सत्यमेव जयते

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

सं: उ.क्षे.वि.स./प्रचालन/106/01/2019/4745-4786 दिनांक: 10/05/2019

विषय: **प्रचालन समन्वय उप-समिति की 159वीं बैठक का कार्यसूची।**
Subject: **Agenda of 159th OCC meeting.**

प्रचालन समन्वय उप-समिति की 159वीं बैठक **15-05-2019** को **10:00** 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।

159th meeting of the Operation Co-ordination sub-committee will be held on **15-05-2019** at **10:00am** at NRPC Secretariat, New Delhi. The agenda of this meeting has been up-loaded on the NRPC web-site http://www.nrpc.gov.in.

It is requested that the updated status of various points under follow-up action points of previous OCC meeting may kindly be furnished prior to the meeting.

Kindly make it convenient to attend the meeting.

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(सौमित्र मजूमदार)
अधीक्षण अभियंता(प्रचालन)

सेवा में : प्रचालन समन्वय उप समिति के सभी सदस्य।
To: All Members of OCC

Part-A NRPC

1. Confirmation of Minutes:

The minutes of the 158th OCC meeting held on 15.04.2019 and 23.04.2019 at NRPC Secretariat, New Delhi were issued vide letter of even number dated 06.05.2019.

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 April, 2019:

2.1 Supply Position (Provisional) for April, 2019

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

State	Req. / Avl.	Anticipated (MU)	Actual (MU)	Variation	Anticipated (MW)	Actual (MW)	Variation
Chandigarh	Avl.	134	117	-12.4%	329	256	-22.2%
	Req.	133	117	-11.7%	313	256	-18.2%
Delhi	Avl.	3054	2698	-11.7%	5982	5664	-5.3%
	Req.	2770	2699	-2.6%	5400	5664	4.9%
Haryana	Avl.	5964	3773	-36.7%	9210	8127	-11.8%
	Req.	3545	3773	6.4%	7700	8127	5.5%
Himachal Pradesh	Avl.	796	781	-1.9%	1291	1387	7.4%
	Req.	788	777	-1.3%	1326	1387	4.6%
Jammu & Kashmir	Avl.	1206	1296	7.5%	2213	2261	2.2%
	Req.	1672	1604	-4.1%	2752	2826	2.7%
Punjab	Avl.	4347	3646	-16.1%	6966	7015	0.7%
	Req.	3840	3646	-5.0%	7039	7015	-0.3%
Rajasthan	Avl.	9328	6208	-33.5%	15713	10560	-32.8%
	Req.	6061	6210	2.5%	10620	10560	-0.6%
Uttar Pradesh	Avl.	11759	10148	-13.7%	17000	19935	17.3%
	Req.	9960	10148	1.9%	17500	19935	13.9%
Uttarakhand	Avl.	626	1120	78.9%	1454	1922	32.2%
	Req.	1161	1120	-3.5%	2012	1922	-4.5%
NR	Avl.	37215	29786	-20.0%	60158	53985	-10.3%
	Req.	29931	30094	0.5%	54662	54476	-0.3%

As per above, it has been observed that there are higher variations (i.e. > 5.0%) in the Anticipated vis-à-vis Actual Power Supply Position (Provisional) for the month of April 2019 in terms of Energy Requirement for Chandigarh, Haryana & Punjab and in terms of Peak Demand for Chandigarh, Haryana, Uttar Pradesh. **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 April 2019 is placed on NRPC website. (http://164.100.60.165/meetings/occ.html).

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 June 2019 to be discussed on 14.05.2019 at NRPC Secretariat, New Delhi.

3.2. Outage Programme for Transmission Elements.

The proposed Outage programme of Transmission lines for the month of June 2019 to be discussed on14.05.2019 at NRPC Secretariat, New Delhi.

4. Planning of Grid Operation

4.1. Anticipated Power Supply Position in Northern Region for June 2019

The Anticipated Power Supply Position in Northern Region for June 2019 is enclosed at **Annexure-I.**

SLDCs are requested to update their estimated power supply position for June, 2019 and measures proposed to be taken to bridge the gap between demand & 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 dt. 27th& 28th February 2018, 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 nos. 400 kV bus reactors at 400 kV sub-stations subject to the availability of space.

6.2 **POWERGRID:**

500MVAr TCR at Kurukshetra S/s: Contract awarded in January 2019 with completion schedule of 22 months, kick off meeting has been held.

In the 41st TCC & 44th NRPC meeting held on 18th & 19th March 2019, POWERGRID informed that as per the order of MoP, few approved reactors are to be done by POWERGRID instead of through TBCB.

6.3 **DTL:**

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

S.No.	Sub Station	Voltage level (kV)	Reactor (MVAr)	Status (As per 41th TCC & 44th NRPC meeting)
1	Peeragarhi	220	1x50	Reactors were approved in the Board which would be further processed for PSDF funding.
2	Mundka	400	1x125	Reactors were approved in the Board which would be further processed for PSDF funding
		220	1x25	
3	Harsh Vihar	220	2x50	Reactors were approved in the Board which would be further processed for PSDF funding
4	Electric Lane	220	1x50	Proposal have been prepared and it would be approved in the board at the earliest
5	Bamnauli	220	2x25	Proposal have been prepared and it would be approved in the board at the earliest
6	Indraprastha	220	2x25	Proposal have been prepared and it would be approved in the board at the earliest
TOTAL			**450**	

DTL may kindly update on any further progress made.

6.4 PSTCL:

Bid validity period was not extended by the bidder for the tenders of 400 kV bus reactor at Dhuri substation and 220 kV bus reactors at Dhuri and Nakodar substations due to pendency in PSDF funding approval.

Queries of PSDF have been clarified and delay was due to shortage of Funds in PSDF. Process of retendering would be done within 3 months, once funding from PSDF is received.

PSTCL may kindly update.

6.5 Uttarakhand:

125 MVAr reactors at Kashipur: Technical Evaluation has been completed. Further, it would be discussed in CPC meeting.

PTCUL may kindly update.

6.6 Rajasthan:

The status as updated in the 158th OCC dt. 23.04.2019 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 on observations made 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 dt. 12.10.2018 to POSOCO for approval.	Clarifications have been sought by Techno-Economic Sub Group of PSDF from Rajasthan.

Rajasthan may kindly update.

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

7.1 In the 38th TCC & 41st NRPC meeting dt. 27th & 28th February 2018, it was decided to conduct capacitor requirement study of NR at 11/33 kV level from CPRI so as to obtain the true requirement of capacitor for FY 2019-20. In the subsequent NRPC meeting, approval was given to the Techno-Commercial offer of CPRI of Rs. 32 Lakh (excluding taxes) for conducting the capacitor study and the format for data submission was shared amongst the members.

7.2 In the 150th OCC meeting dt. 21.08.2018, members expressed concerns on the nature of the format. Accordingly, CPRI made a detailed presentation in the 151st OCC meeting and format was revised based on the received inputs & sent to respective SLDCs on 24.09.2018.

7.3 Utilities had been regularly pursued for the submission of data; however, data received from the utilities were mostly not in line with the requirement of CPRI.

7.4 In the 158th OCC meeting, the decision of previous OCC meeting regarding data collection through third party was reiterated in case requisite data in proper format is not received from the utilities.

7.5 CPRI vide email dt. 10.05.2019 has submitted its observations after reviewing the data formats of Punjab (**Annexure-II**).

All utilities may kindly update.

8. Phase nomenclature mismatch issue with BBMB and interconnected stations

19.1. 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 modify phase sequencing at Dehar as Y-B-R instead of R-Y-B.

19.2. The issue was deliberated in the 138th OCC meeting held on 23.08.2017 and BBMB was requested to rectify the phase nomenclature at their end. However, BBMB requested for the coordination among 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.

19.3. BBMB drew a draft action plan which was duly deliberated by the Committee in its 1st meeting held on 04.06.2018. 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.

19.4. 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. Accordingly, the matter was taken up on 07.10.2018 for POWERGRID consent to the action plan. However, reply of the same is awaited.

19.5. In the 40th TCC & 43rd NRPC meeting, referring to issue encountered in Rajasthan wherein problem was mitigated for a Double circuit line, POWERGRID mentioned that it may not be optimal plan to change the Jumper configuration for a single circuit line in view of requirement for long shut down & material.

19.6. Although tentative dates for conducting site visits at Bhiwani, Rajpura, Panchkula & Panipat S/s were planned during 154th to 157th OCC meetings; however, committee could not make site visit.

19.7. In the 41st TCC & 44th NRPC meeting, held on 18th & 19th March 2019, POWERGRID representative stated that there might be some issues in the work such as design constraint of tower, de-stringing and re-stringing of conductors etc. which would be clarified at the time of site visit and decision of committee would be implemented.

19.8. In the 158th OCC meeting, it was decided that representatives of NRPC, NRLDC in coordination with BBMB and PGCIL will conduct site visit during the first week of May 2019 to understand and resolve the issues.

POWERGRID & BBMB may kindly update.

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

9.1 The updated status of Agenda items is enclosed at **Annexure-III. All utilities are requested to update the status.**

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

10.1 The updated status of FGD installation is attached at **Annexure-IV. All utilities are requested to regularly update the status.**

10.2 **Implementation of Environmental Norms in Thermal Power Plants**

In the review meeting taken up by JS (Thermal), MoP on 20.03.2019, immediate need was felt for action plan for compliance of environmental norms for the balance thermal capacity which is presently not being monitored. The total installed capacity of thermal power plant based on coal and lignite is 197,352 MW out of which 166,972 MW is presently monitored for the installation of FGD. The balance capacity could not be monitored due to various reasons, such as the generators using CFBC technology, FGD already installed, units to be decommissioned, plan not available, etc. The NRPC has been requested to monitor the status as per **Annexure-V** along with the action require by the concerned authorities. Further, a presentation on this matter from CEA is also later scheduled.

Concerned utilities are requested to update the status.

11. LVRT compliance by wind generators

11.1. The CEA (Technical Standards for Connectivity to the Grid) Amendment Regulations, 2013 stipulates for LVRT capability in the wind generating stations connected at voltage level of 66 kV and above. CERC vide order dt. 05.01.2016 had directed all WTGs of capacity equal to or more than 500kW except Stall Type WTGs to implement LVRT, after the issue of necessary regulation/clarification by CEA.

11.2. In the 158th OCC meeting, members were apprised of the amendment in regulation i.e., Central Electricity Authority (Technical Standards for Connectivity to the Grid) (Amendment) Regulations, 2019.

11.3. With regard to monitoring of the installation and performance of LVRT installed on existing WTGs, CERC had directed SLDCs to prepare quarterly reports and submit it to RPCs for validation. Any deficiency and non-compliance to the Commission needs to be reported by RPCs in consultation with RLDCs.

11.4. Rajasthan submitted WTG data with respect to LVRT compliance (status is placed at Annexure-VI of the Minutes of 158th OCC meeting).

SLDCs are requested to submit quarterly reports as per CERC order.

12. System Protection Scheme (SPS) in NR

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

12.1.1. In the 154th OCC meeting, POWERGRID representative informed that modifications related to CB ON/OFF status at both Agra & Gwalior end, DTPC installation and end to end testing for 20 links out of 21 had been done. In the 155th OCC meeting, POWERGRID representative requested concerned utilities to do the terminal connections as cable had been laid down to the Protection panel in all substations.

12.1.2. In the 41st TCC & 44th NRPC meeting, held on 18th & 19th March 2019, POWERGRID representative informed that implementation of revised SPS for 765 kV Agra-Gwalior line has been completed.

12.1.3. In the 158th OCC meeting, representative of Haryana informed that load group has been changed from original submission to NRPC in 2016. 220kV Samaypur-Palwal D/C is feeding load to five districts of Haryana and tripping of these feeders resulted into power supply failure in these districts. Due to this, Haryana has changed it from load group C&D to E&F. Other feeders also changed in view of providing adequate load relief.

12.1.4. POWERGRID representative informed that there were no changes done in old scheme and additional load shedding feeders has been wired in H, I, J & K load group. They have added some of the feeders in C, D, E & F along with existing feeder to provide adequate load shedding. POWERGRID representative further informed that finalization of load group is the responsibility of NRPC secretariat and state utilities were not submitted load group wise details that's why final sheet was yet to be finalized. He also requested NRPC/ NRLDC to finalize the load group and share the final sheet with POWERGRID.

12.1.5. NRLDC representative informed that Haryana also provided load group details only for C, D, E & F. If all the load shedding feeders wired in E&F load group then these feeders will be tripped in other SPS operation of Balia-Bhiwadi SPS. He also informed that for load group finalization inputs required from all the concerned state constituents so it will discuss in next OCC meeting.

12.1.6. NRPC representative suggested to do mock testing first and suggested that if changes are done in future then again mock testing will be done after revised implementation.

12.1.7. Following action points were decided during 158th OCC meeting:

- Mock testing of existing implemented scheme shall be done on 30.04.2019.
- Haryana shall discuss the revised load group with the management for approval and also share the status in next OCC meeting.
- POWERGRID shall check the feasibility for replacement of feeders in existing load group of C, D, E & F also and inform the NRPC/ NRLDC about time duration to complete the work.

Further, PGCIL was requested to resolve the issue related to DTPC at Nara substation, raise by the representative of UP.

- Issue of load group to be discussed in next OCC meeting.

The Mock test of 765kV Agra-Gwalior SPS has been conducted on 01.05.2019. Mock test report is enclosed at **Annexure-VI**. **NRLDC may present the observations on the testing of scheme**. **Haryana and POWERGRID may update the status of action taken on the decision of 158th OCC meeting**.

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

12.2.1. In the 154th OCC meeting, the representative of UPRVUNL intimated that required hardware had been arranged at site. In the 157th OCC meeting, it was intimated that SPS work has been completed in DCS and input has been provided to UPPTCL as per the requirement. Based on the submission of UPSLDC that ICT-3 was not included in the SPS to be implemented, it was advised that UPSLDC, UPRVUNL and other concerned utilities to conduct a meeting to explore the revision of SPS for ICTs at 765kV substation. In the 41st TCC & 44th NRPC meeting, held on 18th & 19th March 2019, representative of UPRVUNL informed that work pertaining to them has been completed and UPPTCL has to do testing of SPS.

12.2.2. In the 158th OCC meeting, it was decided that mock testing for the scheme will be carried out on 02.05.2019 and the revised SPS logic will be shared by UPSLDC.

UPSLDC / UPRVUNL may kindly update the status.

12.3 **SPS for Kawai – Kalisindh - Chhabra generation complex**:

12.3.1. In the 152nd OCC meeting, RRVPNL representative intimated that the Technical specification for implementation of automatic load shedding scheme under SPS for Kawai Kalisindh generation complex is under approval and the estimated implementation period for the scheme may take further 6-7 months. Further, Rajasthan SLDC representative confirmed that Chabra STPS units have also been wired to the SPS.

12.3.2. In the 156th OCC meeting, it was intimated that request was made by Rajasthan to review SPS scheme for Kawai-Kalisindh-Chhabra generation complex upon commissioning of 400kV CTPP-Anta feeder.

12.3.3. In the 157th OCC meeting, representative of Rajasthan informed about the scheduling of meeting to review the SPS for Kawai- Kalisindh-Chhabra generation complex and mentioned that studies were being carried out by Planning Division. It was advised that studies might be shared amongst NRLDC and Rajasthan, so that revised scheme might be formulated at the earliest.

12.3.4. In the 158th OCC meeting, it was decided that NRLDC will examine the proposed interim arrangement as per the study done by Rajasthan (shared on 15.04.2019) and matter will be reviewed in the next OCC meeting.

NRLDC may kindly update the status.

13. Automatic Demand Management System

13.1. Clause 5.4.2 (d) of IEGC mandates for implementation of the state-of-the-art demand management schemes for automatic demand management to reduce overdrawal from the gird. The responsibility for the implementation of the same has been entrusted on SLDCs/SEB/DISCOMs. CERC in its order in petition No. 5/SM/2014 had granted time till 31.06.2016 to the concerned SLDCs/ SEB/ DISCOMs to implement ADMS, failing which action under Section 142 of the Act for non-compliance of the Regulation 5.4.2 (d) of the Grid Code and order of the Commission. RLDCs were also directed to submit the report in this regard to the commission by 31.08.2016. The issue of implementation of ADMS in NR is being deliberated regularly in the OCC meetings. The status of implementation of ADMS in states of NR is as under:

State/ Utility	Status
Punjab	**Not fully implemented.** At SLDC level, remote tripping for 26 locations is operational. At 11kV feeder level, ADMS is to be implemented by Distribution Company.
TPDDL	**Fully implemented.**
Rajasthan	**Under implementation.** LoA placed on 12.12.2018 with an execution period of 18 months for ADMS at the level of 33kV feeders at EHV Substation of RVPN under SCADA / EMS part of project. ADMS functionality at 11 kV feeders from 33/11 kV substation is under the jurisdiction of the DISCOMs and matter is being perused with DISCOMs authorities
UP	**Not fully implemented.** Remote operation of 132 kV feeders under ADMS is operational. For the down below network, issue taken up with the DISCOMs.
Haryana	**Not implemented.**

13.2. **SLDCs/SEBs/DISCOMs are requested update the status**.

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

14.1. Based on the recommendations of the Enquiry Committee on grid disturbances on 30th & 31st July 2012, utilities of NR were requested to take necessary action and submit compliance/status report to NRPC. In the 8th NPC meeting held on 30.11.2018, the non-submission of implementation status related information was highlighted and serious concern was shown. In the subsequent OCC meetings, utilities were requested to submit the requisite information regarding implementation of recommendations of Enquiry Committee. In the 158th OCC meeting, it was decided that requisite information needs to be submitted by UP, HP, SJVNL and NTPC (NR-HQ) before next OCC meeting. The status of information received in this regard is as under:

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

UP, HP and NTPC(NR-HQ) are requested to kindly update the status.

15. Cleaning and Replacement of porcelain insulators

15.1. All transmission licensees in the Northern Region were requested since 148th OCC 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 and all utilities were requested to stick to the timeline 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.

15.2. In the 156th OCC meeting, it was intimated that a web based online application (http://nrpc.gov.in/portal) has been made functional on NRPC website, wherein transmission licensees can regularly fill up their respective data pertaining to cleaning & replacement of porcelain insulators. Demonstration of the application was given to the participants. The requisite login ID and password was subsequently furnished to the transmission licensees by NRPC.

15.3. In the 158th OCC meeting, members were requested to submit requisite data pertaining to cleaning & replacement of porcelain insulators on the online application of NRPC. Further, it was decided that list of elements along with following details (*not covered under first five approved stages for porcelain insulator replacement*) may be submitted by POWERGRID before next OCC meeting:

Element Name & Type; Maximum ESDD (Equivalent Salt Deposit Density) value; Pollution level (as per recommendation of the inquiry committee on grid incident in Northern Region on 27.01.2007); Number of fog related tripping of the element in last one year.

All transmission licensees of NR are again requested to submit cleaning & replacement of porcelain insulators related data on online application using their respective login ID and password. POWERGRID is requested to submit requisite data as per decision taken in 158th OCC meeting.

16. Cyber Security Preparedness Monitoring

16.1. Based on the detailed presentation given by Chief Information Security Officer (CISO), MoP in the 37th TCC and 40th NRPC meeting, all utilities were requested to monitor actions being taken in regard to the following points and report the status:

a. Appointment of organization-wise CISO 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.

16.2. In the 156th OCC meeting, it was mentioned that inherent vulnerability in the ICT infrastructure or website or web applications shall be accessed and remedial action thereon shall be taken by all utilities by conducting Vulnerability Assessment & Penetration Test (VAPT) of their respective ICT infrastructure, websites and web applications.

All utilities are requested to update the status of VAPT conducted in their respective organization and VAPT plan for the future. POWERGRID is requested to update the status of draft CMP.

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

17.1. 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 temperature of 45^{o}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 account variation in thermal capability of lines w.r.t. variation of ambient temperature.

17.2. All STUs and transmission licensees had been requested to furnish terminal equipment ratings at all lines at 400kV & above for fully implementing the temperature adjusted TTC to ensure that there is no gap in security assessment. The matter is under regular follow up since 152nd OCC meeting and only HVPNL has submitted the data so far.

All STUs and transmission licensees, except HVPNL, are requested for expeditious submission of information.

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

18.1. Ministry of Railways has accorded high priority to railway electrification projects for reducing dependence on fuel based on crude oil and enhancing energy security of nation. However, 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. State-wise detail in respect of NR is as under:

Sl. No.	State	Tr. Line to be expedited	Contract to be awarded	Estimate awaited
1	UP	19	5	1
2	Haryana	5	2	-
3	Punjab	1	2	2
4	Rajasthan	5	5	7
5	J&K	1	-	-

18.2. In the 158th OCC meeting, members were again requested to take up the matter with concerned utilities to expeditious completion of the identified transmission line & substation works and update the status. Further, it was decided that representative from Railways will be invited in the future OCC meeting as special invitee.

Respective states are requested to update the status.

19. 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.

19.1. In the 142nd OCC meeting, it was reported by NTPC that after shifting of 2x500MW Rihand Stage-III units (Unit# 5&6) from NR Grid to WR Grid through Vindhyachal Pooling Station on 28.11.2017, 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.

19.2. In the 38th TCC & 41st NRPC meeting, it was decided to constitute a committee with members from CEA, NRPC, POSOCO, NTPC, POWERGRID and CTU to look into the issue of high vibrations during mono pole ground return operation for corrective actions. First meeting of the Committee was held on 16.10.2018 (*minutes attached in the 155th OCC MoM*).

19.3. In the 158th OCC meeting, it was decided that the constituted committee will hold its second meeting for reviewing the situation. In this regard, NTPC was requested to propose the meeting date.

NTPC may kindly update the status.

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

20.1. As per CERC Regulation, UFR and df/dt mapping is mandatory. In the 136th OCC meeting dt. 16.06.2017, it was decided 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.

20.2. In the 137th OCC meeting dt. 18.07.2017, NRPC 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. In the subsequent OCC meetings, all state utilities were requested to correct the SCADA UFR, df/dt displays as per the comments.

20.3. Utilities had been requested to update the progress as per following details in the past OCC meetings:

States	UFR	df/dt	Status as per the 151st OCC meeting	Remarks	Data Availability
J&K	No	No			
UP	Yes	Yes	Following are provided since last status: • 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: • 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: • Stage-2, 3 of df/dtincluded in display. • Feeder wise planned load relief. • Alternate feeder details. • Total actual relief in UFR.	Following yet to be provided: • Telemetry of feeders (Partial details available). • Telemetry of alternate feeders not available. • Calculation of total actual relief in df/dt seems incorrect.	Poor

States	UFR	df/dt	Status as per the 151st OCC meeting	Remarks	Data Availability
Delhi	Yes	Yes		Following yet to be provided: • 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: • Segregation of stage wise load. • Alternate feeder details include for most of the feeders. • Partial telemetry of feeders.	Following yet to be provided: • 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: • Complete telemetry of feeders. • Alternate feeders' details. • Digital Status of all the feeders	Poor
Rajasthan	Yes	Yes	Following are provided since last status: • UFR display provided.	Following yet to be provided: • 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 provide the SCADA UFR, df/dt displays as per the comments.

21. Frequent revisions in schedule (Agenda by APCPL-IGSTPS JHAJJAR)

21.1. In the 158th OCC meeting, APCPL representative mentioned that coal based thermal generating stations are designed for Base Load operation with minimal intervention in Scheduled Generation for better efficiency and stable operation for life span of 25 years. By quoting the example of 31.03.2019, it was mentioned that schedule of IGSTPS is frequently revised in opposite direction. The change in Schedule Generation is maintained by varying the amount of coal fired i.e. by changing the Heat Flux inside the boiler.

Due to continuous variation of Heat Flux undue thermal stress on boiler tubes and other boiler components occur, which may lead to frequent tube/material failure. The electricity demand pattern is generally forecast a day ahead and the scheduling of Generating stations need to be spread out such that there is gradual change in schedule for consecutive blocks and single block revisions need to be avoided. Representative of APCPL requested to review the frequent revision of schedules, consequent schedule revisions in reverse direction and the scheduling pattern in respect of APCPL (IGSTPS)-Jhajjar.

21.2. NRLDC representative stated that all ramp up/down limits given by APCPL Jhajjar are being followed while scheduling at NRLDC. Since Jhajjar is having higher variable cost, requisition of power from beneficiaries changes frequently and accordingly schedule is being given to them. OCC suggested that if issues are coming up in machines within these ramp up/down limits, they shall take up matter with OEM and CERC.

21.3. In the 158th OCC meeting, it was decided that APCPL and CLP India will share requisite data in respect of schedule revisions for the months of March, April and May (upto 15th) 2019 in the next OCC meeting for deliberation.

APCPL and CLP India may present the requisite data for deliberations.

22. Shifting of RLDC's declared peak hours (Agenda by UPSLDC)

22.1. In the 158th OCC meeting, UP representative stated that use of hydro generation for peaking is done by NRLDC based on peak hours declaration. The peak timing declared by NRLDC of Northern region as a whole is different from peak hours of UP. NRLDC representative stated that the issue has been previously deliberated in 156th OCC meeting and it was agreed that for better system operation ISGS hydro scheduling is to be done on regional peak hours requirement with consent of all beneficiaries. In every OCC meeting, NRLDC is presenting demand curve of Northern region and states as well. Thus, if forum decides change in peak hours the same would definitely be incorporated.

22.2. MS, NRPC stated that NRLDC has to look after Northern region as a whole and decide peak hours accordingly and the same could not be done state-wise. MS, NRPC stated that NRLDC shall make sure that request of states is taken into consideration upto best possible extent and peaking hours are rationalized to maximum extent. Further, it was decided that NRLDC will present the monthly load curves of states and region as a whole and same may be deliberated in the next OCC meeting so that all constituents, in consensus, may take a decision on the matter.

NRLDC may present the monthly load curves of states and region as a whole.

23. Scheduling issues with APCPL Jhajjar (Agenda by Delhi and Haryana)

23.1. In the 158th OCC meeting it was highlighted that unit of Aravali Jhajjar was brought on bar solely on the request of one state (either Delhi/Haryana) in the past. However, the second state later started scheduling power from Aravali Jhajjar as per its entitlement and full schedule of the either state could not be met. In the meeting it was decided that a meeting will be convened under the chairmanship of Member Secretary, NRPC with NRLDC, Delhi SLDC and Haryana SLDC. Meeting has been scheduled on 14.05.2019.

24. Agenda by NTPC-NRHQ

24.1. Following parameter may be included in csv file, available under tab scheduling summary (which can be downloaded in auto to run ABT software):

- RRAS UP
- RRAS DOWN
- NET DC

In absence of these data in csv file, manual intervention required for data updation during daily report preparation. In addition, SCE have to post data (RRAS UP/ DOWN, DC, SG etc) in SAP, which is manually fetched from different location in NRLDC site, which is time consuming & probability of error is more in manual mode. Adding requested parameter in csv file (for auto download by ABT software) will be convenient for station and purpose of system improvement will be fulfilled.

24.2. **Requirement of MRI's for Singrauli**

Energy data is being regularly collected by MRI from SEM's on weekly basis. This data is most vital for commercial and billing purpose as all energy account is being done by NRPC with SEM data.

Data for Solar, Hydro and thermal plant is to be collected on every Monday with fix time frame (Monday up to 1200 hrs) positively, no delay is acceptable as advised in OCC meetings.

Presently in SSTPS station there are only 02 no's functional MRI's and these are also old causing frequent battery discharge or MRI getting hang (non-responsive). Many time it become very critical to download meter data and provide it timely to NRLDC. Moreover, only with 02 MRI's it is very difficult to collect data from 03 different locations (Solar, Hydro & Thermal) with total more than 32 meters.
It is kindly requested to provide 03 no's MRI (02 no's MRI of SANDS make and 01 no. MRI compatible with Secure Meter[##]) or equivalent compatible with installed meters at Singrauli injection point.

[##] *Secure meter installed in Allahabad#II line for capturing 0.01 Hz frequency step*.

Part-B NRLDC

1. Reliability issues in the grid: Summer 2019

In 157th and 158th OCC meeting, NRLDC had shared results of studies carried out for assessing the TTC/ATC of large state control area of Northern region for upcoming summer (as per network information available at NRLDC). TTC/ATC of states and other reliability issues are highlighted below:

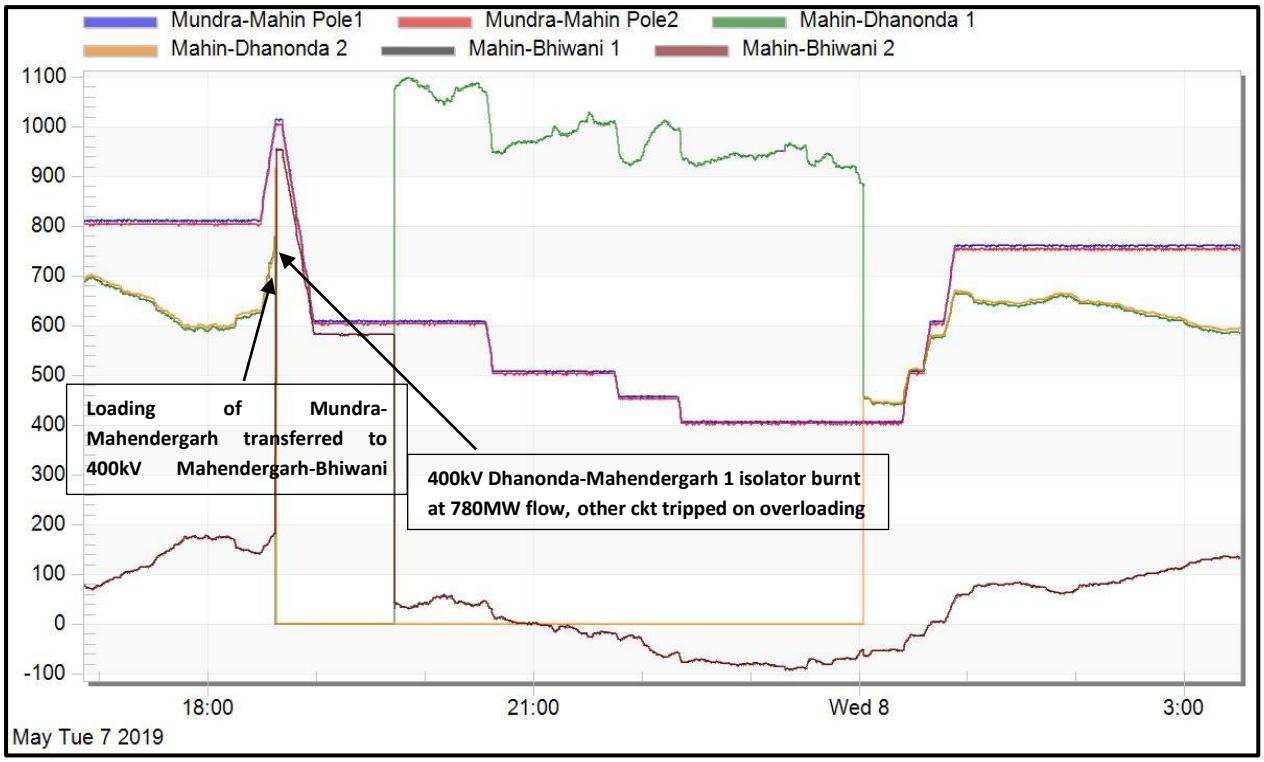
- **Delhi:** As per studies carried out by Delhi SLDC and NRLDC, TTC limit was assessed as 6800MW. Considering reliability margin of 300MW, ATC limit comes out 6500MW. Simulation studies suggest N-1 non-compliance at 400/220kV Mundka and Harsh vihar ICTs. In real-time, under import of 5000MW, loading of Mundka ICTs is 600-700 MW, which is high although loading is below N-1 contingency limit.

  Revival of 400kV Bamnauli-Tughlakabd D/C lines on normal towers which are in service through ERS may be expedited. ***Delhi may kindly update the status.***

- **Uttar Pradesh**: In simulation studies performed in May 2019 after incorporating network changes given by UP, NRLDC has assessed TTC as 13400MW under state generation scenario of 10000MW. Considering reliability margin of 600 MW ATC comes out as 12800 MW. UP has assessed TTC limit of more than 13200MW under generation scenario of ~10000MW which is quite similar to limits assessed by NRLDC. Simulation studies based on data provided suggest N-1 non compliances at 400/220kV Agra(PG) and 400/132kV Mau ICTs. TTC/ATC of UP state control area depends on its own generation scenario and would increase/decrease depending upon internal generation.

- **Haryana:** TTC/ ATC limits assessed by NRLDC are 7500MW/ 6900MW respectively with N-1 non-compliance at 400/220kV Deepalpur and Panipat ICTs. 220kV lines from Hisar, Lula ahir, Abdullapur etc. are heavily loaded. In real-time also under import of 6000-7000MW, loading of Deepalpur and Panipat ICTs are high, although below N-1 contingency limits. As discussed in last OCC, Haryana SLDC have assessed their TTC/ATC limit as 7900MW/ 7300MW. Many new elements are also being commissioned in Haryana, details of which are still awaited. ***In 158th OCC meeting and subsequently through email, Haryana was asked to share modelling data along with latest base case to NRLDC. Haryana may kindly update.***

  NRLDC has been continuously raising issue of low switchgear ratings at Dhanonda, Dadri, Gr. Noida and Nawada in OCC as well as TCC/NRPC meetings and also in quarterly operational feedbacks to CTU and CEA. Same was also highlighted in 40th TCC/ 43rd NRPC and 38th TCC/ 41st NRPC meetings. In an incident on 7th May 2019, as reported by Haryana, 400kV Mahendergarh-Dhanonda ckt 2 tripped due to broken isolator at 18:37hrs. due to which 400kV Mahendergarh-Dhanonda ckt 1 tripped on overloading. Haryana requested to keep loading of 400kV Mahendergarh-Dhanonda ckt 1 upto 950-1000A. Thus, generation backing down had to be done at APL, Mundra to reduce loading on HVDC Mundra-Mahendergarh. Such issues have also been encountered in past where other line tripped on overloading or backing down of generation had to be done at APL, Mundra. Haryana is once again requested to expedite works for replacement of switchgears at Dhanonda and Nawada.



Apart from above, tripping of 400 kV Mahendergarh-Dhanonda ckt-2 on over loading also needs to be investigated and also share the over current setting in both 400 kV Mahendergarh-Dhanonda ckts.

- **Rajasthan:** Simulation studies suggest N-1 non-compliance at 765/400kV Phagi, 400/220kV Jodhpur, Akal and Bhadla ICTs. Constraint for evacuation of power from Rajwest. In real time, high loading of ICTs at Akal (one 500MVA ICT is still out) and Bhadla are being observed with constraints in evacuation of renewables. As highlighted by NRLDC on previous many occasions, there is need for additional reactive power support at Akal.

  Rajasthan vide email dated 16.04.2019 shared study for revised SPS conditions for Kawai-Chhabra-Kalisindh complex carried out by their planning department. However, there are some assumptions in basecase, which needed clarification which were informed to Rajasthan SLDC in 158th OCC and also emailed to them on 30.04.2019. For example, 765kV Phagi-Bhiwani and 765kV Phagi-Gwalior are considered open which indicate already degraded network. Status of 400kV Chhabra-Chhabra Supercritical is not known (in service or not).

  Rajasthan SLDC representative may inform OCC about progress of revised study with expected dates of finalized study report. Quantum of generation to be backed down is being studied, but Rajasthan shall also expedite identification of loads which could be shed under operation of SPS.

  Rajasthan may kindly provide update on the same.

2. Reactive power performance in the grid

a. 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 (08.04.19 - 08.05.19) as per NRLDC SCADA data is enclosed in **Annexure-1**. 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 **(absorbing MVAR above 415kV)**
Dadri Stage2:	Generating and absorbing in the range of 100 to -100 MVAr **(absorbing MVAR above 232kV)**
IGSTPP Jhajjar:	Generating and absorbing in the range of 100 to -300 MVAr **(absorbing MVAR above 420kV)**
Unchahar:	Absorption and generation -50 to 100 MVAr **(absorbing MVAR above 230kV)**
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
CLP Jhajjar:	Absorbing -300 to -100 MVAr
Kawai:	Absorption and generation -120 to 50 MVAr **(absorbing MVAR above 408kV)**
Kalisindh:	Absorption and generation -120 to 80 MVAr
Suratgarh:	Absorption and generation -40 to 80 MVAr **(Telemetry not reliable)**
Chhabra:	Absorbing up to 200 MVAr
Rajpura:	Absorption up to 400 MVAr
Talwandi Saboo:	Absorption up to 400 MVAr **(absorbing MVAR above 410kV)**

It was agreed in previous OCC meetings that utilities 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 and accordingly corrective actions could be taken. 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.

b. Reactive Power injection at ISTS nodes:

NRPC publishes REA account every week indicating the nodes that are injecting/absorbing MVAr into the Grid under high/low voltages respectively. In 144th, 149th and 153rd OCC meetings, it was agreed that identification of nodes at lower voltage level where actual MVAR drawl/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.

c. Tap optimization exercise in Northern region

NRLDC is assessing need for tap changes required at 400/220kV stations in Northern region. In this regard, utilities are requested to provide present tap positions of ICTs for taking it into account while performing tap-changing simulation studies. For identifying nodes for tap change, the scatter plots of nodes for the last month would also be considered.

It is already agreed in OCC/TCC meetings that states would be carrying out studies at 220/132kV and lower voltage levels to assess need for tap changes required. Thus, they may inform OCC about any tap changes done by them recently.

Members may like to discuss.

3. Demand and Generation projections of Q2 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/.

NRLDC vide its letter dated 05.04.2019 had requested utilities to furnish Technical and commercial data for Jul'18-Sep'18 Q2 (2019-2020) by 15th April 2019. Details have been received only from HP, Delhi, NTPC, NHPC, BBMB, SJVN & NAPS. 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-2**. OCC may

like to discuss load-generation scenario to be considered for Q2 2019-20 PoC charges calculation.

Members may please like to discuss.

4. Long outage of hydro generating units

Several units of NHPC, BBMB such as Bairasuil, Kishanganga, Dehar, Pong, Bhakra (left), Kishenganga etc. are out since long duration. Details are attached as **Annexure-3.** Outage of units such as two units at Kishenganga is resulting in spillage of water. It is well known that hydro generation in NR is high from April to Sep every year. Thus, outages of units during this period shall be minimised as much as possible. In view of high hydro season and high demand expected in coming months, it is requested to kindly expedite revival of all central sector as well as state sector units (especially hydro) which are under outage.

Members may please like to discuss.

5. Updation of documents in line with Indian Electricity Grid Code (IEGC):

As discussed in 158th OCC meeting, NRLDC is updating the document, "Important grid element of Northern region", "Operating procedure of Northern region" and "Power Maps of Northern region and related information". Important Grid element and operating procedures are available at NRLDC website and power maps were mailed to respective utilities. It is once again requested to go through the documents and provide the updated information and feedback to modify the above documents.

Only feedback from POWERGRID and Delhi in respect of important grid elements and power maps of NR has been received.

As per Indian Electricity Grid Code (IEGC), in respect of demand control, all efforts must be made to avoid situation of low frequency. The chapter on demand estimation and control may be referred for this purpose. Hon'ble CERC in its order in petition no 125/MP/2012 also directed to have the list of radial feeders which can be opened on the directions of NRLDC to regulate the demand. List of such radial feeders has been provided by respective utilities and is part of 'Operating Procedure of Northern Region' (attached as Annexure in last OCC).

As highlighted in previous meeting, in view of continuous network change and high demand period during summer, it is desirable to have updated list of feeders. Thus, each state control area is again requested to update the information of feeders that can be used for demand regulation by NRLDC (in addition to action by SLDC). Following are the attributes for such feeders:

- Feeders shall be radial in nature
- Usually shall have substantial load flow so that effective change can be experienced on opening of such lines.

Data received only from Haryana.

Thus, it is once again requested that the respective information may be provided till 20th May 2019.

6. Frequent forced outages of transmission elements

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

S. NO.	Element Name	No. of forced outages	Utility/SLDC
1	400kV Aligarh(UP)-Panki(UP)	6	Uttar Pradesh
2	400kV Aligarh(UP)-Mainpuri 765(UP) ckt-1	5	Uttar Pradesh
3	220kV Kishenpur(PG)-Ramban(JK)	5	J&K/POWERGRID
4	315MVA ICT 1 at 400/220 kV Bassi(PG)	4	POWERGRID
5	400kV Gorakhpur(PG)-Motihari(DMTCL) ckt-1	4	POWERGRID
6	220kV Tanakpur(NHPC)-Sitarganj(PG)	4	NHPC/POWERGRID
7	400kV Agra(UP)-Unnao(UP)	3	Uttar Pradesh
8	315MVA ICT 2 400/220 kV Akal(RRVPNL)	3	Rajasthan
9	400kV Akal(RRVPNL)-Kankani(RRVPNL) ckt-1	3	Rajasthan
10	400kV Anpara(UP)-Sarnath(UP) ckt-2	3	Uttar Pradesh
11	400kV Bhilwara(RRVPNL)-Chittorgarh(RRVPNL) ckt-1	3	Rajasthan
12	400kV Bhilwara(RRVPNL)-Chittorgarh(RRVPNL) ckt-2	3	Rajasthan
13	400kV Bhiwani(PG)-Jind(PG) ckt-1	3	POWERGRID
14	400kV Dadri(NTPC)-Panipat(BBMB) ckt-1	3	POWERGRID/NTPC/BBMB
15	765kV Fatehabad 765(UP)-Lalitpur TPS(LPGCL) ckt-1	3	Uttar Pradesh
16	400kV G.Noida 765(UP)-Noida sec-148(UP) ckt-1	3	Uttar Pradesh
17	400kV Gorakhpur(PG)-Motihari(DMTCL) ckt-2	3	POWERGRID
18	132kV Mahendranagar(Nepal)-Tanakpur(NHPC)	3	NHPC/POWERGRID

S. NO.	Element Name	No. of forced outages	Utility/SLDC
19	315MVA ICT 1 at 400/220 kV Obra TPS(UP)	3	Uttar Pradesh
20	400kV Ratangarh(RRVPNL)-Suratgarh(RRVPNL) ckt-2	3	Rajasthan
21	500kV HVDC Vindhyachal(PG) BtB Block 1	3	POWERGRID

The complete details are attached at **Annexure-4.** Frequent outages of such elements affect the reliability and security of the grid. Hence, utilities are requested to look into such frequent outages and share the remedial measures taken/being taken in this respect.

Members may like to discuss.

7. Multiple element tripping events in Northern region in the month of Apr'19:

A total of **20** grid events occurred in the month of Apr'19 of which **11** 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-May-19 is attached at **Annexure-5.**

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 **1200ms** in the event of tripping at Bawana (DTL) on 04-Apr-19 at 12:04hrs.

Delayed clearance of fault (more than 100ms for 400kV and 160ms for 220kV system) observed in total **6** events out of 20 grid events occurred 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.

8. Details of tripping of Inter-Regional lines from Northern Region for Apr'19:

A total of **18** inter-regional lines tripping occurred in the month of Apr'19. The list is attached at **Annexure-6.** 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.

9. Frequency response characteristic:

Three FRC based event has occurred in the month of **Apr-2019**. 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	11-Apr-19	13:02hrs	HVDC Talcher-Kolar pole-I got blocked due to emergency switch off signal from Kolar end triggering SPS. Load loss of 1123 MW took place in southern region and generation loss of 225 MW in eastern region as per SCADA data. The generation relief in aforesaid units was on account of ramp down which took place in span of minutes, so delta P considered in FRC calculation is of load relief quantum in southern region.	50.066	50.120	0.054
2	12-Apr-19	15:25hrs	Chandrapur-Bhadrawathi-4, Chandrapur-Chandrapur-1 & 2, Chandrapur U#8 & 9, Dhariwal CTU and STU Unit tripped resulting in 1500 MW generation loss.	49.907	49.812	-0.095
3	12-Apr-19	23:55hrs	400kV Teesta III-Kishanganj tripped on R-Y-N Fault. As a result around 1865 MW generation of the entire complex started to flow through 400 KV Rangpo-Kishenganj S/C which tripped on overload (Back –up overcurrent with each phase current of 4000 amps) and resulted in loss of generation of around 1900 MW.	50.017	49.928	-0.089

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	Talchar-Kolar Event	Chandrapur Event	Sikkhim Event	Remarks
PUNJAB	64%	4%	19%	
HARYANA	53%	13%	-60%	
RAJASTHAN	25%	8%	1%	
DELHI	-90%	4%	-60%	
UTTAR PRADESH	13%	5%	-8%	
UTTARAKHAND	8%	-40%	18%	
CHANDIGARH	-16%	79%	268%	Small Control area
HIMACHAL PRADESH	-49%	12%	-7%	
JAMMU & KASHMIR	-69%	-30%	47%	
NR	28%	9%	20%	

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

Generator	Talchar-Kolar Event	Chandrapur Event	Sikkhim Event	Generator	Talchar-Kolar Event	Chandrapur Even	Sikkhim Event
Singrauli TPS	125%	17%	28%	Salal HEP	42%	11%	19%
Rihand-1 TPS	129%	-8%	41%	Tanakpur HEP	-2%	8%	9%
Rihand-2 TPS	57%	3%	38%	Uri-1 HEP	0%	2%	-3%
Rihand-3 TPS	25%	20%	18%	Uri-2 HEP	0%	0%	0%
Dadri-1 TPS	154%	4%	19%	Dhauliganga HEP	0%	39%	20%
Dadri -2 TPS	230%	14%	102%	Dulhasti HEP	167%	114%	50%
Unchahar TPS	0%	0%	0%	Sewa-II HEP	182%	0%	0%
Unchahar stg-4 TPS	-85%	30%	-7%	Parbati-3 HEP	193%	Suspected SCADA Data	Suspected SCADA Data
Jhajjar TPS	Increase in schedule	78%	114%	Jhakri HEP	171%	67%	Decrease in
Dadri GPS	-33%	0%	-11%	Rampur HEP	Decrease in schedule	243%	410%
Anta GPS	No generation	No generation	No generation	Tehri HEP	No generation	0%	-2%
Auraiya GPS	No generation	No generation	No generation	Koteswar HEP	141%	0%	0%
Narora APS	24%	-19%	16%	Karcham HEP	144%	34%	91%
RAPS-B	-17%	3%	13%	Malana-2 HEP	No generation	No generation	No generation
RAPS-C	13%	2%	16%	Budhil HEP	26%	No generation	No generation
Chamera-1 HEP	4%	3%	2%	Bhakra HEP	3%	1%	0%
Chamera-2 HEP	-5%	0%	52%	Dehar HEP	17%	3%	0%
Chamera-3 HEP	0%	0%	0%	Pong HEP	No generation	No generation	No generation
Bairasiul HEP	No generation	No generation	No generation	Koldam HEP	No generation	No generation	20%
				AD Hydro HEP	No generation	0%	241%

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

Generator	Talchar-Kolar Event	Chandrapur Event	Sikkhim Event	Generator	Talchar-Kolar Event	Chandrapur Event	Sikkhim Event
PUNJAB				**UP**			
Ropar TPS	No generation	No generation	No generation	Obra TPS	39%	14%	14%
L.Mohabbat TPS	131%	-1%	36%	Harduaganj TPS	150%	4%	2%
Rajpura TPS	93%	-12%	47%	Paricha TPS	No generation	No generation	No generation
T.Sabo TPS	278%	16%	0%	Rosa TPS	Suspect SCADA data	-3%	-3%
Goindwal Sahib TPS	245%	25%	43%	Anpara TPS	-4%	-6%	-1%
Ranjit Sagar HEP	25%	18%	7%	Anpara C TPS	0%	-3%	22%
Anandpur Sahib HEP	No generation	No generation	No generation	Anpara D TPS	12%	8%	6%
HARYANA				Bara TPS	52%	6%	1%
Panipat TPS	-19%	10%	0%	Lalitpur TPS	0%	3%	0%
Khedar TPS	No generation	No generation	No generation	Meja TPS	No generation	No generation	No generation
Yamuna Nagar TPS	No generation	No generation	No generation	Vishnuprayag HEP	0%	0%	0%
CLP Jhajjar TPS	11%	7%	2%	Alaknanda HEP	87%	1%	19%
Faridabad GPS	No generation	No generation	No generation	Rihand HEP	No generation	No generation	1%
RAJASTHAN				Obra HEP	No generation	8%	-2%
Kota TPS	59%	-1%	10%	**UTTARAKHAND**			
Suratgarh TPS	153%	0%	-16%	Gamma Infra GPS	11%	13%	42%
Kalisindh TPS	64%	-9%	No generation	Shravanti GPS	-4%	-1%	14%
Chhabra TPS	No generation	No generation	No generation	Ramganga HEP	Suspect SCADA data	Suspected SCADA data	Suspected SCADA data
Chhabra stg-2 TPS	22%	-19%	49%	Chibra HEP	4%	Suspected SCADA	-1%
Kawai TPS	42%	27%	47%	Khodri HEP	No generation	No generation	No generation
Dholpur GPS	No generation	No generation	No generation	Chilla HEP	6%	Suspected SCADA	1%
Mahi-1 HEP	No generation	No generation	No generation	**HP**			
Mahi-2 HEP	No generation	No generation	No generation	Baspa HEP	-11%	-4%	-3%
RPS HEP	No generation	No generation	No generation	Malana HEP	-4%	2%	2%
JS HEP	No generation	No generation	No generation	Sainj HEP	Suspect SCADA data	No generation	No generation
DELHI				Larji HEP	Suspect SCADA data	Suspect SCADA data	Suspect SCADA
Badarpur TPS	No generation	No generation	No generation	Bhabha HEP	54%	21%	8%
Bawana GPS	-11%	0%	34%	Giri HEP	Suspect SCADA data	0%	32%
Pragati GPS	-11%	-8%	-4%	**J&K**			
				Baglihar-1&2 HEP	-5%	0%	3%
				Lower Jhelum HEP	No generation	No generation	No generation

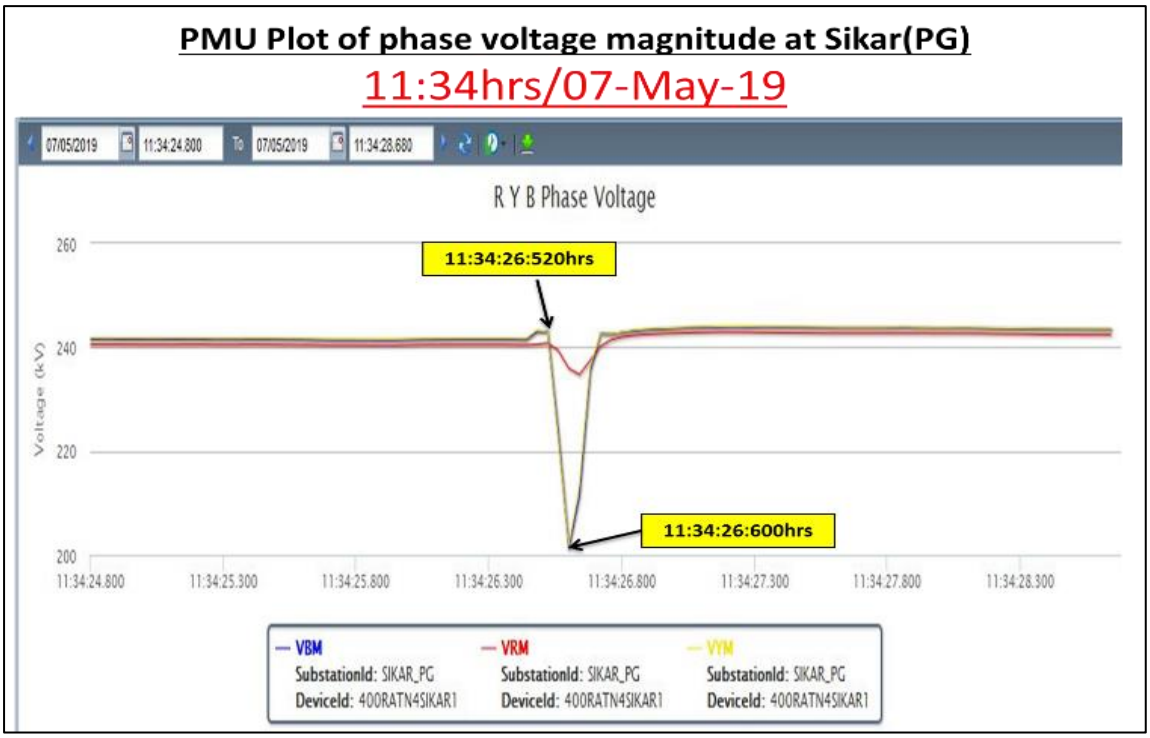
In line with the decisions taken during various OCC meetings, the time and date of the FRC events were e-mailed to respective utilities. Constituents may submit the FRC of their control areas for both the events and reason of poor response, if observed.

10. Loss of Rajasthan Solar power for short duration:

On 07.05.2019, at 11:34hrs, 400kV Bikaner-Bhadla ckt-2 tripped on R-Y phase to phase fault. PMU plot and SCADA solar (Rajasthan area) plot at time of tripping is shown below:

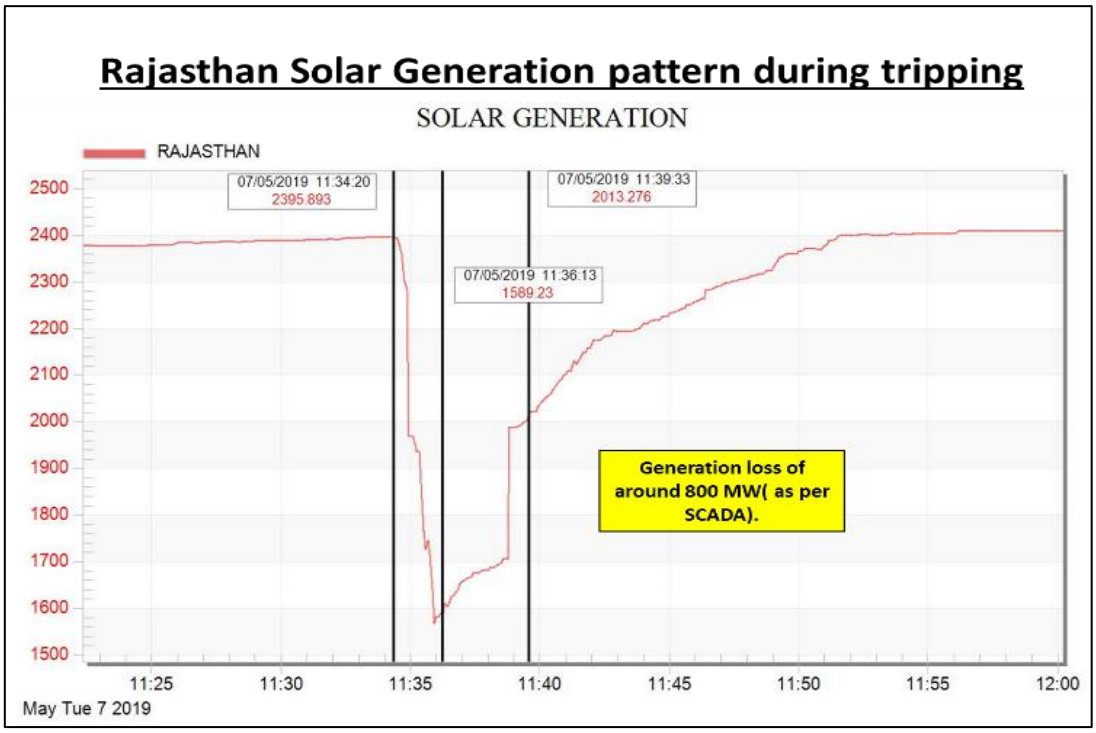
PMU Plot of phase voltage magnitude at Sikar(PG)

11:34hrs/07-May-19



PMU Plot of frequency at Bassi(PG)

11:34hrs/07-May-19



400kV Bikaner-Sikar D/C also tripped along with above. From PMU plot, it could be observed that fault cleared within 100ms but at the same time solar generation loss of around 800MW occurred in Rajasthan. It recovered partially after ~5 minutes whereas full recovery occurred after ~15 minutes of tripping.

As per the following Rajasthan report, no loss of generation occurred.

Preliminary Report

Date & Time of event: - : 07.05.2019 /11.35
Introduction of Event: - : 400 KV Bikaner- Bhadla II
Total Loss of Generation : NA
Total Loss of Load: - : NA
Weather :

Triggering Incident:-

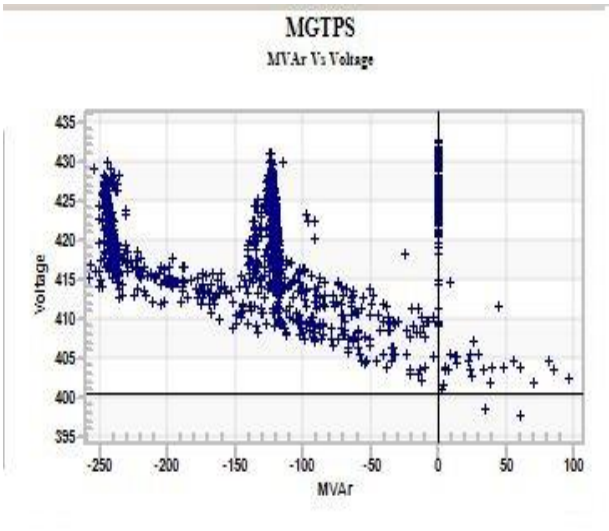
Sr. NO.	NAME OF ELEMENT	TRIPPING DATE	TRIPPING TIME	CLOSING DATE	CLOSING TIME	INDICATION	REMARKS
1	400 KV Bikaner-Bhadla II	07.05.2019	11.35	07.05.2019	14.50	Bikaner- R &Y Ph , Z1, 6.66Km	

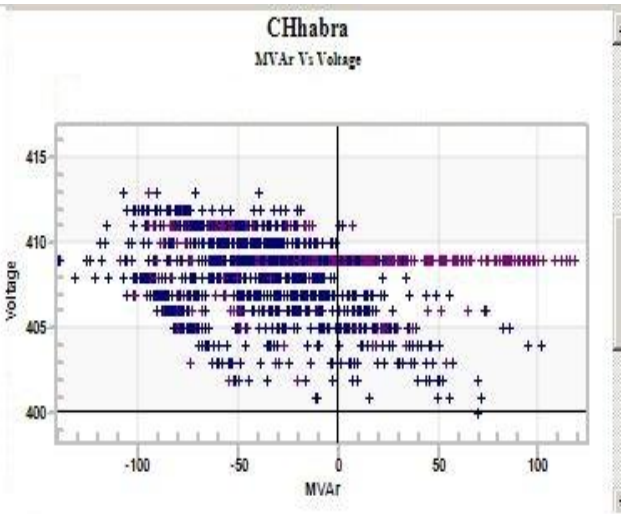
Executive Engineer-II(SOLD)
RVPN, Jaipur

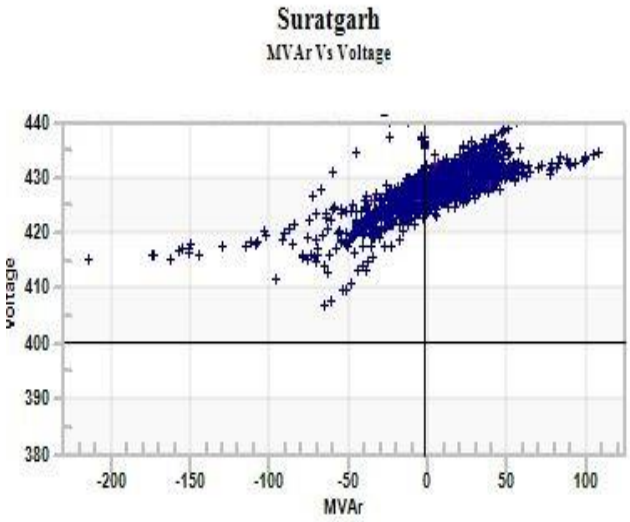
Rajasthan shall confirm any solar generation loss especially near Bhadla area. In case of loss, reason for same and status of LVRT compliance of solar generators in line with CEA standards, shall also be ascertained and provided.

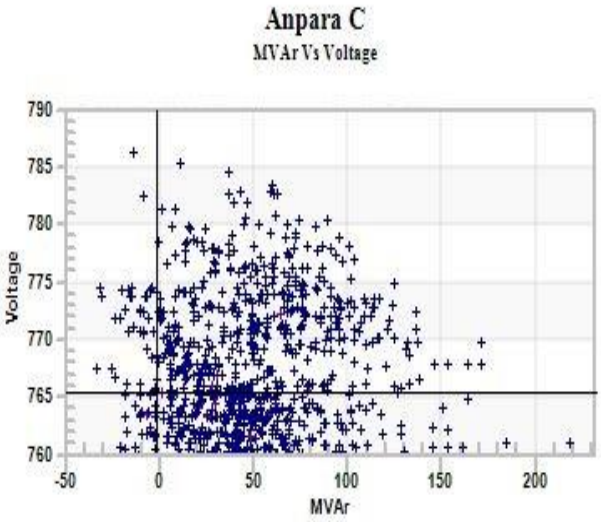
Members may discuss.

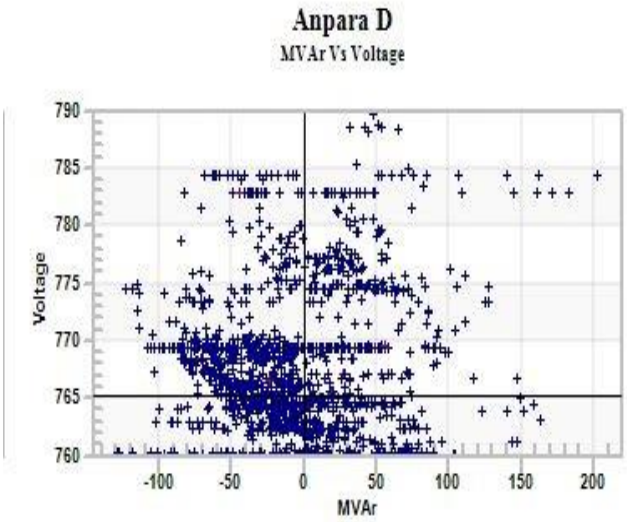
Annexure-1

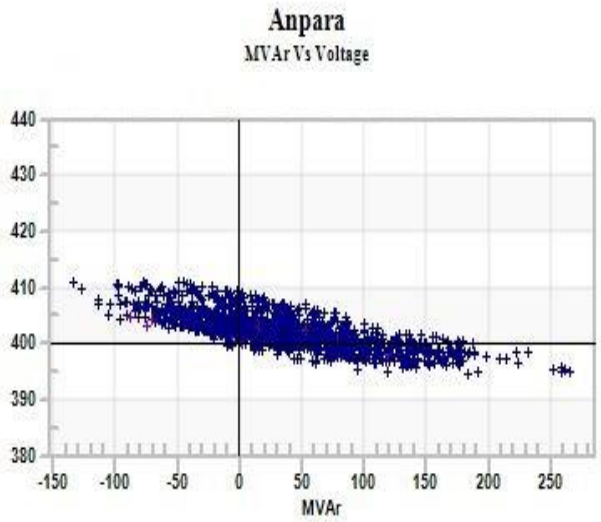

MGTPS
MVAr Vs Voltage
Voltage
MVAr


CHhabra
MVAr Vs Voltage
Voltage
MVAr


Suratgarh
MVAr Vs Voltage
voltage
MVAr

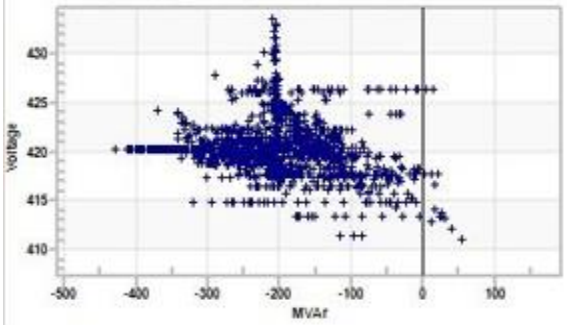

Anpara C
MVAr Vs Voltage
Voltage
MVAr


Anpara D
MVAr Vs Voltage
Voltage
MVAr


Anpara
MVAr Vs Voltage
MVAr

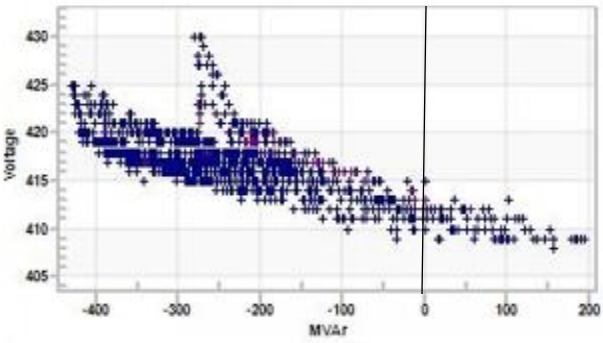
Rajpura

MVAr Vs Voltage



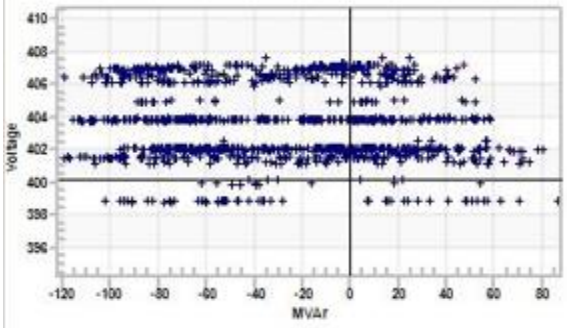
Tahwandi Saboo

MVAr Vs Voltage



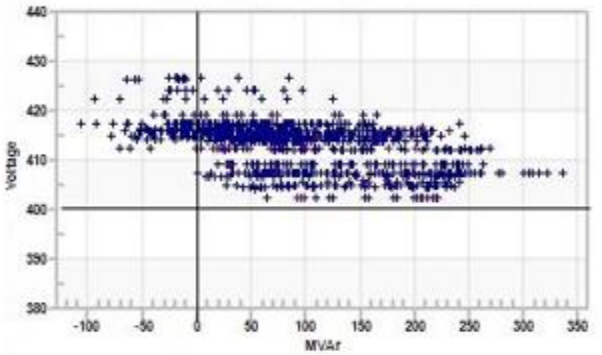
Kalisindh

MVAr Vs Voltage



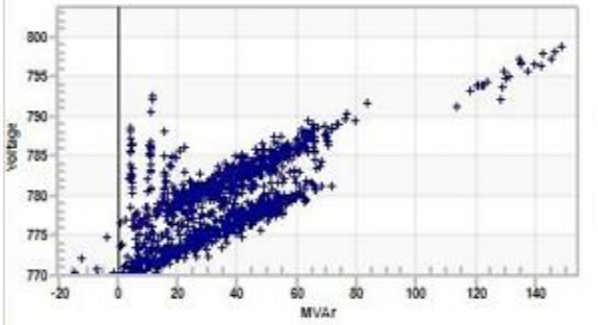
Rosa

MVAr Vs Voltage



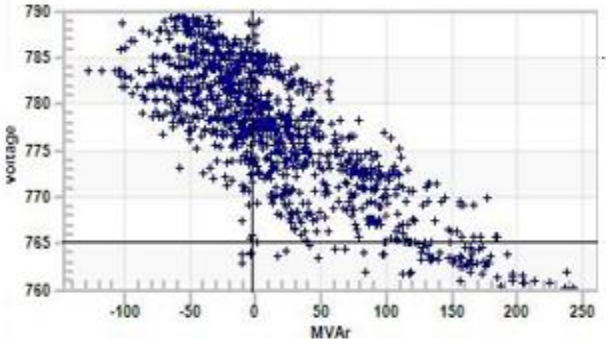
Bara

MVAr Vs Voltage



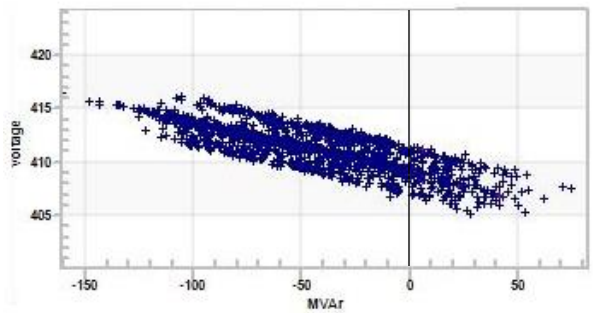
Lalitpur

MVAr Vs Voltage



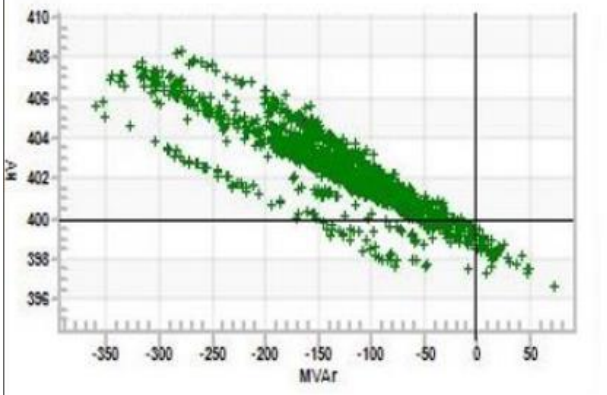
Kawai

MVAr Vs Voltage



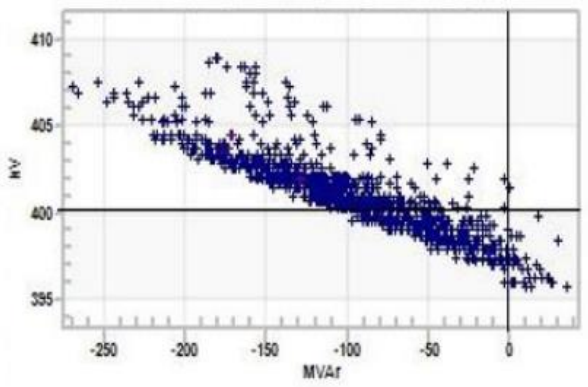
Rihand

MVAr Vs Voltage



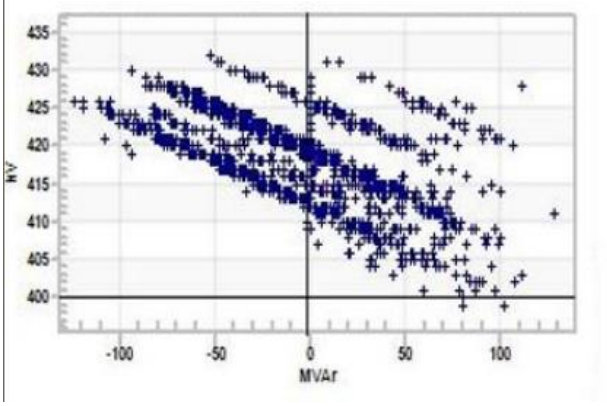
Singrauli

MVAr Vs Voltage



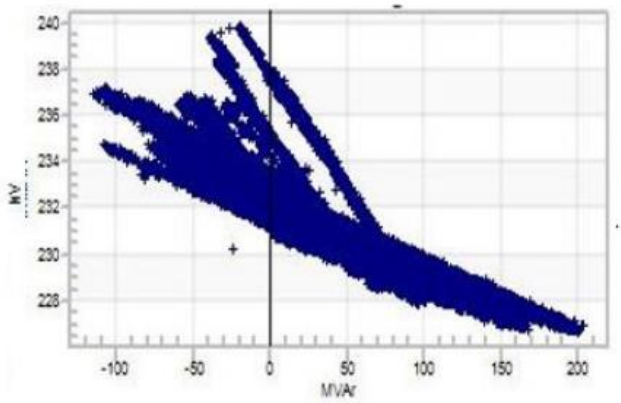
Jhajjar

MVAr Vs Voltage



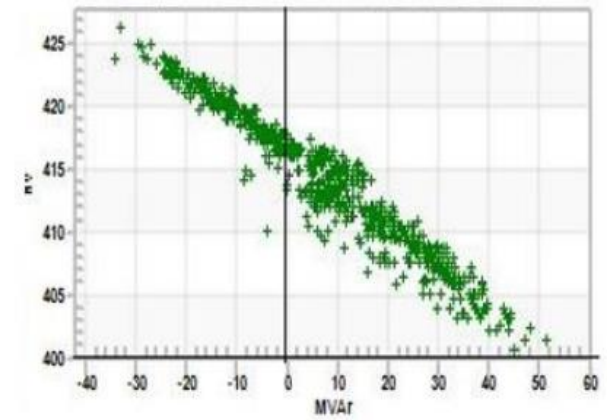
Dadri (4*210)

MVAr Vs Voltage



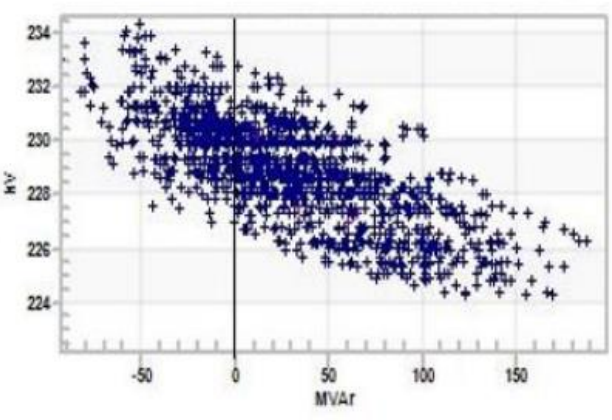
Dadri (2*490)

MVAr Vs Voltage



Unchahar

MVAr Vs Voltage



Annexure-2

Generation Projection (July2019 - Sep 2019)

				Generation declared Commercial from 1st Oct'18 to 31st Mar'19					Generation declared/expected to be declared Commercial from 1st Apr'19 to 30th June'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	9508						Meja	1	660	432	432	9940			9940
2	Delhi	NR	1401											1401	As data given by Delhi	1092	1092
3	Haryana	NR	2750											2750			2750
4	Uttarakhand	NR	1004											1004			1004
5	Punjab	NR	6139											6139			6139
6	Rajasthan	NR	7968						Chhabra SCTPP	6	660	432	432	8400			8400
7	Himachal Pradesh	NR	1051											1051	As data given by H.P.	909	909
8	Jammu & Kashmir	NR	1063											1063			1063
9	BBMB	NR	2457											2457	As per data given by BBMB	2469	2469
10	Chandigarh	NR	0											0			0
11	Railways	NR	0											0			0
12	Dadri Thermal	NR	1717											1717	As per data given by NTPC	500	500
13	Rihand	NR	2919											2919		2807	2807
14	Singrauli	NR	1777											1777		1863	1863
15	Unchahar	NR	969											969		1400	1400
16	Auraiya	NR	313											313		150	150
17	Dadri CCPP	NR	662											662		300	300
18	NAPS	NR	368											368	As per data given by NAPS	440	440
19	Jhajjar	NR	1434											1434	As per data given by Jhajjar	1414	1414
20	DHAULIGANGA	NR	292											292	As per NHPC	280	280
21	Tanakpur	NR	99											99		97	97
22	Koteshwar	NR	407											407			407
23	Tehri	NR	1024											1024			1024
24	Anta	NR	257											257	As per data given by NTPC	150	150
25	RAAP B	NR	379											379			379
26	RAPP C	NR	440											440			440
27	AD Hydro	NR	242											242			242
28	Everest	NR	105											105			105

Generation Projection (July2019 - Sep 2019)

				Generation declared Commercial from 1st Oct'18 to 31st Mar'19					Generation declared/expected to be declared Commercial from 1st Apr'19 to 30th June'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	1172											1172			1172
30	Bairasul	NR	180											180		120	120
31	Chamera 1	NR	554											554	As per NHPC	540	540
32	Chamera 2	NR	309											309		304	304
33	Chamera 3	NR	251											251		231	231
34	Naptha Jhakri	NR	1635											1635	As per data given by SJVN	1605	1605
35	Lanco Budhil	NR	75											75			75
36	DULHASTI	NR	414											414		390	390
37	Salal	NR	713											713		690	690
38	Sewa-II	NR	133											133	As per NHPC	129	129
39	URI 1 HPS	NR	512											512		480	480
40	URI II HPS	NR	243											243		240	240
41	Sree Cement	NR	251											251			251
42	Parbati III	NR	528											528	As per NHPC	520	520
43	Rampur HEP	NR	459											459	As per data given by SJVN	442	442
44	KOLDAM	NR	876											876		792	792
	Rosa Power	NR															0
	Kishanganga	NR	224											224	As per NHPC	330	330
	Sainj HEP	NR	134											134			134
	TOTAL		55408										864	56272			54211

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 (July2019 - Sep 2019)

										1	2	3	4		
	2016-17			2017-18			2018-19								
	Jul-16	Aug-16	Sep-16	Jul-17	Aug-17	Sep-17	Jul-18	Aug-18	Sep-18	2015-16 Average	2016-17Average	2017-18 Average	Projected Demand for (July2019 - Sep 2019) before normalization	Data given by DICs	Comments
Chandigarh	358	350	313	363	335	287	368	338	293	340	328	333	327		
Delhi	6,261	5,707	5,301	6,121	6,129	5,661	7,016	5,937	5,358	5,756	5,970	6,104	6,291	6295	As data given by Delhi
Haryana	9,262	8,984	9,109	9,539	9,501	8,932	10,270	9,415	9,008	9,118	9,324	9,564	9,782		
Himachal Pradesh	1,297	1,293	1,329	1,346	1,369	1,413	1,471	1,479	1,466	1,306	1,376	1,472	1,550	1478	As data given by HP
Jammu & Kashmir	1,950	2,008	1,975	2,114	2,137	2,163	2,113	2,276	2,361	1,978	2,138	2,250	2,394		
Punjab	11,408	11,204	10,543	11,705	11,074	9,939	12,638	12,012	11,405	11,052	10,906	12,018	12,292		
Rajasthan	9,168	7,807	9,816	9,795	10,293	9,900	11,057	11,354	10,612	8,930	9,996	11,008	12,055		
Uttar Pradesh	15,154	14,690	15,457	17,394	17,719	17,902	19,353	19,086	18,121	15,100	17,672	18,853	20,961		
Uttarakhand	1,907	1,888	1,942	1,971	1,987	2,033	2,143	2,096	1,996	1,912	1,997	2,078	2,162		

Notes

1. Projections are based on the past 3 years' monthly Peak Demand Met data available on the website of CEA
2. The above projections are being done for financial year 2019-2020 (Q2) i.e July 2019- Sep 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-07.pdf
http://www.cea.nic.in/reports/monthly/powersupply/2018/psp_peak-08.pdf
http://www.cea.nic.in/reports/monthly/powersupply/2018/psp_peak-09.pdf
http://www.cea.nic.in/reports/monthly/powersupply/2017/psp_peak-07.pdf
http://www.cea.nic.in/reports/monthly/powersupply/2017/psp_peak-08.pdf
http://www.cea.nic.in/reports/monthly/powersupply/2017/psp_peak-09.pdf
http://www.cea.nic.in/reports/monthly/powersupply/2016/psp_peak-07.pdf
http://www.cea.nic.in/reports/monthly/powersupply/2016/psp_peak-08.pdf
http://www.cea.nic.in/reports/monthly/powersupply/2016/psp_peak-09.pdf

Annexure-3

S.No	Station	Location	Owner	Unit No	Capacity (MW)
1	Bairasiul HPS	HP	NHPC	3	60
2	Bairasiul HPS	HP	NHPC	2	60
3	Bairasiul HPS	HP	NHPC	1	60
4	Dehar HPS	HP	BBMB	2	165
5	Dehar HPS	HP	BBMB	1	165
6	Pong HPS	HP	BBMB	2	66
7	Bhakra-L HPS	HP	BBMB	3	108
8	Bhakra-L HPS	HP	BBMB	4	108
9	Koteshwar HPS	UTTRAKHAND	THDC	1	100
10	Pong HPS	HP	BBMB	3	66
11	Kishanganga HEP	JK	NHPC	3	110
12	Kishanganga HEP	JK	NHPC	2	110
					1178

Annexure-3

Reason(s)	Outage Date	Expected Revival Date
For renovation and Modernisation of the plant	15/10/2018	06-05-2019
For renovation and Modernisation of the plant	15/10/2018	31/08/2019
For renovation and Modernisation of the plant	15/10/2018	06-05-2019
Capital Maintenance	28/01/2019	05-09-2019
Capital Maintenance	28/01/2019	05-09-2019
Renovation and Modernization.	14/02/2019	31/05/2019
Renovation and Modernisation of unit(capacity enhancement from 108 to 126 MW)	04-01-2019	12-09-2019
Runner modification and Annual Maintenance.	04-04-2019	31/05/2019
Annual maintenance. .	04-09-2019	05-09-2019
Annual maintenance.	04-09-2019	05-09-2019
Problem in cooling water system	23/04/2019	*
Problem in cooling water system	26/04/2019	*

Annexure-4

S. NO.	Element Name	Outage Date	Outage Time
1	400kV Aligarh(UP)-Panki(UP)	2-Apr-19	13.07
		5-Apr-19	15.43
		12-Apr-19	15.40
		13-Apr-19	10.12
		14-Apr-19	10.21
		30-Apr-19	13.14
2	400kV Aligarh(UP)-Mainpuri 765(UP) ckt-1	11-Apr-19	14.04
		13-Apr-19	10.57
		14-Apr-19	11.21
		24-Apr-19	13.49
		25-Apr-19	12.43
3	220kV Kishenpur(PG)-Ramban(JK)	6-Apr-19	15.37
		16-Apr-19	0.13
		24-Apr-19	0.24
		25-Apr-19	21.39
		29-Apr-19	15.15
4	315MVA ICT 1 at 400/220 kV Bassi(PG)	16-Apr-19	22.32
		17-Apr-19	2.12
		17-Apr-19	4.25
		18-Apr-19	2.45
5	400kV Gorakhpur(PG)-Motihari(DMTCL) ckt-1	6-Apr-19	21.29
		8-Apr-19	11.12
		8-Apr-19	12.12
		13-Apr-19	11.51
6	220kV Tanakpur(NHPC)-Sitarganj(PG)	2-Apr-19	9.33
		2-Apr-19	12.38
		26-Apr-19	20.09
		28-Apr-19	14.12
7	400kV Agra(UP)-Unnao(UP)	6-Apr-19	14.25
		8-Apr-19	3.54
		26-Apr-19	14.01

S. NO.	Element Name	Outage Date	Outage Time
8	315MVA ICT 2 400/220 kV Akal(RRVPNL)	15-Apr-19	4.15
		16-Apr-19	20.16
		24-Apr-19	3.38
9	400kV Akal(RRVPNL)-Kankani(RRVPNL) ckt-1	2-Apr-19	14.43
		4-Apr-19	13.55
		8-Apr-19	17.30
10	400kV Anpara(UP)-Sarnath(UP) ckt-2	9-Apr-19	10.24
		10-Apr-19	13.10
		19-Apr-19	13.41
11	400kV Bhilwara(RRVPNL)-Chittorgarh(RRVPNL) ckt-1	4-Apr-19	13.38
		5-Apr-19	19.33
		16-Apr-19	15.45
12	400kV Bhilwara(RRVPNL)-Chittorgarh(RRVPNL) ckt-2	10-Apr-19	16.50
		16-Apr-19	13.45
		16-Apr-19	18.28
13	400kV Bhiwani(PG)-Jind(PG) ckt-1	22-Apr-19	11.45
		24-Apr-19	13.02
		27-Apr-19	10.12
14	400kV Dadri(NTPC)-Panipat(BBMB) ckt-1	17-Apr-19	5.29
		21-Apr-19	1.53
		30-Apr-19	14.10
15	765kV Fatehabad 765(UP)-Lalitpur TPS(LPGCL) ckt-1	6-Apr-19	3.21
		28-Apr-19	11.08
		29-Apr-19	12.05
16	400kV G.Noida 765(UP)-Noida sec-148(UP) ckt-1	10-Apr-19	14.20
		10-Apr-19	17.53
		11-Apr-19	13.26
17	400kV Gorakhpur(PG)-Motihari(DMTCL) ckt-2	13-Apr-19	11.35
		14-Apr-19	12.42
		28-Apr-19	11.53
18	132kV Mahendranagar(Nepal)-Tanakpur(NHPC)	1-Apr-19	12.05
		2-Apr-19	9.38
		26-Apr-19	20.09

S. NO.	Element Name	Outage Date	Outage Time
19	315MVA ICT 1 at 400/220 kV Obra TPS(UP)	5-Apr-19	12.28
		7-Apr-19	12.10
		29-Apr-19	14.21
20	400kV Ratangarh(RRVPNL)-Suratgarh(RRVPNL) ckt-2	10-Apr-19	13.21
		11-Apr-19	2.15
		25-Apr-19	0.49
21	500kV HVDC Vindhyachal(PG) BtB Block 1	17-Apr-19	22.15
		20-Apr-19	19.55
		25-Apr-19	10.09

Annexure-4

Reason/Remarks
Tripped on B-N fault, 237Km from Panki(UP) end. As per PMU, Y-N fault occured, no auto-reclosing observed.
85 Lockout relay operated at Panki(UP) end. As per PMU, No fault observed.
B-N fault ,A/R sucessful at Aligarh(UP) end. As per PMU, No fault observed.
B-N fault, 127km from Aligarh(UP) end. As per PMU, B-N fault occured, no auto-reclosing observed.
B-N fault, 150km from Panki(UP) end. As per PMU, B-N fault occured, no auto-reclosing observed.
B-N fault, 65.7km from Panki(UP) end. As per PMU, R-N fault occured, no auto-reclosing observed.
B-N fault. As per PMU, B-N fault and unsuccessful auto-reclosing observed.
B-N fault, 79.9km fom Mainpuri(UP) end. As per PMU, B-N fault and unsuccessful auto-reclosing observed.
B-N fault, 80.2km fom Mainpuri(UP) end. As per PMU, B-N fault and unsuccessful auto-reclosing observed.
Y-N fault, 55.4km fom Mainpuri(UP) end. As per PMU, Y-N fault and unsuccessful auto-reclosing observed.
Y-N fault, 51.28km fom Mainpuri(UP) end. As per PMU, R-Y fault is observed.
R-N fault. As per PMU, No fault observed.
B-N fault, 12.5Km from Ramban(JK) end. As per PMU, B-N fault occured, no auto-reclosing observed.
B-N fault, 54km from Kishenpur(PG) end. As per PMU, B-N fault occured, no auto-reclosing observed.
B-N fault. As per PMU, No fault observed.
B-N fault, 12.31Km from Ramban(JK) end. As per PMU, B-N fault occured, no auto-reclosing observed.
Over fluxing.
Over fluxing.
Over fluxing.
Over fluxing.
B-N fault, 127km from Gorakhpur(PG) end. As per PMU, multiple faults are observed.
Y-N fault, 19km from Motihari(DMTCL) end. As per PMU, B-N fault occured, successful autoreclsoing is observed.
Y-N fault, 19km from Motihari(DMTCL) end. As per PMU, B-N fault occured, successful autoreclsoing is observed.
Y-N fault,163 km from Gorakhpur(PG) end. As per PMU, Y-N fault occured, no auto-reclosing observed.
Reason yet to be known,tripped from Tanakpur(NHPC) end. As per PMU, No fault observed.
Reason yet to be known,tripped from Tanakpur(NHPC) end. As per PMU, voltage dip of 1kV in all three phases is observed.
LBB Operated due to fire in Bus Coupler at Tanakpur(NHPC) end. As per PMU, B-N fault occurred and delayed clearance of 400ms with no auto-reclosing observed.
B-N fault, 23.5 Km from Sitarganj(PG) end. As per PMU, multiple faults are observed.
R-Y-B Fault , 61.8km from Unnao(UP) end. As per PMU, Y-B fault is observed.
Y-N fault, 108.1km from Unnao(UP) end. As per PMU, Y-N fault occured, no auto-reclosing observed.
Y-B fault, 274.76 kms from Agra(UP) end, Auto reclose successful at Unnao(UP) end, Tripped only from Agra(UP) end. As per PMU, Y-N fault occured, successful autoreclsoing is observed.

Annexure-4

Reason/Remarks
Over fluxing.
Over fluxing.
R-N fault, 15.5Km from Kankani(Raj) end. As per PMU, R-N fault occured, no auto-reclosing observed.
B-N fault. As per PMU, B-N fault and unsuccessful auto-reclosing observed.
During testing of 315 MVA ICT-2 at 400kV Akal(Raj), inadvertently Bus bar protection of Bus-1 operated. As per PMU, No fault observed.
R-N fault. As per PMU, No fault observed.
B-N fault. As per PMU, B-N fault occured, no auto-reclosing observed.
Fire accident and Ict burned at sarnath. As per PMU, multiple faults are observed.
B-N fault, 27.03km from Bhilwara(Raj) end. As per PMU, B-N fault and unsuccessful auto-reclosing observed.
DT received Bhilwara(Raj) end. As per PMU, No fault observed.
Inclement weather. As per PMU, No fault observed.
DT received at Chittorgarh(Raj) end. As per PMU, No fault observed.
B-N fault, t35.17 Km from Bhilwara(Raj) end. As per PMU, No fault observed.
Inclement weather. As per PMU, No fault observed.
B-N fault, 47 km from Bhiwani(PG) end. As per PMU, B-N fault and unsuccessful auto-reclosing observed.
B-N fault, 52.01km from Jind(PG) end. As per PMU, B-N fault and unsuccessful auto-reclosing observed.
B-N fault, 36.36km from Jind(PG) end. As per PMU, B-N fault and unsuccessful auto-reclosing observed.
R-N fault, 73km from Panipat(BBMB) end.
B-N fault. As per PMU, R-N fault occured, no auto-reclosing observed.
Y-N fault, 33.79km from Panipat(BBMB) end. As per PMU, Y-N fault and unsuccessful auto-reclosing observed.
DT received from Fatehabad during charging of 765 KV Lalitpur-Fatehabad ckt-2. As per PMU, No fault observed.
R-N Fault, 281.90km from Fatehabad(UP) end. As per PMU, R-N fault and unsuccessful auto-reclosing observed.
R-N fault. As per PMU, R-N fault and unsuccessful auto-reclosing observed.
B-N fault, 11.8Km from G.Noida(UP) end. As per PMU, B-N fault occured, no auto-reclosing observed.
Bus bar operated at Noida Sector 148(UP) end. As per PMU, No fault observed.
B-N fault. As per PMU, B-N fault occured, no auto-reclosing observed.
Y-N fault, 22km from Motihari(DMTCL) end. As per PMU, multiple faults are observed.
B-N fault, 180.3km from Gorakhpur(PG) end. As per PMU, B-N fault and unsuccessful auto-reclosing observed.
B-N fault, 189.9km from Gorakhpur(PG) end. As per PMU, B-N fault and unsuccessful auto-reclosing observed.
Over current. As per PMU, No fault observed.
Reason yet to be known,tripped from Tanakpur(NHPC) end. As per PMU, No fault observed.
LBB Operated due to fire in Bus Coupler at Tanakpur(NHPC) end. As per PMU, B-N fault occurred and delayed clearance of 400ms with no auto-reclosing observed.

Annexure-4

Reason/Remarks
Directional Earth fault. As per PMU, R-B fault occurred and delayed clearance of 600ms is observed.
Restricted Earth fault. As per PMU, R-N fault is observed.
Operation of LBB protection of breaker of unit-09.
B-N fault. As per PMU, No fault observed.
B-N fault, 88.2 km from Suratgarh(Raj) end. As per PMU, Y-N fault occured, no auto-reclosing observed.
B-N fault, 45.19km from Ratangarh(Raj) end. As per PMU, Y-N fault occured, no auto-reclosing observed.
DC OVERCURRENT Protection.
DC OVERCURRENT Protection.
DC OVERCURRENT Protection.

Annex-5

S. No.	Name of Elements (Tripped/Manually opened)	Owner/ Agency	Outage		Revival		Event *(As reported)*	Generation Loss(MW)	Load Loss(MW)	Category as per CEA Grid Standards	Energy Unserved (in MU)	Preliminary Report receipt status			DR/EL receipt status			Detailed Report receipt status		Fault Clearance time (in ms)
			Date	Time	Date	Time						within 24hrs	after 24hrs	Not Received	within 24hrs	after 24hrs	Not Received	Received	Not Received	
1	1) 220kV Bawana(DTL)-Kanjhawala(DTL) ckt-1 2) 315 MVA ICT 2 at 400/220kV Bawana(DTL) 3) 315 MVA ICT 4 at 400/220kV Bawana(DTL) 4) 315 MVA ICT 6 at 400/220kV Bawana(DTL)	Delhi	4-Apr-19	12:04	4-Apr-19	12.56	220kV Bawana(DTL)-Kanjhawala(DTL) ckt-1 tripped due to 3-Ph fault and 315 MVA ICT 2, 315 MVA ICT 4 and 315 MVA ICT 6 at 400/220kV Bawana(DTL) tripped due to operation of bus bar protection on 220kV Bus II at 400/220kV Bawana(DTL). As per PMU, R-B fault followed by 3-phase fault is observed in the system. In antecedent conditions, 315 MVA ICT 2 and 315 MVA ICT 4 at 400/220kV Bawana(DTL) carrying 113 MW each.	17	200	GD-1	0.17	Y(Delhi)			Y(Delhi)			Y(Delhi)		1200ms
2	1) 765KV Lalitpur(UP)-Fatehabad(UP) ckt-1 2) 660 MW Unit#1 at 765kV Lalitpur TPS(LPGCL) 3) 660 MW Unit#3 at 765kV Lalitpur TPS(LPGCL) 4) 220kV Lalitpur TPS(UP)-Lalitpur(UP) ckt-1 5) 220kV Lalitpur TPS(UP)-Lalitpur(UP) ckt-2 6) 220kV Lalitpur TPS(UP)-Jhansi(UP) ckt-1 7) 220kV Lalitpur TPS(UP)-Jhansi(UP) ckt-2	UP	6-Apr-19	3:21	6-Apr-19	3.56	765KV Lalitpur(UP)-Fatehabad(UP) ckt-2 tripped on Y-B fault at 0132 Hrs. After charging the circuit from Fatehabad(UP) end(LPGCL end breaker was open), 765KV Lalitpur(UP)-Fatehabad(UP) ckt-1 tripped on DT received from Fatehabad(UP) end(overvoltage at Fatehabad(UP) end). Due to SPS operation 220KV lines Jhansi D/C and Lalitpur D/C tripped and Unit#1 & #3 tripped on Eco inlet flow low. As per PMU, No fault is observed in the system. In antecedent conditions, Unit#1 & #3 carrying 362 MW & 368 MW respectively.	700		GD-1		Y(UP)			Y(UP)			Y(UP)		NA(overvoltage)
3	1) 400 kV Bus 1 at 400/220kV Gurgaon(PG) 2) 400kV Ballabgarh(PG)-Gurgaon(PG) 3) 400kV Gurgaon(PG)-Manesar(PG) ckt-1 4) 400kV Daultabad(HVPNL)-Gurgaon(PG) ckt-1 5) 315 MVA ICT 1 at 400/220kV Gurgaon(PG)	POWERGRID & Haryana	6-Apr-19	18:39	6-Apr-19	20.58	400kV Bus 1 at 400/220kV Gurgaon(PG) tripped due to operation of Bus bar protection leading to tripping of all associated elements of 400kV Bus 1. As per PMU, no fault is observed in the system. In antecedent conditions, 315 MVA ICT 1 carrying 89 MW.			GI-2				Y(Har), Y(PG)			Y(Har), Y(PG)		Y(PG)	NA
4	1) 400kV Kala Amb(PKATL)-Karchamwangtoo(JSW) ckt-1 2) 400kV Kala Amb(PKATL)-Karchamwangtoo(JSW) ckt-2	PKATL, JSW & POWERGRID	8-Apr-19	8:59	8-Apr-19	9.53	400kV Kala Amb(PKATL)-Karchamwangtoo(JSW) ckt-1 & 2 tripped on RYB fault at 166.6km & 153.2km respectively from Kala Amb S/S. As per PMU, three phase fault is observed. In antecedent conditions, 400kV Kala Amb(PKATL)-Karchamwangtoo(JSW) ckt-1 & 2 carrying 166 MW each.			GI-2		Y(PG)	Y(JSW)	Y(PKATL)	Y(PG)	Y(JSW)	Y(PKATL)	Y(PG)		80ms
5	1) 400kV Bus 1 at 400/220kV Akal(Raj) 2) 315 MVA ICT 1 at 400/220kV Akal(Raj) 3) 50 MVAR (400KV) B/R at 400/220kV Akal(Raj) 4) 400kV Akal(Raj)-Kankani(Raj) ckt-1	Rajasthan	8-Apr-19	17:30	8-Apr-19	19.21	Bus bar protection of 400kV Bus 1 at 400/220kV Akal(Raj) operated inadvertently during testing of 315 MVA ICT-2 leading to tripping 315 MVA ICT 1, 50 MVAR (400KV) B/R and 400kV Akal(Raj)-Kankani(Raj) ckt-1. As per PMU, No fault is observed in the system. In antecedent conditions, 400kV Akal(RRVPNL)-Kankani(RRVPNL) ckt-1 carrying 64 MW.			GI-2			Y(Raj)				Y(Raj)		Y(Raj)	NA
6	1) 315 MVA ICT-1 at 400/220kV Muradnagar(UP) 2) 500 MVA ICT-2 at 400/220kV Muradnagar(UP) 3) 220kV Muradanagar(UP)-Loni(UP) 4) 220 KV Muradnagar(UP)-Faridnagar(UP) 5) 220 KV Muradnagar400(UP)-Muradnagar220(UP) ckt-1 6) 132kV elements at 220/132kV Muradnagar(UP)	UP	10-Apr-19	10:45	10-Apr-19	12.19	315 MVA ICT 1, 500 MVA ICT-2 of Muradnagar, 220kV Muradanagar-Loni, 220 KV Muradnagar-Faridnagar, 220 KV Muradnagar400(UP)-Muradnagar220(UP) ckt-1 and 132kV elements at 220/132kV Muradnagar(UP)elements tripped on R-N fault. As per PMU, R-N fault followed by Y-N fault with delayed clearance is observed in the system.In antecedent conditions, 315 MVA ICT 1, 500 MVA ICT-2 carrying 79 MW & 123 MW respectively.		500	GD-1	0.80		Y(UP)			Y(UP)			Y(UP)	1080ms
7	1) 400kV G.Noida 765(UP)-Noida sec-148(UP) ckt 1 2) 400kV G.Noida 765(UP)-Noida sec-148(UP) ckt 2 3) 400kV Bus 1 at 400/220kV Noida sec-148(UP) 4) 400kV Bus 2 at 400/220kV Noida sec-148(UP) 5) 500MVA ICT 1 at 400/220kV Noida sec-148(UP)	UP	10-Apr-19	17:53	10-Apr-19	19.10	400kV G.Noida 765(UP)-Noida sec-148(UP) ckt 1 & 2 tripped due to operation of Bus bar protection at 400/220kV Noida sec-148(UP). As per PMU, No fault is observed in the system. In antecedent conditions, 400kV G.Noida 765(UP)-Noida sec-148(UP) ckt 1 carrying 196 MW.			GI-2				Y(UP)			Y(UP)		Y(UP)	NA
8	1) 400kV Anta(Raj)-Chabra(Raj) ckt-1 2) 400kV Anta(Raj)-Chabra(Raj) ckt-2 3) 400kV Anta(Raj)-Kawai(Adani) ckt-1	Rajasthan & Adani	16-Apr-19	16:54	16-Apr-19	17.32	400kV Anta(Raj)-Kawai(Adani) ckt-1 tripped on B-N fault, 50km from Kawai(Adani) end. At the same time, 400kV Anta(Raj)-Chabra(Raj) ckt-1 & 2 also tripped on phase to earth fault. As per PMU, B-N fault with unsuccessful autoreclosing is observed.			GI-2				Y(Raj), Y(Adani)			Y(Raj), Y(Adani)		Y(Raj)	80ms
9	1) 220kV RAPP B(NPCIL)-Chittorgarh(Raj)(PG) ckt-1 2) 220kV RAPP B(NPCIL)-Chittorgarh(Raj)(PG) ckt-2 3) 220kV RAPP B(NPCIL)-Kota(Raj)	Rajasthan, NPCIL and POWERGRID	16-Apr-19	18:27	16-Apr-19	18.35	220kV RAPP B(NPCIL)-Chittorgarh(Raj)(PG) ckt-1 & 2 tripped on R-N fault at a distance 223km & 211km respectively from RAPP-B end. At the same time, 220kV RAPP B(NPCIL)-Kota(Raj) also tripped (Showing fault distance 308km) from Kota end. 220kV RAPP B(NPCIL)-Debari(Raj) was already under shutdown. As per PMU, R-N fault with delayed clearance is observed. In antecedent conditions, 220kV RAPP B(NPCIL)-Chittorgarh(Raj)(PG) ckt-1 and 220kV RAPP B(NPCIL)-Kota(Raj) carrying 94 MW and 88 MW respectively.			GI-2			Y(NPCIL)	Y(Raj), Y(PG)		Y(NPCIL)	Y(Raj), Y(PG)		Y(PG), Y(Raj)	360ms
10	1) 765KV Lalitpur(UP)-Fatehabad(UP) ckt-2 2) 660 MW Unit#1 at 765kV Lalitpur TPS(LPGCL) 3) 765 kV Bus 1 at 765kV Lalitpur TPS(LPGCL) 4) 765 kV Bus 2 at 765kV Lalitpur TPS(LPGCL) 5) 315 MVA ICT 1 at 765kV Lalitpur TPS(LPGCL) 6) 315 MVA ICT 2 at 765kV Lalitpur TPS(LPGCL) 7) 220kV Lalitpur TPS(UP)-Lalitpur(UP) ckt-1 8) 220kV Lalitpur TPS(UP)-Lalitpur(UP) ckt-2 9) 220kV Lalitpur TPS(UP)-Jhansi(UP) ckt-1 10) 220kV Lalitpur TPS(UP)-Jhansi(UP) ckt-2	UP	16-Apr-19	20:27	16-Apr-19	22.34	765KV Lalitpur(UP)-Fatehabad(UP) ckt-1 was open on high voltage and 765KV Lalitpur(UP)-Fatehabad(UP) ckt-2 tripped on Y-B fault at 140km from Lalitpur TPS(LPGCL) end. Due to SPS operation 220KV lines Jhansi D/C and Lalitpur D/C tripped and Unit#1 tripped on Eco inlet flow low. As per PMU, Y-B fault is observed in the system. In antecedent conditions, Unit#1 generating 360 MW.	360		GD-1		Y(UP)				Y(UP)		Y(UP)		80ms
11	1) 400kV Hapur 765(UP)-Muradnagar(UP) 2) 400kV Ataur(UP)-Muradnagar(UP)	UP	18-Apr-19	4:30	18-Apr-19	5.26	400kV Hapur 765(UP)-Muradnagar(UP) tripped on B-N fault. At the same time, 400kV Ataur(UP)-Muradnagar(UP) tripped on B-N fault, 0.0967km from Muradnagar(UP) end (Pole discrepancy, tripped only at Muradnagar end). As per PMU, B-N fault is observed in the system. In antecedent conditions, 400kV Hapur 765(UP)-Muradnagar(UP) and 400kV Ataur(UP)-Muradnagar(UP) carrying 89 MW and 23 MW respectively.			GI-2				Y(UP)			Y(UP)		Y(UP)	80ms
12	1) 400 kV Bus 1 at 400/220kV Sarnath(UP) 2) 400 kV Bus 2 at 400/220kV Sarnath(UP) 3) 400kV Sarnath(UP)-Varanasi(PG) ckt-1 4) 400kV Sarnath(UP)-Varanasi(PG) ckt-2 5) 400kV Sarnath(UP)-Anpara(UP) ckt-1 6) 400kV Sarnath(UP)-Anpara(UP) ckt-2 7) 400kV Anpara(UP)-Mau(UP) 8) 500 MVA ICT 1 at 400kV Sarnath(UP) 9) 500 MVA ICT 2 at 400kV Sarnath(UP) 10) 315 MVA ICT 1 at 400kV Sarnath(UP) 11) 400kV Azamgarh(UP)-Sarnath(UP)	UP	19-Apr-19	13:41	19-Apr-19	14.47	A fire accident occurred on newly commissioned 500MVA ICT 1 at 400kV Sarnath(UP) which caused the operation of Bus Bar protection at 400kV Sarnath(UP), all the 400kV lines emanating from Sarnath(UP) including ICTs tripped. As per PMU, B-N fault followed by R-N fault is observed in the system. In antecedent conditions, 500 MVA ICT 1 & 2 carrying 114 MW & 118 MW respectively.		250	GD-1	0.28		Y(UP)			Y(UP)			Y(UP)	80ms
13	1) 220kV Dhauliganga(NHPC)-Pithorgarh(PG) 2) 220kV Bareilly(UP)-Dhauliganga(NHPC)	NHPC, UP and POWERGRID	21-Apr-19	0:15	21-Apr-19	0.59	220kV Dhauliganga(NHPC)-Pithorgarh(PG) and 220kV Bareilly(UP)-Dhauliganga(NHPC) tripped due to mal operation in control circuit at Dhauliganga(NHPC) end. As per PMU, No fault is observed in the system. In antecedent conditions, Unit#1 and Unit#3 generating 70 MW each.	140		GD-1				Y(UP), Y(NHPC), Y(PG)			Y(UP), Y(NHPC), Y(PG)		Y(NHPC)	NA

Annex-5

S. No.	Name of Elements (Tripped/Manually opened)	Owner/ Agency	Outage		Revival		Event *(As reported)*	Generation Loss(MW)	Load Loss(MW)	Category as per CEA Grid Standards	Energy Unserved (in MU)	Preliminary Report receipt status			DR/EL receipt status			Detailed Report receipt status		Fault Clearance time (in ms)
			Date	Time	Date	Time						within 24hrs	after 24hrs	Not Received	within 24hrs	after 24hrs	Not Received	Received	Not Received	
14	1) 220 kV Bus I & II at Khetri 2) 220 kV Khetri- Ratanar ckt-1 & 2 3) 220 kV Khetri- Babi ckt-1 & 2 4) 220 kV Khetri- Dari(BBMB) ckt-1 & 2 5) 220 kV Khetri- Chirava 6) 220 kV Khetri- Jhunjhunu 7) 220 kV Khetri- Behrr and 50/35/35 MVA ICT –I, II & III at Khetri 8) 220 KV Bus-I at Dadri (BBMB) 9) 220 kV Dadri (BBMB) - Mahendergarh 10) 220 kV Dadri (BBMB) - Bhiwanckt-1 & 311) 220 kV Dadri (BBMB) - Lula Ahir 12) 220 kV Dadri (BBMB) - Samaypu. 13) 100 MVA ICT-I at Dadri (BBMB)	Rajasthan and BBMB	23-Apr-19	21:59	23-Apr-19	23.30	A blast in R-Ph CT of 220 kV Khetri- Jhunjunu line at Khetri occurred. Due to non-clearance of fault both 220 kV bus bar protection at 220kV Khetri(Raj) operated. BBMB informed that Main CB stuck of 220 kV Dadri (BBMB)- Khetri-I line at Dadri(BBMB) end, LBB protection operated at Dadri (BBMB), causing bus bar protection operation of Bus-1 resulting into 05 nos of 220 kV line associated with Bus-1 and 100 MVA ICT-1 tripped. As per PMU, Y-N fault followed by R-Y fault is observed. In antecedent conditions, 220 kV Khetri- Jhunjhunu & 220 kV Khetri-Chirava carrying 53 MW & 62 MW respectively.		120	GD-1	0.18			Y(Raj), Y(BBMB)			Y(Raj), Y(BBMB)		Y(Raj), Y(BBMB)	80ms & 280ms
15	1) 400kV Kishenpur(PG)-New Wanpoh(PG) ckt-1 2) 400kV Kishenpur(PG)-New Wanpoh(PG) ckt-3	POWERGRID	25-Apr-19	22:25	25-Apr-19	22.37	400kV Kishenpur(PG)-New Wanpoh(PG) ckt-1 tripped Y-B fault, 118.2km from Kishenpur(PG) end. At the same time, 400kV Kishenpur(PG)-New Wanpoh(PG) ckt-3 also tripped on R-N fault, 103km from Kishenpur(PG) end. As per PMU, R-Y-B fault followed by R-N fault is observed. In antecedent conditions, 400kV Kishenpur(PG)-New Wanpoh(PG) ckt-1 & 3 carrying 34 MW & 33 MW respectively.			GI-2				Y(PG)			Y(PG)		Y(PG)	80ms and 120ms
16	1) 400kV Bus 1 at 400kV Parbati(3) HEP(NHPC) 2) 400kV Parbati(3) HEP(NHPC)-Sainj HEP(HPPCL) 3) 400kV Parbati(3) HEP(NHPC)-Parbati Pool(PG)	NHPC/HPPCL/POWERGRID	26-Apr-19	4:30	26-Apr-19	6.28	During synchronization of unit no- 4 bus bar protection operated at 400kV Parbati(3) HEP(NHPC) resulting in trripping of 400kV Parbati(3) HEP(NHPC)-Sainj HEP(HPPCL) and 400kV Parbati(3) HEP(NHPC)-Parbati Pool(PG). As per PMU, R-N fault with no auto-reclosing attempt is observed in the system.	30		GD-1		Y(NHPC)		Y(HP), Y(PG)			Y(HP), Y(PG), Y(NHPC)		Y(NHPC)	80ms
17	1) 220kV Tanakpur(NHPC)-Sitarganj(PG) 2) 220kV Cbganj(UP)-Tanakpur(NHPC) 3) 132kV Mahendranagar(Nepal)-Tanakpur(NHPC) 4) 40 MW Units#1, #2 and #3 at 220kV Tanakpur(NHPC)	NHPC, POWERGRID & UP	26-Apr-19	20:08	26-Apr-19	21.34	LBB Operated due to fire in Bus Coupler at 220kV Tanakpur(NHPC) resuting in tripping of 220kV Tanakpur(NHPC)-Sitarganj(PG), 220kV Cbganj(UP)-Tanakpur(NHPC), 132kV Mahendranaar(Nepal)-Tanakpur(NHPC) and Units#1, #2 and #3. As per PMU, B-N fault with delayed clearance is observed. In antecedent conditions, Units#1, #2 and #3 generating 31MW, 31MW & 32MW respectively.	90		GD-1				Y(UP), Y(PG), Y(NHPC)			Y(UP), Y(PG), Y(NHPC)		Y(NHPC)	400ms
18	1) 220kV Tanakpur(NHPC)-Sitarganj(PG) 2) 220kV Cbganj(UP)-Sitarganj(PG)	POWERGRID, NHPC & UP	28-Apr-19	14:12	28-Apr-19	14.50	220kV Tanakpur(NHPC)-Sitarganj(PG) tripped on B-N fault, 23.5 Km from Sitarganj(PG) end. At the same time, 220kV Cbganj(UP)-Sitarganj(PG) also tripped on B-N fault, 27.4 km from Sitarganj(PG) end. As per PMU, multiple B-N faults are observed in the system. In antecedent conditions, 100 MVA ICT 1 and 2 carrying 26 MW & 21 MW respectively.			GI-2		Y(NHPC)		Y(UP), Y(PG)	Y(NHPC)		Y(UP), Y(PG)		Y(PG)	80ms
19	1) 400kV Dasna(UP)-Hapur 765(UP) ckt-1 2) 400kV Dasna(UP)-Hapur 765(UP) ckt-2 3) 400kV Bus 1 at 400/220kV Dasna(UP) 4) 315 MVA ICT 1 at 400/220kV Dasna(UP) 5) 315 MVA ICT 2 at 400/220kV Dasna(UP)	UP	29-Apr-19	13:11	29-Apr-19	16.16	400kV Dasna(UP)-Hapur 765(UP) ckt-2 tripped on R-N fault. Bus bar protection of 400kV Bus 1 at 400/220kV Dasna(UP) operated leading to tripping of 315 MVA ICT 1 and 400kV Dasna(UP)-Hapur 765(UP) ckt-2. As per PMU, Multiple R-N faults are observed. In antecedent conditions, 400kV Dasna(UP)-Hapur 765(UP) ckt-1 & 2 carrying 24 MW each.		48	GD-1	0.15			Y(UP)			Y(UP)		Y(UP)	80ms
20	1) 400 kV Bus 1 at 400/220kV Obra TPS(UP) 2) 315 MVA ICT 1 at 400/220kV Obra TPS(UP) 3) 200 MW Unit#9 at 400/220kV Obra TPS(UP)	UP	29-Apr-19	14:21	29-Apr-19	17.00	400 kV Bus 1 and 315 MVA ICT 1 tripped due to operation of LBB protection of breaker of unit-09. As per PMU, No fault is observed in the system. In antecedent conditions, Unit#9 generating 108 MW and 315 MVA ICT 1 carrying 110 MW.	108		GD-1				Y(UP)			Y(UP)		Y(UP)	NA

Annexure-6

Northern Regional inter regional lines tripping for Apr-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	800kV HVDC Agra-BNC line-2	POWERGRID	02-Apr-19	19.20	Nil	DC line Protection trip operated.	NA	02-Apr-19	20.26	NA	YES (After 24hrs)	YES (After 24hrs)		As per POWERGRID report, Inverter current latched at a higher value than actual. Inverter current shall be in synchronism with rectifier current in all modes of operation. the above phenomenon needs to be thoroughly checked and RCA to be done and corrective action to be taken to prevent recurrence of the same.	From PMU, DR/EL details(NR end), Slight dip in all three voltage phases observed; One auto-restart attempted as per EL.
2	800kV HVDC Agra-BNC line-2^^	POWERGRID	22-Apr-19	18.25	Nil	tripped on DC Line fault	NA	22-Apr-19	1.58	NA	YES (After 24hrs)	YES (After 24hrs)			From PMU and DR details (NR end), pole tripped due to two faults within 8 sec. Auto-restart attempt successful at first instant.
3	800kV HVDC Agra-BNC pole-2 at Agra^^	POWERGRID	26-Apr-19	12.02	Nil	Tripped due to line fault . Line Fault location detected - 1595.9 km from Agra	NA	26-Apr-19	12.45	NA	NO	YES			From PMU and DR details, DC line protection operated. Auto-restart attempt was unsuccessful.
4	400kV Gorakhpur(PG)-Motihari(DMTCL)-1^^	POWERGRID/ DMTCL	06-Apr-19	21.29	Nil	B-N fault. 127 km from Gorakhpur.	NA	06-Apr-19	10.18	NA	NO	NO		Details of tripping yet to be received.	From PMU, fault in reclaim time observed.
5	400kV Gorakhpur(PG)-Motihari(DMTCL)-1	POWERGRID/ DMTCL	08-Apr-19	11.12	Nil	Y-N fault. 19km from Motihari, fault current 5kA.	NA	08-Apr-19	11.38	NA	NO	NO	Line tripped even after successful auto-reclosing. Auto-reclosing operation at both ends to be checked.	Details of tripping yet to be received.	From PMU, B-N fault followed by successful auto-reclosing observed.
6	400kV Gorakhpur(PG)-Motihari(DMTCL)-1	POWERGRID/ DMTCL	08-Apr-19	12.12	Nil	Y-N fault. 19 km from Motihari end.	NA	08-Apr-19	19.42	NA	NO	NO	Line tripped even after successful auto-reclosing. Auto-reclosing operation at both ends to be checked.	Details of tripping yet to be received.	From PMU, B-N fault followed by successful auto-reclosing observed.
7	400kV Gorakhpur(PG)-Motihari(DMTCL)-2^^	POWERGRID/ DMTCL	13-Apr-19	11.35	Nil	Y-N fault. 22 kms from Motihari. FC- 4.26 kA.	NA	13-Apr-19	19.06	NA	NO	NO		Details of tripping yet to be received.	From PMU, multiple B-N faults observed.
8	400kV Gorakhpur(PG)-Motihari(DMTCL)-1^^	POWERGRID/ DMTCL	13-Apr-19	11.51	Nil	Y-N. 163 kms from Gorakhpur. FC- 2.0 kA	NA	13-Apr-19	19.03	NA	NO	NO		Details of tripping yet to be received.	From PMU, Y-N fault followed by unsuccessful auto-reclosing observed.
9	400kV Gorakhpur(PG)-Motihari(DMTCL)-2^^	POWERGRID/ DMTCL	14-Apr-19	12.42	Nil	B-N fault. F/C= 2.21 KA. 180.3 KM from Gorakhpur end.	NA	14-Apr-19	17.25	NA	NO	NO		Details of tripping yet to be received.	From PMU, B-N fault followed by unsuccessful auto-reclosing observed.
10	400kV Gorakhpur(PG)-Motihari(DMTCL)-2^^	POWERGRID/ DMTCL	28-Apr-19	11.53	Nil	B-N fault. 189.9 KM from Gorakhpur,fault current- 2.8KA.	NA	28-Apr-19	18.49	NA	NO	NO		Details of tripping yet to be received.	From PMU, B-N fault followed by unsuccessful auto-reclosing observed.

Northern Regional inter regional lines tripping for Apr-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						
11	220kV Auraiya(NTPC)-Malanpur(MPPTCL)	NTPC/MP	05-Apr-19	21.54	Nil	R-N fault.	NA	05-Apr-19	22.32	NA	YES (After 24hrs)	NO	Auto-reclosing didn't occur.	Details of tripping yet to be received. Auto-reclosing at Auraiya end to be put in service at the earliest.	From PMU, R-N fault observed without auto-reclosing.
12	220kV Auraiya(NTPC)-Mehgaon(MPPTCL)	NTPC/MP	13-Apr-19	16.37	Nil	R-N fault. (LA problem at Mehgaon)	NA	13-Apr-19	23.56	NA	YES (After 24hrs)	YES (After 24hrs)	Auto-reclosing didn't occur.	Details of tripping yet to be received. Auto-reclosing at Auraiya end to be put in service at the earliest.	From PMU, R-N fault observed without auto-reclosing.
13	220kV Auraiya(NTPC)-Mehgaon(MPPTCL)	NTPC/MP	19-Apr-19	4.07	Nil	R-N fault. Z-1, FD- 22.83KM FROM MEHGAON, FC-3.38 KA.	NA	19-Apr-19	5.10	NA	YES (After 24hrs)	YES (After 24hrs)	Auto-reclosing didn't occur.	Details of tripping yet to be received. Auto-reclosing at Auraiya end to be put in service at the earliest.	From PMU, R-N fault observed without auto-reclosing.
14	HVDC Vindhyachal BtB block-1	POWERGRID	17-Apr-19	22.15	Nil	DC OVERCURRENT Protection trip.	NA	17-Apr-19	0.08	NA	NO	NO		Details of tripping yet to be received. Sensitive DC overcurrent protection to be looked into.	From PMU, no fault observed.
15	HVDC Vindhyachal BtB block-1	POWERGRID	20-Apr-19	19.55	Nil	DC OVERCURRENT Protection trip.	NA	20-Apr-19	21.40	NA	NO	NO	Non operation of auto-reclosing.	Details of tripping yet to be received. Sensitive DC overcurrent protection to be looked into.	From PMU, Fault in AC system observed.
16	HVDC Vindhyachal BtB block-1	POWERGRID	25-Apr-19	10.09	Nil	DC OVERCURRENT Protection trip.	NA	25-Apr-19	12.29	NA	NO	NO		Details of tripping yet to be received. Sensitive DC overcurrent protection to be looked into.	From PMU, Fault in AC system observed.
17	220kV Sakatpura(RRVPNL)-Bhanpura(MPPTCL)^^	Rajasthan/MP	16-Apr-19	5.41	Nil	R-Y fault. 41.25km From Bhanpura.	NA	16-Apr-19	7.49	NA	NO	NO		Details of tripping yet to be received.	From PMU, R-Y fault observed.
18	400kV Rihand-3(NTPC)-Vindhyachal Pool(PG)-1	POWERGRID	15-Apr-19	11.45	Nil	Tripped on R-Y fault. Fault distance is 10KM from Rihand end.	NA	15-Apr-19	16.33	NA	NO	NO		Details of tripping yet to be received.	From PMU, no 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 may be 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 non operation	1. CEA Technical Standard of Electrical Plants and Electric Lines: 43.4.C 2. CEA Technical Planning Criteria

Annexure-I

State		June 2019 (MU)	June 2019 (MW)
Chandigarh	Availability	185	375
	Requirement	195	385
	Surplus/Shortfall (MU)	-10	-10
	Surplus/Shortfall (%)	-5.1%	-2.6%
Delhi	Availability	4110	7540
	Requirement	4100	7200
	Surplus/Shortfall (MU)	10	340
	Surplus/Shortfall (%)	0.2%	4.7%
Haryana	Availability	6150	10260
	Requirement	5620	9750
	Surplus/Shortfall (MU)	530	510
	Surplus/Shortfall (%)	9.4%	5.2%
Himachal Pradesh	Availability	840	1710
	Requirement	870	1490
	Surplus/Shortfall (MU)	-30	220
	Surplus/Shortfall (%)	-3.4%	14.8%
Jammu & Kashmir	Availability	1430	2410
	Requirement	1620	2880
	Surplus/Shortfall (MU)	-190	-470
	Surplus/Shortfall (%)	-11.7%	-16.3%
Punjab	Availability	7120	10670
	Requirement	5980	13110
	Surplus/Shortfall (MU)	1140	-2440
	Surplus/Shortfall (%)	19.1%	-18.6%
Rajasthan	Availability	8540	15340
	Requirement	7320	11700
	Surplus/Shortfall (MU)	1220	3640
	Surplus/Shortfall (%)	16.7%	31.1%
Uttar Pradesh	Availability	13700	20700
	Requirement	12650	21000
	Surplus/Shortfall (MU)	1050	-300
	Surplus/Shortfall (%)	8.3%	-1.4%
Uttarakhand	Availability	1300	2230
	Requirement	1340	2180
	Surplus/Shortfall (MU)	-40	50
	Surplus/Shortfall (%)	-3.0%	2.3%
Total NR	Availability	43375	69005
	Requirement	39695	63300
	Surplus/Shortfall (MU)	3680	5705
	Surplus/Shortfall (%)	9.3%	9.0%

Annexure-II

Subject: **FW: System Study for Capacitor Requirement in NR for the year 2019-20**
To: seprpspcl@gmail.com
Cc: seo-nrpc@nic.in, meera@cpri.in, febaelias@gmail.com
Date: 10/05/19 09:59 AM
From: "Dr. Manohar Singh" <manoharsingh@cpri.in>

BTI.rar (7.4MB) NR P&M Amritsar Circle.rar (101kB) circle Patiala.xlsx (75kB)
P&M Circle Ludhiana.xlsx (106kB)

Dear Sir,

Following are observations from the review of data formats of Punjab.
a. It would be good if they could compile all the information of different stations to a single sheet.
b. Regarding the files shared :

1. BTI : The data format is OK.

2. NR P&M :
(i) The sheet 132-33 kV The sample format for Pathankot reasonably understandable .
(ii) The sheet 132-66 kV has so many redundant bus numbers. Kindly provide unique bus numbers for the FROM and To bus to identify the connection properly and easily.
(iii) The sheet 220-66 kV also has the same issues as in (ii). Redundant bus numbers which makes it difficult to understand.

3. Patiala Sub Station : . But again the redundancy of bus numbers is observed. So kindly give unique bus ids.

4. P&M Circle Ludhiana : It is difficult to correlate the data provided as it is found to be not in the expected format.

General remark- BTI format is okay and readable to CPRI team with respect to provided SLD for these three sample stations.
Hence all others are requested to follow same format.

Regards,
Feba

From: MANOHAR SINGH [mailto:manoharsingh@cpri.in]
Sent: Wednesday, April 24, 2019 12:54 PM
To: febaelias@gmail.com
Subject: Fwd: System Study for Capacitor Requirement in NR for the year 2019-20

ANNEXURE-III

Follow up issues from previous OCCMs

Sl. No.	Agenda point	Details	Status
1	Monitoring of schemes funded from PSDF (*Agenda by NPC*)	The latest status of the schemes for which grant has been sanctioned from PSDF for the schemes in Northern Region. Utilities are requested to expedite implementation of the schemes and submit information of physical as well as financial progress in the prescribed format by first week of every month on regular basis to Member Convener, PSDF Project Monitoring Group (AGM, NLDC and POSOCO) with a copy to NPC Division.	The available status is attached as **Annexure-III/1**. All states are requested to update.
2	Sub-stations likely to be commissioned in next 6 months.	All the concerned states were requested to submit the details of the downstream network associated specially with POWERGRID substations along with the action plan of their proposed/approved networks.	The updated details of the substations of Power Grid and their required downstream network is placed at **Annexure-III/2**. All concerned utilities are requested to update the status.
3	Progress of installing new capacitors and repair of defective capacitors	Information regarding installation of new capacitors and repair of defective capacitors is to be submitted to NRPC Secretariat.	Information received from Uttarakhand (up to March 2019), UP, Rajasthan & Haryana (up to January 2019). All other states are requested to update.
4.	Healthiness of defence mechanism: Self-certification	Report of Mock exercise for healthiness of UFRs carried out by utilities themselves on quarterly basis is to be submitted to NRPC Secretariat and NRLDC. All utilities were advised to certify specifically, in the report that "*All the UFRs are checked and found functional*".	The information of period ending March 2019 received from UP, Haryana, Delhi and Rajasthan. All others are requested to submit information.

Sl. No.	Agenda point	Details	Status
5	Strengthening of Intra-State transmission system	All SLDCs were requested to give information regarding bottlenecks, constraints and overloading in the State transmission network for proper transmission planning	UPPTCL has submitted the information ending 12/2018. ALL other SLDCs are requested to give half yearly feedback ending 12/2018 in the month of 1/2019 to STU regarding bottlenecks, constraints and overloading in the State transmission network for proper transmission planning.
6	Mapping of Feeders in SCADA	All the utilities were requested to go through the “Compendium of SPS in NR” (available on NRLDC & NRPC website) and identify feeders concerning their state and map the same in SCADA	HVPNL-SCADA wing has made provisions in the database as well as associated displays at control centre. The work at RTU locations is yet to be carried out to complete the SCADA mapping. All states except Punjab & Rajasthan are requested to update.

POWER SYSTEM DEVELOPMENT FUND(PSDF)

Status of Schemes Submitted by the Entities for funding from PSDF

Annexure-III/1

Schemes approved under PSDF **All figures in Rs Crore**

SLNo	Name of State/Entity	Region	Name of Entity	Name of Scheme and Unique ID No	Project Cost accepted by Appraisal Committee.	Category of Funding	Quantum of Funding Recommended by Appraisal Committee	Grant Approved by Monitoring Committee	Dateof Issuanceof sanction order by MoP	Date of Signing of Agreement	Completion schedule (in Month)	Date of release of first Installment	Proposed Completion date as per sanction order	Amount Disbursed as on 31-07-2018
I	II		III	IV	IX	X	XI	XIII	XV	XVI				
1	Rajasthan	NR	RRVPNL	Renovation and Upgradation of protection system of substations (003)	159.53	5.1 (c)	90.00	143.58	31-Dec-14	6-Feb-15	24	31-Mar-16	31-Mar-18	14.85
2	Rajasthan	NR	RRVPNL	Installation of Bus Reactors (005)	23.87	5.1(b)	90.00	21.48	31-Dec-14	6-Feb-15	18	22-Mar-16	22-Sep-17	19.33
3	Uttar Pradesh	NR	UPPTCL	Installation of Capacitors and FSC. (025)	39.29	5.1(b)	90.00	35.36	11-May-15	26-Nov-15	18	8-Mar-16	8-Sep-17	29.77
4	Uttar Pradesh	NR	UPPTCL	Renovation and Upgradation of protection system of substations. (026)	202.94	5.1 (c)	90.00	182.65	11-May-15	26-Nov-15	18	31-Mar-16	30-Sep-17	89.47
5	NRPC	Central	NRPC	Study Program on the integration of renewable energy resources (054)	6.45	5.1 (e)	100.00	6.45	28-Oct-15	24-Nov-15	3	29-Dec-15	29-Mar-16	4.49
6	Jammu & Kashmir	NR	PDD-J&K	Renovation and Upgradation of protection system of substations in Jammu(023)	140.04	5.1(c)	100.00	140.04	28-Oct-15	5-Apr-16	18	14-Jul-17	14-Jan-19	26.40
7	Himachal Pradesh	NR	HPSEBL	Renovation and Upgradation of Protection System (049)	55.44	5.1(C)	100.00	55.44	5-Jan-16	8-Jun-16	18	31-May-17	30-Nov-18	34.44
8	Jammu & Kashmir	NR	PDD-J&K	Renovation and Upgradation of protection system of substations in Kashmir(024)	146.12	5.1 (c)	100.00	146.12	17-Mar-16	22-Apr-16	18		16-Sep-17	26.40
9	Delhi	NR	DTL	Renovation and Upgradation of Protection System.(049)	125.98	5.1(c)	90.00	113.38	17-Mar-16	4-May-16	27	25-Nov-16	25-Feb-19	20.75
10	Uttrakhand	NR	PTCUL	Renovation and Upgradation of Protection System.(051)	125.05	5.1(c)	100.00	125.05	17-Mar-16	8-Jun-16	18	8-Nov-16	16-Sep-17	101.75
11	Punjab	NR	PSTCL	Bus bar protection (052)	18.21	5.1(c)	90.00	16.39	17-Mar-16	29-Dec-16	18		16-Sep-17	
12	Uttar Pradesh	NR	UPPTCL	Reconductoring of existing line by HTLS conductor for relieving congestion. (027)	80	5.1(d)	75.00	60.00	17-Mar-16	**Scheme withdrawn**	18	20-Sep-17	16-Sep-17	
13	Haryana	NR	DHVBN	Renovation and modernisation of distribution system of DHBVN, Haryana(077)	364.27	5.1(d)	75.00	273.20	2-Jan-17	24-Nov-17	18		18-Feb-18	28.35
14	Punjab	NR	PSTCL	Provision of second DC Source at 220KV & 132KV Grid Sub Station of PSTCL. (70)	15.3	5.1 (c)	90.00	13.77	2-Jan-17	23-Mar-17	18		1-Jul-18	3.01
15	POWERGRID	Central	POWERGRID	Funding of BNC Agra HVDC (94)	5778	4(3)(A)	50.00	2889.00	10-Mar-17	23-May-17	54		9-Sep-21	
16	Uttar Pradesh	NR	UPPTCL	Repleacement of existing ACSR conductor by HTLS conductor for reliving cogestion. (89)	63.31	5.1(d)	75.00	47.48	16-May-17	27-Jul-17	18		15-Nov-18	4.74
17	Rajasthan	NR	RRVPNL	" Smart Transmission Operation Management Systeem (STOMS) " in Rajasthan Power System. (110)	13.18	5.1(c)	90.00	11.86	19-May-17	10-Oct-17	12		18-May-18	1.186
18	Rajasthan	NR	RRVPNL	Communication Backbone "Smart Transmission Network & Asset Management Systeem " Part-B (136)	569.77	5.1(c)	50.00	284.89	22-May-17	10-Oct-17	18		21-Nov-18	56.969
19	BBMB	Central	BBMB(038)	Renovation and Upgradation of protection system of substations. (038)	25.86	5.1 (c)	90.00	23.27	15-Nov-17	19-Feb-18	22			2.33
20	Rajasthan	NR	RRVPNL	Real Time Data Acquisition System for Monitoring & Control of Transmission Grid under STNAMS (PART A-1) (153)	185.19	5.1(c)	50.00	92.60	15-Nov-17	23-Feb-18	24			
21	Uttrakhand	NR	PTCUL	Implementation of OPGW based reliable communication at 132 kv and above substations. (129)	37.46	5.1(c)	50.00	18.73	15-Nov-17		36			
22	Punjab	NR	PSTCL	Reliable Communication and data Acquisition System upto 132kV Substation in Punjab. (138)	66.1	5.1(c)	50	33.05	27-Jul-18		36			
23	Himachal Pradesh	NR	HPSEBL	Strengthening of Transmission System incidenatls to Inter-State- Transmission System in the State of HP (134)	24.38	5.1(d)	100	24.38	27-Jul-18		18			
24	Himachal Pradesh	NR	HPSEBL	Reliable Communication and data Acquisition System upto 132kV Substation in Himachal Pradesh (135)	18.64	5.1(c)	50	9.32	27-Jul-18		18			

Schemes approved under PSDF **All figures in Rs Crore**

Sl.No	Name of State/Entity	Region	Name of Entity	Name of Scheme and Unique ID No	Project Cost accepted by Appraisal Committee.	Category of Funding	Quantum of Funding Recommended by Appraisal Committee	Grant Approved by Monitoring Committee	Dateof Issuanceof sanction order by MoP	Date of Signing of Agreement	Completion schedule (in Month)	Date of release of first Installment	Proposed Completion date as per sanction order	Amount Disbursed as on 31-07-2018
I	II		III	IV	IX	X	XI	XIII	XV	XVI				
25	NRPC	Central	NRPC	Creation and Maintanance of Web based Protection Database Management and PC based Protection Setting Calculation Tool for Northern Region Power System Network. (203)	28.00	5.1(e)	100	28.00	27-Jul-18		18			
				Total	**8,312.38**			**4,795.49**						**464.24**

Schemes approved under PSDF — **All figures in Rs Crore**

Sl.No	Name of State/Entity	Region	Name of Entity	Name of Scheme and Unique ID No	Project Cost accepted by Appraisal Committee.	Category of Funding	Quantum of Funding Recommended by Appraisal Committee	Grant Approved by Monitoring Committee	Dateof Issuanceof sanction order by MoP	Date of Signing of Agreement	Completion schedule (in Month)	Date of release of first Installment	Proposed Completion date as per sanction order	Amount Disbursed as on 31-07-2018
I	II		III	IV	IX	X	XI	XIII	XV	XVI				

Annexure-III/2

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

S. No.	Substation	Downstream network requirement	Schedule	Planned system and Implementation Status
6	400/220kV, 2x315 MVA Dehradun	Out of 6 bays, only two bays used. Balance 4 bays to be utilised.	Commissioned	02 bays for Yamuna Basin (Mori substation) 2 bays for proposed S/s at Selakui **PTCUL requested to update**.
7	400/220 kV, 2x315 MVA Sohawal	6 Nos 220 kV bays to be utilized.	Commissioned	Sohawal-Sohawal (UP) D/C line energised Sohawal-Barabanki D/C line energised. 2 nos of bay of utilized for 220kV New Tanda-Sohawal line. There is a litigation process on & expected to be completed by November 2018 **UPPTCL requested to update.** Sohawal-Behraich and SohawalGonda lines are under construction and expected to be completed by January, 2019. PGCIL requested to provide the estimate for construction of Bays at PGCIL end. **UPPTCL& PGCIL to update requested to update.**
8	Shahjahanpur, 2x315 MVA 400/220 kV	Partially utilized. Balance 5 Nos. of 220 kV bays to be utilized.	Commissioned	Shajahnapur-Hardoi commissioned Shajahnapur-Azimpur D/C line is planned, land of substation identified. **UPPTCL requested to update**.
9	Moga	Partially utilized. Balance 2 nos. of 220kV bays to be utilized.	Commissioned	Moga–Mehalkalan 220kV D/c line Work completed. Approval from NGT for tree cutting is awaited for balance work to commission line. NGT clearance received and by 31.12.2018 work will be completed **PSTCL to update progress**.
10	Hamirpur 400/220 kV 2x 315 MVA Sub-station (Augmentation by 3x105 MVA ICT)	04 nos. 220 kV downstream lines commissioned under ISTS. Balance two bays to be utilised by HPSEBL	August 2020	2x220 kV bays to be utilized for connecting 220/132kV Kangoo substation of HPSEBL by 220 kV Kangoo-Hamirpur D/c line. **HPPTCL requested to update**.

S. No.	Substation	Downstream network requirement	Schedule	Planned system and Implementation Status
11	Kaithal 400/220 kV 1x 315 MVA Sub-station	July 2017 (Shifting of Transformer from Ballabhgarh).	Commissioned	220kV Kaithal(PG)- Neemwala D/c line - Work awarded on 13.7.2018. Tentative completion date 31.12.2019. 220kV S/s Neemwala-Tenders opened on 30.3.2018 & awarded on 13.7.2018. **HVPNL requested to update further progress.**

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

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

Sl. No.	Name of Substation	MVA Capacity	Expected Schedule	Downstream connectivity furnished by States
8	400/220kV Kala Amb GIS	7*105	Commissioned (Jul'17)	HPSEBL has planned one no. of 220kV D/c line from Kala Amb 400/220kV S/s to 220/132kV Kala Amb S/s. Details for remaining 4 nos. of line bays may be provided.
9	400/220kV Amargarh GIS	7X105	Oct'18 (Under TBCB) (Sterlite Grid planning to prepone)	JKPDD to confirm for LILO of 220kV D/c Zainkote - Delina line at Amargarh. 20 ckm work completed June-18.

Annexure-IV

Sr. No.	Developer	Name of Project	State	Unit No	Unit Capacity	DATE of COMMISSIONING (MM/DD/YYYY)	ESP Plan	ESP Status	FGD Phasing Plan (DD/MM/YYYY)	Whether FGD Installed	FGD Commissioned (Y/N)	FGD Status
1	CHINA LIGHT POWER	MAHATMA GANDHI TPS	Haryana	1	660	**12-01-2012**	SPM Compliant		31/12/2019	N	Y	FGD Installed and is Under Renovation
2	CHINA LIGHT POWER	MAHATMA GANDHI TPS	Haryana	2	660	**11-04-2012**	SPM Compliant		31/12/2019	N	Y	FGD Installed and is Under Renovation
3	HGPCorpn	PANIPAT TPS	Haryana	6	210	**31-03-2001**			31/12/2019	N	0	Developer wants exemption
4	HGPCorpn	PANIPAT TPS	Haryana	7	250	**28-09-2004**	28-02-2021		31/12/2019	N	0	Feasbility Study Under Progress
5	HGPCorpn	PANIPAT TPS	Haryana	8	250	**28-01-2005**	31-12-2020		31/12/2019	N	0	Feasbility Study Under Progress
6	HGPCorpn	RAJIV GANDHI TPS	Haryana	1	600	**31-03-2010**	30-04-2022		31/12/2019	N	0	Feasbility Study Completed.
7	HGPCorpn	RAJIV GANDHI TPS	Haryana	2	600	**01-10-2010**	28-02-2022		31/12/2019	N	0	Feasbility Study Completed.
8	HGPCorpn	YAMUNA NAGAR TPS	Haryana	1	300	**01-11-2007**	31-12-2021		31/12/2019	N	0	Feasbility Study Completed.
9	HGPCorpn	YAMUNA NAGAR TPS	Haryana	2	300	**29-03-2008**	31-10-2021		31/12/2019	N	0	Feasbility Study Completed.
10	NTPC	INDIRA GANDHI STPP	Haryana	1	500	**31-10-2010**	SPM Compliant	SPM Compliant	31/12/2019	N	0	Bid awarded on 30 Jan 2018
11	NTPC	INDIRA GANDHI STPP	Haryana	2	500	**05-11-2011**	SPM Compliant	SPM Compliant	31/12/2019	N	0	Bid awarded on 30 Jan 2018
12	NTPC	INDIRA GANDHI STPP	Haryana	3	500	**07-11-2012**	SPM Compliant	SPM Compliant	31/12/2019	N	0	Bid awarded on 30 Jan 2018
13	GVK Power Ltd.	GOINDWAL SAHIB	Punjab	1	270	**14-02-2016**			30/04/2020	N	0	EOI was invited vide newspaper advrt. On 18.06.2018
14	GVK Power Ltd.	GOINDWAL SAHIB	Punjab	2	270	**15-03-2016**			28/02/2020	N	0	EOI was invited vide newspaper advrt. On 18.06.2018
15	L&T Power Development LTD(Nabha)	Nabha TPP (Rajpura TPP)	Punjab	1	700	**24-01-2014**	SPM Compliant	SPM Compliant	31/12/2019	N	0	NIT expected in Oct' 18
16	L&T Power Development LTD(Nabha)	Nabha TPP (Rajpura TPP)	Punjab	2	700	**06-07-2014**	SPM Compliant	SPM Compliant	31/12/2019	N	0	NIT expected in Oct' 18
17	PSEB	GH TPS (LEH.MOH.)	Punjab	1	210	**29-12-1997**	30-04-2022		31/12/2019	N	0	Techanical Specification for installation of FGD have been drafted and are being finalised after approval
18	PSEB	GH TPS (LEH.MOH.)	Punjab	2	210	**16-10-1998**	30-04-2022		31/12/2019	N	0	Techanical Specification for installation of FGD have been drafted and are being finalised after approval
19	PSEB	GH TPS (LEH.MOH.)	Punjab	3	250	**03-01-2008**	28-02-2022		31/12/2019	N	0	Techanical Specification for installation of FGD have been drafted and are being finalised after approval
20	PSEB	GH TPS (LEH.MOH.)	Punjab	4	250	**31-07-2008**	28-02-2022		31/12/2019	N	0	Techanical Specification for installation of FGD have been drafted and are being finalised after approval
21	Talwandi Sabo Power Limited	TALWANDI SABO TPP	Punjab	1	660	**17-06-2014**	SPM Compliant		31/12/2019	N	0	Feasibility Study Carried Out. PPA issues pending with regulator
22	Talwandi Sabo Power Limited	TALWANDI SABO TPP	Punjab	2	660	**25-10-2015**	SPM Compliant		31/12/2019	N	0	Feasibility Study Carried Out. PPA issues pending with regulator
23	Talwandi Sabo Power Limited	TALWANDI SABO TPP	Punjab	3	660	**29-03-2016**	SPM Compliant		31/12/2019	N	0	Feasibility Study Carried Out. PPA issues pending with regulator
24	Adani Power Ltd.	KAWAI TPS	Rajasthan	1	660	**28-05-2013**	N		31/08/2020	N	0	NIT to be issued soon.
25	Adani Power Ltd.	KAWAI TPS	Rajasthan	2	660	**24-12-2013**	N		30/06/2020	N	0	NIT to be issued soon.
26	RRVUNL	CHHABRA TPP	Rajasthan	1	250	**30-10-2009**	31-12-2021	Tender Specifications under process	31/12/2021	N	0	Technical Specifications & Bid Documents of FGD installation have been finalised. Approval of WTD's for floating NIT has been obtained. NIT shall be floated after permission from Election Commission or waviver of Model Code of conduct due to Election whichever is earlier.
27	RRVUNL	CHHABRA TPP	Rajasthan	2	250	**04-05-2010**	31-10-2021	Tender Specifications under process	31/10/2021	N	0	Technical Specifications & Bid Documents of FGD installation have been finalised. Approval of WTD's for floating NIT has been obtained. NIT shall be floated after permission from Election Commission or waviver of Model Code of conduct due to Election whichever is earlier.
28	RRVUNL	CHHABRA TPP	Rajasthan	3	250	**14-09-2013**	31-08-2021	Tender Specifications under process	31/08/2021	N	0	Technical Specifications & Bid Documents of FGD installation have been finalised. Approval of WTD's for floating NIT has been obtained. NIT shall be floated after permission from Election Commission or waviver of Model Code of conduct due to Election whichever is earlier.
29	RRVUNL	CHHABRA TPP	Rajasthan	4	250	**30-06-2014**	31-08-2021	Tender Specifications under process	31/08/2021	N	0	Technical Specifications & Bid Documents of FGD installation have been finalised. Approval of WTD's for floating NIT has been obtained. NIT shall be floated after permission from Election Commission or waviver of Model Code of conduct due to Election whichever is earlier.
30	RRVUNL	CHHABRA TPP	Rajasthan	5	660	**04-04-2017**	30-04-2020	Tender Specifications under process	30/04/2020	N	0	Technical Specifications & Bid Documents of FGD installation have been finalised. Approval of WTD's for floating NIT has been obtained. NIT shall be floated after permission from Election Commission or waviver of Model Code of conduct due to Election whichever is earlier.
31	RRVUNL	KALISINDH TPS	Rajasthan	1	600	**02-05-2014**		SPM Compliant	30/06/2021	N	0	Technical Specifications & Bid Documents of FGD installation have been finalised. Approval of WTD's for floating NIT has been obtained. NIT shall be floated after permission from Election Commission or waviver of Model Code of conduct due to Election whichever is earlier.
32	RRVUNL	KALISINDH TPS	Rajasthan	2	600	**06-06-2015**		SPM Compliant	30/04/2021	N	0	Technical Specifications & Bid Documents of FGD installation have been finalised. Approval of WTD's for floating NIT has been obtained. NIT shall be floated after permission from Election Commission or waviver of Model Code of conduct due to Election whichever is earlier.
33	RRVUNL	KOTA TPS	Rajasthan	5	210	**26-03-1994**	31-12-2022	Tender Specifications under process	31/12/2022	N	0	Feasibility studies completed. Case fo Administrative and Financial approval from BOD of RVUN has been initiated in on 22.03.2019
34	RRVUNL	KOTA TPS	Rajasthan	6	195	**30-07-2003**	31-12-2022	Tender Specifications under process	31/12/2022	N	0	Feasibility studies completed. Case fo Administrative and Financial approval from BOD of RVUN has been initiated in on 22.03.2019
35	RRVUNL	KOTA TPS	Rajasthan	7	195	**30-08-2009**		SPM Compliant	31/10/2022	N	0	Feasibility studies completed. Case fo Administrative and Financial approval from BOD of RVUN has been initiated in on 22.03.2019
36	RRVUNL	SURATGARH TPS	Rajasthan	1	250	**10-05-1998**		SPM Compliant	31/12/2022	N	0	Technical Specifications & Bid Documents of FGD installation have been finalised. Approval of WTD's for floating NIT has been obtained. NIT shall be floated after permission from Election Commission or waviver of Model Code of conduct due to Election whichever is earlier.

37	RRVUNL	SURATGARH TPS	Rajasthan	2	250	**28-03-2000**		SPM Compliant	31/10/2022	N	0	Technical Specifications & Bid Documents of FGD installation have been finalised. Approval of WTD's for floating NIT has been obtained. NIT shall be floated after permission from Election Commission or waviver of Model Code of conduct due to Election whichever is earlier.
38	RRVUNL	SURATGARH TPS	Rajasthan	3	250	**29-10-2001**		SPM Compliant	31/08/2022	N	0	Technical Specifications & Bid Documents of FGD installation have been finalised. Approval of WTD's for floating NIT has been obtained. NIT shall be floated after permission from Election Commission or waviver of Model Code of conduct due to Election whichever is earlier.
39	RRVUNL	SURATGARH TPS	Rajasthan	4	250	**25-03-2002**		SPM Compliant	30/06/2022	N	0	Technical Specifications & Bid Documents of FGD installation have been finalised. Approval of WTD's for floating NIT has been obtained. NIT shall be floated after permission from Election Commission or waviver of Model Code of conduct due to Election whichever is earlier.
40	RRVUNL	SURATGARH TPS	Rajasthan	5	250	**30-06-2003**		SPM Compliant	30/04/2022	N	0	Technical Specifications & Bid Documents of FGD installation have been finalised. Approval of WTD's for floating NIT has been obtained. NIT shall be floated after permission from Election Commission or waviver of Model Code of conduct due to Election whichever is earlier.
41	RRVUNL	SURATGARH TPS	Rajasthan	6	250	**29-08-2009**	28-02-2022	Tender Specifications under process	28/02/2022	N	0	Technical Specifications & Bid Documents of FGD installation have been finalised. Approval of WTD's for floating NIT has been obtained. NIT shall be floated after permission from Election Commission or waviver of Model Code of conduct due to Election whichever is earlier.
42	Lalitpur Power Gen. Co	LALITPUR TPS	Uttar Pardesh	2	660	**08-01-2016**			28/02/2021	N	0	Petition was filed with UPERC for approval capital cost for installation of FGD and other associated systems. UPERC directed to approach CEA.
43	Lalitpur Power Gen. Co	LALITPUR TPS	Uttar Pardesh	3	660	**01-04-2016**			31/10/2021	N	0	Petition was filed with UPERC for approval capital cost for installation of FGD and other associated systems. UPERC directed to approach CEA.
44	Lalitpur Power Gen. Co.	LALITPUR TPS	Uttar Pardesh	1	660	**26-03-2016**			31/12/2020	N	0	Petition was filed with UPERC for approval capital cost for installation of FGD and other associated systems. UPERC directed to approach CEA.
45	Lanko Anpara Pow Ltd	ANPARA C TPS	Uttar Pardesh	1	600	**12-10-2011**	SPM Compliant		31/08/2022	N	0	Tender Specification made
46	Lanko Anpara Pow Ltd	ANPARA C TPS	Uttar Pardesh	2	600	**18-01-2012**	SPM Compliant		30/06/2022	N	0	Tender Specification made
47	NTPC	DADRI (NCTPP)	Uttar Pardesh	1	210	**21-12-1991**	SPM Compliant		31/12/2019	N	N	Dry Sorbent Injection (DSI) SYSTEM TO BE INSTALLED
48	NTPC	DADRI (NCTPP)	Uttar Pardesh	2	210	**18-12-1992**	SPM Compliant		31/12/2019	N	N	Dry Sorbent Injection (DSI) SYSTEM TO BE INSTALLED
49	NTPC	DADRI (NCTPP)	Uttar Pardesh	3	210	**23-03-1993**	SPM Compliant		31/12/2019	N	N	Dry Sorbent Injection (DSI) SYSTEM TO BE INSTALLED
50	NTPC	DADRI (NCTPP)	Uttar Pardesh	4	210	**24-03-1994**	SPM Compliant		31/12/2019	N	N	Dry Sorbent Injection (DSI) SYSTEM TO BE INSTALLED
51	NTPC	DADRI (NCTPP)	Uttar Pardesh	5	490	**25-01-2010**	SPM Compliant	SPM Compliant	31/12/2019	N	N	Awarded on 01 Feb 18. Work in progress
52	NTPC	DADRI (NCTPP)	Uttar Pardesh	6	490	**16-07-2010**	SPM Compliant	SPM Compliant	31/12/2019	N	N	Awarded on 01 Feb 18. Work in progress
53	NTPC	RIHAND STPS	Uttar Pardesh	1	500	**31-03-1988**	SPM Compliant	SPM Compliant	28/02/2022	N	N	NIT In Sep 18
54	NTPC	RIHAND STPS	Uttar Pardesh	2	500	**05-07-1989**	SPM Compliant	SPM Compliant	31/12/2021	N	N	NIT In Sep 18
55	NTPC	RIHAND STPS	Uttar Pardesh	3	500	**31-01-2005**	SPM Compliant	SPM Compliant	30/10/2021	N	N	Award in 31-08-2018
56	NTPC	RIHAND STPS	Uttar Pardesh	4	500	**24-09-2005**	SPM Compliant	SPM Compliant	30/04/2021	N	N	Award in 31-08-2018
57	NTPC	RIHAND STPS	Uttar Pardesh	5	500	**25-05-2012**	SPM Compliant	SPM Compliant	28/02/2021	N	N	Award in 31-08-2018
58	NTPC	RIHAND STPS	Uttar Pardesh	6	500	**17-10-2013**	SPM Compliant	SPM Compliant	31/12/2020	N	N	Award in 31-08-2018
59	NTPC	SINGRAULI STPS	Uttar Pardesh	1	200	**14-02-1982**	31-12-2021		31/12/2021	N	N	NIT IN LOT-3 PLANNED IN OCT 2018
60	NTPC	SINGRAULI STPS	Uttar Pardesh	2	200	**25-11-1982**	31-12-2021		31/12/2021	N	N	NIT IN LOT-3 PLANNED IN OCT 2018
61	NTPC	SINGRAULI STPS	Uttar Pardesh	3	200	**28-03-1983**	31-08-2021		31/08/2021	N	N	NIT IN LOT-3 PLANNED IN OCT 2018
62	NTPC	SINGRAULI STPS	Uttar Pardesh	4	200	**02-11-1983**	31-08-2021		31/08/2021	N	N	NIT IN LOT-3 PLANNED IN OCT 2018
63	NTPC	SINGRAULI STPS	Uttar Pardesh	5	200	**26-02-1984**	30-04-2021		30/04/2021	N	N	NIT IN LOT-3 PLANNED IN OCT 2018
64	NTPC	SINGRAULI STPS	Uttar Pardesh	6	500	**23-12-1986**	28-02-2021	Under R&M	28/02/2021	N	N	NIT In Sep 18
65	NTPC	SINGRAULI STPS	Uttar Pardesh	7	500	**24-11-1987**	31-12-2020	Under R&M	31/12/2020	N	N	NIT In Sep 18
66	NTPC	UNCHAHAR TPS	Uttar Pardesh	1	210	**21-11-1988**	31-12-2022		31/12/2022	N	N	NIT IN LOT-3 PLANNED IN SEP 2018
67	NTPC	UNCHAHAR TPS	Uttar Pardesh	2	210	**22-03-1989**	31-12-2022		31/12/2022	N	N	NIT IN LOT-3 PLANNED IN SEP 2018
68	NTPC	UNCHAHAR TPS	Uttar Pardesh	3	210	**27-01-1999**	31-10-2022		31/10/2022	N	N	NIT IN LOT-3 PLANNED IN SEP 2018
69	NTPC	UNCHAHAR TPS	Uttar Pardesh	4	210	**22-10-1999**	31-10-2022		31/10/2022	N	N	NIT IN LOT-3 PLANNED IN SEP 2018
70	NTPC	UNCHAHAR TPS	Uttar Pardesh	5	210	**28-09-2006**	30-04-2022		30/04/2022	N	N	NIT IN LOT-2 PLANNED IN JULY 2018
71	NTPC	UNCHAHAR TPS	Uttar Pardesh	6	500	**31-03-2017**	31-08-2020		8-31-2020	N	N	Price bid submitted on 29.06.2018.
72	Prayagraj Power Generation Company LTD.	PRAYAGRAJ TPP	Uttar Pardesh	1	660	**25-12-2016**	SPM Compliant		30/04/2020	N	0	Feasibility Report cleared by CEA, Tariff petition being filed to state Regulator (UPERC) and Tender Specifications under preparation by consultants M/s TCE.
73	Prayagraj Power Generation Company LTD.	PRAYAGRAJ TPP	Uttar Pardesh	2	660	**06-09-2015**	SPM Compliant		30/06/2020	N	0	Feasibility Report cleared by CEA, Tariff petition being filed to state Regulator (UPERC) and Tender Specifications under preparation by consultants M/s TCE.

74	Prayagraj Power Generation Company LTD.	PRAYAGRAJ TPP	Uttar Pardesh	3	660	**22-05-2017**	29-02-2020		29/02/2020	N	0	Feasibility Report cleared by CEA, Tariff petition being filed to state Regulator (UPERC) and Tender Specifications under preparation by consultants M/s TCE.
75	Rosa Power Supply Co	ROSA TPP Ph-I	Uttar Pardesh	1	300	**10-02-2010**	31-12-2021		31/12/2021	N	0	Tendering Under Process
76	Rosa Power Supply Co	ROSA TPP Ph-I	Uttar Pardesh	2	300	**26-06-2010**	31-12-2021		31/12/2021	N	0	Tendering Under Process
77	Rosa Power Supply Co	ROSA TPP Ph-I	Uttar Pardesh	3	300	**28-12-2011**			31/10/2021	N	0	Tendering Under Process
78	Rosa Power Supply Co	ROSA TPP Ph-I	Uttar Pardesh	4	300	**28-03-2012**			31/10/2021	N	0	Tendering Under Process
79	UPRVUNL	ANPARA TPS	Uttar Pardesh	1	210	**24-03-1986**	31-10-2022		31/10/2022	N	0	Tender is floated on 14 February 2019 and Techno- Commercial (Part-I) is scheduled to open on 14 may 2019
80	UPRVUNL	ANPARA TPS	Uttar Pardesh	2	210	**28-02-1987**	31-08-2022		31/08/2022	N	0	Tender is floated on 14 February 2019 and Techno- Commercial (Part-I) is scheduled to open on 14 may 2019
81	UPRVUNL	ANPARA TPS	Uttar Pardesh	3	210	**12-03-1988**	30-06-2022		30/06/2022	N	0	Tender is floated on 14 February 2019 and Techno- Commercial (Part-I) is scheduled to open on 14 may 2019
82	UPRVUNL	ANPARA TPS	Uttar Pardesh	4	500	**19-07-1993**	30-04-2022	Engagement of agency for pre-award services is in process	30/04/2022	N	0	Tender is floated on 14 February 2019 and Techno- Commercial (Part-I) is scheduled to open on 14 may 2019
83	UPRVUNL	ANPARA TPS	Uttar Pardesh	5	500	**04-07-1994**	28-02-2022	Engagement of agency for pre-award services is in process	28/02/2022	N	0	Tender is floated on 14 February 2019 and Techno- Commercial (Part-I) is scheduled to open on 14 may 2019
84	UPRVUNL	ANPARA TPS	Uttar Pardesh	6	500	**08-06-2015**	SPM Compliant	SPM Compliant	30/06/2021	N	0	Part -1 Techno Comm Bid opened on 27.11.2018
85	UPRVUNL	ANPARA TPS	Uttar Pardesh	7	500	**06-03-2016**	SPM Compliant	SPM Compliant	30/04/2021	N	0	Part -1 Techno Comm Bid opened on 27.11.2018
86	UPRVUNL	HARDUAGANJ TPS	Uttar Pardesh	8	250	**27-09-2011**			31/12/2019	N	0	Administrative approval is under process.
87	UPRVUNL	HARDUAGANJ TPS	Uttar Pardesh	9	250	**25-05-2012**			31/12/2019	N	0	Administrative approval is under process.
88	UPRVUNL	OBRA TPS	Uttar Pardesh	9	200	**26-10-1980**			31/08/2022	N	0	Feasiblity Study Under Progress
89	UPRVUNL	OBRA TPS	Uttar Pardesh	10	200	**14-01-1979**	31-10-2022		31/10/2022	N	0	Feasiblity Study Under Progress
90	UPRVUNL	OBRA TPS	Uttar Pardesh	11	200	**31-12-1977**	31-12-2022		31/12/2022	N	0	Feasiblity Study Under Progress
91	UPRVUNL	OBRA TPS	Uttar Pardesh	12	200	**28-03-1981**	30-06-2022		30/06/2022	N	0	Feasiblity Study Under Progress
92	UPRVUNL	OBRA TPS	Uttar Pardesh	13	200	**21-07-1982**	30-04-2022		30/04/2022	N	0	Feasiblity Study Under Progress
93	UPRVUNL	PARICHHA TPS	Uttar Pardesh	3	210	**29-03-2006**	30-04-2022		30/04/2022	N	0	Part -1 Techno Comm Bid opened on 22.02.2019
94	UPRVUNL	PARICHHA TPS	Uttar Pardesh	4	210	**28-12-2006**	30-04-2022		30/04/2022	N	0	Part -1 Techno Comm Bid opened on 22.02.2019
95	UPRVUNL	PARICHHA TPS	Uttar Pardesh	5	250	**24-05-2012**	28-02-2022		28/02/2022	N	0	Part -1 Techno Comm Bid opened on 22.02.2019
96	UPRVUNL	PARICHHA TPS	Uttar Pardesh	6	250	**11-03-2013**	31-12-2021		31/12/2021	N	0	Part -1 Techno Comm Bid opened on 22.02.2019
97	NTPC	Meja STPP	Uttar Pardesh	1	660	**30-03-2018**				N	0	FGD will award in LOT-1A of NTPC

Annexure- V

S.no	Regio	State	Sector	Developer	Organisation	Name of Project	Fuel Used	Unit No.	Total Capac	Remark
1	NR	Rajasthan	State Sector	Rajasthan Rajya Vidyut Utpadan Nigam	RRVUNL	Glndertified for retirement	Lignite	1	125	Unit having CFBC Boiler
2	NR	Rajasthan	State Sector	Rajasthan Rajya Vidyut Utpadan Nigam	RRVUNL	Glndertified for retirement	Lignite	2	125	Unit having CFBC Boiler
3	NR	Rajasthan	Private Sector	Raj West Power LTD. (JSW)	RWPL (JSW)	JALIPA KAPURDI TPP	Lignite	1	135	Unit having CFBC Boiler
4	NR	Rajasthan	Private Sector	Raj West Power LTD. (JSW)	RWPL (JSW)	JALIPA KAPURDI TPP	Lignite	2	135	Unit having CFBC Boiler
5	NR	Rajasthan	Private Sector	Raj West Power LTD. (JSW)	RWPL (JSW)	JALIPA KAPURDI TPP	Lignite	3	135	Unit having CFBC Boiler
6	NR	Rajasthan	Private Sector	Raj West Power LTD. (JSW)	RWPL (JSW)	JALIPA KAPURDI TPP	Lignite	4	135	Unit having CFBC Boiler
7	NR	Rajasthan	Private Sector	Raj West Power LTD. (JSW)	RWPL (JSW)	JALIPA KAPURDI TPP	Lignite	5	135	Unit having CFBC Boiler
8	NR	Rajasthan	Private Sector	Raj West Power LTD. (JSW)	RWPL (JSW)	JALIPA KAPURDI TPP	Lignite	6	135	Unit having CFBC Boiler
9	NR	Rajasthan	Private Sector	Raj West Power LTD. (JSW)	RWPL (JSW)	JALIPA KAPURDI TPP	Lignite	8	135	Unit having CFBC Boiler
10	NR	Rajasthan	Private Sector	Raj West Power LTD. (JSW)	RWPL (JSW)	JALIPA KAPURDI TPP	Lignite	7	135	Unit having CFBC Boiler
11	NR	Rajasthan	Central Sector	Neyveli Lignite Corporation LTD	NLC	Baarsingsar Lignite	Lignite	1	125	Unit having CFBC Boiler
12	NR	Rajasthan	Central Sector	Neyveli Lignite Corporation LTD	NLC	Baarsingsar Lignite	Lignite	2	125	Unit having CFBC Boiler
13	NR	Uttar Pradesh	Private Sector	Bajaj Energy Pvt. LTD.	BEPL	Barkhera TPS	Coal	1	45	Unit having CFBC Boiler
14	NR	Uttar Pradesh	Private Sector	Bajaj Energy Pvt. LTD.	BEPL	Barkhera TPS	Coal	2	45	Unit having CFBC Boiler
15	NR	Uttar Pradesh	Private Sector	Bajaj Energy Pvt. LTD.	BEPL	Kambarkhera TPS	Coal	1	45	Unit having CFBC Boiler
16	NR	Uttar Pradesh	Private Sector	Bajaj Energy Pvt. LTD.	BEPL	Kambarkhera TPS	Coal	2	45	Unit having CFBC Boiler
17	NR	Uttar Pradesh	Private Sector	Bajaj Energy Pvt. LTD.	BEPL	Kundarki TPS	Coal	1	45	Unit having CFBC Boiler
18	NR	Uttar Pradesh	Private Sector	Bajaj Energy Pvt. LTD.	BEPL	Kundarki TPS	Coal	2	45	Unit having CFBC Boiler
19	NR	Uttar Pradesh	Private Sector	Bajaj Energy Pvt. LTD.	BEPL	Maqsoodpur TPS	Coal	1	45	Unit having CFBC Boiler
20	NR	Uttar Pradesh	Private Sector	Bajaj Energy Pvt. LTD.	BEPL	Maqsoodpur TPS	Coal	2	45	Unit having CFBC Boiler
21	NR	Uttar Pradesh	Private Sector	Bajaj Energy Pvt. LTD.	BEPL	Utraula TPS	Coal	1	45	Unit having CFBC Boiler
22	NR	Uttar Pradesh	Private Sector	Bajaj Energy Pvt. LTD.	BEPL	Utraula TPS	Coal	2	45	Unit having CFBC Boiler
23	NR	Haryana	State Sector	Haryana Power Copration Power Ltd	HPGCL	Panipat TPS	Coal	5	210	Unit that have not submitted FGD plan
24	NR	Rajasthan	State Sector	Rajasthan Rajya Vidyut Utpadan Nigam	RRVUNL	Kota TPS	Coal	1	110	Unit that have not submitted FGD plan
25	NR	Rajasthan	State Sector	Rajasthan Rajya Vidyut Utpadan Nigam	RRVUNL	Kota TPS	Coal	2	110	Unit that have not submitted FGD plan
26	NR	Rajasthan	State Sector	Rajasthan Rajya Vidyut Utpadan Nigam	RRVUNL	Kota TPS	Coal	3	210	Unit that have not submitted FGD plan
27	NR	Rajasthan	State Sector	Rajasthan Rajya Vidyut Utpadan Nigam	RRVUNL	Kota TPS	Coal	4	210	Unit that have not submitted FGD plan
28	NR	Uttar Pradesh	State Sector	UP Rajya Vidyut Utpadan Nigam LTD	UPRVUNL	Harduaganj TPS	Coal	7	105	Unit that have not submitted FGD plan
29	NR	Uttar Pradesh	State Sector	UP Rajya Vidyut Utpadan Nigam LTD	UPRVUNL	Obra TPS	Coal	7	94	Unit that have not submitted FGD plan
30	NR	Uttar Pradesh	State Sector	UP Rajya Vidyut Utpadan Nigam LTD	UPRVUNL	Parichha TPS	Coal	1	110	Unit that have not submitted FGD plan
31	NR	Uttar Pradesh	State Sector	UP Rajya Vidyut Utpadan Nigam LTD	UPRVUNL	Parichha TPS	Coal	2	110	Unit that have not submitted FGD plan
32	NR	Delhi	State Sector	Indraprastha Power Generation Co Ltd.	IPGCL	Rajghat TPS	Coal	1	67.5	Unit not in operation
33	NR	Delhi	State Sector	Indraprastha Power Generation Co Ltd.	IPGCL	Rajghat TPS	Coal	2	67.5	Unit not in operation
									3434	

Annexure-VI

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

उत्तरी क्षेत्रीय भार प्रेशण 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.nrldc.org, www.nrldc.in, Tel.: 011- 26519406, 26523869, Fax : 011- 26852747

संदर्भ: उक्षेभाप्रेके/संचालनप्रणाली-II/TS-16/ दिनांक: 09 मई 2019

सेवा में,

वितरण सूची के अनुसार

विषय: Report on the mock testing of 765 kV Agra-Gwalior SPS with revised logic at Agra (PG)
संदर्भ: NRPC letter No.-NRPC/ OPR/107/03/2019/4040-4049 dt 26.04.19

महोदय,

The mock testing of 765 kV Agra-Gwalior System Protection Scheme (SPS) was conducted on 01st May 2019 in line with the decision of Operation Coordination Committee (OCC) of Northern Region and above referred letter from NRPC. Before the testing as well during the testing a high level of support and coordination was extended by all the stakeholders. The testing of the scheme was by and large OK with few observations. A brief report on the SPS testing is attached as **Annex-I**.

धन्यवाद,

भवदीय

(राजीव पोरवाल)
महाप्रबंधक (प्रणाली प्रचालन) 09/05/19

प्रतिलिपि विनम्र सूचनार्थ:

1. सदस्य सचिव, उत्तर क्षेत्रीय विद्युत समिति, 18ए, कुतब इंस्टीट्यूशनल एरिया, नई दिल्ली- 110 016
2. निदेशक (SO), पोसोको, बी-9, कुतुब इन्स्टीट्यूशनल एरिया, नई दिल्ली -110 016
3. कार्यकारी निदेशक, पश्चिमी क्षेत्रीय भार प्रेषण केंद्र, F-3, सेंट्रल रोड, एमआईडीसी एरिया, मरोल, अंधेरी (ईस्ट), मुंबई- 400 093

वितरण सूची:

1. निदेशक (प्रचालन), सौदामनी, प्लॉट नंबर-2, सैक्टर-29, ईफको चौक के पास, गुड़गाँव (हरियाणा) - 122 001
2. प्रबंधक निदेशक (NR-1), पावर ग्रिड, बी-9, कुतुब इन्स्टीट्यूशनल एरिया, नई दिल्ली -110 016
3. प्रबंधक निदेशक (NR-2), पावर ग्रिड, ग्रिड भवन, रेल हैड कॉम्प्लेक्स, जम्मू- 180 012
4. प्रबंधक निदेशक (NR-3), पावर ग्रिड, 12, महाराणा प्रताप मार्ग, सिकंदर बाग चौराहा के पास, लखनऊ- 226 001
5. अध्यक्ष एवं प्रबंध निदेशक, पंजाब स्टेट ट्रांसमिशन कार्पोरेशन लिमिटेड, द मॉल, पटियाला (पंजाब)- 147 001
6. मुख्य अभियंता (SLDC), SLDC बिल्डिंग, 220 kV ग्रिड स्टेशन के पास, पंजाब स्टेट ट्रांसमिशन कार्पोरेशन लिमिटेड, अबलोवल, पटियाला- 147 001
7. प्रबंधक निदेशक, DTL, शक्ति सदन बिल्डिंग, कोटला रोड, नई दिल्ली-110002
8. महाप्रबंधक (SLDC), DTL, SLDC बिल्डिंग, 33 केवी सब-स्टेशन बिल्डिंग, मिन्टो रोड, नई दिल्ली-110002
9. प्रबंधक एवं अध्यक्ष निदेशक, RRVPNL (राजस्थान राज्य विद्युत प्रषारण निगम लिमिटेड), विद्युत भवन, जनपथ, जयपुर-302005
10. मुख्य अभियंता (LD), SLDC, RRVPNL (राजस्थान राज्य विद्युत प्रषारण निगम लिमिटेड), अजमेर रोड, हीरापुरा, जयपुर-302024
11. प्रबंधक एवं अध्यक्ष निदेशक, HVPNL, शक्ति भवन, सैक्टर-6, पंचकुला, अम्बाला-134109
12. मुख्य अभियंता (SO & SLDC), HVPNL, शक्ति भवन, सैक्टर6-, पंचकुला, अम्बाला-134109
13. प्रबंधक एवं अध्यक्ष निदेशक, UPPTCL, शक्ति भवन, 14-अशोक मार्ग, लखनऊ-226001
14. निदेशक (SLDC), विभूति खण्ड, फेज-2, गोमती नगर, लखनऊ-226010, उत्तर प्रदेश
15. मुख्य अभियंता (पावर सिस्टम), 5th फ्लोर, UPPTCL, शक्ति भवन, 14-अशोक मार्ग, लखनऊ- 226001, उत्तर प्रदेश

Annex-I

NRLDC report on mock testing of Agra-Gwalior SPS held on 01st May 2019

As per letter No. NRPC/OPR/107/03/2019/4040-4049 dt 26.04.2019 from SE (O) NRPC, a mock testing of SPS for 765 kV Agra-Gwalior was proposed on 30th Apr 2019. However, it was postponed to 01st May 2019 in view of requirement of shutdown of 765 kV Gwalior bays at Agra end by POWERGRID for affecting changes in the logic (CT input to PLC controller were required to be changed) as per revised scheme.

The logic of the revised scheme tested is enclosed as **Annex-A**. The utility wise detailed observations are enclosed as **Annex-B.** The observations for generation backing down in WR generating units as informed by WRLDC is enclosed as **Annex-C**.

Mock testing of 765 kV Agra-Gwalior SPS was conducted for all four condition and signal was sent to all the location except 220 kV Nara (UP). Consolidated detail is tabulated below:

Condition	Time of mock testing	Logic	Action in revised SPS	Outcome after SPS testing
1	**13:07hrs**	When both ckts are in service and total steady state flow on 765 kV Gwalior to Agra is more than 4000 MW for a period of 10 seconds	Shed loads in load group C&D	Signal sent to all the location comes under load group C&D
2	**13:38hrs**	When only one ckt is in service and flow on 765 kV Gwalior to Agra is more than 3000MW for a period of 5 seconds	Shed loads in load group C&D	Signal sent to all the location comes under load group C&D
3	**14:20hrs**	Steady state voltage at 400kV Agra less than 380 kV & more than 50kV for a period of 10secondsdirection of power flows is WR to NR)	Shed loads in load group C&D	Signal sent to all the location comes under load group C&D

5	**15:30hrs**	Reduction of import by NR on 765 kV Agra-Gwalior Ckt-1 & II by more than or equal to 3000 MW. (The sum of flows on these circuits would be continuously compared with the sum of flows two (2) seconds earlier and the SPS would activate if the difference crosses 3000 MW).	Shed loads in Group C, D, E and F. Additional loads of 1000 MW (in H,I,J&K load group). Automatically back down 1000 MW generation in WR in the shortest possible time at Vindhyachal, Sasan and CGPL Mundra.	Signal sent to all the location except for 220 kV Nara (UP) due to communication problem, however issue has been resolved on the same date at 16:07hrs. SPS signal also sent to generators in Western Region

Mock testing report has been received from most of the utilities except from some location like Bhiwani (BBMB), Charkhi Dadri (BBMB) and Hisar (PG) etc.

Following are the observations based on input reports from the different utilities:

- Actions to be taken by POWERGRID:
  - Communication issue resulting in major DTPC alarm at Nara. (However, communication issue was reportedly resolved in the evening of the same day at 1607hrs).
  - Counter at 220 kV Nara (UP), Narwana (Haryana) and Jamsher (Punjab) did not increase and therefore to be checked and corrected.
  - 66 kV Sarinh feeder is yet to be wired (Cable is yet to be laid for 66 kV feeder at 220 kV Laltokalan station).
  - Two DTPC are installed at Beawar (Rajasthan) station but one DTPC did not receive the signal, therefore 132 kV GSS Ber Jaitaran and 132 KV GSS Asind feeders connected to this DTPC would not trip. (DTPC is to be wired for input signal)
  - 220/132 kV Ratangarh (Sardar Sahar ckt): It's mapped for load Group-B but DTPC is not found at Ratangarh site. DTPC location to be checked and reported.

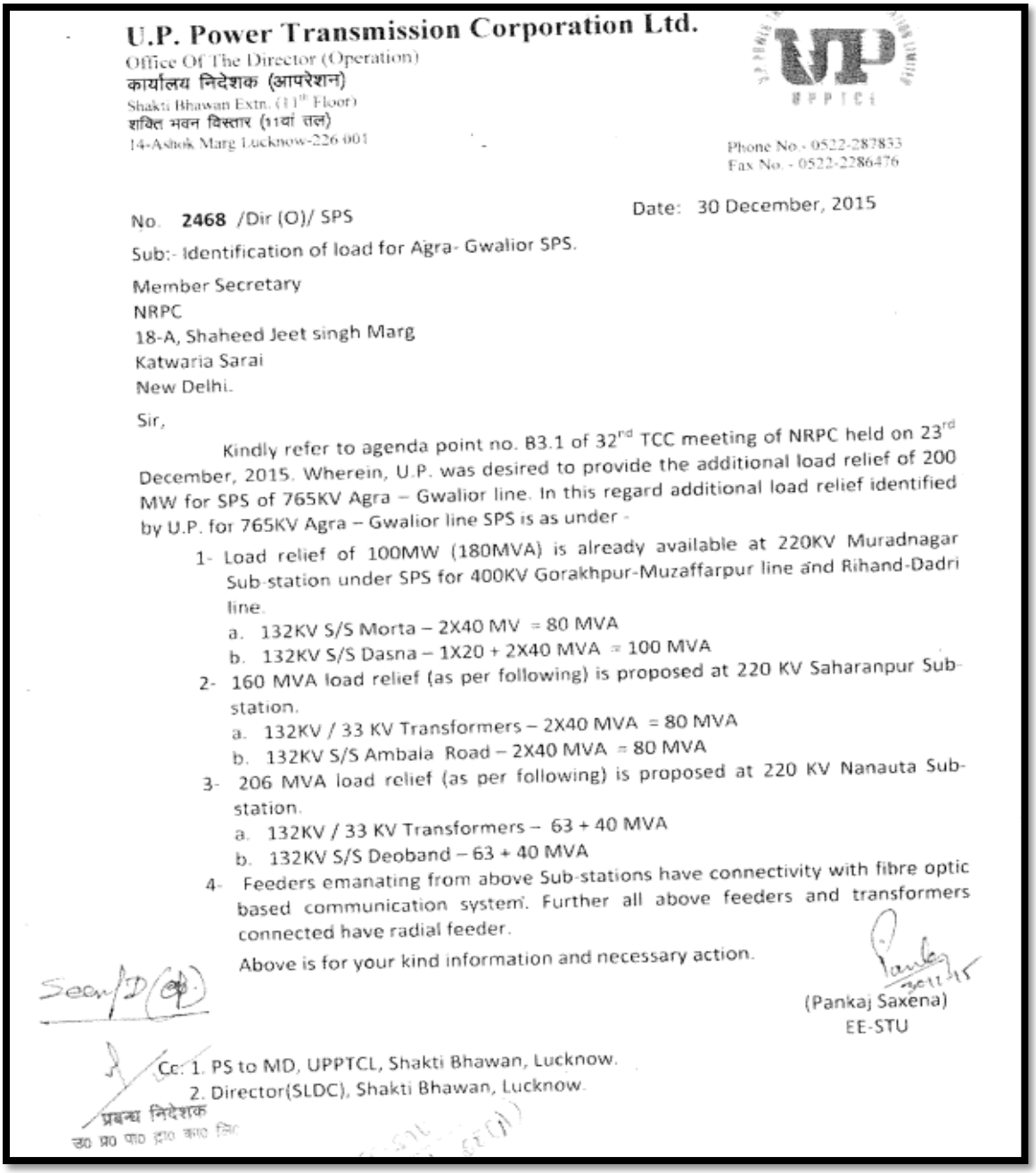
- Punjab:
  - At 220 kV Dhandhari-2: Failure of DC supply at 220 kV Dhandhari-2 before the testing resulted into DTPC major alarm, however DC supply to DTPC was restored before testing of condition-5 in which signal extended to Dhandhari-2
  - At 220 kV Jamsher:
    - 66 kV Nakodar ckt-1 & 2 was non-radial feeder
    - At the time of mock testing, load on 66kV Nakodar ckt-1 & 2 was nil against planned load relief of 100MW (minimum).
    - Display of DTPC Counter was faulty.
  - At 220 kV Ablowal: At the time of mock testing, load on 66 kV Barn, Passiana-1 was nil against planned load relief of 18MW (minimum).
  - At 220 kV Bahadurgarh (Bhateri):
    - 66 kV Ghanour feeder was non-radial feeder.

        - 66kV Patiala feeders was not wired for tripping.
        - At the time of mock testing, total load wired under SPS scheme at Bahadurgarh station was ~43MW against planned load relief of 135MW (minimum).
    - At Mandi Gobindgarh2:
        - 66kV Grain market feeder was not wired for tripping.
        - At the time of mock testing, total load on the feeders wired under SPS scheme at Mandi Gobindgarh 2 station was ~61MW against planned load relief of 90MW (minimum).
    - At Mandi Gobindgarh1: Is 66kV Chourwala ckt-2 and Focal Point ckt is wired in old SPS scheme of Agra-Gwalior?
    - At Mohali-I:
        - Clarity require from Punjab for feeders connected at Mohali-I in old scheme and new scheme.
        - Feeders connected on DTPC under DIP-5000 scheme are non-radial in nature.
    - Planned load relief of Ajitwal station is still pending (at the time of mock testing load was around 15MW)

- Haryana:
    - Details pending from BBMB (except Samaypur) and POWERGRID station (Hisar). It's responsibility of Haryana to collect the information and share the details with NRLDC/ NRPC.
    - 220 kV Fatehabad (PG): 220 kV Fatehabad (PG)-Fatehabad (HVPNL) ckt-1 &2 were non-radial in nature.
    - 132 kV PTPS: Feeders were non-radial in nature.
    - Narwana: Display of DTPC Counter was faulty.
    - What is the status of feeders & ICTs (132kV Dadri city, 132kV Matenhail, 132kV Kalanaur, 132kV Bahu, 132/33kV T/F 20/25MVA, 132/133V T/F 16/20 MVA) from Charkhi Dadri connected in load Group-G, which is used in Balia-Bhiwadi SPS scheme?

- Rajasthan:
    - Total 362 MW load shedding is planned under Agra-Gwalior SPS scheme against target of 550MW. It seems Rajasthan has taken lower load relief in planning itself than how target load relief will be achieved.
    - 220/132 kV Ratangarh (Sardar Sahar ckt):
        - It's mapped for load Group-B but DTPC is not found at Ratangarh site.
        - 132 kV sardar Sahar ckt was non-radial in nature.
    - 220kV Ratangarh: 132 kV Fatehpur ckt was non-radial in nature.
    - 220 kV Merta: 132 kV Lamba+Gotan and Kuchera needs to be wired from DTPC NSD-70D at Merta, so that these feeders will also be tripped in case of tripping operation of load group C&D.
    - 220 kV Alwar: 132 kV Bansur feeder was non-radial in nature.
    - 220 kV Debari: 132kV Bhatewar feeder was non-radial in nature (132kV Bhatewar fed from 220 kV GSS Nimbahera due to system constraints).

- Uttar Pradesh:
    - 220 kV Modipuram:
        - 132kV Kankankhera feeder was non-radial in nature.
        - Lower load relief during actual operation on 25th Mar 2019.
    - 220 kV Mainpuri: At the time of mock testing, total load on the feeders wired under SPS scheme at Mainpuri (UP) station was ~33MW against planned load relief of 50MW (minimum).
    - 220 kV Nara:
        - Communication issue resulting in major DTPC alarm at Nara. (This issue related to POWERGRID)
        - Display of DTPC Counter was faulty
    - 220 kV Nanauta:
        - 132kV Deoband line was non-radial in nature.
        - At the time of mock testing, total load on the feeders wired under SPS scheme at Nanauta (UP) station was ~60MW against planned load relief of 195MW (minimum).
    - 220 kV Saharanpur:
        - 132kV Ambala Road was non-radial in nature.
        - At the time of mock testing, total load on the feeders wired under SPS scheme at Saharanpur (UP) station was ~86MW against planned load relief of 152MW (minimum).
    - Feeders name from 220/132 kV Muradnagar old station to be informed to NRLDC/ NRPC.
    - As per UPPTCL details of additional load shedding of 200MW, load relief figure was calculated on the basis of summation of ICT MVA capacity but actual load flow on these feeders/ ICTs are well below these values. UPPTCL shall provide feeder/ICT wise details of minimum load on the feeders or ICT mapped in SPS scheme. UPPTCL letter submitted to NRPC is as below:



U.P. Power Transmission Corporation Ltd.

Office Of The Director (Operation)
कार्यालय निदेशक (आपरेशन)
Shakti Bhawan Extn. (11th Floor)
शक्ति भवन विस्तार (११वां तल)
14-Ashok Marg Lucknow-226 001

UPPTCL

Phone No.- 0522-287833
Fax No. - 0522-2286476

No. **2468** /Dir (O)/ SPS

Date: 30 December, 2015

Sub:- Identification of load for Agra- Gwalior SPS.

Member Secretary
NRPC
18-A, Shaheed Jeet singh Marg
Katwaria Sarai
New Delhi.

Sir,

Kindly refer to agenda point no. B3.1 of 32rd TCC meeting of NRPC held on 23rd December, 2015. Wherein, U.P. was desired to provide the additional load relief of 200 MW for SPS of 765KV Agra – Gwalior line. In this regard additional load relief identified by U.P. for 765KV Agra – Gwalior line SPS is as under -

1- Load relief of 100MW (180MVA) is already available at 220KV Muradnagar Sub-station under SPS for 400KV Gorakhpur-Muzaffarpur line and Rihand-Dadri line.
   a. 132KV S/S Morta – 2X40 MV = 80 MVA
   b. 132KV S/S Dasna – 1X20 + 2X40 MVA = 100 MVA
2- 160 MVA load relief (as per following) is proposed at 220 KV Saharanpur Sub-station.
   a. 132KV / 33 KV Transformers – 2X40 MVA = 80 MVA
   b. 132KV S/S Ambala Road – 2X40 MVA = 80 MVA
3- 206 MVA load relief (as per following) is proposed at 220 KV Nanauta Sub-station.
   a. 132KV / 33 KV Transformers – 63 + 40 MVA
   b. 132KV S/S Deoband – 63 + 40 MVA
4- Feeders emanating from above Sub-stations have connectivity with fibre optic based communication system. Further all above feeders and transformers connected have radial feeder.

Above is for your kind information and necessary action.

(Pankaj Saxena)
EE-STU

Cc: 1. PS to MD, UPPTCL, Shakti Bhawan, Lucknow.
2. Director(SLDC), Shakti Bhawan, Lucknow.

प्रबन्ध निदेशक
उ0 प्र0 पा0 ट्रा0 कार्प लि0

- Delhi:
  - Bamnauli (DTL): 220 kV Bamnauli-Pappankalan ckt-1 & 2 were non-radial in nature.

The aforesaid points need to be deliberated in next OCC meeting and SPS load groups also to be finalized with the input of all the concerned utilities.

Annex-A

Revised Logic of SPS for 765 kV Agra-Gwalior (As approved in 32nd TCC/36th NRPC meetings)

Sr. No	Revised Logic	Action in revised SPS
1	When both ckts are in service and total steady state flow on 765 kV Gwalior to Agra is more than 4000 MW for a period of 10 seconds	Shed loads in Group C, D.
2	When only one ckt is in service and flow on 765 kV Gwalior to Agra is more than 3000MW for a period of 5 seconds	Shed loads in Group C, D.
3	Steady state voltage at 400kV Agra less than 380 kV & more than 50kV for a period of 10secondsdirection of power flows is WR to NR)	Shed loads in Group C, D.
5	Reduction of import by NR on 765 kV Agra-Gwalior Ckt-1 & II by more than or equal to 3000 MW. (The sum of flows on these circuits would be continuously compared with the sum of flows two (2) seconds earlier and the SPS would activate if the difference crosses 3000 MW).	Shed loads in Group C, D, E and F. Additional loads of 500-1000 MW. Automatically back down 1000 MW generation in WR in the shortest possible time at Vindhyachal, Sasan and CGPL Mundra.

Annex-B

Annex-II

Format for submission of Information regarding load shedding (POWERGRID)

Name of Sub-station: AGRA

Name of the Utility: POWERGRID

Name of the Feeder	Whether Feeder is radial or not(Y/N)	Initial Counter Reading	Counter Reading after Condition 1	Counter Reading after Condition 2	Counter Reading after Condition 3	Counter Reading after Condition 4	Counter Reading after Condition 5	Flow on the feeder at the time of receipt of signal (MW)
–	–	0						
–	–							
–	–							

attached separately

Revised Logic of SPS for 765 kV Agra-Gwalior

Sr. No	Revised Logic	Action in revised SPS
1	When both ckts are in service and total steady state flow on 765 kV Gwalior to Agra is more than 4000 MW for a period of 10 seconds	Shed loads in Group C, D.
2	When only one ckt is in service and flow on 765 kV Gwalior to Agra is more than 3000MW for a period of 5 seconds	Shed loads in Group C, D.
3	Steady state voltage at 400kV Agra less than 380 kV & more than 50kV for a period of 10secondsdirection of power flows is WR to NR)	Shed loads in Group C, D.
5	Reduction of import by NR on 765 kV Agra-Gwalior Ckt-1 & II by more than or equal to 3000 MW. (The sum of flows on these circuits would be continuously compared with the sum of flows two (2) seconds earlier and the SPS would activate if the difference crosses 3000 MW).	Shed loads in Group C, D, E and F. Additional loads of 500-1000 MW in Group H, I, J and K. Automatically back down 1000 MW generation in WR in the shortest possible time at Vindhyachal, Sasan and CGPL Mundra.

(Signature of sub-station officer/in-charge with Name, Designation and Mobile No)

S. SRINIVAS
DGM- AGRA S/S

Annex-B

Counter Increment at Agra POWERGRID during Mock Testing of Agra Gwalior SPS dated 01.05.2019

	ABB DTPC-1 (To Dadri) -				ABB DTPC-2 (To Sasan)	Alstom DTPC-1 (To Dadri)		Alstom DTPC (To Mundra/Vindhyanagar/Korba)	
	Code A (Case-1)	Code B (Case 2)	Code D (Case-2)	Code E (Case-2)	Code B (Case-2)	Code 1 (Case-1)	Code 2 (Case-2)	Code 1 (Case-2)	Code 1 (Case-2)
Initial counter reading	0	0	0	0	0	0	0	0	0
Counter reading after Condition 1	1	0	0	0	0	1	0	0	0
Counter reading after Condition 2	2	0	0	0	0	2	0	0	0
Counter reading after Condition 3	3	0	0	0	0	3	0	0	0
Counter reading after Condition 4	3	1	1	1	1	3	1	1	1

(Signature of sub-station officer/in-charge with Name, Designation and Mobile No.

SRINIVAS SUROJ
DGM- AGRA S/S

Annex-B

Format for submission regarding load shedding (Punjab)

Name of Sub-Station : **220 kV S/S Lalton kalan**

Name of Utility : **PSTCL**

Name of feeder	Whether Feeder is radial or not (YN)	Intail counter reading	Counter reading after condition:1	Counter reading after condition:2	Counter reading after condition:3	Counter reading after condition:4	Counter reading after condition:5	Flow on the feeder at the time of receipt of signal (M/W)
66 kV Gill road CKT:1	Y	12	13	14	15	18	20	44.92
66 kV Gill road CKT:2	Y	12	13	14	15	18	20	39.6
66 kV Dugri	Y	12	13	14	15	18	20	13.91

Note: The cable has not been laid for 66 kV Sarinh Ckt by PGCIL

2) Relays were unblocked before condition 5 as desired by NRLDC and all 3 66kV Circuits were tripped on command for Mock Testing.

Sr Xen/ P&M Divn.
PSTCL, Lalton Kalan

Nameof Sub-station: **220 kV Mandi GOBINDGARH-1**

Nameof the Feeder	Whether Feederis radialor not(Y/N)	Initial Counter Reading	Counter Reading after Condition1	CounteReadingafterCondition2	Counter ReadingafterCondition3	Counter Reading after Condition4	Counter Reading after Condition5	Flowonthefeederatthetimeofreceiptofsignal(MW)
66KV Focal Point	Y	**81**	**82**	**84**	**87**	**89**	**94**	**20.58**
66KV Talwara-1	Y	**35**	**36**	**38**	**41**	**43**	**48**	**22.86**
66KV Talwara-2	Y	**35**	**36**	**38**	**41**	**43**	**48**	**22.86**
66KV Chaurwala 1 1	Y	**57**	**58**	**60**	**63**	**65**	**70**	**2.29**
66KV Chaurwala 2 2	Y	**81**	**82**	**84**	**87**	**89**	**94**	**3.43**

Nameof Sub-station: **220 kV Ablowal**

Nameof the Feeder	Whether Feederis radialor not(Y/N)	Initial Counter Reading	Counter Reading after Condition1	CounteReadingafterCondition2	Counter ReadingafterCondition3	Counter Reading after Condition4	Counter Reading after Condition5	Flowonthefeederatthetimeofreceiptofsignal(MW)
66 kV Baran	Y	**2**	**NA**	**NA**	**NA**	**NA**	**3**	**Nil**
66 kV Passiana	Y	**2**	**NA**	**NA**	**NA**	**NA**	**3**	**Nil**

Nameof Sub-station: **220 kV Ajitwal**

Nameof the Feeder	Whether Feederis radialor not(Y/N)	Initial Counter Reading	Counter Reading after Condition1	CounteReadingafterCondition2	Counter ReadingafterCondition3	Counter Reading after Condition4	Counter Reading after Condition5	Flowonthefeederatthetimeofreceiptofsignal(MW)
66 kV Chogawan 1	Y	**0**	**NA**	**NA**	**NA**	**NA**	**1**	**2.93**
66 kV Passiana	Y	**0**	**NA**	**NA**	**NA**	**NA**	**1**	**3.16**
66 kV Galib Kalan	Y	**0**	**NA**	**NA**	**NA**	**NA**	**1**	**2.82**
66 kV Daudhar	Y	**0**	**NA**	**NA**	**NA**	**NA**	**1**	**6.32**

Nameof Sub-station: **220 kV Bahadurgarh (Bhateri)**

Nameof the Feeder	Whether Feederis radialor not(Y/N)	Initial Counter Reading	Counter Reading after Condition1	CounteReadingafterCondition2	Counter ReadingafterCondition3	Counter Reading after Condition4	Counter Reading after Condition5	Flowonthefeederatthetimeofreceiptofsignal(MW)
66 kV Bahadurgarh-1	Y	**3**	**NA**	**NA**	**NA**	**NA**	**4**	**7.20**
66 kV Ghanour	N	**2**	**NA**	**NA**	**NA**	**NA**	**3**	**3.49**
66 kV Barn-1	Y	**3**	**NA**	**NA**	**NA**	**NA**	**4**	**16.20**
66 kV Barn-2	Y	**2**	**NA**	**NA**	**NA**	**NA**	**3**	**16.20**

Nameof Sub-station: **220 kV Dhandhari Kalan-2**

Nameof the Feeder	Whether Feederis radialor not(Y/N)	Initial Counter Reading	Counter Reading after Condition1	CounteReadingafterCondition2	Counter ReadingafterCondition3	Counter Reading after Condition4	Counter Reading after Condition5	Flowonthefeederatthetimeofreceiptofsignal(MW)
66/11 kV 20MVA Transformer-2	Y	**0**	**NA**	**NA**	**NA**	**NA**	**1**	**9.73**
66/11 kV 20MVA Transformer-4	Y	**0**	**NA**	**NA**	**NA**	**NA**	**1**	**11.31**
66 kV Dhandhari-Sherpur ckt-1	Y	**0**	**NA**	**NA**	**NA**	**NA**	**1**	**44.13**
66 kV Dhandhari-Sherpur ckt-1	Y	**0**	**NA**	**NA**	**NA**	**NA**	**1**	**44.13**

There was DC supply problem wih DC supply to DTPC and Fibre Home. Supply to these was restored at 14:40 hrs before start of Condition-5

Annex-B

Format for submission regarding load shedding (Punjab)

Nameof Sub-station: **220 kV Mandi Gobindgarh-2**

Nameof the Feeder	Whether Feederis radialor not(Y/N)	Initial Counter Reading	Counter Reading after Condition1	CounteReadingafterCondition2	Counter ReadingafterCondition3	Counter Reading after Condition4	Counter Reading after Condition5	Flowonthefeederatthetimeofreceiptofsignal(MW)
66 kV Bhari line	Y	3	NA	NA	NA	NA	4	0.00
66/11 kV 20MVA Transformer-4	Y	3	NA	NA	NA	NA	4	1.37
66 kV Central S/S	Y	3	NA	NA	NA	NA	4	11.45
66/11 kV 20MVA Transformer-2	Y	3	NA	NA	NA	NA	4	8.01
66 kV Khanna-1	Y	3	NA	NA	NA	NA	4	10.50
66 kV Khanna-2	Y	3	NA	NA	NA	NA	4	10.50
66 kV Badeenpur	Y	3	NA	NA	NA	NA	4	13.74
66/11 kV 20MVA Transformer-6	Y	3	NA	NA	NA	NA	4	5.04

66 kV Bhari ckt was on standby during mock testing, so there was no load shedding

Nameof Sub-station: **220 kV Jamsher**

Nameof the Feeder	Whether Feederis radialor not(Y/N)	Initial Counter Reading	Counter Reading after Condition1	CounteReadingafterCondition2	Counter ReadingafterCondition3	Counter Reading after Condition4	Counter Reading after Condition5	Flowonthefeederatthetimeofreceiptofsignal(MW)
66 kV Nakodar-1	N	--	NA	NA	NA	NA	Counter Defective	Nil
66 kV Nakodar-2	N	--	NA	NA	NA	NA	Counter Defective	Nil

Nameof Sub-station: **220 kV Mohali-1 (NSD-570)**

Nameof the Feeder	Whether Feederis radialor not(Y/N)	Initial Counter Reading	Counter Reading after Condition1	CounteReadingafterCondition2	Counter ReadingafterCondition3	Counter Reading after Condition4	Counter Reading after Condition5	Flowonthefeederatthetimeofreceiptofsignal(MW)
66 kV Incomer C-1	Y	0	NA	NA	NA	NA	1	90.53
66 kV Incomer C-2	Y	0	NA	NA	NA	NA	1	53.10
66 kV Incomer C-3	Y	0	NA	NA	NA	NA	1	56.94
66 kV Chandigarh ckt-1	Y	0	NA	NA	NA	NA	1	36.46
66 kV Chandigarh ckt-2	Y	0	NA	NA	NA	NA	1	21.49
66 kV Chandigarh ckt-3	Y	0	NA	NA	NA	NA	1	22.72
66 kV Chandigarh ckt-4	Y	0	NA	NA	NA	NA	1	22.74

Note : Load on 66 kV Chandigarh ckts included in the load on 66 kV Incomers so net load shedding is 220.57MW

Nameof Sub-station: **220 kV Mohali-1 (DIP-5000)**

Nameof the Feeder	Whether Feederis radialor not(Y/N)	Initial Counter Reading	Counter Reading after Condition1	CounteReadingafterCondition2	Counter ReadingafterCondition3	Counter Reading after Condition4	Counter Reading after Condition5	Flowonthefeederatthetimeofreceiptofsignal(MW)
66 kV Incomer C-1	Y	0	NA	NA	NA	NA	1	90.53
66 kV Incomer C-2	Y	0	NA	NA	NA	NA	1	53.10
66 kV Incomer C-3	Y	0	NA	NA	NA	NA	1	56.94
66 kV Chandigarh ckt-1	Y	0	NA	NA	NA	NA	1	36.46

Annex-B

Submission of informatiion regarding mock testing for 765kV Agra Gwalior on 01.05.2019

Name of Utility **HVPNL (Haryana)**

Name of Substation	Whether feeder is Radial or not (Y/N)	**Initial Counter Reading**	**Counter reading after Condition 1**	**Counter reading after Condition 2**	**Counter reading after Condition 3**	**Counter reading after Condition 5**	**Flow on the feeder at the time of receipt of signal (MW)**
1 X 100 MVA, 220/132 kV TlF at 400 kV Dhanonda 220 kV Dhanonda-Lula Ahir ckt 1&2	Not reported	counter 0	First try 6 Second try 7	8	9	11	197
2 X 100 MVA 220/132 kV T/F- T-2 & T-3 at 220kV N/Majra	Not reported	counter 7	7	7	7	8	76
2 X 100 MVA 220/132 kV T/F at 132 kV Safidon	Not reported	counter 0	0	0	0	1	62
132kV Garhi,Tohana,Ukalana,Dhamtansahib, 132/33 20MVA,132/11 8MVA at 220kV Narwana	Not reported	counter 8	8	8	8	8	41
220kV PTPS 132kV PTPS- 132kV Chandauli &132kV Munak	Not reported	counter 0	0	0	0	1	36
TOTAL							**412**

Name of Substation:220 KV Samaypur
Name of Utility:BBMB

Name of the Feeder	Whether feeder is Radial or not (Y/N)	Initial Counter Reading	Counter Reading after Condition 1	Counter Reading after Condition 2	Counter Reading after Condition 3	Counter Reading after Condition 4	Counter Reading after Condition 5
220 KV Palwal I&II	Radial	71	80 13:12Hrs	81 13:40Hrs	82 14:20Hrs	83 14:42Hrs	84 15:32Hrs
Flow on the feeder at the time of receipt of signal (MW)-Palwal 1		79.31	96.55	110.34	106.89	103.44	113.79
Flow on the feeder at the time of receipt of signal (MW)-Palwal 2		103.44	127.58	96.55	93.1	96.55	117.24

Annex-B

Detail report of One to One testing of SPS on 765KV Agra- Gwalior Line on dated 01.05.2019 (Rajsthan details)

Name of GSS	Name of the Feeder	Whether Feeder is radial or not(Y/N)	Initial counter Reading	Counter reading after condition 1	Counter reading after condition 2	Counter reading after condition 3	Counter reading after condition 4	Counter reading after condition 5	Flow on the feeder at time of receipt of Signal (MW)
220 KV GSS Chittorgarh	133/33kV 40/50 MVA TR	Y	1	1	1	1		2	Cond. 5 - 10.5 MW
	133/33kV 20/25 MVA TR	Y	1	1	1	1		2	Cond. 5 - 17.4 MW
	132/11kV 6.3/8 MVA TR	Y	1	1	1	1		2	Cond. 5 - 0
	132kV Ajoliya Ka Khera + Bassi Line	Y	1	1	1	1		2	Cond. 5 - 34.2 MW
220 KV GSS Alwar	132 kv Alwar - Bansur	Y	16	17	18	19 & 20		21	132 kV Bansur fed from 220 kV GSS Bansur due to system constraints
	132 KV Alwar - Malakhera	Y	10	11	12	13 & 14		**15**	Cond.1 - 22 MW Cond.2- 20 MW Cond. 3 - 18 MW Cond. 5- 10 MW
	132 KV Alwar local	Y	68	68	68	68		69	Cond. 5- 84 MW
220 KV GSS Ratangarh	132 Kv Momasar + Patlisar	Y	1	1	1	1		2	Cond. 5- 37 MW
	132 Kv Fatehpur	Y	1	1	1	1		2	132 kV Fatehpur fed from 220 kV Laxmangarh due to system constraints
220 KV GSS Beawer	132 KV Masuda	Y	1	1	1	1		2	Cond 5 - 5 MW
	Local Load	Y	1	1	1	1		2	Cond 5- 63 MW
400 KV GSS Merta	132 Kv Merta City	N	36	44	46	48		49	Cond. 1 - 52 MW Cond. 2 - 54 MW Cond. 3 - 54 MW Cond. 5- 50 MW
	132 Kv Roon	Y							Cond. 1 - 8 MW Cond. 2 - 8 MW Cond. 3 - 4 MW Cond. 5 - 6 MW
220 KV GSS Kota	132 KV Nanta	Y	9	10	11	12 &13		14	Cond.1- 10.4 MW Cond.2- 10.05 MW Cond 3- 11.4 MW Cond 5- 11.35 MW
	132/33 Kv 40/50 MVA T/F	Y	2	3	4	5 & 6		7	Cond.1- 20.6 MW Cond.2- 21.5 MW Cond 3- 123.4 MW Cond 5- 123.1 MW
220 KV GSS Debari	132 KV Bhatewar	Y	35	0	0	0		36	132kV Bhatewar fed from 220 kV GSS Nimbahera due to system constraints
	132 KV Mavli	Y	26	0	0	0		27	Cond 5- 18 MW
220 kv gss Bhilwara	132 Kv GSS Danta	Y	0	0	0	0	0	1	Cond. 5 - 35 MW
	132 KV GSS Karera	Y	0	0	0	0	0	1	Cond. 5 - 33 MW
	132 KV GSS Gangapur	Y	0	0	0	0	0	1	Cond. 5 - 39 MW
	Local Load	Y	0	0	0	0	0	1	Cond. 5 - 50 MW

Annex-B

Format for submisssion of information regarding load shedding (UPPTCL)

Name of Sub-station : **220 KV Sub-station Saharanpur.** Name of Sub Station Incharge/ Mob No- Abhinav Garg/9412756282
Name of Utility : UPPTCL

Name of the Feeder	Whether Feeder is radial (Y/N)	Intial Counter Reading	Counter Reading after Condition 1	Counter Reading after Condition 2	Counter Reading after Condition 3	Counter Reading after Condition 4	Counter Reading after Condition 5	Flow on the feeder at the time of receipt of signal (MW)
40 MVA-I T/F	-	3	3	3	3	3	4	16.9 MW
63 MVA-II T/F	-	3	3	3	3	3	4	23.9 MW
132 KV Ambala Road line	N	3	3	3	3	3	4	45.3 MW

Name of Sub-station : **220 KV Sub-station Nanauta.** Name of Sub Station Incharge/ Mob No- Peetam Singh/9412756285
Name of Utility : UPPTCL

Name of the Feeder	Whether Feeder is radial (Y/N)	Intial Counter Reading	Counter Reading after Condition 1	Counter Reading after Condition 2	Counter Reading after Condition 3	Counter Reading after Condition 4	Counter Reading after Condition 5	Flow on the feeder at the time of receipt of signal (MW)
63 MVA-I	-	4	4	4	4	4	5	10.70 MW
63 MVA-II T/F	-	4	4	4	4	4	5	08.70 MW
132 KV Deoband line	N	4	4	4	4	4	5	42.01 MW

Name of Sub-station : **220 KV Sub-station Mainpuri** Name of Sub Station Incharge/ Mob No- P.R. Singh/9458096486
Name of Utility : UPPTCL

Name of the Feeder	Whether Feeder is radial (Y/N)	Intial Counter Reading	Counter Reading after Condition 1	Counter Reading after Condition 2	Counter Reading after Condition 3	Counter Reading after Condition 4	Counter Reading after Condition 5	Flow on the feeder at the time of receipt of signal (MW)
63 MVA-I	-	16	16	16	16	16	17	24 MW
63 MVA-II T/F	-	16	16	16	16	16	17	9 MW

Name of Sub-station : **220 KV Sub-station Nara** Name of Sub Station Incharge/ Mob No- Anurag Singh/9412749863
Name of Utility : UPPTCL

Name of the Feeder	Whether Feeder is radial (Y/N)	Intial Counter Reading	Counter Reading after Condition 1	Counter Reading after Condition 2	Counter Reading after Condition 3	Counter Reading after Condition 4	Counter Reading after Condition 5	Flow on the feeder at the time of receipt of signal (MW)
63 MVA-I	-	-	Counter Display defective at 220 KV Nara S/S since 07.01.16					29.22 MW
63 MVA-II T/F	-	-						25.10 MW
40 MVA T/F	-	-						Shut Down

Note :- DTPC major alarm problem at 220 KV Nara Substation was rectified by PGCIL on dated 29.04.19 but it was again occurred on dated 01.05.19. Major alarm problem was resolved by PGCIL engineer after mock testing at 16:10 hrs on dated 01.05.19.

Annex-B

Format for submisssion of information regarding load shedding (UPPTCL)

Name of Sub-station : **220 KV Sub-station Modipuram.** Name of Sub Station Incharge/ Mob No- Ravindra Dholka/9412749810

Name of Utility : UPPTCL

Name of the Feeder	Feeder is radial (Y/N)	Intial Counter Reading	Counter Reading after Condition 1		Counter Reading after Condition 2		Counter Reading after Condition 3		Counter Reading after Condition 4		Counter Reading after Condition 5	
			counter	Load	counter	Load	counter	Load	counter	Load	counter	Load
132 KV Sardhana	Y	10	11	20 MW	12	26 MW	13	29 MW	14	28 MW	15	25 MW
132 KV Kankerkhera	N	10	11	36 MW	12	38 MW	13	40 MW	14	40 MW	15	42 MW
132 KV Kapsad	Y	10	11	12 MW	12	12 MW	13	16 MW	14	18 MW	15	17 MW
132 KV KKR 2	Y	10	11	16 MW	12	15 MW	13	15 MW	14	14 MW	15	16 MW
40 MVA T/F 2	-	10	11	10 MW	12	11 MW	13	13 MW	14	12 MW	15	12 MW
63 MVA T/F 3	-	10	11	17 MW	12	20 MW	13	23 MW	14	21 MW	15	22 MW
33 KV Ladies Park	-	10	11	07 MW	12	07 MW	13	08 MW	14	08 MW	15	08 MW
33 KV Pallavpuram	-	10	11	06 MW	12	07 MW	13	07 MW	14	07 MW	15	08 MW
33 KV Siwaya	-	10	11	01 MW	12	01 MW	13	03 MW	14	03 MW	15	03 MW

Annex-B

Details received from Delhi (DTL)

Annex-II

Format for submission of Information regarding load shedding

Name of Sub-station: 400 kV Bamnauli
Name of the Utility: DTL

Name of the Feeder	Whether Feeder is radial or not(Y/N)	Initial Counter Reading	Counter Reading after Condition 1	Counter Reading after Condition 2	Counter Reading after Condition 3	Counter Reading after Condition 4	Counter Reading after Condition 5	Flow on the feeder at the time of receipt of signal (MW)
220kV PPK-I CKT-1	N	4	—	—	—	—	5	100 MW
220 kV PPK-I CKT-2	N	4	—	—	—	—	5	100 MW

Revised Logic of SPS for 765 kV Agra-Gwalior

Sr. No	Revised Logic	Action in revised SPS
1	When both ckts are in service and total steady state flow on 765 kV Gwalior to Agra is more than 4000 MW for a period of 10 seconds	Shed loads in Group C, D.
2	When only one ckt is in service and flow on 765 kV Gwalior to Agra is more than 3000MW for a period of 5 seconds	Shed loads in Group C, D.
3	Steady state voltage at 400kV Agra less than 380 kV & more than 50kV for a period of 10secondsdirection of power flows is WR to NR)	Shed loads in Group C, D.
5	Reduction of import by NR on 765 kV Agra-Gwalior Ckt-1 & II by more than or equal to 3000 MW. (The sum of flows on these circuits would be continuously compared with the sum of flows two (2) seconds earlier and the SPS would activate if the difference crosses 3000 MW).	Shed loads in Group C, D, E and F. Additional loads of 500-1000 MW in Group H, I, J and K. Automatically back down 1000 MW generation in WR in the shortest possible time at Vindhyachal, Sasan and CGPL Mundra.

(Signature of sub-station officer/in-charge with Name, Designation and Mobile No)

Amit G
09-05-2019
AM(T) Plot-I
#-9999535079

Annex-C

पावर सिस्टम ऑपरेशन कारपोरेशन लिमिटेड
(भारत सरकार का उद्यम)
POWER SYSTEM OPERATION CORPORATION LIMITED
(A Government of India Enterprise)

पश्चिम क्षेत्रीय भार प्रेषण केन्द्र
एफ-3, सेन्ट्रल रोड, एम्.आई.डी.सी. एरिया, मरोल, अन्धेरी (पूर्व), मुंबई - 400 093.
दुरभाष : 022-28202690 • फैक्स : 022-28235434, 28202630 • ई-मेल : wrldc@posoco.in
WESTERN REGIONAL LOAD DESPATCH CENTRE
F-3, Central Road, MIDC Area, Marol, Andheri (East), Mumbai – 400 093.
Phone : 022-28202690 • Telefax : 28235434, 28202630 • E-mail : wrldc@posoco.in
CIN : U40105DL2009GOI188682

WRLDC/SO-II/002/2019-01 Date: 02.05.2019

संदर्भ संख्या / Ref. No.

To

Member Secretary,
Western Region Power Committee
F-3 MIDC Area, Marol, Andheri East
Mumbai 400093

Sub: Report on the mock testing of 765kV Agra-Gwalior SPS for load shedding in NR and automatic generation backing down in WR generating stations conducted on 01.05.19

Ref: - NRPC letter No-NRPC/ OPR/107/03/2019/4040-4049 dt 26.04.19

Dear Sir,

This has reference to the above mentioned letter regarding mock testing of 765kV Agra-Gwalior SPS conducted on 01.05.19. The above SPS testing was conducted successfully on 01st May 2019 and all the four generators in Western Region i.e. CGPL, SASAN, NTPC Korba and NTPC Vindhyachal have received the signal for Condition 5 of WR-NR SPS. The report on the SPS testing is attached as annexure.

Thanking you

Yours faithfully,

Pushpa

(Pushpa. S)
General Manager (SO)

Copy to:-

1. CGM, NLDC, POSOCO, New Delhi.
2. ED, NRLDC, POSOCO, New Delhi.
3. MS, NRPC, New Delhi.

Annexo

Report on testing of 765 kV Agra-Gwalior SPS on 01-05-19

As per letter No. NRPC/OPR/107/03/2019/4040-4049 dt 26.04.2019 from SE (O) NRPC, a mock testing of SPS for 765 kV Gwalior-Agra was proposed on 30th April 2019. However due to shutdown requirement of 765kV Gwalior-Agra bays one by one for logic modification as suggested by NRPC, the above said testing was postponed to 01st May 2019.

WRLDC coordinated for condition-5 of 765kV Agra-Gwalior SPS i.e. "Reduction of import by NR on 765kV Agra-Gwalior-I&II by more than or equal to 3000 MW and action of 1000 MW automatic generation back down in WR" (Presently automatic generation back down is 500 MW in WR) with CGPL, SASAN, NTPC and POWERGRID. Code was issued from WRLDC Control room to CGPL, SASAN and NTPC to block the automatic backing down of generation during the mock drill.

Accordingly test signal for condition-5 of 765kV Agra-Gwalior SPS was sent from Agra end at 15:30hrs on 01st May 2019 as intimated by NRLDC and it was reported from CGPL, SASAN, KSTPS and VSTPS that SPS signals were received at their end. The confirmation mail received from CGPL, SASAN, KSTPS and VSTPS are attached as annexures 1, 2, 3 and 4 respectively.

WRLDC, Mumbai

Annexure 1: CGPL

Annex-III

Format for submission of Information regarding Generation Back down

Name of the Generating Station	Initial Counter reading	Counter Reading after condition 5
CGPL	15	16

Sr. No	Revised Logic	Actions in revised SPS
5	Reduction of import by NR on 765 kV Agra-Gwalior Ckt-1 & II by more than or equal to 3000 MW. (The sum of flows on these circuits would be continuously compared with the sum of flows two (2) seconds earlier and the SPS would activate if the difference crosses 3000 MW).	Shed loads in Group C, D, E and F. Additional loads of 500-1000 MW : Group H, I, J and K. Automatically back down 1000 MW generation in WR in the shortest possible time at Vindhyachal, Sasan and CGPL Mundra.

Name : Priyank Shah.
Desig. : Shift charge Engineer
Mobile : 9227891537

(Signature of generating station officer/in-charge with Name, Designation and Mobile No)

Annexure 2: SASAN

Annex-III

Format for submission of Information regarding Generation Back down

Name of the Generating Station	Initial Counter reading	Counter Reading after condition 5
SASAN	Code B 14	15

Sr. No	Revised Logic	Actions in revised SPS
5	Reduction of import by NR on 765 kV Agra-Gwalior Ckt-I & II by more than or equal to 3000 MW. (The sum of flows on these circuits would be continuously compared with the sum of flows two (2) seconds earlier and the SPS would activate if the difference crosses 3000 MW).	Shed loads in Group C, D, E and F. Additional loads of 500-1000 MW : Group H, I, J and K. Automatically back down 1000 MW generation in WR in the shortest possible time at Vindhyachal, Sasan and CGPL Mundra.

We received Generation Back down signal through Code B of DTPC related to Agra. There was no increment for DTPC related to Gwalior.

(Signature of generating station officer/in-charge with Name, Designation and Mobile No)

Raghavendra Jha

RAGHAWENDRA JHA
SENIOR MANAGER
9820359447.

Annexure 3: NTPC-KORBA

Mock Testing of Gwalior-Agra-SPS_01.05.2019

Name of the Generating station	Initial counter reading		Counter reaging after simulation of condition-5	
NTPC-Korba	Rx	Tx	Rx	Tx
	00 00 00 00	00 00 00 00	01 01 00 00	00 00 01 00

Yatish Tikaria
01/05/2019
YATISH TIKARIHA
AGM (Opn)
9425249891

Annexure 4: NTPC-VINDHYACHAL

Annex-III

Format for submission of Information regarding Generation Back down

Name of the Generating Station	Initial Counter reading	Counter Reading after condition 5
VSTPS Stage #03	5	4

Sr. No	Revised Logic	Actions in revised SPS
5	Reduction of import by NR on 765 kV Agra-Gwalior Ckt-I & II by more than or equal to 3000 MW. (The sum of flows on these circuits would be continuously compared with the sum of flows two (2) seconds earlier and the SPS would activate if the difference crosses 3000 MW).	Shed loads in Group C, D, E and F. Additional loads of 500-1000 MW : Group H, I, J and K. Automatically back down 1000 MW generation in WR in the shortest possible time at Vindhyachal, Sasan and CGPL Mundra.

21/5/2019

मुनेन्द्र शर्मा
MUNENDRA SHARMA
उप महाप्रबंधक (विद्युत अनुरक्षण)
DGM (O&M-EMD)
एनटीपीसी लि –विंध्याचल
N[illegible] Ltd.-Vindhyachal

(Signature of generating station officer/in-charge with Name, Designation and Mobile No)

Mobile:- 9650323666