



सत्यमेव जयते

भारत सरकार

Government of India

विद्युत मंत्रालय

Ministry of Power

उत्तर क्षेत्रीय विद्युत समिति

Northern Regional Power Committee

सं.-उक्षेविस/प्रचालन/106/01/2019/1222-1263

दिनांक: 07/02/2019

विषय: प्रचालन समन्वय उपसमिति की 156वीं बैठक का कार्यसूची।
Subject: Agenda of 156th OCC meeting.

प्रचालन समन्वय उप-समिति की 156वीं बैठक 12-02-2019 को 10:30 बजे से उ.क्षे.वि.स.सचिवालय, नई दिल्ली में आयोजित की जाएगी। उक्त बैठक की कार्यसूची उत्तर क्षेत्रीय विद्युत समिति की वेबसाइट <http://www.nrpc.gov.in> पर उपलब्ध है।

156th meeting of the Operation Co-ordination sub-committee will be held on 12-02-2019 at 10:30am at NRPC Secretariat, New Delhi. The agenda of this meeting has been uploaded on the NRPC web-site <http://www.nrpc.gov.in>.

The status of various points under follow up issues from previous OCC meetings may please be furnished prior to the meeting for ensuring healthy discussions in the meeting.

Sd/-

(सौमित्र मजूमदार)

अधीक्षण अभियंता(प्रचालन)

सेवा में : प्रचालन समन्वय उपसमिति के सभी सदस्य।

To: All Members of OCC

Part-A NRPC

1. Confirmation of Minutes:

The minutes of the 155th OCC meeting held on 17.01.2019 and 18.01.2019 at New Delhi were issued vide letter of even number dated 06.02.2019.

No comment on the minutes has been received from any of the members till date.

The sub-committee may kindly confirm the Minutes.

2. Review of Grid operations of January, 2019:

2.1 Supply Position (Provisional) for January, 2019

Anticipated Power Supply Position v/s Actual Power Supply Position (Provisional) of Northern Region during the month of January, 2019 is as given below:

<u>January</u>							
State	Req/ Avl	Anticipated	Actual	%age Variation	Anticipated	Actual	%age Variation
		(MU)			(MW)		
Chandigarh	Avl	115	115	0.2	300	258	-14.0
	Req	115	115	0.2	260	258	-0.8
Delhi	Avl	3540	2142	-39.5	5660	4472	-21.0
	Req	2150	2141	-0.4	4600	4472	-2.8
Haryana	Avl	5450	3939	-27.7	8200	7078	-13.7
	Req	3800	3939	3.7	7120	7078	-0.6
H.P.	Avl	836	892	6.7	1650	1686	2.2
	Req	838	901	7.6	1640	1686	2.8
J&K	Avl	760	1528	101.0	1760	2866	62.8
	Req	1710	1881	10.0	2980	3582	20.2
Punjab	Avl	4937	3402	-31.1	7549	6049	-19.9
	Req	3600	3402	-5.5	6760	6049	-10.5
Rajasthan	Avl	8553	7265	-15.1	11730	12921	10.2
	Req	6963	7284	4.6	12499	12921	3.4
U.P.	Avl	10605	8597	-18.9	16770	14928	-11.0
	Req	11160	8645	-22.5	17500	14928	-14.7
Uttarakhand	Avl	1040	1189	14.3	1970	2216	12.5
	Req	1290	1192	-7.6	2180	2216	1.7

As per above, it has been observed that there are much variations (i.e. > 5.0%) in the Anticipated vis-à-vis Actual Power Supply Position (Provisional) for the month of January, 2019 in terms of Energy Requirement for HP, J&K, Punjab, Uttarakhand & UP and in terms of Peak Demand for

J&K, Punjab & UP. These states are requested to submit reasons for such variations in writing so that the same can be deliberated in the meeting.

All SLDCs are requested to furnish the provisional and revised 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 of NCR:

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 November, 2018 is placed on NRPC website. (www.nrpc.gov.in/meetings/occ.html)

2.3 Detailed presentation on grid operation during January, 2019 by NRLDC.

3. Maintenance Programme of Generating Units and Transmission Lines:

3.1. Maintenance Programme for Generating Units.

The proposed maintenance programme for Generating Units for the month of March, 2019 will be discussed on 11.02.2019 at NRPC office, New Delhi.

3.2. Outage Programme for Transmission Elements.

The proposed Outage programme of Transmission lines for the month of March, 2019 will be discussed on 11.02.2019 at NRPC office, New Delhi.

4. Planning of Grid Operation:

4.1. Anticipated Power Supply Position in Northern Region for March, 2019 (As per 15th LGBR Sub-committee meeting)

Anticipated Power Supply Position in Northern Region for March, 2019 (As per 17th LGBR Sub-committee meeting)

The Anticipated Power Supply Position in Northern Region for March, 2019 is enclosed at **Annexure 4.**

SLDCs are requested to inform their updated estimate of power supply position for March, 2019 and measures proposed to be taken to bridge the gap in availability as well to dispose of the surplus, if any, in the prescribed format.

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

The variable charges details for different generating units are available on the Merit Order Portal.

All utilities are requested to confirm if the process of Scheduling is being done as per Merit Order Despatch and in case of variations the reasons may be highlighted.

6. Reactive compensation at 220 kV/400kV level

6.1 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.

6.2 POWERGRID:

POWERGRID may update the progress made for the installation of 500 MVAR TCR at Kurukshetra. In the previous OCC meetings it has been intimated that the price bids have been opened and the LOA was expected to be placed with commissioning schedule of 2 years from the issue of LOA.

POWERGRID may update.

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 in the previous OCC meetings to update the progress of the same.

POWERGRID may update.

6.3 DTL:

The updated status of the reactors as received from DTL is placed below:

S.No.	Bus Name	Voltage level (kV)	Reactor (MVAR)	Plg. Status
1	Peeragarhi	220	1x50	PR No 1100002017 Raised.
2	Mundka	400	1x125	Scheme is being placed before BOD,DTL for approval
		220	1x25	
3	Harsh Vihar	220	2x50	Board preamble sent for financial vetting & approval. Scheme shall be placed before BOD,DTL.
4	Electric Lane	220	1x50	Feasibility report received from SS&LM division and site revisited. Accordingly, the Scheme is under preparation.
5	Bamnauli	220	2x25	Under financial concurrence
6	Indraprastha	220	2x25	Under financial concurrence
TOTAL			450	

Regarding the utilization of generators as synchronous condensers for reactive compensation, DTL had intimated in the 155th OCC meeting that the matter has already been taken up them with CEA for further deliberations.

DTL may update on any further progress made.

6.4 PSTCL:

Technical bid for 400 kV bus reactor at Dhuri substation has been opened and Price bids have been put on hold due to pending PSDF approval. As regards the 220 kV bus reactors at Dhuri and Nakodar substation, tender has been opened on 15.06.2018 (technical bid) & Price bid opening has been put on hold on account of pending PSDF approval.

DPR for installation of reactors has been submitted for PSDF funding. PSTCL has already submitted its reply to the queries of TESC (proposal no. 158). Order shall be placed after securing the approval for PSDF funding.

PSTCL may update.

6.5 Uttarakhand:

125 MVAR reactors at Kashipur: Technical bid has been opened and is under evaluation.

PTCUL may update.

6.6 Rajasthan:

The status as updated in the 155th OCC meeting is placed below:

Item	Background	Status
3 Nos. each of 25 MVAR (220 KV) reactors for Akal, Bikaner & Suratgarh.	DPR submitted for PSDF funding on 27.04.2018. Reply of observations raised by NLDC submitted on 28.07.2018	Approved in the Monitoring Committee of PSDF. Minutes of the Monitoring Committee meeting to be issued.
1 No. of 25 MVAR (220 KV) reactor for Barmer & 125 MVAR (400 KV) reactor for Jodhpur, included in 450 MVAR (13x25 + 1x125 MVAR) proposal	Revised DPR for 450 MVAR approved Reactor after separating STATCOM was submitted vide letter dtd. 12.10.2018 to POSOCO for approval.	Clarifications have been sought by Techno-Economic Sub Group of PSDF from Rajasthan.

Rajasthan may update.

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

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.

7.1 39th TCC and 42nd NRPC approved the Techno Commercial offer of CPRI at **Rs. 32 lakhs (Rs. 20 lakhs for previous study and Rs. 12 lakhs for additional assignment) excluding taxes** for conducting the capacitor study. In the meeting the format for data submission was shared with the members and they were requested to ensure timely submission of the data so that the study may be carried out in the stipulated time frame.

7.2 In the **150th OCC meeting**, members expressed concerns on the nature of the format and submitted that the format being lengthy would require some time for better understanding of

the format and submission of data accordingly.

- 7.3** To address the concerns of the members of OCC forum, in the **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 Youtube at <https://youtu.be/QTxx7owPF3g>.
- 7.4** Members were also requested to initially fill the data format for any one 220 kV or 132 kV substation and send it to CPRI (manoharsingh@cpri.in) to check its suitability for utilization in carrying out the study and further action.
- 7.5** **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.
- 7.6** **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.
- 7.7** **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.
- 7.8** The issue of non-submission of data for system study of capacitor requirement in NR for the year 2019-20 has been taken up with the highest management of DISCOMs, STUs and SLDCs. The letter regarding the same dated 06.11.2018 is enclosed at Annexure – Agenda item no 7 of the Agenda of the 154th OCC meeting, for reference.
- 7.9** **154th OCC meeting:** SE (O) stated that the matter is being pursued with the top management of the DISCOMs (refer Annexure – Agenda item no 7 of the Agenda of the 154th OCC meeting) & follow-up is also being done. He stated that all SLDCs should take up the issue with their respective DISCOMs for submission of the data as desired at the earliest.
- 7.10** **155th OCC meeting:** MS, NRPC stated that the sample data as received from most of the utilities were not in line as per the requirement of CPRI and the same has also been informed through mail by CPRI to the respective utilities. He further stated that due to non-availability of data in proper format, the study could not be performed and low voltage profile issue may be encountered in future. Representative of DTL stated that they have incorporated the changes as suggested by CPRI and has again submitted the same to CPRI. Once approved, DTL would start compiling data for their whole network and submit the same to CPRI.

All utilities are requested to update.

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

8.9 153rd OCC meeting: POWERGRID updated that the site visit is planned shortly to resolve the issue. As desired in the 43rd NRPC meeting POWERGRID submitted all their reservations in writing (Annexure 8 of MoM of 153rd OCC meeting). 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.

8.10 154th OCC meeting: POWERGRID submitted the details (Annexure 8 of the MOM of the 154th OCC meeting) of the issues/ difficulty which would be faced while completing the phase nomenclature mismatch work. POWERGRID intimated that the site visit had been done by their site officials.

MS, NRPC stated that the completion of the phase mismatch issue work is very important and it should be completed during the lean period.

After deliberations it was decided that a joint visit by POWERGRID, BBMB, NRLDC and NRPC would be conducted on 15/01/2019 so as to figure out the difficulties that would be faced in order to rectify the issue as listed out by POWERGRID.

8.11 155th OCC meeting: Due to the schedule of OCC meeting on 16th and 17th January, the visit could not be carried out. In the meeting, it was decided that the same may be tentatively done on 23rd and 24th January 2019. The visit is again proposed on 14th & 15th February 2019.
POWERGRID & BBMB may update.

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 were again requested to update the desired information in soft copy in excel format on a regular basis. All the utilities (except PSPCL) were requested to 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 were requested to 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 MOM of the 152nd 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 MoM of the 152nd 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.
- 10.5 154th OCC meeting:** All utilities were requested to review the revised phasing plan that was attached at **Annexure-10(A) of the MoM of the 152nd OCC meeting.**
NTPC was requested also to intimate the progress of the FGD installation. The updated status as received is enclosed at ANNEXURE 10 of the MOM of the 154th OCC meeting. MS NRPC stated that the issue is being regularly monitored by the TRM division of CEA
- 10.6 155th OCC meeting:** The updated status as received from NTPC, UPRVUNL, RVUN was enclosed at Annexure 10 of MoM of the 155th OCC meeting..
All utilities are requested to regularly update the status as per the revised phasing plan that was attached at Annexure-10 (A) of the MOM of the 152nd OCC meeting.
- 11. LVRT compliance by wind generators.**

- 11.1** Installation of LVRT needs to be ensured at the time of “connection” of the wind generators. The CEA (Technical Standards for Connectivity to the Grid) (Amendment) Regulations, 2013 provide that wind generating station connected at voltage level of 66 kV and above shall remain connected. LVRT is the capability of the electrical device to operate through periods of lower grid voltage. LVRT mechanism boosts the terminal voltage of the point of connection of the wind machine when there is a fault at the remote location to provide transient stability support.

Many wind generations operate without LVRT/FRT feature thereby adversely responding at low voltage either due to high load condition at wind pockets or any fault condition in different parts of the grid and becomes a source for grid incident. The installed capacity having LVRT, their setting is not uniformly matching with the provisions of the Central Electricity Authority (Technical standards for connectivity to the Grid) Regulation, 2007 as amended from time to time (CEA Technical Standards for Connectivity Regulations).

Regulation B2. (3) of the CEA (Technical Standards for Connectivity) Regulations provides that Low Voltage Ride Through (LVRT) is compulsory for machines installed after 15.04.2014, but for existing wind power generating stations, LVRT should be mutually discussed. It does not exempt any station from installing LVRT. STUs/DISCOMs/SLDCs should take up the matter of getting compensation for additional capitalization on account of installing LVRT to be made “pass through “with their concerned State Electricity Regulatory Commissions.

LVRT is technical requirements from the point of view of the safety and security of the grid and its usefulness cannot be overlooked in view of the cost involved in retrofitting of LVRT. CERC has already directed all WTGs of capacity equal to or more than 500kW except Stall Type WTGs to comply with LVRT.

With regard to monitoring of the installation and performance of LVRT installed on existing WTGs, CERC has directed SLDCs to prepare quarterly reports and submit it to RPCs. RPCs are directed to validate the reports submitted by SLDCs in consultation with RLDCs and report any deficiency and non-compliance to the Commission in accordance with law.

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 and OCC so far without any result.

In 38th TCC/41st NRPC meeting, 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. In 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.”

In 148th OCC meeting, MS, NRPC apprised the Committee about above reference order and requested 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).

In 149th OCC meeting, Rajasthan representative intimated that a meeting of wind turbine manufacturers was held on 05.07.2018 by RRVPNL to sort out the issue of LVRT and to get its compliance expeditiously. (Minutes enclosed as Annex- XI of the MOM of the 149th OCC meeting) It was informed that 638 generators are LVRT complaint & 106 do not require as per regulation and 2641 generators need to be LVRT complaint. The capacity of generators that are non – complaint is 3019 MW. It was also informed that the cost of installing LVRT was 25-40 lakh per generator for which the generators will have to make arrangements.

Again meetings with WTG were held on 23.07.2018 and 09.10.2018 by RRVPNL (Minutes attached as Annexure 11 of the Agenda of the 151st OCC meeting and Annexure-XI of the Minutes of 152nd OCC meeting respectively). It was informed that M/S Suzlon and Inox have filed a petition for waiver of installation of LVRT on account of the additional cost involved.

Further, 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. CEA stated that SLDCs may file a petition with respective SERCs indicating problem being faced by the WTGs in installation of LVRTs. In 154th OCC meeting, Representative of Rajasthan informed that petition to be filled to SERC was put up for approval but as per Central Electricity Authority (Technical Standards for Connectivity to the Grid) Amendment Regulations, 2013 B.3 management has intimated that matter would be taken up by STU.

MS, NRPC told that CERC has directed SLDCs to prepare quarterly reports and submit it to RPCs and RPCs are directed to validate the reports submitted by SLDCs in consultation with RLDCs and report any deficiency and non-compliance to the Commission in accordance with law. Accordingly, he asked SLDCs to submit the quarterly reports and report non-compliance to SERC.

RRVPNL may update on the status of report on monitoring of the installation and performance of LVRT installed on existing WTGs

12. System Protection Scheme (SPS) in NR

12.1 Revised System Protection Scheme (SPS) for 765 kV Agra-Gwalior line:

154th OCC meeting: POWERGRID representative informed that modifications related to CB

ON/OFF status have been completed at both Agra and Gwalior end. He told that DTPC installation has been completed and the end to end testing has also been done for 20 links out of 21. He further stated that end to end testing is remaining only for Bhiwadi-Heerapura-Bhilwara-Chittorgarh link. He further requested the concerned states to terminate the links at the designated feeder on which the load shedding is required to be done. He told that end connections with Trip relay of the feeder to be done States. He assured that as targeted the mock testing will be planned to be carried out in 01/2019. Representative of NRLDC requested POWERGRID to coordinate with states and keep NRPC/NRLDC in loop for early completion of the scheme. MS NRPC requested POWERGRID to coordinate with nodal officers of the concerned states for early termination of the links at their end.

In 155th OCC meeting, POWERGRID representative stated that the cable has already been laid down to the Protection panel in all substations and only the terminal connection needs to be done which has to be done by the utility concerned. Once the terminal connections are done, mock testing of the scheme can be done. Delhi, Haryana, Rajasthan, Punjab and UP were advised to expedite. POWERGRID was requested to coordinate with nodal officers of the concerned states for early termination of the links at their end.

POWERGRID was advised to pursue with the concerned utilities and get the work done at the earliest so that mock testing of the scheme may be conducted in the first week of February 2019.

POWERGRID may update the status.

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

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

154th OCC meeting: UPRVUNL updated that all the hardware required has been arranged at site. BHEL Engineer will be available at site from 22/12/2018 to finalize the design of logic in 15 days. Thereafter implementation will be done in next 7-8 days. The implementation of logic is expected to be completed by 1/2019.

155th OCC meeting: UPRVUNL in its letter dated 15.01.2019 has intimated that all the hardware required has been arranged at site. BHEL engineer will be available in the 3rd week of January. The design of SPS logic is under process with BHEL and the implementation of SPS is expected to be completed by January 2019.

UPRVUNL may update the status.

12.3 SPS for Kawai – Kalisindh - Chhabra generation complex:

In 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.

155th OCC meeting: RRVPNL representative stated that the tender would be floated by the end of February 2019.

RRVPNL may update the status.

13. Automatic Demand Management System

Since 147th OCC utilities were being requested to update on the action plan & status of implementation of the ADMS in their utility as it is mandatory requirement of IEGC. State-wise status is as under:

Punjab:

147th OCC meeting:

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.

148th OCC meeting:

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.

TDDPL: Fully Implemented

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.

Rajasthan:

149th OCC meeting:

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.

152nd OCC meeting:

Rajasthan representative has also added 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. 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.

154th OCC meeting: RRVPNL representative stated that the work order for Smart Transmission Network & Assets Management System having ADMS part has been issued on 12/12/2018

155th OCC meeting:

Work order has already been placed with an execution period of 18 months.

UP:

The remote operation of 132 kV feeders under ADMS has been done, but for the down below network they have taken up the issue with the DISCOMs.

Haryana:

155th OCC meeting: Representative of Haryana STU stated that the issue is being regularly followed-up with the DISCOM of Haryana but NO progress has been made into it. He stated that DISCOMs were shifting the responsibility on the part of STUs for implementation of ADMS.

MS, NRPC advised HVPN representative to take up the matter at the highest level as ADMS needs to be implemented in each state and the responsibility for implementation shall not be shifted on one another.

EE (O) advised HVPN representative to mark a copy of the correspondence to MS, NRPC so that the matter may be followed up at NRPC Secretariat level also.

All utilities concerned are requested to update.

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

The utilities are again requested to update the information as per the letter enclosed at **Annexure 14**. In 155th OCC meeting, it was informed that in 8th NPC meeting held on 30th Nov, 2018 the non-submission of this information was highlighted and a serious concern was shown regarding the same. The status of information received is as followed:

Submitted		Not Submitted	
NTPC (NCR)	POSOSCO	Uttar Pradesh	Delhi
BBMB	NHPC	Himachal Pradesh	UT of Chandigarh
Punjab	HPGCL (Panipat TPS)	SJVNL	Jammu and Kashmir
Rajasthan	NPCIL	NTPC (NR-HQ)	
THDC	POWERGRID (NR-1 & NR-2)	POWERGRID (NR-3)	

Utilities are requested to update the status.

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

The updated status as per the 155th OCC meeting is enclosed as Annexure –15.

The 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).

In the **155th OCC meeting**, MS, NRPC advised BBMB to procure ERS for their system to which BBMB replied that the decision has already been taken in the full board that partner states will provide ERS to BBMB, whenever needed. **MS, NRPC stated that if such a stance has been taken by the partner states, the partner states shall procure 1 additional set each, to be provided to BBMB whenever they require.**

All utilities are requested to update.

16. Cleaning and Replacement of porcelain insulators

16.1 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.

16.2 All utilities are 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 is stressed that the cleaning of porcelain insulators in the polluted/fog prone area also be taken up expeditiously.

The data as per MoM of the meeting stands submitted by POWER GRID (NR3), BBMB, DTL, HVPNL, PSTCL. POWER GRID NR 1 submitted the data. POWERGRID NR 2 submitted that the replacement of porcelain insulators on all critical stretches stands completed.

154th OCC Meeting: RRVPNL & UPPTCL were requested to submit information as per MOM issued, failing which outages for cleaning/replacement of insulator may not be approved. Further, all the utilities were requested to intimate the progress of the cleaning/replacement work completed may also be intimated.

155th OCC Meeting:

MS, NRPC stated that the information regarding each transmission line detailing about the cleaning and replacement done needs to be submitted. The information shall also mention the details of the fog prone zone in which the replacement has been done.

All utilities are requested to update the status as per the deliberations of 155th OCC Meeting.

17. Cyber Security Preparedness Monitoring

- A. In the **37th TCC and 40th NRPC meeting** held on 27th and 28th October, Chief Engineer IT, CEA and Chief Information Security Officer (CISO), MoP, Sh. Vijay Menghani, gave a detailed 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.

The status of the information received from the following utilities:

NTPC, NHPC, Tata Power, THDC, BBMB, PTCUL, NPCIL RAPS, NAPS, PSTCL, DTL, Rajasthan, SJVN & PTCUL.

All other utilities (except from those mentioned above) were again requested to update.

POWERGRID was also requested to update regarding the guidelines they have to frame on CERT-In. He added that the guidelines once finalized will be followed by the STUs. SE (O) added that NHPC & NTPC have prepared sectoral CMP for Hydro & Thermal generators.

155th OCC meeting:

POWERGRID was requested to update the status regarding formulation of Cyber Security specific Crisis Management Plan (CMP) for Transmission sector.

All other utilities (except from those mentioned above) are requested to update.

POWERGRID is requested to update the status of Cyber Security specific Crisis Management Plan (CMP) for Transmission sector.

B. Periodical audit and Vulnerable Assessment & Penetration Testing (VAPT) of ICT Infrastructure.

Information Technology Division, CEA vide letter dated 31.01.19 (**Annexure-17**) has highlighted a very critical issue highlighting vulnerability in website of an organization under Power Sector.

Any vulnerability present in ICT infrastructure, website, web applications etc. may invite attackers to carry out malicious activities and could also exploit the targeted organization.

In this regard, all power sector organizations are requested to ensure periodical audit and vulnerability Assessment and Protection Testing (VAPT) of all ICT infrastructure by competent auditors and testers. Further, sectoral CERTs are requested to take immediate action and coordinate with organizations under their purview for the same.

All sectoral CERTs, Utilities/ Organizations are also required to report CISO MoP after conducting VAPT of all Infrastructure, website, and web applications etc. at the earliest.

Members may take a note and ensure compliance at the earliest.

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

Geographical Information System (GIS) based energy map for India (https://vedas.sac.gov.in/powergis_main/index.jsp) is being implemented by NITI Aayog. This would provide true locations of all energy resources including power plants and transmission lines, etc. on a map of India which would be hosted on NITI Aayog's website. CEA is a designated nodal agency for collecting power sector data and accordingly power utilities and DISCOMs were requested to submit the requisite data to CEA for onward

transmission to NITI Aayog. The details required are - name, voltage level, capacity, longitude and latitude of all s/s of 33 kV and above; longitude and latitude of origin and terminating points of lines of 33 kV and above. DISCOMs and other power utilities are requested to submit the requisite data to CEA through cedpd-cea@gov.in email id at the earliest. The above agenda is under discussion since the 147th OCC meeting.

All SLDCs are requested to update the status on the same.

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

For conducting studies in PSSE for assessment of inter control area transfer capability, POSOCO considers thermal ratings of lines as specified in CEA's 'Manual on Transmission Planning criteria- 2013' considering ambient temp. of 45°C for terminal equipment ratings of both ends of the lines.

As there is a scope for considering temperature adjusted thermal ratings for these lines in the PSSE studies, NRCE has decided to finalize the methodology for computation of TTC/ATC/TRM taking into a/c variation in thermal capability of lines wrt variation of ambient temp.

Therefore, POSOCO is in the process of populating the temp. adjusted thermal ratings in these lines in the PSSE study case.

All STUs and transmission licensees are requested to furnish terminal equipment ratings at all lines at 400kV and above for fully implementing the temp adjusted TTC to ensure that there is no gap in security assessment. The matter is under regular follow up since 152nd OCC meeting; still no data is received so far.

Till date no information has been received and all STUs and transmission licensees are requested for expeditious submission of information.

20. Expediting Construction of 132kV supply for railway traction substation for railway electrification projects in states in NR region.

Ministry of Railways has accorded high priority to railway electrification projects for reducing dependence on imported petroleum based fuel thereby enhancing energy security of nation. However, it is observed progress of ongoing transmission line and substation works being executed by SEBs is not matching with the targets for railway sections planned to be commissioned on electric traction. It is found that the work of transmission line for 31 traction sub stations (UP 19, Haryana 5, Punjab 1, and Rajasthan 5 & J&K 1) is yet to be completed. Further tender for transmission line work for 14 traction sub stations(UP 5,Haryana 2,Punjab 2, Rajasthan 5) is yet to be awarded and estimate for 10 traction sub stations(UP 1,Punjab 2, Rajasthan 7) are yet to be received by Railways from respective SEBs. The details are enclosed at Annexure –20 of the Agenda of the 154th OCC meeting.

154th OCC meeting: SE (O) stated that early commissioning of transmission line works and substation across the nation is required, so as to harness full potential of electrification.

Members were requested to take up the matter with concerned utilities to expeditious completion of the transmission line works and substation and regularly update the progress of the work in monthly OCC meeting.

On deliberations it was observed that for expeditious action, RAILWAY authorities should be requested to present the detail of the pending works.

Members are requested to update as per the Annexure –20.

21. Problem of excessive vibrations in GTs of Rihand Stage – III and Vindhyachal Stage-IV during operation of Rihand - Dadri HVDC, on monopole mode with ground return.

148th OCC meeting:

NTPC representative highlighted as under:

- Shifting of 2x500MW Rihand Stage-III units (Unit# 5&6) from NR Grid to WR Grid through Vindhyachal Pooling Station was successfully done on 28th Nov' 17 with coordination in real time between POSOCO, NTPC and POWERGRID (WRTS-II).
- With Rihand stage-III units connected to Vindhyachal Pooling Station, problem of excessive vibrations in GTs of Rihand stage III (and Vindhyachal Stage-IV also) has been observed whenever Rh- Dadri HVDC is run on single pole in ground return mode. The observations during the period 27th Nov' 17 to 5th March' 18 at Rihand is enclosed in the attached sheet (ANNEXURE AA of the Additional Agenda OCC 148th Meeting).
- The issue was briefly discussed in the 142nd OCC Meeting against agenda point no 18 and where it was decided that system study was required to be done to further deal with this problem. Previous experience of NTPC in this regard was also sought which was subsequently provided to NRLDC by Rihand station.
- It is apparent that DC current passes through these GTs during above situation which is detrimental for the GTs and which may lead to their failure.
- It is therefore requested that a solution may kindly be arrived to deal with the above situation at the earliest.

The issue was deliberated in light of the discussions held earlier in the 142nd OCC meeting NTPC was requested to check transducer at Vindhyachal end as there was huge mismatch in MVAR and also get assessment of earthing system at Rihand done. Further it was decided that as per decision in the 38th TCC & 41st NRPC meeting the committee will look into resolving the issue.

Nominations from CEA, CTU/ POWERGRID, NTPC, POSOCO were received and the first meeting of the committee (Minutes attached at Annexure -Agenda item no. 21) was held prior to the 152nd OCC meeting.

154th OCC: NTPC and POWERGRID were again requested to submit all the information as requested during 1st meeting of the committee at the earliest.

155th OCC Meeting: NTPC informed that all the relevant information has been submitted on seo-nrpc@nic.in. POWERGRID was again requested to submit the information as desired in the first meeting of the committee (Minutes were again attached at *Annexure-21 of the MoM of 155th OCC*).

POWERGRID is requested to update on the details which were sought from them in the first meeting of the committee.

22. Sudden load connection/ disconnection by Rajasthan state control area.

NRLDC vide letter dated 29.01.2019 (**Annexure-22**) has raised the issue of sudden connection of load at 1100 Hrs and 2200 Hrs (~700 – 1200 MW) and sudden disconnection of load at 0400 Hrs and 1700 Hrs (~500 – 1000 MW) in the Rajasthan control area.

Rajasthan may kindly update on the measures taken so as to avoid sudden connection/ disconnection of load by Rajasthan state control area.

23. Mismatch between SLDC data & SEM data (Agenda by UHBVN)

Mismatch between SLDC data & SEM data has resulted in levy of charges on account of same sign violation despite best efforts made by the Discoms (UHBVN & DHBVN) to keep them at minimum. The table comparing the same sign violations is tabled below:-

Comparison of no. of same sign violations of Haryana State

Date	As per SLDC data	As per SEM data
1-Jan-19	1	3
2-Jan-19	1	3
3-Jan-19	1	7
4-Jan-19	1	5
5-Jan-19	0	5
6-Jan-19	3	5
7-Jan-19	2	4
8-Jan-19	3	8
9-Jan-19	1	2
10-Jan-19	2	4

11-Jan-19	1	4
12-Jan-19	1	8
13-Jan-19	2	2
14-Jan-19	3	5
15-Jan-19	3	4
16-Jan-19	0	1
17-Jan-19	1	2
18-Jan-19	0	5
19-Jan-19	0	5
20-Jan-19	1	7
TOTAL	27	89

In view of the above, it is proposed that:-

1. Charges imposed on account of same sign violations be based on the real time data visible to the Discoms or else the real time data accuracy be ensured.
2. The mismatch between the SEM and SCADA data is detrimental to the safe operation of the Grid as real time corrective action based on frequency may be actually working against the principle and priority of safe grid. The majority of State drawl points in the SCADA system of Haryana are from the 15 no. Power Grid S/stns and therefore the accuracy of data fetched rests on Power Grid as well.
3. Variation in slot wise drawl recorded by SEMs and SCADA data is more than 100 MW which causes problems in incorrect sign change monitoring as displayed below:-

18.01.19				19.01.19			
Time	NRPC drawl	SLDC drawl	Diff	Time	NRPC drawl	SLDC drawl	Diff
11:30	3175	3283	-107.98	11:30	3018	3149	-130.55
11:45	3182	3307	-125.43	11:45	3039	3179	-140.39
12:00	3296	3390	-93.26	12:00	3039	3175	-136.69
12:15	3244	3375	-130.65	12:15	3085	3173	-88.32
12:30	3180	3319	-139.27	12:30	3165	3307	-141.86
12:45	3236	3347	-111.25	12:45	3048	3137	-89.15
13:00	3224	3354	-130.85	13:00	3036	3178	-141.84
13:15	3237	3425	-187.35	13:15	3041	3188	-146.93
13:30	3452	3604	-151.60	13:30	3280	3452	-171.46
13:45	3334	348	-146.48	13:45	3492	3649	-157.08
14:00	3338	346	-125.44	14:00	3392	3545	-152.78
14:15	3180	32	-89.96	14:15	3378	3510	-132.56
14:30	3150	33	-171.35	14:30	3281	3401	-120.07
14:45	2858	29	-123.94	14:45	2938	3023	-84.82
15:00	2789	301	-228.34	15:00	2833	2936	-103.26
15:15	2849	299	-150.64	15:15	2875	2979	-104.24
15:30	2921	310	-181.30	15:30	3092	3184	-91.58
15:45	3324	3444	-120.53	15:45	3139	3254	-115.36
16:00	3257	3351	-93.85	16:00	3125	3239	-113.49
16:15	3190	3263	-72.18	16:15	3167	3233	-66.68
16:30	3172	3281	-108.93	16:30	3131	3232	-100.99
16:45	3221	3292	-70.67	16:45	3130	3223	-92.86
17:00	3189	3250	-60.94	17:00	3229	3344	-114.73
17:15	3304	3345	-40.56	17:15	3352	3430	-77.92
17:30	3643	3667	-23.91	17:30	3674	3756	-82.76
17:45	3636	3621	15.34	17:45	3867	3944	-76.97
18:00	3923	4024	-101.18	18:00	4099	4205	-105.48
18:15	4357	4448	-88.59	18:15	4782	4874	-92.46

An over-drawl of even 100 MW would not actually register a sign change as per the SEM reading, and such mismatch leads to levy of charges on account of same sign violations despite best efforts by the Discoms.

- Computation for calculating same sign violation- clarification:-
On dated 30.01.2019, a UI of **-0.04 MW** during the time slot 0430-0445 was recorded by the SLDC Panipat website, it was assumed as overdrawl and 1 no. violation was lodged in account of Haryana (**-0.04 MW, 29.02 MW, 213.57 MW, 316.10 MW, 275.63 MW, 233.36 MW & 86.70 MW**) during the period 0430-0615, background page of SLDC for dated 30.01.19 attached for ready reference.
The above may kindly be verified and if it is an error, the same may be got corrected in the formula since SLDC Panipat has informed that the data is being mirrored from NRLDC data and no calculation is being done at their end in counting same sign violations.
- In order to avoid sign change violations due to sustained deviation, generators are asked to increase/ decrease their schedule for a single slot, the same is refused by them on several occasions citing that this change in schedule for just 1 or 2 time slots makes their machines unstable and is detrimental to the mechanical health of their boiler which also leads to accumulation of same sign violations.
- The 4 time slot rule for scheduling/ rescheduling of CGS powers was prevalent during the time when 12 time slots for sustained deviation same sign regulation, needs to be correspondingly reduced to 4 time slots to enable the Discoms avoid same sign violations.
- The Accuracy Class of RTUs, be made at par with those of the SEMs so that mismatch in readings on this account is minimised.

Members may deliberate.

24. FRAS/ Inverse FRAS Scheduling regarding (Agenda based on letter from SJVN)

NLDC has introduced 5 min time block scheduling under FRAS/ Inverse FRAS from 26.11.2018. Generally, for Rampur HPS FRAS/ Inverse FRAS scheduling is in proportion of NJHPS. However, it has been observed that FRAS scheduling for NJHPS and RHPS is not proportionate due to which operation engineers at Rampure HPS have to face difficult situations, when there are chances of water spillage from NJHPS or it is not possible to meet FRAS schedule. (Letter regarding the same is enclosed as **Annexure- 24**). To avoid the same, NLDC is requested to schedule the FRAS/ Inverse FRAS as per the details given in annexure-

NLDC may update.

25. Mapping of UFR, df/dt relay details in SCADA

The UFR and df/dt mapping is mandatory as per Hon'ble CERC regulation. The issue has been discussed in various OCC, NRPC-TCC meetings.

In 136th OCC meeting it was discussed that in addition to the SCADA mapping, states should provide the following information regarding the UFR, df/dt relays installed at their respective substations:

Source of frequency measurement for UFR, df/dt relay viz. positive sequence, phase-to-neutral, phase-to-phase.

Computational time for measurement of frequency, rate of change of frequency in UFR, df/dt relays respectively.

In 137th OCC meeting, MS NRPC once again reiterated that mapping of UFR has to be done in the SCADA of SLDC & NRLDC for better visibility of relay status and feeder load relief and emphasized upon the importance of digital breaker status of feeders in such defense schemes. In 140th, 143th, 146th and 151st OCC meeting, all the state utilities were requested to correct the SCADA UFR, df/dt displays as per the comments. The defense schemes are extremely important schemes and can avert any major contingency. Hence, State utilities should make all possible efforts to strengthen the same.

States	UFR	df/dt	Status as per the 151 st OCC meeting	Remarks	Data Availability
J&K	No	No			
UP	Yes	Yes	Following are provided since last status: <ul style="list-style-type: none"> Feeder wise planned load relief in df/dt. Alternate feeder details in UFR display. Total planned relief in df/dt display. 	Following yet to be provided: <ul style="list-style-type: none"> Feeder-wise planned load relief of UFR. Telemetry of feeders (Partial details available). Alternate feeder details in df/dt display (Partial details available for UFR). Total planned relief in UFR display. (Stage wise) Total actual relief. (Stage Wise) 	Very Poor
Haryana	Yes	Yes	Following are provided since last status: <ul style="list-style-type: none"> Stage-2, 3 of df/dt included in display. Feeder wise planned load relief. 	Following yet to be provided: <ul style="list-style-type: none"> Telemetry of feeders (Partial details available). Telemetry of alternate feeders not available. Calculation of total actual relief in df/dt 	Poor

			<ul style="list-style-type: none"> Alternate feeder details. Total actual relief in UFR. 	seems incorrect.	
Delhi	Yes	Yes		Following yet to be provided: <ul style="list-style-type: none"> Total of actual analog data of MW and alternate feeders. Data suspected for most of the digital and Analog value at NRLDC display but available at SLDC display. 	Poor
HP	Yes	Yes	Following are provided since last status: <ul style="list-style-type: none"> Segregation of stage wise load. Alternate feeder details include for most of the feeders. Partial telemetry of feeders. 	Following yet to be provided: <ul style="list-style-type: none"> Telemetry of feeders (Partial data available). Alternate feeder details in UFR (a few not available). 	Poor
Uttarakhand	No	No			
Punjab	Yes	Yes		Following yet to be provided: <ul style="list-style-type: none"> Complete telemetry of feeders. Alternate feeders' details. Digital Status of all the feeders 	Poor
Rajasthan	Yes	Yes	Following are provided since last status: <ul style="list-style-type: none"> UFR display provided. 	Following yet to be provided: <ul style="list-style-type: none"> Analog value and digital data not available in UFR display (only alternate feeder details provided) 	Very Poor

Utilities are requested to submit the progress on details tabulated above at the earliest and correct, provide the SCADA UFR, df/dt displays as per the comments.

26. Issue of High Voltage at BBMB Rohtak road (Agenda by TPDDL)

Tata Power DDL is frequently facing high voltage from BBMB Rohtak Road. The issue has already been raised in previous OCC meetings, however, BBMB representative has informed that they cannot reduce the Tap Position of PTR because of their Higher authority instructions.

Members may deliberate.

27. Presentation by NLDC on “Pilot on Security Constrained Economic Dispatch (SCED) of Inter-State Generating Station (ISGS) Pan India”

- Hon'bl Commission, vide Order in Petition No. 02/SM/2019 (Suo-Motu) dtd. 31st January, 2019 directed for Pilot on SCED of Inter-State Generating Stations (ISGS) Pan india <http://cercindia.gov.in/2019/orders/02-SM-2019.pdf>
- The Central Commission observed that there is an overarching objective to optimize the scheduling and dispatch of the generation resources and reduce the overall cost of production of electricity without major structural changes in the existing system/framework. SCED is a desired step in the Indian grid operation towards

optimization methodologies. SCED is an involved procedure requiring developing software, creating interfaces and establishing various protocols, information dissemination and streamlining settlement system etc.

- Accordingly, the Commission directed for pilot of SCED for the Inter-State Generating Stations, on pilot basis, w.e.f. **01st April, 2019**.
- The SCED optimization model is for all the thermal Inter State Generating Stations (ISGS) that are regional entities and whose tariff is determined or adopted by the Commission for their full capacity without violating grid security and honouring the existing scheduling practices prescribed in the Indian Electricity Grid Code.
- A Detailed Procedure would be formulated that would contain the guidelines regarding operational aspects of SCED including scheduling, dispatch, accounting, settlement etc.
- The variable charges declared by the generators for the purpose of Reserve Regulation Ancillary Services (RRAS) would be considered in the optimization process.
- Schedules of the States/beneficiaries would not be changed and the beneficiaries would continue to pay the charges for the scheduled energy directly to the generator as per the existing practices.
- NLDC would open a separate bank account called "National Pool Account (SCED)". All payments to/from the generators on account of SCED schedules would flow to and from the said National Pool Account.
- For any increment in the injection schedule of a generator due to optimization, the generator would be paid from the National Pool Account (SCED) for the incremental generation at the rate of its variable charge.
- For any decrement in the schedule of a generator due to optimization, the generator would pay to the aforesaid National Pool Account (SCED) for the decremental generation at the rate of its variable charge after discounting compensation due to part load operation as certified by RPC as per the provisions of IEGC.
- The incremental changes in schedules on account of optimization would not be considered for incentive computation for the generating stations. The deviation in respect of such generators would be settled with reference to their revised schedule. The increment or decrement of generation under SCED would not form part of RRAS.
- RPCs would issue weekly SCED accounts along with the DSM, RRAS, FRAS and AGC accounts based on data provided to them by RLDCs.
- RPCs would issue the regional accounts including the SCED schedules and NLDC would issue a consolidated "National SCED Settlement Statement" comprising payment and receipts to/from all generators participating in the SCED.
- The savings obtained through SCED after settlement of all accounts of SCED would be recorded and maintained in the "National Pool Account (SCED)" by the NLDC.
- CTU is directed to ensure reliable communication between the respective generating stations and Load Despatch Centres.
- As and when the detailed procedure on implementation of SCED pan-India is finalized, the same would also be circulated in the forthcoming OCC meetings in the month of March, 2019,

28. Certification of Non-ISTS line for inclusion in PoC charges for hydro rich States (Agenda by HPPTCL)

HPPTCL has constructed 220/33 kV, 80/100MVA GIS Substation at Phojal along with LILO of 220 kV D/C Allian Duhangan HEP – Nalagarh transmission line at Patlikual. The substation was commissioned on 5.6.2016. The substation was constructed to evacuate power of Kathi(3.5MW), Baloot Fozal(5MW), Kukri(5MW), Kesta(4.5MW), Galang(3.5MW) and Baragaon(24MW) SHEPs which are located in the Kullu valley of Himachal Pradesh . Presently power of Baragaon SHEP (24MW) and power of SHEPs connected to HPSEBL (27MW) is flowing through this asset.

HPPTCL had filed petition for approval of transmission tariff for 2016-17 period for 220/33 kV, 80/100 MVA GIS Substation Phozal along with 220 kV D/C LILO Transmission line vide petition no. 244/MP/2017. The above said petition was filed in CERC for approval of tariff because beneficiaries of generator (Baragaon SHEP) connected to Phojal are outside the State. M/s Kanjungunga which injects its power in Phojal substation sells its power to Power exchange. In this context, it is pertinent to mention here that MoP had submitted the proposal by ADHPL for grant of approval for construction of 220 kV D/C Allian Duhangan HEP – Nalagarh transmission line under section 68 of Electricity Act, 2003 to CEA for comments. This proposal was examined by CEA and it was concurred that out of total 400MW transmission capacity of 220kV D/C line, ADHPL would utilize 192MW for evacuation of ADHPL power and balance spare transmission capacity of the lines would be made available for evacuation of power from other projects in the Parbati/Beas valley viz. Malana-II (100MW) and Sainj (100MW).

Hon'ble CERC vide hearing held on 31.05.2018 directed HPPTCL to obtain certificate from RPC stating that the instant asset is an interstate transmission line. HPPTCL vide letter no. HPPTCL/C&M/Phozal Petition/2018-2939 dated 7.6.2018 wrote letter to NRPC for issuance of NRPC certificate and also provided brief details of these assets. Hon'ble CERC dismissed above mentioned petition vide date of order 8.10.2018 in the absence of NRPC certificate.

NRPC vide additional agenda-II for 40th meeting of Technical Coordination Sub-Committee and 43th meeting of NRPC held on 29.10.2018 and 30.10.2018 (Annexure B.33.1) published average utilization by states other than home state of owner STU for 2017-18 which was reported as 36.55% for 220kV Phozal-Patlikul line leading to denial of NRPC certificate to HPPTCL. This was contrary to HPPTCL's assumption as the substation was constructed essentially to evacuate the power from hydropower plants.

Thereafter engineers from HPPTCL had detailed discussion in NRLDC and following emerged,

- (a) Network used by NRLDC for above study is different from actual system. In studies, Phojal substation is simulated as load bus having 11 MW load in both summers and winters which is in contradiction to actual scenario. Corrected drawing showing actual model is attached as **Annexure-28A**.
- (b) Phozal substation evacuates 55 MW hydro power (peak) in summer months. In peak generation time i.e. summer months, 28 MW power from Baragaon SHEP (24 MW + 20% overload) & 27 MW power from SHEPs connected to HPSEBL system is evacuated, whereas, in winter season 2-3 MW power from Baragaon SHEP is injected in Phojal

substation which also caters 11-15 MW peak load drawl of HPSEBL on Naggar feeder. Thus Phozal bus should be treated as generator bus instead of load bus. Network used by NRLDC is attached as **Annexure-28B**. Thus studies need to be redone with corrected network attached as Annexure-28A.

- (c) As per study 2nd and 4th quarter for a particular year has been considered which is in line with methodology approved in 32nd TCC and 36th NRPC meeting in which states of Uttarakhand, HP and J&K had not participated. As per above study 2nd and 4th quarter for a particular year will be considered. It is submitted that there is seasonal variation in available generation (State has only hydro generation which varies from maximum in summer to minimum in winter). Similarly, load drawl also varies from maximum in winter to minimum in summer. Therefore, in order to capture the realistic generation/ demand scenario, we need to consider quarter-1 and quarter-3 also in addition to quarter-2 and quarter-4 for above studies. Log sheet data is attached as **Annexure-28C**.

Part B NRLDC

1. Review of SPS schemes of Kawai-Kalisindh-Chhabra-Chhabra SC complex

SPS for Kawai-Kalisindh-Chhabra complex has already been discussed and recommended in 122nd OCC & approved in 34thTCC-38th NRPC meeting, however, till date partial SPS has only been implemented therefore, it is requested to expedite the SPS implementation of such large generating complex as soon as possible as approved in OCC.

Apart from above, in view of recently commissioned/Synchronized Chhabra SC generation of 1320 MW (2 units of 660 MW each) and associated transmission lines i.e. 400kV Chhabra SC-Anta, 400kV Anta-Kota and likely to be commissioned 400kV Chhabra SC-Chhabra interconnector, review of SPS for entire complex is necessary for reliability & security of this large generating complex of ~ 5000 MW. In present scenario, Chhabra & Chhabra SC has following connectivity:

- i. 400kV Chhabra-Bhilwara
- ii. 400kV Chhabra-Hindaun
- iii. 400kV Chhabra-Kawai
- iv. 400kV Chhabra-Anta
- v. 400kV Chhabra SC-Anta
- vi. 400kV Chhabra SC-Chhabra D/C interconnector (likely to synchronize)

Though the connectivity of Chhabra & Chhabra SC has improved, however entire complex is still being evacuated through only following network:

- i. 765kV Anta-Phagi I & II
- ii. 400kV Chhabra-Bhilwara
- iii. 400kV Chhabra-Hindaun

iv. 400kV Anta-Kota

v. 400/220kv Single ICT at Kalisindh & Chhabra of 315 MVA each (Operating in radial mode)

Based on new element connectivity in this complex, some of the clauses of existing SPS logic need review. As the generation in this complex has further increased by ~ 1350 MW loading of Phagi ICTs would also increase and N-1 contingency of Phagi ICT would become critical hence, SPS for considering N-1 compliance of 765/400kv Phagi ICT is also important. Therefore, it is suggested to review the SPS schemes in order to take care of large generation complex of ~ 5000 MW and implement the same as early as possible.

SLDC, Rajasthan may review the SPS, quantum of backing down of generation under N-1 or N-1-1 contingencies in this complex and suggest modification.

Member may please discuss

2. Tripping of ICTs in Punjab on over-flux

Recently, numbers of ICTs tripped on no. of days in Punjab control area reportedly on over-flux. It has been observed that high voltage is prevailing in large area of Punjab /Haryana. As per SCADA data, following are observed:

i. MVAR injection from 220kV to 400kV side, voltage is also high at both 220kV & 400kV side. SLDC, Punjab must have switch off capacitor and ensure, all available reactors are in service. Further, in view of persistent high voltage during winter, reactor planning may be expedited for this area.

ii. V/f ratio of some of the 400/220kV station in Punjab are touching 1.1 on certain instances, however, tripping has been observed in some areas only. Earlier to this, 400/220kV Fatehbad ICT-3 (new) of POWERGRID also tripped on over-flux while other two ICT (1&2) remain in service. Therefore, it is important to understand the over flux setting to trip and respective delay time. Generally, over-flux setting at 1.1 is for over-flux alarm only and higher for tripping with considerable time delay. Hence, over-flux setting for trip need to review.

Trippings of ICTs on over-flux is enclosed in Annex-I. SCADA plots of v/f ratio of major 400/220kV nodes in Punjab is enclosed in Annex-II.

In view of above tripping on over-flux, SLDC, Punjab is requested to please share the details of trippings of ICTs with all relevant supporting documents/data and over-flux setting in Punjab control area.

Members may please discuss

3. Security Constrained Economic Dispatch (SCED) of Inter-State Generating Stations Pan-India

Hon'ble Commission Order in Petition No. 02/SM/2019 (Suo-Motu) dated 31st January, 2019, (<http://cercind.gov.in/2019/orders/02-SM-2019.pdf>) directed for Pilot on SCED of Inter-State Generating Stations (ISGS) Pan India.

The Central Commission observed that there is an overarching objective to optimize the scheduling and dispatch of the generation resources and reduce the overall cost of production of electricity without major structural changes in the existing system/framework. SCED is a desired step in the Indian grid operation towards optimization methodologies. SCED is an involved procedure requiring developing software, creating interfaces and establishing various protocols, information dissemination and streamlining settlement system etc.

Accordingly, the Commission directed for pilot of SCED for the Inter-State Generating Stations, on pilot basis, w.e.f. **01st April, 2019**.

A Detailed Procedure would be formulated by POSOCO in line with CERC directions that would contain the guidelines regarding operational aspects of SCED including scheduling, dispatch, accounting, settlement etc.

NLDC communication vide its letter dated 4th Feb 2019 on above subject for stakeholder's awareness in implementing pilot basis for SCED is enclosed in Annex-III.

Members may like to discuss.

4. Demand and Generation projections of Q1-2019-20 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/>.

NLDC vide its letter dated 03.01.2019 had requested utilities to furnish Technical and commercial data for Apr'19-Jun'19 Q1 (2019-2020). Details have been received only from **NTPC, NHPC, SJVNL, BBMB, Delhi & UP**. Other utilities are also requested to submit data as early as possible.

Further, generation and load projection has been done by NLDC/RLDCs based on monthly maximum injection/demand met in the last 3 years from actual metered data and accordingly projections have been made as attached in **Annexure-IV**. Utilities are requested to kindly check the data and correct anomalies, if any with valid justification.

Members may please like to discuss.

5. Hydro optimization during peak hours' demand

Hydro generating station are known for high flexibility as well as for energy constraints based on water availability. It is therefore very important to utilize the hydro resources in very effective way. Inter-state hydro generating stations are normally scheduled based on regional peak hours' requirement. This practice is being followed in Northern region since long with the consent of all beneficiaries for better system operation. Peak demand of Northern region as whole are considered to be peak hours' requirement.

As we all are aware that peak hours' demand & load ramp rate also changes with seasonal pattern. During winter, morning peak hours & load ramp rate used to very high (45-50 MW/min for 2-3 hours) therefore generation ramping is also equally important to commensurate this load ramping. Hydro generations are quick & flexible and best suited for such peaking load with high ramp rate. Hence, optimization of hydro resources for such peak hours' demand need to be done prudently.

Lately, we have received some request from different state for inter-state hydro scheduling as per state requirement, however this may not be feasible due to different consideration of all stakeholders. During peak hours, market rates are also very high, therefore for certain period, that state may manage their requirement either through portfolio management or through energy market.

Member may please discuss

6. Grid connectivity of Kashmir region

Recently, Srinagar Leh Transmission System (SLTS) has been commissioned and charged at 220 kV level through Alstung – Drass – Kargil_Khalsti –Leh new transmission network along with 220/132/33 kV S/s at Alstung and 220/66 kV GIS S/S at Drass, Kargil, Khalsti, and Leh and dedicated to state by Hon'ble prime minister on dated 3rd, Feb 2019.

Two hydro station of NHPC Nimoo bazgo(3X15 MW) and Chutak (4X11 MW) which were operating since 2013 in isolation mode) has also been synchronized with this new STS network at Leh and Kargil respectively. This network is to be synchronized with ISTS through 220 kV Newwanpoh, Wagoora-Ziankot-Alstung, etc. In order to have good visibility, RLDC has come out with procedure in which all the necessary document & compliances (ensuring SLD, Telemetry, Metering etc.) are checked before connecting to the ISTS system. Same procedure has also been adopted by some state for first time element connected to state transmission system (STS). Telemetry of above referred new transmission link is not available at RLDC/SLDC that mean the procedure has not been followed by respective state agencies. In view of above, following are suggested:

- i. Please share the likely date of synchronization of above transmission link with ISTS and further connectivity of 220kV at Ziankote.
- ii. Procedure need to be adopted so that all the data & compliances may be checked before connecting to Grid.

Apart from above, following are issues with SLDC, J&K:

- i. Load shedding: As per furnished data from J & K it seems that there is load shedding in the tune of 10-12 Mu/day. However, Government of India has announced for 24X7 supply. Kindly update
- ii. It has been observed that due to lack of correspondence between SLDC, J&K/ PDD & RLDCs, exchange of information couldn't be done at the need of time. Therefore, all the authorized contact details of all S/s control centers may please share to NRLDC/NRPC for fast & reliable information flow.

Members may please like to discuss.

7. Reactive Power management in Northern Region:

(i) Reactive power performance of generators

Reactive power response of generating stations is being regularly discussed in OCC meetings. Reactive power response in respect of MVAR vs Voltage for **past 30 days (07.01.19 - 06.02.19)** as per NRLDC SCADA data is enclosed in **Annexure-VI**. Based on available data, it is 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. Based on available data, MVAR performance of generators is shown below:

Rihand:	Absorbing up to 300 MVAR
Singrauli:	Absorption up to 200 MVAR
Dadri Stage1:	Generating and absorbing in range of 250 to -100 MVAR (data needs correction)
Dadri Stage2:	Generating and absorbing in the range of 100 to -100 MVAR (MVAR response needs improvement)
IGSTPP Jhajjar:	Generating and absorbing in the range of 100 to -300 MVAR
Unchahar:	Absorption and generation -50 to 100 MVAR (MVAR response needs improvement)
Anpara-C:	Generating up to 150 MVAR most of the time (MVAR response needs improvement)
Bara TPS:	Generating MVAR most of the time (data needs correction)
Anpara-D:	Absorption and generation -100 to 100 MVAR (MVAR response needs improvement)
Anpara TPS:	Absorption and generation -100 to 150 MVAR (MVAR response needs improvement)
CLP Jhajjar:	Absorbing -300 to -100 MVAR
Khedar:	Absorption and generation -150 to 50 MVAR
Kawai:	Absorption and generation -200 to 50 MVAR
Kalisindh:	Absorption and generation -200 to 50 MVAR
Suratgarh:	Absorption and generation -40 to 80 MVAR (Telemetry not reliable)
Chhabra:	Absorbing up to 200 MVAR
Rajpura:	Absorption up to 450 MVAR
Talwandi Saboo:	Absorption up to 450 MVAR

It was agreed in previous OCC meetings that 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. It is requested

that states and generators shall also develop MW vs MVAR and Voltage vs MVAR plots at their end so that their operation based on capability curve be also assessed.

Members may like to discuss.

(ii) Reactive Power injection at ISTS nodes:

As per NRPC REA account, following are the nodes that are injecting MVAR into the Grid and need quick attention to check all the possible desired actions.

State	As per NRPC Reactive energy account (14/01/19-20/01/19): Injection of MVAR at ISTS during High voltage
Punjab	Gobindgarh, Ludhiana, Moga (PG) & Sarna
Haryana	Rohtak Road, Bahadurgarh, Fatehabad, Gurgaon & Hissar
Rajasthan	Hissar, Heerapura, Jaipur South, Kota, Kankroli & Sikar
Uttar Pradesh	Chinhat, Kanpur, Lucknow, Mainpuri, Moradabad, Rosa & Simbholi
Delhi	Narela(BBMB), Narela, Bamnauli, Bawana, Maharani Bagh & Mundka
HP	Jessore

In 144th, 149th and 153rd OCC meetings, it was agreed that identification of nodes at lower voltage level where actual MVAR draw/injection is taking place need 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. States are requested to provide progress on the same.

Members may like to discuss.

8. Frequent forced outages of transmission elements

The following transmission elements were frequently under forced outages during the month of **Jan'19**:

S. NO.	Element Name	No. of forced outages	Utility/SLDC
1	765kV Anpara C(UP)-Unnao(UP)	6	UP
2	400kV Anpara(UP)-Mau(UP)	6	UP
3	400kV Akal(RRVPNL)-Jodhpur(RRVPNL)	5	Rajasthan
4	400kV Anpara(UP)-Sarnath(UP) ckt-2	5	UP
5	400kV Dadri(NTPC)-Panipat(BBMB) ckt-2	5	POWERGRID/NTPC/BBMB
6	400kV Kishenpur(PG)-New Wanpoh(PG) ckt -1	5	POWERGRID
7	400kV Akal(RRVPNL)-Kankani(RRVPNL) ckt-1	4	Rajasthan
8	400kV Bareilly(UP)-Unnao(UP) ckt-2	4	UP
9	400kV Chabra(RRVPNL)-Hindaun(RRVPNL)	4	Rajasthan
10	400kV Kala Amb(PKATL)-Karchamwangtoo(JSW) ckt-2	4	PKATL/JSW

11	400kV Akal(RRVPNL)- Barmer(RRVPNL) ckt-1	3	Rajasthan
12	500kV HVDC Balia(PG)-Bhiwadi(PG) Pole 2	3	POWERGRID
13	400kV Baspa(HP)- Karchamwangtoo(JSW) ckt-2	3	HP/JSW
14	400kV Bhiwani(PG)-Hisar(PG)	3	POWERGRID
15	400 kV Bikaner(RRVPNL)- Suratgarh(RRVPNL)	3	Rajasthan
16	400kV Daultabad(HVPNL)- Jhajjar(APCPL) ckt-1	3	Haryana/APCPL

The complete details are attached at **Annexure-VI**. The frequent outages of such elements affect the reliability and security of the grid. For instance, tripping of 765kV Anpara C(UP)-Unnao(UP) lead to evacuation constraint for Anpara complex. Due to this, backing down of generation in the complex had to be done.

Utilities are requested to look into such frequent outages which also reduces reliability in the grid and share the remedial measures taken/being taken in this respect.

Members may like to discuss.

9. Multiple element tripping events in Northern region in the month of Jan'19:

A total of **30** grid events occurred in the month of Jan'19 of which **12** are of GD-1 category. The preliminary report of all the events have been issued from NRLDC. A list of all these events along with the status of details received by 02-Feb-19 is attached at **Annexure-VII**.

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

Maximum Fault Duration is **9320ms** in the event of multiple element tipping at 220kV Shahjahanpur(UP) substation on 22nd Jan 2019 at 01:29hrs.

Delayed clearance of fault (more than 100ms for 400kV and 160ms for 220kV system) observed in total **5** events out of 30 events in the month.

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

Members may like to discuss.

10. Details of tripping of Inter-Regional lines from Northern Region for Jan'19:

A total of **20** inter-regional lines tripping occurred in the month of Jan'19. The list is attached at **Annexure-VIII**. 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.

Members may please note and advise the concerned for taking corrective action to avoid such trippings as well as timely submission of the information.

11. 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 are 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.

The schedule of mock exercise along with current status is as follows:

Hydro Power Stations:

Date	Revised Date	Name of stations	Remarks
24-Oct-18	NA	Malana-2	Exercise was not successful. It is proposed to carry out the exercise again with AD Hydro.
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.
30-Nov-18	6-Dec-18	Sewa-2	NHPC confirmed. Date revised by J&K. Exercise was partially successful. Unit went under emergency stop twice.
3-Dec-18	NA	Chamera-1 & Chamera-2	Exercise was partially successful. Large variation in frequency observed in islanded operation with Chamera-1. Chamera-2 unit could not be able to synchronize to the island.
11-Dec-18	19-Dec-18	Parbati-3	Carried out successfully.

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19-Dec-18	20-Dec-18	Koteshwar	Carried out successfully. 400kV Koteshwar-Koteshwar(PG)-1 tripped from Koteshwar(PG) end at first attempt during charging of Tehri ckt-1.
28-Dec-18	3-Jan-19	AD Hydro, Malana-2, Phojal (Kanchanjanga)	Exercise was partially successful. Island created and synchronized with AD Hydro. However, during blackstart, the AD Hydro running island collapsed while connecting Phojal (Kanchanjanga). Malana-2 couldn't be synchronized.
11-Jan-19	NA	Koldam	Exercise carried out successfully.
Yet to be carried out			
18-Oct-18	NA	Kishanganga (new plant)	NHPC reported to intimate date separately. It is proposed to carry out the exercise with Uri, L.Jhelum, Pampore and U. Sindh.
26-Oct-18	15-Jan-19	Dhauliganga	Revised date by NHPC
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	To be carried out after 15-Dec-18 due to load management by J&K and shutdown of 400kV Amargarh-Uri-1 ckt-2.
19-Nov-18		Budhil	To be carried out after 15-Dec-18.
28-Nov-18		Chamera-3	To be carried out after 15-Dec-18 as per Chamera-3 request.
14-Dec-18		Bairasiul	As reported by NHPC, Power House shall be under complete shutdown since 01/10/2018 for R&M of power house.
4-Jan-19		Tehri	Exercise deferred on request of UP due to load management.
8-Jan-19		Karcham Wangtoo & Baspa	Exercise deferred on request of Haryana due to load management.

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

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Mock black-Start procedure circulated during last exercise/ previous year may be used. The unit selection may be changed from the one taken during last year exercise.

Mock black start exercise of Gas power stations viz. Auraiya, Dadri, Anta also to be carried out. In 153rd OCC meeting, NTPC informed that Procedure in line with Dadri GPS needs to be prepared for other gas stations as well. NTPC is requested to provide information on above.

As requested in 152nd, 153rd and 154th OCC meetings, SLDC's may also 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 along with status as informed in 154th OCC meeting:

S. NO	Utility	Hydro Power Station	Installed Capacity(MW)	Tentative Date as reported by SLDC
1	J&K	Baglihar	3x150	
2		Baglihar stage-2	3x150	
3		Lower Jhelum	3x35	
4		Upper Sindh	2x11+3x35	
5	HP	Sainj	2x50	In coordination with NRLDC
6		Larji	3x42	Jan-19
7		Bhabha	3x40	
8		Malana -I	2x43	Jan-19
9		Baspa	3x100	To be clubbed with Karcham
10	Punjab	Anandpur Sahib	4x33.5	
11		Ranjit Sagar	4x150	
12	Rajasthan	Mahi-I&II	2x25+2x45	Mar-19
13		Rana Pratap Sagar	4x43	Mar-19
14		Jawahar Sagar	3x33	
15		Gandhi Sagar	5x23	
16		Dholpur GPS	3x110	Plant under outage
17		Ramgarh GPS	1x35.5+2x37.5+1x110	
18	UP	Rihand	6x50	Carried out

				in Aug-18. Report to be submitted
19		Obra	3x33	
20		Vishnupraya g	4x100	
21		Srinagar (Alaknanda)	4x82.5	
22	Uttarakhan d	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	Shared the procedure

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. The information may please be shared by SLDCs and program for this year's mock black start exercises shall also be updated. SLDCs shall submit the reports of black start exercise in their respective control area. SLDCs may also identify further generating stations/unit for black start exercise.

Members may please discuss.

12. Frequency response characteristic:

Two FRC based event has occurred in the month of May-2018. 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	16- Jan- 19	12:25hrs	There was a dropper flashover at 220kV GIS Bhadla substation. There was also tripping of 400kV Jodhpur-Bhadla, 400kV Merta-Bhadla, 400kV	49.965	49.916	- 0.049

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			Bhadla-Bikaner 1&2. Solar Generation loss around 1400MW as reported by Rajasthan SLDC.			
2	23-Jan-19	06:25hrs	400KV Jhakri-Panchkula 1, 400KV Jhakri-Rampur 1 tripped due to bus bar protection operated at NJPC during charging of 400KV Jhakri-Karcham 1. Consequently, 925 MW generation loss occurred at both Jhakri and Rampur.	49.961	49.921	-0.040

The Hon'ble CERC approved procedure has already been shared with all concerned during previous OCC meetings. FRC observed for each state control area for the events is tabulated below:

States	10-Jul-18 Event		30-Jul-18 Event	
	FRC	Remarks	FRC	Remarks
PUNJAB	48%		-29%	
HARYANA	66%		83%	
RAJASTHAN	447%	Generation loss in this control area	0%	
DELHI	-58%		10%	
UTTAR PRADESH	-11%		6%	
UTTARAKHAND	-23%		159%	
CHANDIGARH	90%	Small Control area	-1206%	Small Control area, increase in schedule
HIMACHAL PRADESH	42%		-296%	Increase in schedule
JAMMU & KASHMIR	43%		-212%	Increase in schedule
NR	100%		74%	

FRC calculation of ISGS stations based on NRLDC SCADA data is tabulated below:

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Generator	FRC (16-Jan-19 event)	FRC (23-Jan-19 event)	Generator	FRC (16-Jan-19 event)	FRC (23-Jan-19 event)
Singrauli TPS	-13%	56%	Salal HEP	No generation	50%
Rihand-1 TPS	2%	11%	Tanakpur HEP	0%	0%
Rihand-2 TPS	-82%	33%	Uri-1 HEP	152%	89%
Rihand-3 TPS	-71%	-7%	Uri-2 HEP	-62%	204%
Dadri-1 TPS	-2%	61%	Dhauliganga HEP	No generation	44%
Dadri -2 TPS	36%	125%	Dulhasti HEP	94%	-343%
Unchahar TPS	0%	550%	Sewa-II HEP	No generation	0%
Unchahar stg-4 TPS	0%	22%	Parbati-3 HEP	No generation	No generation
Jhajjar TPS	79%	174%	Jhakri HEP	No generation	Suspect SCADA data
Dadri GPS	No generation	No generation	Rampur HEP	No generation	-374%
Anta GPS	0%	163%	Tehri HEP	83%	0%
Auraiya GPS	No generation	No generation	Koteswar HEP	0%	16%
Narora APS	0%	0%	Karcham HEP	Suspect SCADA data	103%
RAPS-B	0%	0%	Malana-2 HEP	Suspect SCADA data	Suspect SCADA data
RAPS-C	35%	19%	Budhil HEP	0%	No generation
Chamera-1 HEP	No generation	209%	Bhakra HEP	2%	-5%
Chamera-2 HEP	-115%	-25%	Dehar HEP	No generation	13%
Chamera-3 HEP	No generation	No generation	Pong HEP	-6%	-12%
Bairasiul HEP	No generation	No generation	Koldam HEP	No generation	328%
			AD Hydro HEP	No generation	No generation

FRC calculation of major state generators based on NRLDC SCADA data is tabulated below:

Generator	FRC (16-Jan-19 event)	FRC (23-Jan-19 event)	Generator	FRC (16-Jan-19 event)	FRC (23-Jan-19 event)
PUNJAB			UP		
Ropar TPS	No generation	No generation	Obra TPS	3%	147%
L.Mohabbat TPS	13%	No generation	Harduaganj TPS	Suspect SCADA data	Suspect SCADA data
Rajpura TPS	11%	0%	Paricha TPS	-1%	9%
T.Sabo TPS	0%	-80%	Rosa TPS	0%	40%
Goindwal Sahib TPS	147%	81%	Anpara TPS	5%	-8%
Ranjit Sagar HEP	12%	No generation	Anpara C TPS	35%	152%
Anandpur Sahib HEP	-13%	No generation	Anpara D TPS	-2%	1%
HARYANA			Bara TPS	1%	-16%
Panipat TPS	25%	-12%	Lalitpur TPS	0%	No generation
Khedar TPS	187%	No generation	Meja TPS	No generation	No generation
Yamuna Nagar TPS	No generation	No generation	Vishnuprayag HEP	Suspect SCADA data	Suspect SCADA data
CLP Jhajjar TPS	-7%	38%	Alaknanda HEP	No generation	48%
Faridabad GPS	0%	33%	Rihand HEP	102%	-21%
RAJASTHAN			Obra HEP	-13%	-12%
Kota TPS	Suspect SCADA data	11%	UTTARAKHAND		
Suratgarh TPS	-87%	26%	Gamma Infra GPS	-14%	967%
Kalisindh TPS	-9%	7%	Shravanti GPS	Suspect SCADA data	Suspect SCADA data
Chhabra TPS	No generation	No generation	Ramganga HEP	Suspect SCADA data	Suspect SCADA data
Chhabra stg-2 TPS	Error in SCADA data	99%	Chibra HEP	No generation	No generation
Kawai TPS	146%	54%	Khodri HEP	No generation	No generation
Dholpur GPS	No generation	No generation	Chilla HEP	-12%	-23%
Mahi-1 HEP	0%	-8%	HP		
Mahi-2 HEP	No generation	No generation	Baspa HEP	-2%	No generation
RPS HEP	24%	8%	Malana HEP	No generation	No generation
JS HEP	20%	-21%	Sainj HEP	No generation	No generation
DELHI			Larji HEP	Suspect SCADA data	Suspect SCADA data
Badarpur TPS	No generation	No generation	Bhabha HEP	Suspect SCADA data	No generation
Bawana GPS	-46%	-45%	Giri HEP	Suspect SCADA data	No generation
Pragati GPS	-40%	-17%	J&K		
			Baglihar-1&2 HEP	-10%	-8%
			Lower Jhelum HEP	No generation	No generation

156th Operation Coordination Committee Meeting (12th February 2019) - Agenda

In line with the decisions taken during various OCC meetings, the time and date of the FRC events were e-mailed to respective utilities. Constituents may submit the FRC of their control areas for both the events and reason of poor response, if observed.

Annexure 4

		MU	MW
State		Mar-19	Mar-19
Chandigarh	Availability	125	305
	Requirement	115	235
	Surplus/Shortfall (MU)	10	70
	Surplus/Shortfall (%)	8.7%	29.8%
Delhi	Availability	3490	5800
	Requirement	2080	4100
	Surplus/Shortfall (MU)	1410	1700
	Surplus/Shortfall (%)	67.8%	41.5%
Haryana	Availability	5580	8360
	Requirement	3700	7536
	Surplus/Shortfall (MU)	1880	824
	Surplus/Shortfall (%)	50.8%	10.9%
Himachal Pradesh	Availability	1030	2200
	Requirement	880	1620
	Surplus/Shortfall (MU)	150	580
	Surplus/Shortfall (%)	17.0%	35.8%
Jammu & Kashmir	Availability	990	2070
	Requirement	1570	2570
	Surplus/Shortfall (MU)	-580	-500
	Surplus/Shortfall (%)	-36.9%	-19.5%
Punjab	Availability	5169	7930
	Requirement	3900	7120
	Surplus/Shortfall (MU)	1269	810
	Surplus/Shortfall (%)	32.5%	11.4%
Rajasthan	Availability	8960	12551
	Requirement	6510	11089
	Surplus/Shortfall (MU)	2450	1461
	Surplus/Shortfall (%)	37.6%	13.2%
Uttar Pradesh	Availability	10943	16870
	Requirement	11377	17000
	Surplus/Shortfall (MU)	-434	-130
	Surplus/Shortfall (%)	-3.8%	-0.8%
Uttarakhand	Availability	1010	1760
	Requirement	1130	2000
	Surplus/Shortfall	-120	-240

	(MU)		
	Surplus/Shortfall (%)	-10.6%	-12.0%
Total NR	Availability	37297	56086
	Requirement	31262	49300
	Surplus/Shortfall (MU)	6035	6786
	Surplus/Shortfall (%)	19.3%	13.8%



भारत सरकार
उत्तर क्षेत्रीय विद्युत समिति
18-ए, श.जीत सिंह मार्ग, कटवरिया सराय
नई दिल्ली- 110016
Government of India
Northern Regional Power Committee
18-A, S. Jeet Singh Marg, Katwaria Sarai,
New Delhi-110016

सं. उक्षेविस/प्रचालन/107/2019/ 001-014

दिनांक: 28.01.2019

सेवा में : सूची के अनुसार।

विषय : जांच समिति की सिफारिश के कार्यान्वयन की स्थिति के संबंध में।

महोदय,

उपरोक्त विषय से संबंधित पत्र सूचना और आवश्यक कार्यवाही हेतु संलग्न है।

भवदीय,

(भंवर सिंह मीना)

कार्यपालक अभियंता



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

No: NRPC/OPR/107/2019/ १०१-८१५

Dated: १८.०१.२०१९

To: As per the List attached

Sub: Status of Implementation of Enquiry Committee Recommendation – Reg.

Ref: NRPC/OPR/105/12/2018/1455-1500 dated 29/01/2018.
NRPC/OPR/107/12/2018/8060-98 dated 10/07/2018.

Sir,

The reference is invited to our letter no NRPC/OPR/105/12/2018/1455-1500 dated 29/01/2018 and NRPC/OPR/107/12/2018/8060-98 dated 10/07/2018 vide which updated status of Implementation of Enquiry Committee Recommendation was requested. The agenda regarding the same is also being taken up in monthly OCC meetings for follow up.

Despite of continuous follow up, updated status of Implementation of Enquiry Committee Recommendation is still awaited from your organization. Hence, it is kindly requested to submit the updated status, from your organization to NRPC Secretariat on e-mail seo-nrpc@nic.in latest by 18.01.2019. The status of implementation of the Enquiry Committee Recommendation recommendations as furnished in the agenda of 8th meeting of NPC is attached at **Annexure – I**. The indicative format is also attached at **Annexure – II**.

Encls: as above

Yours faithfully,

(Bhanwar Singh Meena)
Executive Engineer

List of Recipients:

1. HVPNL: (i) SE (SO & SLDC): 0181-2664440 Fax-0172-2560622
2. POWERGRID (NR-3): GM (AM), Lucknow; 0522-2471640
3. NTPC (NRHQ), GM (OS), NRHQ Lucknow; Fax-0522-2305849.
4. HPSEBL (i) CE (SLDC): Fax-0177-2837649
5. SJVNL/NJHPS General Manager (C&SO), Fax- 0177-2673283
6. PTCUL/UPCL: (i) SE (SLDC), Fax- 0135-2451160, 0135-2763570
7. UPPTCL (i) Director (Op), Fax- 0522-2286476
(ii) Chief Engineer (SLDC), Fax- 0522-2287880, 2288736
8. DTL General Manager (SLDC)/ General Manager (Protection) Fax-23236462,
23221069
9. CHANDIGARH SE (Elect. Op.Circle) – Fax-0172-2740505
10. HPPTCL Director (Planning & Contracts), Fax: 0177-2626284
11. J&K (PDD) Chief Engineer (Survey & Commercial) Fax-0191-2476213
12. J&K SPDCL GM, Fax: 0194-2500145
13. UPRVUNL DGM (TOM), 0522-2287861

Annex-1

**Status of the Implementation of the Recommendations of the Enquiry Committee on
Grid Disturbance in NR, ER & NER during 2012**

Recommendation		Fully completed (FC) / Partially Completed(PC)	Responsible Entity
No.	Content of recommendation		
2	Frequency control generation reserve/ancillary services		
2.1	Frequency band tightened and brought close to 50 Hz	FC ✓	CERC
2.2	Review of UI mechanism	PC ✓	CERC
5.1	Congestion regulation due to forced outages and UI	FC	POSO, CERC
8	Review of penal provision (UI) of Electricity Act, 2003	PC	Indian Parliament, MOP
15.1	Grid Connectivity Standards (communication and telemetry facilities)	FC	CEA
17	Review of Transmission Planning Criteria	FC	CEA
19	Task force to study security issues	FC	MOP, CEA

Recommendation		Fully completed (FC) / Partially Completed(PC) / Not Completed(NC)					Responsible Entity
No.	Content of recommendation	NR	WR	SR	ER	NER	
1	Review of Protection System						
1.1	Third party protection audit	FC ✓	PC	PC	PC	PC	Powergrid, STU, GEN
1.2	Review of zone-3 philosophy	PC	FC	FC	PC	PC	Powergrid, STU, GEN
1.3	Synchro phasor measurements /PMUs & deploy of SPSs	PC	FC	FC	FC	FC	RPC, RLDC, Powergrid, STU, GEN
1.4	Time synchronization of DRs/ELs/PMUs	FC	FC	FC	FC	FC	Powergrid, STU, GEN
3	Defense mechanism - f_{min} and df/dt - load shedding schemes	PC	FC	FC	FC	PC	STUs, RPCs, POSOCO
4	Ensuring primary frequency response from generators	PC	PC	PC	NC	PC	POSO, RPC, Generators
5	Revising TTC based on change in system conditions						
5.2	Real-time security desk caring TTC calculations	FC	FC	FC	FC	FC	NLDC and RLDCs

Recommendation		Fully completed (FC) / Partially Completed(PC) / Not Completed(NC)					Responsible Entity
		NR	WR	SR	ER	NER	
6	Coordinated outage planning of transmission elements	FC	FC	FC	FC	FC	NLDC and RLDCs
7	Reactive power planning -	FC	FC	FC	FC	FC	Powergrid, STU, GEN
9	Optimum utilization of availability assets						
9.1	Regulatory provision - absorption of reactive power by generators	PC	PC	PC	FC	NC	POSO, RPC, Generators
9.2	Audit of HVDC, TCSC, SVA and PSS	PC	PC	PC	PC	NC	CTU, STUs, Generators
9.3	Functioning of existing PMU and availability of their output to RLDC	FC	FC	FC	FC	FC	CTU, POSOCO
10	Deployments of WAMS						
10.1	Synchro phasor based WAMS employing PMUs	PC	PC	PC	PC	PC	CTU
10.2	Possible of voltage collapse prediction	PC	NC	NC	NC	NC	RPCs
11	Dynamic security assessment and review of state estimation	NC	NC	NC	NC	NC	POSO
12	Implementation of islanding schemes	PC	PC	FC	PC	PC	CEA, RPCs, Powergrid, STUs, SLDCs, Generators
13	Autonomy to Load Dispatch Centers						
13.1	Organization of the Load Dispatch Centers reviewed and entrusted to ISO	PC	PC	PC	NC	NC	Govt. Of India, State Govt.
13.2	Training and certification of system operators need to be given focused attention	PC	PC	PC	NC	PC	Govt. Of India, State Govt.
14	Development of Intra-state transmission system	PC	PC	PC	PC	PC	STUs
15	Network visualization						
15.2	Fiber optic communication system	PC	PC	PC	PC	PC	CTU, STUs
15.3	RTUs and communication equipment should have uninterruptible power supply with proper battery back up	PC	PC	PC	PC	PC	CTU, STUs
15.4	Telemetry facilities will be install for all generation station and transmission element without these	PC	PC	PC	PC	PC	RPCs, POSOCO

10.1	Synchro phasor based WASM employing PMUs								
10.2	Possible of voltage collapse prediction								
11	Dynamic security assessment and review of state estimation								
12	Implementation of islanding schemes								
13	Autonomy to Load Dispatch Centers								
13.1	Organization of the Load Dispatch Centers reviewed and entrusted to ISO								
13.2	Training and certification of system operators need to be given focused attention								
14	Development of Intra-state transmission system								
15	Network visualization								
15.2	Fiber optic communication system								
15.3	RTUs and communication equipment should have uninterruptible power supply with proper battery back up								
15.4	Telemetry facilities will be install for all generation station and transmission element without these								
16	Reduction in Start-up time Generators								
18	Strengthening of system study groups in various power sector organization								
20	Improved telecom infrastructure for cyber security								

State-wise Emergency Restoration system in NR #				
Transmission Licensee	Requirement of Total no of ERS in State	Number of ERS available in state	No of ERS to Be Procured	Remark if Any
POWERGRID		2 sets of 400 kV & 2 sets 765 kV	-	-
DTL		2 sets	-	-
PSTCL		2 sets	-	-
UPPTCL		2 sets	-	-
PTCUL			2 sets	DPR under finalization
HVPN			2 sets	Under tendering
RRVPN			2 sets	NIT floated
HPPTCL			2 sets	Matter under consideration regarding funds availability
PDD J&K		2 sets	-	-
BBMB		0	0	##
Sterlite*				

*Sterlite has an arrangement with M/s Supreme, Kolkata to provide the ERS services as and when required and are in the process of procurement of their own.

Data as available with NRPC Sectt.

In the 155th OCC meeting, MS, NRPC advised BBMB to procure ERS for their system to which BBMB replied that the decision has already been taken in the full board decision of BBMB that the partner states will provide ERS to BBMB whenever needed.

MS, NRPC stated that if such a stance has been taken by the partner states, the partner states shall procure 1 additional set each to be provided to BBMB whenever they require.

I/3869/2019



भारत सरकार

Government of India
विद्युत मंत्रालयMinistry of Power
केन्द्रीय विद्युत प्राधिकरणCentral Electricity Authority
सूचना प्रौद्योगिकी प्रभाग
Information Technology Division

URGENT



Subject: Periodical audit and Vulnerability Assessment & Penetration Testing (VPAT) of ICT Infrastructure.

A vulnerability has been reported in website of an organisation under Power Sector. Any vulnerability present in ICT Infrastructure, website, web application etc. may invites attackers to carry out malicious activities. In this case, attackers could exploit the targeted organisation.

To avoid the possibility of Cyber Security related issue by plugging and fixing the vulnerability, it is essential to conduct regular & meaningful audit and Vulnerability Assessment and Penetration Testing (VPAT) of all ICT Infrastructure in addition to adopting the best practices and guidelines, by all Power Sector Organisations.

In this regard, all Power Sector organisations are requested to ensure periodical audit and Vulnerability Assessment and Penetration Testing (VPAT) of all ICT Infrastructure by competent auditors and testers. Further, Sectoral CERTs are requested to take immediate action and co-ordinate with organisations under their purview for the same.

All Sectoral CERTs, Utilities/Organisations are also advised to report CISO MoP after conducting audit and Vulnerability Assessment and Penetration Testing (VPAT) of all ICT Infrastructure, website, web application etc. at the earliest

VPAT

भवदीय,

(विजय मेंघाणी)
31.1.19

मुख्य अभियंता (सू.प्रौ.) एवं
सी.आई.एस.ओ., विद्युत मंत्रालय

प्रकृत

6/2/19

कृपा चर्चा करें

आनिल मित्तल
4/1/19

अधीक्षक अभियंता (प्रमालन)

सेवा में /To,

संलग्न सूची अनुसार,

सेवा भवन, आर. के. पुरम-I, नई दिल्ली-110066 टेलीफैक्स: 011-26732303 ईमेल: itcea@nic.in वेबसाइट: www.cea.nic.in
Sewa Bhawan, R.K Puram-I, New Delhi-110066 Telefax: 011-26732303 Email: itcea@nic.in Website: www.cea.nic.in

Apart from other agenda points pertaining to Cyber Security, kindly ensure that upcoming Sec shall have agenda point about status of audit of ICT infrastructure & VPAT.

EE(6)

21/1/19
05/02/19

Annexure

Summary of Transmission line work being executing by various State electricity board				
SN	STATE	Tr. Line work to be expedited (Annexure-I)	Contact yet to Award (Annexure-II)	Estimate awaited (Annexure-III)
1	Madhya Pradesh	13	4	4
2	Odisha	11	2	
3	Andhra Pradesh	5		
4	Karnataka	2	4	5
5	West Bengal	5	2	
6	Assam	1	4	
7	Uttar Pradesh ✓	19	5	1
8	Haryana ✓	5	2	
9	Punjab ✓	1	2	2
10	Rajasthan ✓	5	5	7
11	Bihar	6	11	1
12	Jharkhand	2	3	
13	Gujarat	2	7	4
14	Telangana	1		
15	Tamil Nadu	2	1	3
16	Jammu & Kashmir ✓	1		
17	Maharashtra		7	
18	Chhattisgarh		1	
19	Damodar Valley Corporation Limited		5	
Total		81	65	27

Transmission line for which commissioning to be expedited

SN	Electrification Project/Agency	Name of Grid Sub Station	Name of Rly TSS	Tr. Line (kms)	STATE
1	CHHINDWARA-KALUMNA (RVNL)	Chhindwara	Linga	10.5 Kms.	MADHYA PRADESH
2	CHHINDWARA-KALUMNA (RVNL)	Boregaon	Sausar	19Kms.	MADHYA PRADESH
3	Jabalpur- Satna -Rewa (CORE)	Katni	Patwara	20	MADHYA PRADESH
4	Jabalpur- Satna -Rewa (CORE)	Maihar	Bhadanpur	13	MADHYA PRADESH
5	Jabalpur- Satna -Rewa (CORE)	Kotar	Kaima	26	MADHYA PRADESH
6	Manikpur - Shankargarh (CORE)	Sirmour	Dabhaura	56	MADHYA PRADESH
7	Manikpur - Jhansi (CORE)	Naugaon	Harpalpur	51	MADHYA PRADESH
8	Manikpur - Jhansi (CORE)	Prithvipur	Niwari	23	MADHYA PRADESH
9	Jabalpur- Nainpur - Gondia (CORE)	Lalbra	Balaghat	20	MADHYA PRADESH
10	Jabalpur- Nainpur - Gondia (CORE)	Nainpur	Ghansore	38	MADHYA PRADESH
11	Jabalpur- Nainpur - Gondia (CORE)	Nainpur	Nainpur	8	MADHYA PRADESH
12	Ratlam-Nimach (CORE)	Jaora	Jaora	5	MADHYA PRADESH
13	Ratlam-Nimach (CORE)	Mandore	Sindpan	15	MADHYA PRADESH
14	Angul-Sukinda new line (RVNL)	Kamakhya Nagar	Kamakhya Nagar	5.226	ODISHA
15	Angul-Sukinda new line (RVNL)	Jabamayee	Sukinda	3.678	ODISHA
16	Haridaspur-Paradeep (RVNL)	Marshaghai	Kendrapara	13.251	ODISHA
17	Vizianagaram-Rayagada-Titlagarh (CORE)	Munguda	Bissamcullack	13.5	ODISHA
18	Vizianagaram-Rayagada-Titlagarh (CORE)	Bhawanipatna	Lanjigarh	34.5	ODISHA
19	Titlagarh-Sambalpur-Jharsuguda (CORE)	Kanatapali	Godbhaga	13	ODISHA
20	Titlagarh-Sambalpur-Jharsuguda (CORE)	Barapali	Dungripali	8	ODISHA
21	Titlagarh-Sambalpur-Jharsuguda (CORE)	Tusura	Deogaon Road	15	ODISHA
22	Singapur Road-Damanjodi (CORE)	Theruvalli	Bhalumaska	31	ODISHA
39	Singapur Road-Damanjodi (CORE)	Lakshmipur	Kakriguma	27	ODISHA
40	Singapur Road-Damanjodi (CORE)	Lakshmipur	Tikri	24	ODISHA
23	Angul-Sambalpur (ECoR)	Boinda	Boinda	3.3	ODISHA
24	Angul-Sambalpur (ECoR)	Maneswar	Maneswar	6.09	ODISHA
25	Diguvametta- Guntakal (CORE)	Nandyal	Nandyal	6.3	ANDHRA PRADESH

SN	Electrification Project/Agency	Name of Grid Sub Station	Name of Rly TSS	Tr. Line (kms)	STATE
26	Diguvametta- Guntakal (CORE)	Somayajula-palli	Ramgapuram	2.5	ANDHRA PRADESH
27	Diguvametta- Guntakal (CORE)	Nansurulia	Pendekallu	12	ANDHRA PRADESH
28	Nallapadu- Pigidipalli (CORE)	Rentachintala	Guraj	15	ANDHRA PRADESH
29	Nallapadu- Pigidipalli (CORE)	Sattenapalli	Sattenapalli	5	ANDHRA PRADESH
30	HOSPET-BALLERY-GUNTAKAL (RVNL)	Alipura	Bellary cant	3	KARNATAKA
31	WD-RC-GTL Pkg-2 (RVNL)	Khanapur	Yadgir	12 Km	KARNATAKA
32	Katihar-New Jalpaiguri (CORE)	Dalkhola	Dalkhola	2.5	WEST BENGAL
33	Katihar-New Jalpaiguri (CORE)	Tista Canal fall	Rangapani	7.4	WEST BENGAL
34	RANINAGAR JALPAIGUDI-NEW BONGAIGAON (RVNL)	New Mayanaguri	New Mayanaguri	1.5 km	WEST BENGAL
35	RANINAGAR JALPAIGUDI-NEW BONGAIGAON (RVNL)	New Cooch Behar	Pundibari	10 Km	WEST BENGAL
36	Katwa-Azimganj (CORE)	Raghunathganj	Jangipur	7	WEST BENGAL
37	RANINAGAR-JALPAIGURI-NEW BONGAIGAON (RVNL)	-	Gosangaon	10	ASSAM
73	NEW BONGAIGAON-GUWAHATI (RVNL)	-	Kamakhya	5 km	ASSAM
38	CHHAPRA-BALLIA-GHAZIPUR-VARANASI-ALLAHABAD (RVNL)	Chitbara Gaon	Bansdin Road	29.57 Km	UTTAR PRADESH
39	CHHAPRA-BALLIA-GHAZIPUR-VARANASI-ALLAHABAD (RVNL)	Ghazipur	Ghazipur	38.52 Km	UTTAR PRADESH
40	CHHAPRA-BALLIA-GHAZIPUR-VARANASI-ALLAHABAD (RVNL)	Aurai	Kachhwa Road	15.0 Km	UTTAR PRADESH
41	UTRATI RAIBARELI-AMETHI-JANGHAI (RVNL)	Bachharawan	Harchanapur	18 km	UTTAR PRADESH
42	UTRATI RAIBARELI-AMETHI-JANGHAI (RVNL)	Gauriganj	Gauriganj	12.5 Km	UTTAR PRADESH
43	UTRATI RAIBARELI-AMETHI-JANGHAI (RVNL)	Ranganj	Pithiganj	7 Km	UTTAR PRADESH
44	Garwa Rd- Remkut (CORE)	Rihand Thermal power station	Remkut	5.5	UTTAR PRADESH
45	Remkut- Singrauli (CORE)	Obra Thermal power station	Obra Dam	7	UTTAR PRADESH
46	Jhansi- Manikpur (CORE)	Allara	Engwai	20	UTTAR PRADESH
47	Jhansi- Manikpur (CORE)	Pahar	Khal	17	UTTAR PRADESH
48	Jhansi- Manikpur (CORE)	Ghatampur	Ghatampur	7	UTTAR PRADESH
49	Gorakhpur-Kaptanganj (CORE)	Motram	Kaptanganj	15	UTTAR PRADESH
50	Shikohabad-Farrukhabad (CORE)	Neevaura	Bhugra	3	UTTAR PRADESH

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SN.	Electrification Project/Agency	Name of Grid Sub Station	Name of Rly TSS	Tr. Line (kms)	STATE
51	Kaptanganj-Chhapra Kacheri (CORE)	Rajapakar	Tariyasujan	18	UTTAR PRADESH
52	Mankapur-Katra-Ayodhya (CORE)	Katra	Katra	12	UTTAR PRADESH
53	Mathura-Kasganj-Kalyanpur (IRCON)	Sikandrara	Kasganj	35	UTTAR PRADESH
54	Mathura-Kasganj-Kalyanpur (IRCON)	Kayanganj	Kempil Road	18	UTTAR PRADESH
56	Mathura-Kasganj-Kalyanpur (IRCON)	Chhibramau	Khudaganj	22	UTTAR PRADESH
56	MANHERU-HISAR (RVNL)	Hisar-Hansi LILO arrangement	Satrod	2.5 Km	HARYANA
57	REWARI-MANHERU (RVNL)	Lulaoahir	Jatusana	10.6 Km	HARYANA
58	REWARI-MANHERU (RVNL)	kalanaur	Manheru	30.0 Km	HARYANA
59	Rohtak-Bathinda-Lehra Muhabbat (CORE)	Chander khurd	Jakhhal	18	HARYANA
60	Rohtak-Bathinda-Lehra Muhabbat (CORE)	Talwandi	Maiserkhana	18	Punjab
61	Rohtak-Bhiwani (CORE)	Kalanaur	Kalanaur	4	HARYANA
62	Ajmer-Ajmer-Jaipur (CORE)	Nangal Pyariwas	khanbhakari	30	RAJASTHAN
63	Ajmer-Mavli-Udaipur (CORE)	Nasirabad	Nasirabad	9	RAJASTHAN
64	Ajmer-Mavli-Udaipur (CORE)	Senthi	Ghosunda	10	RAJASTHAN
65	Ajmer-Mavli-Udaipur (CORE)	DakanKotra	Umra	3	RAJASTHAN
66	Ajmer-Rani (CORE)	Kharachi	Marwar	3	RAJASTHAN
67	Barauni- Mansi-Katihar (CORE)	LILO arrangement at 132kV line near to Naugachhia	Naugachhia	5	BIHAR
68	Bakhtiyarpur-Manpur-Tilaiya (CORE)	Nalanda	Nalanda	6	BIHAR
69	Muzaffarpur-Valmikinagar (CORE)	Motipur	Mahwal	3	BIHAR
70	Muzaffarpur-Valmikinagar (CORE)	Motipur	Jivdhara	10	BIHAR
71	Muzaffarpur-Valmikinagar (CORE)	Bettiah	Majhauhya	10	BIHAR
72	Muzaffarpur-Valmikinagar (CORE)	Ramnagar	Harinagar	5	BIHAR
73	Garwa Road- Singrauli (CORE)	LILO arrangement near to Nagaurani	Nagaurani	10	JHARKHAND

SN	Electrification Project/Agency	Name of Grid Sub Station	Name of Rly TSS	Tr. Line (kms)	STATE
74	Ranchi-Lohardaga-Tori (CORE)	LILC arrangement near to Piska	Piska	5	JHARKHAND
75	Ahmedabad-Mahesana-Palanpur (CORE)	Soja	Ambliyasari	43	GUJARAT
76	Ahmedabad-Mahesana-Palanpur (CORE)	Kheralu	Dharawara	53	GUJARAT
77	Nalapadu-Pagdipalli (CORE)	Miryalaguda	Miryalaguda	5	TELANGANA
78	Erode-Karur-TPJ (CORE)	Pagaluru	Pagaluru	1 km UG	TAMIL NADU
79	Erode-Karur-TPJ (CORE)	Pettaivatala	Pettaivatala	2.5	TAMIL NADU
80	Jammu Tawi- Udhampur SVDK (CORE)	Bhattal	Manwal	3.4 km	JAMMU & KASHMIR
81	Noli-Tapri (CORE)	Thanabhawan	Hind	18 Km	UTTAR PRADESH

257342/2018/OFFICE OF MOS(IG) works for which tender finalization to be expedited

SN	Electrification Project/Agency	Name of Grid Sub Station	Name of Rly TSS	Tr. Line (kms)	STATE
1	Daund Manmand (RVNL)	Kopergaon	Kopergaon 2 nd feeder	2.95	MAHARASHTRA
2	Bhigwan-Solapur section of (Pune-Wadi-Guntakal) RVNL	Parewadi	Parewadi	5 km	MAHARASHTRA
3	Bhigwan-Solapur section of (Pune-Wadi-Guntakal) RVNL	LILO Kuruwadi-Jeur line	Kurtiwadi	7 km	MAHARASHTRA
4	Bhigwan-Solapur section of (Pune-Wadi-Guntakal) RVNL	Mohol	Mohol	7.5 km	MAHARASHTRA
5	Solapur-Gulberga section of (Pune-Wadi-Guntakal) RVNL	Hotagi	Hotagi	6 km	MAHARASHTRA
6	Solapur-Gulberga section of (Pune-Wadi-Guntakal) RVNL	Godgaon	Godgaon		KARNATAKA
7	CHHINDWARA-KALUMNA (RVNL)	LILO	Patansaongi	3.6	MAHARASHTRA
8	Daund-Baramati (RVNL)	Shirsufal	Shirsai	5 km.	MAHARASHTRA
9	Ratlam-Nimach (CORE)	Nimach	Nimach	11	MADHYA PRADESH
10	RAIPUR-TITLAGARH (RVNL)	Paraswani	Mahasamund	11	CHHATTISGARH
11	Haridaspur-Paradeep (RVNL)	Paradeep	SIJU	5.000	ODISHA
12	Singapur Road-Damanjodi (CORE)	Lakshmiapur	Lakshmiapur	2.5	ODISHA
61	HOSPET-BALLERY-GUNTAKAL (RVNL)	Aipura	Bellary cant	3	KARNATAKA
13	Kengeri - Mysore (CORE)	Tubalkare	Yellur	6	KARNATAKA
14	Kengeri - Mysore (CORE)	Hootabally	Mysore	7	KARNATAKA
15	Calicut-Mangalore (CORE)	Mangalore	Jakotte	5	KARNATAKA
16	Pakur-Malda (CORE)	Malda	Khaltipur	23	WEST BENGAL
17	Katwa-Azimganj (CORE)	Gokarna	Kharghat	16	WEST BENGAL
18	NEW BONGAIGAON-GUWAHATI (RVNL)	-	New Bongaigaon	10 Km	ASSAM
19	NEW BONGAIGAON-GUWAHATI (RVNL)	-	Sarbhog	2 Km	ASSAM
20	NEW BONGAIGAON-GUWAHATI (RVNL)	-	Nalbari	5 Km	ASSAM
21	NEW BONGAIGAON-GUWAHATI (RVNL)	-	Kamakhya	5 Km	ASSAM
22	Bhandai-Udi (CORE)	Bah	Bah	24.6	UTTAR PRADESH
23	Bhandai-Udi (CORE)	Bah	Fathabad	20.6	UTTAR PRADESH
24	Urnao-Unchahar (CORE)	Saran	Raghuraj singh	12	UTTAR PRADESH

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SN	Electrification Project/Agency	Name of Grid Sub Station	Name of Rly TSS	Tr. Line (kms)	STATE
25	Chunar-Chopan (CORE)	Robortganj	Robortganj	6	UTTAR PRADESH
26	Mathura-Achnera	Agra	Achnera	30	UTTAR PRADESH
27	Rohtak-Bathinda-Lehra Muhabbat (CORE)	Chandi	Kharainti	3	HARYANA
28	Rohtak-Bhiwani (CORE)	Kalanaur	Kalanaur	4	HARYANA
28	Delhi-Rewari (CORE)	Garhi-Harsaru	Garhi-Harsaru	4	HARYANA
29	Rewari-Phulera (CORE)	Ringas	Ringas	4	RAJASTHAN
30	Ajmer-Mavli-Udaipur (CORE)	Hamirgarh	Hamirgarh	4	RAJASTHAN
31	Ajmer Rani (CORE)	Jethana	Makrera	7	RAJASTHAN
32	Hanuman-Suratgarh (CORE)	Hanumangarh	Hanumangarh		RAJASTHAN
33	Atwar-Ajmer-Jaipur (CORE)	Nala Power house Jaipur	Jaipur	01 km UG cable	RAJASTHAN
34	JAKHAL-DHURI-LUDHIANA (RVNL)	Chajli	Chajli	1.5 Km	PUNJAB
35	JAKHAL-DHURI-LUDHIANA (RVNL)	Sandhora	KUP	12 Km	PUNJAB
36	Bakhtiyarpur-Manpur-Tilaya (CORE)	Wazirganja	Tilaya	25	BIHAR
37	Bonidanga-Barharwa-sahibganj Kiul (CORE)	Sabaur	Sabaur	5	BIHAR
38	Bonidanga-Barharwa-sahibganj Kiul (CORE)	Jamalpur	Jamalpur	5	BIHAR
39	Kaptanganj-Chhapra Kacheri (CORE)	Rajapatu	Rajapatti	10	BIHAR
40	Biharsharif-Daniawan & Fatuha-Istampur (CORE)	Ekrangar Sarai	Ekrangar Sarai	6	BIHAR
41	Darbhanga-Jaynagar (CORE)	Pandaul	Pandaul	6	BIHAR
42	Samastipur-Khagaria (CORE)	Rosara	Hasanpur	22	BIHAR
43	Raxaul-Sitamarhi-Darbhanga-	Raxaul	Raxaul	5	BIHAR
44	Samastipur	Dhaka	Bargaincha	22	BIHAR
45	(CORE)	Runnishaidpur	Bajpatti	25	BIHAR
46	Kiul Tilaya (CORE)	Shekhpura	Shekhpura	10	BIHAR
47	Bonidanga-Sahibganj (CORE)	Sahibganj	Kanacurda	5	BIHAR
48	Bonidanga-Sahibganj (CORE)	Rajmanal	Imphal	2	BIHAR
49	Ranchi-Lehardaga Ton (CORE)	Lehardaga	Lehardaga	7	JHARKHAND
50	Ahmedabad Rajkot (CORE)	Wakode	Wakode	25	GUJARAT
51	Ahmedabad -Rajkot (CORE)	Trudhal	Savaldarnagar	17	GUJARAT
52	Ahmedabad -Rajkot (CORE)	Jakhwari	Jakhwari	4	GUJARAT

SN	Electrification Project/Agency	Name of Grid Sub Station	Name of Rly TSS	Tr. Line (kms)	STATE
53	Mahesana-Viramgarm-Samakhiyali (CORE)	Mitha	Katosan	20	GUJARAT
54	Mahesana-Viramgarm-Samakhiyali (CORE)	Sadla	Sadla	44	GUJARAT
55	Mahesana-Viramgarm-Samakhiyali (CORE)	Mansar	Ghansyangarh	7	GUJARAT
56	Mahesana-Viramgarm-Samakhiyali (CORE)	Morvi	Maliya	35	GUJARAT
57	Katni - Singrauli (IRCON)	Beohari	Beohari	10 KM	MADHYA PRADESH
58	Katni - Singrauli (IRCON)	Sidhi	Marwasgram	54 KM	MADHYA PRADESH
59	Katni - Singrauli (IRCON)	Dongarital	Gajara Bahara	30 KM	MADHYA PRADESH
60	Erode-Karur-TPJ (CORE)	Namakkal	Namakkal	10	TAMIL NADU
61	Koderma- Hazaribag-Barkakana-Ranchi (CORE)	Barhi	Barhi	4.7 km	Damodar Valley Corporation limited
62	Koderma- Hazaribag-Barkakana-Ranchi (CORE)	Hazaribagh	Hazaribagh	19 km	Damodar Valley Corporation limited
63	Koderma- Hazaribag-Barkakana-Ranchi (CORE)	Sidhwar	Ramgarh	8 km	Damodar Valley Corporation limited
64	Koderma-Giridih (CORE)	Koderma	Kanweer	15	Damodar Valley Corporation limited
65	Koderma-Giridih (CORE)	Runny Saidpur	Navadih	35	Damodar Valley Corporation limited

257342/2018/OFFICE OF MOS(IC)

Estimate awaited from various State Electricity Board

SN	Electrification Project/Agency	Name of Grid Sub Station	Name of Rly TSS	Tr. Line (kms)	STATE
1	Jabalpur- Nainpur – Gondia (CORE)	Bargi	Jamtara	8	MADHYA PRADESH
2	Ratlam-Fatehabad-Laxmibainagar (CORE)	Fatehabad	Fatehabad	10	MADHYA PRADESH
3	Ratlam-Fatehabad-Laxmibainagar (CORE)	Vadnagar	Vadnagar	5	MADHYA PRADESH
4	Vijapur-Makshi	Rajgarh	Biaora	24	MADHYA PRADESH
5	Gadag-Hotgi (CORE)	Belavanike	Mallapur	3	KARNATAKA
6	Gadag-Hotgi (CORE)	Navanagar	Navanagar	2	KARNATAKA
4	Gadag-Hotgi (CORE)	Mukartihal	Basavana Bagewadi	10	KARNATAKA
8	Gadag-Hotgi (RVNL)	Kiadb	Vjayapura	8	KARNATAKA
9	Gadag-Hotgi (CORE)	Lachyan	Lachyan	2	KARNATAKA
10	Unnao-Balamau-Sitapur (CORE)	Bbangamau	Mallava		UTTAR PRADESH
11	Jaipur- Phulera- Madar	Phulera	Phulera	2	RAJASTHAN
12	Ajmer-Rani (CORE)	Haripur	Bar	13	
13	Ajmer-Rani (CORE)	Falna	Khimal	3	RAJASTHAN
14	Phulera-Madar (CORE)	Kishangarh	Kishangarh		RAJASTHAN
15	Bharatpur-Bandikui (CORE)	Nadawai	Nadawai	8.5	RAJASTHAN
16	Bharatpur-Bandikui (CORE)	Bandikui	Bandikui	10	RAJASTHAN
17	Hanuman-Suratgarh (CORE)	Suratgarh	Suratgarh	5	RAJASTHAN
18	Ara-Sasaram (CORE)	Bikram ganj	Piro	25	BIHAR
19	Samakhiali-Gandhidham-Kandla port (CORE)		Bachhao		GUJARAT
20	Surendarnagar-Pipavav		Kurdali		GUJARAT
21	Surendarnagar-Pipavav		Jalia		GUJARAT
22	Surendarnagar-Pipavav		Padada		GUJARAT
23	Trichirapali-Tanjavaur (CORE)		Tanjavaur		TAMIL NADU
24	Trichirapali-Tanjavaur (CORE)	Location yet to be finalised	Thiruvarur		TAMIL NADU
25	Trichirapali-Tanjavaur (CORE)		Karaikal		TAMIL NADU
26	Hisar-Bhatinda-Suratgarh (CORE)	Bhatinda	Gahri bhagi	7	Punjab
27	Hisar-Bhatinda-Suratgarh (CORE)	Location yet to be finalised	Mandi dabwali		Punjab



पावर सिस्टम ऑपरेशन कारपोरेशन लिमिटेड

(भारत सरकार का उद्यम)

POWER SYSTEM OPERATION CORPORATION LIMITED

(A Govt. of India Enterprise)



उत्तरी क्षेत्रीय भार प्रेषण केन्द्र / NORTHERN REGIONAL LOAD DESPATCH CENTRE

कार्यालय : 18-ए, शहीद जीत सिंह सनसनवाल मार्ग, कटवारिया सराय, नई दिल्ली- 110016

OFFICE : 18-A, Shaheed Jeet Singh Sansanwal Marg, Katwaria Sarai, New Delhi- 110016

CIN : U40105DL2009GOI188682, Website : www.nrlcdc.org, www.nrlcdc.in, Tel.: 011- 26519406, 26523869, Fax : 011- 26852747

सदभ सः NRLDC/SO-I/151/ 307

Date: 29-01-2019

To,

Chief Engineer (LD)

SLDC Rajasthan

RVPNL Ajmer Road

Heerapura, Jaipur-302024

पूर्व संदर्भ: 1. Discussions in OCC, TCC meetings of NR

2. Written Communications

Sub: Sudden load connection/disconnection by Rajasthan state control area

Sir,

Please refer to the load curve of Rajasthan control area for last 7 days (attached as Annexure-I). It could be observed that there is sudden connection of load at 1100 hrs. and 2200 hrs. (~700-1200MW) similarly there is sudden disconnection of load at 0400 hrs. and 1700 hrs. (~500-1000 MW). This sudden variation of load leads to excursions in grid frequency and thus reducing the grid reliability. There has been instances wherein sudden disconnection of load at 0400 hrs. has led to over voltages in system and tripping of lines as well on overvoltage protection. IEGC prescribes limit on sudden variation in load by User/SEBs. The relevant extract is quoted below.

5.2(j) Except under an emergency, or to prevent an imminent damage to a costly equipment, no User shall suddenly reduce his generating unit output by more than one hundred (100) MW (20 MW in case of NER) without prior intimation to and consent of the RLDC. Similarly, no User/SEB shall cause a sudden variation in its load by more than one hundred (100 MW) without prior intimation to and consent of the RLDC. [All users and SEBs shall ensure that temporary over voltage due to sudden load rejection and the maximum permissible values of voltage unbalance shall remain within limits specified under Central Electricity Authority (Grid Standards) Regulations, 2010.]

Therefore, it is requested that all concerned may please be advised to restrict the load variation to the tune of limits specified in IEGC through staggering of load connection/disconnection, for safe and reliable operation of national grid.

धन्यवाद,

for next occm.

आर.के.पोरवाल

SE (operation)

(आर.के.पोरवाल)

महाप्रबंधक (प्रणाली प्रचालन)

(उ. क्ष. भा. प्रे. केंद्र)

Copy for kind Information: -

1. CMD RVPNL, Vidyut Bhawan, Jyotinagar, Vidyut Marg, JAIPUR-302 005
2. Member Secretary, NRPC, New Delhi-110016
3. Chief General Manager (I/c), NLDC, New Delhi
4. Executive Director, NRLDC, New Delhi
5. Director (SO), POSOCO
6. CMD, POSOCO

As per direction.

EE(0)

01/02/19

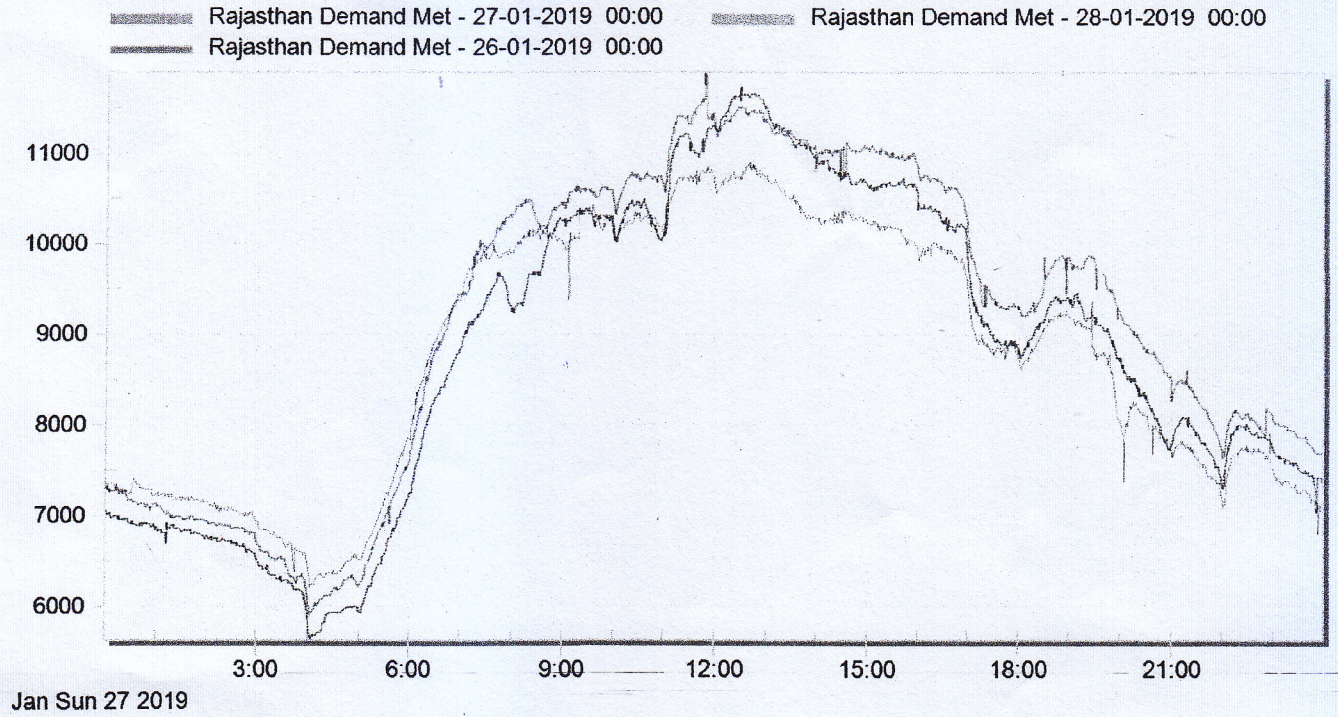
AEE(0) - for next occm.

अधीक्षक

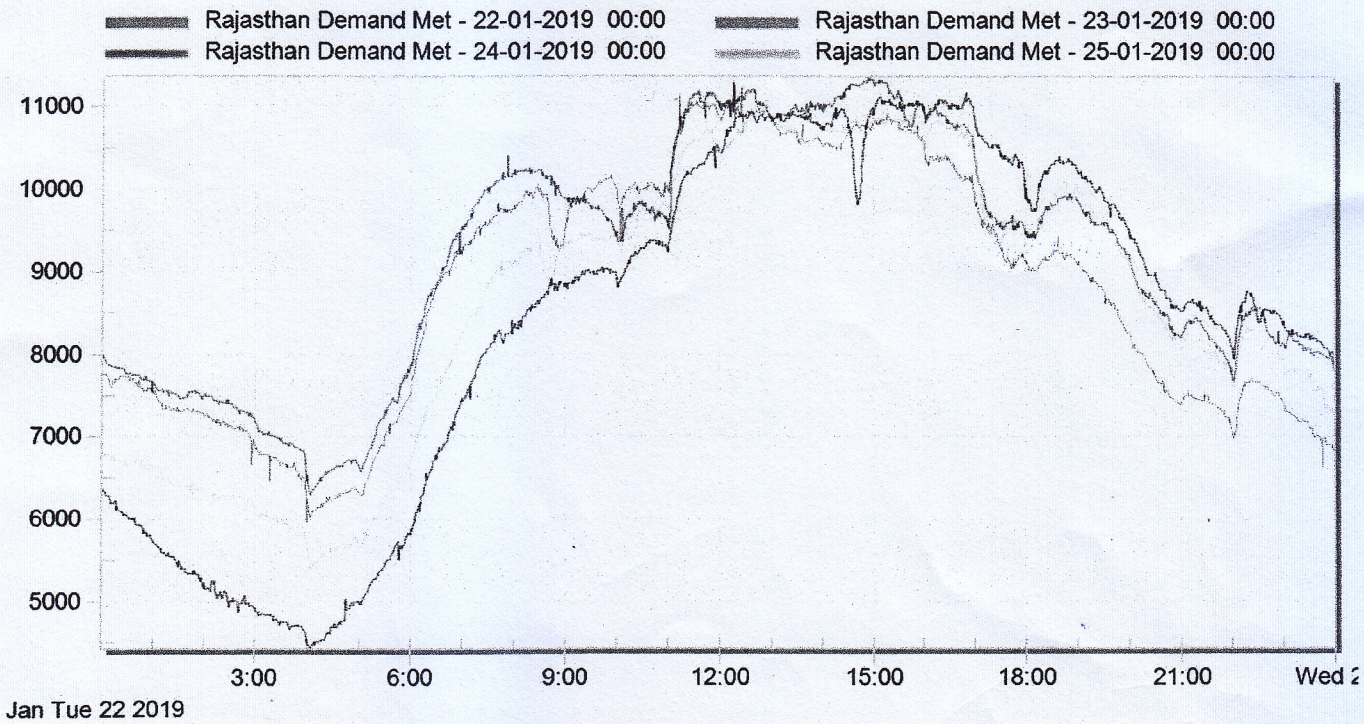
1/2/19

Demand Pattern of Rajasthan

Rajasthan Demand Met



Rajasthan Demand Met





एसजेवीएन लिमिटेड

(भारत सरकार एवं हिमाचल प्रदेश सरकार का संयुक्त उपक्रम)

A Mini Ratna & Schedule "A" PSU

आईएसओ 9001:2008 प्रमाणित कम्पनी

एसजेवीएन कॉरपोरेट कार्यालय परिसर, शनान, शिमला - 171 006

CIN:L40101HP1988GOI008409



संदर्भ: एसजेवीएन/सीसी/सीएवंएसओ/ 05052- 2827-28

दिनांक: 28.01.2019

Sh. G. Chakraborty

वरि. महाप्रबंधक (NLDC)

उत्तरी भार प्रेषण केन्द्र, 18 / ए,

शहीद जीत सिंह सनसनवाला मार्ग,

कटवरिया सराय, नई दिल्ली -110016

Subject : FRAS/ Inverse FRAS Scheduling regarding

श्रीमान,

This is in reference to the 5 min time block scheduling under FRAS/Inverse FRAS (Fast Response Ancillary Services) introduced by NLDC from 26.11.2018. Instructions for this scheduling are being communicated by NLDC through email and also through telephonic communication from time to time.

Generally, FRAS/ Inverse FRAS scheduling for load of Rampur HPS is in proportion of NJHPS load. However, at times (i.e. 18.12.18, 08.01.19, 09.01.19 and 14.01.19) it has been observed that FRAS scheduling for NJHPS and RHPS is not proportionate due to which operation Engineers at Rampur HPS have to face difficult situations, when there are chances of water spillage from NJHPS or it is not possible to meet FRAS schedule. The matter has already been intimated through email.

Since, Rampur HPS is operating in tandem with NJHPS, so the FRAS or inverse FRAS detail of Rampur HPS are to be implemented inline with NJHPS i.e divide the FRAS or inverse FRAS of NJHPS with factor 3.63(ex bus capacity of NJHPS i.e 1482/ ex bus capacity of RHPS i.e 408).

It is, therefore, requested to kindly schedule the FRAS/ Inverse FRAS proportionately as per details given above to avoid any spillage or less availability of water at RHPS end.

सधन्यवाद,

एसजेवीएन लिमिटेड की ओर से,

भवदीय,

सिंह
28/1/19
(रोमेश कपूर)

मुख्य महाप्रबंधक (सी एंड एसओ)

*Pls. include as
agenda i oee
आनेल मीटि
SE (operation)*

Registered Office: SJVN Corporate Office Complex, Shanan, Shimla-171006, HP

Website: www.sjvn.nic.in

Kindly include in upcoming oee agenda.

AEE(0)

सिंह
05/04/19



एसजेवीएन लिमिटेड

(भारत सरकार एवं हिमाचल प्रदेश सरकार का संयुक्त उपक्रम)

A Mini Ratna & Schedule "A" PSU

आईएसओ 9001:2008 प्रमाणित कम्पनी

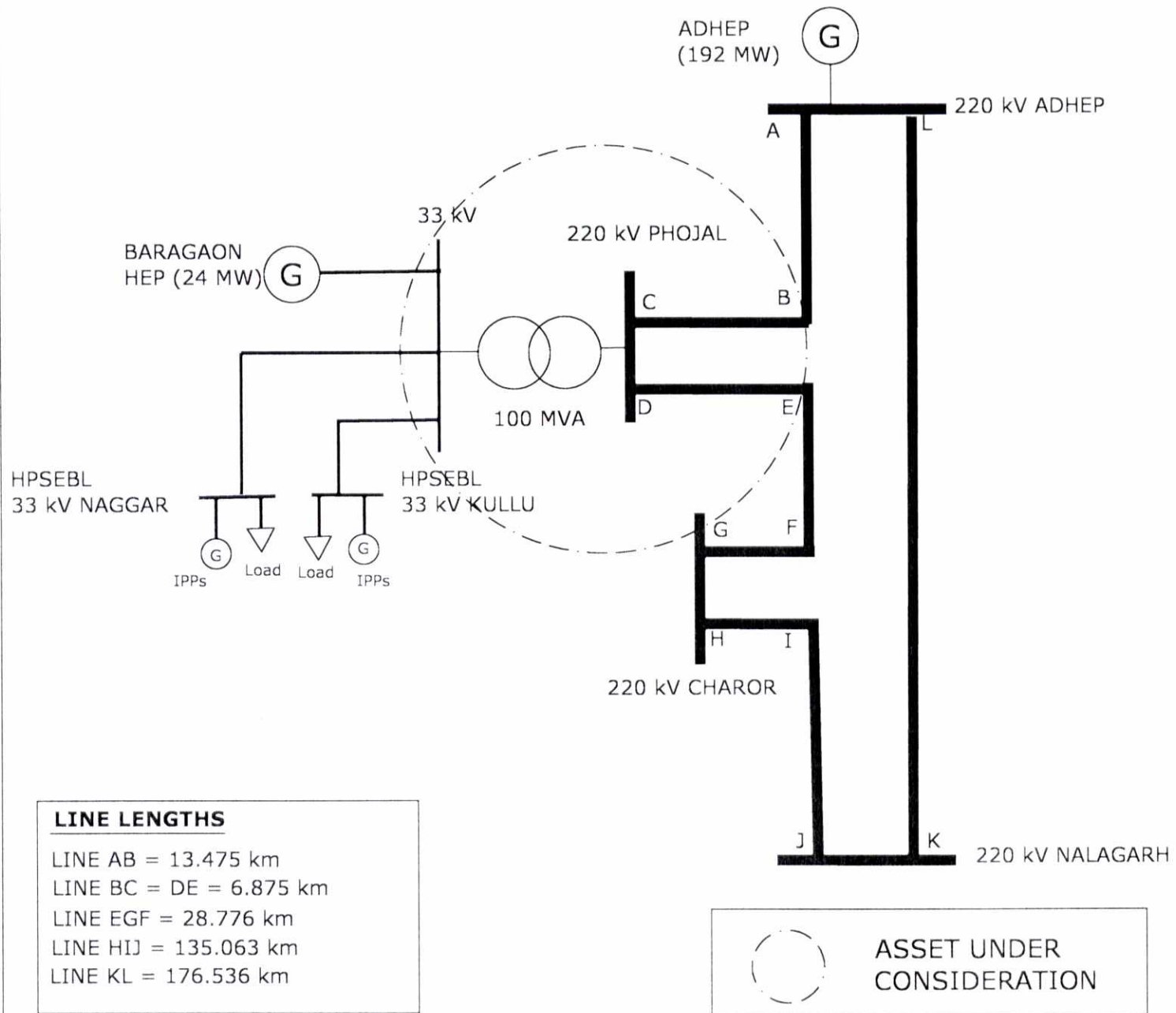
एसजेवीएन कॉरपोरेट कार्यालय परिसर, शनान, शिमला - 171 006

CIN:L40101HP1988GOI008409

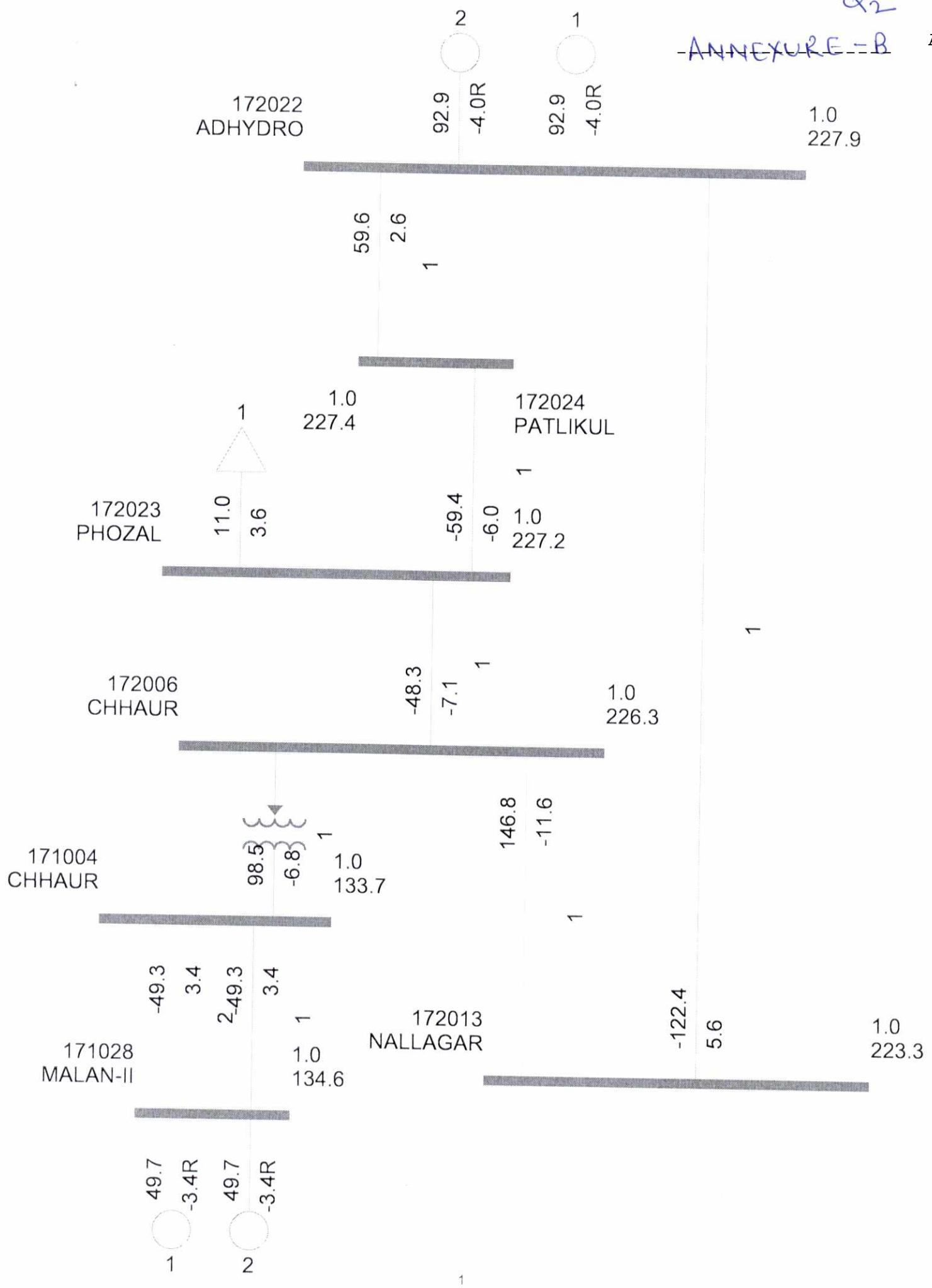
प्रतिलिपि सूचनार्थः

अधीक्षण अभियंता (प्रचालन), उत्तरी क्षेत्रीय विद्युत समिति, 18 ए, कुतुब इंस्टीट्यूशनल एरिया, शहीद जीत सिंह मार्ग, कटवरिया सराय, नई दिल्ली -110 016. फ़ैक्स नंबर-011-26865206.

CONNECTIVITY OF 220/33 kV PHOJAL SS WITH 220 kV ADHEP-NALAGARH TL



Q₂
ANNEXURE-B



172022
ADHYDRO

55.3
-20.1R



55.3
-20.1R



1.0
227.9

Q4

18.3
-7.2
13.7
-6.3
1

1.0
228.0

172024
PATLIKUL

1

172023
PHOZAL

-13.7
2.2

1.0
228.0

172006
CHHAUR

-21.0
4.6

11.0
3.6

1.0
228.2

100.3
-25.9

171004
CHHAUR

79.3
-13.5

1.0
134.1

172013
NALLAGAR -77.0

9.1

1.0
228.8

171028
MALAN-II

-39.7
6.7
-39.7
6.7

1.2
134.6

39.9
-7.1R

1

39.9
-7.1R

2

HIMACHAL PRADESH POWER TRANSMISSION CORPORATION LIMITED
DAILY LOG SHEET FOR 220/33 KV, 80/100 MVA G.I.S SUBSTATION, PHOJAL

33kV Incoming/Out going Feeder's Load

Name of Division : HPTCL PHOJAL, Kullu
 Date : 24/06/2018 Day : Thursday

Time	BAY -301 (LV TRF)			BAY -306 BARAGRAM HEP			BAY -307 HPSEBL NAGGAR			BAY -308 HPSEBL KULLU			DC Voltage/ Current of Battery Charger					
	Amp.	MW	PF	Amp.	MW	PF	Amp.	MW	PF	Amp.	MW	PF	220V DC BANK	220V DC BANK	48V DC BANK	48V DC BANK		
HS												Voltage	Current	Voltage	Current	Voltage	Current	
1200	4224	4.226	1.00	4823.6	-2.644	-1.00	3841.0	-1.547	-0.99	24.6	-0.01	-0.08	32.6	2.21	2.21	3.57	5.02	5.02
1300	4156	4.156	1.00	4730.9	-2.644	-1.00	3841.0	-1.547	-0.99	24.6	-0.01	-0.08	32.6	2.21	2.21	3.57	5.02	5.02
1400	4156	4.156	1.00	4730.9	-2.644	-1.00	3841.0	-1.547	-0.99	24.6	-0.01	-0.08	32.6	2.21	2.21	3.57	5.02	5.02
1500	4156	4.156	1.00	4730.9	-2.644	-1.00	3841.0	-1.547	-0.99	24.6	-0.01	-0.08	32.6	2.21	2.21	3.57	5.02	5.02
1600	4156	4.156	1.00	4730.9	-2.644	-1.00	3841.0	-1.547	-0.99	24.6	-0.01	-0.08	32.6	2.21	2.21	3.57	5.02	5.02
1700	4156	4.156	1.00	4730.9	-2.644	-1.00	3841.0	-1.547	-0.99	24.6	-0.01	-0.08	32.6	2.21	2.21	3.57	5.02	5.02
1800	4156	4.156	1.00	4730.9	-2.644	-1.00	3841.0	-1.547	-0.99	24.6	-0.01	-0.08	32.6	2.21	2.21	3.57	5.02	5.02
1900	4156	4.156	1.00	4730.9	-2.644	-1.00	3841.0	-1.547	-0.99	24.6	-0.01	-0.08	32.6	2.21	2.21	3.57	5.02	5.02
2000	4156	4.156	1.00	4730.9	-2.644	-1.00	3841.0	-1.547	-0.99	24.6	-0.01	-0.08	32.6	2.21	2.21	3.57	5.02	5.02
2100	4156	4.156	1.00	4730.9	-2.644	-1.00	3841.0	-1.547	-0.99	24.6	-0.01	-0.08	32.6	2.21	2.21	3.57	5.02	5.02
2200	4156	4.156	1.00	4730.9	-2.644	-1.00	3841.0	-1.547	-0.99	24.6	-0.01	-0.08	32.6	2.21	2.21	3.57	5.02	5.02
2300	4156	4.156	1.00	4730.9	-2.644	-1.00	3841.0	-1.547	-0.99	24.6	-0.01	-0.08	32.6	2.21	2.21	3.57	5.02	5.02
2400	4156	4.156	1.00	4730.9	-2.644	-1.00	3841.0	-1.547	-0.99	24.6	-0.01	-0.08	32.6	2.21	2.21	3.57	5.02	5.02

ENERGY METER READINGS

Description	Bay No. -202 (HV TRF)		Bay No. -301 (LV TRF)		Bay No. -306 Baragan H.E.P		Bay No. -307 HPSEBL Naggar		Bay No. -308 HPSEBL Kullu		Bay No. -309 Station T/F	
	IMPORT	EXPORT	IMPORT	EXPORT	IMPORT	EXPORT	IMPORT	EXPORT	IMPORT	EXPORT	IMPORT	EXPORT
New Reading	512632	527318	16613	54934.3	64538	43126	144.4	43548.9	3418	20123	135618	92540
Old Reading	512632	527318	16613	54934.3	64538	43126	144.4	43548.9	3418	20123	135618	92540
Difference	0	0	0	0	0	0	0	0	0	0	0	0
Multiplying Factor	1	1	1	1	1	1	1	1	1	1	1	1
Total Energy	0	0	0	0	0	0	0	0	0	0	0	0

HIMACHAL PRADESH POWER TRANSMISSION CORPORATION LIMITED

DAILY LOG SHEET FOR 220/33 KV, 80/100 MVA G.I.S SUBSTATION, PHOJAL

33kV Incomer / Out going Feeder's Load

Name of Division : HPPTCL PIU -Phojal, Kullu
 Dated : 9/08/2018 Day : Thursday

TIME In Hrs	BAY-301 (LV TRF)			BAY-306 BARAGRANHEP			BAY-307 HPSEBL NAGGAR			BAY-308 HPSEBL KULLU			TOTAL DC BANK		Frequency HZ	33KV Voltage	DC Voltage/ Current of Battery Charger							
	Amp	MW	PF	Amp	MW	PF	Amp	MW	PF	Amp	MW	PF	Amp	MW			PF	220V DC BANK 1 Voltage	220V DC BANK 2 Voltage	48V DC BANK 1 Current	48V DC BANK 2 Current			
1.00	412.5	54.33	1.00	405.04	-27.37	-1.00	823.05	-13.05	-0.98	291.68	-12.13	-0.99	-	-	44.93	31.60	237.43	1.72	229.70	3.57	61.93	0.00	50.95	3.55
2.00	414.5	53.78	1.00	412.53	-27.36	-1.00	824.14	-13.39	-0.98	280.57	-12.28	-0.99	-	-	50.00	31.72	237.43	1.72	229.79	3.57	51.93	0.00	50.95	3.55
3.00	410.02	51.61	1.00	410.78	-27.37	-1.00	822.61	-13.35	-0.98	280.55	-12.33	-0.99	-	-	44.93	31.82	237.43	1.72	229.79	3.57	51.93	0.00	50.95	3.55
4.00	410.02	55.02	1.00	410.92	-27.36	-1.00	822.94	-13.55	-0.98	280.54	-12.29	-0.99	-	-	44.93	31.86	237.43	1.72	229.80	3.57	51.93	0.00	50.95	3.55
5.00	410.02	54.49	1.00	410.95	-27.37	-1.00	822.54	-13.75	-0.98	280.52	-12.12	-0.99	-	-	44.93	31.82	237.43	1.72	229.80	3.57	51.93	0.00	50.95	3.55
6.00	410.02	53.83	1.00	410.43	-27.39	-1.00	823.33	-13.04	-0.98	280.54	-12.59	-0.99	-	-	44.93	31.76	237.43	1.72	229.80	3.57	51.93	0.00	50.95	3.55
7.00	410.02	50.84	1.00	411.81	-27.39	-1.00	843.24	-13.35	-0.98	183.87	-10.23	-0.99	-	-	50.00	31.85	237.43	1.72	229.77	3.57	51.94	0.00	50.96	3.55
8.00	410.02	45.99	1.00	412.45	-27.39	-1.00	287.04	-14.74	-0.96	144.54	-8.02	-0.98	-	-	50.00	31.88	237.43	1.72	229.87	3.57	51.94	0.00	50.96	3.55
9.00	410.02	31.14	1.00	412.19	-27.32	-1.00	1.53	0.00	0.00	2.31	-0.01	-0.11	-	-	50.00	31.97	237.43	1.72	229.82	3.57	51.94	0.00	50.96	3.55
10.00	410.02	24.12	1.00	414.85	-27.31	-1.00	1.51	0.00	0.00	2.40	-0.04	-0.09	-	-	44.93	31.94	237.43	1.72	229.82	3.57	51.94	0.00	50.96	3.55
11.00	410.02	27.57	1.00	415.57	-27.32	-1.00	74.52	0.39	1.00	2.05	-0.01	-0.04	-	-	44.93	31.90	237.43	1.72	229.79	3.57	51.94	0.00	50.96	3.55
12.00	410.02	20.89	1.00	410.71	-27.06	-1.00	114.05	5.90	0.51	0.51	0.01	-0.08	-	-	50.00	31.92	237.43	1.72	229.81	3.57	51.94	0.00	50.96	3.55
13.00	410.02	41.25	0.99	410.24	-26.64	-1.00	271.11	14.57	0.42	2.32	-0.01	-0.12	-	-	50.00	31.94	237.43	1.72	229.82	3.57	51.94	0.00	50.96	3.55
14.00	410.02	41.29	1.00	505.57	-27.53	-1.00	268.56	14.53	-0.09	2.15	-0.01	-0.09	-	-	44.93	31.93	237.43	1.72	229.82	3.57	51.94	0.00	50.96	3.55
15.00	410.02	37.18	0.99	410.73	-26.85	-1.00	188.46	-9.04	-0.07	2.10	-0.01	-0.10	-	-	50.00	31.95	237.43	1.72	229.76	3.57	51.94	0.00	50.96	3.55
16.00	410.02	37.70	1.00	410.42	-26.64	-1.00	148.58	-10.12	-0.09	2.14	-0.01	-0.09	-	-	44.93	31.96	237.43	1.72	229.76	3.57	51.94	0.00	50.96	3.55
17.00	410.02	37.82	1.00	410.70	-27.11	-1.00	205.29	-10.03	-0.09	2.81	-0.01	-0.08	-	-	50.00	31.97	237.43	1.72	229.76	3.57	51.94	0.00	50.96	3.55
18.00	410.02	31.80	1.00	411.48	-27.03	-1.00	48.71	-5.04	-0.14	2.29	-0.01	-0.09	-	-	50.00	31.98	237.43	1.72	229.76	3.57	51.94	0.00	50.96	3.55
19.00	410.02	32.54	1.00	412.44	-27.06	-1.00	136.28	-6.70	-0.06	2.98	-0.01	-0.06	-	-	44.93	31.98	237.43	1.72	229.76	3.57	51.94	0.00	50.96	3.55
20.00	410.02	31.12	1.00	414.15	-27.11	-1.00	83.00	-4.41	-0.09	2.35	-0.01	-0.04	-	-	44.93	31.98	237.43	1.72	229.76	3.57	51.94	0.00	50.96	3.55
21.00	410.02	31.61	1.00	412.29	-27.40	-1.00	89.18	-4.54	-0.06	2.24	-0.01	-0.06	-	-	44.93	31.95	237.43	1.72	229.76	3.57	51.94	0.00	50.96	3.55
22.00	410.02	33.28	1.00	412.50	-27.33	-1.00	112.09	-4.14	-0.06	2.15	-0.01	-0.06	-	-	44.93	31.98	237.43	1.72	229.76	3.57	51.94	0.00	50.96	3.55
23.00	410.02	35.34	1.00	410.71	-27.70	-1.00	151.91	-8.15	-0.06	2.24	-0.01	-0.04	-	-	44.93	31.98	237.43	1.72	229.76	3.57	51.94	0.00	50.96	3.55
24.00	410.02	35.22	1.00	412.78	-27.30	-1.00	121.70	-9.16	-0.06	2.38	-0.01	-0.04	-	-	44.93	31.92	237.43	1.72	229.76	3.57	51.94	0.00	50.96	3.55

ENERGY METER READING

Description	Bay No.-202 (HV TRF)		Bay No.-301 (LV TRF)		Bay No.-306 Baragranh H.E.P		Bay No.307 HPSEBL Naggar		Bay No.308 HPSEBL Kullu		Bay No.309 Station T/F								
	Main Meter	Check meter	Main Meter	Check meter	Main Meter	Check meter	Main Meter	Check meter	Main Meter	Check meter	Main Meter	Check meter							
New Reading	41212.0	34322.7	162.1	18340.7	54972.0	11111.0	44450.0	310.8	44509.8	913.7	35940.7	15414.3	64328.2	4232.4	15187.9	12585.4	454.1	5221.4	322.6
Old Reading	41211.9	32814.9	162.1	12800.0	54938.0	9473.4	44350.0	310.8	44408	913.7	35821.0	14400.0	64328.2	4232.4	15187.9	12585.4	454.1	5221.4	322.6
Difference	0.1	1407.8	0.0	5540.7	40.0	1637.6	0.0	22.2	0.0	88.8	118.7	14.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Multiplying Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Total Energy	41212.0	34322.7	162.1	18340.7	54972.0	11111.0	44450.0	310.8	44509.8	913.7	35940.7	15414.3	64328.2	4232.4	15187.9	12585.4	454.1	5221.4	322.6

HIMACHAL PRADESH POWER TRANSMISSION CORPORATION LIMITED
DAILY LOG SHEET FOR 220/33 kV, 80/100 MVA G.I.S SUBSTATION, PHOJAL

Name of Division : HPTCL PU - Phojal, Kullu
 Date : 21/11/2022 Day : Monday

TIME In Hrs.	33kV Incoming /Out going Feeder's Load						DC Voltage/ Current of Battery Charger								
	BAY-301 (LV TRF) Amp.	MW	PF	Amp.	MW	PF	BAY-306 BARAGRAN H.E.P. Amp.	MW	PF	BAY-307 HPSEBL NAGGAR Amp.	MW	PF	BAY-308 HPSEBL KULLU Amp.	MW	PF
1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00
2.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00
3.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00
4.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00
5.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00
6.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00
7.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00
8.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00
9.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00
10.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00
11.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00
12.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00
13.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00
14.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00
15.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00
16.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00
17.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00
18.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00
19.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00
20.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00
21.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00
22.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00
23.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00
24.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00	1000	1.00	1.00

ENERGY METER READING

Description	Bay No. -202 (HV TRF)		Bay No. -301 (LV TRF)		Bay No. -306 Baragran H.E.P.		Bay No. 307 HPSEBL Naggar		Bay No. 308 HPSEBL Kullu		Bay No. 309 Station T/F	
	Main Meter	Check meter	Main Meter	Check meter	Main Meter	Check meter	Main Meter	Check meter	Main Meter	Check meter	Main Meter	Check meter
New Reading	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Old Reading	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Difference	0	0	0	0	0	0	0	0	0	0	0	0
Multiplying Factor	1	1	1	1	1	1	1	1	1	1	1	1
Total Energy	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000

HIMACHAL PRADESH POWER TRANSMISSION CORPORATION LIMITED

Name of Division : HPTCL PIU -Phojal, Kullu
 Dated : 21/01/18 Day : 21/01/2018

DAILY LOG SHEET FOR 220/33 KV, 80/100 MVA G.I.S SUBSTATION, PHOJAL

TIME In Hrs.	33kV Incomer /Out going Feeder's Load										DC Voltage/ Current of Battery Charger										
	BAY-301 (LV TRF) Amp	BAY-306 BARAGRAH HEP MW	BAY-307 HPSEEL NAGGAR PF	BAY-307 HPSEEL NAGGAR Amp	BAY-308 HPSEEL KULLU MW	BAY-308 HPSEEL KULLU PF	BAY-308 HPSEEL KULLU Amp	IMP/EXP	IMP/EXP	IMP/EXP	IMP/EXP	220V DC BANK Voltage	220V DC BANK Current	48V DC BANK Voltage	48V DC BANK Current						
1.00	10.81	1.23	0.99	40.24	-2.32	0.99	21.18	0.00	4.78	0.01	0.01	49.93	34.34	239.50	1.74	230.05	2.52	52.10	0.00	51.28	2.55
2.00	23.03	2.34	0.97	35.28	-2.30	0.99	12.23	0.00	3.58	0.00	0.00	50.00	34.51	239.54	1.74	230.05	2.52	52.10	0.00	51.14	2.55
3.00	28.67	2.34	0.94	35.61	-2.30	0.99	12.23	0.00	4.77	0.00	0.00	49.99	34.54	239.54	1.74	230.05	2.52	52.10	0.00	51.24	2.55
4.00	28.14	2.36	0.95	34.57	-2.25	1.00	11.34	0.00	4.81	0.00	0.00	49.98	34.55	239.54	1.74	230.05	2.52	52.10	0.00	51.24	2.55
5.00	23.33	2.15	0.97	34.90	-2.25	0.99	10.37	0.00	3.26	0.05	0.00	49.98	34.44	239.54	1.74	230.05	2.52	52.10	0.00	51.24	2.55
6.00	13.51	0.23	0.25	35.58	-2.24	0.99	26.05	0.00	0.00	0.00	0.00	49.95	33.93	239.54	1.74	230.05	2.52	52.10	0.00	51.24	2.55
7.00	8.52	-4.55	-1.00	30.25	-2.21	0.99	65.08	0.00	5.63	1.00	1.00	49.90	31.39	239.54	1.74	230.05	2.52	52.10	0.00	51.24	2.55
8.00	24.04	-13.41	-0.91	36.10	-2.15	0.99	14.90	0.00	1.73	1.00	0.99	50.03	33.34	239.54	1.74	230.05	2.52	52.10	0.00	51.24	2.55
9.00	23.45	-11.84	-0.88	34.05	-2.16	0.99	14.57	0.00	2.01	1.00	0.98	50.00	33.22	239.54	1.73	230.05	2.52	52.10	0.00	51.24	2.55
10.00	22.72	-12.79	-0.98	36.25	-2.15	0.99	9.24	0.00	2.26	0.98	0.99	49.95	33.30	239.53	1.74	230.05	2.52	52.10	0.00	51.24	2.55
11.00	22.45	-15.28	-0.95	34.11	-2.04	0.98	13.62	0.00	2.57	0.99	0.99	49.95	33.00	239.53	1.74	230.05	2.52	52.10	0.00	51.24	2.55
12.00	19.72	-10.73	0.98	34.84	-2.04	0.99	10.94	0.00	5.55	0.98	0.98	50.14	33.45	239.53	1.73	230.05	2.52	52.10	0.00	51.24	2.55
13.00	14.79	-2.94	0.98	31.88	-2.05	1.00	8.32	0.00	4.61	0.98	0.99	50.10	34.14	239.52	1.73	230.05	2.52	52.10	0.00	51.24	2.55
14.00	11.84	-6.52	-1.00	31.63	-1.98	0.99	10.43	0.00	3.15	1.00	0.99	50.11	33.59	239.52	1.73	230.05	2.52	52.10	0.00	51.24	2.55
15.00	11.71	-6.11	-0.99	28.15	-2.37	0.99	7.54	0.00	4.31	0.99	0.99	49.97	33.66	239.50	1.73	230.05	2.52	52.10	0.00	51.24	2.55
16.00	10.11	-6.20	-1.00	28.62	-2.24	0.99	6.81	0.00	5.76	0.97	0.97	49.93	33.24	239.50	1.73	230.05	2.52	52.10	0.00	51.24	2.55
17.00	12.14	-6.58	-1.00	27.95	-2.25	0.99	7.43	0.00	4.41	1.00	0.99	49.93	33.24	239.50	1.73	230.05	2.52	52.10	0.00	51.19	2.55
18.00	14.20	-6.78	-1.00	27.28	-2.24	0.99	10.16	0.00	6.14	1.00	0.99	49.93	33.24	239.50	1.73	230.05	2.52	52.10	0.00	51.19	2.55
19.00	15.14	-6.97	-0.99	29.24	-2.32	0.99	15.00	0.00	2.45	1.00	0.99	49.94	33.20	239.50	1.73	230.05	2.52	52.10	0.00	51.19	2.55
20.00	20.56	-12.16	-0.99	28.61	-2.29	0.99	15.63	0.00	6.45	0.99	0.99	50.05	33.56	239.50	1.73	230.05	2.52	52.10	0.00	51.19	2.55
21.00	24.73	-15.84	-0.98	27.43	-2.33	0.99	14.53	0.00	8.22	0.99	0.99	49.93	32.59	239.50	1.73	230.05	2.52	52.10	0.00	51.21	2.55
22.00	18.30	-10.00	-0.99	28.04	-2.34	0.99	13.31	0.00	4.00	0.99	1.00	49.94	33.94	239.50	1.73	230.05	2.52	52.10	0.00	51.21	2.55
23.00	16.30	-9.30	-0.99	36.62	-2.33	1.00	8.28	0.00	4.59	0.99	0.99	50.05	34.26	239.50	1.73	230.05	2.52	52.10	0.00	51.22	2.55
24.00	17.53	0.09	0.99	36.02	-2.33	1.00	9.71	0.00	4.63	0.99	0.99	50.05	34.65	239.50	1.73	230.05	2.52	52.10	0.00	51.23	2.55

ENERGY METER READINGS

Description	Bay No. -202 (HV TRF)				Bay No. -301 (LV TRF)				Bay No. -306 Baragran H.E.P				Bay No. 307 HPSEEL Naggar				Bay No. 308 HPSEEL Kullu				Bay No. 309 Station T/F							
	IMP/EXP	IMP/EXP	IMP/EXP	IMP/EXP	IMP/EXP	IMP/EXP	IMP/EXP	IMP/EXP	IMP/EXP	IMP/EXP	IMP/EXP	IMP/EXP	IMP/EXP	IMP/EXP	IMP/EXP	IMP/EXP	IMP/EXP	IMP/EXP	IMP/EXP	IMP/EXP	IMP/EXP	IMP/EXP	IMP/EXP	IMP/EXP	IMP/EXP	IMP/EXP	IMP/EXP	
New Reading	12.51	15.21	12.51	12.51	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	
Old Reading	32.91	12.51	32.91	32.91	11.95	11.95	11.95	11.95	11.95	11.95	11.95	11.95	11.95	11.95	11.95	11.95	11.95	11.95	11.95	11.95	11.95	11.95	11.95	11.95	11.95	11.95	11.95	
Difference	20.40	2.80	20.40	20.40	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	
Multiplying Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Total Energy	12.720	10.923	12.720	12.720	12.600	12.600	12.600	12.600	12.600	12.600	12.600	12.600	12.600	12.600	12.600	12.600	12.600	12.600	12.600	12.600	12.600	12.600	12.600	12.600	12.600	12.600	12.600	12.600

Scanned by CamScanner

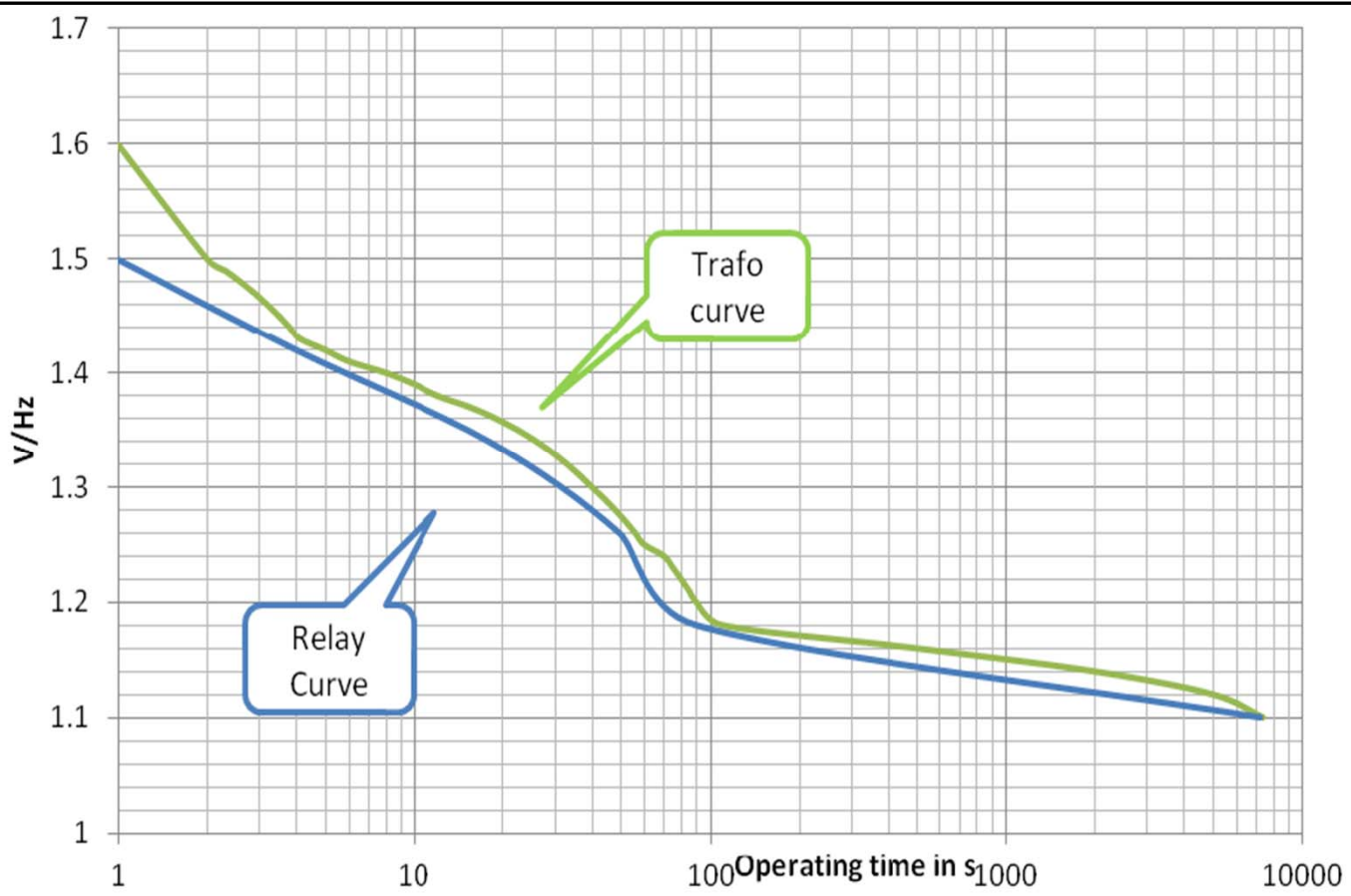
Annex-I

S.no.	Element Name	Type	Voltage Level	Owner	Outage	Time	Revival	Time	Reason / Remarks
1	Makhu 315 MVA ICT 2	ICT	400/220 kV	PSTCL	30-01-2019	2:26	30-01-2019	9:13	Over fluxing
2	Makhu 315 MVA ICT 1	ICT	400/220 kV	PSTCL	31-01-2019	1:28	31-01-2019	9:16	Over fluxing
3	Mukatsar 315 MVA ICT 2	ICT	400/220 kV	PSTCL	31-01-2019	1:59	31-01-2019	7:02	Over fluxing
4	Makhu 315 MVA ICT 2	ICT	400/220 kV	PSTCL	31-01-2019	2:31	31-01-2019	12:09	Over fluxing
5	Mukatsar 315 MVA ICT 1	ICT	400/220 kV	PSTCL	31-01-2019	2:37	31-01-2019	7:00	Over fluxing
6	Dhuri(400) 500 MVA ICT 1	ICT	400/220 kV	PSTCL	31-01-2019	3:24	31-01-2019	10:28	Over fluxing
7	Makhu 315 MVA ICT 1	ICT	400/220 kV	PSTCL	1/2/2019	1:52	1/2/2019	8:54	Over fluxing
8	Dhuri(400) 500 MVA ICT 1	ICT	400/220 kV	PSTCL	3/2/2019	0:32	3/2/2019	8:50	Over fluxing
9	Mukatsar 315 MVA ICT 2	ICT	400/220 kV	PSTCL	3/2/2019	0:52	3/2/2019	7:38	Over fluxing
10	Makhu 315 MVA ICT 1	ICT	400/220 kV	PSTCL	3/2/2019	1:14	3/2/2019	10:41	Over fluxing
11	Makhu 315 MVA ICT 1	ICT	400/220 kV	PSTCL	4/2/2019	3:06	4/2/2019	10:10	Over fluxing
12	Mukatsar 315 MVA ICT 2	ICT	400/220 kV	PSTCL	4/2/2019	3:06	4/2/2019	8:46	Over fluxing
13	Mukatsar 315 MVA ICT 1	ICT	400/220 kV	PSTCL	4/2/2019	3:13	4/2/2019	6:49	Over fluxing

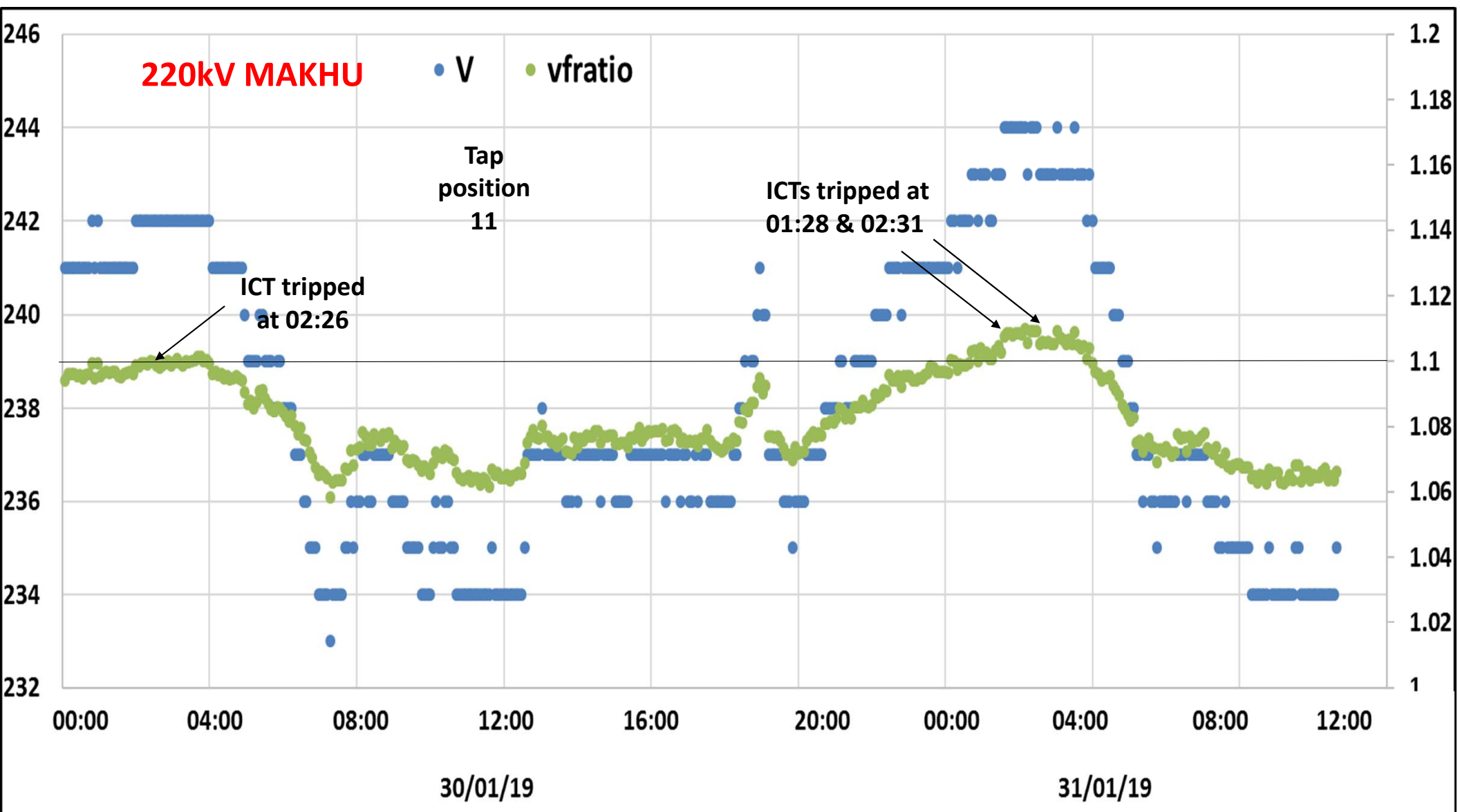
VOLTAGE PROFILE of PUNJAB STATIONS (30.1.19-31.1.19)

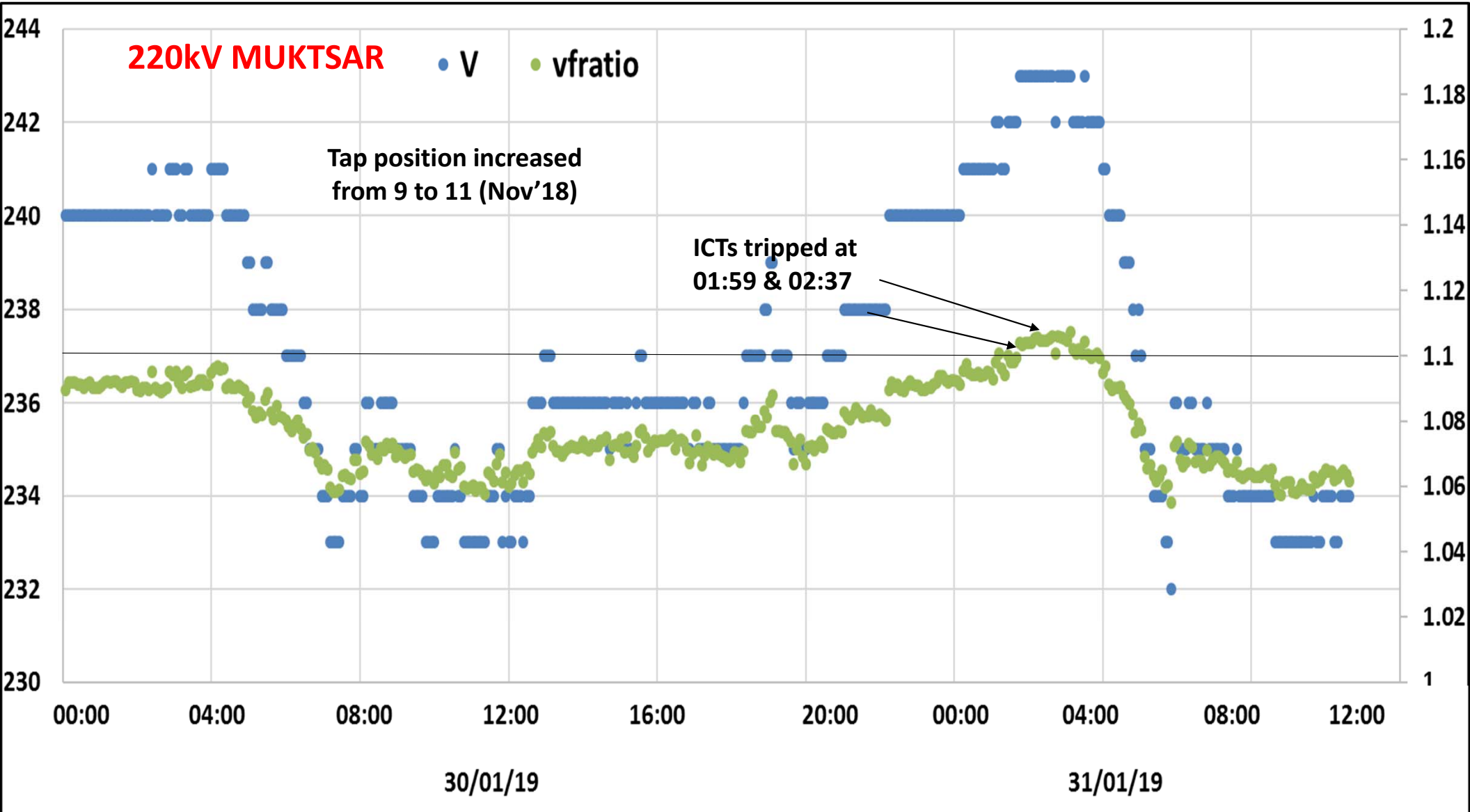
Bus voltage and Bus frequency SCADA data used

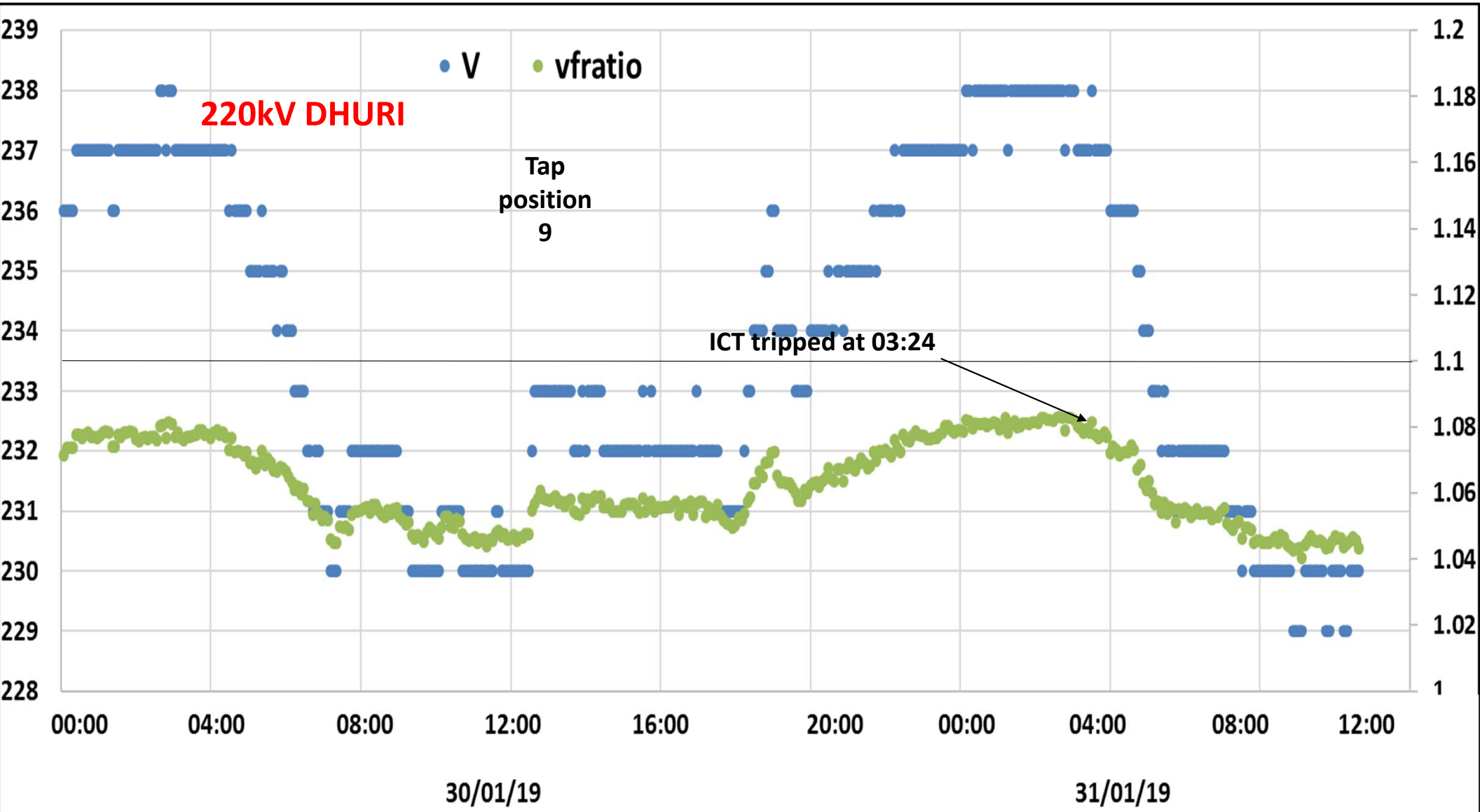
Standard Overflux settings as per Ramakrishna committee

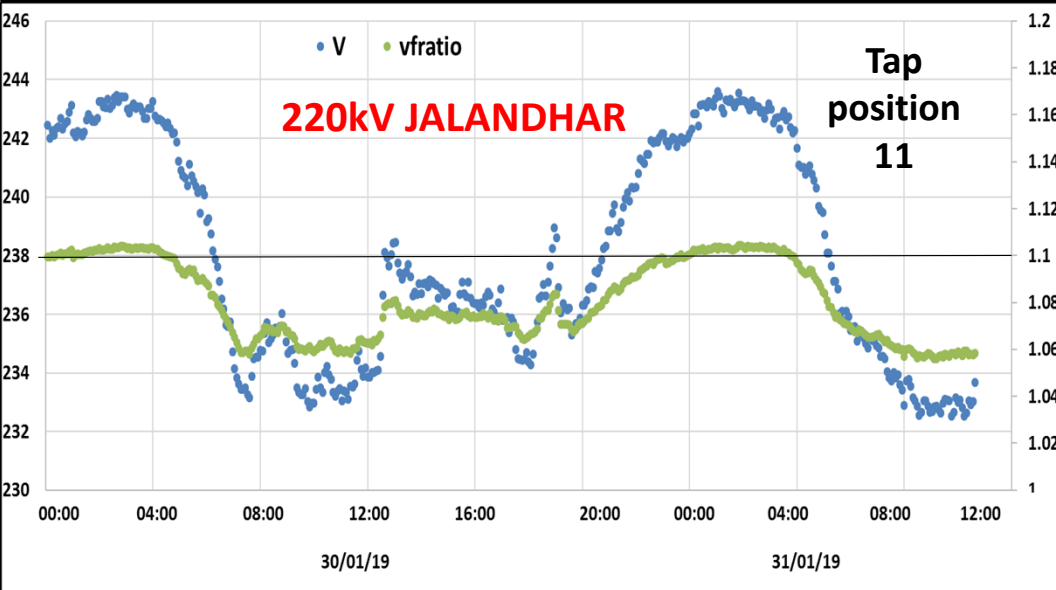
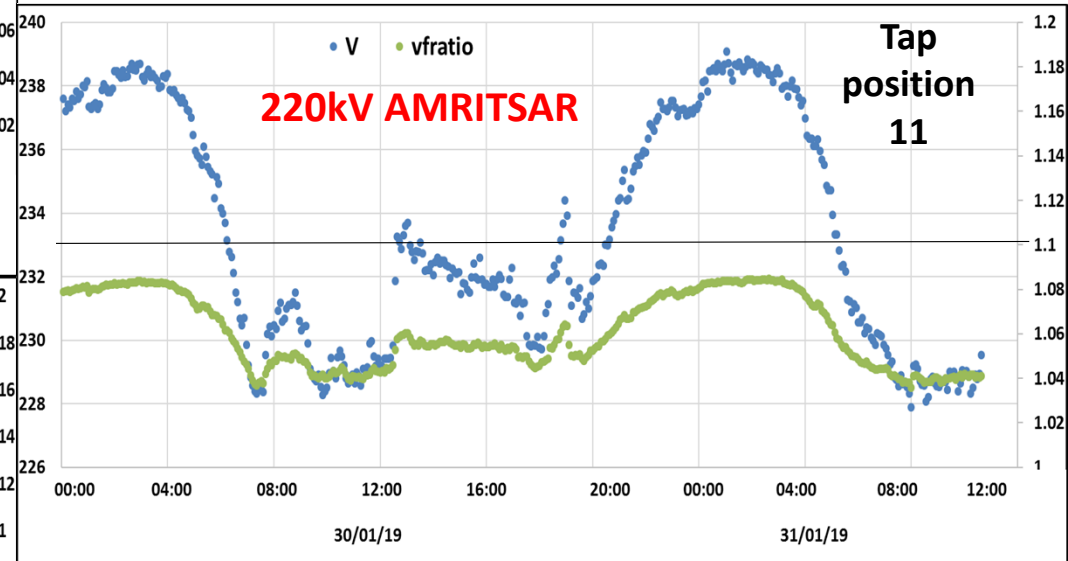
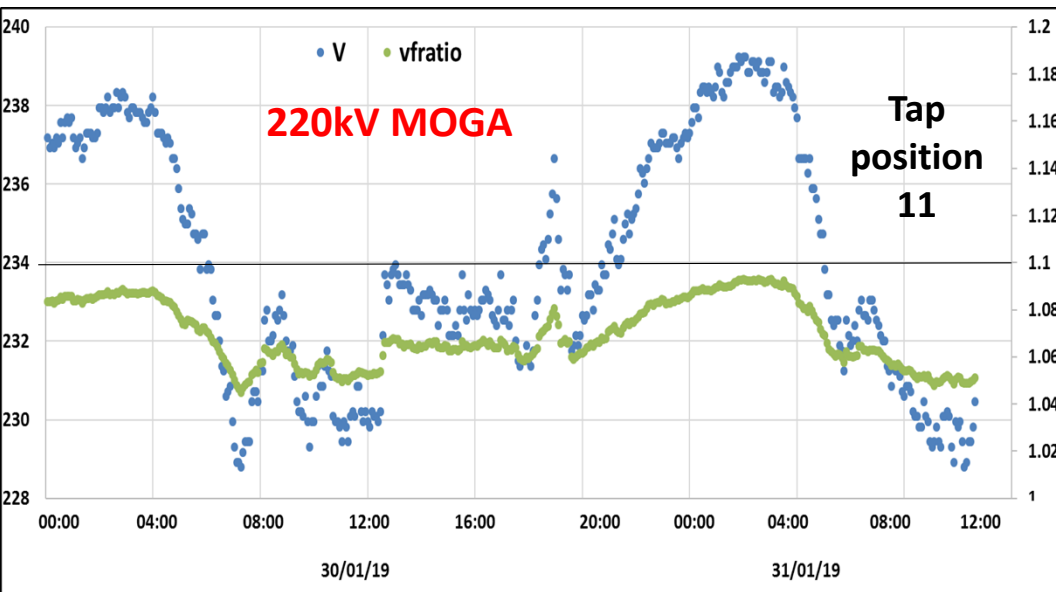


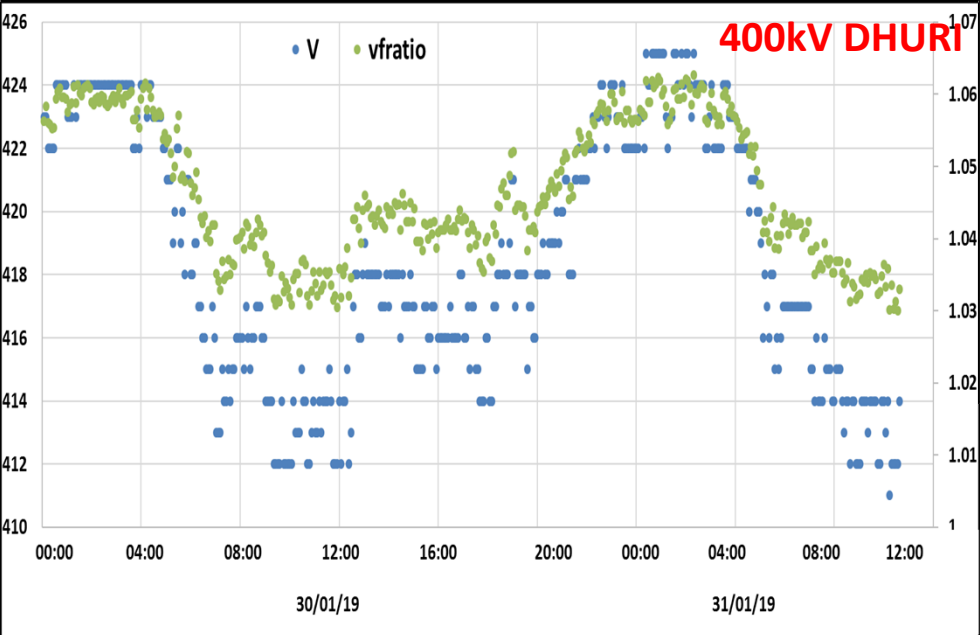
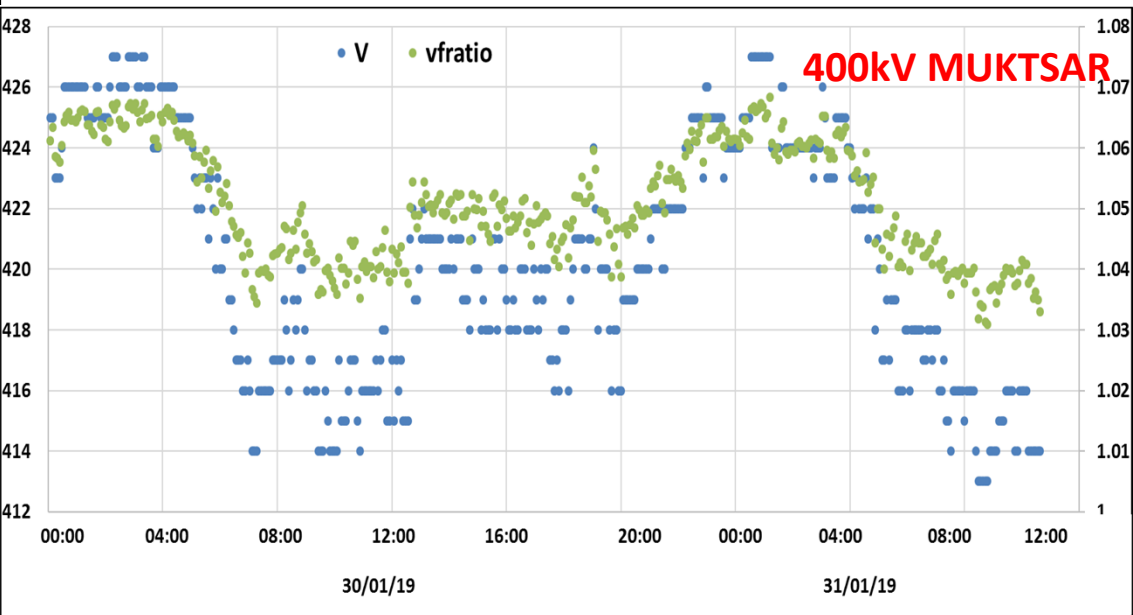
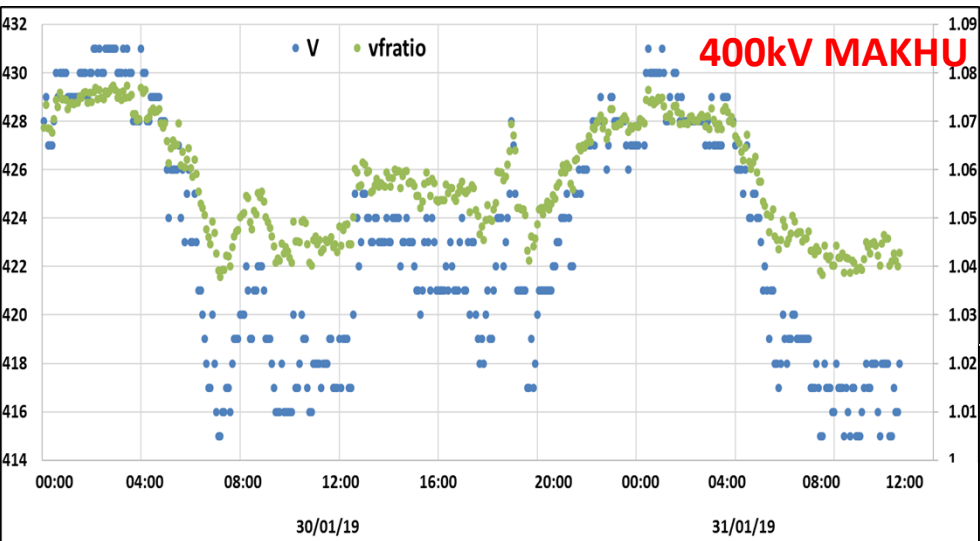
U/F %	Timer	Time set (s)
110	t1	9000
118	t2	90
126	t3	49.5
134	t4	18
142	t5	4
150	t6	1

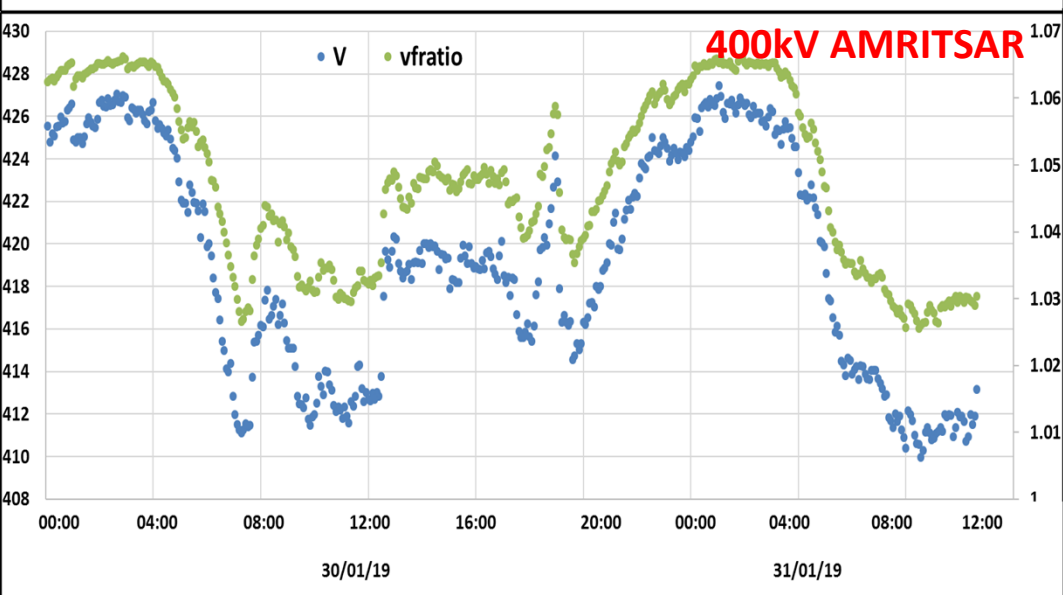
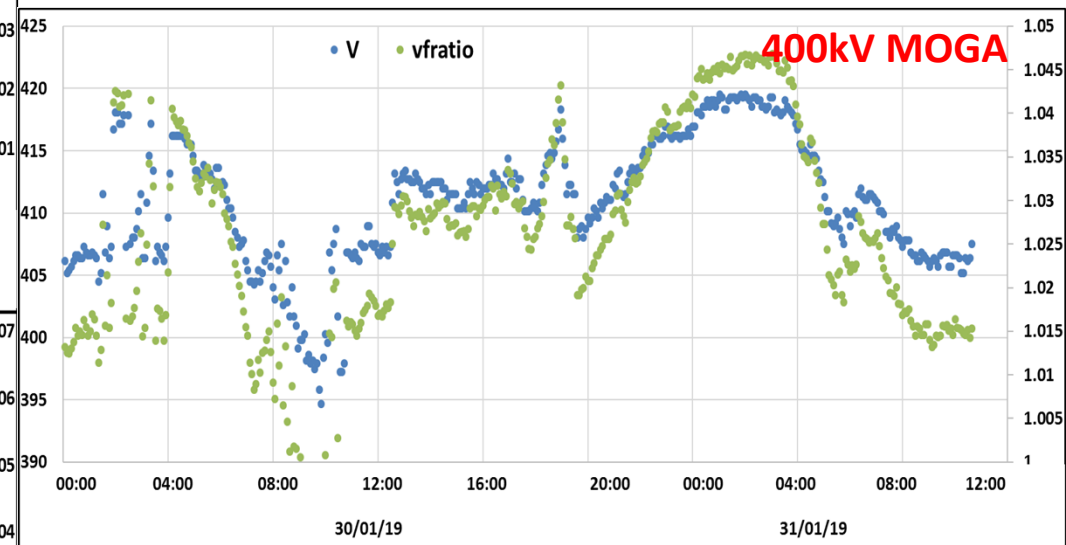
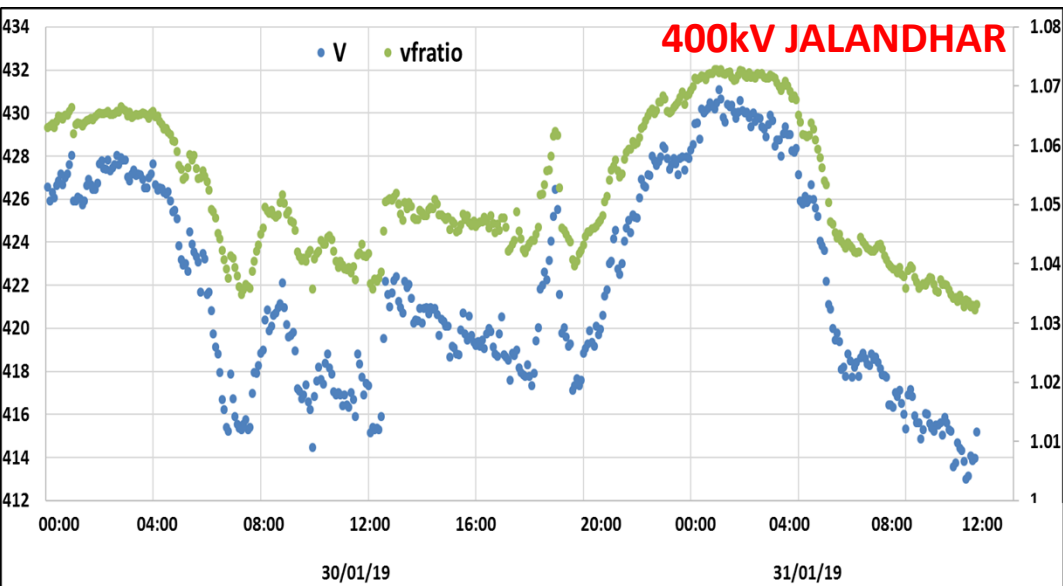






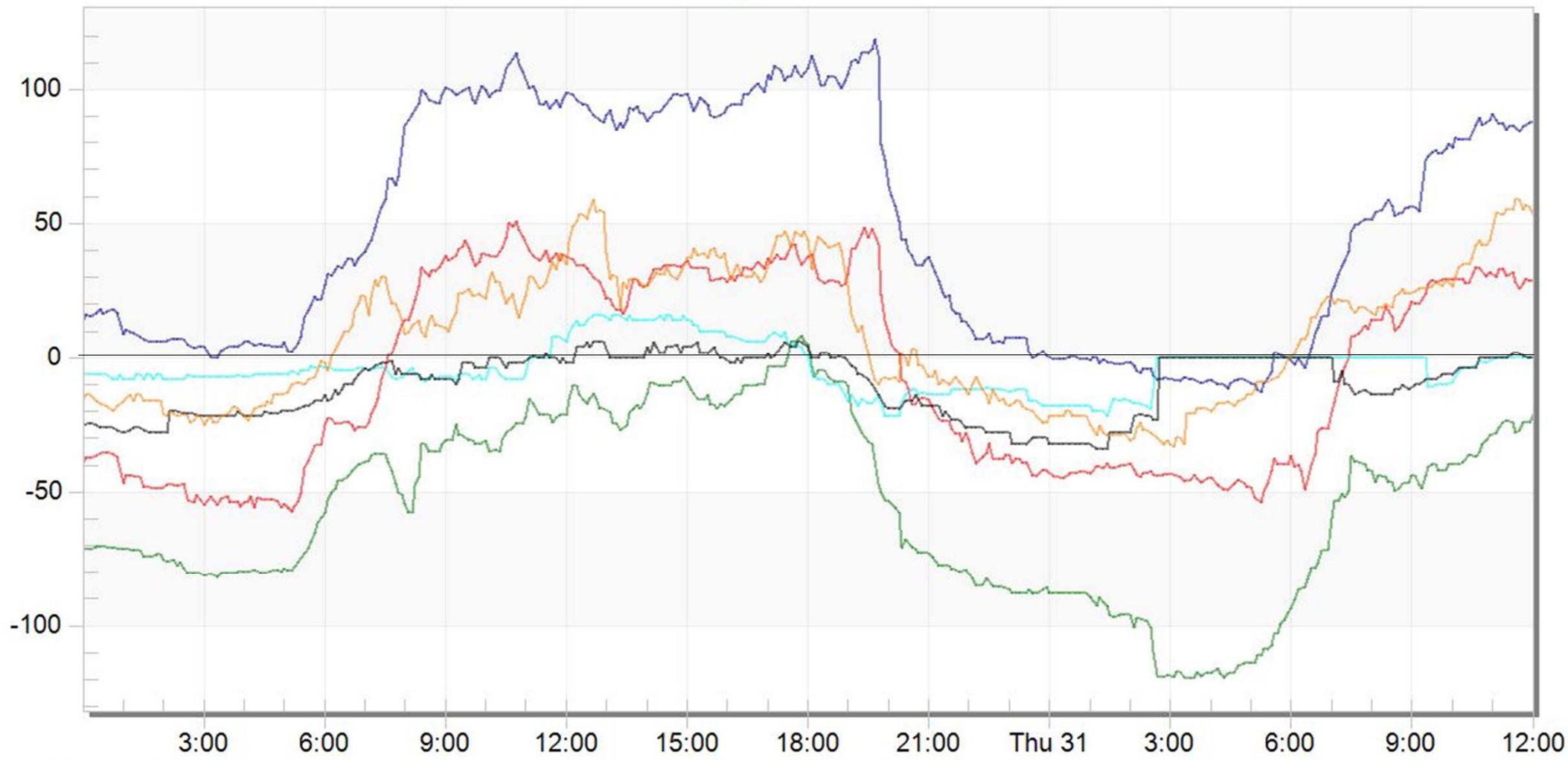






ICT MVAR FLOW 400 to 220

Amritsar Jalandhar Moga Makhu Muktsar Dhuri



Jan Wed 30 2019

पावर सिस्टम ऑपरेशन कॉर्पोरेशन लिमिटेड

(भारत सरकार का उद्यम)

POWER SYSTEM OPERATION CORPORATION LIMITED

(A Govt. of India Enterprise)



पंजीकृत एवं केन्द्रीय कार्यालय : प्रथम तल, बी-9, कुतुब इंस्टीट्यूशनल एरिया, कटवारिया सराय, नई दिल्ली-110016
Registered & Corporate Office : 1st Floor, B-9, Qutab Institutional Area, Katwaria Sarai, New Delhi -110016
CIN : U40105DL2009GOI188682, Website : www.posoco.in, E-mail : posococc@posoco.in, Tel.: 011- 41035696, Fax : 011- 26536901

संदर्भ संख्या: पोसोको/एनएलडीसी/2019/402

दिनांक: 04th February, 2019

सेवा मे,

As per the Distribution List

विषय: Agenda Item regarding Pilot on Security Constrained Economic Dispatch (SCED) of Inter-State Generating Stations (ISGS) Pan India in respective Operational Coordination Committee (OCC) meetings

संदर्भ: CERC Order vide Petition No. 02/SM/2019(Suo-Motu) dtd. 31st January, 2019 in the matter of Pilot on Security Constrained Economic Dispatch (SCED) of Inter-State Generating Stations (ISGS) Pan India <http://cercind.gov.in/2019/orders/02-SM-2019.pdf>

महोदय,

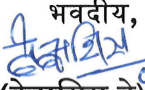
With reference to the above-mentioned order by the Hon'ble Commission, it has been directed that stakeholder awareness programs may be conducted by Regional Power Committees (RPCs) and POSOCO for smooth implementation of SCED pan-India.

It is, hereby, requested that an Agenda Item regarding Pilot on Security Constrained Economic Dispatch (SCED) of Inter-State Generating Stations (ISGS) Pan India may be placed in the respective upcoming OCC meetings in the month of February, 2019. In this connection, an agenda note is also enclosed herewith for kind reference.

As and when the detailed procedure on implementation of SCED pan-India is finalized, the same would also be circulated in the forthcoming OCC meetings in the month of March, 2019.

सादर धन्यवाद,

संलग्न: As above

भवदीय,

(देबासिस डे) 04/02

मुख्य महाप्रबंधक

वितरण सूची:

- 1 सदस्य सचिव, उ. क्षे. वि. स., 18/ए, शहीद जीत सिंह सनसनवाल मार्ग, नई दिल्ली – 110016
- 2 सदस्य सचिव, प. क्षे. वि. स., एफ-3, एम आई डी सी क्षेत्र, अंधेरी(पूर्व), मुंबई – 400093
- 3 सदस्य सचिव, द. क्षे. वि. स., 29, रेस कोर्स क्रॉस रोड, बंगलूरु – 560009
- 4 सदस्य सचिव, पू. क्षे. वि. स., 14, गोल्फ क्लब रोड, कोलकाता – 700033
- 5 सदस्य सचिव, उ. पू. क्षे. वि. स., उ. पू. क्षे. वि. स. परिसर, दांग परमाव, लापलंग, शिलोंग – 793003
- 6 मुख्य अभियन्ता, राष्ट्रीय विद्युत समिति (एनपीसी), 18/ए, शहीद जीत सिंह सनसनवाल मार्ग, दिल्ली - 16

प्रतिलिपि :

1. प्रमुख, क्षे. भा. प्रे. के. (नई दिल्ली/मुंबई/ बंगलूरु/ कोलकाता/शिलोंग)

Agenda Note on Security Constrained Economic Dispatch (SCED) of Inter-State Generating Stations Pan-India

- Hon'ble Commission, vide Order in Petition No. 02/SM/2019 (Suo-Motu) dtd. 31st January, 2019, directed for Pilot on SCED of Inter-State Generating Stations (ISGS) Pan India <http://cercind.gov.in/2019/orders/02-SM-2019.pdf>
- The Central Commission observed that there is an overarching objective to optimize the scheduling and dispatch of the generation resources and reduce the overall cost of production of electricity without major structural changes in the existing system/framework. SCED is a desired step in the Indian grid operation towards optimization methodologies. SCED is an involved procedure requiring developing software, creating interfaces and establishing various protocols, information dissemination and streamlining settlement system etc.
- Accordingly, the Commission directed for pilot of SCED for the Inter-State Generating Stations, on pilot basis, w.e.f. **01st April, 2019**.
- The SCED optimization model is for all the thermal Inter State Generating Stations (ISGS) that are regional entities and whose tariff is determined or adopted by the Commission for their full capacity without violating grid security and honouring the existing scheduling practices prescribed in the Indian Electricity Grid Code.
- A Detailed Procedure would be formulated that would contain the guidelines regarding operational aspects of SCED including scheduling, dispatch, accounting, settlement etc.
- The variable charges declared by the generators for the purpose of Reserve Regulation Ancillary Services (RRAS) would be considered in the optimization process.
- Schedules of the States/beneficiaries would not be changed and the beneficiaries would continue to pay the charges for the scheduled energy directly to the generator as per the existing practices.

- NLDC would open a separate bank account called "National Pool Account (SCED)". All payments to/from the generators on account of SCED schedules would flow to and from the said National Pool Account.
- For any increment in the injection schedule of a generator due to optimization, the generator would be paid from the National Pool Account (SCED) for the incremental generation at the rate of its variable charge.
- For any decrement in the schedule of a generator due to optimization, the generator would pay to the aforesaid National Pool Account (SCED) for the decremental generation at the rate of its variable charge after discounting compensation due to part load operation as certified by RPC as per the provisions of IEGC.
- The incremental changes in schedules on account of optimization would not be considered for incentive computation for the generating stations. The deviation in respect of such generators would be settled with reference to their revised schedule. The increment or decrement of generation under SCED would not form part of RRAS.
- RPCs would issue weekly SCED accounts along with the DSM, RRAS, FRAS and AGC accounts based on data provided to them by RLDCs.
- RPCs would issue the regional accounts including the SCED schedules and NLDC would issue a consolidated "National SCED Settlement Statement" comprising payment and receipts to/from all generators participating in the SCED.
- The savings obtained through SCED after settlement of all accounts of SCED would be recorded and maintained in the "National Pool Account (SCED)" by the NLDC.
- CTU is directed to ensure reliable communication between the respective generating stations and Load Despatch Centres.
- As and when the detailed procedure on implementation of SCED pan-India is finalized, the same would also be circulated in the forthcoming OCC meetings in the month of March, 2019.

Generation Projection (April 2019 - June 2019)

				Generation declared Commercial from 1st Jul'18 to 31st Dec'18					Generation declared/expected to be declared Commercial from 1st Jan'19 to 31st Mar'19								
Sl. No.	Entities	Region	Projections based on 3 Years Data	Bus Name	Unit No.	Installed Capacity	Gen. considered	Sub Total	Bus Name	Unit No.	Installed Capacity	Gen. considered	Sub Total	TOTAL	Comments From DICs /Others (if any)	Figure as per Comments/PoC Data	Projected Generation before normalization w.r.t projected All India Peak Demand
			(MW)			(MW)	(MW)	(MW)			(MW)	(MW)	(MW)	(MW)			(MW)
1	Uttar Pradesh	NR	10526						Meja	1	660	432	432	10958	As per data given by U.P.	11100	11100
2	Delhi	NR	1723											1723	As per data given by Delhi	1094	1094
3	Haryana	NR	2877											2877			2877
4	Uttarakhand	NR	1063											1063			1063
5	Punjab	NR	5182											5182			5182
6	Rajasthan	NR	7257											7257			7257
7	Himachal Pradesh	NR	801											801			801
8	Jammu & Kashmir	NR	972											972			972
9	BBMB	NR	2073											2073	As per data given by BBMB	2065	2065
10	Chandigarh	NR	0											0			0
11	Railways	NR	0											0			0
12	Dadri Thermal	NR	1738											1738	As per data given by NTPC	1200	1200
13	Rihand	NR	2845											2845		2807	2807
14	Singrauli	NR	1700											1700		1863	1863
15	Unchahar	NR	979											979		1400	1400
16	Auraiya	NR	155											155		150	150
17	Dadri CCPP	NR	385											385		300	300
18	NAPS	NR	399											399			
19	Jhajjar	NR	1111											1111			1111
20	DHAULIGANGA	NR	290											290	As per data given by NHPC	280	280
21	Tanakpur	NR	82											82		73	73
22	Koteshwar	NR	363											363			363
23	Tehri	NR	558											558			558
24	Anta	NR	267											267	As per data given by NTPC	150	150
25	RAAP B	NR	385											385			385
26	RAPP C	NR	427											427			427
27	AD Hydro	NR	224											224			224
28	Everest	NR	104											104			104

Generation Projection (April 2019 - June 2019)

				Generation declared Commercial from 1st Jul'18 to 31st Dec'18					Generation declared/expected to be declared Commercial from 1st Jan'19 to 31st Mar'19								
Sl. No.	Entities	Region	Projections based on 3 Years Data	Bus Name	Unit No.	Installed Capacity	Gen. considered	Sub Total	Bus Name	Unit No.	Installed Capacity	Gen. considered	Sub Total	TOTAL	Comments From DICs /Others (if any)	Figure as per Comments/PoC Data	Projected Generation before normalization w.r.t projected All India Peak Demand
			(MW)			(MW)	(MW)	(MW)			(MW)	(MW)	(MW)	(MW)			(MW)
29	Karcham Wangtoo	NR	1134											1134			1134
30	Bairasul	NR	185											185	As per data given by NHPC	120	120
31	Chamera 1	NR	559										559	540		540	
32	Chamera 2	NR	310										310	300		300	
33	Chamera 3	NR	246										246	231		231	
34	Naptha Jhakri	NR	1626										1626	As per data given by SJVN		1605	1605
35	Lanco Budhil	NR	74										74			74	
36	DULHASTI	NR	403										403	As per data given by NHPC	399	399	
37	Salal	NR	689										689		690	690	
38	Sewa-II	NR	138										138		127	127	
39	URI 1 HPS	NR	566										566		480	480	
40	URI II HPS	NR	247										247		240	240	
41	Sree Cement	NR	240										240			240	
42	Parbati III	NR	452										452	As per data given by NHPC	520	520	
43	Rampur HEP	NR	451										451	As per data given by SJVN	442	442	
44	KOLDAM	NR	878										878	As per data given by NTPC	792	792	
	Rosa Power	NR															0
	Kishanganga	NR	222											222	As per data given by NHPC	330	330
	Sainj HEP	NR	105											105			105
	TOTAL		53008					0					432	53440			52574

Note:

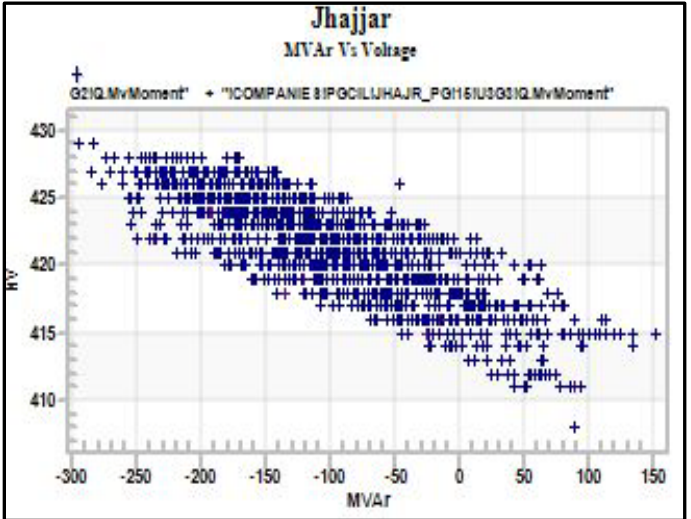
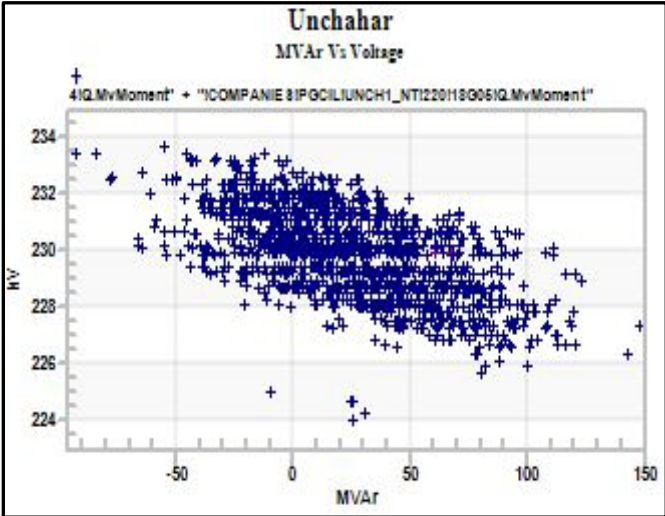
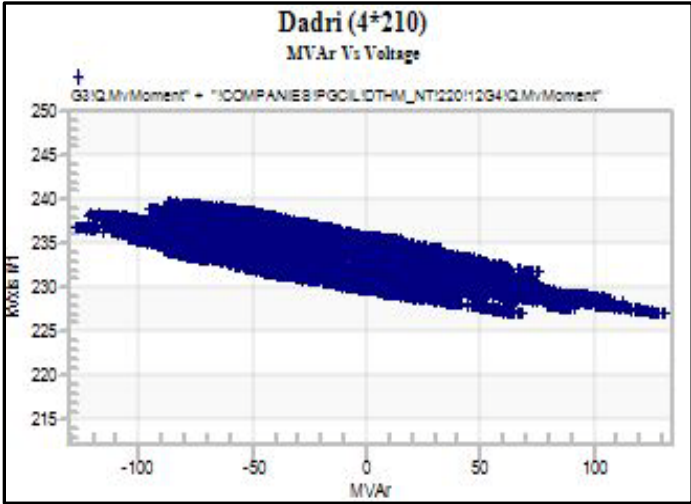
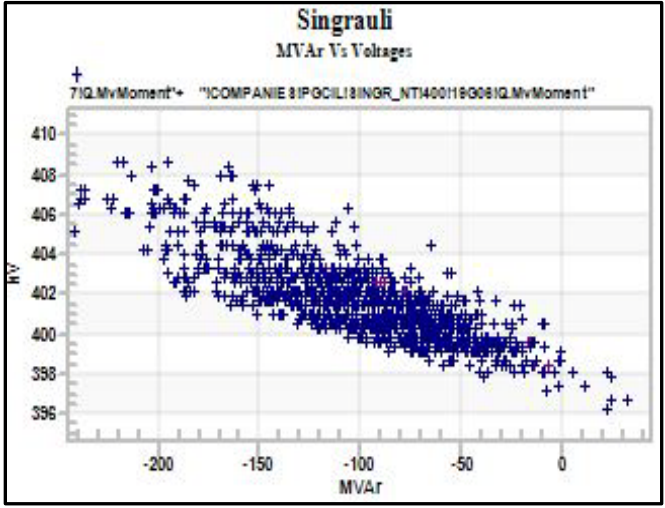
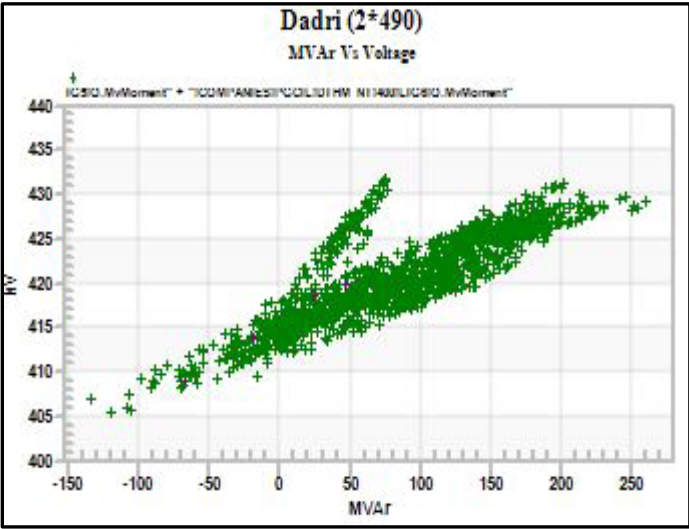
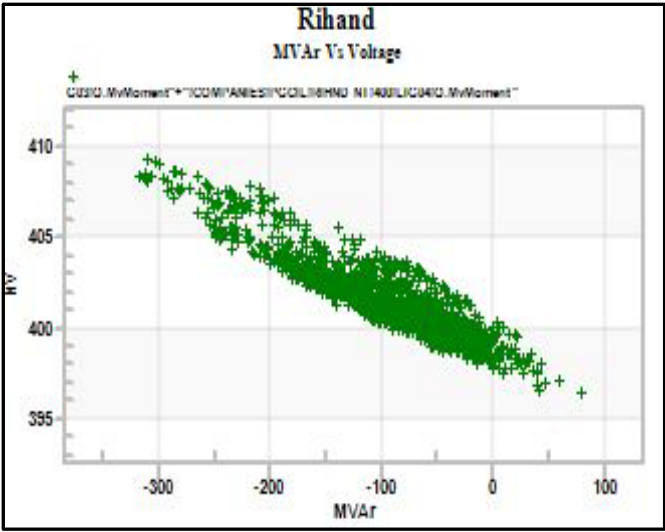
1. Projections are based on monthly maximum injection in the last 3 years from actual metered data.
2. Generation forecast has been done based on the following criteria
 - (i) If there is an increasing trend then last year average generation has been considered
 - (ii) Otherwise average of past three year average generation has been considered
3. In case of new generators where past data was not available following has been assumed
 - (i) 1.0 plf for hydro generators
 - (ii) 0.7 plf for thermal generators.
 - (iii) 0.3 plf for gas stations

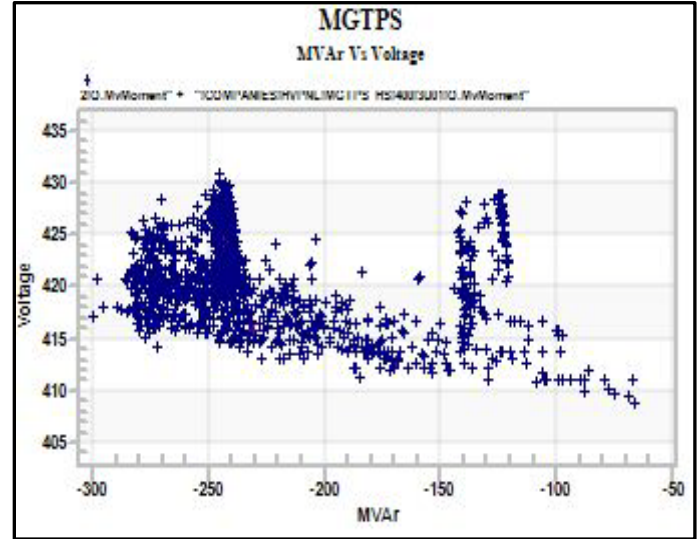
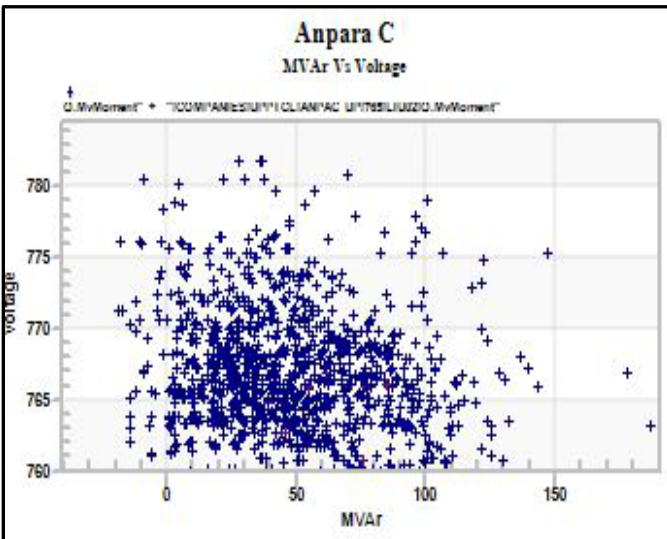
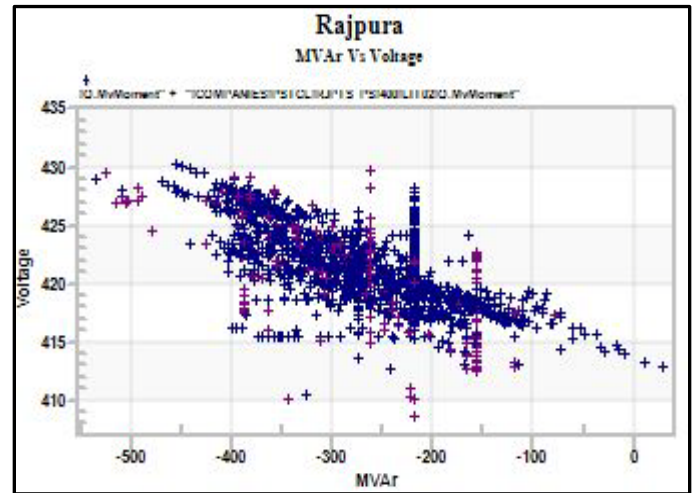
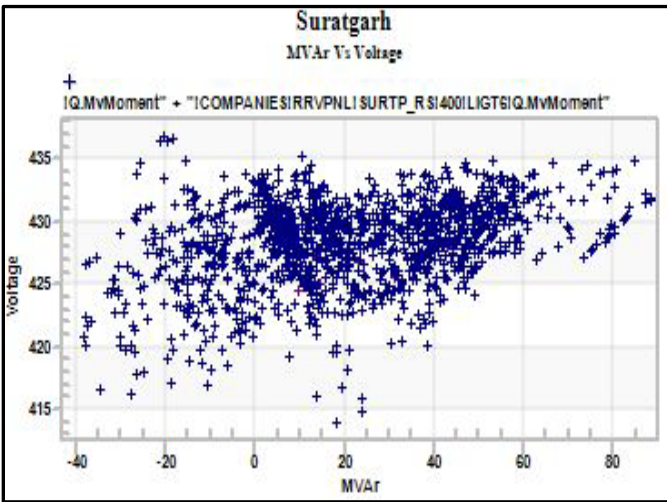
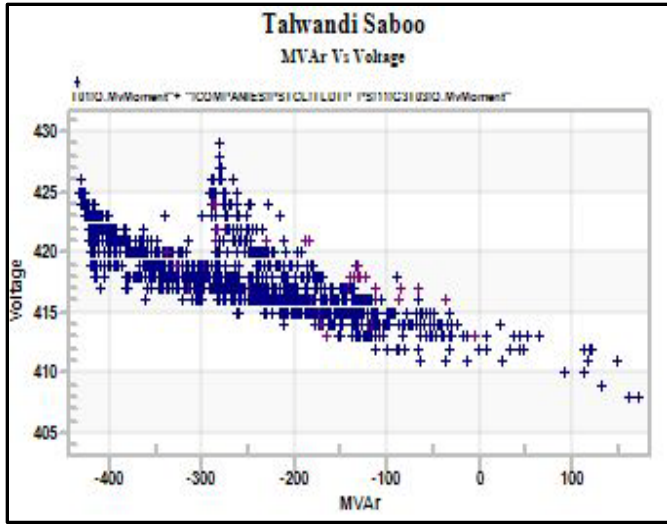
DEMAND FORECAST USING PAST 3 YEARS DATA (April 2019 - June 2019)															
	2016-17			2017-18			2018-19			1	2	3	4	Data given by DICs	Comments
	Apr-16	May-16	Jun-16	Apr-17	May-17	Jun-17	Apr-18	May-18	Jun-18	2015-16 Average	2016-17 Average	2017-18 Average	Projected Demand for (Apr 2019 - June 2019) before normalization		
Chandigarh	263	361	356	321	340	356	252	350	369	327	339	324	327		
Delhi	4,797	6,188	6,261	5,685	6,021	6,526	5,200	6,442	6,934	5,749	6,077	6,192	6,449	6450	As per data given by Delhi
Haryana	7,477	7,950	8,763	7,463	7,780	8,912	7,706	8,351	10,050	8,063	8,052	8,702	8,911		
Himachal Pradesh	1,272	1,270	1,330	1,329	1,349	1,377	1,424	1,405	1,474	1,291	1,352	1,434	1,503		
Jammu & Kashmir	2,046	2,102	2,092	2,062	2,134	2,214	2,183	2,356	2,197	2,080	2,137	2,245	2,319		
Punjab	6,283	7,997	10,997	8,078	8,229	11,024	7,083	8,920	12,377	8,426	9,110	9,460	10,033		
Rajasthan	9,027	9,690	9,906	9,155	10,305	10,347	10,053	11,298	11,698	9,541	9,936	11,016	11,640		
Uttar Pradesh	14,197	14,970	15,501	17,332	17,819	18,061	16,697	19,284	20,062	14,889	17,737	18,681	20,894	21000	As per data given by U.P.
Uttarakhand	1,911	1,938	1,945	1,917	1,992	2,027	1,953	2,097	2,134	1,931	1,979	2,061	2,120		

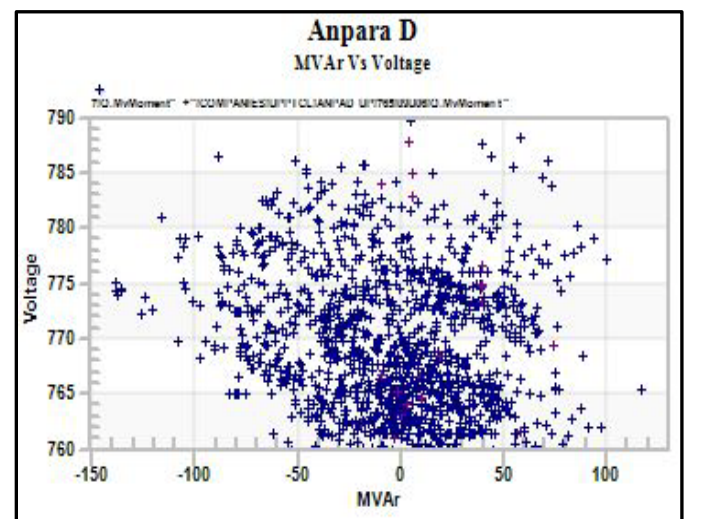
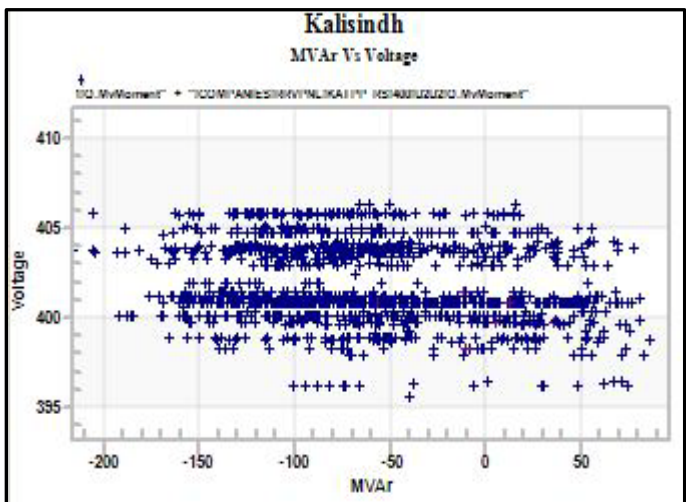
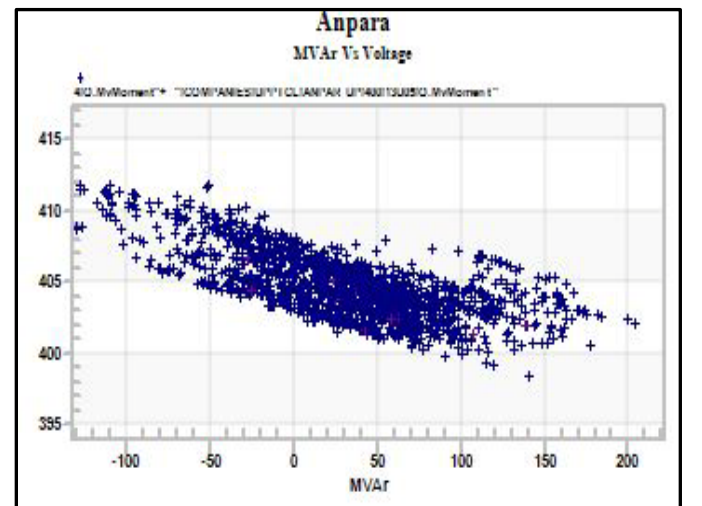
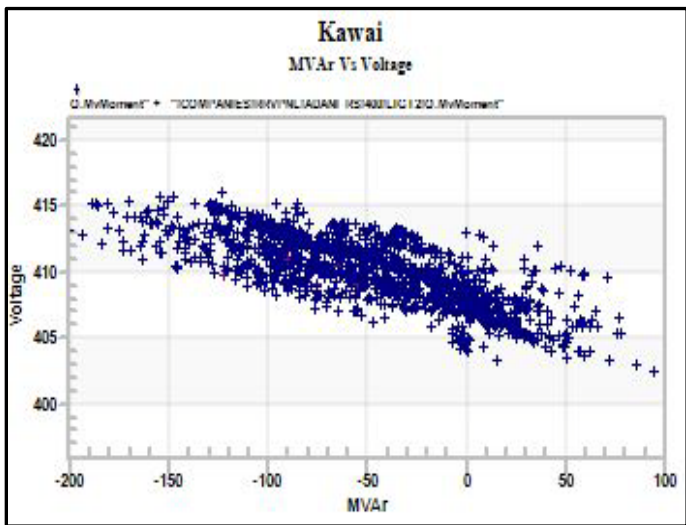
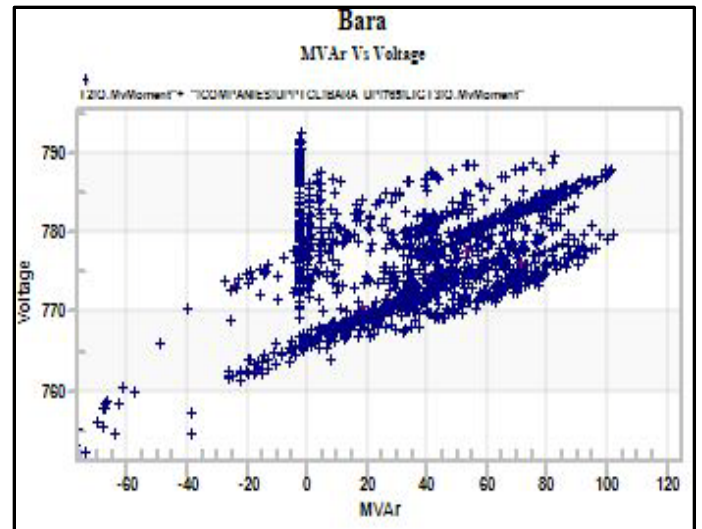
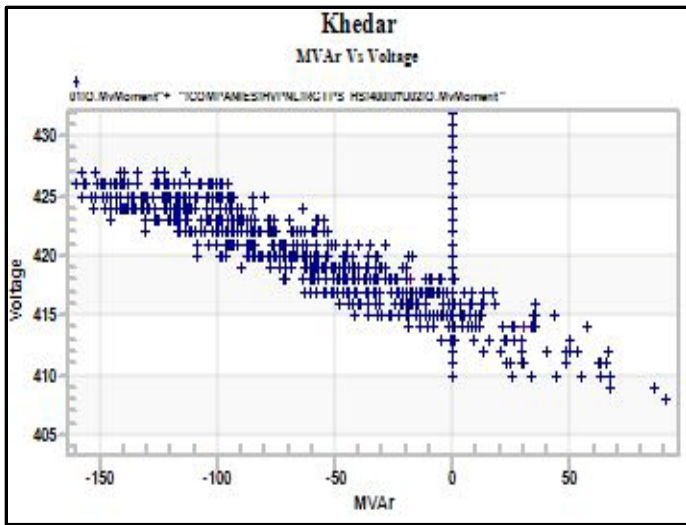
Notes

1. Projections are based on the past 3 years' monthly Peak Demand Met data available on the website of CEI
2. The above projections are being done for financial year 2019-2020 (Q1) i.e Apr 2019- June 2019
3. Projections are being done based on the forecast function available in MS Office Excel
4. CEA Reports can be accessed from the following links
http://www.cea.nic.in/reports/monthly/powersupply/2018/psp_peak-04.pc
http://www.cea.nic.in/reports/monthly/powersupply/2018/psp_peak-05.pc
http://www.cea.nic.in/reports/monthly/powersupply/2018/psp_peak-06.pc
http://www.cea.nic.in/reports/monthly/powersupply/2017/psp_peak-04.pc
http://www.cea.nic.in/reports/monthly/powersupply/2017/psp_peak-05.pc
http://www.cea.nic.in/reports/monthly/powersupply/2017/psp_peak-06.pc
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Annexure-V







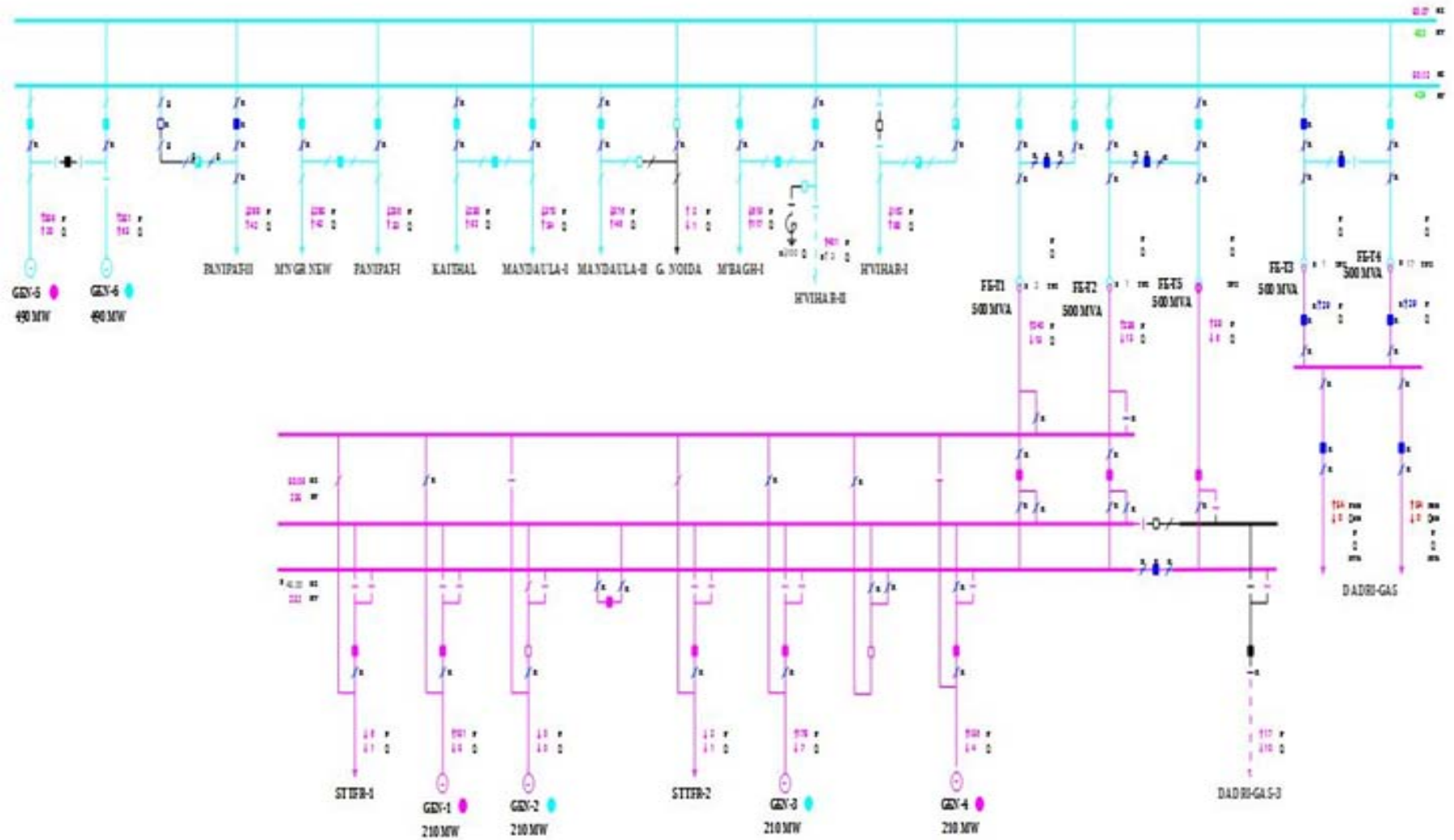
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From(amt) -> 11

To(amt) -> 40
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Annexure-6

S. NO.	Element Name	Outage Date	Outage Time	Reason/Remarks
1	765kV Anpara C(UP)-Unnao(UP)	7-Jan-19	03:15	B-N fault, 271.6Km from Unnao(UP) end. As per PMU, B-N fault occurred, successful autorecloing is observed.
		23-Jan-19	04:25	Y-N fault, 54Km from Unnao(UP) end. As per PMU, Y-N fault occurred, successful autorecloing is observed.
		23-Jan-19	07:20	Phase to earth fault. As per PMU, R-N fault occurred, successful autorecloing is observed.
		25-Jan-19	08:47	B-N fault, 220Km from Unnao(UP) end. As per PMU, B-N fault occurred, successful autorecloing is observed.
		25-Jan-19	20:03	Y-N fault, 108 Km from Unnao(UP) end. As per PMU, Y-N fault occurred, successful autorecloing is observed.
		27-Jan-19	07:12	Y-N fault, 152Km from Unnao(UP) end. As per PMU, Y-N fault occurred, successful autorecloing is observed.
2	400kV Anpara(UP)-Mau(UP)	2-Jan-19	08:32	Bus bar protection operated due to non operation of Unit 4 CB on BTL. As per PMU, multiple faults are observed.
		8-Jan-19	02:35	Y-N fault, 126.3km from Mau(UP) end. As per PMU, Y-N fault occurred, no auto-reclosing observed.
		23-Jan-19	09:15	R-B fault, 11.5Km from Mau(UP) end. As per PMU, R-B fault is observed.
		24-Jan-19	03:20	Phase to earth fault. As per PMU, R-B fault is observed.
		26-Jan-19	10:14	R-N fault. As per PMU, R-N fault occurred, no auto-reclosing observed.
		28-Jan-19	05:29	B-N fault, 71.8 km from Anpara(UP) end. As per PMU, B-N fault occurred, no auto-reclosing observed.
3	400kV Akal(RRVPNL)-Jodhpur(RRVPNL)	6-Jan-19	07:37	B-N fault, 36.55km from Akal(RRVPNL) end. As per PMU, Y-N fault occurred, no auto-reclosing observed.
		11-Jan-19	20:22	Y-N fault. As per PMU, Y-N fault occurred, no auto-reclosing observed.
		13-Jan-19	04:01	B-N fault, 184 km from Jodhpur(RRVPNL) end. As per PMU, No fault observed.
		29-Jan-19	06:20	DT Received at Jodhpur(RRVPNL) end, 86A indication observed at Akal(RRVPNL) end. As per PMU, No fault observed.
		29-Jan-19	20:11	B-N fault. As per PMU, No fault observed.
4	400kV Anpara(UP)-Sarnath(UP) ckt-2	2-Jan-19	08:32	Bus bar protection operated due to non operation of Unit 4 CB on BTL. As per PMU, multiple faults are observed.
		8-Jan-19	05:10	Y-N fault. As per PMU, Y-N fault occurred and delayed clearance of 400ms with no auto-reclosing observed.
		10-Jan-19	14:36	R-N fault, 136.4 km from Anpara(UP) end. As per PMU, R-N fault occurred and delayed clearance of 400ms with no auto-reclosing observed.
		15-Jan-19	14:25	No fault observed. As per PMU, Y-B fault occurred.
		18-Jan-19	10:26	R-Y fault, 14.6km from Sarnath(UP) end. As per PMU, R-Y fault occurred.
5	400kV Dadri(NTPC)-Panipat(BBMB) ckt-2	5-Jan-19	03:58	DT received at Panipat(BBMB). Tripped on Overvoltage at Dadri(NTPC) end. As per PMU, No fault observed.
		6-Jan-19	03:04	Overvoltage. As per PMU, No fault observed.
		6-Jan-19	15:44	DT received at Panipat(BBMB) end. As per PMU, No fault observed.
		14-Jan-19	03:04	Overvoltage. As per PMU, No fault observed.
		26-Jan-19	03:16	Overvoltage. As per PMU, No fault observed.
6	400kV Kishenpur(PG)-New Wanpoh(PG) ckt - 1	5-Jan-19	05:38	B-N fault, 18 km from New Wanpoh(PG). As per PMU, B-N fault and unsuccessful auto-reclosing observed.
		22-Jan-19	07:13	R-N fault. As per PMU, R-N fault and unsuccessful auto-reclosing observed.
		22-Jan-19	08:24	R-N fault. As per PMU, R-N fault and unsuccessful auto-reclosing observed.
		22-Jan-19	12:23	R-N fault, 42 Km from New Wanpoh(PG) end. As per PMU, R-N fault and unsuccessful auto-reclosing observed.
		22-Jan-19	13:22	R-N Fault, 99km from New Wanpoh(PG) end. As per PMU, R-N fault and unsuccessful auto-reclosing observed.

Annexure-6

S. NO.	Element Name	Outage Date	Outage Time	Reason/Remarks
7	400kV Akal(RRVPNL)-Kankani(RRVPNL) ckt-1	6-Jan-19	07:47	R-Y-B fault. As per PMU, Y-N fault, unsuccessful auto-reclosing observed.
		12-Jan-19	10:10	Tripped with tripping of 400kV Akal(RRVPNL)-Barmer(RRVPNL). As per PMU, Y-N fault occurred and no auto-reclosing observed.
		26-Jan-19	04:56	Y-N fault , 55km from Akal(RRVPNL) end. As per PMU, Y-N fault occurred, successful autorecloing is observed.
		29-Jan-19	15:55	R-N fault. As per PMU, Fluctuations observed in the phase voltages.
8	400kV Bareilly(UP)-Unnao(UP) ckt-2	4-Jan-19	23:29	R-N fault. As per PMU, R-N fault occurred and no auto-reclosing observed.
		5-Jan-19	01:26	B-N fault. As per PMU, B-N fault occurred and no auto-reclosing observed.
		5-Jan-19	05:56	R-N fault, 136.8 km from Bareilly(UP) end. As per PMU, fluctuations observed in the phase voltages.
		5-Jan-19	20:52	R-N fault, 233.5KM from Bareilly(UP) end. As per PMU, R-N fault occurred and no auto-reclosing observed.
9	400kV Chabra(RRVPNL)-Hindaun(RRVPNL)	26-Jan-19	19:25	Y-N fault, 19.19km from chabra(RRVPNL) end. As per PMU, Y-N fault occurred, successful autorecloing is observed.
		26-Jan-19	22:55	Y-N fault, 19.6 Km from chabra(RRVPNL) end. As per PMU, Y-N fault occurred, successful autorecloing is observed.
		29-Jan-19	11:19	Y-N fault, 269 km from Hindaun(RRVPNL) end. As per PMU, Y-N fault occurred, no autorecloing is observed.
		29-Jan-19	20:56	Y-N fault, 19.77km from Chabra(RRVPNL) end. As per PMU, Y-N fault occurred, no autorecloing is observed.
10	400kV Kala Amb(PKATL)-Karchamwangtoo(JSW) ckt-2	4-Jan-19	21:45	Phase to earth fault. As per PMU, No fault observed.
		23-Jan-19	01:24	Phase to earth fault. As per PMU, Y-B fault followed by three phase fault with delayed clearance of 560ms is observed.
		23-Jan-19	05:08	B-N fault ,176km From Kala Amb(PKATL) end. As per PMU, multiple faults is observed.
		27-Jan-19	06:01	R-N fault, 172.1Km from karcham(JSW) end. As per PMU, no fault observed.
11	400kV Akal(RRVPNL)-Barmer(RRVPNL) ckt-1	6-Jan-19	07:47	B-N fault, 10.23km from Akal(RRVPNL) end. As per PMU, Y-N fault, unsuccessful auto-reclosing observed.
		12-Jan-19	10:10	Y-N fault, 17km from Akal(RRVPNL) end. As per PMU, Y-N fault occurred and no auto-reclosing observed.
		25-Jan-19	06:19	Y-N fault, 34.88 km from Akal(RRVPNL) end. As per PMU, Y-N fault, unsuccessful auto-reclosing observed.
12	500kV HVDC Balia(PG)-Bhiwadi(PG) Pole 2	13-Jan-19	05:51	Tripped due to station ground over current 76SG-2 block operation at Bhiwadi, DC Earth Fault, 359.56 kms from Bhiwadi(PG) end.
		27-Jan-19	04:34	DC filter 2 trip.
		27-Jan-19	06:56	DC Line Fault
13	400kV Baspa(HP)-Karchamwangtoo(JSW) ckt-2	23-Jan-19	07:01	Phase to earth fault. As per PMU, no fault observed.
		23-Jan-19	08:41	R-Y fault, 14.77Km from Baspa(HP) end. As per PMU, R-Y fault is observed.
		23-Jan-19	23:07	Bus fault at Karcham(JSW) end. As per PMU, no fault observed.
14	400kV Bhiwani(PG)-Hisar(PG)	6-Jan-19	03:01	Over voltage. As per PMU, no fault observed.
		21-Jan-19	04:01	Over Voltage. As per PMU, no fault observed. (Voltage ~ 431kV)
		21-Jan-19	20:42	Over voltage. As per PMU, no fault observed.
15	400 kV Bikaner(RRVPNL)-Suratgarh(RRVPNL)	9-Jan-19	05:42	R-N fault. As per PMU, Y-N fault occurred and no auto-reclosing observed.
		9-Jan-19	21:10	B-N fault. As per PMU, no fault observed.
		20-Jan-19	03:06	Y-N Fault, 8.52 km from Bikaner(RRVPNL) end. As per PMU, Y-N fault occurred and no auto-reclosing observed.
16	400kV Daultabad(HVPNL)-Jhajjar(APCPL) ckt-1	4-Jan-19	06:11	Suspected fog, Y-N fault. As per PMU, Y-N fault followed by R-N fault with delayed clearance of 1120ms is observed.
		21-Jan-19	21:33	R-N fault. As per PMU, R-N fault occurred and no auto-reclosing observed.
		28-Jan-19	04:30	DT received at Daulatabad(HVPNL) end. As per PMU, No fault observed.

S.No.	Region	Name of Elements (Tripped/Manually opened)	Owner/ Agency	Outage		Event (As reported)	Generation Loss(MW)	Load Loss(MW)	Category as per CEA Grid Standards	Energy Unreserved (in MU)	Preliminary Report receipt status			DR/EL receipt status			Detailed Report receipt status		Fault Clearance time (in ms)
				Date	Time						within 24hrs	after 24hrs	Not Received	within 24hrs	after 24hrs	Not Received	Received	Not Received	
1	NR	1) 400kV Bawana(DTL)-Mundka(DTL) ckt-1 2) 400kV Bawana(DTL)-Mundka(DTL) ckt-2 3) 400kV Jhatikara(PG)-Mundka(DTL) ckt-1 4) 400kV Jhatikara(PG)-Mundka(DTL) ckt-2 5) 315 MVA ICT 2 at 400/220kV Mundka(DTL)	Delhi & POWERGRID	1-Jan-19	10:17	Multiple element Tripping occurred at 400/220kV Mundka(DTL) due to Bus bar protection operated during heating shutdown of 400kV Jhatikara(PG)-Mundka(DTL) ckt-2. 315 MVA ICT 3 & ICT 4 remain charged through tie CB of 400kV Mundka-Jhajjar Ckt-2 & 400kV Mundka-Jhajjar Ckt-1 respectively. As per PMU, No fault is observed in the system. In antecedent conditions, 400kV Bawana(DTL)-Mundka(DTL) ckt-1 & 2, 400kV Jhatikara(PG)-Mundka(DTL) ckt-1 carrying 254 MW, 253 MW & 333 MW respectively.			GI-2		Y(Delhi)	Y(PG)	Y(PG)	Y(Delhi)	Y(Delhi)	NA			
2	NR	1) 400kV Anpara(UP)-Samath(UP) ckt-1 2) 400kV Anpara(UP)-Samath(UP) ckt-2 3) 400kV Anpara(UP)-Singrauli(NTPC) 4) 400kV Anpara(UP)-Sultanpur(UP) (Bypassing Obrar(UP)) 5) 400kV Anpara(UP)-Mau(UP) 6) 400kV Anpara(UP)-Anpara C(UP) D/C 7) 400kV Anpara(UP)-Anpara D(UP) D/C 8) 210 MW Unit#1, Unit#2 & Unit#3 at 400kV Anpara A&B(UP) 9) 500 MW Unit#4, Unit#5 at 400kV Anpara A&B(UP)	UP & NTPC	2-Jan-19	8:32	Heavy BTL was observed in Unit#4 at 400kV Anpara A&B(UP). Turbine trip command was initiated but due to non tripping of unit breaker and LBS operation, all 400kV lines emanating from 400kV Anpara A&B(UP) and all running units at 400kV Anpara A&B(UP) tripped. As per PMU, R-N fault with delayed clearance is observed. In antecedent conditions, all units at 400kV Anpara A&B(UP) generating 1117 MW (as per SCADA).	1100	50	GD-1	0.06	Y(UP)	(NTPC)		Y(UP),NTPC)	Y(UP)	2560ms			
3	NR	1) 400kV Muktsar(PSTCL)-Talwandi Sabo(PSTCL) ckt-2 2) 400kV Makhu(PSTCL)-Muktsar(PSTCL) ckt-1	Punjab	3-Jan-19	5:47	400kV Muktsar(PSTCL)-Talwandi Sabo(PSTCL) ckt-2 tripped due to B-N fault, 8.01km from Talwandi sabo(PSTCL) end. At the same time, 400kV Makhu(PSTCL)-Muktsar(PSTCL) ckt-1 tripped due to B-N fault 65.80km from Makhu(PSTCL) end. As per PMU, B-N fault with unsuccessful auto reclosing is observed. In antecedent conditions, 400kV Muktsar(PSTCL)-Talwandi Sabo(PSTCL) ckt-2 and 400kV Makhu(PSTCL)-Muktsar(PSTCL) ckt-1 carrying 166 MW & 101 MW respectively.			GI-2		Y(Pun)		Y(Pun)	Y(Pun)	80ms				
4	NR	1) 400kV Moga(PG)-Talwandi Sabo(PSTCL) 2) 600 MW Unit#3 at 400kV Talwandi Sabo(PSTCL)	Punjab & POWERGRID	3-Jan-19	6:15	400kV Moga(PG)-Talwandi Sabo(PSTCL) tripped due to fog. At the same time, 600 MW Unit#3 at 400kV Talwandi Sabo(PSTCL) also tripped. 400kV Muktsar(PSTCL)-Talwandi Sabo(PSTCL) ckt-1 & 2, 400kV Nakodar(PSTCL)-Talwandi Sabo(PSTCL) ckt-1 already out at the time of tripping. As per PMU, B-N fault is observed. In antecedent conditions, Unit#3 generating 310 MW.	310		GD-1		Y(Pun), Y(PG)		Y(Pun), Y(PG)	Y(Pun)	80ms				
5	NR	1) 400kV Aligarh(UP)-Mainpuri 765(UP) ckt-1 2) 400kV Aligarh(UP)-Muradnagar(UP)	UP	5-Jan-19	3:43	400kV Aligarh(UP)-Mainpuri 765(UP) ckt-1 and 400kV Aligarh(UP)-Muradnagar(UP) tripped due to inclement weather and fog. As per PMU, B-N fault followed by R-B fault is observed. In antecedent conditions, 400kV Aligarh(UP)-Mainpuri 765(UP) ckt-1 and 400kV Aligarh(UP)-Muradnagar(UP) carrying 159 MW & 125 MW respectively.			GI-2		Y(UP)		Y(UP)	Y(UP)	80ms				
6	NR	1) 400kV Gorakhpur(PG)-Muzaffarpur(PG) ckt-1 2) 400kV Gorakhpur(PG)-Muzaffarpur(PG) ckt-2	POWERGRID	5-Jan-19	6:56	400kV Gorakhpur(PG)-Muzaffarpur(PG) ckt-1 & 2 tripped due to inclement weather and fog. As per PMU, Multiple faults with oscillations are observed in the system. In antecedent conditions, 400kV Gorakhpur(PG)-Muzaffarpur(PG) ckt-1 & 2 carrying 37 MW & 38 MW respectively.			GI-2		Y(PG)		Y(PG)	Y(PG)	NA				
7	NR	1) 400kV Akal(RRVPNL)-Barmer(RRVPNL) 2) 400kV Akal(RRVPNL)-Kankani(RRVPNL) ckt-1	Rajasthan	6-Jan-19	7:47	400kV Akal(RRVPNL)-Barmer(RRVPNL) tripped on B-N fault. At the same time, 400kV Akal(RRVPNL)-Kankani(RRVPNL) ckt-1 also tripped on three phase fault. As per PMU, Y-N fault with unsuccessful autoreclosing is observed. In antecedent conditions, 400kV Akal(RRVPNL)-Barmer(RRVPNL) & 400kV Akal(RRVPNL)-Kankani(RRVPNL) ckt-1 carrying 94 MW & 125 MW respectively.			GI-2		Y(Raj)		Y(Raj)	Y(Raj)	80ms				
8	NR	1) 400kV Banda(UP)-Oral(UP) ckt-1 2) 400kV Bus 2 at Oral(UP) 3) 63 MVAR Bus Reactor 1 at 400kV Oral(UP)	UP	9-Jan-19	12:07	400kV Banda(UP)-Oral(UP) ckt-1 tripped on R-N fault. At the same time, 400kV Bus 2 and 63 MVAR Bus Reactor 1 at 400kV Oral(UP) also tripped due to malfunction of isolator & earthswitch due to insulation damage of wire. As per PMU, B-N fault with no auto-reclosing is observed. In antecedent conditions, 400kV Banda(UP)-Oral(UP) ckt-1 carrying 30 MW.			GI-2		Y(UP)		Y(UP)	Y(UP)	80ms				
9	NR	1) 220kV AD Hydro(ADHY)-Phojal(HP) 2) 220kV Chhaur(MALN2)-Phojal(HP)	HP & AD Hydro	10-Jan-19	10:14	220kV AD Hydro(ADHY)-Phojal(HP) tripped on B-N fault, 50.5 km from AD Hydro(ADHY) end. At the same time, Chhaur(MALN2)-Phojal(HP) also tripped on B-N fault, 9.0 km from Chhaur(MALN2) towards phojal end. As per PMU, No fault is observed in the system.			GI-2		Y(HP), Y(AD Hydro)		Y(HP), Y(AD Hydro)	Y(HP), Y(AD Hydro)	NA				
10	NR	1) 200 MVA ICT 1 at 400/132kV Mau(UP) 2) 200 MVA ICT 2 at 400/132kV Mau(UP)	UP	11-Jan-19	11:15	200 MVA ICT 1 & ICT 2 at 400/132kV Mau(UP) tripped due to overloading. 200 MVA ICT 3 was already under outage to attend hot point at R phase CT clamp. As per PMU, multiple Y-N fault with no autoreclosing attempt is observed. In antecedent conditions, 400kV Akal(RRVPNL)-Barmer(RRVPNL) & 400kV Akal(RRVPNL)-Kankani(RRVPNL) ckt-1 carrying 122 MW & 44 MW respectively.		140	GD-1	0.15	Y(UP)		Y(UP)	Y(UP)	NA				
11	NR	1) 400kV Akal(RRVPNL)-Barmer(RRVPNL) 2) 400kV Akal(RRVPNL)-Kankani(RRVPNL) ckt-1	Rajasthan	12-Jan-19	10:10	400kV Akal(RRVPNL)-Barmer(RRVPNL) tripped on Y-N fault, 17km from Akal(RRVPNL) end. At the same time, 400kV Akal(RRVPNL)-Kankani(RRVPNL) ckt-1 also tripped. As per PMU, multiple Y-N fault with no autoreclosing attempt is observed. In antecedent conditions, 400kV Akal(RRVPNL)-Barmer(RRVPNL) & 400kV Akal(RRVPNL)-Kankani(RRVPNL) ckt-1 carrying 122 MW & 44 MW respectively.			GI-2		Y(Raj)		Y(Raj)	Y(Raj)	80ms				

Sl. No.	Category	Description	Location	Outage		Description	Voltage	Phase	Preliminary Report receipt status	DR/EL receipt status		Detailed Report receipt status				
				Date	Time					Y	Y	Y	Y			
12	NR	1) 500 kV HVDC Balla[PG]-Bhiwadi[PG] pole 1 2) 500 kV HVDC Balla[PG]-Bhiwadi[PG] pole 2	POWERGRID	13-Jan-19	5:51	500 kV HVDC Balla[PG]-Bhiwadi[PG] bipole tripped due to DC Earth Fault. 359.56 km from Bhiwadi[PG] end and operation of station ground over current 765G-2 block at Bhiwadi[PG] end. As per PMU, fluctuations observed in the phase voltages. In antecedent conditions, 500 kV HVDC Balla[PG]-Bhiwadi[PG] bipole carrying 500MW.		GI-2		Y[PG]		Y[PG]	NA			
13	NR	1) 220kV Sikar[PG]-Sikar[RRVFN] ckt-1 2) 220kV Sikar[PG]-Sikar[RRVFN] ckt-2	POWERGRID & Rajasthan	14-Jan-19	13:40	220kV Sikar[PG]-Sikar[RRVFN] ckt-1 & 2 tripped due to kite entanglement in lines. As per PMU, R-Y fault is observed in the system. In antecedent conditions, 220kV Sikar[PG]-Sikar[RRVFN] ckt-1 & 2 carrying 121 MW each.		GI-2	Y[PG]	Y[Raj]	Y[PG]	Y[Raj]	Y[PG]	120ms		
14	NR	1) 220kV Vasantkun[DTL]-Mehrauli[DTL] ckt-1 2) 220kV Vasantkun[DTL]-Mehrauli[DTL] ckt-2 3) 220kV Vasantkun[DTL]-R.K. Puram[DTL] ckt-1 4) 220/66kV 100MVA ICT 1 at 220kV Vasantkun[DTL] 5) 220/66kV 100MVA ICT 2 at 220kV Vasantkun[DTL]	Delhi	15-Jan-19	11:01	220kV Bus 2 at 220kV Vasantkun[DTL] tripped due to operation of Bus bar protection leading to tripping of all 220kV elements connected to the Bus 2. 220kV Bus 1 and 220kV Bus coupler at 220kV Vasantkun[DTL] was under shutdown for preventive maintenance. As per PMU, No fault is observed in the system. In antecedent conditions, 220kV Vasantkun[DTL]-Mehrauli[DTL] ckt-1 & 2 carrying 67 MW & 70 MW respectively.	110	GD-1	0.01	Y[Delhi]		Y[Delhi]		NA		
15	NR	1) 800 kV HVDC Champa[WR]-Kurukshetra[NR] pole-1 2) 800 kV HVDC Champa[WR]-Kurukshetra[NR] pole-2	POWERGRID	15-Jan-19	12:56	800 kV HVDC Champa[WR]-Kurukshetra[NR] bipole tripped due to filter power limit. As per PMU, fluctuations observed in the phase voltages. In antecedent conditions, 800 kV HVDC Champa[WR]-Kurukshetra[NR] pole-1 and pole-2 carrying approx 500 MW each.		GI-2		Y[PG]		Y[PG]	NA			
16	NR	1) 400kV Bhadla[RRVFN]-Bikaner[RRVFN] ckt-1 2) 400kV Bhadla[RRVFN]-Bikaner[RRVFN] ckt-2 3) 400kV Bhadla[RRVFN]-Jodhpur[RRVFN] 4) 400kV Bhadla[RRVFN]-Merta[RRVFN]	Rajasthan	16-Jan-19	12:25	400kV Bhadla[RRVFN]-Bikaner[RRVFN] ckt-1 tripped on R-N fault. 189.1Km from Bikaner end. 400kV Bhadla[RRVFN]-Bikaner[RRVFN] ckt-2 tripped due to DT received at Bikaner end. 400kV Bhadla[RRVFN]-Jodhpur[RRVFN] trip due to Y-B fault. 254.4Km from Jodhpur end and 400kV Bhadla[RRVFN]-Merta[RRVFN] trip due to Y-B fault. 333.17 Km from Merta end. As per PMU, Y-B fault with delayed clearance is observed. In antecedent conditions, 400kV Bhadla[RRVFN]-Bikaner[RRVFN] ckt-1 & 2, 400kV Bhadla[RRVFN]-Merta[RRVFN] carrying 301 MW, 303 MW & 188 MW respectively.	1400	GD-1		Y[Raj]		Y[Raj]	Y[Raj]	520ms		
17	NR	1) 400kV Ballabgarh[PG]-Mainpur[PG] ckt-2 2) 400kV Fatehpur[PG]-Mainpur[PG] ckt-1	POWERGRID	20-Jan-19	10:25	400kV Ballabgarh[PG]-Mainpur[PG] ckt-2 tripped on R-N fault. At the same time, 400kV Fatehpur[PG]-Mainpur[PG] ckt-1 also tripped. As per PMU, R-N fault with unsuccessful auto-reclosing is observed. In antecedent conditions, 400kV Fatehpur[PG]-Mainpur[PG] ckt-1 & 2, 400kV Ballabgarh[PG]-Mainpur[PG] ckt-2 carrying 420 MW & 182 MW respectively.		GI-2		Y[PG]		Y[PG]	80ms			
18	NR	1) 400kV Koteswar Pool[PG]-Tehri[THDC] ckt-1 2) 400kV Koteswar Pool[PG]-Tehri[THDC] ckt-2 3) 400kV Koteswar Pool[PG]-Koteswar[THDC] ckt-1 4) 400kV Koteswar Pool[PG]-Koteswar[THDC] ckt-2 5) 400kV Koteswar Pool[PG]-Meerut[PG] ckt-1 6) 250 MW Unit#1, #2 & #3 of 400kV Tehri[THDC] 7) 100 MW Unit#1 of 400kV Koteswar[THDC]	POWERGRID & THDC	21-Jan-19	15:57	400kV Koteswar Pool[PG]-Meerut[PG] ckt-1 (Ckt-2 was already under shutdown), 400kV Koteswar Pool[PG]-Tehri[THDC] ckt-1 & 2, 400kV Koteswar Pool[PG]-Koteswar[THDC] ckt-1 & 2 tripped on overvoltage. Due to loss of evacuation path, 250 MW Unit#1, #2 & #3 of 400kV Tehri[THDC] & 100 MW Unit#1 of 400kV Koteswar[THDC] tripped. However, as per SCADA data Bus voltage at Meerut was around 426kV (<440kV). As per PMU, fluctuation observed in the phase voltages. In antecedent conditions, 400kV Koteswar Pool[PG]-Meerut[PG] ckt-1 carrying 768 MW. Units at 400kV Tehri and 400kV Koteswar synchronised by 1646 Hrs and 1700 Hrs respectively.	780	GD-1		Y[PG], Y[THDC]		Y[PG]	Y[THDC]	Y[PG], Y[THDC]	NA	
19	NR	1) 400kV Kishenpur[PG]-New Wanpoh[PG] ckt-3 2) 220kV Kishenpur[PG]-Udampur[JK] ckt-2	POWERGRID & PDDJK	22-Jan-19	1:04	400kV Kishenpur[PG]-New Wanpoh[PG] ckt-3 tripped on R-N fault. At the same time, 220kV Kishenpur[PG]-Udampur[JK] ckt-2 also tripped on R-Y fault. As per PMU, Multiple R-N faults observed in the system. In antecedent conditions, 400kV Kishenpur[PG]-New Wanpoh[PG] ckt-3 & 220kV Kishenpur[PG]-Udampur[JK] ckt-2 carrying 155 MW & 10 MW respectively.		GI-2		Y[PG]		Y[JK]	Y[PG]	80ms		
20	NR	1) 220kV Shahjahanpur[UP]-Bareilly[UP] 2) 220kV Shahjahanpur[UP]-Sitapur[UP] 3) 220kV Shahjahanpur[UP]-Nigahsan[UP] 4) 220kV Shahjahanpur[UP]-Hardoi[UP] 5) 220kV Rosa[UP]-Shahjahanpur[UP] ckt-1 6) 220kV Rosa[UP]-Shahjahanpur[UP] ckt-2 7) 200 MVA ICT 1 at 400/220kV Rosa[UP] 8) 200 MVA ICT 2 at 400/220kV Rosa[UP]	UP	22-Jan-19	1:29	Y-N fault occurred in 220kV Shahjahanpur[UP]-Bareilly[UP] but breaker at 220kV Shahjahanpur[UP] did not trip. In the absence of LBB protection system at 220kV Shahjahanpur[UP], the fault was sensed by the relays at other end of the lines. 200 MVA ICT 1 & 2 at 400/220kV Rosa[UP] tripped on differential protection and Unit#2 at Rosa TPS also tripped as it sensed earth fault occurred in 220kV Shahjahanpur[UP]-Bareilly[UP]. As per PMU, Y-N fault followed by Y-B fault with delayed clearance is observed. In antecedent conditions, 200 MVA ICT 1 & 2 at 400/220kV Rosa[UP] carrying 14 MW & 16 MW respectively.	150	GD-1		Y[UP]		Y[UP]		Y[UP]	9320ms	
21	NR	1) 400kV Kala Amb[PKATL]-Karchamwangtoo[JSW] ckt-1 2) 400kV Kala Amb[PKATL]-Karchamwangtoo[JSW] ckt-2	PKATL & JSW	23-Jan-19	1:24	400kV Kala Amb[PKATL]-Karchamwangtoo[JSW] ckt-1 & 2 tripped on phase to earth fault. As per PMU, Y-B fault followed by three phase fault with delayed clearance is observed in antecedent conditions, 400kV Kala Amb[PKATL]-Karchamwangtoo[JSW] ckt-1 & 2 carrying 57 MW & 59 MW respectively.		GI-2		Y[PKATL], Y[JSW]		Y[PKATL], Y[JSW]	Y[PKATL], Y[JSW]	560ms		
22	NR	1) 400kV Jharkri[SVNL]-Karchamwangtoo[JSW] ckt-1 2) 400kV Jharkri[SVNL]-Rampur[SVNL] ckt-1 3) 400kV Jharkri[SVNL]-Panchkula[PG] ckt-1 4) 250 MW Unit#1,3,5 at 400kV Jharkri[SVNL] 5) 68 MW Unit#2,3,4, at 400kV Rampur[SVNL]	SVNL, JSW & POWERGRID	23-Jan-19	6:37	400kV Jharkri[SVNL]-Karchamwangtoo[JSW] ckt-1 tripped on Y-B fault. As soon as line tripped, High impedance based Bus Bar differential relay of Bus-1 operated which tripped all elements associated with Bus-1 (Unit #1,3,5, 400kV Jharkri[SVNL]-Panchkula[PG] ckt-1 & 400kV Jharkri[SVNL]-Rampur[SVNL] ckt-1). As per PMU, Y-B fault is observed. In antecedent conditions, 400kV Jharkri[SVNL]-Panchkula[PG] ckt-1 & 400kV Jharkri[SVNL]-Rampur[SVNL] ckt-1 carrying 607 MW & 416 MW respectively.	925	GD-1		Y[SVNL]		Y[PG], Y[JSW]	Y[SVNL]	Y[PG], Y[JSW]	Y[SVNL]	80ms
23	NR	1) 400 kV Bus 2 at 400/220kV Roorkee[PG] 2) 400kV Roorkee[PG]-Saharanpur[PG] 3) 400kV Kashipur[UTT]-Roorkee [PG] ckt-1	POWERGRID & Uttarakhand	23-Jan-19	16:04	400 kV Bus 2 at 400/220kV Roorkee[PG] tripped due to operation of Bus bar protection during busbar testing of Bus-1. 400kV Roorkee[PG]-Saharanpur[PG] & 400kV Kashipur[UTT]-Roorkee [PG] ckt-1 also tripped. As per PMU, No fault is observed in the system. In antecedent conditions, 400kV Roorkee[PG]-Saharanpur[PG] & 400kV Kashipur[UTT]-Roorkee [PG] ckt-1 carrying 111 MW & 183 MW respectively.		GI-2		Y[PG]	Y[UTT]	Y[PG]	Y[UTT]	Y[PG]	NA	
24	NR	1) 400kV Baspa[HP]-Karchamwangtoo[JSW] ckt-1 2) 400kV Baspa[HP]-Karchamwangtoo[JSW] ckt-2 3) 400kV Jharkri[SVNL]-Karchamwangtoo[JSW] ckt-1	JSW, HP and SVNL	23-Jan-19	23:07	During charging of 400kV Karcham[JSW]-Kala Amb[PKATL] ckt-2 a spike in voltage occurs leading to bus fault at 400kV Karchamwangtoo[JSW] and tripping of 400kV Baspa[HP]-Karchamwangtoo[JSW] ckt-1 & 2. As per PMU, No fault is observed in the system. In antecedent conditions, 400kV Baspa[HP]-Karchamwangtoo[JSW] ckt-1 & 2 carrying 15 MW each.	30	GD-1		Y[PG], Y[JSW], Y[SVNL]		Y[PG], Y[JSW], Y[SVNL]	Y[JSW]	NA		
25	NR	1) 765kV Orai-Jabalpur ckt-2 2) 765kV Bus-1 of Orai [PG] 3) 765kV Orai-Jabalpur ckt-1 (it charged through tie CB and bus reactor at Orai [PG])	POWERGRID	24-Jan-19	1:27	765 kV Orai-Jabalpur line-2 tripped on persistent R-N fault. After some time (700ms), 765 kV Bus-1 of Orai [PG] tripped on R-phase bus differential protection operation. It resulted into tripping of all main CB connected to that bus. 765 kV Orai-Jabalpur line-1 remain charged from Jabalpur end and hanged at Orai end with the Tie CB ON and Bus Reactor-2 connected. After establishing problem in CB compartment, 716 bay (765 kV Main bay of Orai-Jabalpur ckt-2) is taken out and both side disconnector switch is opened. After removing faulty Main bay section 716 bay, 765 kV Main Bus-1 is charged at 18:17 hrs.		GI-2		Y[PG]		Y[PG]		Y[PG]	100ms	

Annexure-7

				Outage						Preliminary Report receipt status			DR/EL receipt status			Detailed Report receipt status			
26	NR	1) 400kV Uri-1-Uri-2 ckt 2) Main Bus Coupler at 400 kV Uri-1 HEP 3) 120 MW Unit-1,2,3&4 at Uri-1 HEP 4) 60 MW Unit-4 at Uri-2 HEP	NHPC	24-Jan-19	8:49	All four units of Uri-1 HEP was running with 410MW generation with arrangement of all running unit with Uri-2 ckt was on one bus and Amargah ckt-1 & 2 was on other bus. As most of the current flowing through bus coupler leads to operation of backup over current protection of Bus Coupler at 400 kV Uri-1 HEP. Further Uri-1 Uri-2 ckt also tripped on over current protection and units tripped on over frequency due to loss of evacuation path.	470		GD-1		Y(NHPC)			Y(NHPC)			Y(NHPC)	NA	
27	NR	1) 400kV Meerut-Koteshwar Pool ckt-1 2) Koteshwar Pool-Tehri ckt-1 3) Koteshwar Pool-Tehri ckt-2 4) Koteshwar Pool-Koteshwar THDC ckt-1	POWERGRID	24-Jan-19	17:14	In Antecedent condition, 400 kV Meerut-Koteswar Pool Ckt-2 was under planned shutdown due to insulator replacement work till 16:00hrs. Shutdown was extended by POWERGRID. 400 kV Meerut-Koteshwar Pool Ckt-1 (only ckt available for entire complex) tripped due to Y-N line fault. It further resulted into outage of 1000MW, 895 MW at Tehri & 90MW at Koteshwar HEP generation in the complex.	1000		GD-1		Y(THDC)	Y(PG)		Y(THDC)	Y(PG)		Y(THDC), Y(PG)	100ms	
28	NR	1) 220kV Satal(NHPC)-Kishenpur(PG) ckt-1 2) 220kV Satal(NHPC)-Kishenpur(PG) ckt-2	POWERGRID & NHPC	25-Jan-19	15:08	220kV Satal(NHPC)-Kishenpur(PG) ckt-1 & 2 tripped on B-N fault. As per PMU, B-N fault with delayed clearance and no auto-reclosing attempt is observed. In antecedent conditions, 220kV Satal(NHPC)-Kishenpur(PG) ckt-1 & 2 carrying 20 MW & 18 MW respectively.			GI-2			Y(PG)	Y(NHPC)		Y(PG)	Y(NHPC)		Y(PG)	400ms
29	NR	1) 400kV Azamgarh(UP)-Sultanpur(UP) 2) 400kV Lucknow(PG)-Sultanpur(UP) 3) 315 MVA ICT 1 at 400/220kV Sultanpur(UP) 4) 240 MVA ICT 2 at 400/220kV Sultanpur(UP)	UP & POWERGRID	28-Jan-19	9:50	400kV Azamgarh(UP)-Sultanpur(UP) & 400kV Lucknow(PG)-Sultanpur(UP) tripped during BUS changeover. At the same time, 315 MVA ICT 1 & 240 MVA ICT 2 at 400/220kV Sultanpur(UP) also tripped. As per PMU, R-N fault is observed in the system. In antecedent conditions, 400kV Azamgarh(UP)-Sultanpur(UP) & 400kV Lucknow(PG)-Sultanpur(UP) carrying 10 MW & 234 MW respectively.			GI-2			Y(UP)	Y(PG)		Y(UP)	Y(PG)	Y(UP)		80ms
30	NR	1) 220kV Amargah(NRSS29)-Delina(JK) 2) 220kV Delina(JK)-Zainkote(JK) 3) 220kV Amargah(NRSS29)-Zainkote(JK)	J&K and NRSS29	28-Jan-19	14:24	220kV Amargah(NRSS29)-Delina(JK) tripped on R-N fault at 14:22hrs. At the same time, 220kV Delina(JK)-Zainkote(JK) also tripped. At 14:30hrs 220kV Amargah-Zainkote line also tripped due to failure of B-Phase CVT dropper at Zainkote(JK) end. As per PMU, R-N fault and B-N fault is observed in the system.	100		GD-1	0.45			Y(JK), Y(NRSS29)			Y(JK), Y(NRSS29)	Y(JK)	80ms	

Northern Regional inter regional lines tripping for Jan-19

S. No.	Name of Transmission Element Tripped	Owner/ Utility	Outage		Load Loss/ Gen. Loss	Brief Reason (As reported)	Category as per CEA Grid standards	Restoration		# Fault Clearance Time (>100 ms for 400 kV and 160 ms for 220 kV)	*FIR Furnished (YES/NO)	DR/EL provided in 24 hrs (YES/NO)	Other Protection Issues and Non Compliance (inference from PMU, utility details)	Suggestive Remedial Measures	Remarks
			Date	Time				Date	Time						
1	400kV Gorakhpur(PG)-Muzaffarpur(PG)-2	POWERGRID	5-Jan-19	04:40	Nil	Suspected Foggy weather. Tripped on fault.	NA	5-Jan-19	05:45	NO	NO	NO		Details of tripping yet to be received.	From PMU, multiple faults observed.
2	400kV Gorakhpur(PG)-Motihari(DMTCL)-1^^	POWERGRID/DMTCL	5-Jan-19	04:48	Nil	Suspected Foggy weather. B-N fault followed by R-N fault.	NA	5-Jan-19	06:16	NO	NO	YES (After 24hrs)		Time shift of ~650ms observed in PMU and DR clock. Same needs to be corrected in DR.	Information received from NR end. From PMU and DR, B-N fault followed by R-N fault occurred within reclaim time.
3	400kV Gorakhpur(PG)-Muzaffarpur(PG)-1^^	POWERGRID	5-Jan-19	05:07	Nil	Suspected Foggy weather. Y-N fault followed by B-N fault.	NA	5-Jan-19	06:25	NO	NO	YES (After 24hrs)		Time shift of ~650ms observed in PMU and DR clock. Same needs to be corrected in DR.	Information received from NR end. From PMU and DR, Y-N fault followed by B-N fault occurred within reclaim time.
4	400kV Gorakhpur(PG)-Motihari(DMTCL)-2^^	POWERGRID/DMTCL	5-Jan-19	05:30	Nil	Suspected Foggy weather. Tripped on fault.	NA	5-Jan-19	06:01	NO	NO	NO		Details of tripping yet to be received	From PMU, B-N fault with unsuccessful auto-reclosing observed.
5	400kV Gorakhpur(PG)-Muzaffarpur(PG)-1^^	POWERGRID	5-Jan-19	06:56	Nil	Suspected Foggy weather. Tripped on fault.	GI-2	5-Jan-19	11:38	NO	NO	NO		Details of tripping yet to be received. Simultaneous tripping of ckt-1 along with ckt-2 to be ascertained and issue to be rectified.	From PMU and DR, line unsuccessfully auto-reclosed on Y-N fault. Ckt-2 tripped at same time.
6	400kV Gorakhpur(PG)-Muzaffarpur(PG)-2^^	POWERGRID	5-Jan-19	06:56	Nil	Suspected Foggy weather. Y-N fault.	GI-2	5-Jan-19	10:28	NO	NO	YES (After 24hrs)			Information received from NR end. From PMU and DR, line unsuccessfully auto-reclosed on Y-N fault.
7	800kV HVDC Champa-Kurukshetra pole-1 at Kurukshetra	POWERGRID	15-Jan-19	12:56	Nil	Due to filter power limit.	GI-2	15-Jan-19	13:41	NA	NO	YES			Information received from NR end. From PMU, AC Voltage fluctuation observed near Kurukshetra.
8	800kV HVDC Champa-Kurukshetra pole-2 at Kurukshetra	POWERGRID	15-Jan-19	12:56	Nil	Due to filter power limit.	GI-2	15-Jan-19	13:41	NA	NO	YES			Information received from NR end. From PMU, AC Voltage fluctuation observed near Kurukshetra.
9	765kV Agra(PG)-Gwalior(PG)-2^^	POWERGRID	21-Jan-19	22:39	Nil	Y-N fault. Fault distance is 2.1 km from Agra end.	NA	21-Jan-19	23:58	NO	NO	NO		Details of tripping yet to be received	From PMU, line unsuccessfully auto-reclosed on Y-N fault.
10	765kV Agra(PG)-Gwalior(PG)-2^^	POWERGRID	22-Jan-19	01:58	Nil	Y-N Fault, Dist. 2.3km (AGRA end).	NA	22-Jan-19	06:29	NO	NO	NO		Details of tripping yet to be received	From PMU, line unsuccessfully auto-reclosed on Y-N fault.
11	765kV Jabalpur(PG)-Orai(PG)-1	POWERGRID	24-Jan-19	01:27	Nil	B-N fault in ckt-2. Flashover at Jabalpur end resulted in bus bar protection operation for bus-1. ckt-1 remained charged with Bus Reactor.	GI-2	24-Jan-19	19:16	NO	YES	YES			Information received from NR end. From PMU and DR, flashover occurred resulted in bus bar protection operation of one bus.
12	765kV Jabalpur(PG)-Orai(PG)-2	POWERGRID	24-Jan-19	01:27	Nil	B-N fault.	GI-2	24-Jan-19	06:02	NO	YES	YES		As reported, water leakage arrested and ploe charged subsequently	Information received from NR end. From PMU and DR, line unsuccessfully auto-reclosed on R-N fault.
13	500kV HVDC Mundra-Mohindergarh Pole-1^^	APL/ATL	3-Jan-19	04:27	Nil	Block by DC line fault recovery	NA	4-Jan-19	06:31	NA	YES	YES			Information received from NR end. From PMU, no fault observed.
14	400kV Balia(PG)-Biharshariff(PG)-1^^	POWERGRID	9-Jan-19	18:03	Nil	R-Y fault. FD-212km from Balia. FC-3.3 kA.	NA	9-Jan-19	20:36	NO	NO	YES (After 24hrs)			Information received from NR end. From PMU and DR, R-Y fault observed.
15	765kV Jabalpur(PG)-Orai(PG)-1	POWERGRID	11-Jan-19	14:18	Nil	Phase to earth fault. Tripped only from Jabalpur end.	NA	11-Jan-19	14:55	No fault observed	NO	NO		Details of tripping yet to be received.	From PMU, no fault observed.

Northern Regional inter regional lines tripping for Jan-19

S. No.	Name of Transmission Element Tripped	Owner/ Utility	Outage		Load Loss/ Gen. Loss	Brief Reason (As reported)	Category as per CEA Grid standards	Restoration		# Fault Clearance Time (>100 ms for 400 kV and 160 ms for 220 kV)	*FIR Furnished (YES/NO)	DR/EL provided in 24 hrs (YES/NO)	Other Protection Issues and Non Compliance (inference from PMU, utility details)	Suggestive Remedial Measures	Remarks
			Date	Time				Date	Time						
16	220kV Sasaram(PG)-Sahupuri(UP)	UP/POWERGRID	11-Jan-19	02:34	Nil	Phase to earth fault. B-N fault. F.D.= 193.6 KM from Pasauli end ,F.C.= 1.308 KA	NA	11-Jan-19	04:15	YES	NO	NO	No auto-reclosing observed.	Reason for delayed clearance of fault and non auto-reclosing to be ascertained and issue to be rectified.	From PMU, B-N fault observed with delayed fault clearance.
17	800kV HVDC Agra-BNC Pole-2 at Agra	POWERGRID	16-Jan-19	10:53	Nil	Commutation Failure at BNC	NA	16-Jan-19	11:49	NA	NO	NO		Details of tripping yet to be received.	From PMU, dip in AC voltage observed.
18	HVDC Vindhyachal BtB pole-1	POWERGRID	16-Jan-19	09:10	Nil	DC Overcurrent Protection trip.	NA	16-Jan-19	11:26	NA	NO	YES (After 24hrs)			Information received from NR end. From PMU, fault observed in AC system.
19	765kV Balia(PG)-Gaya(PG)	POWERGRID	27-Jan-19	06:41	Nil	B-N fault, Fault current: 3.31kA, Fault distance: 174.8km from Balia end.	NA	27-Jan-19	08:48	NO	NO	NO	No auto-reclosing observed.	Details of tripping yet to be received. Reason for non auto-reclosing to be ascertained and issue to be rectified.	From PMU, fault observed
20	220kV Sakatpura(RRVPNL)-Bhanupura(MPPTCL)	Rajasthan	31-Jan-19	21:28	Nil	Phase to earth fault. R-N fault	NA	31-Jan-19	21:56	NO	NO	NO	No auto-reclosing observed.	Details of tripping yet to be received. Reason for non auto-reclosing to be ascertained and issue to be rectified.	From PMU, R-N fault observed.

Fault Clearance time has been computed using PMU Data from nearest node available and/or DR provided by respective utilities (Annexure- II)

*Yes, if written Preliminary report furnished by constituent(s)

R-Y-B phase sequencing (Red, Yellow, Blue) is used in the list content.All information is as per Northern Region unless specified.

^^ tripping seems to be in order as per PMU data, reported information. However, further details awaited.

Reporting of Violation of Regulation for various issues for above tripping

1	Fault Clearance time(>100ms for 400kV and >160ms for 220kV)	1. CEA Grid Standard-3.e 2. CEA Transmission Planning Criteria
2	DR/EL Not provided in 24hrs	1. IEGC 5.2(r) 2. CEA Grid Standard 15.3
3	FIR Not Furnished	1. IEGC 5.9.6.a 2. CEA Grid Standard 12.2 (Applicable for SLDC, ALDC only)
4	Protection System Mal/Non Operation	1. CEA Technical Standard of Electrical Plants and Electric Lines: 43.4.A 2. CEA (Technical Standards for connectivity to the Grid) Regulation, 2007: Schedule Part 1. (6.1, 6.2, 6.3)
5	A/R not operation	1. CEA Technical Standard of Electrical Plants and Electric Lines: 43.4.C 2. CEA Technical Planning Criteria

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