DTL has submitted that these reactors would be commissioned by **December 2020**. Out of the above, scheme for five reactors at 220 kV level are under approval. DTL representative informed that order for the above reactors is expected to be placed by **December 2018**.

PSTCL:

Technical bid for 400 kV bus reactor at Dhuri substation has been opened and Price bid will be opened on 18.10.2018. As regards 220 kV bus reactors at Dhuri and Nakodar substation, tender has been opened on 15-06-2018 (technical bid) & is under evaluation. DPR for installation of 400 kV and 220 kV bus reactors has been submitted for PSDF funding. It was informed that there were certain observations of TESG of PSDF to which the clarifications have been reverted on 07.09.2018.

Uttarakhand:

PTCUL representative informed that for 125 MVAR reactors at Kashipur tender date has been extended as only 2 bids were received. 80 MVAR reactor at Srinagar has been commissioned.

Rajasthan: Rajasthan representative updated as under:

The DPR for 3 Nos. each of 25 MVAR reactors (Akal, Bikaner & Suratgarh) i.e. total 75 MVAR reactors has been submitted for PSDF funding on 27.04.2018. Further the reply of observations raised by NLDC has been submitted on 28.07.2018 and

approval is under process at their end. The installation process of these 3 reactors shall be started on receipt of approval by PSDF.

The MS NRPC advised that 450 MVAR (13x25+1x125MVAR) agreed in the standing committee should have been got installed even if the locations had changed in revised study / proposal. In this context it is to submit that the revised DPR for 450 MVAR approved Reactor after separating STATCOM has been sent to POSOCO for approval vide letter dtd. 12.10.2018.

Regarding status of 150 MVAR (25 MVAR at Barmer and 125 MVAR at Jodhpur), it is to submit that reactors at these locations are already included in proposal of 450 MVAR reactors of Rajasthan, approved in the 39th SCPSPNR.

7 System Study for Capacitor Requirement in NR for the year 2019-20

7.1 **38th TCC & 41st NRPC meeting**: NRPC approved that the capacitor requirement study of NR shall be conducted at 11/33 kV level from CPRI so as to obtain the true requirement of capacitor for FY 2018-19.

7.2 Techno Commercial revised offer submitted by CPRI for System studies for assessment of capacitor requirements in Northern region for year 2019-20 for a peak and off peak load condition was enclosed at Annexure-VII of the Agenda of the 147th OCC meeting.

7.3 In the 147th OCC meeting MS, NRPC informed the Sub-Committee that CPRI has given a final (negotiated) Techno Commercial offer of Rs. 32 lakhs (Rs. 20 lakhs for previous study and Rs. 12 lakhs for additional assignment) excluding taxes. The approval of NRPC for the cost of the system study was obtained in the 39th TCC and 42nd NRPC held on 27.06.2018 and 28.06.2018.

7.4 **149th OCC meeting:** In the meeting members were informed about the methodology proposed by CPRI for conducting the study *(*Annexure-7 attached with the MOM of the 149th OCC meeting.*)* which provided with three options. Of the three options, members agreed to go with the third option of **working separately for each state utility(s) for its peak loading time & date to figure out the capacitor requirement for the state**. After having obtained the capacitor requirement for each state individually, the study will be carried out for the complete region so as to reduce the reactive power flow on ISTS lines (considering the capacitors which have been identified for each state).

All the utilities were advised to submit the data for their States in the prescribed format corresponding to date they have met peak requirement for their States. Utilities were requested to submit the data within a month so as to complete the study in time.

In case of any clarification at the time of data collection utilities were advised to directly contact Dr. Manohar Singh, CPRI (manoharsingh@cpri.in, +91-96329 40855).

7.5 **150th OCC meeting**: All the utilities expressed concern on the nature of the format. It was observed in general by all constituents that the format is very lengthy & will require some time for understanding the same and providing data accordingly.

MS, NRPC proposed that all utilities should highlight the problems being faced by them by the second week of September & thereafter a separate meeting will be held with CPRI representative for better understanding of the format and to resolve the issues**.**

7.6 **151st OCC meeting:** Representative of CPRI made a detailed presentation explaining the format in the meeting and based on the inputs received from the members, the format has been revised and has already been sent to the respective SLDC's through e-mail dated 24.09.2018. CPRI has also shared a video of the presentation explaining the format which can be viewed on You tube at https://youtu.be/QTXx7owPF3g.
It was also requested to initially fill the data format for any one 220 kV or 132 kV substation and send it to CPRI to check its suitability for utilization in carrying out the study and further action

7.7 **152nd OCC meeting:** No progress has been made so far for submission of data. All the utilities were again requested to make efforts to do the needful.

7.8 **40th TCC & 43rd NRPC meeting:** Members were requested to expedite submission of the data to CPRI in the format prescribed for studies to be conducted for Capacitor requirement in NR for the year 2019-20.

7.9 **153rd OCC meeting:** MS, NRPC expressed his concerns as no data in the specified format has been received from any of the state even for a single substation which was desired to verify its suitability for utilization in carrying out the capacitor study.
Representative of Haryana stated that they had submitted data to which the representative of CPRI replied that the data submitted by Haryana was not in the format as decided in the 151st OCC meeting which was forwarded to all the utilities via e-mail dated 24.09.2018.
Representative of Rajasthan SLDC stated that the load data at 11 kV substations was not being maintained. Therefore, it was not possible for them to furnish the same.
EE (O), NRPC and representative of JVVNL stated that the load data was maintained at 11 kV sub-station and the same may be made available.
Representative of Rajasthan SLDC stated that the same would be verified and the data shall be submitted at the earliest.
All utilities were requested to expedite the process of data collection and submission so that the study for 2019-20 may be conducted in time.

8 Phase nomenclature mismatch issue with BBMB and interconnected stations

8.1 The Protection Sub-Committee while discussing multiple elements tripping at 400/220/132kV Dehar HEP of BBMB in its 34th meeting held on 21.04.2017 recommended inter-alia that BBMB should modified nomenclature of phase sequencing at Dehar as Y-B-R instead of R-Y-B. The issue was further deliberated in the 138th OCC meeting held on 23.08.2017, wherein it was observed that nomenclature of phases at BBMB end has inadvertently been marked as outlined below:

Phase of the grid	Corresponding nomenclature of the phase at BBMB end
R Phase	B Phase
Y Phase	R Phase
B Phase	Y Phase

The BBMB was asked to rectify the nomenclature issue at their end accordingly.

8.2 However, BBMB raised concern that the issue could not be resolved in one go, as coordination would be required from all the concerned utilities to carry out this activity and requested NRPC to form a committee comprising of BBMB and its partner states, utilities with which BBMB has interconnection, NRPC Secretariat and

POWERGRID for the same. NRPC in its 41st meeting held on 28th February, 2018 approved the proposed formation of the committee and advised BBMB to resolve the issue within six months.

BBMB drew a draft action plan which was duly deliberated by the Committee in its 1st meeting held on 04.06.18. The action plan was circulated to all the concerned utilities for -their comments and concurrence. The execution of the action plan was tentatively planned during month of November-December, 2018.

8.3 HPSEB and PSTCL agreed with action plan, however, PSTCL was of the view that 400kV Dehar-Rajpura line is owned by PGCIL and hence the work is to be executed by them. Comments on the action plan were also received from NTPC and POWERGRID BBMB has agreed with the comments from NTPC and has given their reply on the comments of POWERGRID.

8.4 The reply of BBMB vis-à-vis the comments of POWERGRID were deliberated in the 151st OCC meeting wherein members were of the view that reply of BBMB was generally in order. However, POWERGRID representative stated that the matter pertains with NR-I and NR-II region of POWERGRID and final decision regarding the same is to be taken up at the level Executive Directors of respective regions.

8.5 Accordingly, the matter was taken up vide letter of even number dated 07.10.2018 for POWERGRID consent to the action plan. However, reply of the same is still awaited.

8.6 **152nd OCC meeting:** POWERGRID representative assured that the issue will be resolved with BBMB.

8.7 SE (O) requested POWERGRID to give their consent at the earliest so as the BBMB could execute the work in the upcoming months of November & December as per the decision of NRPC.

8.8 **40th TCC & 43rd NRPC meeting:** In the meeting POWERGRID stated that they have reservation regarding the action plan submitted by BBMB, as for a single circuit line it may not be optimal plan to change the Jumper configuration in view of requirement for long shut down & material. He further stated that a similar issue was encountered in Rajasthan wherein same problem was mitigated for a Double circuit line.MS NRPC had requested POWERGRID to submit all their reservations in writing, highlighting the issues which may be encountered at the time of implementation of above.In the meeting it was stressed that the work should be completed in the lean period of November-December 2018

POWERGRID updated that the site visit is planned shortly top resolve the issue. As desired in the 43rd NRPC meeting POWERGRID submitted all their reservations in writing (Annexure 8).Further MS NRPC requested POWERGRID to resolve the matter immediately so that the work can be done by BBMB in the lean period. BBMB representative also requested for the same as once the clearance from POWERGRID IS received thereafter also the matter has to be approved by their Protection Committee.

9 Follow up of issues from previous OCC Meetings – Status update

The detail of the updated status of Agenda items is enclosed at **Annexure 9.**

10 Status of FGD installation vis-à-vis installation plan at identified TPS.

10.1 The list of FGDs to be installed as finalized in the 36th TCC (Special) meeting held on 14.09.2017 was enclosed as Annexure-13 with the Agenda of the 144th OCC meeting. All SLDCs are regularly being requested since 144th OCC meeting to take up with the

concerned generators where FGDs is to be installed and submit the progress of FGD installation on monthly basis regularly to NRPC in the available format on the NRPC website.

10.2 **151st OCC meeting:** MS NRPC stated that in the meeting CEA held a meeting with generators on 28.08.2018 in which CE, TR&M, CEA informed that the FGD installation deadlines have been advanced for stations falling in NCR and also for the stations above 500 MW capacity or in stations located in the area having population density more than 400 persons per square km or are in critically polluted area. He further added that many IPPs like NPL are waiting for guidelines from the SERCs regarding the FGD installation cost adjustment. In this regard, he briefed the sub-committee that Ministry is concerned about the issue and a policy decision is being made about the cost to be adjusted duly and CERC is being directed in this regard to pass an order to the SERCs. He asked all the generators to seriously make efforts to meet the deadline of installation of FGD.

All constituents are again requested to update the desired information in soft copy in excel format on a regular basis. All the utilities (except PSPCL) should give the contact details of the officer who is concerned with FGD installation so that the information can be expeditiously collected directly from him/her. All SLDCs shall coordinate and submit the information.

10.3 **152nd OCC meeting:** SE(O) NRPC informed that in June, 2018, MoP in a letter to the CERC stated that investment in the installation of emission control technology like FGDs in TPPs in compliance to MoEF&CC norms will be considered for pass through in tariffs and TPPs can approach appropriate commission for the approval of additional capital expenditure and compensation for the increased cost on account of this change-in-law event.

The Sub-Committee was also informed about revised phasing plan received from TR&M Division of CEA placed at Annexure-10(A) of the Agenda of the 153rd OCC meeting**.** He requested all utilities to look into the same and implement the installation plan accordingly and update.

10.4 **153rd OCC meeting:** All utilities were requested to review the revised phasing plan that was attached at Annexure-10(A) of the Agenda of the 153rd OCC meeting.

PSPCL intimated that the Work order for carrying out the Detailed Feasibility Study for Installation of FGD at GGSSTP, Rupnagar & GHTP, Lehra Mohabbat has been placed upon M/s NTPC Consultancy Services and work is in progress.

The status received from NPL & UPRVUNL as submitted is placed at Annexure 10.

11 LVRT compliance by wind generators.

11.1 As per the CERC order dated 05.01.2016 issued in Petition No. 420/MP/2014, CERC has directed that LVRT should be implemented in all wind turbines (except Stall Types) commissioned before 15.04.2014 having installed capacity equal to or more than 500 KW. Further, as per the CEA Technical Standard for connectivity to the Grid (Amend.) Reg.2013 (sub clause (3) of Clause B 2) of the station connected to the grid 06 months after publication of these regulations (i.e.15.04.2014) should have the LVRT capability as depicted in the sub-clause.

As LVRT are not installed in many of the wind turbines in State of Rajasthan, the issue is being regularly raised in the various meetings of NRPC so far without any result.

38th TCC/41st NRPC meeting: LVRT compliance was a pre-requisite according to CEA connectivity standards and these wind generators should not have been provided the connectivity in the first place itself. NRPC directed Rajasthan to issue a notice to all the LVRT non-compliant wind generators specifying a time period within which they need to get the LVRT compliance beyond which they would be constrained to deny scheduling to these generators.

145th OCC meeting: RRVPNL submitted the letter from the Ministry of New & Renewable Energy in this regard in which the following is stated regarding LVRT compliance:

"*A Concerned WTG manufactures may apply for LVRT testing to any internationally accredited testing body or NTWE by 15.3.2018, which should include the following:*

i An affidavit that the manufacturer would comply with CEA Technical standards for connectivity to the grid.

ii A bank guarantee of Rs 1 crore per model, which would be returned on producing the compliance certificate for LVRT and other technical standards as stipulated by CEA."

147th OCC meeting: MS, NRPC stated that all the wind generators shall be LVRT complaint for which retro fitment needs to be done & it shall be responsibility of Rajasthan SLDC to get it enforced. Rajasthan should comply with the decision of 38th TCC/41st NRPC meeting & write letters to wind generators communicating the decision of NRPC.

148th OCC meeting: MS, NRPC apprised the Committee that the above reference order facilitates WTG manufactures to obtain statement of compliance/confirmation standard for demonstrating the compliance to applicable CEA Technical standards for connecting to the Grid for their WTG models which were unable to get LVRT compliance certificate from accredited testing agencies. He further stated that the time period for applying for LVRT testing to any internationally accredited testing body or NIWE stands expired on 15.3.2018. He added that notice should be issued to all Wind generators who have not done the needful. Rajasthan SLDC representative has intimated the same has been issued (Copy of the letter was placed at Annexure 11 of the MoM of the 148th OCC meeting).

MS, NRPC added that as per 38th TCC and 41st NRPC decision, SLDC should not schedule the wind generators which are not LVRT complaint. Also he added that due to LVRT non compliance on part of the wind generators has lead to a near voltage collapse instances but luckily the grid survived. NRLDC representative also added that the compliance of the wind generators is mandatory for the safety of the grid as 2-3 incidents have already occurred in the grid which could have resulted in the catastrophe.

11.2 149th OCC meeting:

Rajasthan representative intimated that a meeting of wind turbine manufacturers was held on 05.07.2018 to sort out the issue of LVRT and to get its compliance expeditiously. Further, the assessment of manufacturer wise non complied WTG has been identified and enclosed at Annex- XI of the MOM of the 149th OCC meeting. He informed the Sub-Committee that 638 generators are LVRT complaint & 106 do not require as per regulation. He further added that 2641 generators need to be LVRT complaint. The capacity of generators that are non – complaint is 3019 MW. He also informed that the cost of installing LVRT was 25-40 lakh per generator for which the generators will have to make arrangements. MS, NRPC stated that the cheaper solutions are available and they should be explored cost needs to be reviewed

MS NRPC requested that Rajasthan should submit these details to their SERC. He informed additionally that the wind generators had requested for scheduling of power till they review the time line for getting work done.

Rajasthan representative also informed that the next meeting with WTG manufacturers is scheduled for 23.7.2108 for further deliberating the actions in this regard.

Director, GM division, CEA representative added that LVRT compliance is mandatory as per connectivity regulation requirement of CEA. He added that a single LVRT solution can be used on the plant which will be cheaper.

11.3 150th OCC meeting:

Rajasthan representative intimated that in line with the discussions in the last OCC meeting the WTG manufacturers in the meeting on 23.07.2018 has been advised to review the possibility of having a single LVRT for a plant. MS, NRPC requested that the MOM of the meeting may be shared so that the progress in this regard can be monitored.

11.4 151st OCC meeting:

The MOM of the meeting held on 23.07.2018 stands shared (Annexure 11 of the Agenda of the 151st OCC meeting).

MS NRPC briefed the forum that M/S Suzlon and Inox have filed a petition for waiver of installation of LVRT on account of the additional cost involved.

RRVPNL representative intimated that the next meeting with the WTG manufacturers is scheduled tentatively for 05.10.2018**.**

152nd OCC Meeting:

RRVPNL representative intimated that a meeting along with presentation from LVRT solution provider (M/s Enerfra) has been convened on dated 09.10.2018. MOM of said meeting are attached as Annexure-XI of the Minutes of THE 152nd OCC meeting.. During the meeting, he informed that it was also decided by MS, NRPC that a meeting of WTG Manufacturers and generators will be convened at NRPC on dated 23.10.2018 to discuss bottlenecks issues in implementation of LVRT in Rajasthan control area.

11.5 In a **meeting held on 23.10.2018 at NRPC with the WTGs** GSS/PSS level solution like STATCOM was discussed. M/s Siemens would provide voltage relief graph which would be superimposed on the system voltage profile at any S/s, If it matches with that provided by the LVRT device then Siemens would explore further possibility of having LVRT devices**.** Siemens was also requested to explore any other alternative for their own WTG to make them LVRT compliant. WTGs were requested to take up for "Pass-through tariff" under "change in law" with SERC**.**

11.6 **40th TCC & 42nd NRPC meeting:** In the meeting it was advised to Rajasthan SLDC to enforce the decision of 42nd NRPC of not scheduling LVRT non- compliant WTGs commissioned after the date as mentioned in the CEA (Connectivity Regulation) amendment dated 15.10.2013.

CEA stated that SLDCs may file a petition with respective SERCs indicating problem being faced by the WTGs in installation of LVRTs.

MS, NRPC informed the TCC that NRPC along with Rajasthan SLDC, WTGs, OEMs is in the process of finding economic way to ensure LVRT compliance

11.7 **153rd OCC meeting: RRVPNL representative updated that WTGs are in the process of finding economic way to ensure LVRT compliance.**

12. System Protection Scheme (SPS) in NR

12.1 **Revised System Protection Scheme (SPS) for 765 kV Agra-Gwalior line:**
In the **37th TCC and 40th NRPC meeting** recommended for convening a separate meeting comprising members from NRLDC, NRPC Secretariat and POWERGRID for reviewing revised logic of the scheme presented by POWERGRID in 140th OCC meeting. A meeting for reviewing the logic of the scheme was held on 07th November 2017 and scheme was revised and finalized.

Since OPGW has now been laid, POWERGRID agreed for utilizing the signals from circuit breaker (CB Open/ CB close) of both the ends for SPS logic so as to negate the chances of mis-operation/ mal-operation of the SPS.

POWERGRID had informed that the circuit breaker (ON/ OFF) signal was being utilized from Agra end in the logic. However, that from Gwalior end was not being utilized as the purpose of the scheme was being served by utilizing the CB signal from one end.

Representative of NRLDC stated that even if the scheme was functioning properly in normal circumstances there are chances that the scheme may not operate in case of breaker lockout from Agra end and the line getting tripped from Agra end.

NLDC also stressed on utilizing CB signals from both the ends as Agra-Gwalior is an important inter-regional transmission line and its implementation will make the scheme even more reliable.

POWERGRID agreed to implement the logic utilizing the CB signal from both the ends as per the decision of TCC. NRPC had concurred with the deliberations of TCC.

POWERGRID had informed that the work at Agra end was in progress but for the implementation at Gwalior end the issue needs to be taken up and highlighted with WRPC also

147th OCC Meeting:

POWERGRID representative stated that their management has enquired about the recovery of cost that will be incurred on implementation of the scheme. Representative of POWERGRID was informed that a decision regarding the same has already been taken in 129th OCC meeting and thereafter ratified in the 35th TCC and 39th NRPC meeting to book the cost of the implementation of revised SPS in some other ongoing project/work. POWERGRID was advised that the decision of NRPC to be implemented at the earliest as this is an important IR line between NR & WR.

NRLDC informed that average load now prevailing on the feeders approved for SPS might have changed and these feeders might not have remained radial and as such the list of feeders needs to be reviewed.

NRPC Secretariat has written a letter dated 28.5.18 regarding this issue to ED/ NR-III, POWERGRID (was placed at Annexure 12A of the minutes of the 148th OCC meeting). This issue has also been taken up with WRPC for implementation at Gwalior end by deliberating in their OCC/ RPC meetings. A letter in this regard had been written to WRPC & the reply received thereof was placed at Annexure 12A of the minutes of the 148th OCC meeting.

148th OCC Meeting:

POWERGRID representative intimated the Sub-Committee that for implementation of the scheme due coordination with the concerned States was required.

MS, NRPC requested each SLDCs to extend cooperation & provide all required support to Power Grid for early execution of the work.

39th TCC and 42nd NRPC meeting: MS, NRPC informed that there were 2 issues involved which needed to be discussed. One was for the utilization of CB signal from both the ends (Gwalior and Agra) in the logic and the other was for incorporating additional 1000 MW load for load shedding in the already approved scheme.

Regarding the additional 1000 MW load, MS stated that the same has been identified and were now pending at POWERGRID's end for wiring with the logic.

POWERGRID representative informed that the material has been received at the site and for 2 locations viz. Dadri and Bhiwadi the scheme was almost completed. Regarding other locations under the ownership of other utility, POWERGRID requested to provide the details of nodal officers with whom they may coordinate. He further stated that, once the details of the nodal officers were received, additional load of 1000 MW shall be wired within 02 months (tentatively by end of August 2018).

MS, NRPC assured POWERGRID of all possible support by the utilities and to provide them with the list of nodal officers for each substation location identified for additional load shedding.

Regarding the issue of utilizing CB from both the ends (Gwalior & Agra) in the logic of SPS, MS, NRPC stated that even though the decision was already taken in NRPC/TCC forum, the issue of booking the cost of the scheme was again raised in the OCC forum. To this, Members expressed concerns and stated that once a decision has already been taken at NRPC/TCC forum, the issue shall not be raised again in any sub-committee of NRPC.

MS, NRPC requested POWERGRID to go ahead with the decision of 41st NRPC to utilize the CB signals from both the end in the logic of SPS so as to ensure more robust and reliable operation of the scheme. He further requested POWERGRID to not to cause any further delay in the implementation of the scheme as such delay may lead to some unforeseen catastrophic incident for the grid.

Representative of POWERGRID stated that the changed logic for utilizing CB signal from Gwalior end shall be provided to them so that the same may be incorporated in the SPS logic. Representative of NRLDC informed the committee that the logic had already been provided to POWERGRID and there was no need of again discussing the same. POWERGRID was advised to go ahead as per the decision of NRPC and complete the scheme in time.

149th OCC meeting:

MS NRPC stated that in the last OCC meeting the Name of the nodal officers for coordinating with Power grid was requested which have not been received till date. He added that as per directions of CERC a report has to be submitted within 15 days on the status of implementation of the scheme. Power grid stated that in the last week of July the mock testing can be done.

Further, on it was added by MS, NRPC that representative of CERC should also be called.SE (O) NRPC stated that the actual testing on the revised scheme be planned in the month of November in coordination with WRPC.

150th OCC meeting:

MS, NRPC apprised the Committee that mock testing for the Revised 765 kV Agra-Gwalior SPS is to be carried out after integration of additional 1000 MW load shedding and Hon'ble CERC has been intimated accordingly. He asked POWERGRID to complete the work at the earliest.

Representative of POWERGRID again requested for the Nodal Officers from the states as problems were being faced while working at the substation of state utilities.

It was informed that names of nodal officers have been requested again and again from the states but only U.P. has intimated the coordinator. MS, NRPC further asked representative of the concerned states present in the OCC to be coordinator for resolving any problems encountered by POWERGRID at substations of respective utilities. Accordingly, the following officers were nominated as Nodal officer:

Haryana – Shri. N. K. Makkar, EE, HVPNL
Punjab- Shri. Akshay Garg, ASE, PSTCL
Rajasthan – Shri. Kamal Patidar, EE, Rajasthan (SLDC)
Delhi – Shri. Loveleen Singh, GM, DTL

151st OCC meeting:

POWER GRID representative updated that the work for Delhi, UP & Haryana is completed. He further added that the work at 7 locations in Punjab & 6 locations in Rajasthan is remaining which is targeted to be completed by October 2018.

152nd OCC meeting:

POWERGRID updated that the work will be completed in totality by November end. He added that physical installation will be completed within this month and testing of the 21 number of link will start thereafter.

NRLDC representative stated that the mock testing would be planned thereafter in the first week of December, 2018.

40th TCC & 43rd NRPC meeting:

In the meeting POWERGRID representative informed the following**:**

- Physical installation at DTPC completed at all the locations.
- Communication link of all hardware would be done by November, 2018.
- RoW issue on 765kV Gwalior-Satna for stretch of 25km is faced. Expected to be resolved by December, 2018.
- Signal Extension to Sasan over OPGW from Agra has been completed. Repeaters installation is in progress and expected by November, 2018.
- Mock testing would be done in January, 2019.

153rd OCC meeting:

POWERGRID updated that the the connectivity work has been done on ten stations and the work on the rest of stations of Rajasthan & Punjab would be will be completed by 15.12.2018 .He further ensured that as agreed in the 43rd NRPC meeting they will target to go ahead with the mock testing in 1/2019

12.2 SPS for ICTs at 765 kV Unnao sub-station:

144th & 145th OCC meeting: UPRVUNL update: "Offer to incorporate the logic of SPS at Anpara "D" is pending with BHEL. The efforts are underway to get the offer from BHEL. The work is expected to be completed by 31.03.2018. The cost of the logic of SPS at Anpara "D" is to be indemnified by UPPTCL".

150th OCC meeting: It was informed that on continuous pursuance of matter with BHEL, negotiated offer for SPS has been received from BHEL on 16.08.2018 (ANNEXURE 12 of the MOM of the 150th OCC meeting) and the order for the same shall be placed within a week with completion target of September, 2018**.** The copy of the LOI placed on BHEL is placed at Annexure 12 of the Agenda of the 151st OCC meeting.

151st OCC meeting: UPRVUNL updated that order has been placed on M/s BHEL vide letter no 310/C&D-VI /DTPP/T-1 dated 20.08.2018.The work is to be completed in around 40days. The cost of the work would be 54.20 lac & UPPTCL has been intimated about the same**.**

152nd OCC meeting: UPRVUNL updated that they will complete the work by November end. UPPTCL representative stated that the work at their end and LANCO is complete and once the UPRVUNL completes the work mock testing will be done. It was further added by representative of UPRVUNL and UPPTCL that only action at Anpara D is pending and therefore with the commissioning of scheme at Anapara D, entire scheme would stand commissioned.

153rd OCC meeting: UPRVUNL updated that the work is under progress. BHEL they intimated has given a list of MAX-DNA Hardware to be procured by department. The offer stands received and procurement process is being done. He further added that BHEL is developing the software logic of the SPS. As on date it is expected that the work would be completed by December 2018

12.3 SPS for Kawai – Kalisindh - Chhabra generation complex:

146th OCC meeting: RRVPNL updated as under:

"The communication scheme is being reviewed on PLCC/Optical fiber in place of earlier GPS scheme as tripping time on GPS scheme was higher. Tender is likely to be floated by 5/2018."

147th OCC meeting: RRVPNL representative intimated that feeder identification has been done & tendering will be done shortly. He added that further communication scheme is being reviewed on PLCC/Optical fiber in place of earlier GPS scheme as tripping time on GPS scheme was higher. Tender is likely to be floated by May-18.

148th OCC meeting: RRVPNL representative intimated that the Technical specification is under preparation & communication link are under review. Tender is likely to be floated in July 2018.MS NRPC expressed concern over inordinate delay & requested RRVPNL to take up the issue with the communication wing expeditiously or else NRPC Secretariat will take up the matter with higher management**.**

149th OCC meeting: RRVPNL representative intimated that the details from the communication wing stand received. & the tender will be floated positively by next month. He explained that the details of the OPGW involved have been accounted for in the details received from the communication wing**.**

150th OCC meeting: RRVPNL representative intimated that the Technical Committee has rejected the proposal on the basis that the reliability of the PLCC system proposed for the load shedding at the time of outage of Kawai-Kalisindh units along with Anta–Phagi line is not present. It was added by the Committee that till March 2019 the OPGW will be laid in the entire network (12000 Kms) & the same can be used for the purpose.MS NRPC requested RRVPNL to submit the written communication from their STU in this regard.

151st OCC meeting: RRVPNL representative submitted the written communication from their STU in this regard is enclosed at Annexure 12A of the MOM of the 151st OCC meeting It has been intimated that the Technical specification for implementation of Automatic load shedding scheme under SPS for Kawai Kalisindh generation complex is under process of approval and the whole procedure till award of contract may be completed within 4-5 months and complete implementation of above scheme may take further at least 6-7 months.

152nd OCC meeting: RRVPNL representative submitted a letter from SE (Procurement-I), RVPN, Jaipur Annexure-XII of the MOM of the 152nd OCC meeting, vide which it has been intimated that the Technical specification for implementation of Automatic load shedding scheme under SPS for Kawai Kalisindh generation complex is under approval.

Further, it was intimated that the contract will be awarded within 4-5 months and complete implementation of above scheme may take further 6-7 months. SLDC Rajasthan representative confirmed that Chabra STPS units have also been wired to the SPS.

153rd OCC meeting: RRVPNL representative stated that the order will be placed in 1/2019 positively for completion of work in 6-7 months thereafter.

13. Automatic Demand Management System

13.1 147th OCC meeting: All utilities were once again requested to submit update on the action plan & status of implementation of the ADMS in their utility as it is mandatory requirement of IEGC.

Delhi, Haryana, Uttarakhand, & UP (SLDC) representative were requested to take up the matter expeditiously with their distribution companies. SE NPC stated that the problems if any in implementing the same may also be brought to the notice of the sub –committee as it is now 10 years, since the regulations were issued by CERC.

Punjab representative intimated that at SLDC level they were doing remote tripping for 96 locations. He added that the ADMS at 11 kV feeder level is to be implemented by Distribution Company. He added that the Tender specification had finalized and it has been targeted to be complete by 2020. The information was submitted by HP. MS, NRPC requested all SLDCs to plan and get the ADMS implemented soon in their States.

13.2 148th OCC meeting: TDDPL representative stated that the ADMS system is working well in their organization as per the latest regulations since last more than 5 years. He added that the scheme is also working in Rajadhani & Yamuna Power distribution companies.

Punjab SLDC representative stated that 26 locations remote tripping from SLDC has been tested. Around 10 percent of the running load can be disconnected through these locations. The latest status regarding implementation of ADMS by PSPCL is as under:

The matter of engaging a consultant for preparation of DPR of ADMS at balance location is under consideration with the higher authorities and work of ADMS would be implemented within stipulated time.

MS, NRPC stated that the all States should review their system demand and Automatic Demand Management System should be planned and implemented at the earliest for grid security.

13.3 149th OCC meeting: MS NRPC stated that the issue is lingering since many years & it is very important for the grid security. He stated that the States should submit a detailed scheme which they want to execute. Further Rajasthan representative stated as under:

That approval of PSDF for STNAMS (Smart Transmission Network & Assets Management System) project which is consisting of Automatic Demand Management System (ADMS) functionality at the level of 33 feeders at EHV Substation of RVPN under SCADA / EMS part of project has been received. Bid documents prepared and

under final approval with the CMD, RVPN. Bidding process will be initiated immediately on approval as above. Tentative timeline is as under:-

1. Issue of NIT – June, 2018
2. Finalization of Tender / Purchase order issued – August, 2018
3. Proposed timeline to complete the work – 18 months from date of issue of LOI/NOA

Further, the Automatic Demand Management System (ADMS) functionality at 11 kV feeders from 33/11 kV substation are under the jurisdiction of the Discoms and matter is being perused with discoms authorities.

NRLDC representative added that the updated list of the feeders of the state that can directly be made available to NRLDC, and should also be shared by all states as it is required in line with CERC guidelines.

PTCUL representative added that the issue is being taken up with the DISCOMs but no update has been received.

UP representative stated that they had submitted the details of the remote operation of 132kV feeders under ADMS.

MS, NRPC advised UP to have a detailed study on their complete system. He also stated that this issue will be discussed in the meeting on 30.7.18 wherein issues related to DISCOMs will be highlighted.

13.4 150th OCC meeting:

Concerned states (UP, Haryana and PTCUL) were requested to update.

MS, NRPC stated that the responsibility lies with the SLDC & STU to get the data from the DISCOMs**.**

13.5 151st OCC meeting:

PTCUL representative intimated that the matter stands taken up with the Operation circle of Uttrakhand Power Corporation limited.

Representative of Rajasthan stated that Tender for Smart Transmission Network & Assets Management System having ADMS part has been floated and Techno commercial bid has been opened on 30.08.2018. Evaluation of Techno commercial bid is under process.

UP & Haryana representatives were requested to also update.

13.6 152nd OCC meeting:

UPPTCL representative informed that the remote operation of 132 kV feeders under ADMS has been done, but for the below network they have taken up the issue with the Distribution companies.

Haryana & PTCUL representative informed the Sub Committee that they are vigorously taking up the issue with the distribution companies in this regard.

Rajasthan representative updated as under:

Tender for Smart Transmission Network & Assets Management System having ADMS part has been floated and Techno commercial bid has been opened on 30.08.2018. Financial Bid has also been opened and financial bid analysis is yet to be submitted for approval of WTD. Work order is expected to be placed by December-18 after expiring of model code of conduct for assembly election in Rajasthan.

13.7 153rd OCC meeting: PSPCL representative intimated as under:

For the switching off of interruptible load in the event of over drawl from the grid. Punjab SLDC SCADA has already provisions of opening of 96 no. of 66 KV substations controlling approximately 10% of the running load. DISCOM SCADA for the control of 11 KV feeders emanating from approximately 50 no. of 66 KV sub stations in three cities of Amritsar, Jalandhar and Ludhiana is under implementation stage and the entire work is likely to be completed by March-2019. In addition to cover the switching off the rest of interruptible load feeders, ADMS scheme agenda is under consideration of higher authorities of PSPCL

UP, PTCUL& Haryana were gain requested to update

14. Status of implementation of recommendations of Enquiry Committee on grid disturbances on 30 & 31.7.2012

14.1 147th OCC meeting: All utilities were requested to update the information as per the letter enclosed at Annexure 18 with the Agenda of the 146th OCC meeting. Compliance report from POSOCO & NHPC has been received.

14.2 148th OCC meeting: SE (O) stated that it is regretted to state that no information has been received from any quarters till date in spite of repeated requests/ reminders. He added that the matter is viewed very seriously by CERC and would be taken up with higher authorities of each state utility. MS, NRPC emphasized that it is very essential to get the protection audit done & it is for the betterment of the system of the State & the region as a whole.

14.3 149th OCC meeting: BBMB. PSTCL, Rajasthan, Koteshwar (THDC), HPGCL, NPCIL, POWRGRID (NR-2) have submitted the data. (Annexure 15 of the MOM of the 149th OCC meeting.)

14.4 150th OCC meeting:

NTPC submitted the information for NCR (Annexure 15 of the MOM of the 150th OCC meeting).

14.5 151st OCC meeting & 152ndOCC meeting:

SE (O) requested all utilities (except NTPC, BBMB. PSTCL, Rajasthan, Koteshwar (THDC), HPGCL, NPCIL, POWRGRID (NR-2)) to update the status as per the prescribed Formats.

14.6 153rdOCC meeting: POWERGRID NR1 submitted the information **(Annexure 14).** All utilities (except NTPC, BBMB. PSTCL, Rajasthan, Koteshwar (THDC), HPGCL, NPCIL, POWRGRID (NR-2& NR 1)) were requested to update the status as per the prescribed Formats.

15. Planning, procurement and the deployment of Emergency Restoration System.

The updated status in the 153rdOCC meeting is as under:

DTL, PSTCL & UPPTCL - 02 nos. of ERS procured.

RRVPNL: - For procurement of ERS, preparation of Tender documents has been completed and it's under approval.

HVPNL: - BOQ finalization it's under process.

PTCUL: - 151st OCC: PTCUL representative stated that they have taken up the matter for providing the definite status with the Chief Engineer O&M (Dehradun & Haldwani)**.** He further informed that a committee has been formed to finalize DPR**. No further update on the issue.**

HPSEBL: – The process of arranging funds for procurement of ERS has been initiated. HPSEBL representative intimated that they were coordinating with PTCUL. He was advised to coordinate with J&K, citing the status of PTCUL. No further update from 149th OCC meeting.

J&K: - Order has been placed for 2 nos. ERS. No further update.

BBMB: - **BBMB representative stated that the issue has been discussed in the Power Sub –Committee meeting of BBMB and it has been decided that the ERS will be obtained as and when required from the partner states only**.

150th OCC meeting: CEA representative stated that being a transmission licensee they can go ahead with the procurement of their own ERS. He also added that instructions for procurement of ERS were issued from the Ministry. ERS are very essential for the safety of the nation also in case of any attack.

SE(O) NRPC stated that guidelines have been issued vide which the Ministry of Power has directed that for 5000 ckt kms minimum 2 numbers of ERS are required (Annexure 16 of the MOM of the 150th OCC meeting). All utilities were requested to review accordingly**.**

HPSEBL, Haryana, PTCUL & Rajasthan were requested to update. All other utilities were again requested to review& update in view of the Annexure 16 of the MOM of the 150th OCC meeting.

16. Cleaning and Replacement of porcelain insulators

16.1 Northern Regional power transmission lines are exposed to the high pollution levels along their routes. Such pollution levels with the onset of the winter season, lead to the frequent trippings and finally to breakdown and long outages of the transmission lines. These outages make the grid weak, thereby endangering the grid reliability and security. Therefore, in order to avoid/mitigate trippings of lines during foggy (smog) weather in winter season, preventive actions like cleaning/washing of insulators, replacement to conventional insulators with polymer insulators has been recommended and are being taken every year.

16.2 It being a regular activity, all the transmission licensees in the Northern Region are being requested in monthly OCCM since the 148th Meeting to plan insulator replacement work from September 2018 onwards.
The meeting for cleaning and replacement work of conventional insulator was held on 15.10.2018.

The minutes of the meeting stand issued vide letter dated 12.11.2018.

All utilities were requested to stick to the timeline as brought out in the meeting to mitigate fog related trippings during winter season and to ensure proper submission of data regarding progress of the cleaning/ replacement work in line with the discussions held in the meeting. It was stressed that the cleaning of porcelain insulators in the polluted/fog prone area also be taken up expeditiously.

17. Cyber Security Preparedness Monitoring

In the **37th TCC and 40th NRPC meeting** held on 27th and 28th October, Chief Engineer IT, CEA and Chief Information Security Officer, MoP, Sh. Vijay Menghani, gave a presentation on potential cyber threats for power sector, the agencies working on this aspect, recent incidents of cyber attacks on and the action points to prevent the cyber threat. It was stated that in view of increasing incidents of cyber-attacks and threat to the integrated grid operation, all utilities need to monitor action being taken in regard to the following points and report the status to respective Computer Emergency Response Teams (CERTs):

a. Appointment of organization-wise Chief Information Security Officers and its status.

b. Identification of organization-wise Critical Infrastructure and its status.

c. Preparation of organization-wise Crisis Management Plan and its status.

d. Status of Cyber Security Mock Drill activity in coordination with CERT-In.

e. Status of Training / Workshops on Cyber Security organized / participated by power sector entities.

f. Status of action taken on CERT-In / NCIIPC advisories.

All the utilities were again requested to furnish the above information, however, except from TATA Power – DDL the information has not been received from any of the utilities. The report as submitted by TATA Power- DDL was attached at Annexure-21 with the Agenda of the 146th OCC meeting. NHPC have also submitted the status. All the other utilities were once again requested to furnish the information in the format as submitted by TATA Power**.**

147th OCC meeting: NTPC updated the information. All utilities (except NTPC, NHPC & TATA Power) were requested to kindly update the status. Some of the members enquired about the training to be imparted by NRPC/CEA on cyber security. They were asked to contact CE (IT), CEA in this regard as they are organizing training on cyber security and other related issues.

148th OCC meeting: THDCIL submitted the information in the meeting. All other utilities (except NTPC, NHPC & TATA Power) were again requested to update the status. Rajasthan representative intimated that the issue is being taken up with their IT wing and information would be submitted shortly. Tata Power representative stated that they welcome any utility to visit their station for seeing the implementation of

Cyber security done at their end.

149th OCC meeting & 150th OCC meeting: The information from NAPS & PSTCL stands received. **All utilities except NTPC, NHPC, Tata Power, THDCIL, NAPS & PSTCL were requested to update**. SE(O) stated that it is a long pending issue and the information in the desired format should be submitted by all remaining utilities. Rajasthan representative stated that they had forwarded the information to CEA.

151st OCC meeting & 152nd OCC meeting & 153rd OCC meeting: The information has been received from NTPC, NHPC, Tata Power, THDCIL, PTCUL, NPCIL RAPS, NAPS, PSTCL, DTL & PTCUL and Rajasthan. **All other utilities (except from those mentioned above) were requested to update**

18. Requirement of Data for the GIS based Energy map being developed by Energy division of NITI Aayog.

The Sub –Committee was informed that a copy of a letter from the Chief Engineer (DP&T) was placed at Annexure 22 of the Agenda of the 147th OCC meeting.

148th OCC meeting: MS, NRPC requested all DISCOMs /Power Departments to furnish the information regarding the name, voltage level, capacity, longitude & latitude of 33 kV & 66 kV Substations and lines as detailed in the letter. He informed that RPCs have been given the work of collecting the data from States and forwarding to CEA. Except NHPC, the data has not been received from any of the utilities**.**

UPPTCL representative intimated that the data needs to be collected from the DISCOMs and if a communication from the NRPC secretariat is sent to the DISCOMs the matter could be expedited**.** Rajasthan representative intimated that they are also taking up the issue with their distribution companies.SE (O) stated that SLDC being the nodal agency for the state, matter should take up by them with their DISCOMs for early submission of the data. All agreed for the same**.**

149th OCC meeting: All utilities were again requested to submit the desired information. Rajasthan representative sated that they are taking up matter with distribution companies.MS NRPC added that the issue will also be discussed in the meeting to be held on 30.7.2018 with the DISCOMs

150th OCC Meeting: All utilities were again requested to make all out efforts and submit the desired information by taking up expeditiously with the DISCOMs.

151st OCC Meeting: Punjab has submitted the information that has been forwarded to concerned office of CEA. All other utilities (except NHPC)were requested to make all out efforts and submit the desired information

152nd OCC Meeting: All utilities except Punjab &NHPC were requested to update. The representatives of Rajasthan informed the Sub-Committee that they are making all out efforts to get the information from the distribution companies but communication from NRPC Secretariat would help in expediting the issue.SE(O) informed that the issue would be brought forth in the next meeting scheduled to be held with the DISCOMs.

153rd OCC Meeting: All utilities except Punjab & NHPC were requested to update.

19. Distribution automation and development of smart grid in NCR

Smart grid will enable optimization of energy generation, transmission, distribution and consumption. It provides an opportunity for energy companies to make power delivery more efficient, whether by minimizing the visits of personnel to transmission and distribution locations or by enabling better decisions through timely information. Automation is the key to development of smart grid. The implementation of automation may be taken up in the selected towns initially which would be the first step towards implementation of smart grid in the NCR.

SE(O) stated that at present, the level of preparedness of distribution sector to adopt smart grid is in a very preliminary stage and every DISCOM has to prepare a clear road map for implementing automation and smart grid in their area of operation along with the financial requirement and sources for all funding to roll out the plan in coming years.

MS, NRPC stated that Delhi DISCOMs are proactive in this case. He requested that the concerned (Haryana, Rajasthan & UP) STUs & SLDCs to coordinate with the respective DISCOM & take active action for up gradation of automation by deploying smart grid. All states were requested to take note and intimate the progress in this regard in each OCC.

In the 153rd OCC meeting all members (Haryana, Rajasthan & UP) were again requested to update.

20. TTC assessment considering temperature dependent rating of lines/terminal equipment

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

In response to the NPC Division letter dated 17.08.2018, seeking status report regarding compliance/implementation of ambient temperature adjusted TTC for all the transmission corridors of the country, POSOCO vide letter dated 31.08.2018 (Annexure 32/A of the Agenda of the 152nd OCC meeting) has informed that the terminal equipment rating of both ends for the lines were available only for 99 Nos. of 400 kV lines, out of 183 lines as per the data submitted by PGCIL& it had requested NPC to facilitate.. Therefore, we are again taking up with PGCIL to send the complete information. NPC vide letter dated 20.09.2018 (Annexure-32/B of the Agenda of the 152nd OCC meeting) had requested RPCs to furnish the terminal equipment ratings of the STUs' and other transmission utilities' transmission lines in respective Region

SE(O) stressed that the information is very crucial and all STUs' and other transmission licensees' transmission lines should compile & furnish the data as desired on priority.

21. Water shortage at Unchahar

NTPC representative stated that the main source of water at NTPC Unchahar is Sharda Sahayak Canal. But during canal closure in the month of April and October, Unchahar get water from Dalmau pump house. During last canal closure shortage of water was faced & situation was critical even-though only stg-1,2 and 3 units were in service.Stg-4 (500 MW) unit will be put on bar & will require additional water. Total water requirement will be 85 cusec. It is requested to ensure continuous supply of above quantity of water from Dalmau pump house during canal closure (28/10-27/11/2018) for smooth operation of the power station.

MS NRPC, assured that efforts would be made in this regard.

22. Diversion of water from Nangal Hydel Channel (NHC) to Anandpur Sahib Hydel Channel (ASHC) in case of simultaneous outage of Generating Unit at Ganguwal & Kotla Power House(Agenda of HVPNL)

BRIEF HISTORY

1. Ganguwal and Kotla Power stations of BBMB each having three generating units with total installed capacity of 76.39 MW & 77.34 MW respectively are located on Nangal Hydel Channel (NHC). On Anandpur Sahib Hydel Channel (ASHC), PSPCL constructed Anandpur Sahib Hydel Project (ASHP) with two power stations at Ganguwal and Nakain each having two generating units with total installed capacity of 67 MW at each Project.
2. Out of the total releases from Bhakra Power Houses, the first priority is to supply water through NHC and balance through ASHC. Under certain conditions of outage of a machine at Ganguwal/Kotla Power House, depending upon the water requirement of Punjab, Haryana etc., and additional water is diverted from NHC to ASHC.
3. BBMB Board in its 184th meeting held on 23.12.2003 approved the proposal for diversion of water from NHC to ASHC. Since then the diversion of water is carried out depending upon the outage of machines at Ganguwal/Kotla and irrigation requirement as per the modalities as mutually decided/agreed between erstwhile PSEB & BBMB in the meeting held at Patiala on dated 03.02.2004. The methodology of computation of deemed generation is as under:
    a. The loss of generation due to diversion on the running/available machines at Ganguwal and Kotla was being fully compensated by PSPCL.
    b. The balance increase in generation at ASHP after crediting the energy to BBMB at (a) above was being shared equally between BBMB and PSPCL.

c. When there was no loss of generation at Ganguwal and Kotla due to diversion of water, the excess generation at ASHP was being shared equally between BBMB and PSPCL.

d. Deemed generation was being manually added in the SEM data of respective Power Houses and adjusted/accounted for as drawl from the system by NRPC.

ISSUE & PRESENT STATUS

4. In compliance to CERC order dated 21.03.2016 in petition No. 251/GT/2013 BBMB Generating stations have come under the ambit of ABT w.e.f. 01.06.2016 and there is no methodology available where any energy can be manually added in the ABT accounts.

5. Accordingly, meeting was held by NRPC on 29.08.2016 with BBMB and representative of partner States to discuss the modalities of scheduling, metering and accounting of BBMB generating stations under ABT.

As per the Minutes of the above said meeting of NRPC (copy of Minutes enclosed as Annexure 22 of the Agenda of the 153rd OCC meeting) it was felt that under present regulatory provision it would not be possible to account for such deemed generation adjustments in the energy accounts issued by NRPC Secretariat. It was decided that BBMB may settle the matter mutually with Punjab.

6. A meeting was held between BBMB and Punjab (PSPCL) to finalize the modalities on account of deemed generation for diversion of water from Nangal Hydel Channel to Anandpur Sahib Hydel Channel on dated 07.10.2016 at BBMB, Chandigarh. Following was discussed and agreed upon in the meeting:

a. It was agreed that under the ABT mechanism (i.e. w.e.f. 01.06.2016) methodology to work out the deemed generation will remain the same as is being done presently as per the MOM dated 03.02.2004 but there will not be any adjustment of deemed generation in the energy accounts issued by NRPC and drawal of PSPCL. It will be accounted for in the form of cash only as mutually agreed.

b. It was proposed that gain to PSPCL on account of deemed generation due to diversion of water from NHC to ASHC will be compensated by

PSPCL to BBMB on the monthly basis at the yearly average power purchase cost of PSPCL proposed in its respective ARR/Tariff petition.

c. Representative of PSPCL stated that the proposal as discussed during the meeting will be apprised to the higher authorities of PSPCL and accordingly the same will be finalized during the upcoming meeting with BBMB authorities.

7. To discuss the further course of action in the matter, next meeting with PSPCL authorities was held on 04.11.2017. PSPCL conveyed that compensation to BBMB at Yearly Power Purchase Cost of PSPCL is not acceptable.

8. An arrear of 734.63 LUs is pending towards Punjab on account of the indecisiveness of BBMB out of which Haryana share is 233.6195 LUs.

The issue was deliberated in the meeting where it was suggested that adjustment of deemed generation can be made by change in power allocation of partner states in generation of power houses of BBMB for limited period. It was proposed further that the detailed discussions may be held with NRLDC separately.

PSPCL submitted as under:

The proposal to settle the issue of diversion of water from NHC to ASHC and accounting of deemed generation adjustment on account of the same has been sent to concerned office for consideration and is likely to be deliberated by the Power Sub Committee of BBMB.

23. Regarding Bottlenecks, constraints & overloading in the State Transmission Network in state of Rajasthan

At Annexure 23 of the Agenda of the 153rd OCC meeting is placed the detailed report on the subject cited**.**

In the meeting RRVPNL representative stated that the detailed updated status of the TRANSMISSION SYSTEM as planned will be submitted at the earliest.

24. High loading on 400kV Anta –KOTA (PG) single circuit line since its commissioning

At Annexure 24 of the Agenda of the 153rd OCC meeting is a letter from NRLDC on the issue**.**

RRVPNL representative intimated that they have taken up the matter with SE(P&P) RVPN, Jaipur. He has been advised to review the following two options so the excessive power flow 400kV Anta –KOTA (PG) single circuit line can be reduced:

- **The possibility to bypass 765kv Anta for evacuating generation of CTPP through 400kV CTPP-Anta line and connect the same with 400Kv Anta – Kota line at common tower location No 3**

- **The possibility to provide one more ILT each at CTPP and Kalisindh generating stations or upgrade the capacity of existing ILT from 315MVA to 500MVA to strengthen the Chabra, Kawai & Kalisindh Generation complex.**

Also the representative added the SE (P&P) has been requested to share the information as desired by NRLDC in their letter enclosed at Annexure 24

25. Observance of High shaft vibration at DADRI Stage 2 UNITS (5&6) during power system faults near its vicinity.

At Annexure 25 of the Agenda of the 153rd OCC meeting is a letter from NRLDC on the issue**.**

SE(O) requested NRLDC &NTPC to share the details of any further studies carried out regarding the High shaft vibration at DADRI Stage 2 UNITS (5&6) during power system faults.

26. Phasing Out of BTPS Station

BTPS unit have the installed capacity and commissioning of units is as under:

Stage I Unit

SNO	Unit No	Capacity in MW	Date of Commissioning/Commercial Operation
1	1	95	1.11.1973
2	2	95	1.9.1974
3	3	95	1.4.1975
	Total	285	

Stage II Unit

SNO	Unit No	Capacity in MW	Date of Commissioning/Commercial Operation
1	1	210	17.3.1980
2	2	210	01.04.1982
	Total	420	

Presently, the details of outage of units are as under:

SNO	Unit No	Capacity in MW	Date of last closure	Remarks
1	1	95	1.11.1973	Not in operation due to less requisition by DISCOMs in merit order load dsepatch principal.Further as per direction of DPCC. BTPS Unit NO 1, 2 &3 have been closed due to non meeting the pollution norms wef 1.1.2016
2	2	95	1.9.1974	
3	3	95	1.4.1975	
4		210	*	Closed as per as per direction of DPCC. To control the pollution of Delhi
5		210	*	

On enquiry from NRLDC regarding feasibility of running BTPS Generator under "Condenser Mode of Operation" for controlling high voltages in the grid,

NTPC informed that BTPS Generators are not designed to run as "Motor" as per informal discussions with OEM and hence cannot be used for Condenser Mode of Operation.

As desired NTPC submitted BTPS decommissioning plan placed at Annexure 20.

27. Islanding scheme of Delhi

Following the massive grid disturbance occurred in the grid on 30th & 31st July 2012 , the Islanding Scheme was envisaged to take care of the essential load of Delhi in the event of occurrence of such events. The Islanding Scheme has been revised from time to time depending upon the load generation scenario. Revised Islanding Scheme of Delhi was discussed in detail in 32nd PSC held on 30.11.2016 and was found to be in order. The same was also approved in 35th TCC & 39th NRPC.

POWERGRID intimated that the 400kv/ 220kv Tughlakabad Substation stands commissioned and the necessary action can be taken for implementation of the revised scheme.DTL representative stated that as per revised scheme the Isolation is to be done now at Tughlakabad Sub station. He added that the matter is being taken up with the OEM for providing the new panel. HOWEVER THAT WILL TAKE 3-4 Months hence an arrangement is proposed to be done in the relays of POWERGRID at Tughlakabad so that the isolation can be done in case of any problem.

MS NRPC stated that the issue may be resolved at the earliest as December month is very crucial as Grid disturbance are expected in this period. He further added that the time frame in which the arrangement would be made be reported so that GM division can be intimated accordingly.

28. Strengthening of Intra state Transmission System

In the NRPC meeting held on 30.11.2012, it was decided that SLDCs should give half yearly feedback to STU regarding bottlenecks, constraints and overloading in the STATE transmission network for proper Transmission planning **.**Also all SLDCs are requested to give half yearly feedback ending 6/2018 in the month of 7/2018 to STU regarding bottlenecks, constraints and overloading in the State transmission network for proper transmission planning.

DTL vide their letter dated 11.9.2018 (Annexure28 of the 153rd OCC Agenda) have submitted report on Transmission system constraints in Delhi system observed at the time of day peak demand (7016 MW on 10.7.2018 at 15:26:58hrs) and evening peak demand (6668MW on 9.7.2018 at 22:30hrs) occurred in summer 2018 in Delhi.

In the 3rd Steering Committee of 2017-18 held on 17.1.2018 remedial measures in each case of transmission system constraints were discussed and action plan was drawn.

DTL representative intimated that requisite action is being taken as per the remedial measures proposed in each case.

Part B: NRLDC

1. Reliability issues in the grid:

Rajasthan: NRLDC representative stated that 400kV Anta-Kota line having twin moose conductor was synchronized on 09.07.2018. Loading of this line remains in range of 800-900MW and pose serious threat in case of other trippings in this area. When Chhabra Supercritical would be fully commissioned (2*660MW) loading of 400kV Anta-Kota would rise further. This clearly shows importance of studies to be carried out during planning stage.

Bus split at Kota Sakatpura has been done by Rajasthan SLDC to limit power drawn from Kota(PG). However, even then loading of 400kV Anta-Kota has remained high. Apart from this, to restrict line loading of 400kV Anta-Kota, on request of Rajasthan SLDC 400kV Kota-Rapp C lines are being opened on daily basis. However, as stated by NRLDC representative this weakens the system and thus, there is need for alternative solutions.

NRLDC representative stated that 400kV Anta-Kota and 400kV Anta-Chhabra were connected after LILO of 400kV Chhabra-Kota line, thus if these are connected at LILO point then 400kV Anta-Kota and 400kV Anta-Chhabra can be charged as 400kV Chhabra-Kota. Additionally, from the SLD of Kota substation available at NRLDC it is understood that 400kV Chhabra-Anta and 400kV Anta-Kota are connected in same dia. If the **main bays of these lines are manually kept open at Anta end, line effectively becomes as 400kV Chhabra-Anta-Kota. Simulation studies suggest that under such operation line loading reduces by nearly 40%** (from 800-900MW to 500-600MW). NRLDC has requested Rajasthan SLDC to implement this suggestion after assessment at their end as well.

Rajasthan SLDC representative stated that they have received communication from NRLDC and possibility of such connections is being explored at their end. He added that there is some **doubt whether the two lines viz. 400kV Anta-Kota and 400kV Anta-Chhabra are on the same dia or not. Moreover, if the lines are not found in the same dia, even then they would be connected at LILO point and line would be operated as 400kV Chhabra-Kota.**

NRPC and NRLDC representatives expressed concern on the doubt expressed by Rajasthan SLDC on whether SLD available at SLDC/NRLDC is correct or not. NRLDC representative stated that the line has been recently commissioned by Rajasthan therefore SLD must have been checked. He added that due concern and active actions shall be taken by states so that there are no mismatches between actual and available single line diagrams. MS NRPC also asked Rajasthan and other states as well to ensure that such doubts are taken care in future and all checks done thoroughly before allowing first time charging of elements.

NRLDC representative added that only single ICT is available at **Rajwest, Chhabra and Kalisindh**. Rajasthan SLDC representative stated that they are taking up matter with STU and have suggested for enhancing capacity of existing ICT or adding another ICT at these locations.

N-1 non-compliance was observed in 15Oct-15Nov'18 at **765/400kV Phagi SS (attached as Annexure-1).**

UP: NRLDC representative highlighted that N-1 non-compliance was observed at Azamgarh substation during 15Oct-15Nov'18 **(attached as Annexure-1).** He added that evacuation constraints at Bara, Anpara, Lalitpur complex are still persisting and need actions. It was also requested to expedite commissioning of following lines for increasing reliability:

- 765kV Bara-Mainpuri 1
- 765kV Hapur-Mainpuri
- 765kV AnparaD-Unnao
- Underlying n/w at recently commissioned 400/220kV stations: UP representative informed that commissioning work of 400kV Sector 148 station is under progress and shall be completed by Feb'19.

Jammu & Kashmir: In past years, there have been multiple elements tripping incidents and collapse of valley system during winter months/ high demand period on N-1 contingency in the Kashmir valley power system. In order to improve reliability of power to the valley the following measures have been suggested in previous meetings and operational feedbacks and are once again reiterated:

a. The New Wanpoh substation has been commissioned in 2013. However, the underlying network is yet to be commissioned which needs to be expedited.
b. LILO of 220 kV Ziankote- Delina S/C at Amargarh completed, other circuit LILO also to be done
c. J&K may explore possibilities of shifting some load fed through 220kV Pampore to 220kV Ziankote to reduce loading of 220kV Wagoora-Pampore d/c.

MS NRPC added that work for switchgear changes at Gr. Noida and Nawada shall be prioritized and carried out at the earliest as agreed in 40th TCC/ 43rd NRPC meeting.

2. Deviation by NR entities

It has been discussed in number of previous meeting that load forecast should be carried out accurately and subsequently states shall plan their load generation balance so that deviations remain within permissible limits in real time. Deviation of NR utilities is being shown in every OCC meeting to sensitize the issues on regular basis still it has been observed that NR utilities are continuously over/under drawing from the Grid on various instances. Deviation violations (average number of blocks of overdrawl/ underdrawl) for the month of July-October 2018 were presented in the meeting (**attached as Annexure-2)** along with deviations observed based on SCADA data.

NRLDC representative highlighted that some of NR states such as HP and Haryana have been over drawing while J&K has been under drawing for most of the time in past 3-4 months. This was highlighted in 150th, 151st and 152nd OCC meetings as well, however the trend is continuing.

OCC agreed that actions that are more concrete are required by states for restricting overdrawl/ underdrawl and thus better grid management.

3. Demand and Generation projections of Q4-2018-19 for POC charges calculation

In line with CERC sharing of ISTS charges and losses regulation 2010 and subsequent amendments thereof, all the DICs have to submit the data for new transmission assets, Yearly transmission charges (YTC), forecast injection and withdrawal and node wise injection/withdrawal data to implementing agency for computation of PoC charges and losses for the application period. The format for data submission is available on NLDC website at https://posoco.in/transmission-pricing/formats-for-data-submission/.

NRLDC representative highlighted that data has been received only from **NTPC, NHPC, Haryana and SJVNL**. Other utilities were also requested to submit data as early as possible.

MS NRPC stated that alongwith MW data, MVAr data shall also be submitted by states and the same shall be used for basecase preparation.

Following demand and generation data were agreed for in the meeting:

- Demand/generation of Haryana to be taken as 7012MW/3014MW.
- Demand/generation of Delhi to be taken as 4165MW/774MW (figures submitted by Delhi in meeting).
- Data for NTPC, NHPC, SJVNL to be taken as submitted by utilities.
- Kishenganga generation to be considered as 229MW.

UP representative stated that they shall provide the data shortly. ***MS NRPC asked all stated to submit the data as early as possible (before validation committee meeting scheduled on 26.11.2018)***

4. Reactive power management in the grid

i. Reactive power performance of generators

Reactive power response in respect of MVAr vs Voltage for past 30 days as per NRLDC SCADA data were presented in the meeting (**attached as Annexure-3)**. It has been observed that there are margins available as per capability curves for most of the generating stations. In addition, telemetry (sign and magnitude of MVAR) of various generating station is yet to be corrected. The matter has been discussed in numbers of OCC/TCC meetings, still actions are to taken. Based on available data, MVAr performance of generators is shown below:

Rihand:	Absorbing up to 250 MVAr
Singrauli:	Absorption up to 170 MVAr and generation up to 50 MVAr
Dadri-Th:	Generating and absorbing in range of 220 to -50 MVAr**(although line data suggest units absorbing MVAr)**
Jhajjar:	Generating and absorbing in the range of 50 to -230 MVAr
Unchahar:	Absorption and generation -70 to 70 MVAr **(MVAr response needs improvement)**
Anpara-C:	Generating up to 100 MVAR most of the time **(MVAr response needs improvement)**
Bara TPS:	Generating up to 100 MVAR most of the time **(data needs check)**

Lalitpur TPS:	Absorption and generation -100 to 100 MVAr **(MVAr response needs improvement)**
Anpara-D:	Absorption and generation -50 to 50 MVAr **(MVAr response needs improvement)**
Anpara TPS:	Absorption and generation -100 to 100 MVAr **(MVAr response needs improvement)**
CLP Jhajjar:	Absorbing -270 to -100 MVAr
Khedar:	Absorption and generation -200 to 100 MVAr **(MVAr response needs improvement)**
Kawai:	Absorption upto 200 MVAr
Suratgarh:	Absorption and generation -70 to 100 MVAr **(Telemetry not reliable)**
Chhabra:	Absorbing up to 200 MVAr
Rajpura:	Absorption up to 450 MVAr

It has been experienced that generators (specially those under state control) need significant improvement in reactive power response as per its capability curve. NRLDC representative added that MVAr data telemetry from generators is still not reliable. Apart from improving the telemetry of MVar data, states shall also develop MVAr vs voltage plots for generators under their jurisdiction. This would also help to improve telemetry of MVAr data and more reliable MVAr vs voltage plots would be available. Generators shall also develop MVAr vs voltage plots at their end so that MVAR data at generation voltage (LV side of GT) is used which would also take care for MVAr absorption in GT.

NTPC representative stated that they shall be sharing MVAr vs voltage plots for generators in next few days as done last year.

MS NRPC asked other generators as well as states to develop MVAr vs voltage plots at their end as well. He also suggested that MW vs MVAr plots for generators be developed so that their operation based on capability curve be also assessed.

ii. Reactive Power injection at ISTS nodes:

List of nodes (400kV voltage level) that are injecting MVAr into the Grid based on reactive power document and need quick attention to check all the possible desired actions was attached as Annexure of OCC additional agenda. Similarly, 400/220kV ICT nodes where MVAr is being injected from 220kV to 400kV system (NRLDC SCADA data of October'18) was also attached as Annexure of OCC additional agenda.

NRLDC representative stated that in 144th and 149th OCC meeting, it was agreed that identification of nodes at lower voltage level where actual MVAR drawl/injection is taking place needs to be ascertained. New reactors and capacitors are being planned at several locations. Therefore, it is necessary to identify locations where actually there is need for MVAR support. This would help in better and more efficient utilization of resources. The draft format for feedback from states regarding above was also circulated in minutes of 144th OCC. However, feedback from states is yet to be received.

MS NRPC stated that states shall produce this data at their end as it would help them identify nodes where injection/absorption of MVAr is taking place at high/ low voltages. This way they can also reduce reactive power charges by taking appropriate actions. States have been requested to provide data from past several OCC meetings, but the same is not happening. Therefore, this agenda shall be included in regular agenda points for better actions.

Rajasthan representative added that reactive power is flowing from 400kV to 220kV at Ratangarh whereas 220kV to 400kV whereas at Sikar it is from 220kV to 400kV. NRLDC representative stated that this may be due to tap position differences at Ratangarh and Sikar. He suggested that tap positions at the two stations be shared with NRLDC.

iii. ***Reactor utilization:***

a. Updated list of Bus reactor, its availability and data at control centers.
b. Update List of lines whose line reactor can be switched as bus reactor on opening of such lines. A list of lines wherein there is a provision of such switching (including those for which confirmation from the respective utility is pending) was attached at (Annexure-4) of additional agenda of 153 OCC meeting. As per the current list:

No. of transmission lines having LRs with provision to be used as BR	Total no. of LRs having provision to be used as BR	Total no. of LRs that have the confirmation by utilities for the usage as BR
115	**147**	**95**

Utilities were requested to confirm whether line reactors can be used as bus reactor in 151st and 152nd OCC meeting as well; however, information is yet to be received. Respective constituents were requested to confirm the same as soon as possible to utilize it for voltage regulation.

NRLDC representative added that due to remote operation from RTAMC/NTAMC sometimes operation (opening/ closing) of reactors is being delayed. Powergrid representative stated that this might have happened in few cases and they would take care that such instances are not repeated in future.

Further, it was discussed that since in winter months high voltages are observed frequently and many lines are opened for voltage regulation. So, utilities shall try to ensure that line reactors which can be charged as bus reactor are taken in service under outage of line. Apart from this, utility shall explore wherever provisions can be made to use line reactor as Bus reactor on opening of lines so that such reactors can be used for voltage regulation as per grid conditions.

OCC agreed for the same.

5. Frequent forced outages of transmission elements

NRLDC representative highlighted that the following transmission elements were under frequent forced outages during the month of **Oct'18**:

S. NO.	Element Name	No. of forced outages	Utility/SLDC
1	800kV HVDC (Agra-BNC) Pole-2 at Agra HVDC	4	POWERGRID
2	400kV Anpara(UP)-Mau(UP)	3	UP
3	400kV Azamgarh(UP)-Gorakhpur(UP)	3	UP
4	400kV Kashipur(PTCUL)-Nehtaur(UP)	3	UP/Uttarakhand

The complete details were attached at Annexure-5 of Additional Agenda**.** The frequent outages of such elements affect the reliability and security of the grid. Hence, Utilities were requested to look into such frequent outages and share the remedial measures taken/being taken in this respect. NRLDC representative stated that the number of trippings under this agenda have reduced significantly in Oct'18.

The following were the discussion on the trippings:

- 800kV HVDC (Agra-BNC) Pole-2 at Agra HVDC: POWERGRID representative stated that three trippings occurred due to line fault whereas in one instance pole tripped during testing. NRLDC representative requested POWERGRID and other constituents that the nomenclature of DR configuration channel may also be provided along with the DR files to interpret the DR file.
- 400kV Anpara(UP)-Mau(UP): UP representative stated that the problem of auto-reclosing is at Mau end. The same would be rectified.
- 400kV Azamgarh(UP)-Gorakhpur(UP): UP requested to check auto-reclosing at both ends.
- 400kV Kashipur(PTCUL)-Nehtaur(UP): It was reported that in one of the tripping on fault, auto-reclosing occurred from Nehtaur end but failed from Kashipur end. PTCUL requested to check the same at Kashipur end.

NRLDC representative requested all the constituents to provide a timeline for all the remedial measure to be adopted for mitigation of such tripping incidents. Members agreed to the same.

6. Multiple element tripping events in Northern region in the month of Oct'18:

A total of **14** grid events occurred in the month of Oct'18 of which **7** are of GD-1 category. The preliminary report of all the events was issued from NRLDC. A list of all these events along with the status of details received by 05-Nov-18 was attached at Annexure-6 of Additional Agenda**.**

Further, despite persistent discussions/follow-up in various OCC/PCC meetings, the compliance of the regulations was still much below to the desired level.

Maximum Fault Duration was **1640ms** in the event of multiple element tipping at Kashipur(PTCUL) substation on 25th Oct 2018 at 13:28hrs.

Delayed clearance of fault (more than 100ms for 400kV and 160ms for 220kV system) observed in total **5** events out of 14 events in the month.

Members were requested to take expeditious actions to avoid such tripping in future. Moreover, utilities were requested to impress upon all concerned for providing the Preliminary Report, DR/EL & Detailed Report of the events in line with the regulations.

7. Details of tripping of Inter-Regional lines from Northern Region for Oct'18:

NRLDC representative highlighted that a total of **11** inter-regional lines tripping within a month occurred in the month of Oct'18. The list was attached at Annexure-7 of Additional Agenda. The status of receipt of preliminary reports, DR/EL within 24hrs of the event and fault clearing time as per PMU data has also been mentioned in the table. The non-receipt of DR/EL & preliminary report within 24hrs of the event is in violation of various regulations. As per regulations, all the utilities shall furnish the DR/EL, flag details & preliminary report to RLDC/RPC within 24hrs of the event. They shall also furnish the detailed investigation report within 7 days of the event if fault clearance time is higher than mandated by CEA (Grid Standard) Regulations.

It could be observed from attached table that not all information regarding the tripping was received from the utilities.

Concerned members were requested to provide the tripping details timely and take remedial measures to avoid such trippings in future.

NRLDC representative also stated that the number of DR/EL received from concerned constituents have increased over past few months as compared to Preliminary report primarily due to the data received for SoPR. NRLDC representative appreciated the improved reporting and further requested constituents to provide the Preliminary report also for multiple element, inter-regional tripping incident.

8. Frequency response characteristic:

NRLDC representative stated that one FRC based event occurred in the month of Oct'18. Description of the events is as given below:

Table:

S. No.	Event Date	Time (in hrs)	Event Description	Starting Frequency (in Hz)	End Frequency (in Hz)	Δf
1	30-Oct-18	19:22hrs	Unit # 30, 40 and 50 (830 MW each) of CGPL Mundra UMPP	49.937	49.787	0.15

			tripped due to generator Class-A2 Protection operation. Total generation loss as per SCADA data was 2240MW.			

The Hon'ble CERC approved procedure has already been shared with all concerned during previous OCC meetings. FRC observed for state control area, ISGS stations and few state generators is as follows:

STATE Control Area	PUNJAB	HARYANA	RAJASTHAN	DELHI	UTTAR PRADESH	UTTARAKHAND	CHANDIGARH	HIMACHAL PRADESH	JAMMU & KASHMIR	NR
FRC	37%	26%	10%	-2%	29%	8%	32%	18%	3%	19%

Generator	FRC	Generator	FRC
Singrauli TPS	4%	Salal HEP	-7%
Rihand-1 TPS	-1%	Tanakpur HEP	-13%
Rihand-2 TPS	3%	Uri-1 HEP	141%
Rihand-3 TPS	-3%	Uri-2 HEP	Suspect SCADA data
Dadri-1 TPS	-44%	Dhauliganga HEP	12%
Dadri -2 TPS	0%	Dulhasti HEP	-2%
Unchahar TPS	-4%	Sewa-II HEP	56%
Unchahar stg-4 TPS	No generation	Parbati-3 HEP	7%
Jhajjar TPS	46%	Jhakri HEP	27%
Dadri GPS	0%	Rampur HEP	16%
Anta GPS	4%	Tehri HEP	Suspect SCADA data
Auraiya GPS	4%	Koteswar HEP	Suspect SCADA data
Narora APS	24%	Karcham HEP	80%
RAPS-B	Suspect SCADA data	Malana-2 HEP	Suspect SCADA data
RAPS-C	3%	Budhil HEP	1%
Chamera-1 HEP	3%	Bhakra HEP	4%
Chamera-2 HEP	2%	Dehar HEP	-4%
Chamera-3 HEP	2%	Pong HEP	-11%
Bairasiul HEP	No generation	Koldam HEP	2%
		AD Hydro HEP	65%

Generator	FRC	Generator	FRC
PUNJAB		**UP**	
Ropar TPS	-10%	Obra TPS	Suspect SCADA data
L.Mohabbat TPS	No generation	Harduaganj TPS	Suspect SCADA data
Rajpura TPS	32%	Paricha TPS	-2%
T.Sabo TPS	26%	Rosa TPS	25%
Goindwal Sahib TPS	93%	Anpara TPS	0%
Ranjit Sagar HEP	36%	Anpara C TPS	38%
Anandpur Sahib HEP	No generation	Anpara D TPS	3%
HARYANA		Bara TPS	4%
Panipat TPS	No generation	Lalitpur TPS	No generation
Khedar TPS	17%	Meja TPS	No generation
Yamuna Nagar TPS	No generation	Vishnuprayag HEP	-11%
CLP Jhajjar TPS	1%	Alaknanda HEP	-22%
Faridabad GPS	No generation	Rihand HEP	-9%
RAJASTHAN		Obra HEP	Suspect SCADA data
Kota TPS	31%	**UTTARAKHAND**	
Suratgarh TPS	-3%	Gamma Infra GPS	Suspect SCADA data
Kalisindh TPS	0%	Shravanti GPS	Suspect SCADA data
Chhabra TPS	No generation	Ramganga HEP	Suspect SCADA data
Chhabra stg-2 TPS	-8%	Chibra HEP	Suspect SCADA data
Kawai TPS	31%	Khodri HEP	No generation
Dholpur GPS	No generation	Chilla HEP	Suspect SCADA data
Mahi-1 HEP	No generation	**HP**	
Mahi-2 HEP	No generation	Baspa HEP	-6%
RPS HEP	1%	Malana HEP	Suspect SCADA data
JS HEP	Suspect SCADA data	Sainj HEP	0%
DELHI		Larji HEP	Suspect SCADA data
Badarpur TPS	No generation	Bhabha HEP	2%
Bawana GPS	17%	Giri HEP	Suspect SCADA data
Pragati GPS	8%	**J&K**	
		Baglihar-1&2 HEP	0.084069794
		Lower Jhelum HEP	No generation

In line with the decisions taken during various OCC meetings, the time and date of the FRC events were e-mailed to respective utilities. Adani (Kawai), NHPC and UP submitted the FRC. NRLDC representative stated that it has been observed that in few cases generator could not provide frequency response due to no margin available as reported by generator. NRLDC representative further stated that per IEGC 5th Amendment, margin should be kept for primary response except in case of any spillage condition reported to RLDC.

MS, NRPC stated that it has been observed that generator is declaring higher DC even in case of reduction in reservoir level in off monsoon months as well.

NRLDC representative stated that if DC declared by a plant is less than the Installed Capacity less Auxiliary consumption, it becomes difficult for the NRLDC operator to assess whether any margin for frequency response is available with the generator or not. OCC agreed that the matter needs to be discussed further.

9. Mock black start exercise in NR:

As per Indian Electricity Grid Code (IEGC) clause 5.8(b) "Mock trial runs of the procedure for different sub-systems shall be carried out by the Users/ CTU/ STU at least once every six months under intimation to the RLDC".

Mock Black-start exercise of power stations therefore needs to be carried out in-order to ensure healthiness of black start facility. The winter months are off peak hydro period and therefore good time to carry out such exercises.

NRLDC representative presented the following schedule of mock exercise:

Hydro Power Stations:

Date	Revised Date	Name of stations	Remarks
18-Oct-18	NA	*Kishanganga (new plant)	Date shall be intimated separately
24-Oct-18	NA	*Malana-2	Exercise was not successful.
26-Oct-18	15-Jan-19	Dhauliganga	Revised date by NHPC
2-Nov-18	NA	*Salal	Exercise carried out successfully. However, due to less load on account of bad weather, frequency kept on varying and island could not be synchronized with grid.
13-Nov-18	21-Jan-19	Nathpa Jhakri & Rampur	Revised date by SJVNL
16-Nov-18		*Uri-I, II HEP, Lower Jhelum HEP, Pampore GT's & Upper Sindh	NHPC confirmed
19-Nov-18		*Budhil	
28-Nov-18		Chamera-3	NHPC confirmed
30-Nov-18		Sewa-2	NHPC confirmed
3-Dec-18		Chamera-1 & Chamera-2	NHPC confirmed
11-Dec-18		Parbati-3	NHPC confirmed
14-Dec-18		Bairasiul	Power House shall be under complete shutdown since 01/10/2018 for R&M of power house
19-Dec-18		Koteshwar	
28-Dec-18		AD Hydro	
4-Jan-19		Tehri	
8-Jan-19		Karcham Wangtoo & *Baspa	
11-Jan-19		Koldam	

** Mock black-Start exercise not carried out during Year 2017-18.*

NRLDC representative stated that Malana-2 HEP and Salal HEP blackstart were carried out on 24-Oct-18 and 02-Nov-18 respectively. Malana-2 blackstart exercise could not be successful and it is proposed to carry out the exercise with AD Hydro HEP. Further, he stated that the blackstart exercise of Uri, Pampore, Lower Jhelum and Pampore would be carried out

after 15-Dec-18 due to outage of 400kV Uri-I—Amargarh-2 ckt and load management at J&K.

Mock black start exercise of Gas power stations viz. Auraiya, Dadri, Anta also to be carried out. NTPC representative reported that since Dadri GPS unit was blackstarted last time, similar procedure needs to be made for other Gas stations as well. MS NRPC stated that possibility to be explored to extend blackstart Hydro or Gas unit supply to some auxiliary of nearby Thermal station. NRLDC representative stated the in case of Dadri GPS blackstart, this time say a Feed pump may be run from Dadri GPS blackstarted unit's supply during the mock exercise.

SLDC's were requested in 152nd & 153rd OCC meetings to carryout mock black-start of station in their respective control area & inform the tentative dates to the OCC as well as outcome of these exercises. The proposed Hydro Power Stations to undergo the exercise are as follows:

S. NO.	Utility	Hydro Power Station	Installed Capacity(MW)
1	J&K	Baglihar	3x150
2		Baglihar stage-2	3x150
3		Lower Jhelum	3x35
4		Upper Sindh	2x11+3x35
5	HP	Sainj	2x50
6		Larji	3x42
7		Bhabha	3x40
8		Malana -I	2x43
9		Baspa	3x100
10	Punjab	Anandpur Sahib	4x33.5
11		Ranjit Sagar	4x150
12	Rajasthan	Mahi-I&II	2x25+2x45
13		Rana Pratap Sagar	4x43
14		Jawahar Sagar	3x33
15		Gandhi Sagar	5x23
16		Dholpur GPS	3x110
17		Ramgarh GPS	1x35.5+2x37.5+1x110
18	UP	Rihand	6x50
19		Obra	3x33
20		Vishnuprayag	4x100
21		Srinagar (Alaknanda)	4x82.5
22	Uttarakhand	Gamma Infra	2x76+1x73
23		Shravanti	6x75
24		Ramganga	3x66
25		Chibro	4x60
26		Khodri	4x30
27		Chilla	4x36
28		Maneri Bhali-I&II	3x30+4x76
29	Delhi	IP Extn GTs	6x30+3x30
30		Pragati GPS	2x104.6+1x121.2
31		Rithala	3x36
32	Haryana	Faridabad GPS	2x137.75+1x156.07

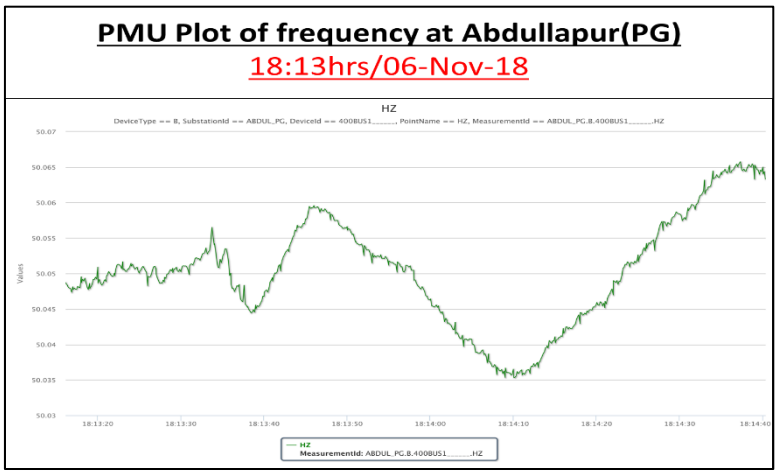
During last winter, SLDCs had been requested to carry out mock drills and share their experiences. However, the information was received from HP (Sainj, Baspa) and Rajasthan (only schedule of exercises) only.

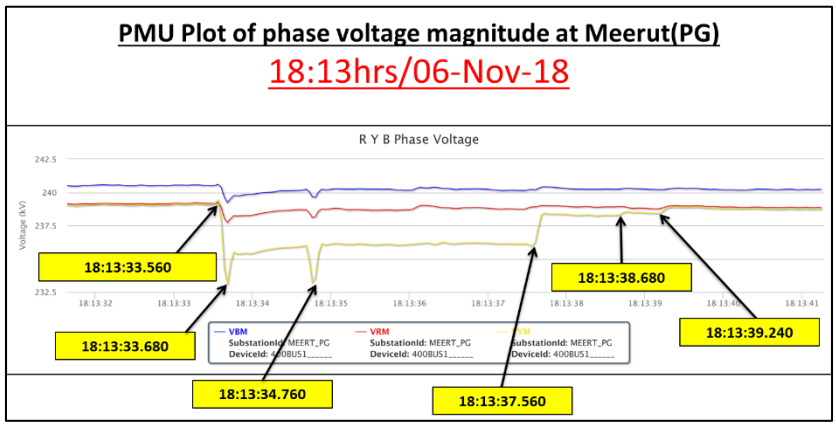
SLDCs were requested to carry out the exercise in their respective control area, share the program for this year's mock exercises and also identify further generating stations/unit for black start exercise.

10. Tripping of all 400kV elements at 400/220kV Aligarh(UP):

NRLDC representative stated the following:

As reported, on 06-Nov-18 at 18:13hrs, B-N fault occurred resulted in tripping of all 400kV ckts from Aligarh(UP) along with both 400/220kV ICTs except 400kV Sikandrabad-Aligarh D/C which were hand tripped. 400kV Muradnagar-Ataur, 765/400kV ICT #1 at Mainpuri(UP) and 400kV Sikandrabad-G.Noida also tripped during the event. As per PMU, fault cleared in 4000ms. As per NRLDC SCADA SoE, elements tripped in sequential manner in around 5000ms. A preliminary report of the event has been issued from NRLDC. The PMU plot and NRLDC SCADA SoE are as follows:





Time (hrs)	Station	Voltage (kV)	Element	Protection/ Device	Status	Remarks	Reference Time
18:13:33.560	B-N fault occcurred as seen from PMU data.						0ms
18:13:33,697	ALIGR_UP	400	LIMUR1N	Protection Trip	App	Aligarh-Muradnagar opened from Aligarh end	190ms
18:13:33,750	ALIGR_UP	400	02TIE	Circuit Breaker	Open		
18:13:34,472	MURADNGR-1	400kV	F_03(PANK1)	Circuit Breaker	Close	Aligarh-Muradnagar closed from Muradnagar end	910ms
18:13:34,862	MANP1_U	765	LIAT1	Protection Trip	App	765/400kV ICT #1 at Mainpuri(UP) tripped	1345ms
18:13:34,904	MANP1_U	765	03AT1	Circuit Breaker	Open		
18:13:34,906	MANP1_U	400	03T1	Circuit Breaker	Open		
18:13:34,907	MANP1_U	400	02T1ORI	Circuit Breaker	Open		
18:13:34,973	MURADNGR-1	400kV	F_01(MUZA1)	Circuit Breaker	Open	Muradnagar-Ataur opened from Muradnagar end	1410ms
18:13:35,104	SHARN_UP	132kV	D_03(DEOBD)	BusBar Isolator 2	Close		1545ms
18:13:35,161	ATAUR_U	400	04MUR1N	Circuit Breaker	Open	Muradnagar-Ataur opened from Ataur end	1600ms
18:13:36,022	ALIGR_UP	400	LIT1	Protection Trip	App	400/220kV ICT #1 at Aligarh tripped	2550ms
18:13:36,068	ALIGR_UP	400	LIT2	Protection Trip	App		
18:13:36,082	ALIGR_UP	400	09T1	Circuit Breaker	Open		
18:13:36,090	ALIGR_UP	400	08TIE	Circuit Breaker	Open		
18:13:36,109	ALIGR_UP	220	04T1	Circuit Breaker	Open		
18:13:36,113	MURADNGR-1	400kV	F_03(PANK1)	Circuit Breaker	Open	Aligarh-Muradnagar opened from Muradnagar end	2555ms
18:13:36,130	ALIGR_UP	400	21T2	Circuit Breaker	Open	400/220kV ICT #2 at Aligarh tripped	2595ms
18:13:36,140	ALIGR_UP	400	20TIE	Circuit Breaker	Open		
18:13:36,152	ALIGR_UP	220	10T2	Circuit Breaker	Open		
18:13:36,447	MANP1_U	400	LIALGRH1	Protection Trip	App	Aligarh-Mainpuri-1 tripped from both ends	2980ms
18:13:36,479	MANP1_U	400	08ALMNP1	Circuit Breaker	Open		
18:13:36,480	ALIGR_UP	400	LIMANP71	Protection Trip	App		
18:13:36,481	MANP1_U	400	09ALIGRH	Circuit Breaker	Open		
18:13:36,519	ALIGR_UP	400	10MANP71	Circuit Breaker	Open		
18:13:36,541	ALIGR_UP	400	11TIE	Circuit Breaker	Open		
18:13:37,531	ALIGR_UP	400	LIMANP72	Protection Trip	App	Aligarh-Mainpuri-2 opened from Aliagarh end. Fault cleared as per PMU data.	3970ms
18:13:37,572	ALIGR_UP	400	07MANP72	Circuit Breaker	Open		
18:13:38,446	PANK1_UP	400kV	F_10(MUR1N)	Circuit Breaker	Open	Panki-Aligarh opened from Panki end	4885ms
18:13:38,521	SKNBD_UP	220kV	08SIKND1	Circuit Breaker	Open	Sikandrabad(400)-Sikandrabad D/C opened from sikandrabad end	4990ms
18:13:38,549	SKNBD_UP	220kV	09SIKND2	Circuit Breaker	Open		

UP was requested to kindly look into the following:

- Exact reason and location of fault.
- Delayed clearance of fault of around 4000ms.
- Simultaneous tripping of multiple elements within 5 seconds of fault.
- Status of tripping of 220kV feeders at Aligarh to be confirmed as per SCADA SLD, power flow is observed in the 220kV ckts.

- Reason for tripping of 400kV Sikandrabad(UP)-G.Noida(UP) as well as all other elements.
- Review of settings of ICTs at Aligarh and Mainpuri.
- Explanation for sequential tripping of elements as tabulated in NRLDC SoE data.
- DR/EL, Report along with remedial measures taken to be shared covering above points.

An event of such magnitude wherein forced outage of elements occurred at complete voltage level of a station may affect the safety and security of the grid. Further, delayed clearance of 4000ms as against the standard of 100ms is also very alarming and indicate towards an immediate and in depth analysis. UP was requested to look into the event and send a report on above points, take remedial measures to avoid such incidents in future.

11. Revision of document for Reactive Power Management for Northern Region:

NRLDC representative stated that Reactive Power Management document for Northern region is due for revision. The last updated document link is as below:

https://nrldc.in/download/nr-reactive-power-management-2018/

Document is password protected and password was already informed to all the NR constituents through letter dated 29th Dec 2017.

Constituents were requested to provide the feedback, suggestion and updated information by 15th December 2018.

12. Revision of document for System Restoration Procedure (SRP) for Northern Region:

NRLDC representative stated that System restoration procedure for Northern region is due for revision. The last updated document link has already been shared with the constituents.
https://nrldc.in/Websitedata/NR-SRP-2018.pdf

Document is password protected and password was already informed to all the NR constituents through letter dated 31st Jan 2018.

Constituents were requested to go through the document and provide any modification/addition in respect of their system. SLDC/Generating utilities were also requested to update and share the restoration procedure in respect of their state/generating station. The updates were requested to be sent be sent by 15th December 2018.

Additional Points:

Decreasing tap positions of 400/220kV ICTs of Delhi

Delhi SLDC vide email dated 14.11.2018 had requested for reducing tap positions of 400/220kV ICTs at Bamnoli, Bawana, Mundka and Harshvihar. NRLDC representative stated that on analysis of Nov'18 data (01.11.18 to 15.11.18) (**attached as Annexure-IV.a),** it appears that 400kV voltages at Harshvihar, Mundka and Bawana are reaching 430kV during night hours. If tap change at these stations is implemented 400kV voltage is expected to rise

further and during coming days when demand of Delhi would reduce, voltage at times may reach 440kV resulting in overvoltage trippings of lines. Further, voltages at 220kV level are reportedly reaching 235kV which is not very high. Further, after tap change of ICTs, 400kV voltage may rise resulting in higher reactive energy charges for Delhi state.

MS NRPC suggested that tap change at these nodes is not the solution and Delhi shall expedite commissioning of reactors at these stations.

Delhi representative stated that at Harshvihar tap position may be reduced as was done last year and trial exercise for same may be done this year as well to see impact of tap change exercise. OCC agreed for the same.

Voltage limits for operation of bus reactors

NRLDC representative presented voltage profile of Powergrid substations in Northern region (NR1, NR2, NR3) for one day from each months of Jun'18, Sep'18 and Nov'18 **(attached as Annexure-IV.b).** He stated that on analyzing the plots it could be observed that voltages generally remain above 395kV at most stations. Only for very few stations, the voltages at stations have excursions below 395kV and above 405kV on the same day i.e. if voltage is above 405kV it does not come down below 395kV on same day. Thus, there would be only few instances when bus reactors would be taken in service and out of service on the same day.

MS NRPC stated that based on the presented data, it appears that there would be only few operations of bus reactors. However, if any utility feels that frequent operation of bus reactors are taking place, then data validating same shall also be presented by concerned utility. If such data is presented, then based on discussion in forums the limits can be revised in future.

Powergrid representative stated that reactive power charges are payable/receivable when voltage is outside limits of 388-412kV. Further, IEGC specifies grid voltage shall be maintained in range of 380-420kV. So the voltage limits set for standing instructions for operation of bus reactors may be revised. However, as of now Powergrid stations are following standing instructions mentioned in operating procedures and would continue to do so.

OCC was of the opinion that since grid voltage is to be maintained in limit of 380-420kV all actions have to be taken within a narrower voltage band. Further, since reactive power charges are also calculated based on range of 388-412kV, therefore the voltage limits for taking in and out reactors shall be more close to 400kV than 388-412kV. However, based on discussions and data suggesting frequent operation of bus reactors the limits can be increased to say 392-408kV in future.

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AD Hydro Power Ltd.

Name	Designation-Org.	Contact No.	Email

Jaiprakash Power Ventures Ltd.

Name	Designation-Org.	Contact No.	Email

NRPC

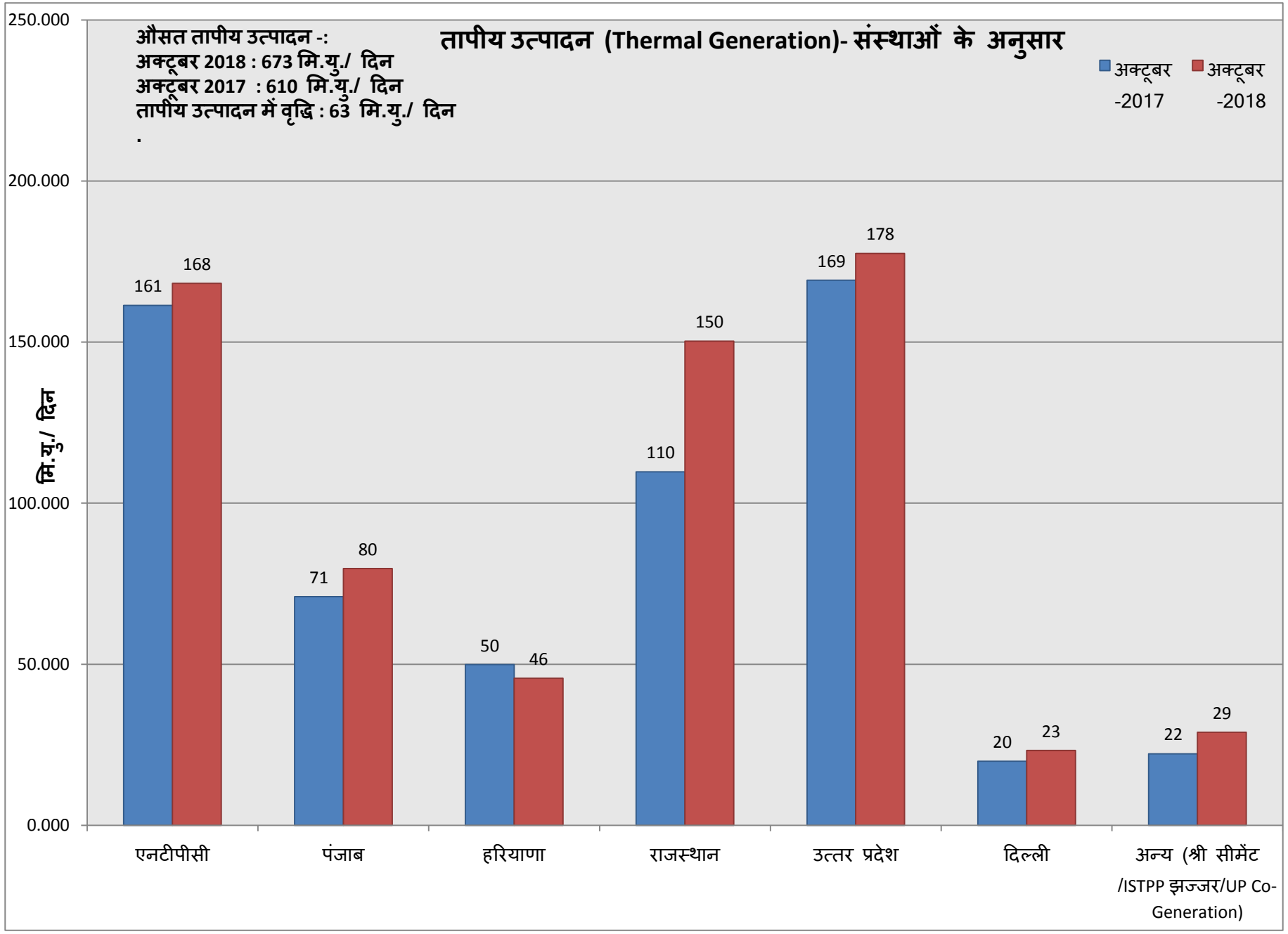
Name	Designation	Contact No.	Email
P K Pandey	SO (Elect)		
[illegible]	SO (Elect)		

IPGCL-PPCL, Delhi

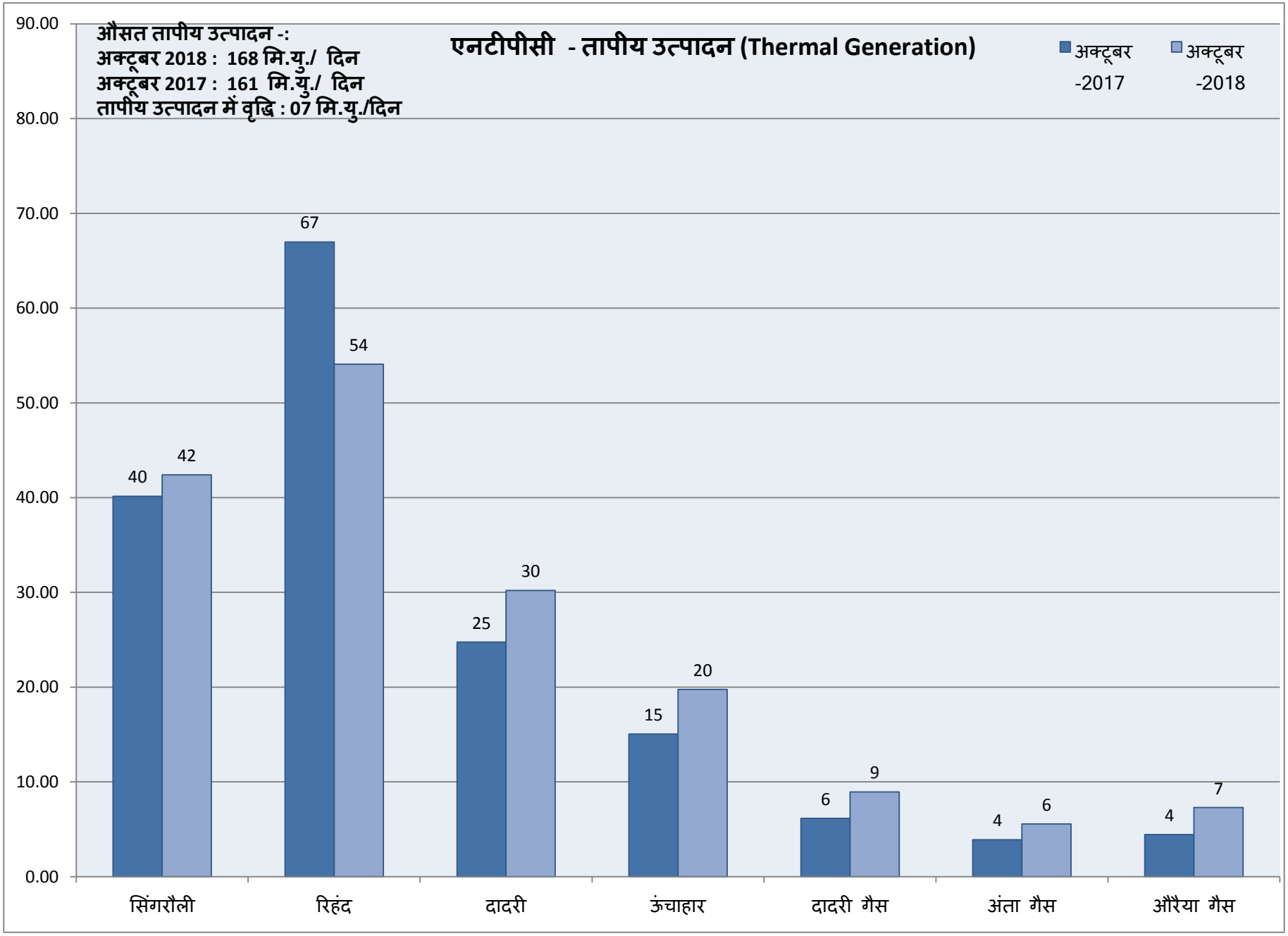
Satyendra Prakash AGM(T) 9717694813 spmprakash@gmail.com

TPDDL

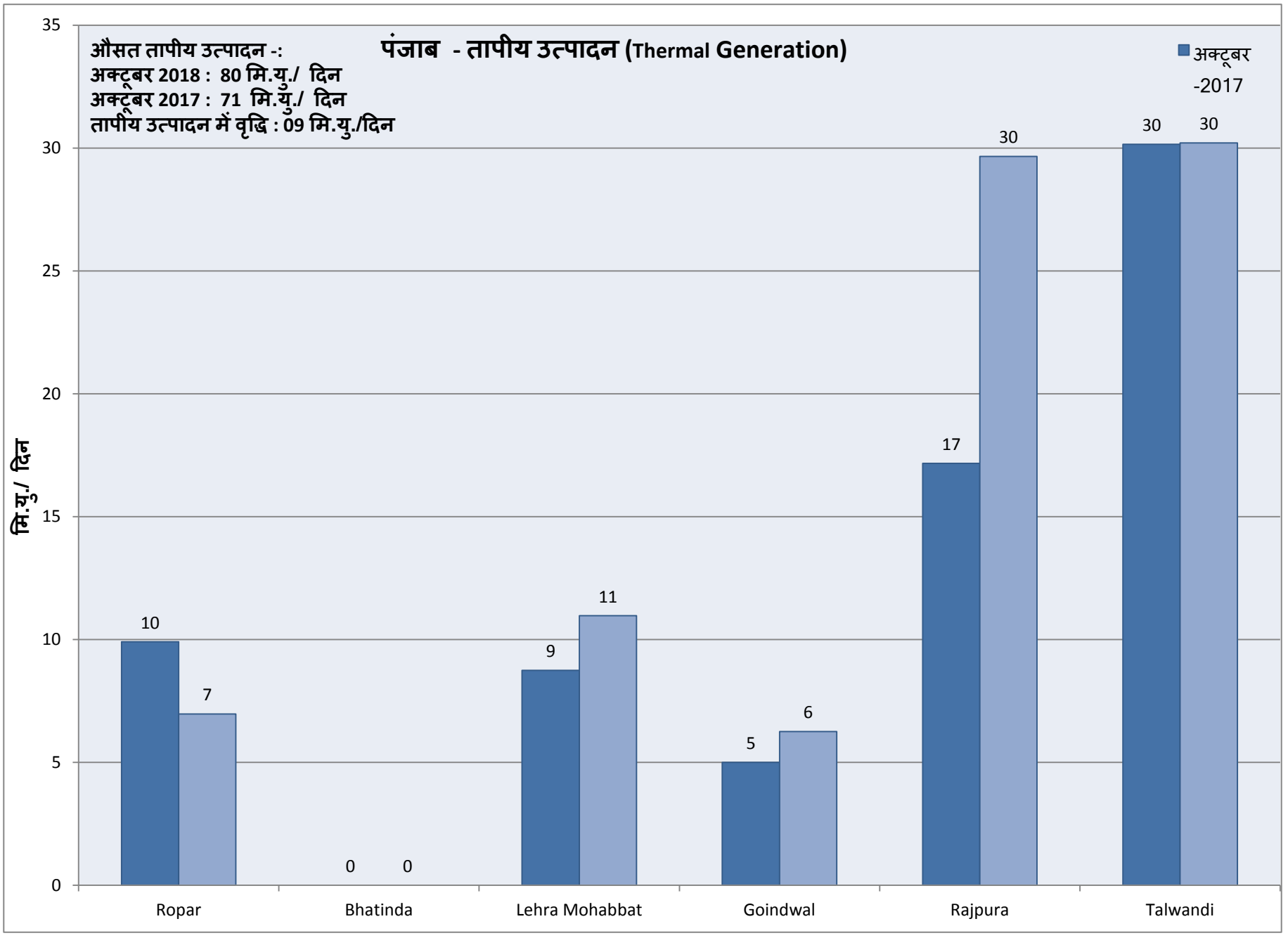
P. Devanand Addl. GM 9871800506 p.devanand@tatapower-ddl.com

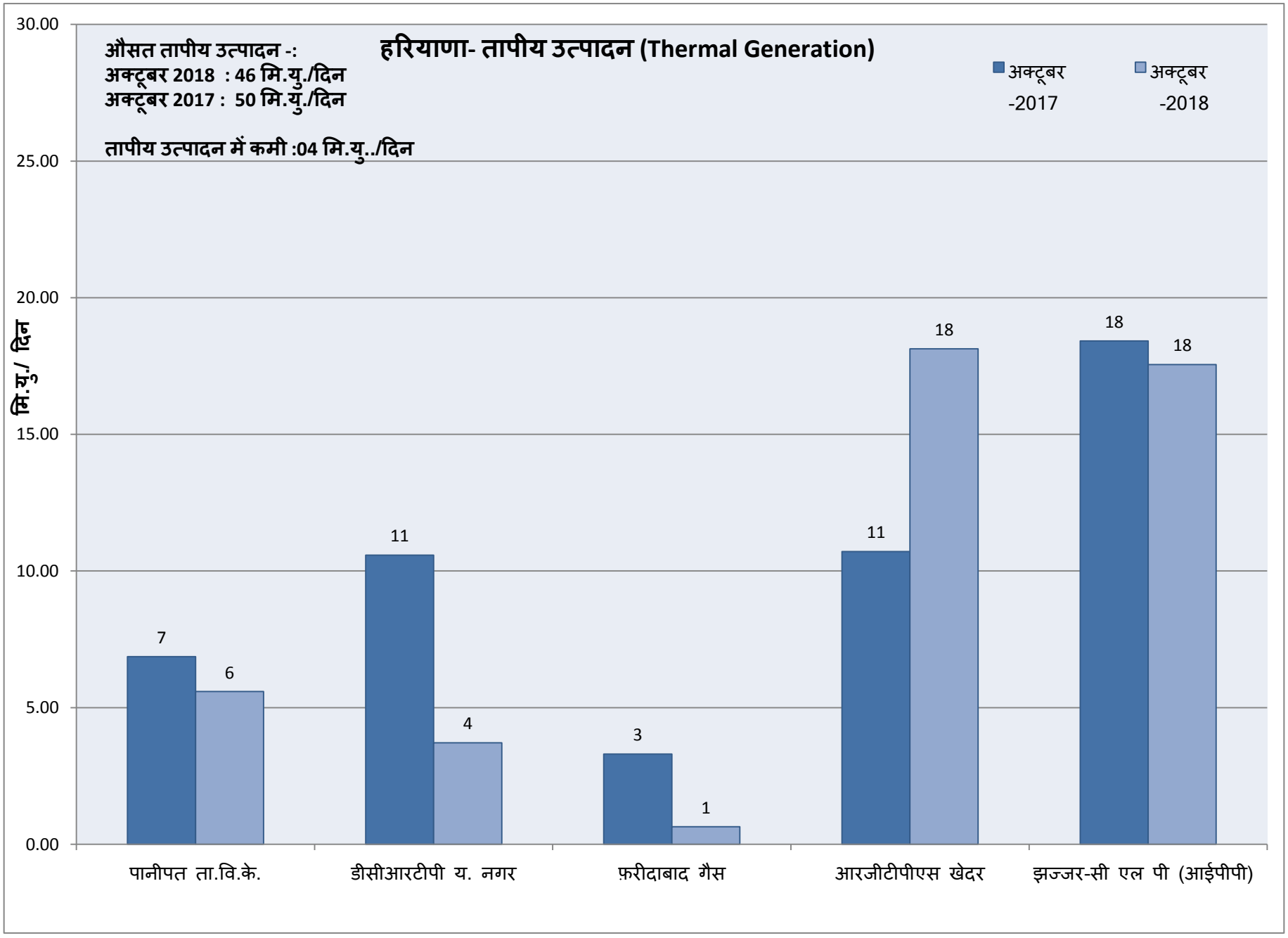

औसत तापीय उत्पादन -:
अक्टूबर 2018 : 673 मि.यु./ दिन
अक्टूबर 2017 : 610 मि.यु./ दिन
तापीय उत्पादन में वृद्धि : 63 मि.यु./ दिन
.
तापीय उत्पादन (Thermal Generation)- संस्थाओं के अनुसार
अक्टूबर -2017
अक्टूबर -2018
मि.यु./ दिन
250.000
200.000
150.000
100.000
50.000
0.000
161
168
71
80
50
46
110
150
169
178
20
23
22
29
एनटीपीसी
पंजाब
हरियाणा
राजस्थान
उत्तर प्रदेश
दिल्ली
अन्य (श्री सीमेंट /ISTPP झज्जर/UP Co-Generation)

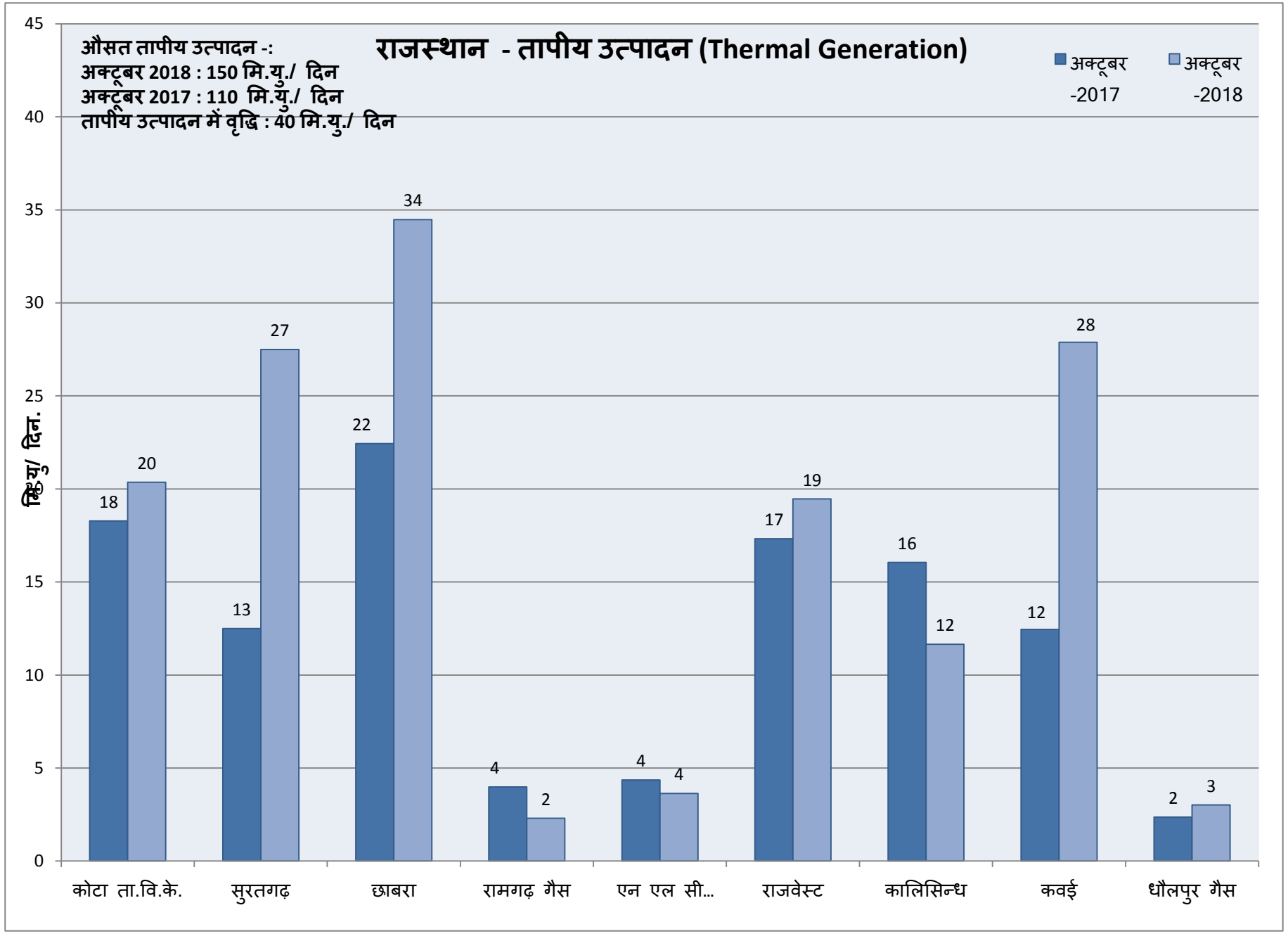
औसत तापीय उत्पादन -:
अक्टूबर 2018 : 168 मि.यु./ दिन
अक्टूबर 2017 : 161 मि.यु./ दिन
तापीय उत्पादन में वृद्धि : 07 मि.यु./दिन



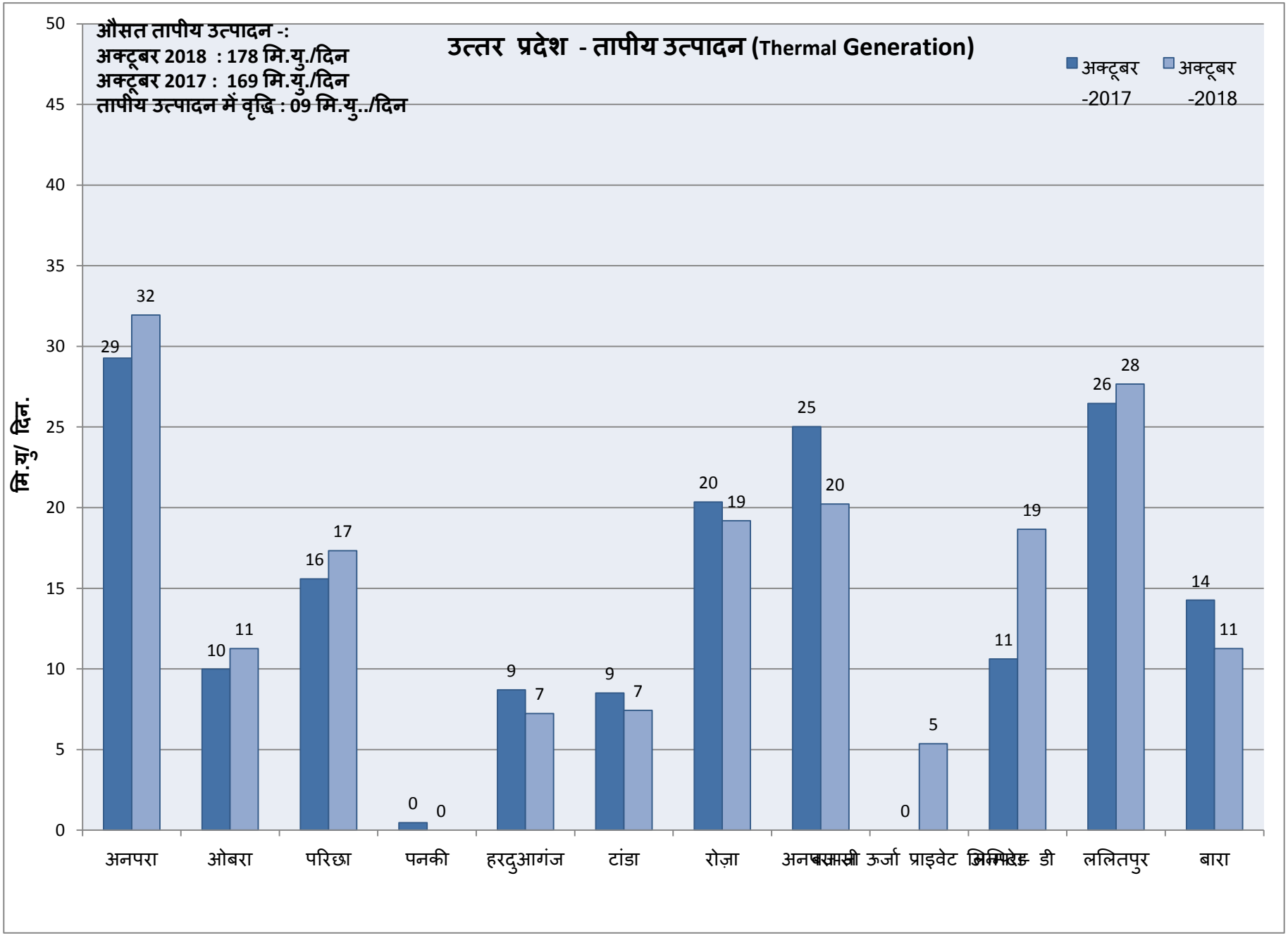
औसत तापीय उत्पादन -:
अक्टूबर 2018 : 80 मि.यु./ दिन
अक्टूबर 2017 : 71 मि.यु./ दिन
तापीय उत्पादन में वृद्धि : 09 मि.यु./दिन



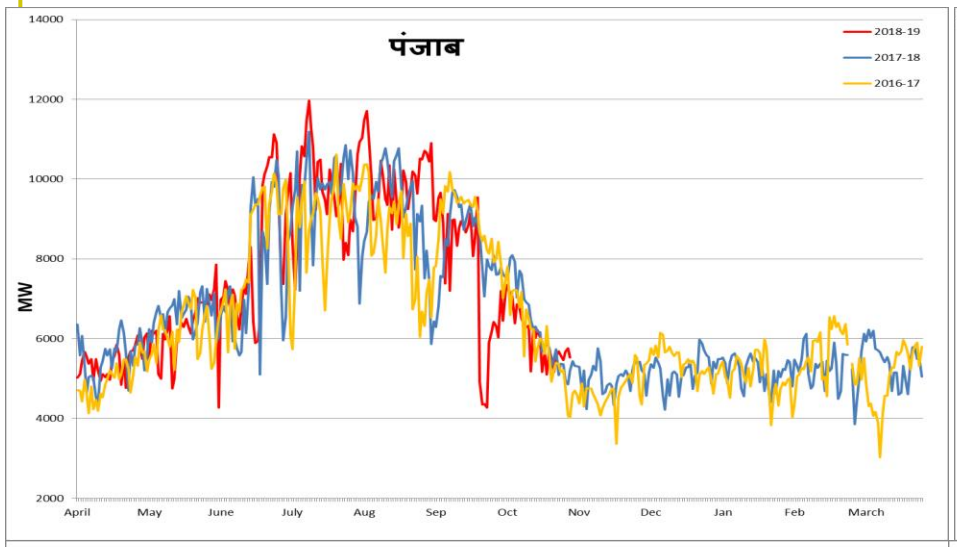

औसत तापीय उत्पादन -:
अक्टूबर 2018 : 46 मि.यु./दिन
अक्टूबर 2017 : 50 मि.यु./दिन
तापीय उत्पादन में कमी :04 मि.यु../दिन
हरियाणा- तापीय उत्पादन (Thermal Generation)
अक्टूबर -2017
अक्टूबर -2018
मि.यु./ दिन
30.00
25.00
20.00
15.00
10.00
5.00
0.00
7
6
11
4
3
1
11
18
18
18
पानीपत ता.वि.के.
डीसीआरटीपी य. नगर
फ़रीदाबाद गैस
आरजीटीपीएस खेदर
झज्जर-सी एल पी (आईपीपी)

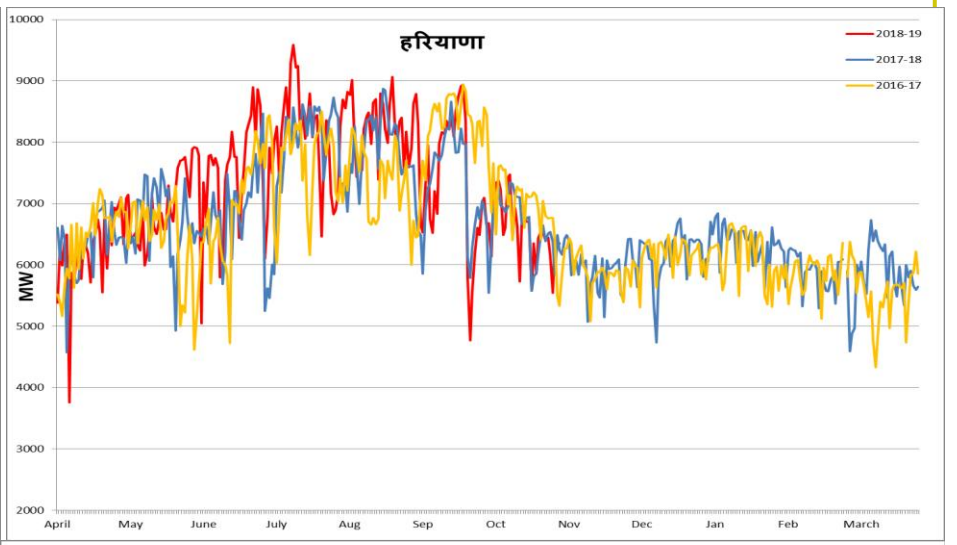

औसत तापीय उत्पादन -:
अक्टूबर 2018 : 150 मि.यु./ दिन
अक्टूबर 2017 : 110 मि.यु./ दिन
तापीय उत्पादन में वृद्धि : 40 मि.यु./ दिन
राजस्थान - तापीय उत्पादन (Thermal Generation)
अक्टूबर -2017
अक्टूबर -2018
मि.यु./ दिन.
45
40
35
30
25
20
15
10
5
0
18
20
13
27
22
34
4
2
4
4
17
19
16
12
12
28
2
3
कोटा ता.वि.के.
सुरतगढ़
छाबरा
रामगढ़ गैस
एन एल सी...
राजवेस्ट
कालिसिन्ध
कवई
धौलपुर गैस

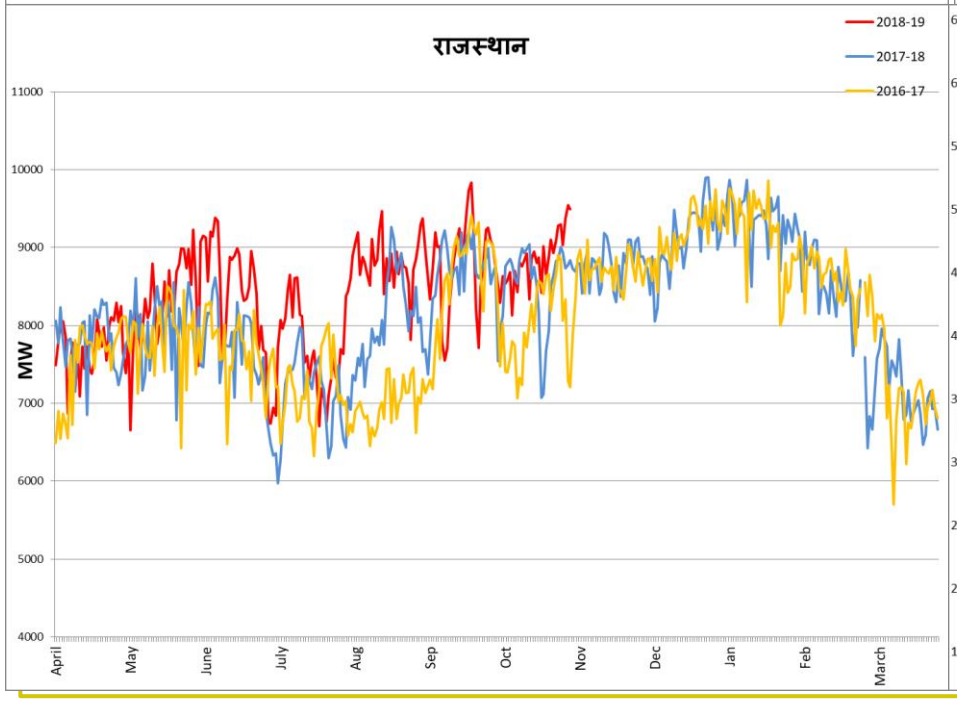
औसत तापीय उत्पादन -:
अक्टूबर 2018 : 178 मि.यु./दिन
अक्टूबर 2017 : 169 मि.यु./दिन
तापीय उत्पादन में वृद्धि : 09 मि.यु../दिन

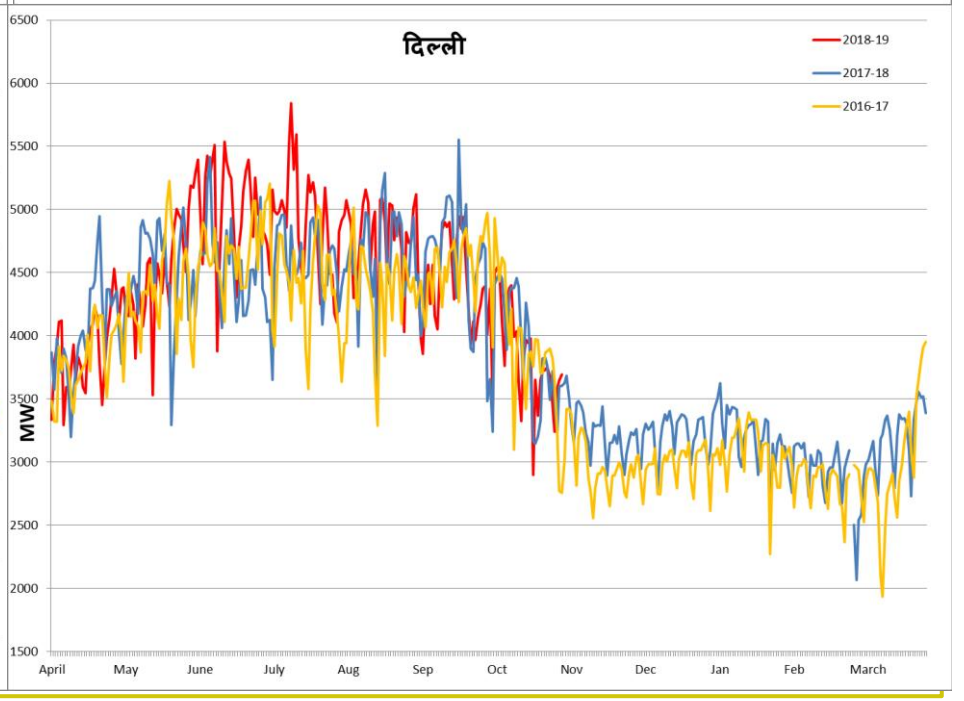


प्रति दिन अधिकतम मांग (Demand Met) at Peak Hrs (19:00 Hrs/20:00Hrs)

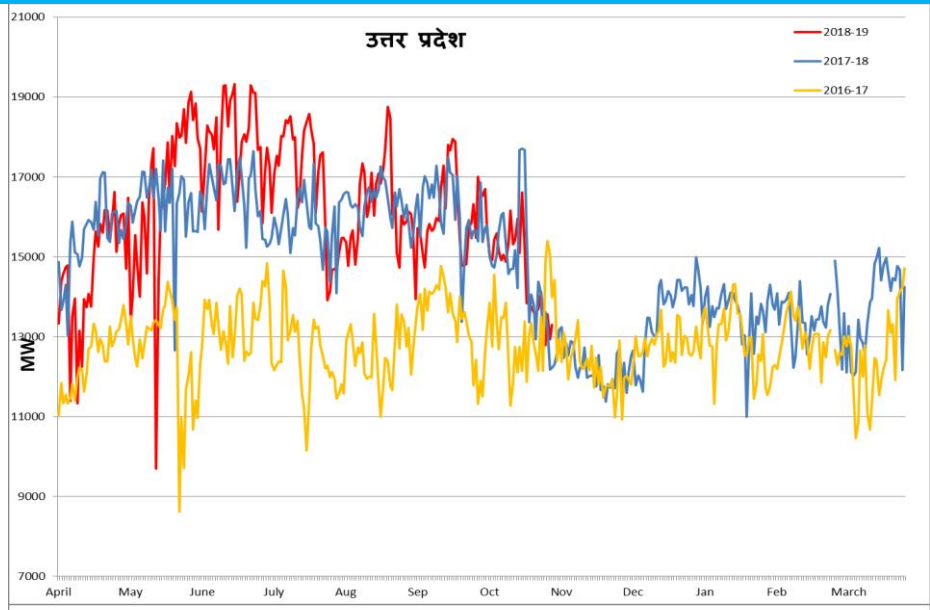


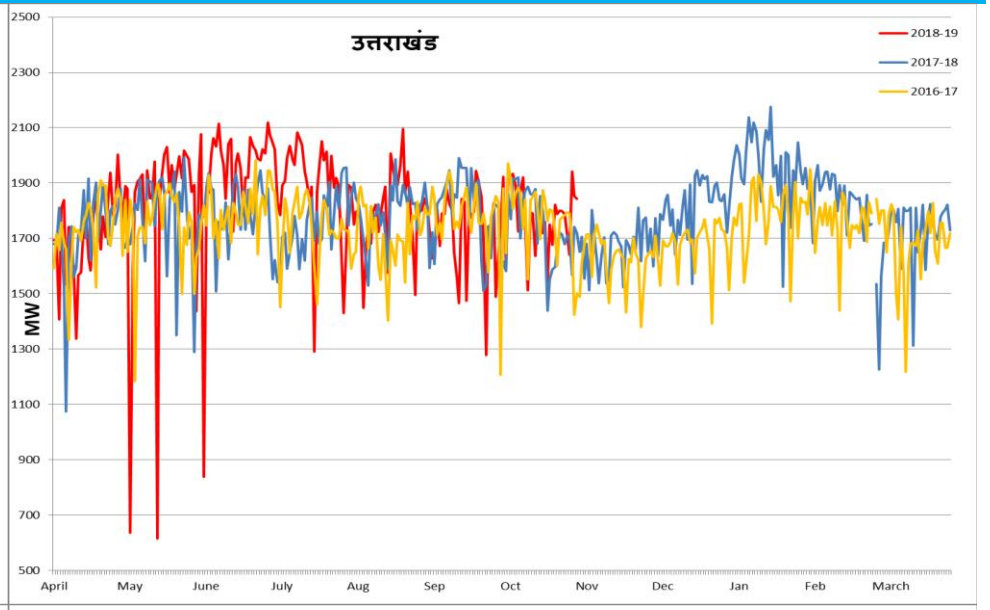


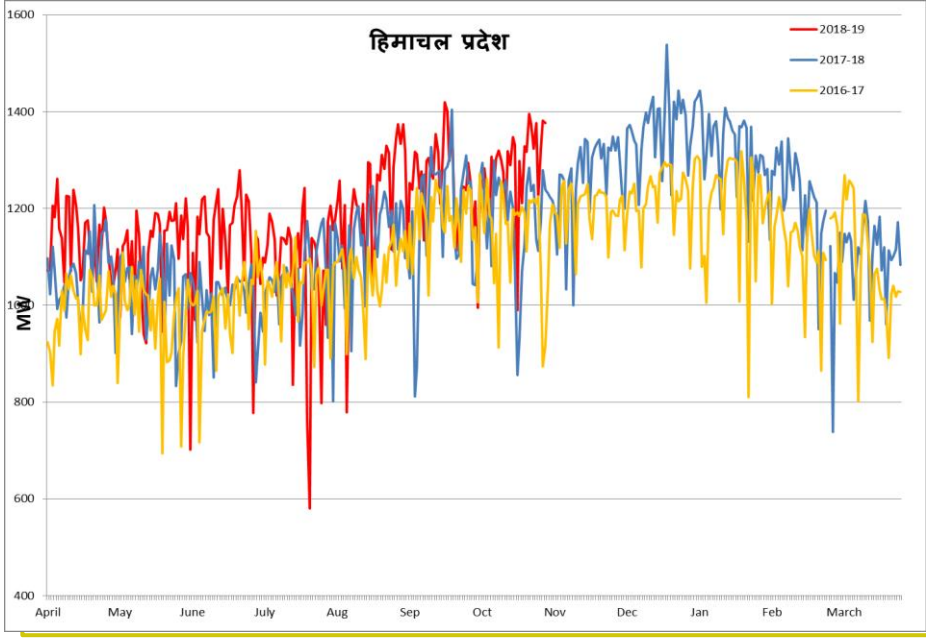


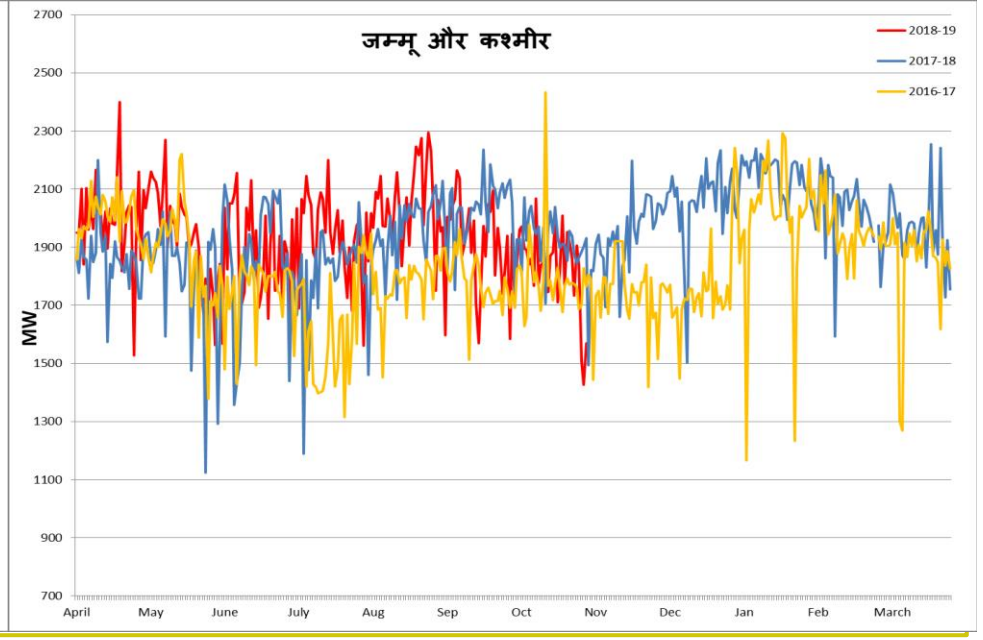


प्रति दिन अधिकतम मांग (Demand Met) at Peak Hrs (19:00 Hrs/20:00Hrs)









Long Outages of Transmission Element (15 days) and Generating Units(30 days) as on 15.11.2018

SL. No	Element Name	Type	Voltage Level	Owner	Outage		Reason / Remarks
					Date	Time	
1	400kV Bamnauli(DTL)-Tughlakabad(PGCIL)-1	Line	400 kV	DTL	12/10/2018	8:15	SD taken by DTL for replacement of Tower No 173 by new Tower.
2	Akal-Barmer 1	Line	400 kV	RRVPNL	22-10-2018	12:32	400 kV Akal-Barmer line to be removed from gantry for shifting of line from bay no.8 to 12. For erection of 2 nos. 400 kV D/C towers underline and for stringing for completion of line upto gantry at 400 kV GSS Akal
3	Amargarh 400(NRSS29)-URI I(NHPC) 2	Line	400 kV	PGCIL	29-10-2018	10:13	Replacement of complete Power cable and other maintenance work at Uri HEP.
4	Patiala(PG)-Patiala(PSEB) 1	Line	220 kV	PSTCL	22-10-2018	12:32	For replacement of conductor the line by PSTCL
5	Patiala(PG)-Patiala(PSEB) 2	Line	220 kV	PSTCL	28-10-2018	10:25	For replacement of conductor the line by PSTCL
6	FSC of Pampore-2 at Kishnpr	FSC	220 kV	PGCIL	30-10-2012	12:00	Line length has reduced after LILO work completion
7	FSC of Pampore-1 at Kishnpr	FSC	220 kV	PGCIL	30-10-2012	12:00	Line length has reduced after LILO work completion
8	Champa(WR) - Kurukshetra(NR) line -1	Line	800 kV HVDC	PGCIL	28-09-2018	15:25	RVO mode.
9	Unnao 189.9 MVAR B/R	Bus Reactor	765 kV	UPPTCL	2/10/2018	19:20	Low voltage at Unnao
10	Vindhyachal HVDC BtB Block 2	HVDV	500 kV HVDC	PGCIL	26-11-2017	14:55	Differential protection operated.
11	Allahabad Rewa Road(400kV) - Obra	Line	400 kV	UPPTCL	14-10-2018	4:45	Tripped due to fire in cable gallery at Obra end
12	Allahabad Rewa Road(400kV)(UP)-Meza TPS(UP) 2	Line	400 kV	UPPTCL	31-10-2018	12:34	Manually tripped at Meja end due toR-ph CT cable under severe stress & likely to be broken at any point of time & its PLCC cable has broken due to soil sinking.

SL. No	Element Name	Type	Voltage Level	Owner	Outage		Reason / Remarks
					Date	Time	
13	Akal 500 MVA ICT 4	ICT	400/220 kV	RRVPNL	5/8/2018	16:00	ICT burnt
14	Akal 315 MVA ICT 2	ICT	400/220 kV	RRVPNL	22-08-2018	22:55	ICT burnt.
15	Panki 240 MVA ICT 1	ICT	400/220 kV	UPPTCL	6/10/2018	15:49	ES/D. To attend abnormal heating at bottom cover bolt.
16	Obra TPS(UPPTCL) 315 MVA ICT 1	ICT	400/220 kV	UPPTCL	14-10-2018	4:45	Tripped due to fire in cable gallery at Obra end
17	Wagoora 50 MVAR B/R	Bus Reactor	400 kV	PGCIL	22-04-2015	18:56	Taken out due to low voltage.
18	FACT at BLB in Knp-BLB Line	FACTS	400 kV	PGCIL	2/7/2016	10:20	Y-Phase current imbalance
19	FSC (50%) of Koteshwar Pool -2 at Meerut (PG)	FSC	400 kV	PGCIL	14-07-2017	19:22	Fire in Y-ph unit
20	FSC (40%) of Fatehpur-II at MainpurI(PG)	FSC	400 kV	PGCIL	5/8/2018	0:10	Minimum oil protection operated. Presently out due to Low current.
21	Koteshwar HEP 125 MVAR (400kV) Bus Reactor 1	Bus Reactor	400 kV	PGCIL	27-10-2018	0:00	Taken out for maintenance work by PGCIL as informed by Koteshwar HEP.

Long Outage of Generating Units

SL. No	Station Name	Location	Owner	Unit No	Capacity	Reason	Outage		Remarks
							Date	Time	
1	RAPS-A	RAJASTHAN	NPC	1	100	Subject to regulatory clearance	9/10/2004	22:58	
2	Badarpur TPS	DELHI	NTPC	2	100	Order of NGT for Environmental protection	24-09-2015	19:29	
3	Badarpur TPS	DELHI	NTPC	3	100	Order of NGT for Environmental protection	9/10/2015	1:00	
4	Badarpur TPS	DELHI	NTPC	1	100	Order of NGT for Environmental protection	30-10-2015	15:30	
5	RAPS-B	RAJASTHAN	NPC	1	220	Annual maintenance	14-10-2018	11:57	
6	Bairasiul HPS	HP	NHPC	3	60	For renovation and Modernisation of the plant	15-10-2018	9:11	
7	Bairasiul HPS	HP	NHPC	2	60	For renovation and Modernisation of the plant	15-10-2018	10:02	
8	Bairasiul HPS	HP	NHPC	1	60	For renovation and Modernisation of the plant	15-10-2018	10:14	
9	Obra TPS	UP	UPRVUNL	7	100	R & M work	1/7/2010	13:44	
10	Paricha TPS	UP	UPRVUNL	1	110	R & M Work	2/7/2016	17:30	
11	Unchahar TPS	UP	NTPC	6	500	Furnace pressure high	1/11/2017	15:40	
12	Pong HPS	HP	BBMB	2	66	Repair and Replacement of draft tube gates.	28-03-2018	16:20	
13	Badarpur TPS	DELHI	NTPC	4	210	Plant closed as per government directives	15-10-2018	18:05	

Central Sector reserve shutdown (1925 MW)

SL. No	Station Name	Location	Owner	Unit No	Capacity	Reason	Outage		Remarks
							Date	Time	
1	Faridabad GPS	HARYANA	NTPC	3	156	Reserve Shutdown	8/5/2018	0:17	
2	Faridabad GPS	HARYANA	NTPC	1	137.75	Reserve Shutdown	8/5/2018	0:24	
3	Faridabad GPS	HARYANA	NTPC	2	137.75	Reserve Shutdown	6/7/2018	22:51	
4	Auraiya GPS	UP	NTPC	2	111.19	Reserve Shutdown	5/11/2018	23:54	
5	Dadri GPS	UP	NTPC	4	130.19	Reserve Shutdown	12/11/2018	23:06	
6	Auraiya GPS	UP	NTPC	5	109.3	Reserve Shutdown	13-11-2018	9:28	
7	Auraiya GPS	UP	NTPC	1	111.19	Reserve Shutdown	13-11-2018	9:36	
8	Auraiya GPS	UP	NTPC	4	111.19	Reserve Shutdown	13-11-2018	10:03	
9	Auraiya GPS	UP	NTPC	6	109.3	Reserve Shutdown	13-11-2018	10:21	
10	Dadri GPS	UP	NTPC	2	130.19	Reserve Shutdown	13-11-2018	10:23	
11	Dadri GPS	UP	NTPC	5	154.51	Reserve Shutdown	13-11-2018	10:26	
12	Auraiya GPS	UP	NTPC	3	111.19	Reserve Shutdown	13-11-2018	10:28	
13	Dadri GPS	UP	NTPC	6	154.51	Reserve Shutdown	13-11-2018	10:38	
14	Dadri GPS	UP	NTPC	3	130.19	Reserve Shutdown	13-11-2018	11:10	
15	Dadri GPS	UP	NTPC	1	130.19	Reserve Shutdown	13-11-2018	12:18	

State Sector reserve shutdown/Coal shortage (4005 MW)

SL. No	Station	Location	Owner	Unit No	Capacity	Reason(s)	Outage		Expected Revival Date
							Date	Time	
1	Panipat TPS	HARYANA	HPGCL	5	210	Reserve Shutdown	13-07-2018	16:55	
2	Panipat TPS	HARYANA	HPGCL	6	210	Reserve Shutdown	4/8/2018	20:26	
3	DCRTPP (Yamuna Nagar)	HARYANA	HPGCL	1	300	Reserve Shutdown	22-09-2018	4:51	
4	Guru Gobind Singh TPS (Ropar)	PUNJAB	PSEB	4	210	Reserve Shutdown	11/10/2018	13:10	
5	Suratgarh TPS	RAJASTHAN	RRVUNL	6	250	Less Demand	7/11/2018	19:45	
6	Guru Gobind Singh TPS (Ropar)	PUNJAB	PSEB	3	210	Reserve Shutdown	7/11/2018	22:25	
7	Guru Hargobind Singh TPS (Lehra Mohabbat)	PUNJAB	PSEB	2	210	Reserve Shutdown	7/11/2018	23:11	
8	Lalitpur TPS	UP	LPGCL	2	660	Reserve Shutdown	7/11/2018	23:41	
9	Lalitpur TPS	UP	LPGCL	3	660	Reserve Shutdown	9/11/2018	8:01	
10	Lalitpur TPS	UP	LPGCL	1	660	Reserve Shutdown	13-11-2018	0:15	
11	Guru Hargobind Singh TPS (Lehra Mohabbat)	PUNJAB	PSEB	1	210	Reserve Shutdown	13-11-2018	16:18	
12	Paricha TPS	UP	UPRVUNL	2	110	Reserve Shutdown	13-11-2018	21:00	
13	Harduaganj-C TPS	UP	UPRVUNL	7	105	Reserve Shutdown	13-11-2018	21:15	

LILO of Transmission Lines
(400kV- 112 ckt. Km and 220kV- 4 ckt. km)

S. No.	Name of element	Voltage Level (in kV)	Line Length (In kM)	Conductor Type	LILO Length (In Km)	Owner	Remarks	Actual date & time of charging (Synchronized)	
								Date	Time
1	400kV Jodhpur(old)-Kakani (Jodhpur New)-S/C & bay no 406B at Kakani**{ LILO of 400kV Jodhpur-Merta-I at Kakani}**	400	67	Twin Moose		RRVPNL		**13.10.2018**	**12:51**
2	400kV Merta-Kakani (Jodhpur New)-S/C & bay no 405B at Kakani**{ LILO of 400kV Jodhpur-Merta-I at Kakani}**	400	140	Twin Moose		RRVPNL		**13.10.2018**	**12:51**
3	400kV Ballabhgarh-Tughlakabad-1 & assocaited bays no 401(main),402(tie) **{ LILO of 400kV DC Ballabhgarh-Bamnauli at Tughlakabad}**	400	39.8	HTLS INVAR (LILO) & Bersimies (before LILO)	28	PGCIL		**10.10.2018**	**1:26**
4	400kV Bamnauli-Tughlakabad-1 & assocaited bays no 404(main),405(tie) **{ LILO of 400kV DC Ballabhgarh-Bamnauli at Tughlakabad}**	400	68	HTLS INVAR (LILO) & Bersimies (before LILO)	27.88	PGCIL		**10.10.2018**	**1:03**
5	400kV Ballabhgarh-Tughlakabad-2 & assocaited bays no 407(main),408(tie) **{ LILO of 400kV DC Ballabhgarh-Bamnauli at Tughlakabad}**	400	39.8	HTLS INVAR (LILO) & Bersimies (before LILO)	28	PGCIL		**10.10.2018**	**0:12**

LILO of Transmission Lines
(400kV- 112 ckt. Km and 220kV- 4 ckt. km)

S. No.	Name of element	Voltage Level (in kV)	Line Length (In kM)	Conductor Type	LILO Length (In Km)	Owner	Remarks	Actual date & time of charging (Synchronized)	
								Date	Time
6	400kV Bamnauli-Tughlakabad-2 & assocaited bays no 406(main) **{ LILO of 400kV DC Ballabhgarh-Bamnauli at Tughlakabad}**	400	68	HTLS INVAR (LILO) & Bersimies (before LILO)	27.88	PGCIL		**10.10.2018**	**0:44**
7	220kV BTPS-Tughlakabad-1 & bay no 206 at Tughlakabad**{ LILO of 220kV BTPS-Mahrauli-DC at Tughlakabad}**	220	5.46	Single Zebra	1.021	DTL		**06.10.2018**	**18:18**
8	220kV BTPS-Tughlakabad-2 & bay no 208 at Tughlakabad**{ LILO of 220kV BTPS-Mahrauli-DC at Tughlakabad}**	220	5.46	Single Zebra	1.021	DTL		**06.10.2018**	**18:26**
9	220kV Mahrauli-Tughlakabad-1 & bay no 204 at Tughlakabad **{ LILO of 220kV BTPS-Mahrauli-DC at Tughlakabad}**	220	10.73	Single Zebra	0.742	DTL		**06.10.2018**	**18:18**
10	220kV Mahrauli-Tughlakabad-1 & bay no 205 at Tughlakabad **{ LILO of 220kV BTPS-Mahrauli-DC at Tughlakabad}**	220	10.73	Single Zebra	0.742	DTL		**06.10.2018**	**18:26**

Bus Reactor

(Capacity Addition - 330 MVAR)

S. No.	Name of element	Voltage Level (kV)	Transformation Capacity (in MVAr)	New/ replacement /augmentation	Make	Agency/ Owner	Remarks	Actual date & time of charging	
								Date	Time
1	80 MVAR Bus Reactor at Srinagar (PTCUL)	400	80	New	PTCUL	80 MVAR Bus Reactor at Srinagar (PTCUL)	400	**18.10.2018**	**16:06**
2	125 MVAR Bus Reactor along with associated bay no 412(main);411(tie),410(GT upto isolator) at Meja	400	125	New	MEJA			**11.10.2018**	**17:39**
3	125 MVAR Bus Reactor at Tughlakabad along with associated bays no 410 (main),411(tie)	400	125	New	PGCIL			**09.10.2018**	**16:51**

ICTs- 1963 MVA

S.No.	Name of element	Voltage Level	Transformation Capacity (in MVA)	New/replacement /augmentation	Make		Actual date & time of charging (on load)	
							Remarks	Date
1	12 MVA ICT along with associated bays no 205,301 at Kishenganga	220	12	New	BHEL	**At no load**	23.10.2018	20:02
2	6 MVA ICT along with associated bays no 301 at Kishenganga	33	6	New	BHEL	**At no load**	23.10.2018	20:02
3	315 MVA ICT-1 at Jodhpur(new)/Kakani along with associated bays no , 402B	400	315	New	BHEL	**At no load**	12.10.2018	19:05
4	500 MVA ICT-1 at Tughlakabad along with associated bays no 403 (main),402(tie) & 203	400	500	New	TBEA		**10.10.2018**	**0:44**
5	500 MVA ICT-2 at Tughlakabad along with associated bays no 409 (main),408(tie) & 201	400	500	New	TBEA		**10.10.2018**	**0:44**
6	500 MVA ICT-4 at Tughlakabad along with associated bays no 415 (main),414(tie) & 215	400	315	New	TBEA		**18.10.2018**	**16:16**
7	315 MVA ICT-2 at Panki and associated bays no 404,202 **{ Augmentation of ICT capacity by replacing 240 with 315 }**	400	315	Augmentation	Alstom		**02.10.2018**	**19:36**

FIRST TIME CHARGING ADVISORY REGARDING DOCUMENTATION AND TIMELINE

- Please submit Annexure A1-A6 (in 10 days advance) and B1-B5 (in 3 days advance once there is certainty of charging) after data validation, SEM installation & download initial reading, as per procedure only.
- Format B5 which is undertaking with regards to all statuary body is to be sent only after obtaining the requisite clearances.
- Please ensure filling of relevant columns in the formats.
- Checking of stamp/name of signing officer at transmission licensee end.
- Name of transmission licensee/address at the top of each format.
- Date of signing the documents.
- Tick on all the submitted documents in Annexure-1 etc.
- Certifying the redundant data communication (so many cases only one data channel being provided).
- Contact person information etc.
- Standing committee/CTU/CEA/RPC approval.
- Charging instruction obtained from CTU/STU in case of line.
- Schematic diagram indicating all line lengths, conductor type, tower location and ownership including LILO portion in case of LILO of Line.

FIRST TIME CHARGING ADVISORY REGARDING PROTECTION SYSTEM

- Ensure that suitable RPC protection philosophy compliant relay settings have been loaded in all protection relays and are properly activated.
- Ensure that all protection relays installed for subject element are powered ON and healthy status LED is glowing.
- Ensure that all the relays have their time GPS synchronized and relay is receiving regular synchronization signal from GPS clock.
- Ensure that Analog and Digital channels are properly configured in Disturbance recorder of all relays and proper identifiable nomenclature has been provided for channels. The list of important DR channels which must be configured at least is annexed herewith.
- Ensure that Dedicated station Event logger/ SAS Event logger is functioning and recording at the instant of first time charging.
- Ensure that Circuit Breaker close transition status signal is mapped as Trigger signal for initiating recording of DR. If automatic trigger signal is not mapped ensure manual triggering of DR at the instant of first time charging at one end and Synchronizing at remote end.

Ensure that if the element does not hold on first time charging the relay flags and indications are recorded promptly

REQUIREMENTS FOR TRIAL RUN CERTIFICATE

- After first time charging followings should be sent to RLDC for verification of Protection system and issue of Trial run certificate:
- In case of Transmission lines charging instant Disturbance recording of one end and synchronizing instant Disturbance recording of remote end of all the relays installed for subject element at both ends of Line in COMTRADE format.
- In case of Transformers and Reactors, charging instant Disturbance recording of all the relays installed for subject element in COMTRADE format.
- Charging/ synchronizing instant Station Event logger recording of both ends.
- Relay settings of all the Protection relays installed for subject element in RIO/Pdf file format.
- Please download SEM data after one or two once power flow started to check SEM healthiness and same may please be forwarded to NRLDC.

Note: Please also go through the procedure for integration of new element into the grid available at NRLDC website as **https://nrldc.in/documents/.**

Annexure 4

		MU	MW
State		Dec-18	Dec-18
Chandigarh	Availability	120	315
	Requirement	110	235
	Surplus/Shortfall (MU)	10	80
	Surplus/Shortfall (%)	9.1%	34.0%
Delhi	Availability	3550	5750
	Requirement	2020	4100
	Surplus/Shortfall (MU)	1530	1650
	Surplus/Shortfall (%)	75.7%	40.2%
Haryana	Availability	5460	8240
	Requirement	3900	7282
	Surplus/Shortfall (MU)	1560	958
	Surplus/Shortfall (%)	40.0%	13.2%
Himachal Pradesh	Availability	845	1475
	Requirement	847	1474
	Surplus/Shortfall (MU)	-2	1
	Surplus/Shortfall (%)	-0.2%	0.1%
Jammu & Kashmir	Availability	820	1910
	Requirement	1730	2810
	Surplus/Shortfall (MU)	-910	-900
	Surplus/Shortfall (%)	-52.6%	-32.0%
Punjab	Availability	5114	7886
	Requirement	3630	6460
	Surplus/Shortfall (MU)	1484	1426
	Surplus/Shortfall (%)	40.9%	22.1%
Rajasthan	Availability	8071	11326
	Requirement	7107	12371
	Surplus/Shortfall (MU)	964	-1045
	Surplus/Shortfall (%)	13.6%	-8.4%
Uttar Pradesh	Availability	9300	15800
	Requirement	9300	16200
	Surplus/Shortfall (MU)	0	-400

Annexure 4

	Surplus/Shortfall (%)	0.0%	-2.5%
Uttarakhand	Availability	1040	1940
	Requirement	1300	2130
	Surplus/Shortfall (MU)	-260	-190
	Surplus/Shortfall (%)	-20.0%	-8.9%
Total NR	Availability	34320	52702
	Requirement	29944	49600
	Surplus/Shortfall (MU)	4376	3102
	Surplus/Shortfall (%)	14.6%	6.3%

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

उत्तरी क्षेत्र-1, मुख्यालय, बी-9, कुतुब इंस्टीट्यूशनल एरिया, कटवारिया सराय, नई दिल्ली-110016, दूरभाष: 26560112, 26560115, फैक्स: 011-26564849 तार 'नेटग्रिड'
Northern Region-1 Headquarters, B-9, Qutab Institutional Area, Katwaria Sarai, New Delhi-110016 Tel.: 26560112, 26560115, Fax : 011-26564849 Gram: 'NETGRID'

संदर्भ संख्या/Ref. No. :

दिनांक/Dated :

Ref No.:POWERGRID/NR-I/BBMB/01

Date: November 15, 2018

To,

SE (Operation)
Northern Region Power Committee
18-A, Qutab Institutional Area,
Katwaria Sarai,, New Delhi-110016

Subject: Regarding feedback of phase change in Rajasthan system

In reference to the phase change in BBMB system, the feedback has desired of similar issue encountered in Rajasthan which was mitigated for 400kV D/C line is attached herein in the form of sketch and actual photographs of site indicating the phase change. Accordingly the feasibility of change over at all the respective locations needs to be seen for the required material to enable the phase change over.

It is suggested that the members from respective constituents & NRPC may be kindly confirm for the site visit for ascertain feasibility & material requirement.

Thanking You,

Your's truly

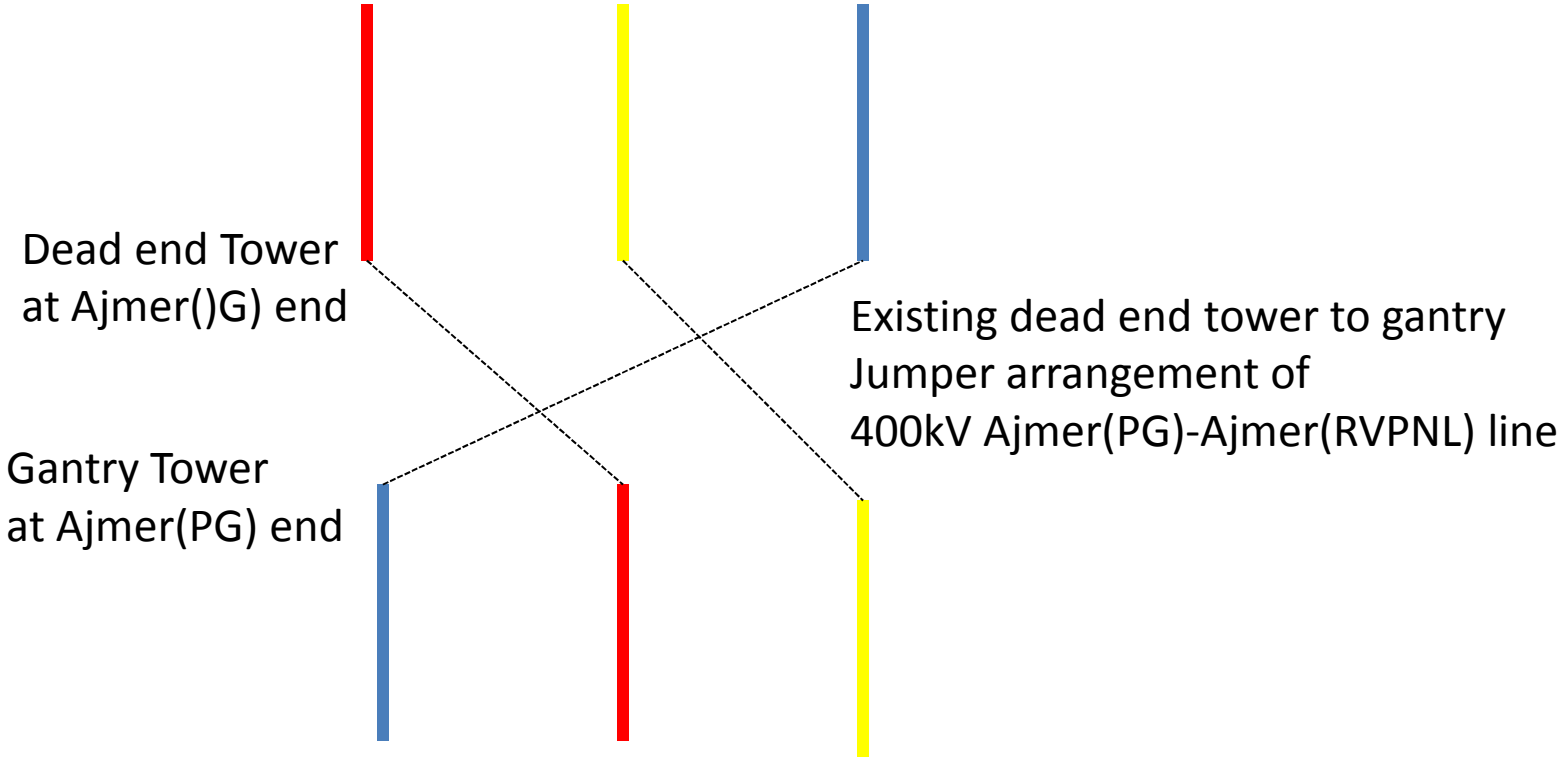
[Ravindra N. Gupta]
GM(AM), NR-1

Encl:- As above

Copy for kind information please,

i) Executive Director, NR1
ii) Chief GM(AM), NR1
iii) Chief GM(AM), NR2

400/220kV Ajmer (RVPNL), Gigal Sub Station



765/400kV Ajmer (PG) Sub Station


2018-11-15 14:57


2018-11-15 14:56


2018-11-15 14:57


2018-11-15 14:57

Follow up issues from previous OCCMs **ANNEXURE 9**

SNO	Description of Agenda point	Details	STATUS UPDATED
1	**Monitoring of schemes funded from PSDF (Agenda by NPC)**	The latest status of the schemes for which grant has been sanctioned from PSDF for the schemes in Northern Region. Utilities are requested to expedite implementation of the schemes and submit information of physical as well as financial progress in the prescribed format by first week of every month on regular basis to Member Convener, PSDF Project Monitoring Group (AGM, NLDC and POSOCO) with a copy to NPC Division	**The updated status available was attached as Annexure 9/1 of the Agenda of the 153rd OCC meeting .All states were requested to update regularly.**
2	**Sub-stations likely to be commissioned in next 6 months.**	All the concerned states were requested to submit the details of the downstream network associated SPECIFICALLY with THESE POWERGRID substations along with the action plan of their proposed/approved networks.	**The details of the substations of Power Grid and their required downstream network was enclosed *as* Annexure 9/2 .** **All concerned were again requested to update regularly and ensure that the work is completed expeditiously.**
3	**Progress of installing new capacitors and repair of defective capacitors**	. The available up to date status of installation of new capacitors and revival of defective capacitor by the State constituents is enclosed as ***ANNEXURE 10/3OF THE AGENDA OF THE 146TH OCC MEETING.*** **.**	**All utilities were requested to update regularly.**
4.	**Healthiness of defence mechanism: Self-certification**	Report of Mock exercise for healthiness of UFRs carried out by utilities themselves on quarterly basis is to be submitted to NRPC Secretariat and NRLDC. All utilities were advised to certify specifically, in the report that "***All the UFRs are checked and found functional"***. ***151st OCC meeting:*** **All utilities are requested to submit reports of testing in every**	**Information from for period ending September 2018 has not been received from Punjab, Delhi, BBMB & Rajasthan.**

		quarter in soft copy. All the states were requested that the reports for period ending September 2018 by all the states should be submitted positively by First week of October.	
5	**Strengthening of Intra-State transmission system**	Also all SLDCs are requested to give half yearly feedback ending 6/2018 in the month of 7/2018 to STU regarding bottlenecks, constraints and overloading in the State transmission network for proper transmission planning **151st OCC meeting:** **PTCUL & Rajasthan have submitted the data regarding the constraints / bottlenecks observed in the system to their STU. Punjab has submitted the data** **All states were again requested by SE(O) to update regularly as this information is very crucial for better planning of the grid.**	**PTCUL,Punjab ,Delhi & Rajasthan have submitted the information .HVPNL & UPPTCL to submit the information.**
6	**Mapping of Feeders in SCADA**	In the 141st OCC meeting members were informed about the "Compendium of SPS in NR" (*Annexure-_9 of the MOM_)* which was released in the 40th NRPC meeting. All the utilities were requested to go through the compendium and identify feeders concerning their state and map the same in SCADA. **150th OCC meeting:** PSTCL submitted information all other were requested to update. IRPC stated that as per the Compendium of SPS in NR" which was released in the 40th NRPC meeting. All the utilities are requested to go through the compendium and identify feeders concerning their state and map the same in SCADA. This document is available on NRLDC & NRPC website. NRLDC representative added that it is very important that the feeders should be mapped in SCADA. It was stated that this issue will be discussed in the Test committee meeting also.	**All states except Punjab & Rajasthan were requested to update.**

ANNEXURE 9/2				
S. No.	**Substation**	**Downstream network requirement**	**Schedule**	**Planned system and Implementation Status**
1	400/220 kV, 3x315 MVA Samba	2 nos. bays utilized under ISTS. Balance 4 Nos to be utilized	Commissioned	LILO of 220kV Bishnha – Hiranagar D/c line : under tendering (PMDP) (status as available with CEA) Status as updated by J&KPDD in 38th TCC/ 41st NRPC: LoA has been issued and Material has reached the site. Anticipated – Nov'19 **Targeted Completion is required to be updated by J&KPDD**
2	400/220kV, 2x315 MVA New Wanpoh	6 Nos. of 220 kV bays to be utilized	Commissioned	220kV New Wanpoh –Mirbazar D/c line: under tendering (PMDP) 220 kV Alusteng- New Wanpoh line Anticipated – Nov'19 **Targeted Completion is required to be updated by J&KPDD**
3	400/220kV, 2x315 MVA Parbati Pooling Station	2 Nos. of 220 kV bays to be utilized.	Commissioned	220kV Charor- Banala D/c line (18km) : under construction **Target completion -December 2018 as intimated by HPPTCL**
4	400/220kV, 2x500 MVA Kurukshetra (GIS)	8 nos. of 220 kV bays to be utilized	Commissioned	LILO of one circuit of Kaul-Pehowa 220kV D/c line LILO of one circuit of Kaul-Bastara 220kV D/c line Work awarded. Contractual Completion period upto 31.10.2019 **HVPNL requested to update further progress**
5	400/220kV, 2x500 MVA Bagpat GIS	3 nos. of 220 kV d/s lines to Shamli, Muradnagar and Bagpat commissioned. Balance 5 Nos. of bays to be utilized	Commissioned	Bagpat- Baraut - energised(D/C) Bhagpat-Shamli- energised(S/C) LILO of 220kV Muradnagar II - Baghpat (PG) at Baghpat UP **Bagpat(PG)-Modipuram New 220kV D/c-is under planning stage. UPPTCL to update .**
6	400/220kV, 2x315 MVA Dehradun	Out of 6 bays, only two bays used. Balance 4 bays to be utilised.	Commissioned	02 bays for Yamuna Basin (Mori substation) 2 bays for proposed S/s at Selakui **PTCUL requested to update**.
7	400/220 kV, 2x315 MVA Sohawal	6 Nos 220 kV bays to be utilized.	Commissioned	Sohawal-Sohawal (UP) D/C line energised Sohawal-Barabanki D/C line

ANNEXURE 9/2				
S. No.	**Substation**	**Downstream network requirement**	**Schedule**	**Planned system and Implementation Status**
				energised. 2 nos of bay of utilized for 220kV New Tanda-Sohawal line .There is a litigation process on & expected to be completed by November 2018 **UPPTCL to update.** Sohawal-Behraich and Sohawal-Gonda lines are under construction and expected to be completed by January, 2019. PGCIL requested to provide the estimate for construction of Bays at PGCIL end. **UPPTCL& PGCIL to update.**
8	Shahjahanpur, 2x315 MVA 400/220 kV	Partially utilized. Balance 5 Nos. of 220 kV bays to be utilized.	Commissioned	Shajahnapur-Hardoi commissioned Shajahnapur-Azimpur D/C line is planned, land of substation identified. **UPPTCL to update**.
9	Moga	Partially utilized. Balance 2 nos. of 220kV bays to be utilized.	Commissioned	Moga–Mehalkalan 220kV D/c line Work completed. Approval from NGT for tree cutting is awaited for balance work to commission line. NGT clearance received and by 31.12.2018 work will be completed **PSTCL to update progress**.
10	Hamirpur 400/220 kV 2x 315 MVA Sub-station (Augmentation by 3x105 MVA ICT)	04 nos. 220 kV downstream lines commissioned under ISTS. Balance two bays to be utilised by HPSEBL	August 2020	2x220 kV bays to be utilized for connecting 220/132kV Kangoo substation of HPSEBL by 220 kV Kangoo-Hamirpur D/c line. **HPPTCL requested to update**.
11	Kaithal 400/220 kV 1x 315 MVA Sub-station	July 2017 (Shifting of Transformer from Ballabhgarh).	Commissioned	220kV Kaithal(PG)- Neemwala D/c line - Work awarded on 13.7.2018. Tentative completion date 31.12.2019. 220kV S/s Neemwala-Tenders opened on 30.3.2018 & awarded on 13.7.2018. **HVPNL requested to update further progress.**

Establishment of new 400/220kV substations of POWERGRID in Northern Region. All concerned utilities are requested to update.

Sl. No.	Name of Substation	MVA Capacity	Expected Schedule	Downstream connectivity furnished by States
1	400/220kV Dwarka-I GIS	4x 500	Oct'18	**DTL may update.**
2	400/220kVTughlakabadGIS	4x 500	Oct'18	
3	220/66kV Chandigarh GIS	2x160	Feb'19	Out of 8 nos. of 66kV bays 6 no. of bays shall be utilized as per the timeline given by POWERGRID.
4	400/220kV Jauljivi GIS	2x315	December 2019	2 bays for 220kV AlmoraJauljibi line 2 bays for 220kV Brammah-Jauljibi line
5	400/220kV Sohna Road GIS	2x500	May'19 (Under TBCB) (8 bays)	-
6	400/220kV Prithla GIS	2x500	May'19 (Under TBCB) (8 bays)	Two nos. of 220kV bays for Prithla(400)-Prithla (HVPNL) 220kV D/c line Four nos. of 220kV bays for LILO of existing 220kV Palwal–RangalaRajpur D/c line at Prithla (400) (FY 2019-20) Two nos. of 220kV bays for 220kV Prithla (400)–Sector-78, Faridabad S/s D/c (FY-2020-21)
7	400/220kV Kadarpur GIS	2x500	May'19 (Under TBCB) (8 bays)	
8	400/220kV Kala Amb GIS	7*105	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. .
9	400/220kV Amargarh GIS	7X105	Oct'18 (Under TBCB) (Sterlite Grid planning to prepone)	JKPDD to confirm for LILO of 220kV D/c Zainkote - Delina line at Amargarh. 20 ckm work completed June-18.

Annexure-01

AGENDA ITEM NO.- 10
OCC -
STATUS OF FGD INSTALLATION VIS-À-VIS INSTALLATION PLAN AT IDENTIFIED TPS

S.No.	Attribute	Status
1.	Developer	UPRVUNL
2.	Name of Project	ANPARA 'D' TPS
3.	Sector (State / Central /Private)	State
4.	State	U.P.
5.	Region (NR, ER etc)	NR
6.	Unit No	6&7
7.	Unit Capacity (MW)	2x500 MW
8.	DT-of COMMISSIONING (DD/MM/YYYY)	Unit-6 – 08.06.2015 Unit-7 – 06.03.2016
9.	Age in years (Till 18.06.2018)	Unit-6 – 3 years Unit-7 – 2.25 years
10.	Whether FGD Installed (Y/N)	N
11.	Whether FGD space available (Y/N)	Y
12.	Whether FGD planned (Y/N)	Y
13.	Feasibility Study Started (Y/N)	Y
14.	Feasibility Study Completed (Y/N)	Y
15.	Tender Specifications Made (Y/N)	Y
16.	NIT Issued (Y/N)	Y
17.	Bids Opened (Y/N)	N
18.	Bid Opening Date (DD/MM/YYYY)	22.11.2018 (Techno commercial bid-stage-I)
19.	Bids Awarded (Y/N)	N
20.	Regulator Petition Cleared (Y/N)	N
21.	% Progress of FGD Installation	–
22.	FGD Commissioned (Y/N)	N
23.	FGD working satisfactorily (Y/N)	–
24.	FGD Phasing Plan for Implementation (DD/MM/YYYY)	Unit-6 – May-June-2021 Unit-7 – March-April-2021
25.	Current Status& remarks	NIT has been Published on 20.07.2018

15/11/18 15/11/18 13-11-18

AGENDA ITEM NO.
OCC -
STATUS OF FGD INSTALLATION VIS-À-VIS INSTALLATION PLAN AT IDENTIFIED TPS

S.No.	Attribute	Status
1.	Developer	UPRVUNL
2.	Name of Project	ParichhaTPS (2X210MW) & (2X250MW) Harduaganj TPS (2X250MW)
3.	Sector (State / Central /Private)	State
4.	State	U.P.
5.	Region (NR, ER etc)	NR
6.	Unit No	ParichhaTPS Unit no. 3,4 & 5, 6 Harduaganj TPS Unit no. 8 & 9
7.	Unit Capacity (MW)	(2X210MW) & (2X250MW) ParichhaTPS (2X250MW)Harduaganj TPS
8.	DT-of COMMISSIONING (DD/MM/YYYY)	ParichhaTPS Unit-3 – 29.03.2006 Unit-4 – 28.12.2006 Unit-5 – 24.05.2012 Unit-6– 11.03.2013 Harduaganj TPS Unit-8 – 27.09.2011 Unit-9 – 25.05.2012
9.	Age in years (Till 18.06.2018)	ParichhaTPS Unit-3 – 12.2 years Unit-4 – 11.5 years Unit-5 – 6 years Unit-6– 5.2 years Harduaganj TPS Unit-8 – 6.75 years Unit-9 – 6 years
10.	Whether FGD Installed (Y/N)	N
11.	Whether FGD space available (Y/N)	Y
12.	Whether FGD planned (Y/N)	Y
13.	Feasibility Study Started (Y/N)	Y
14.	Feasibility Study Completed (Y/N)	Y
15.	Tender Specifications Made (Y/N)	Y
16.	NIT Issued (Y/N)	Expected upto 20.11.18
17.	Bids Opened (Y/N)	-
18.	Bid Opening Date (DD/MM/YYYY)	–
19.	Bids Awarded (Y/N)	N

13-11-18

AGENDA ITEM NO.
OCC -
STATUS OF FGD INSTALLATION VIS-À-VIS INSTALLATION PLAN AT IDENTIFIED TPS

20.	Regulator Petition Cleared (Y/N)	–
21.	% Progress of FGD Installation	–
22.	FGD Commissioned (Y/N)	N
23.	FGD working satisfactorily (Y/N)	–
24.	FGD Phasing Plan for Implementation (DD/MM/YYYY)	ParichhaTPS Unit-3 – March-April- 2022 Unit-4 – March-April- 2022 Unit-5 – Jan.-Feb.-2022 Unit-6– Nov.-Dec.2022 Harduaganj TPS Unit-8 – 31.12.2019 Unit-9 – 31.12.2019
25.	Current Status& remarks	Publication of NIT is in process.

AGENDA ITEM NO.
OCC -
STATUS OF FGD INSTALLATION VIS-À-VIS INSTALLATION PLAN AT IDENTIFIED TPS

S.No.	Attribute	Status
1.	Developer	UPRVUNL
2.	Name of Project	ANPARA 'A' & 'B' TPS
3.	Sector (State / Central /Private)	State
4.	State	U.P.
5.	Region (NR, ER etc)	NR
6.	Unit No	1,2,3 & 4,5
7.	Unit Capacity (MW)	3x210 MW & 2x500 MW
8.	DT-of COMMISSIONING (DD/MM/YYYY)	**Anpara A TPS** Unit-1 – 24.03.1986 Unit-2 – 28.02.1987 Unit-3 – 12.03.1988 **Anpara B TPS** Unit-4 – 19.07.1993 Unit-5 – 04.07.1994
9.	Age in years (Till 18.06.2018)	**Anpara A TPS** Unit-1 – 32 years Unit-2 – 31 years Unit-3 – 30 years **Anpara B TPS** Unit-4 – 25 years Unit-5 – 24 years
10.	Whether FGD Installed (Y/N)	N
11.	Whether FGD space available (Y/N)	Y
12.	Whether FGD planned (Y/N)	Y
13.	Feasibility Study Started (Y/N)	Y
14.	Feasibility Study Completed (Y/N)	Y
15.	Tender Specifications Made (Y/N)	N
16.	NIT Issued (Y/N)	N
17.	Bids Opened (Y/N)	N
18.	Bid Opening Date (DD/MM/YYYY)	–
19.	Bids Awarded (Y/N)	N
20.	Regulator Petition Cleared (Y/N)	N
21.	% Progress of FGD Installation	–
22.	FGD Commissioned (Y/N)	N

AGENDA ITEM NO.
OCC -
STATUS OF FGD INSTALLATION VIS-À-VIS INSTALLATION PLAN AT IDENTIFIED TPS

23.	FGD working satisfactorily (Y/N)	–
24.	FGD Phasing Plan for Implementation (DD/MM/YYYY)	**Anpara A TPS** Unit-1 – Sept-Oct 2022 Unit-2 – July- Aug 2022 Unit-3 – May-June 2022 **Anpara B TPS** Unit-4 – March-April 2022 Unit-5 – Jan-Feb 2022
25.	Current Status& remarks	An order for Pre-award services has been placed on M/s NTPC on 09.10.2018. Tender Specification to be submitted up to 15.12.18.

AGENDA ITEM NO.
OCC -
STATUS OF FGD INSTALLATION VIS-À-VIS INSTALLATION PLAN AT IDENTIFIED TPS

S.No.	Attribute	Status
1.	Developer	UPRVUNL
2.	Name of Project	OBRA 'B' TPS
3.	Sector (State / Central /Private)	State
4.	State	U.P.
5.	Region (NR, ER etc)	NR
6.	Unit No	9,10,11,12 &13
7.	Unit Capacity (MW)	2x500 MW
8.	DT-of COMMISSIONING (DD/MM/YYYY)	Unit- 9 – 26.10.1980 Unit -10 – 14.01.1979 Unit- 11 – 31.12.1977 Unit- 12 – 28.03.1981 Unit- 13 – 21.07.1982
9.	Age in years (Till 18.06.2018)	Unit- 9 – 38 years Unit -10 – 39 years Unit- 11 – 41 years Unit- 12 – 37 years Unit- 13 – 36 years
10.	Whether FGD Installed (Y/N)	N
11.	Whether FGD space available (Y/N)	Y
12.	Whether FGD planned (Y/N)	Y
13.	Feasibility Study Started (Y/N)	Y
14.	Feasibility Study Completed (Y/N)	Y
15.	Tender Specifications Made (Y/N)	N
16.	NIT Issued (Y/N)	N
17.	Bids Opened (Y/N)	N
18.	Bid Opening Date (DD/MM/YYYY)	–
19.	Bids Awarded (Y/N)	N
20.	Regulator Petition Cleared (Y/N)	N
21.	% Progress of FGD Installation	–
22.	FGD Commissioned (Y/N)	N
23.	FGD working satisfactorily (Y/N)	–

AGENDA ITEM NO.
OCC -
STATUS OF FGD INSTALLATION VIS-À-VIS INSTALLATION PLAN AT IDENTIFIED TPS

24.	FGD Phasing Plan for Implementation (DD/MM/YYYY)	Unit-9 – July- Aug 2022 Unit-10 – Sept- Oct.2022 Unit-11 – Nov-Dec 2022 Unit-12 – May-June.2022 Unit-13 – March-April.2022
25.	Current Status& remarks	Short term tender has been floated for engagement of agency for Pre-award services. part -1 will be open on 15.11.2018

NABHA POWER LIMITED

Mailing Address: Larsen & Toubro Ltd,Aspire Tower, 4th Floor, Plot No. 55
Industrial and Business Park, Phase I,Chandigarh- 160002
Phone: 0172 4646846 •Fax: 0172 4646802

E-mail : Kumar.Rajesh@larsentoubro.com
Ref: NPL/RK/CEA/6524

Date: 05.11.2018

The Chief Engineer
Central Electricity Authority,
Thermal Projects Renovation and Modernization Division,
Sewa Bhawan, R. K. Puram-1, New Delhi-110066.

Sub: Monthly Progress Report on Emission Norms

Ref: CEA letter No: 2/17/CEA/TPRM/FGD&ESP/2018/838-906 dated 08-08-2018

Dear Sir,

Please refer to your aforesaid memo cited under reference, we herewith submit the Monthly Progress Report of October 2018 (as per the format) regarding the progress on New emission Norms.

Yours sincerely,

For Nabha Power Limited

(Authorised Signatory)

CC:
1. Member (Thermal), CEA
2. CE (UMPP Division),CEA
3. Joint Secretary (Thermal), MoP
4. Chief Engineer (Thermal Design), PSPCL
5. Regional Director, CPCB
6. Environment Engineer, PPCB
7. Member Secretary, NRPC

	Unit	Unit - 1	Unit - 2
	Power Station Details		

Under 'A', please provide the general details of each unit of the power station.

A	Details of the thermal power unit	Value	Value
A1	Developer	L&T Power Development Limited	L&T Power Development Limited
A2	Name of Project	Nabha Power Limited	Nabha Power Limited
A3	Sector (State / Central /Private)	Private	Private
A4	District	Patiala	Patiala
A5	State	Punjab	Punjab
A6	Region (NR, ER, NER, SR, WR)	NR	NR
A7	Unit No	1	2
A8	Unit Capacity (MW)	700	700
A9	Date of Commissioning (DD-MM-YYYY)	24-01-2014	06-07-2014
A10	Population Density of District* (persons/sq. km)	570	570

** Ref*
https://www.census2011.co.in/census/district/601-patiala.html

	Add units in this direction ----------->	1	2
	SOx		

Under 'A', please provide the details regarding De-SOx technology.

A	Details of De-SOx technology (FGD)	Value	Value
A1	Current level of SOx emission (mg/Nm3)	1610	1620
A2	Applicable SOx norms (100, 200 or 600 mg/Nm3)	200	200
A3	Whether FGD Installed (Y/N)	N	N
A4	Whether FGD planned (Y/N)	Y	Y
A5	De-Sulphurisation Technology Used / **proposed** (use Annexure if required)	Wet Lime Stone Based FGD	Wet Lime Stone Based FGD
A6	FGD Phasing Plan for Implementation (DD/MM/YYYY)	30-04-2021*	28-02-2021*

Under 'B', please provide the target dates of De-SOx equipment installation milestones

B	De-SOx equipment installation milestones - target dates	Target Date (DD-MM-YYYY)	Target Date (DD-MM-YYYY)
B1	Feasibility Study Started	Completed	Completed
B2	Feasibility Study Completed	Completed	Completed
B3	Tender Specifications Made	Completed	Completed
B4	NIT Issued	15-12-2018*	15-12-2018*
B5	Bids Opened	20-02-2019*	20-02-2019*
B6	Bids Awarded	01-03-2019*	01-03-2019*
B7	% Progress of FGD Installation	-	-
B8	FGD Commissioned	30-11-2021*	30-08-2021*

*	Timelines depend upon the approval from PSERC for grant of in -principle approval under change in law

Under 'C', please provide the actual date of De-SOx equipment installation milestones
If the milestone has been achieved, right Y for Yes and provide date of achievement. Y (DD-MM-YYYY)
If the milestone has not been achieved yet, right N for No.
For cells filled with N, make sure target date is provided in the section above.

C	De-SOx equipment installation milestones - actual dates	Yes or No (Y/N), if Yes provide actual date (DD-MM-YYYY)	Yes or No (Y/N), if Yes provide actual date (DD-MM-YYYY)
C1	Feasibility Study Started	09-09-2016	09-09-2016
C2	Feasibility Study Completed	01-03-2017	01-03-2017
C3	Tender Specifications Made	14-03-2018	14-03-2018
C4	NIT Issued	14-05-2018**	14-05-2018**
C5	Bids Opened	-	-
C6	Bids Awarded	-	-
C7	% Progress of FGD Installation	-	-
C8	FGD Commissioned	-	-

**	RFQ publication date

Under 'D', please offer any comments/ remarks you may have.

D	Current Status & Remarks	# RFQ floated on 14 May 18 # CEA Recommendations received # CEA Recommendations submitted to PSERC # Order awaited from PSERC regarding in-principle approval for change in law. Hearing done on 12 Sep 18. # PSPCL participated in bid opening on 23 Aug 18 and advised NPL not to open the bids and to revisit the bidding requirements. # Qualification requirement (QR) revised & fresh application with due date of 26 Nov 18, being published.

	Add units in this direction ----------->	1	2
	SPM		

Under 'A', please provide the details regarding ESP technology.

A	Details of ESP upgradation technology	Value	Value
A1	Current level of SPM (mg/Nm3)	< 50	< 50
A2	Applicable SPM norms (30, 50 or 100 mg/Nm3)	50	50
A3	Whether ESP upgradation planned (Y/N)	N	N
A5	ESP Technology Used / proposed (use Annexure if required)	NA	NA
A6	ESP Phasing Plan for Implementation (DD/MM/YYYY)	NA	NA

Under 'B', please provide the target dates of ESP equipment installation milestones

B	ESP equipment installation milestones - target dates	Target Date (DD-MM-YYYY)	Target Date (DD-MM-YYYY)
B1	Feasibility Study Started	NA	NA
B2	Feasibility Study Completed	NA	NA
B3	Tender Specifications Made	NA	NA
B4	NIT Issued	NA	NA
B5	Bids Opened	NA	NA
B6	Bids Awarded	NA	NA
B7	% Progress of upgraded ESP Installation	NA	NA
B8	Whether upgraded ESP Commissioned	NA	NA

Under 'C', please provide the actual date of ESP equipment installation milestones
If the milestone has been achieved, right Y for Yes and provide date of achievement. Y (DD-MM
If the milestone has not been achieved yet, right N for No.
For cells filled with N, make sure target date is provided in the section above.

C	ESP equipment installation milestones - actual dates	Yes or No (Y/N), if Yes provide actual date (DD-MM-YYYY)	Yes or No (Y/N), if Yes provide actual date (DD-MM-YYYY)
C1	Feasibility Study Started	NA	NA
C2	Feasibility Study Completed	NA	NA
C3	Tender Specifications Made	NA	NA
C4	NIT Issued	NA	NA
C5	Bids Opened	NA	NA
C6	Bids Awarded	NA	NA
C7	% Progress of upgraded ESP Installation	NA	NA
C8	Whether upgraded ESP Commissioned	NA	NA

Under 'D', please offer any comments/ remarks you may have.

D	Current Status & Remarks	NA	NA

	Add units in this direction ----------->	1	2
	NOx		

Under 'A', please provide the details regarding De-Nox technology.

A	Details of De-NOx Equipment	Value	Value
A1	Current level of Nox emissions (mg/Nm3)	450	464
A2	Applicable NOx norms (100, 300 or 600 mg/Nm3)	300	300
A3	Whether SCR planned (Y/N)	N	N
A5	Details of Nox control technology and other measures planned (use Annexure if required)	Selective Non - Catalytic Reduction (SNCR)	Selective Non -Catalytic Reduction (SNCR)
A6	DeNOx Phasing Plan for Implementation (DD/MM/YYYY)	30-04-2021*	28-02-2021*

Under 'B', please provide the target dates of De-NOx equipment installation milestones

B	De-Nox equipment installation milestones - target dates	Target Date (DD-MM-YYYY)	Target Date (DD-MM-YYYY)
B1	Feasibility Study Started	Completed	Completed
B2	Feasibility Study Completed	Completed	Completed
B3	Tender Specifications Made	-	-
B4	NIT Issued	-	-
B5	Bids Opened	-	-
B6	Bids Awarded	-	-
B7	% Progress of De-NOx equipment Installation	-	-
B8	De-Nox equipment commissioned	*	*

*	18 months required to comply with the NOx emission norms pursuant to recommendation of appropriate technology by the CEA (Prospective vendors are undertaking pilot projects at NTPC Plants,results of which is awaited)

Under 'C', please provide the actual date of DeNOx equipment installation milestones
If the milestone has been achieved, right Y for Yes and provide date of achievement. Y (DD-MM-YYY
If the milestone has not been achieved yet, right N for No.
For cells filled with N, make sure target date is provided in the section above.

C	De-Nox equipment installation milestones - actual dates	Yes or No (Y/N), if Yes provide actual date (DD-MM-YYYY)	Yes or No (Y/N), if Yes provide actual date (DD-MM-YYYY)
C1	Feasibility Study Started	20-06-2017	20-06-2017
C2	Feasibility Study Completed	24-08-2017	24-08-2017
C3	Tender Specifications Made	-	-
C4	NIT Issued	-	-
C5	Bids Opened	-	-
C6	Bids Awarded	-	-
C7	% Progress of De-NOx equipment Installation	-	-
C8	De-Nox equipment commissioned	-	-

Under 'D', please offer any comments/ remarks you may have.

D	Current Status & Remarks	# Combustion tuning done # Plant has Low Nox burner (PM : Pollution minimum Burners-MHPS Terminology) with OFA (AA : Additional Air-ports MHPS Terminology) # SNCR to be installed # Discussion with SNCR supplier is under progress. # Further 18 months required to comply with the NOx emission norms pursuant to recommendation of appropriate technology by the CEA

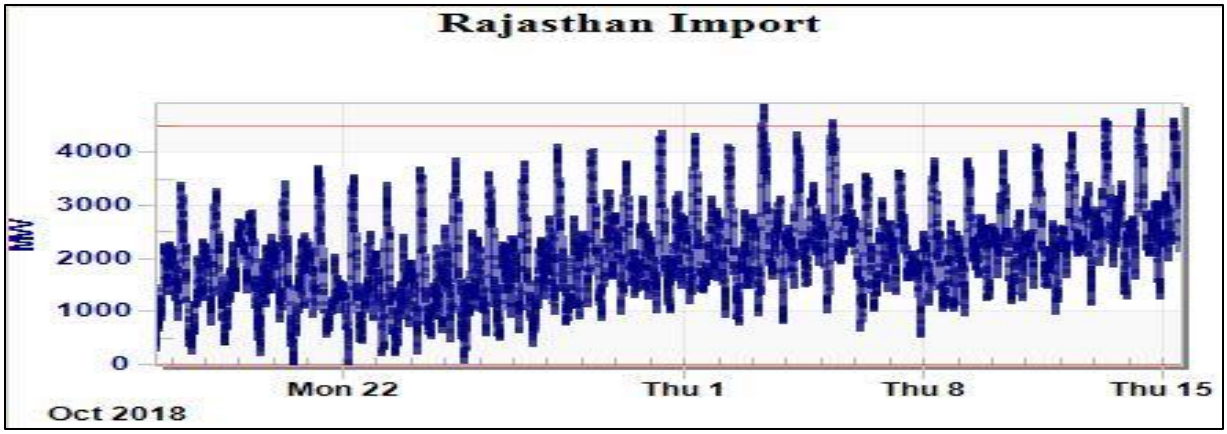
Status of Implemenation in Northern Region-POWERGRID (NR-I)

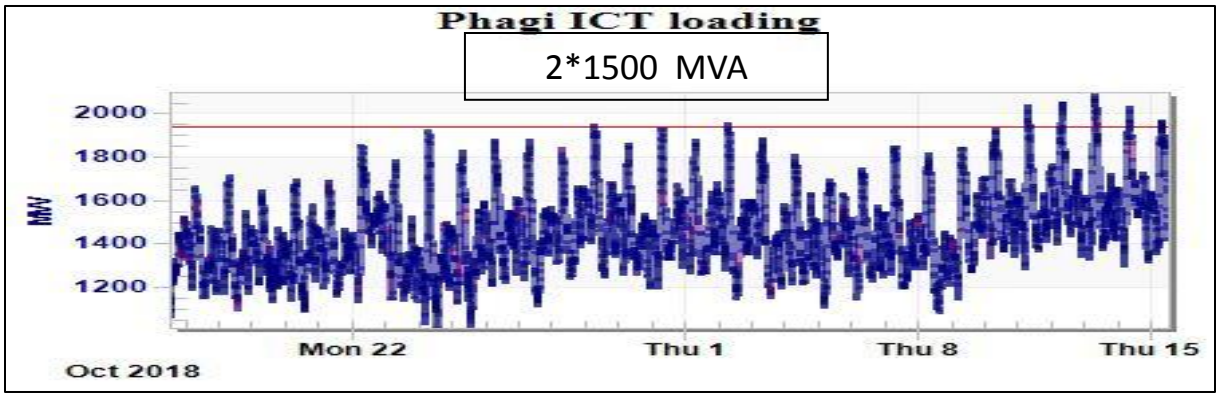
S. No.	Recommendation	Status	Remarks
1	**Review of Protection System**		
1.1	Third party protection audit	Completed	
1.2	Review of zone-3 philosophy	Completed	
1.3	Synchro phasor measurements /PMUs & deploy of SPSs	Completed	SPS in following transmission element: 1. HVDC Rihand-Dadri 2. HVDC Balia-Bhiwadi 3. 765kV Agra-Gwalior 4. ICT at Mandola, Ballabhgarh & Maharani Bagh
1.4	Time synchronization of DRs/ELs/PMUs	Completed	
2	**Frequency control generation reserve/ancillary services**	NA	
3	**Defense mechanism - f_{min} and df/dt - load shedding schemes**	NA	
4	**Ensuring primary frequency response from generators**	NA	
5	**Revising TTC based on change in system conditions**		
5.2	Real-time security desk caring TTC calculations	NA	
6	**Coordinated outage planning of transmission elements**	Coordianted as per OCC S/D approval	
7	**Reactive power planning**	Done	
9	**Optimum utilization of availability assets**		
9.1	Regulatory provision - absorption of reactive power by generators	NA	
9.2	Audit of HVDC, TCSC, SVC and PSS	Completed	
9.3	Functioning of existing PMU and availability of their output to RLDC	Completed	

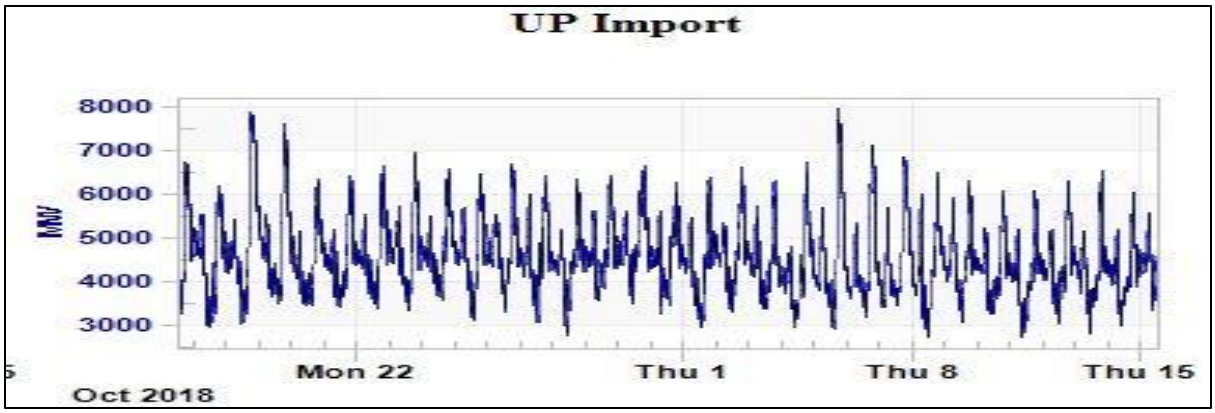
S. No.	Recommendation	Status	Remarks
10	**Deployments of WAMS**		
10.1	Synchro phasor based WAMS employing PMUs	Completed	
10.2	Possible of voltage collapse prediction	NA	
11	**Dynamic security assessment and review of state estimation**	NA	
12	**Implementation of islanding schemes**	NA	
13	**Autonomy to Load Dispatch Centers**		
13.1	Organization of the Load Dispatch Centers reviewed and entrusted to ISO	NA	
13.2	Training and certification of system operators need to be given focused attention	NA	
14	**Development of Intra-state transmission system**	Done	
15	**Network visualization**		
15.2	Fiber optic communication system	Done	
15.3	RTUs and communication equipment should have uninterruptible power supply with proper battery back up	Done	
15.4	Telemetry facilities will be install for all generation station and transmission element without these	Done	
16	**Reduction in Start-up time Generators**	NA	
18	**Strengthening of system study groups in various power sector organization**	Done	
20	**Improved telecom infrastructure for cyber security**	Done	

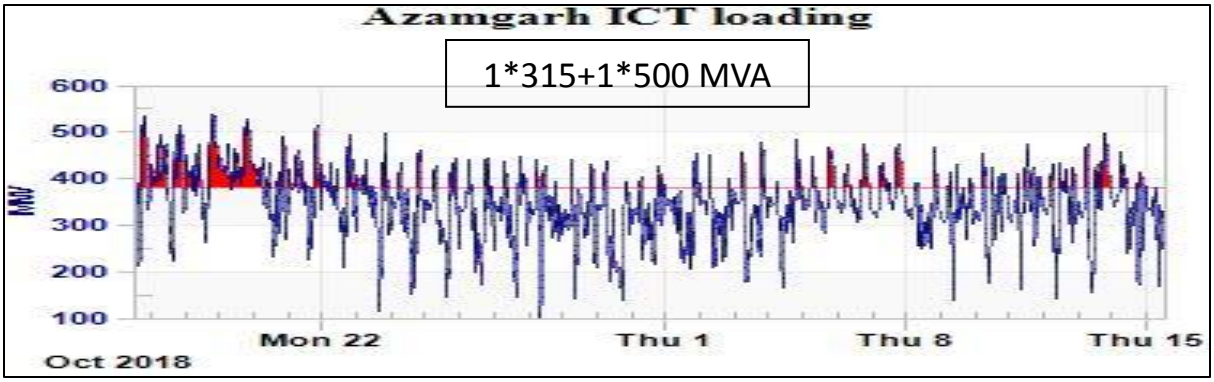
Decommissioning Plan of NTPC, Badarpur

	Activity	Target/ Actual Date
1.	Stoppage of Operation of Unit#4&5	15.10.2018
2.	Cooling down and Decommissioning of Units	31.10.2018
3.	Transfer of switchyard to DTL	15.11.2018
4.	Sending of Equipment and Spares to other NTPC stations	31.12.2018
5.	Award of contract for sell of Equipment	31.3.2019
6.	Dismantling and sell of Equipment	30.9.2020


Rajasthan Import
4000
3000
2000
1000
0
MW
Mon 22
Thu 1
Thu 8
Thu 15
Oct 2018

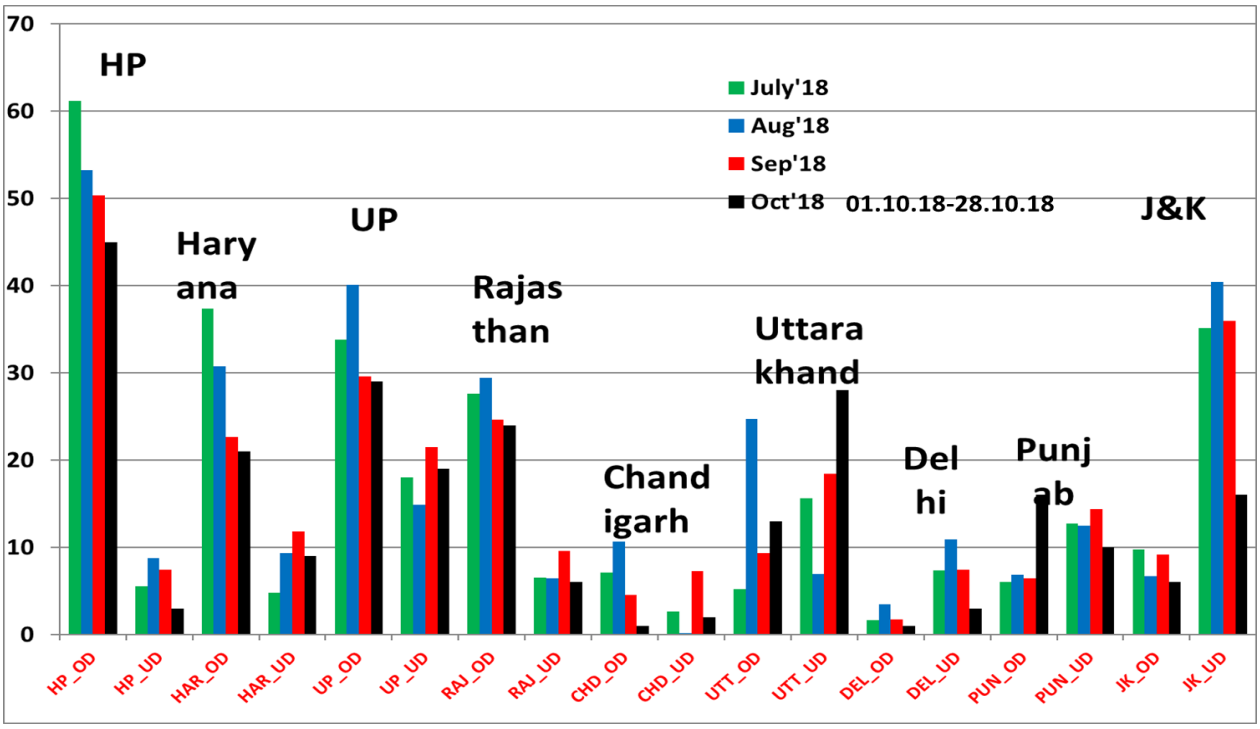

Phagi ICT loading
2*1500 MVA
2000
1800
1600
1400
1200
MW
Mon 22
Thu 1
Thu 8
Thu 15
Oct 2018

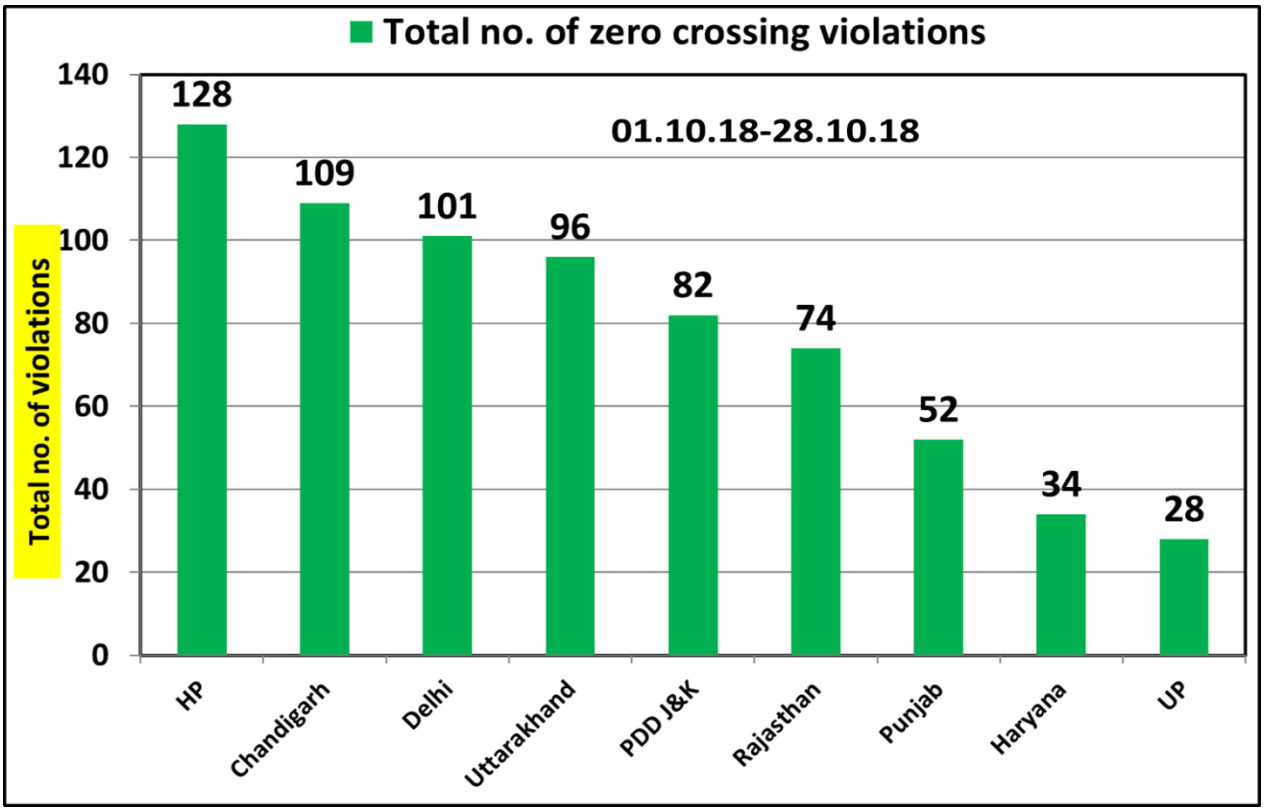

UP Import
8000
7000
6000
5000
4000
3000
MW
Mon 22
Thu 1
Thu 8
Thu 15
Oct 2018


Azamgarh ICT loading
1*315+1*500 MVA
600
500
400
300
200
100
MW
Mon 22
Thu 1
Thu 8
Thu 15
Oct 2018

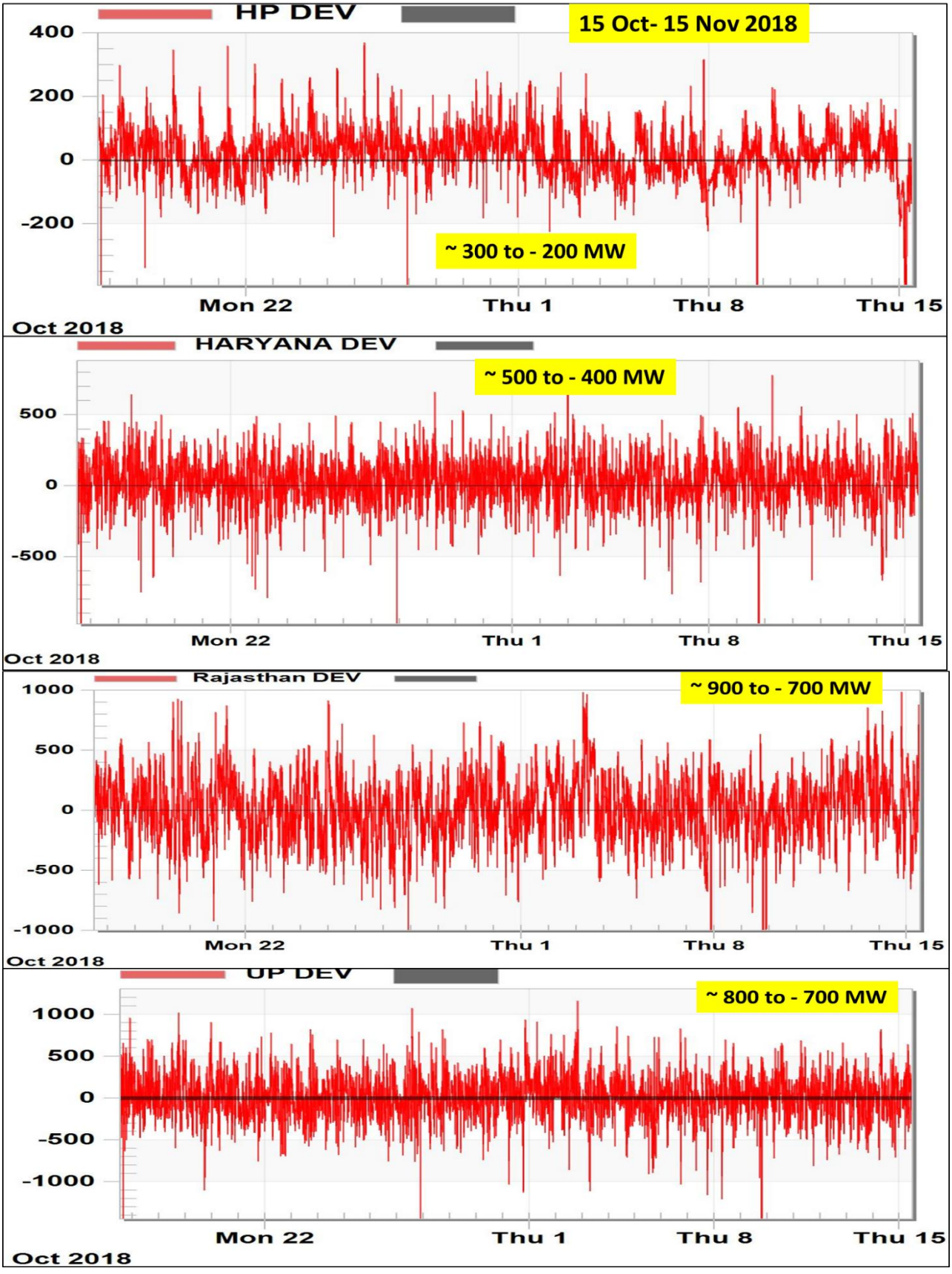
Annexure-II

Deviation Violations Jul-Oct'18
Average no. of blocks per day

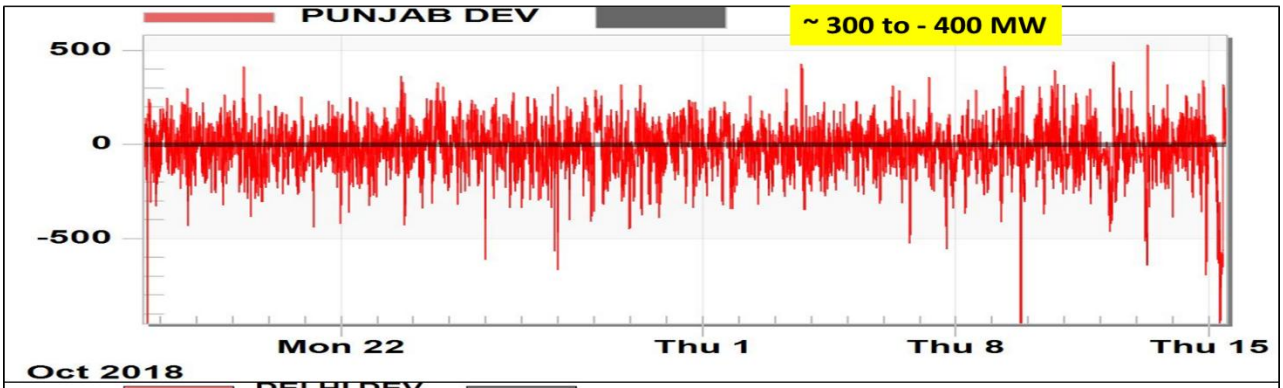


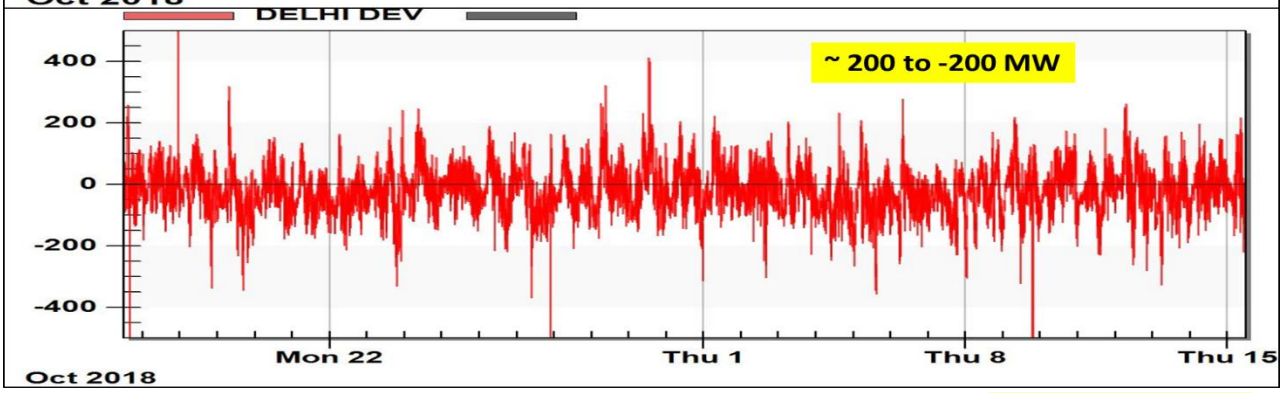


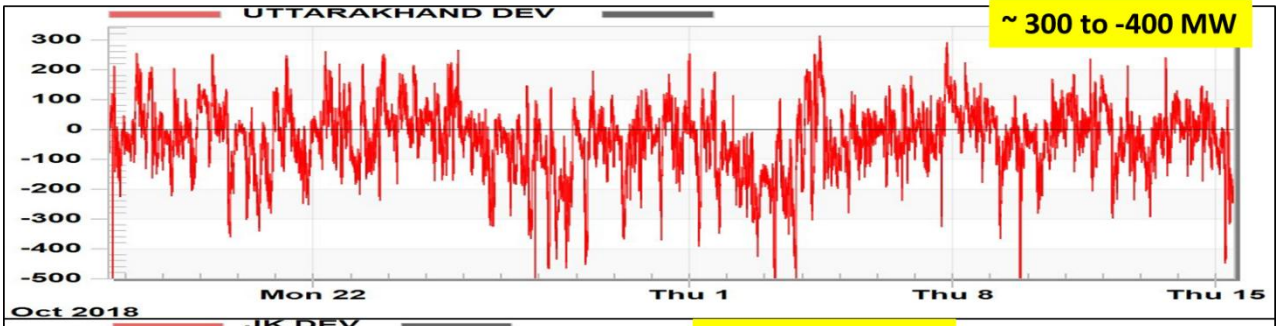
Annexure-II

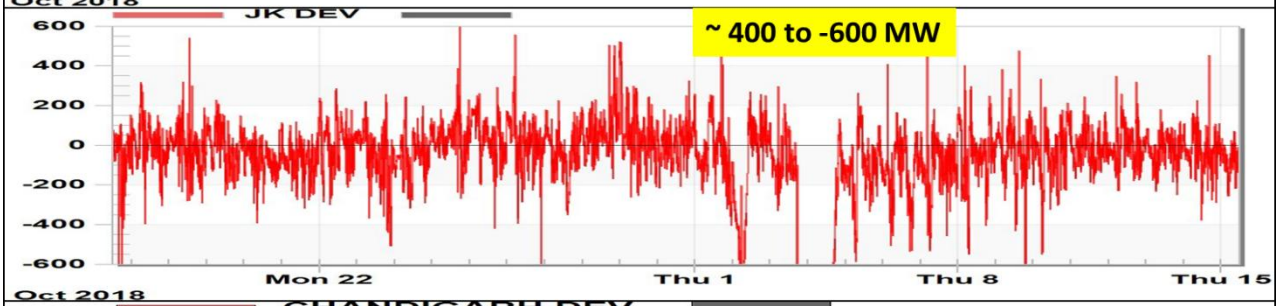

HP DEV
15 Oct- 15 Nov 2018
400
200
0
-200
~ 300 to - 200 MW
Mon 22
Thu 1
Thu 8
Thu 15
Oct 2018
HARYANA DEV
~ 500 to - 400 MW
500
0
-500
Mon 22
Thu 1
Thu 8
Thu 15
Oct 2018
Rajasthan DEV
~ 900 to - 700 MW
1000
500
0
-500
-1000
Mon 22
Thu 1
Thu 8
Thu 15
Oct 2018
UP DEV
~ 800 to - 700 MW
1000
500
0
-500
-1000
Mon 22
Thu 1
Thu 8
Thu 15
Oct 2018

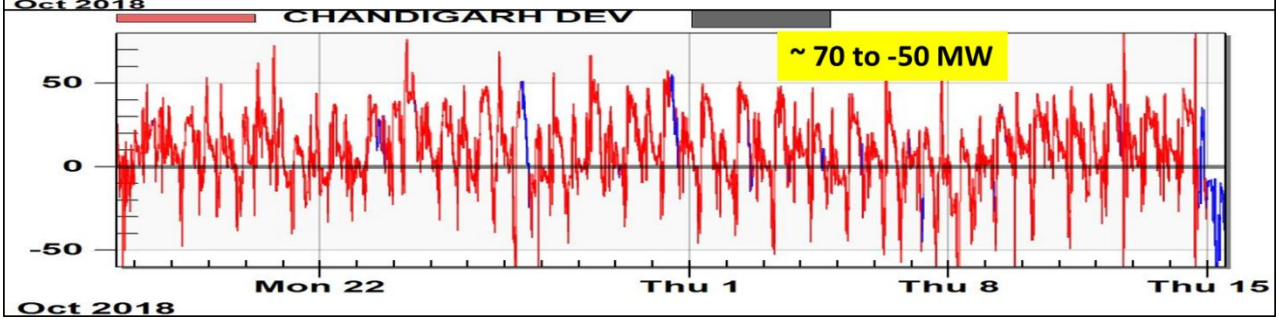
Annexure-II


PUNJAB DEV
~ 300 to - 400 MW
500
0
-500
Mon 22
Thu 1
Thu 8
Thu 15
Oct 2018

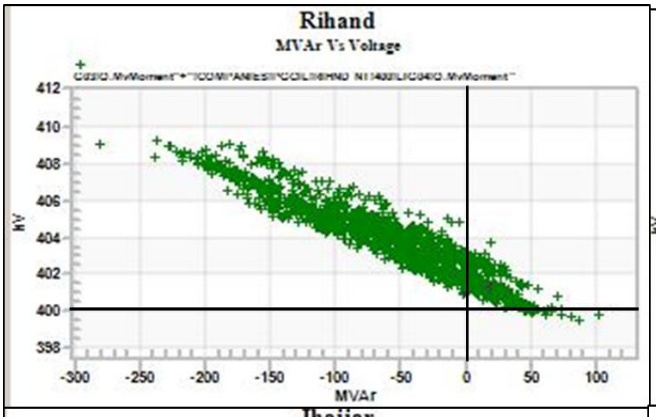

DELHI DEV
~ 200 to -200 MW
400
200
0
-200
-400
Mon 22
Thu 1
Thu 8
Thu 15
Oct 2018

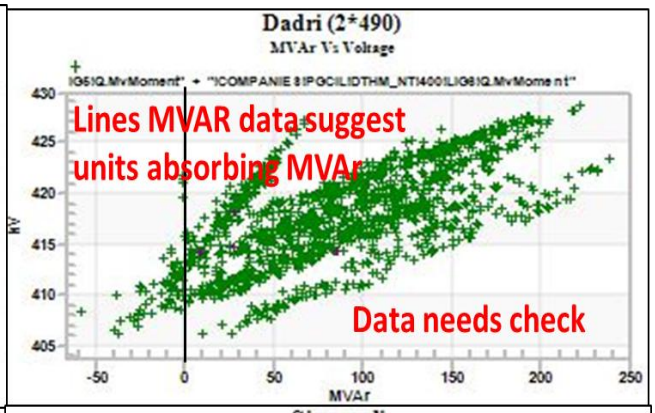

UTTARAKHAND DEV
~ 300 to -400 MW
300
200
100
0
-100
-200
-300
-400
-500
Mon 22
Thu 1
Thu 8
Thu 15
Oct 2018

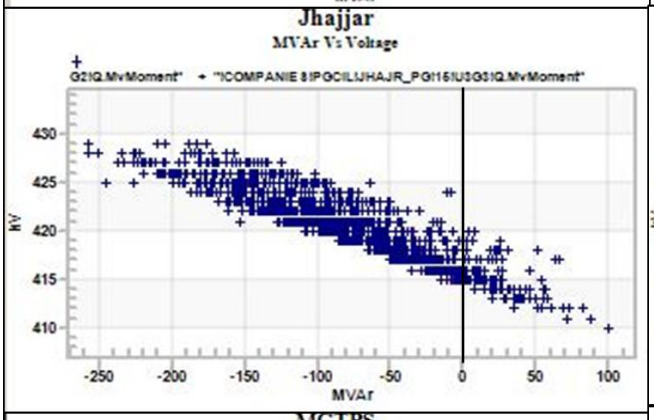

JK DEV
~ 400 to -600 MW
600
400
200
0
-200
-400
-600
Mon 22
Thu 1
Thu 8
Thu 15
Oct 2018

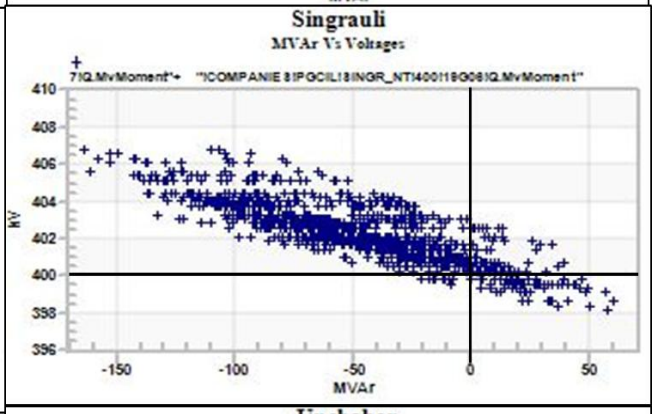

CHANDIGARH DEV
~ 70 to -50 MW
50
0
-50
Mon 22
Thu 1
Thu 8
Thu 15
Oct 2018

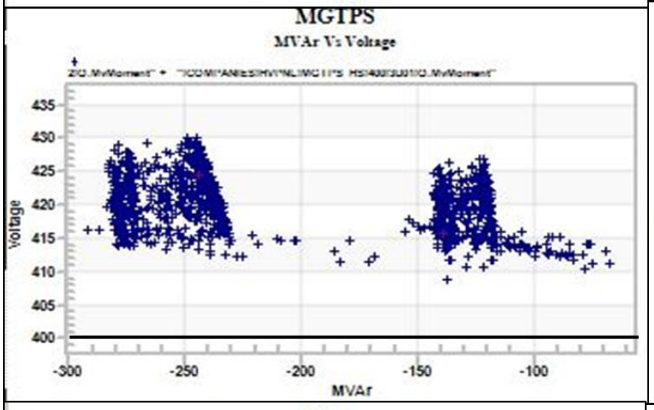
Annexure-III

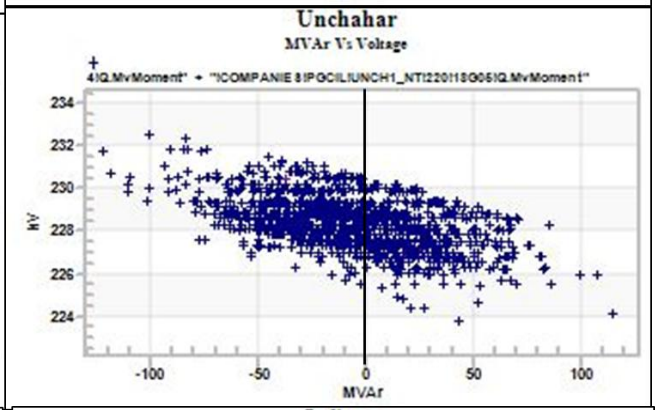


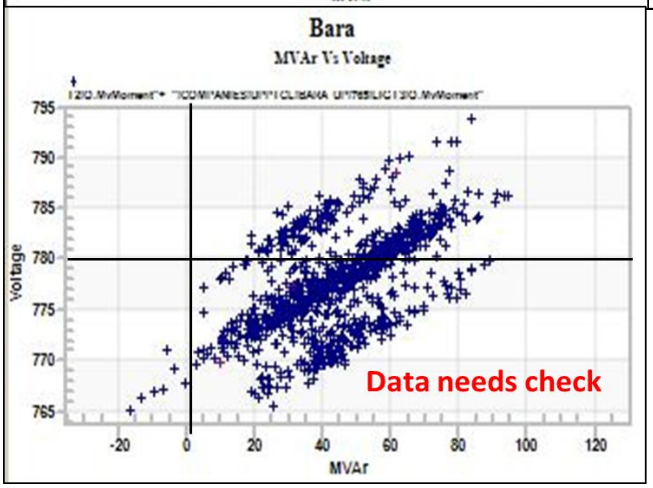


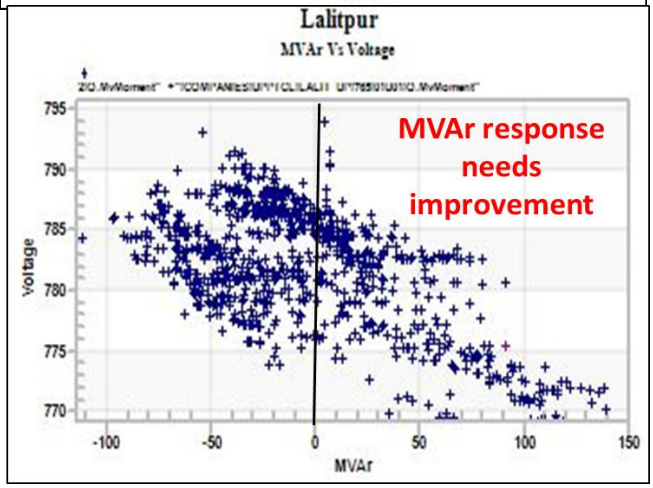




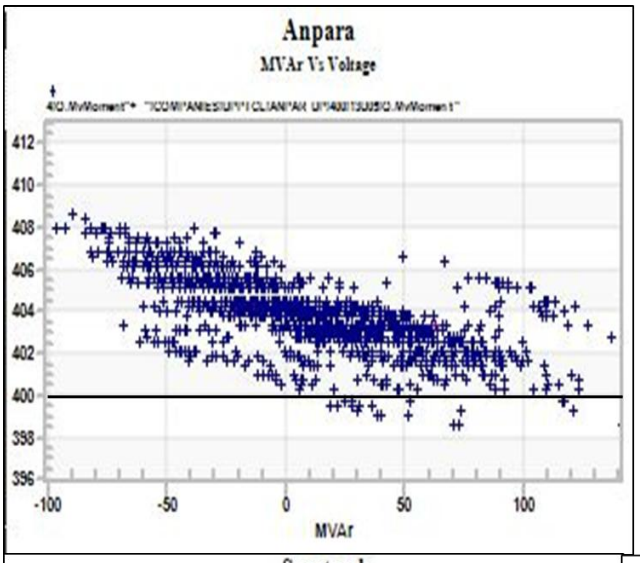


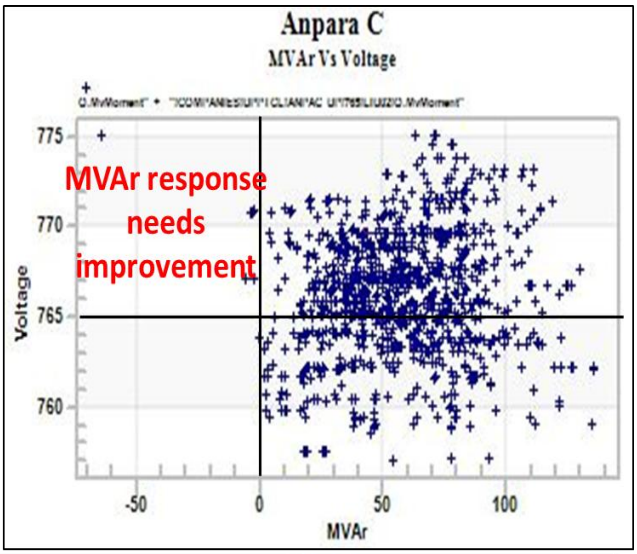


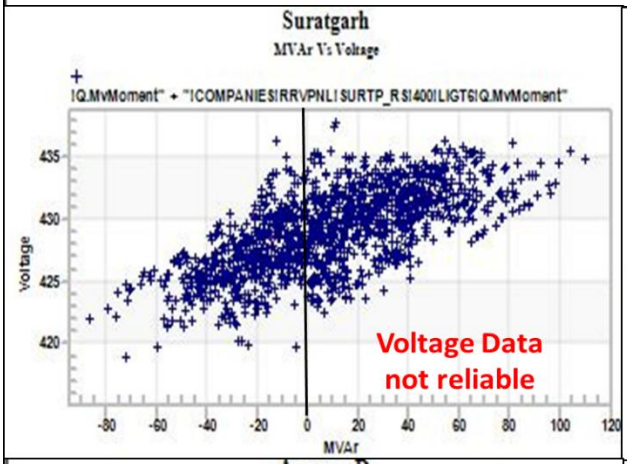


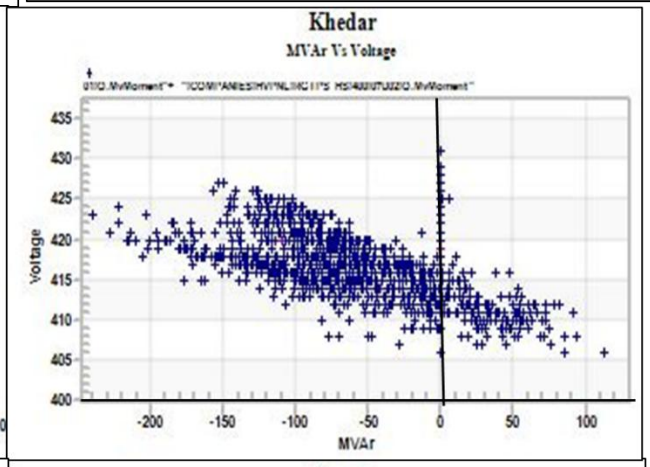


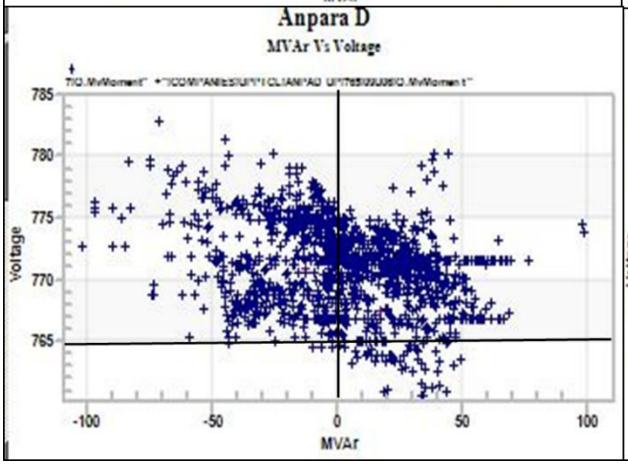
Annexure-III

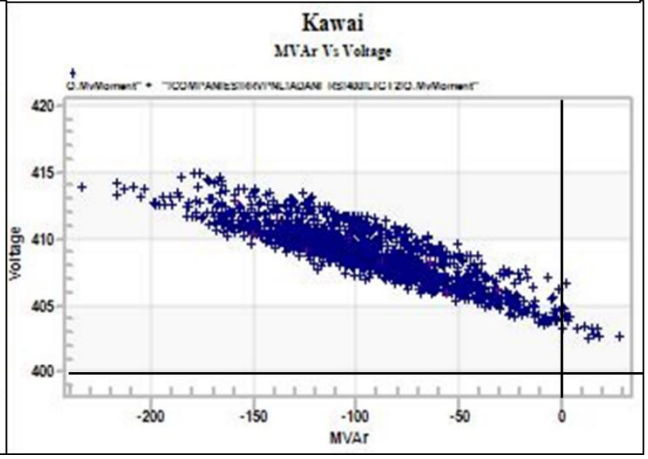




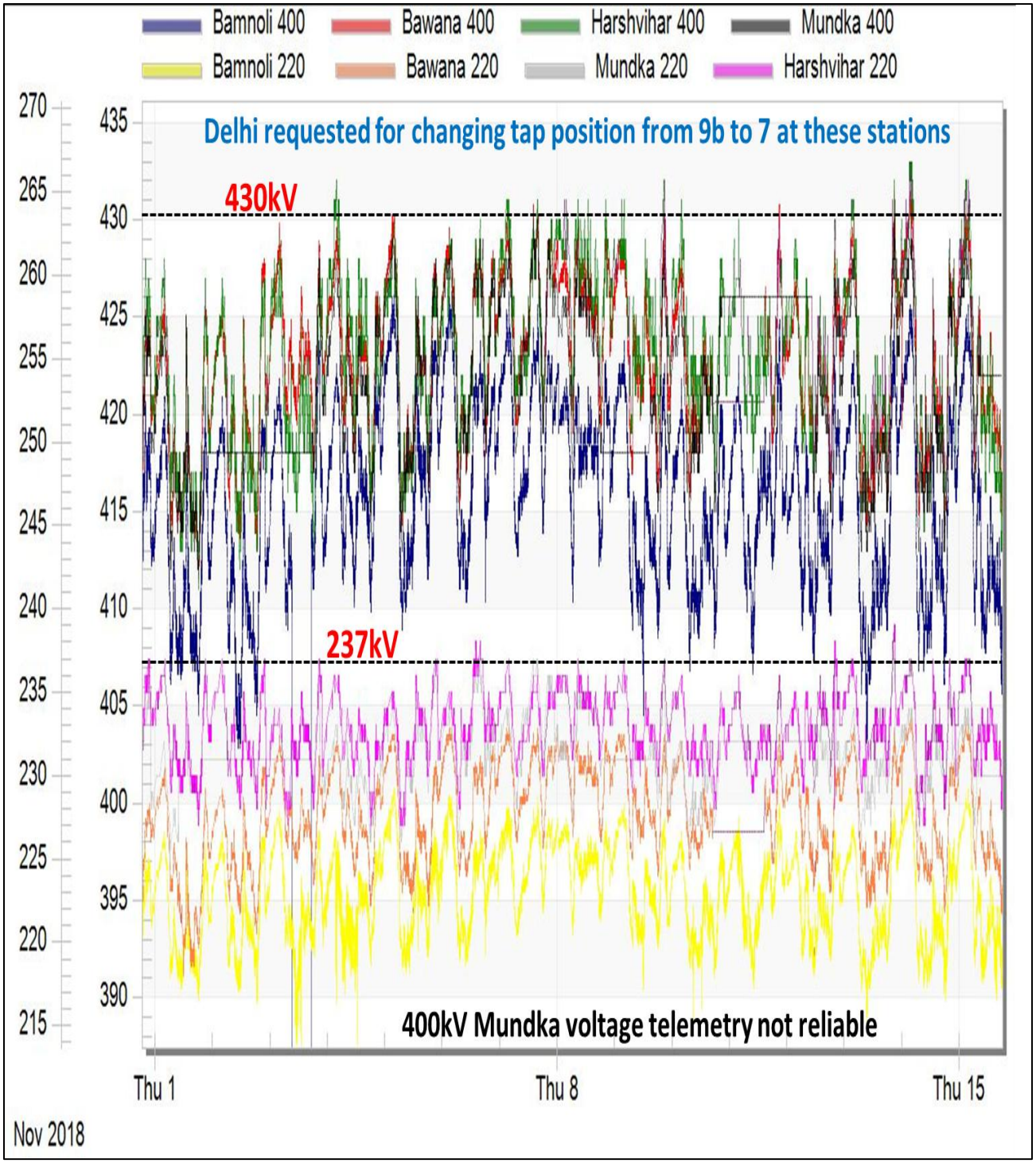








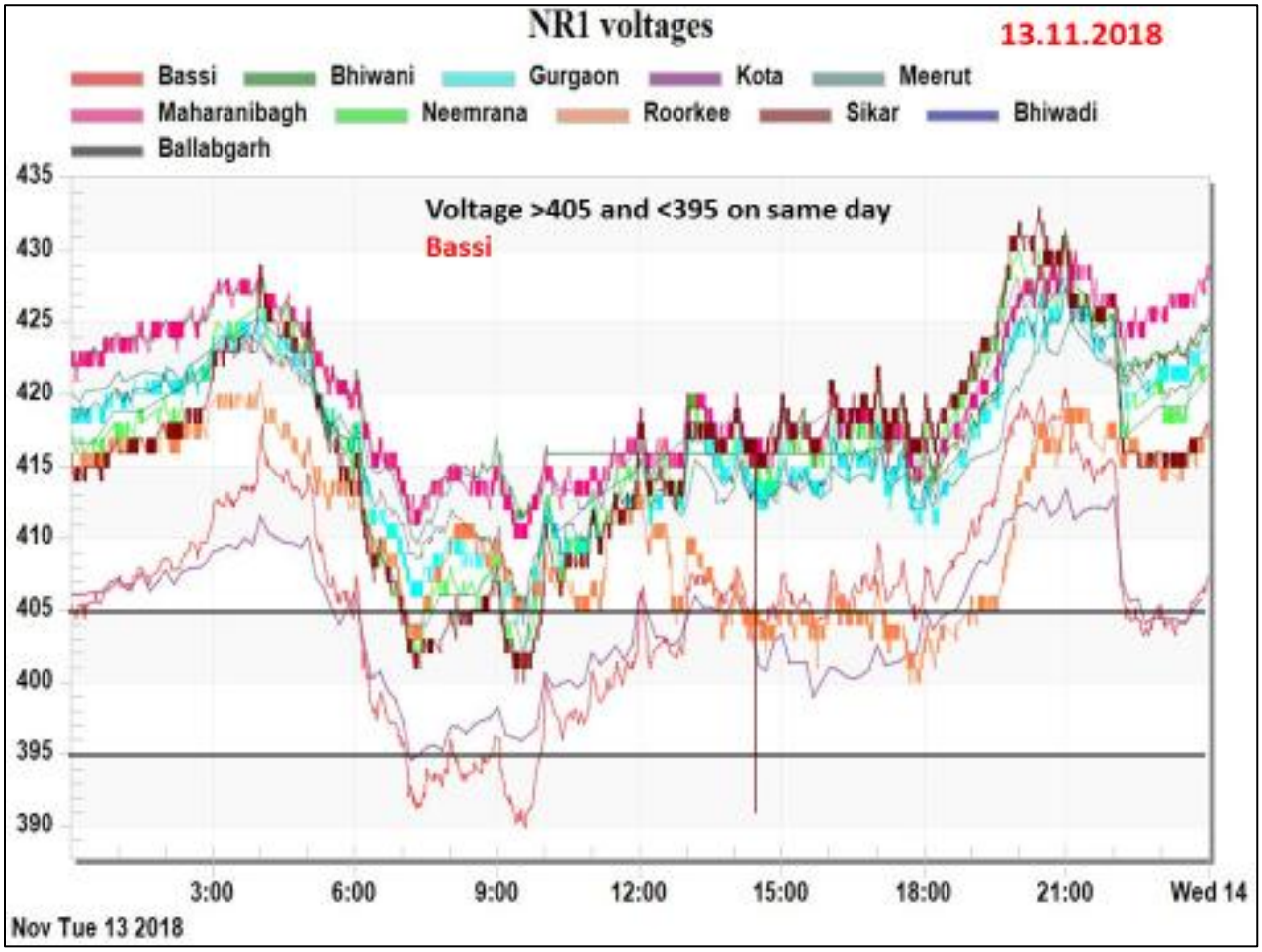
Annexure-IV.a

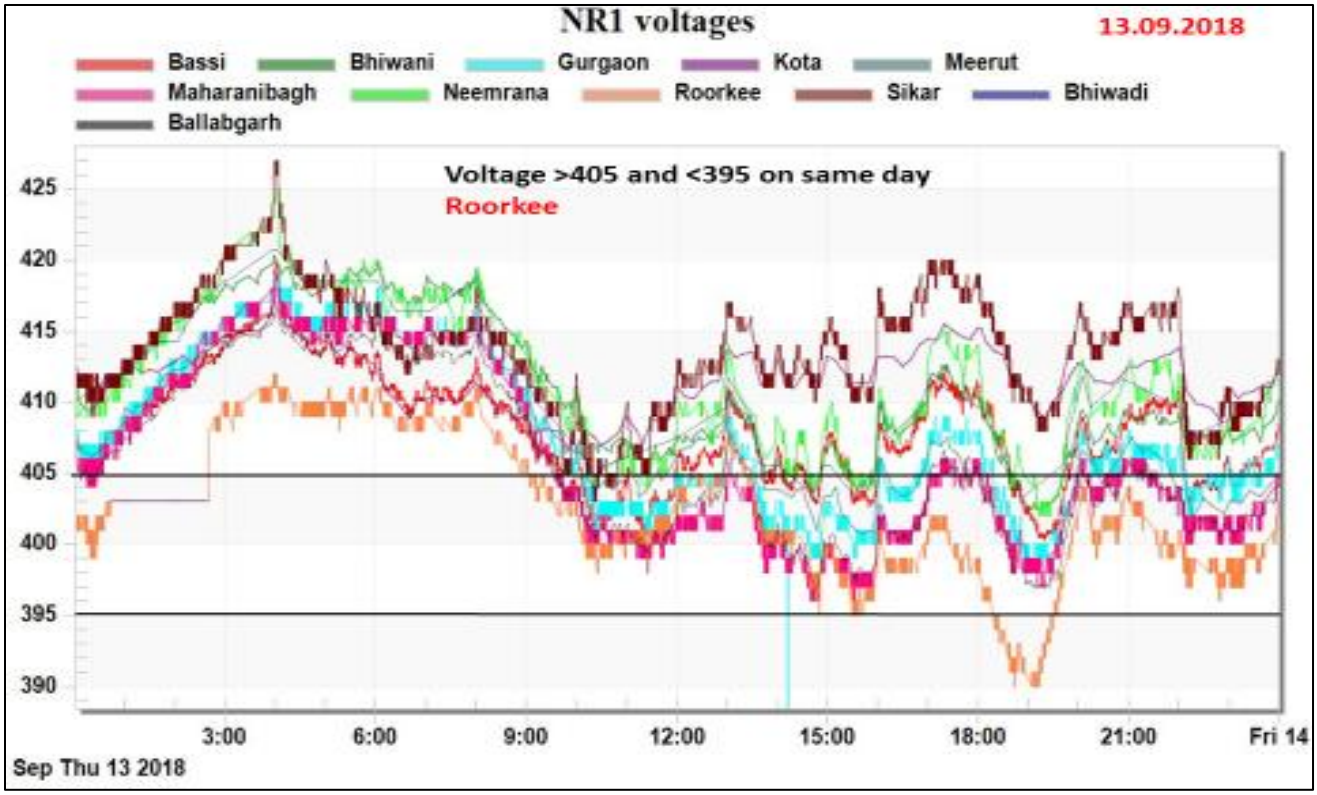


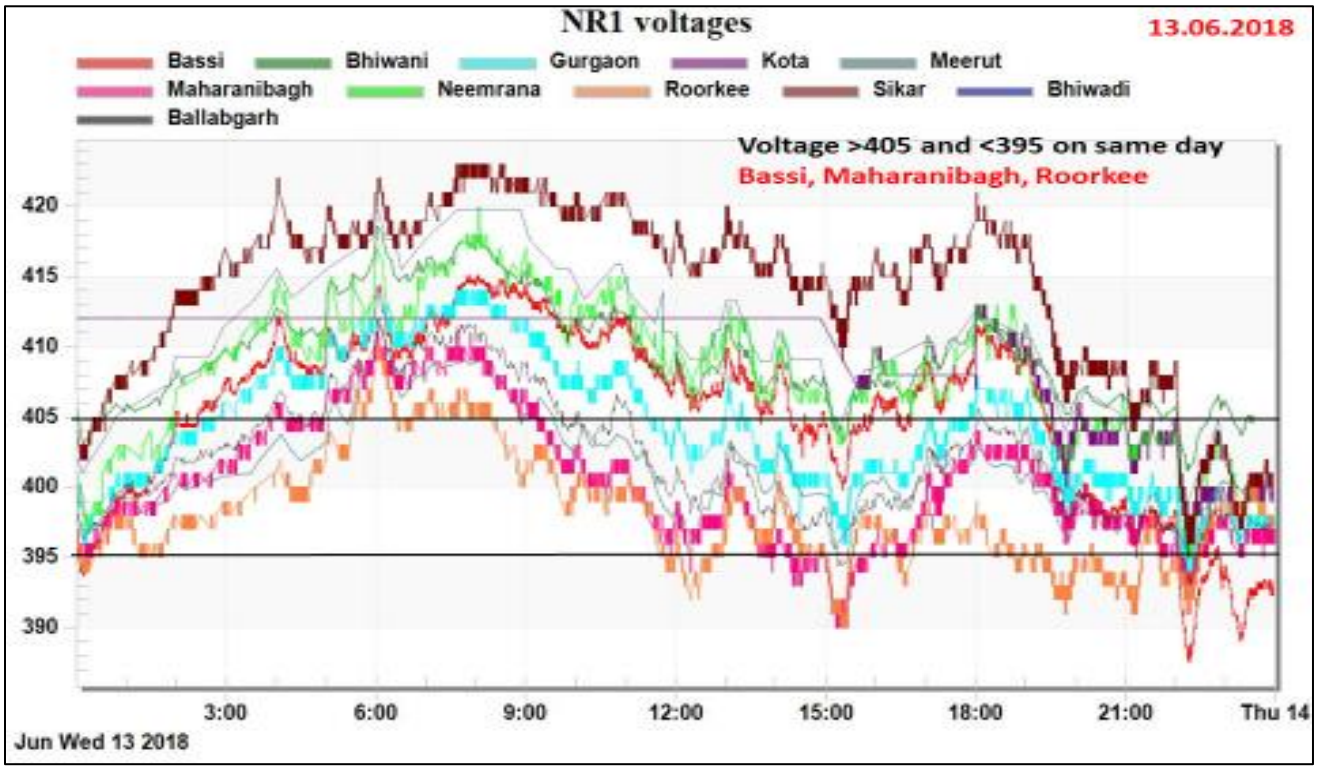
Annexure-IV.b

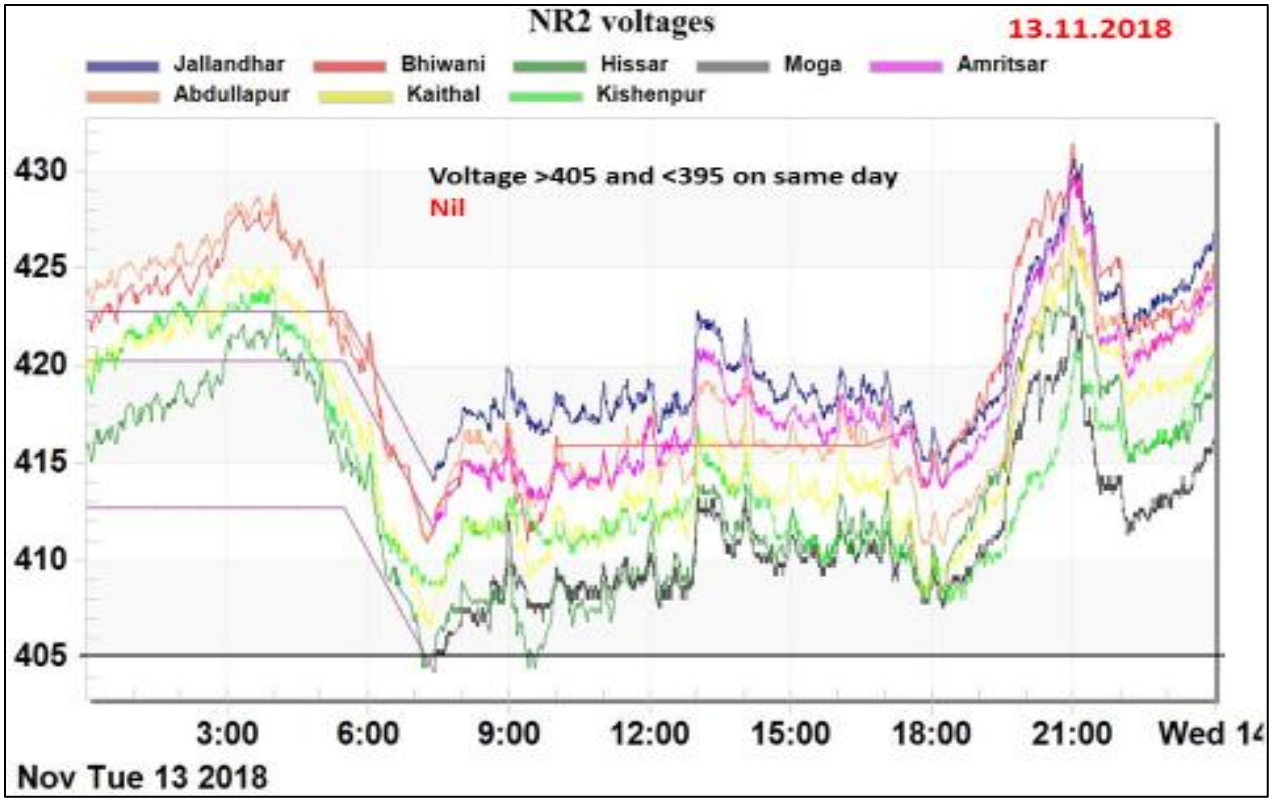
NORTHERN REGION POWERGRID SUBSTATIONS VOLTAGE PROFILE

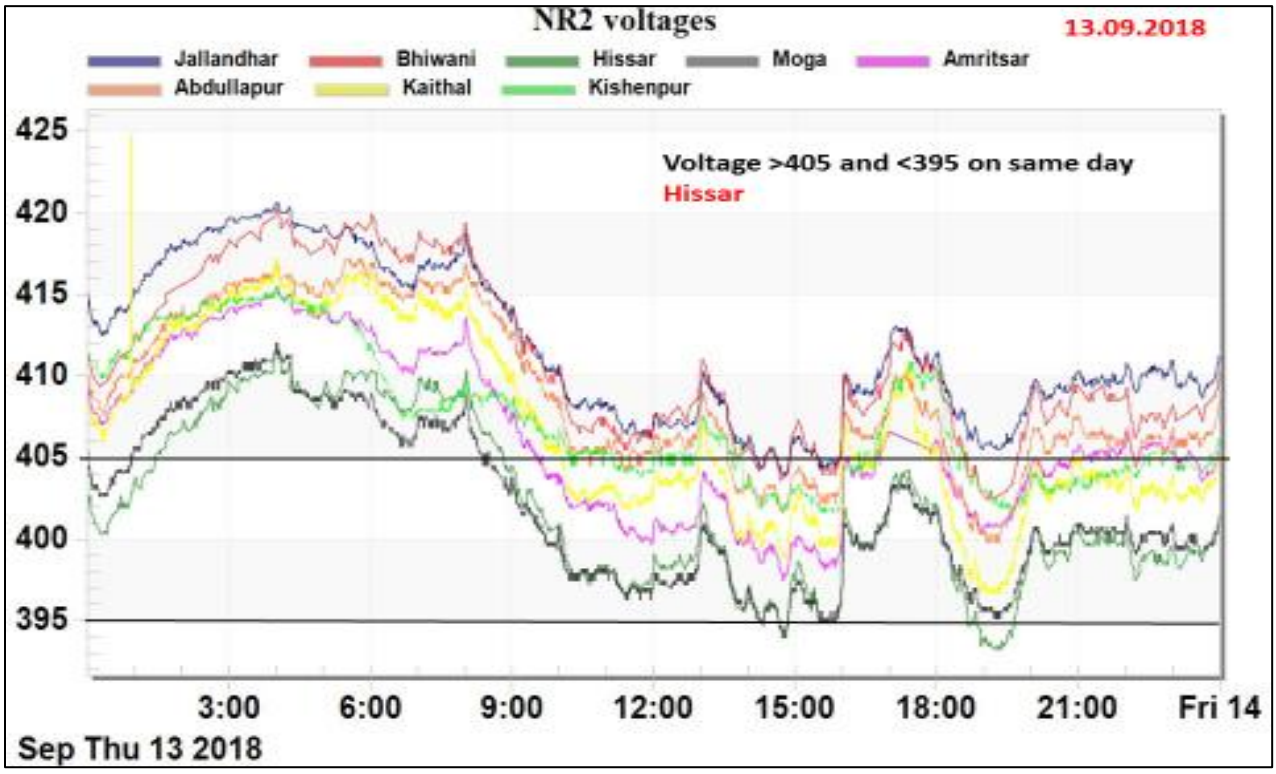
Samples for Nov'18, Sep'18, Jun'18

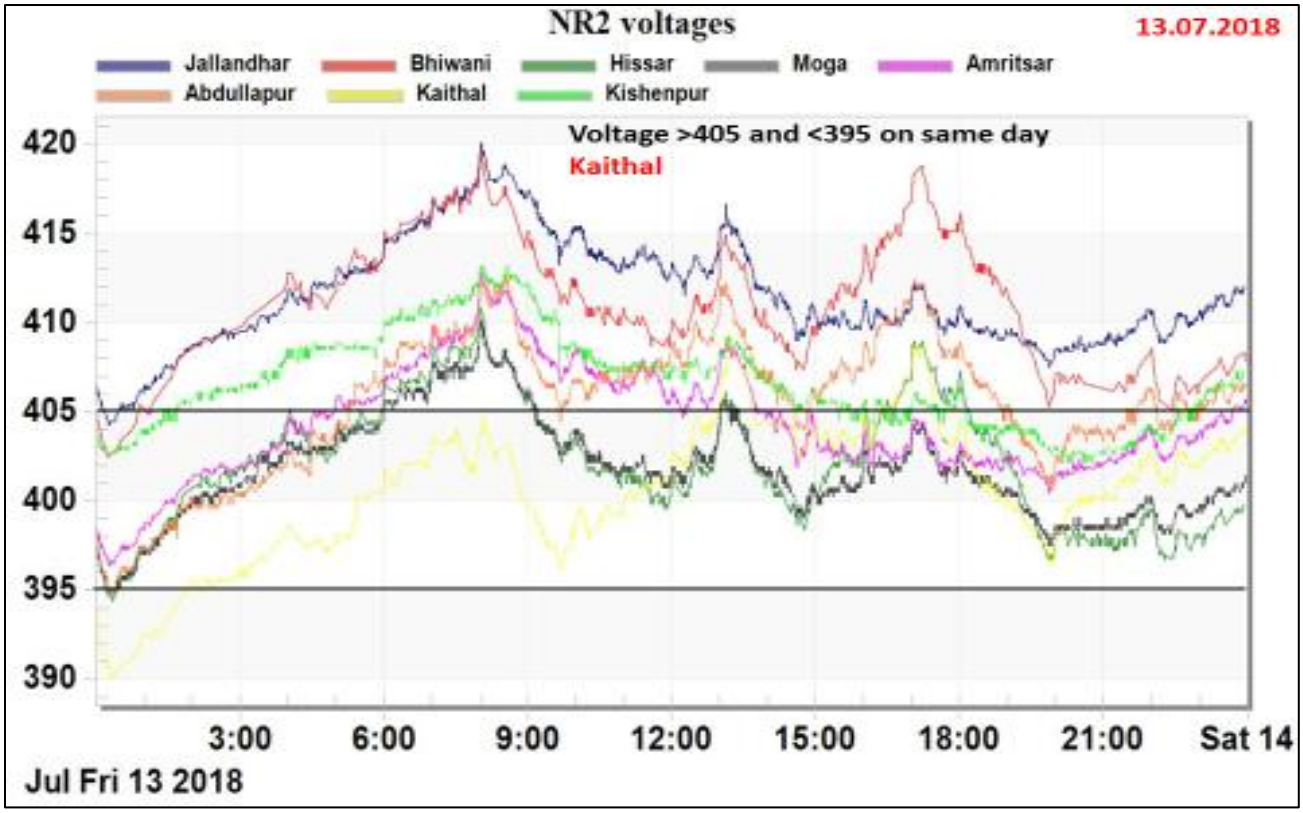


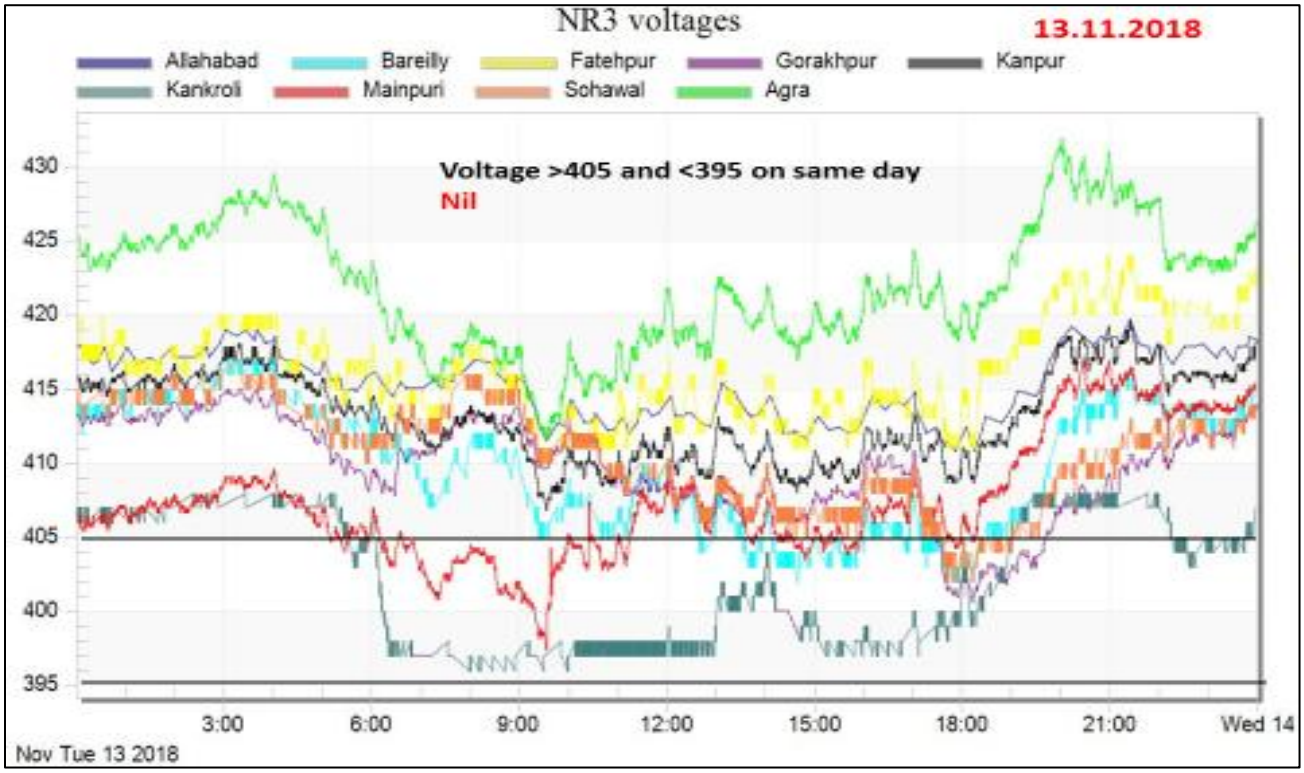

NR1 voltages
13.09.2018
Bassi
Bhiwani
Gurgaon
Kota
Meerut
Maharanibagh
Neemrana
Roorkee
Sikar
Bhiwadi
Ballabgarh
Voltage >405 and <395 on same day
Roorkee
425
420
415
410
405
400
395
390
3:00
6:00
9:00
12:00
15:00
18:00
21:00
Fri 14
Sep Thu 13 2018

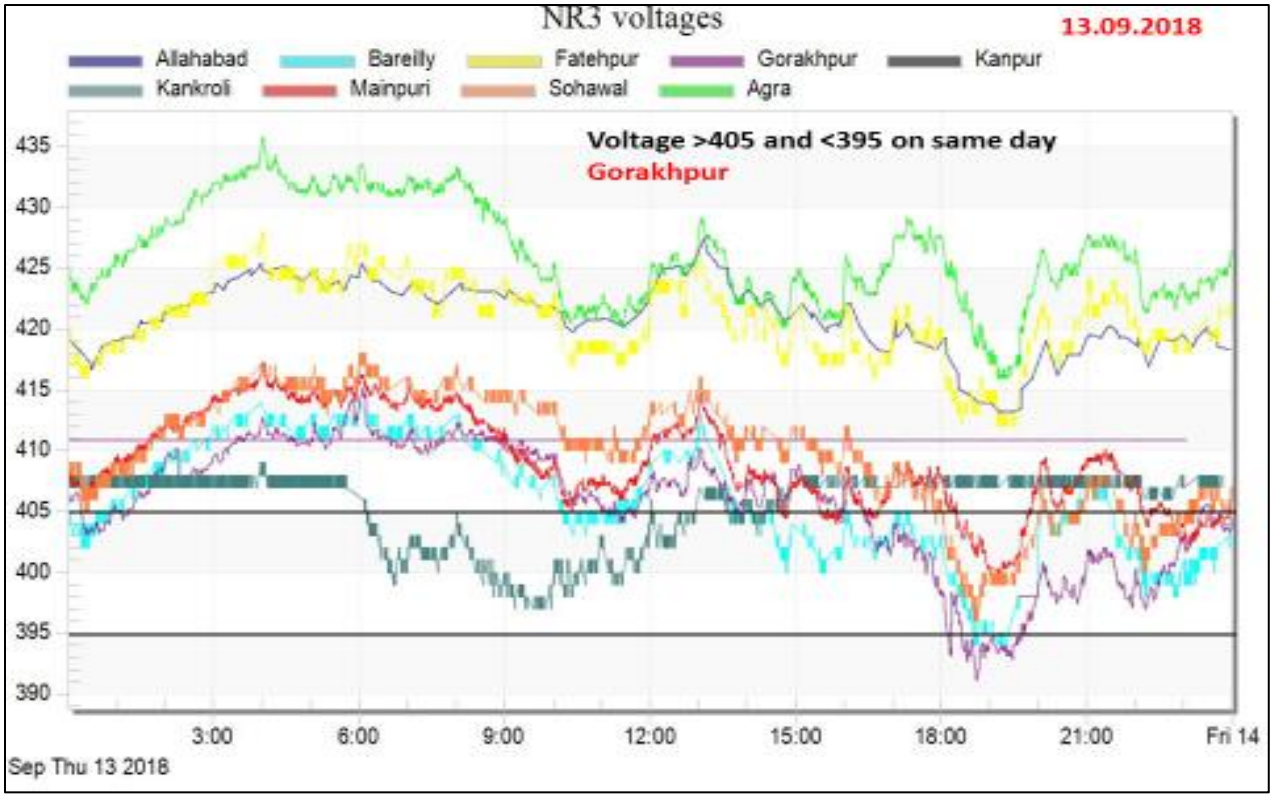

NR1 voltages
13.06.2018
Bassi
Bhiwani
Gurgaon
Kota
Meerut
Maharanibagh
Neemrana
Roorkee
Sikar
Bhiwadi
Ballabgarh
Voltage >405 and <395 on same day
Bassi, Maharanibagh, Roorkee
420
415
410
405
400
395
390
3:00
6:00
9:00
12:00
15:00
18:00
21:00
Thu 14
Jun Wed 13 2018

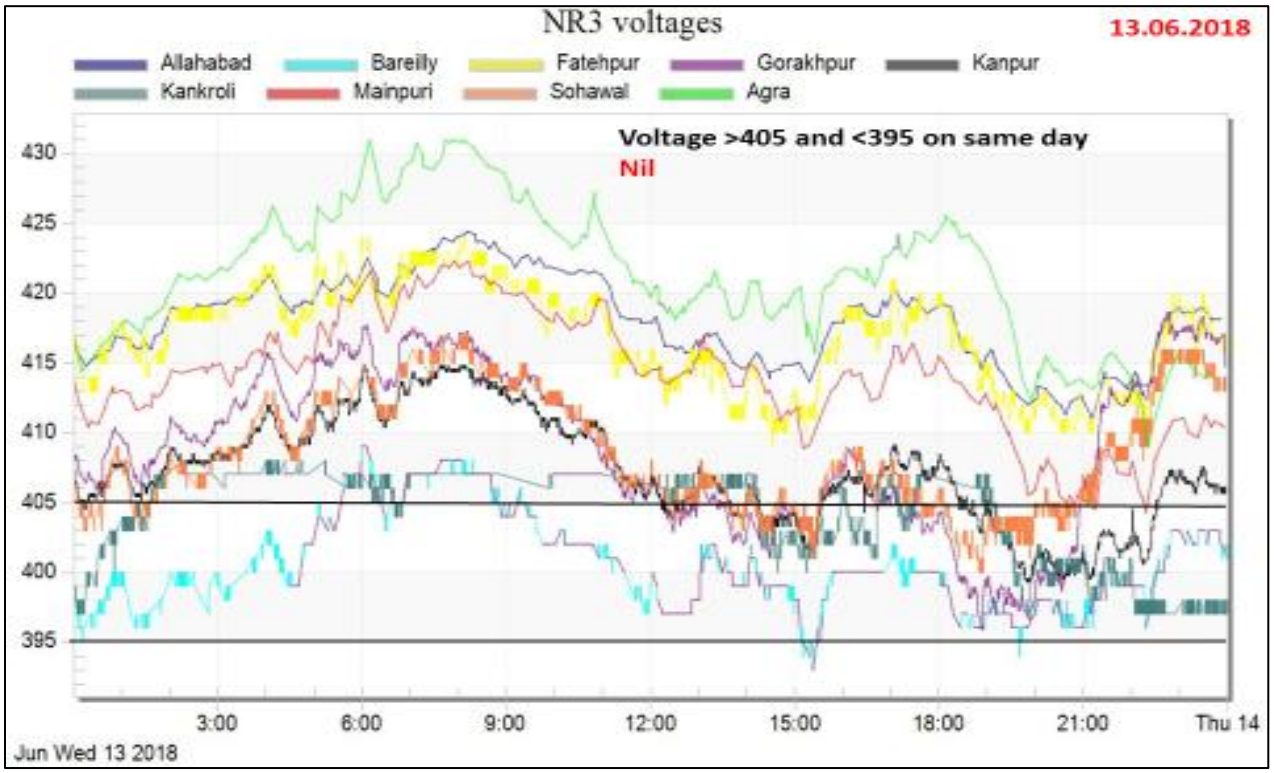

NR2 voltages
13.11.2018
Jallandhar
Bhiwani
Hissar
Moga
Amritsar
Abdullapur
Kaithal
Kishenpur
Voltage >405 and <395 on same day
Nil
430
425
420
415
410
405
3:00
6:00
9:00
12:00
15:00
18:00
21:00
Wed 14
Nov Tue 13 2018


NR2 voltages
13.09.2018
Jallandhar
Bhiwani
Hissar
Moga
Amritsar
Abdullapur
Kaithal
Kishenpur
Voltage >405 and <395 on same day
Hissar
425
420
415
410
405
400
395
3:00
6:00
9:00
12:00
15:00
18:00
21:00
Fri 14
Sep Thu 13 2018


NR2 voltages
13.07.2018
Jallandhar
Bhiwani
Hissar
Moga
Amritsar
Abdullapur
Kaithal
Kishenpur
Voltage >405 and <395 on same day
Kaithal
420
415
410
405
400
395
390
3:00
6:00
9:00
12:00
15:00
18:00
21:00
Sat 14
Jul Fri 13 2018


NR3 voltages
13.11.2018
Allahabad
Bareilly
Fatehpur
Gorakhpur
Kanpur
Kankroli
Mainpuri
Sohawal
Agra
Voltage >405 and <395 on same day
Nil
430
425
420
415
410
405
400
395
3:00
6:00
9:00
12:00
15:00
18:00
21:00
Wed 14
Nov Tue 13 2018


NR3 voltages
13.09.2018
Allahabad
Bareilly
Fatehpur
Gorakhpur
Kanpur
Kankroli
Mainpuri
Sohawal
Agra
Voltage >405 and <395 on same day
Gorakhpur
435
430
425
420
415
410
405
400
395
390
3:00
6:00
9:00
12:00
15:00
18:00
21:00
Fri 14
Sep Thu 13 2018


NR3 voltages
13.06.2018
Allahabad
Bareilly
Fatehpur
Gorakhpur
Kanpur
Kankroli
Mainpuri
Sohawal
Agra
Voltage >405 and <395 on same day
Nil
430
425
420
415
410
405
400
395
3:00
6:00
9:00
12:00
15:00
18:00
21:00
Thu 14
Jun Wed 13 2018

Adani PL.	(i) Sh. Nirmal Sharma, VP (O&M), Fax- 0141-2292065 (ii) Sh. Sameer Ganju, Head-Northern Region, Fax No. 011-24115560
APCPL	(i) AGM (O&M)-I, IGSTPP, Fax No. 01251-266326 (ii) AGM (EEMG), 01251-266326
BBMB	(i) Director (PR) Fax- 0172-2652820 (ii) Power Controller, Fax- 0172-2653297.
HVPNL	(i) Chief Engineer (Comm.); SE (SO & SLDC): 0181-2664440 Fax-0172-2560622
NHPC	(i) Sh. N.S.Parameshwaran, E.D., Faridabad – Fax-0129-2272413 (ii) Sh.V.K.Sinha,Chief Engineer (O&M), Faridabad – Fax-0129-2272413
POWERGRID	(i) Sh. Prabhakar singh, ED (NR-I), Fax No. 011-26853488 (ii) Sh. A.K. Arora, General Manager (O&M), NR-I, (iii) Sh. R.V.S Kushwaha, General Manager (O&M), Jammu; Fax- 0191-2471187 (iv) Sh.Rajeev Sudan Dy, General Manager (OS), Fax- 0191-2471187
RRVUNL	(i) Sh. P.S Arya, Chief Engineer (PPMC & IT),) Fax- 0141-2740006
NTPC	(i) Head of OS/ Head of RCC, Fax No. 0120-2410082 (ii) Sh. Praveen Chaturvedi, GM (OS), NRHQ Lucknow; Fax-0522-2305849. (iii) DP Singh AGM –OS NRHQ NTPC LIMITED Lucknow
HPSEBL	(i) Sh Suneel Grover, Chief Engineer (SO &P), Fax No. 0177-2653656 (ii) Sh. Deepak Uppal, SE (PR& ALDC): Fax-0177-2837143 (iii) Sh. Joginder Singh. Power Controller, Fax No. 0177-2837143.
NRLDC	General Manager - 26854861, 4051, 26569504 Fax- 26852747
NLDC	General Manager, NLDC, Fax: 011-26853488/26601079
Lanco APTL	Sh. Raj Kumar Roy, Director, Fax: 0124-2341627/4741024
SJVNL/NJHPS	General Manager (C&SO), Fax- 0177-2673283
PTCUL/UPCL	(i) Sh. Anupam Sharma, SE (SLDC), Fax- 0135-2451160, 0135-2763570
UPPTCL	(i) Director (Op), Fax- 0522-2286476 (ii) Chief Engineer (SLDC), Fax- 0522-2287880, 2288736
HPLDS	(i) Sh. N.P.sharma, SE, SLDC, Fax: 0177-2837649 (ii) Sh. Lokesh Thakur, Executive engineer, Fax: 0177-2837649
DTL	General Manager (SLDC)/ General Manager (Protection) Fax-23236462, 23221069
THDCIL	Sh. GM (EM - Design), Rishikesh
PSTCL	(i) Chief Engineer (SLDC) Fax – 0175-2365340 (ii) Dy.Chief Engineer (SLDC) Fax – 0175-2365340
CHANDIGARH	Sh. M.P.Singh, SE (Elect. Op.Circle) – Fax-0172-2740505
IPGCL/PPCL	(i) Sh. Y.P.Arora,GM (T), IPGCL, New Delhi, Fax- 23370884 (ii) Sh. R.K.Yadav, DGM (T), IPGCL, New Delhi, Fax- 23370884
BRPL	Sh. Satinder Sondhi, VP & Head System Operations, Fax No. 011-39996549
Everest PPL	Sh. Yogendra Kumar, Chief Operating Officer, Fax No. 011-45823862/ 43852507
RPSCL	Sh. Niranjan Jena, Addl.VP/ Sh. Suvendu Dey, Asst. VP-O&M, Fax: 05842-300003
HPGCL	Sh. S.K. Wadhwa SE/Technical(HQ), Fax: 0172-5022436
CEA	(i) Sh.Vikram Singh, Director; Fax-26170385,26108834 (ii) Chief Engineer, NPC, New Delhi
TPDDL	(i) Sh. Sanjay Banga, VP, Tata power-DDL, New Delhi (Fax: 011-27468042) (ii) Sh. Praveen Verma, Addl. GM, Tata Power-DDL, New Delhi (Fax: 011-27468042)
PTC India Ltd.	Sh. Ajit Kumar, Director (Commercial & Operations), PTC India Ltd., New Delhi (Fax- 011-41659144,41659145)
AD Hydro	Sh. Anil Kumar Garg, General Manager(BD), AD Hydro Power Ltd., Noida-201301, (Fax: 0120-4323271/4278772)
DISCOM UP	Sh. Rakesh Kumar, Director (T), Dakshinanchal VVNL, Agra-282007 (Fax- 0562-2605465)

NPL Mr. Rajesh Kumar, Head Operations- 08427183924, Email id: Kumar.Rajesh@larsentoubro.com
Address: Nabha Power Limited, PO box 28, Near Village Nalash, Rajpura, Punjab 140401.

Mr. Ravinder Singh Lall, Head O&M – 09815355411, Email : Ravindersingh.lall@larsentoubro.com
Mr. Pinaki Mukherjee, Sr. DGM, Commercial – 09871391388, Email id: Pinaki.mukhejee@larsentoubro.com

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J&K SPDCL	GM, Fax: 0194-2500145
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UPRVUNL	DGM (TOM), 0522-2287861
UJVNL	General Manager Engineering: 0135-2761485, fax- 0135-2761549
NPCIL	(i) Station Director, NAPS; Fax. 05734-222177.(ii) Sr. Manager (Transmission), NPCILFax.-022-25563350
JPPVL	Sh. Suresh Chandra, Director, Fax- 0120-4516201/4609464/4609496
Jhajjar PL	Sh. Goutam Biswas, GM (Production), 01251-270155.
	Nabha Power Ltd (Rajpura)
LPGCL	Sh. A. N. Sar, Unit Head And Exec. Director, Fax- 91-22-22048681

Talwandi saboo Pvt ltd	Amit Mittal,GM- Power Sales, Strategy & Corporate Affairs,Talwandi Saboo