



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

सं: उ.क्षे.वि.स./प्रचालन/106/01/2021/9767-9808

दिनांक: 14.10.2021

विषय: प्रचालन समन्वय उप-समिति की 188^{वीं} बैठक की कार्यसूची।
Subject: Agenda of 188th OCC meeting.

प्रचालन समन्वय उप-समिति की 188^{वीं} बैठक का आयोजन वीडियो कॉन्फ्रेंसिंग के माध्यम से दिनांक 22.10.2021 को 10:30 बजे से किया जायेगा। उक्त बैठक की कार्यसूची उत्तर क्षेत्रीय विद्युत् समिति की वेबसाइट <http://164.100.60.165/> पर उपलब्ध है।

बैठक में सम्मिलित होने के लिए लिंक व पासवर्ड सभी सदस्यों को ई-मेल द्वारा प्रदान किया जाएगा।

कृपया बैठक में उपस्थित होने की सुविधा प्रदान करें।

188th meeting of the Operation Co-ordination sub-committee will be conducted through Video Conferencing on 22.10.2021 from 10:30 Hrs. The agenda of this meeting has been uploaded on the NRPC web-site <http://164.100.60.165/>.

The link and password for joining the meeting will be e-mailed to respective e-mail IDs in due course.

Kindly make it convenient to attend the meeting.

-sd-

(सौमित्र मजूमदार)
अधीक्षण अभियंता (प्रचालन)

सेवार्मे : प्रचालन समन्वय उप समिति के सभी सदस्य।

To : All Members of OCC

1. Confirmation of Minutes

The minutes of the 187th OCC meeting which was held on 21.09.2021 through video conferencing were issued vide letter of even number dated 12.10.2021.

Sub-committee may deliberate and kindly confirm the Minutes.

2. Review of Grid operations of September 2021

2.1 Power Supply Position (Provisional) for September 2021

Anticipated Power Supply Position v/s Actual Power Supply Position (Provisional) of Northern Region during the month of September-2021 is as under:

State / UT	Req. / Avl.	Energy (MU)			Peak (MW)		
		Anticipated	Actual	% variation	Anticipated	Actual	% variation
CHANDIGARH	(Avl)	170	166	-2.4%	350	363	3.7%
	(Req)	150	166	10.6%	390	363	-6.9%
DELHI	(Avl)	4860	3025	-37.8%	6962	5548	-20.3%
	(Req)	3550	3026	-14.8%	6800	5548	-18.4%
HARYANA	(Avl)	5960	4952	-16.9%	11550	8980	-22.3%
	(Req)	6070	4958	-18.3%	10500	8980	-14.5%
HIMACHAL PRADESH	(Avl)	972	975	0.4%	1535	1566	2.0%
	(Req)	960	977	1.8%	1553	1566	0.8%
J&K and LADAKH	(Avl)	1940	1334	-31.2%	3340	2459	-26.4%
	(Req)	1480	1437	-2.9%	2620	2659	1.5%
PUNJAB	(Avl)	7633	6593	-13.6%	13500	12002	-11.1%
	(Req)	7633	6593	-13.6%	13500	12002	-11.1%
RAJASTHAN	(Avl)	8490	6549	-22.9%	18300	12047	-34.2%
	(Req)	8250	6552	-20.6%	14000	12047	-14.0%
UTTAR PRADESH	(Avl)	13800	11592	-16.0%	25000	22990	-8.0%
	(Req)	13500	11695	-13.4%	25000	22990	-8.0%
UTTARAKHAND	(Avl)	1390	1250	-10.1%	2850	2074	-27.2%
	(Req)	1410	1255	-11.0%	2150	2074	-3.5%
NORTHERN REGION	(Avl)	45215	36435	-19.4%	74600	63600	-14.7%
	(Req)	43003	36658	-14.8%	70700	64000	-9.5%

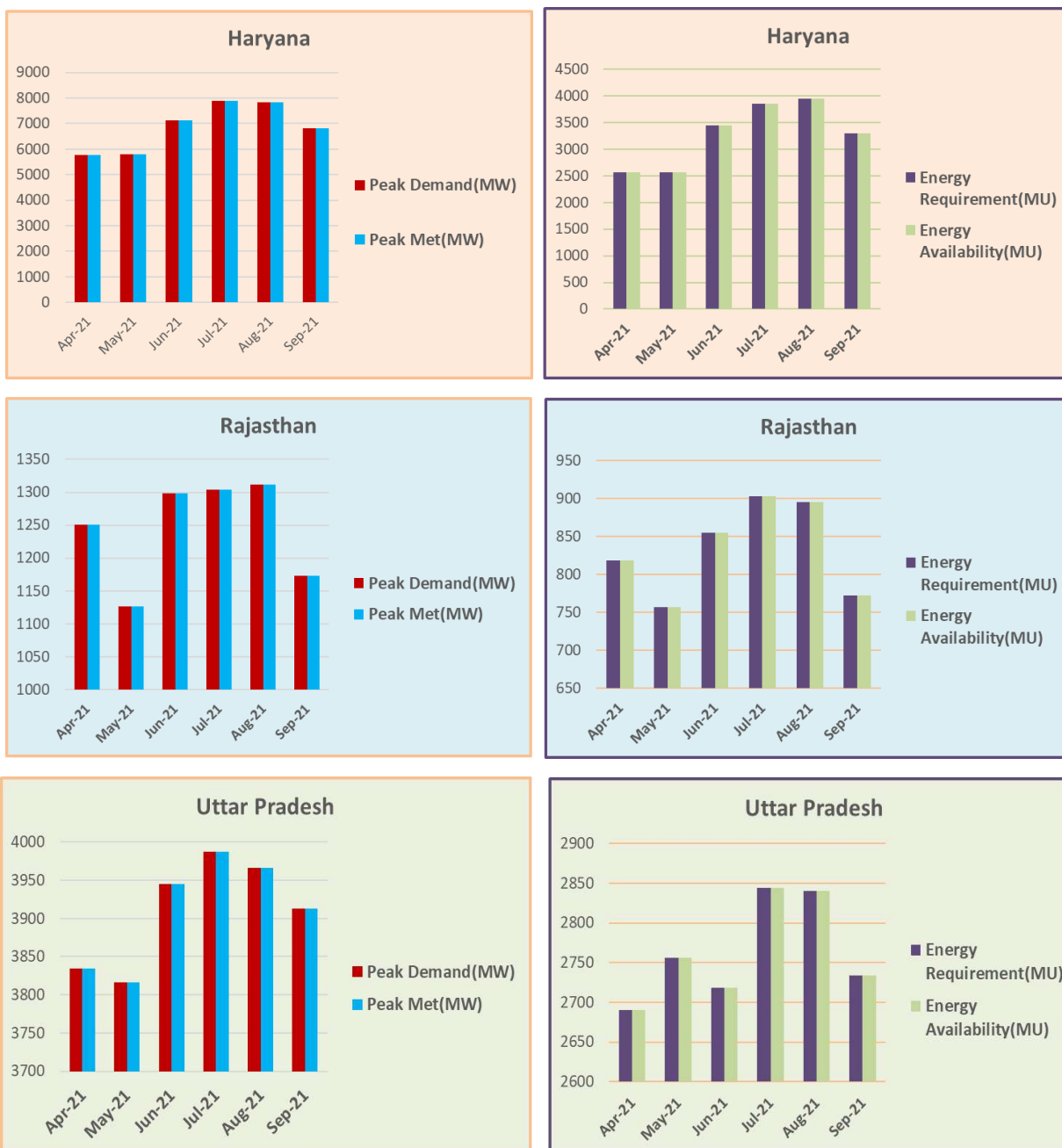
As per above, negative / significant variation ($\geq 5\%$) in Actual Power Supply Position(Provisional) vis-à-vis Anticipated figures is observed for the month of September-2021 in terms of Energy Requirement for Chandigarh, Delhi, Haryana, UTs of J&K and Ladakh, Punjab, Rajasthan, UP, and Uttarakhand and in terms of Peak Demand similar variation is noted for Chandigarh, Delhi, Haryana, Punjab, Rajasthan,

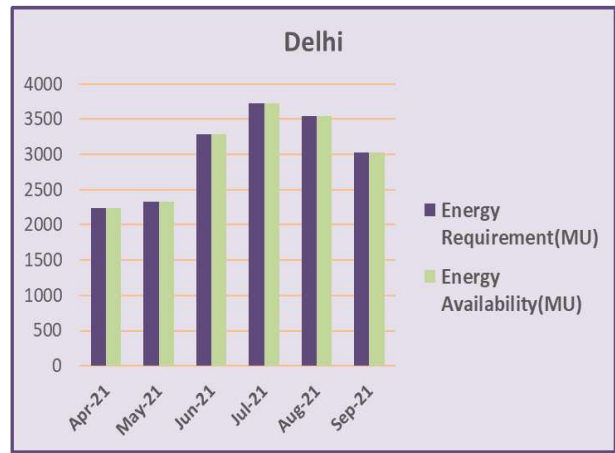
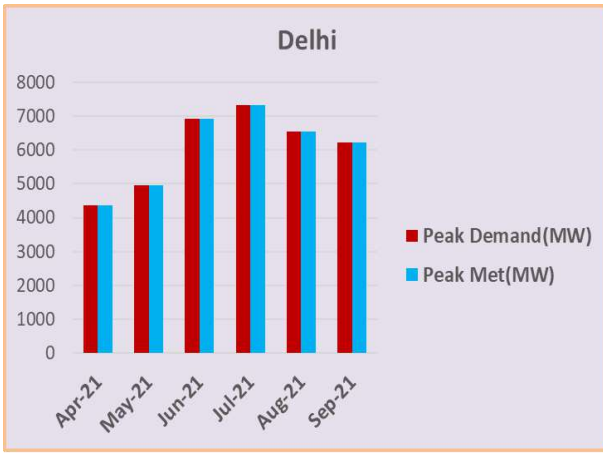
UP, and Uttarakhand. These states/UTs are requested to submit reason for such variations so that the same can be deliberated in the meeting.

All SLDCs are requested to furnish provisional and revised power supply position in prescribed formats on NRPC website portal by 2nd and 15th day of the month respectively for the compliance of Central Electricity Authority (Furnishing of Statistics, Returns and Information) Regulations, 2007.

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 September-2021 is placed on NRPC website (<http://nrpc.gov.in/operationcategory/power-supply-position>). Power supply position during the current financial year is shown as under:





3. Maintenance Programme of Generating Units and Transmission Lines

3.1. Maintenance Programme for Generating Units

The meeting on proposed maintenance programme for Generating Units for the month of November-2021 is scheduled on 21-October-2021 via Video Conferencing.

3.2. Outage Programme for Transmission Elements

The meeting on proposed outage programme of Transmission elements for the month of November-2021 is scheduled on 21-October-2021 via Video conferencing.

4. Planning of Grid Operation

4.1. Anticipated Power Supply Position in Northern Region for November 2021

The Anticipated Power Supply Position in Northern Region for November 2021 is as under:

State / UT	Availability / Requirement	Revised Energy (MU)	Revised Peak (MW)
CHANDIGARH	Availability	110	260
	Requirement	100	210
	Surplus / Shortfall	10	50
	% Surplus / Shortfall	10.0%	23.8%
DELHI	Availability	2600	5980
	Requirement	1950	3700
	Surplus / Shortfall	650	2280
	% Surplus / Shortfall	33.3%	61.6%
HARYANA	Availability	4390	9590
	Requirement	3750	6990
	Surplus / Shortfall	640	2600
	% Surplus / Shortfall	17.1%	37.2%
HIMACHAL PRADESH	Availability	850	1762
	Requirement	858	1742

State / UT	Availability / Requirement	Revised Energy (MU)	Revised Peak (MW)
(Revised on 12-Oct-21)	Surplus / Shortfall	-8	20
	% Surplus / Shortfall	-1.0%	1.1%
J&K and LADAKH	Availability	1070	3740
	Requirement	1630	2550
	Surplus / Shortfall	-560	1190
	% Surplus / Shortfall	-34.4%	46.7%
PUNJAB	Availability	4270	8540
	Requirement	3280	5740
	Surplus / Shortfall	990	2800
	% Surplus / Shortfall	30.2%	48.8%
RAJASTHAN	Availability	7770	17910
	Requirement	7880	13180
	Surplus / Shortfall	-110	4730
	% Surplus / Shortfall	-1.4%	35.9%
UTTAR PRADESH (Revised on 13-Oct-21)	Availability	8400	17000
	Requirement	8100	17000
	Surplus / Shortfall	300	0
	% Surplus / Shortfall	3.7%	0.0%
UTTARAKHAND (Revised on 07-Oct-21)	Availability	981	1890
	Requirement	1020	1950
	Surplus / Shortfall	-39	-60
	% Surplus / Shortfall	-3.8%	-3.1%
NORTHERN REGION	Availability	30441	62100
	Requirement	28568	49400
	Surplus / Shortfall	1873	12700
	% Surplus / Shortfall	6.6%	25.7%

SLDCs are requested to update the anticipated power supply position of their respective state / UT for the month of November-2021 and submit the 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. Submission of breakup of Energy Consumption by the states

The updated status on the submission of energy consumption breakup is presented below:

State / UT	From	To
DELHI	Apr-2018	Aug-2021
HARYANA	Apr-2018	Jul-2021
HIMACHAL PRADESH	Apr-2018	Aug-2021
PUNJAB	Apr-2018	Jul-2021
RAJASTHAN	Apr-2018	Jul-2021
UTTAR PRADESH	Apr-2018	Jul-2021

All the remaining states/UTs viz., Uttarakhand, UTs of J&K and Ladakh and Chandigarh are again requested to submit the requisite data w.e.f. April 2018 as per the billed data information in the format given as under:

Category →	Consumption by Domestic Loads	Consumption by Commercial Loads	Consumption by Agricultural Loads	Consumption by Industrial Loads	Tracti on supply load	Miscellaneous / Others
<Month>						

6. System Study for Capacitor requirement in NR for the year 2019-20

- 6.1 In the 45th TCC/ 48th NRPC meeting, it was decided that the study report for 2019-20 along with the guidelines for finding the capacitor requirement at 11/33 kV level in NR would be submitted by CPRI. In the meeting, CPRI representative had stated that as there were diversified network configurations at the level of DISCOMs, the guidelines to be provided would be generalized and may also include some empirical formula along with examples which may guide the DISCOMs for finding out the capacitor requirement.
- 6.2 Based on the above deliberation, CPRI submitted the system study report (enclosed in the agenda of 177th OCC meeting) and which was circulated among all the SLDCs and STUs vide e-mail dated 02.11.2020.
- 6.3 In the 177thOCC meeting, representatives of Punjab, Rajasthan, Delhi and Haryana stated that the capacitors considered in the study were far less than already installed. In the meeting, it was decided that states shall first analyze the PSSE file considered by CPRI in its study and bring out the locations wherein capacitors are already installed in the network, but are not modelled along with their comments.
- 6.4 The list of bus-wise available MVAR and the additionally required MVAR computed in the CPRI report was shared separately by NRPC Sectt with SLDCs of Punjab, Haryana, Rajasthan, Delhi and Uttarakhand on 07.01.2021 with the request to provide available MVAR values in those buses. In 179thOCC meeting, it was decided that any submission of MVAR data / feedback from the states would be allowed till 22.01.2021 and thereafter CPRI would conduct the modelling and simulation work for the purpose of final capacitor study report. Accordingly, feedbacks received from Punjab, Rajasthan, Haryana and Delhi was forwarded to CPRI for carrying out study

and submission of report.

- 6.5 CPRI has submitted the revised report on 24.02.2021 and thereafter same was shared with the constituent states. The recommended capacitor compensation, additionally required as per the report is 352MVar. The report has brought out the additional requirement of 137MVar and 215MVar compensation for Punjab and J&K respectively. Moreover, empirical relationship for capacitor requirement against voltage profile at 11 kV, based on two configurations has been worked out in the report.
- 6.6 In the 45th TCC / 48th NRPC meeting, it was decided after the submission of report for 2019-20 and the guidelines, the same would be studied by the same Committee who had earlier recommended for guidelines and foreclosure of the contract. Based on Committee's recommendations, NRPC Sectt. can process the pending bills of Rs. 14 lakhs (Rs. 2 + 12 Lakhs), excluding taxes along with foreclosure of the contract. Accordingly, submitted report needs to be examined by the Committee.
- 6.7 In the 181st OCC meeting, the sub-group comprising of ten members was advised to study the CPRI report and submit its recommendation within two weeks.
- 6.8 NRPC Sectt. asked comments/observations on the CPRI report from all the states via e-mail. Comment from Delhi had been received. Rajasthan, HP, Punjab, Haryana had submitted NIL comment. Comment from rest of the members was not received.
- 6.9 In the 182nd OCC meeting, forum decided that a video-conferencing meeting may be held by members of sub-group to finalize the comments latest by 30th April, 2021 and compiled comments may be sent to CPRI for necessary correction in the report.
- 6.10 In the 183rd OCC, NRPC representative informed that the meeting of sub-group was held on 03.05.21 (in place of originally schedule meeting on 30.04.21, delayed as per request of some sub-group members due to health related concerns). Representative from Rajasthan could not attend as she was suffering from covid-19 while Uttarakhand representative informed in the meeting that there is an acute shortage of available officers at this time and they will agree to the remarks made by NRLDC. Further, PSSE file was requested from CPRI as per request of all sub-group members for better understanding and the same was shared with them.
- 6.11 NRPC representative requested for any other comments on the CPRI report, if remaining, from any of the members. Sub-group committee member from Rajasthan stated that since the CPRI report is for the year 2019-20, old data needs to be collected and then values in the CPRI report would be checked. It was further intimated that around 2-3 days time would be required for this task. Rajasthan representative was requested to send their observation/comments via e-mail to NRPC Sectt. at the earliest.
- 6.12 Forum decided that after receiving observations/comments from Rajasthan, the compiled observations/comments may be sent to CPRI so that necessary corrections may be done in the draft report.
- 6.13 In 184th OCC, forum was apprised that compiled comments have been mailed to CPRI vide email dated 28th May'21 with a request to submit the corrected report within two weeks' time. CPRI vide email dated 31st May'21 communicated that majority of comments are on the modeling of base case PSSE file. Since the file is given by NRPC and CPRI has not modeled it; so, they are not in position to make any comment on the accuracy & modeling of file. Forum decided that a reminder may be sent to CPRI for submission of corrected Report as two weeks has already passed.

- 6.14 In 185th OCC, NRPC representative intimated the forum that CPRI has submitted its point-wise reply on the observations of sub-group along with updated report on 28th June 2021.
- 6.15 MS, NRPC expressed concern over inordinate delay in finalizing the report. Forum decided that issues highlighted by the sub-group in the report and clarifications/comments thereon of CPRI need to be converged at the earliest and thus a video-conferencing meeting may be held between the sub-group and CPRI for resolution of issues and enabling report finalization.
- 6.16 The meeting was held on 06.08.2021 at 11:00 a.m. under the chairmanship of MS, NRPC through Video Conferencing. It was attended by members of the sub-group (constituted for studying the CPRI report), CPRI representatives, and officials from NRPC Sectt & NRLDC.
- 6.17 In the meeting, comments of the sub-group on the latest version of CPRI report was deliberated in detail. After weighing the merits of the original & both revisions of the report, following were decided:
- First Report submitted by CPRI in September, 2020 shall be considered as the reference report. CPRI confirmed that the basecase of 11.07.2018 at 00:45 hrs. received from NRPC Sectt has been used for preparing September, 2020 report.
 - Comments from all utilities and NRLDC on September 2020 report must be submitted to NRPC Sectt, latest by 24.08.2021.
 - NRPC Sectt, after examination, shall share with CPRI the compiled comments of the utilities and NRLDC, latest by 31.08.2021.
 - Thereafter, CPRI shall submit its reply on the compiled comments sent by NRPC Sectt, latest by 15.09.2021.
- 6.18 Base case file (11.07.2018 00:45 hrs) and CPRI September 2020 report has been e-mailed to all sub-group members on 10.08.2021 requesting to submit comments/observations thereon latest by 24.08.2021 as per decision of the meeting dtd. 06.08.2021.
- 6.19 In the meeting (187th OCC), forum was apprised that although last date for submission of comments was 24.08.2021, NRPC Sectt. received comments from Himachal Pradesh, Punjab, Rajasthan, Delhi, and NRLDC vide mails dtd. 24.08.2021, 25.08.2021, 26.08.2021, 31.08.2021, and 03.09.2021 respectively. As the received comments were also on the base-case data, a meeting was held on 06.09.2021 among officers of NRPC Sectt, NRLDC and above four states for discussing comments before sending to CPRI. After detailed discussions, following were decided:
- A. Himachal Pradesh:**
- a) It was apprised by NRLDC that generation data of micro IPPs has not been modelled by them in base-case due to their small quantity. Further, Capacitor at Baddi needs to be removed from base-case.
 - b) HP was requested to submit within 3 days data regarding (11.07.2018 00:45 HRS):
 - i. Generation break-up along with details of micro IPPs.
 - ii. Capacitors at 132 kV level.

- iii. Nodes of major voltage profile mismatch
 - iv. Load factor of state (current scenario if data of past is not available)
- c) It was decided that after getting above data from HP, base-case will be tuned by NRLDC before sending to CPRI.

B. Punjab:

- a) All switched reactors/capacitors to be converted into fixed & net shunt capacitor value in the base-case to be corrected as per Punjab's comment.
- b) Punjab was requested to submit low voltage nodes (11.07.2018 00:45 HRS) within 3 days.
- c) Based on data from Punjab, initial tuning to be done by NRLDC for Q values of generators. CPRI may be required to do further tuning.

C. Rajasthan:

- a) Except low voltage points, power factor needs to be upgraded in the base-case.
- b) Rajasthan representative confirmed that most of the capacitors were off during the time for which modelling is done, so lumped capacitor at 132kV needs to be deleted.
- c) Rajasthan was requested to submit
 - i. List of bus-wise capacitors and their status (OFF/ON condition) on 11.07.2018 00:45 HRS.
 - ii. Voltage profile of generator buses.

D. Delhi:

- a) Delhi was requested to submit voltage profile of generator buses.

- 6.20 It was decided that after receiving data from above four states, NRLDC will tune the basecase initially and will also ensure that regional generators shall not absorb reactive power in the base-case and then base case will be sent to CPRI along with compiled comments.
- 6.21 In the meeting, UP representative stated that they will send reply on mail of NRPC Sectt. dtd. 10.08.2021 for submission of their comments.
- 6.22 It was decided that data received at NRPC Sectt. may be sent to NRLDC for tuning of base-case.
- 6.23 NRLDC representative stated that base-case tuning may be completed by 30.09.2021.
- 6.24 CPRI vide e-mail dtd. 23.09.2021, requested to send comments at the earliest.
- 6.25 NRPC Sectt. vide e-mail dtd. 23.09.2021 apprised the CPRI that as per decisions of meeting dtd. 06.09.2021, tuning of base-case file is being done by NRLDC so that no new issue arises in future.
- 6.26 CPRI vide e-mail dtd. 24.09.2021 has requested that any change in loading & generation profile will be a new base case and this will be a fresh study for new base case. It will require an extensive time and efforts. CPRI has requested to ensure that load/generation profile in tuned PSSE should be same as was given to CPRI for PSSE base 11.7.2018 at 00.45.
- 6.27 In view of CPRI's request, NRLDC was requested vide e-mail dtd. 24.09.2021 to

halt tuning of base-case till further discussion.

- 6.28 A meeting was held between NRPC Sectt. and NRLDC on 04.10.2021, wherein it was decided that without incorporating corrective comments of states, the report is not acceptable w.r.t drawing any conclusion on requirement of capacitor. Accordingly, NRLDC was requested vide e-mail dtd. 08.10.2021 to complete tuning of base-case at the earliest.
- 6.29 Tuned base-case is awaited from NRLDC.

Sub-Committee may kindly note.

7. Automatic Demand Management System

- 7.1 The status of ADMS implementation in NR, which is mandated in clause 5.4.2 (d) of IEGC by SLDC/SEB/DISCOMs is presented in the following table:

State/ Utility	Status
Punjab	Scheme not implemented. At SLDC level, remote tripping of 100 feeders at 66 kV is possible. At 11 kV feeder level, ADMS is to be implemented by Distribution Company.
Delhi	Fully implemented by TPDDL, BRPL and BYPL. NDMC implementation was scheduled to be completed by 31.03.2020 but got delayed due to some changes incorporated in the scheme.
Rajasthan	Under implementation. LoA placed on 12.12.2018 with an execution period of 18 months for ADMS at the level of 33 kV feeders at EHV Substation of RVPN under SCADA / EMS part of project. Supply is in progress. Work is under execution and likely to completed by June'2021. ADMS functionality at 11 kV feeders from 33/11 kV substation is under the jurisdiction of the DISCOMs.
UP	Scheme implemented by NPCL only. Remote operation of 50 feeders at 132 kV level being operated from SLDC. Further, the solution proposed by M/s Siemens was found to be non-economical and was not accepted by the management. Noida Power Company Ltd have implemented Intelligent Load Shedding (ILS) scheme, in compliance of IEGC requirements for automatic demand management.
Haryana	Scheme not implemented. More than 1700 feeders were tested from SLDC control room for remote operation. Regarding the implementation of ADMS at DISCOM level, the matter is being taken up with the DISCOMs.

State/ Utility	Status
HP	<p>Scheme not implemented.</p> <p>02 feeders could be operated from SLDC through manual intervention. Letter has been sent by HPSEB to HP-SLDC for making its operation automatic.</p>

- 7.2 As decided in the 175th OCC meeting, the nominations for matter specific meeting has been received from HVPN, UHBVN/DHBVN, PSPCL, RVPN (SLDC & Automation), UPPTCL, KESCO (DISCOM-UP), NPCL (DISCOM-UP).
- 7.3 Meetings on ADMS implementation road map have been held with the officers of Haryana, Himachal Pradesh, Punjab and UP on 05.02.2021, 19.02.2021, 05.03.2021, and 14.07.2021 respectively. In these meetings, issues and apprehensions on ADMS were discussed along with vital aspects like addressing the commercial issues, basic architecture for scheme and funding possibilities for the scheme.
- 7.4 As per request of states for DPR of any state that has got PSDF support for ADMS, website link of PSDF Sectt. has been shared with Haryana, Himachal Pradesh, Punjab and Uttar Pradesh for accessing DPR. SLDCs were also requested to expedite the submission of pending nominations.
- 7.5 In 186th OCC, In-charge, NRLDC stated that as per IEGC, implementation of ADMS is mandatory. It helps in reducing DSM charges also. States must take it seriously.
- 7.6 MS, NRPC stated that non-implementation of ADMS by states is indistinguishably non-adherence to directions of CERC.
- 7.7 NRPC representative added that initial deadline for ADMS implementation was 1st January 2011 as per para 5.4.2 (d) of IEGC. Later, CERC has taken suo-motu cognizance of non-implementation of ADMS by states and given 31.06.2016 as deadline vide its order dtd. 31.12.2015 in petition no. 5/SM/2014. Implementation deadline given by the statutory and regulatory body need to be complied by concerned SLDC / SEB / distribution licensee as per regulation no. 5.4.2 (a) & (b) of IEGC. Moreover, hand holding process for project proposal preparation in respect of four NR states has already been done by NRPC
- 7.8 Forum decided that NRLDC may file a report to CERC based on compiled status of ADMS implementation in states of Northern Region.
- 7.9 In 187th OCC meeting, NRLDC representative quoted the texts of CERC order dtd. 31.12.2015 in petition no. 5/SM/2014. He apprised the status of ADMS implementation till 2015. Further, he requested the states to update the status so that NRLDC may file petition in CERC on the basis of compiled status.

Accordingly, all SLDC/DISCOMs are requested to furnish the latest status of ADMS implementation in their respective control areas latest by 31st October 2021 to NRLDC. Status as received till 31.10.2021 would be reported to CERC by NRLDC.

Members may kindly note.

8. Follow-up of issues from previous OCC Meetings- Status update.

The updated status of agenda items is enclosed at **Annexure-A.I.**

All utilities are requested to update the status.

9. NR Islanding scheme

- 9.1. Based on the decisions taken in the meeting taken by Hon'ble Minister of State (IC) for Power and New & Renewable Energy on 28.12.2020, Islanding Schemes for NR have been continuously reviewed/discussed in various forums during Apr'21 – Aug'21. The implemented as well as proposed Islanding Schemes of NR have been categorized in following manner:

Islanding Scheme	SLDC	Status	Category	Remarks
Delhi IS	Delhi	Implemented	Category-I	Major City
NAPS IS	UP	Implemented	Category-I	Sensitive Generation
RAPS IS	Rajasthan	Implemented	Category-I	Sensitive Generation
Agra IS	UP	Newly Proposed	Category-I	Strategic Load
Jodhpur-Barmer-Rajwest IS	Rajasthan	Newly Proposed	Category-I	Strategic Load
Patiala-Nabha Power Rajpura IS	Punjab	Newly Proposed	Category-I	Strategic Load
Pathankot-RSD IS	Punjab	Newly Proposed	Category-I	Strategic Load
Talwandi Sabo IS	Punjab	Newly Proposed	Category-II	Others
Dehradun IS	Uttarakhand	Newly Proposed	Category-I	Strategic Load
Jammu-Salal IS	J & K	Under Discussion	Category-II	Others
Suratgarh IS	Rajasthan	Under Discussion	Category-I	Strategic Load
Chamba-Chamera IS	HP	Under Discussion	Category-II	Others
Kangra-Chamba-Bairasuil IS	HP	Under Discussion	Category-II	Others
Kullu-Dehar IS	HP	Under Discussion	Category-II	Others
Butari-Jamsher-Verpal IS	Punjab	Under Discussion	Category-II	Others
Kargil-Ladakh IS	Ladakh	Under Discussion	Category-I	Strategic Load
Lucknow-Unchahar IS	UP	Under Implementation	Category-I	Major City

- 9.2. In 187th OCC, it was decided to submit MIS report before every OCC meeting so that same may be discussed. It was also highlighted that MoP has agreed for PSDF funding for implementation of islanding schemes and states were requested to prepare and submit DFR for the same.

- 9.3. The current status of Islanding schemes of NR is attached as **Annexure-A.II**.

- 9.4. Further, a sample DPR on implementation of Islanding scheme for PSDF funding has been already circulated vide email dated 07.10.2021. States can refer sample DPR, if PSDF funding is needed for implementation of Islanding schemes. In case PSDF funding is needed, it is requested to expedite the preparation of DPR on implementation of Islanding. A meeting was also held by Honourable Cabinet Minister

(Power, New & Renewable Energy) on 07.10.2021 wherein emphasis was given on PSDF funding for Islanding schemes and DPR submission for the same.

9.5. In view of the above, states may update status of DPR if PSDF funding is needed.

9.6. A Standard Operating Procedure for Islanding schemes has been issued by NPC, CEA which is enclosed as **Annexure-A.III**. Utilities are requested to refer and submit SOP for every Islanding scheme in their control area.

10. Coal Supply Position of Thermal Plants in Northern Region

10.1. In 186th OCC meeting, it was proposed that coal stock position of generating stations in northern region may be reviewed in the OCC meetings on the monthly basis.

10.2. Accordingly, coal stock position of generating stations in northern region during current month (till 10th October 2021) is as follows:

Station	Capacity (MW)	PLF % (prev. months)	Normative Stock Req'd (Days)	Actual Stock (Days)
ANPARA C TPS	1200	86.87	15	3.1
ANPARA TPS	2630	74.39	15	2.8
BARKHERA TPS	90	47.29	20	4.6
CHHABRA TPP	2320	34.87	25	0.0
DADRI (NCTPP)	1820	39.87	30	0.9
GH TPS (LEH.MOH.)	920	18.72	30	10.2
GOINDWAL SAHIB TPP	540	54.26	30	1.0
HARDUAGANJ TPS	605	59.26	30	0.8
INDIRA GANDHI STPP	1500	50.03	30	0.8
KAWAI TPS	1320	60.22	25	4.0
KHAMBARKHERA TPS	90	44.65	20	2.9
KOTA TPS	1240	64.15	30	3.3
KUNDARKI TPS	90	75.52	25	0.6
LALITPUR TPS	1980	71.74	25	2.3
MAHATMA GANDHI TPS	1320	70.54	25	4.5
MAQSOODPUR TPS	90	55.22	20	0.8
MEJA STPP	1320	81.44	20	0.7
OBRA TPS	1094	49.78	20	4.3
PANIPAT TPS	710	28.90	30	0.1
PARICHHA TPS	1140	44.73	30	0.7

PRAYAGRAJ TPP	1980	65.40	20	1.6
RAJIV GANDHI TPS	1200	36.71	30	0.2
RAJPURA TPP	1400	74.71	25	3.6
RIHAND STPS	3000	80.10	15	8.5
ROPAR TPS	840	14.11	30	9.4
ROSA TPP Ph-I	1200	62.69	25	2.7
SINGRAULI STPS	2000	93.32	15	4.7
SURATGARH TPS	1500	14.00	30	0.9
TALWANDI SABO TPP	1980	49.96	25	3.0
TANDA TPS	1760	35.94	25	3.0
UNCHA HAR TPS	1550	61.10	25	1.4
UTRAULA TPS	90	66.06	20	2.6
YAMUNA NAGAR TPS	600	38.85	25	0.2

11. Declaration of high demand season and low demand season

11.1.CERC has notified regulatory framework of differential tariff, applicable to thermal generating station, during peak and off-peak hours, during high demand season of three months and low demand season of remaining nine months in Tariff Regulations, 2019. In view of above, concerned RLDC has to declare high demand season and low demand season in region after consultation with stakeholders in accordance with 2019 tariff regulations six months before any financial year.

11.2.Based on the deliberations in 176th OCC meeting, it was decided that peak season be decided after considering average NR consumption data of all months for previous five years.

11.3.In the same manner, energy demand data has been compiled from CEA website (data for Sep'21 has been taken from format-28) and is as under:

Year	May	Jun	Jul	Aug	Sep
2017	33900	33672	36168	36792	34454
2018	35206	37624	38331	38567	33405
2019	37338	41624	41377	39153	38422
2020	30905	37782	41309	39527	40958
2021	32109	39393	45180	44175	36658
Average	33892	38019	40473	39643	36779

From the above, it may be seen that 3 high demand months for next FY may be June, July and August.

Members may kindly deliberate.

12. Proposal to implement additional protection in 220KV lines at NAPS (Agenda by NAPS)

- 12.1. NAPS vide email dated 06.10.2021 submitted that on 11.08.2021 at 13:25 hrs, both units (NAPS-1 and NAPS-2) had tripped subsequent to isolation of NAPS switchyard from grid due to fault caused by R-phase CVT of 220kV Line-1(Narora-Sambhal).
- 12.2. In view of above incident, matter was discussed with designer, NPCIL, Mumbai and additional protection for the 220kV lines has been suggested (details attached as **Annexure-A.IV**).

Members may kindly deliberate.

13. Charging of 400/220 kV Jauljibi substation without 220 kV, 25 MVAR Bus Reactor. (Agenda by NR-3/POWERGRID)

- 13.1 In the meeting of 36th Standing committee on Power System Planning of Northern Region held on 30.10.2015, establishment of 400/220 kV, 7x105 MVA GIS S/S in Jauljibi under ISTS was approved.

400/220 kV S/S in Jauljibi shall be established by:

1. LILO of both circuits of 400 kV Dhauliganga – Bareilly (presently charged at 220 kV) at 400/220 kV, Jauljibi (incoming line from Dhauliganga shall be charged at 220 kV and outgoing to Bareilly shall be charged at 400 kV).
2. 2x63 MVAR switchable line reactors in Bareilly – Jauljibi 400 kV D/C at Jauljibi end
3. 8 no. of 220 kV bays (Pithoragarh-2, Dhauliganga-2, Almora-2, Jauljibi-2)

S. N.	Elements	Status
1	LILO of both circuits of 400 kV Dhauliganga – Bareilly at Jauljibi	Completed
2	2x63 MVAR switchable line reactors in Bareilly – Jauljibi 400 kV D/C at Jauljibi end	Completed
3	Jauljibi – Pithoragarh 220 kV line	Will be completed by Nov'21
4	220 kV Jauljibi – Almora D/c	Under PTCUL Scope
5	220 kV Jauljibi – Jauljibi (PTCUL) D/c	Under PTCUL Scope
6	8 no. of 220 kV bays (Pithoragarh-2, Dhauliganga-2, Almora-2, Jauljivi-2)	Completed

- 13.2 The existing 400 kV Dhauliganga – Bareilly (charged at 220 kV) is approx. 240 kms with 25 MVAR line reactor at Dhauliganga end. After LILO at Jauljibi, length of Dhauliganga-Jauljibi section becomes approx. 40 kms. Therefore, this 25 MVAR line reactor is to be shifted to 400/220 kV, Jauljibi and shall be used as a Bus reactor at 220 kV after LILO of Dhauliganga – Bareilly at Jauljibi.

- 13.3 The present status of 400/220 kV Jauljibi S/s is as follows:

The 400/220 kV Jauljibi S/s was scheduled to be charged by Mar'21. POWERGRID approached BRO in the month of Feb'21 to shift 25 MVAR line reactor from Dhauliganga as per approved scheme. However, BRO informed that the road at Dobat

(road from Dhauliganga to Jauljibi) washed out due to heavy rain. BRO created a temporary valley bridge at Dobat which had load limitation and was not suitable to transport 25 MVAR reactor (weighing 30 MT) to Jauljibi from NHPC Dhauliganga. Further, BRO confirmed that the road is expected to be repaired in 6 months. Hence, the shifting of reactor could not be taken up and was postponed till the road to Jauljibi is ready. Subsequently, the bridge on Pithoragarh-Tawaghat road washed out on 07-08 July'21 due to flash floods and rolling down of huge stone boulders in the Kulagad Nallah. After that 170 feet DDR Bailey Bridge with capacity of only 24 MT has been launched at same location on 20 Jul'21 (BRO letter attached at **Annexure-A.V**).

As transportation of 220 kV bus reactor at Jauljibi substation is not possible at present, the reactor shall be shifted and commissioned after construction of the bridge by BRO.

Hence, permission may be granted to charge the 400/220 kV Jauljibi S/s without 220 kV bus reactor.

Members may kindly deliberate.

14. Report Preventive maintenance of interface metering CTs and CVTs under STU ownership. (Agenda by ARPL)

- 14.1 ARPL vide email dated 05.10.2021 has submitted that recently on 17.08.2021 failure of Y Phase CT (CT blast and fire in bay equipment) of 400 kV APMuL – Hadala line and subsequent line tripping on 17.08.2021 at 18:17 Hrs, was observed. In this regards faulty CT has been replaced after testing of bay equipments. Blast of CT has also damaged the other nearby CTs and CVTs. It took 2 days to restore the line along with cleaning, testing and checking of bay equipments.
- 14.2 400 kV APMuL – Hadala being critical grid element, after checking of complete healthiness, the line was charged with ALDC / SLDC and WRLDC code on 19/08/2021 at 20:48hrs considering the urgency.
- 14.3 Ownership of the interface meters (meter, CT and CVT) is of either CTU or STU. STU generally seals all the Secondary TB and JB of CTs, CVTs and meters terminal covers, including the metering panel.
- 14.4 As per the standard procedure, preventive maintenance of other bay equipment's are performed yearly. Since STU metering CT and CVT are sealed, it's Preventive maintenance such as tan delta, loop test and oil check was not performed as per the schedule as Sealing involves coordination of DISCOM and STU officials; and may prolong resumption of said line.
- 14.5 It is suggested that preventive maintenance of metering CT and CVT should be carried out at least once in a year, to prevent corrosion and maloperation in the grid and loss of important elements.

Members may kindly deliberate.

15. Grid Highlights for September 2021

In Sep'21, the Maximum energy consumption of Northern Region was 1388 Mus on 6th Sep'21 and it was 8 % lower than Sep' 2020 (1507 Mus 18th Sep'20)

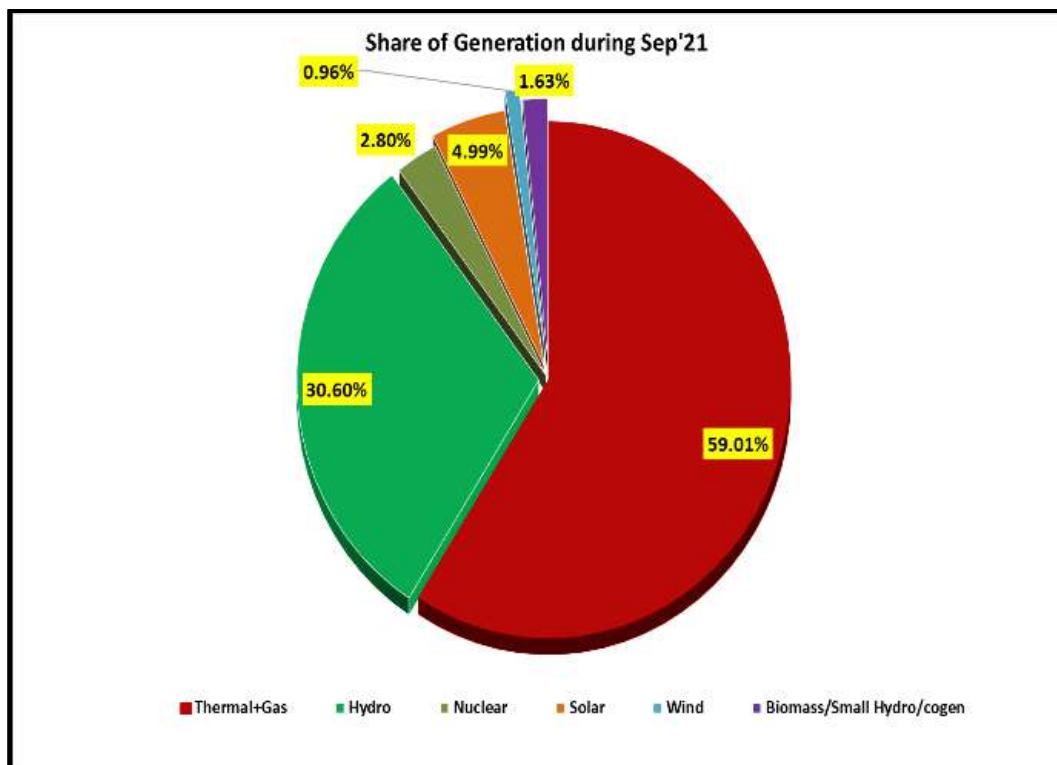
In Sep'21, the Average energy consumption per day of Northern Region was 1211.88 Mus and it was 11.04 % lower than Sep'20 (1362.34 Mus per day)

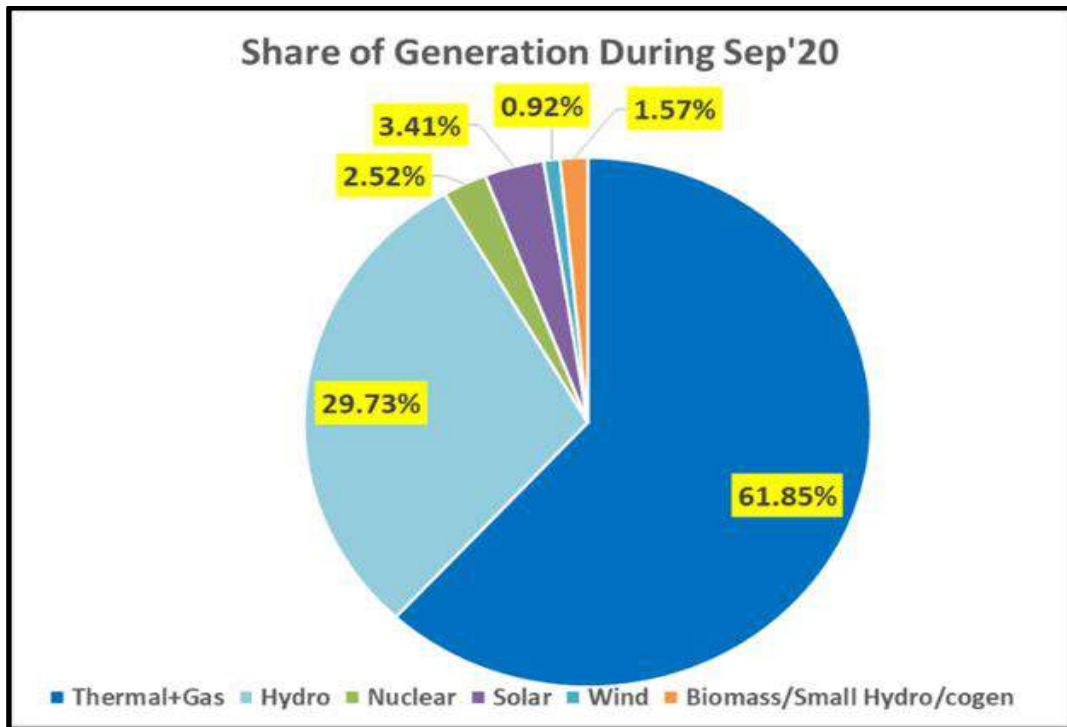
In Sep'21, the Maximum Demand met of Northern Region was 63559 MW met on 6th Sep'21 @ 21:00 hours (Based on data submitted by Constituents) as compared to 67807 MW met on 18th Sep'20 @ 23:00 hours

Northern Region all time high value recorded in Sep' 21:

Energy Generation	All Time High Record		Previous Record (upto August-21)	
	Value (MU)	Achieved on	Value (MU)	Achieved on
Solar Generation	60.49	16.09.21	60.36	17.08.21

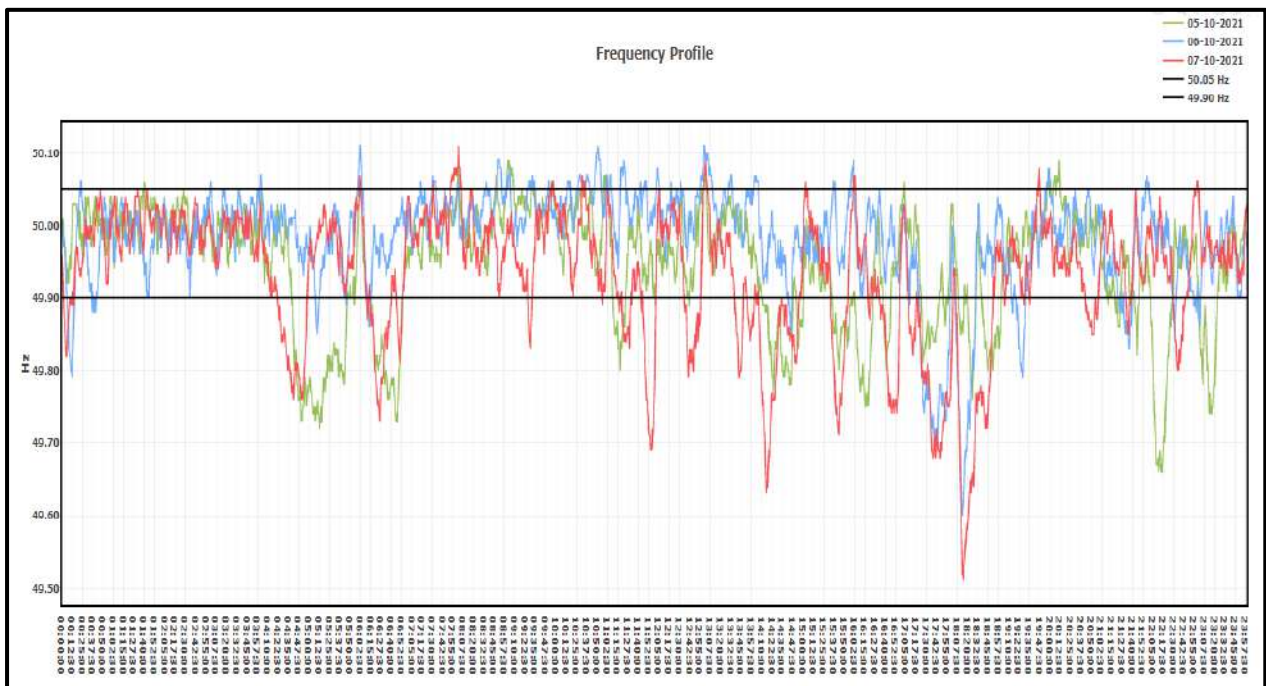
Total average per day energy production by Northern region was 1022.43 Mus in the month of Sep'21 in comparison of 1050.23 Mus in Sep'21. The fuel wise share of generation is shown below.





List of important first time charged elements during Sep'21 is attached as **Annexure-B.I.**

In Sep'21, Frequency remained within IEGC band for 77.40% of the time. Frequency touched a low of 49.50 Hz on 24th Sep-21. Emergent contingency events during such times such as large generation outage, could result in further drop in frequency and therefore, overdrawals below 49.90 Hz must be controlled quickly in order to keep system secure.



Frequency profile for 06-08 Oct 2021 showing continuous low frequency operation

During this month some of the NR states such as Rajasthan also had overdrawal contributing to low frequency operation. NRLDC has been continuously requesting Rajasthan to maintain its drawl within schedule during low frequency instances and also take necessary measures for revival of intrastate generating units. NRLDC has also issued letter dated 8th October 2021 in this regard (attached as **Annexure-B.II**).

Rajasthan SLDC to provide actions being taken at their end in this regard.

Following actions were discussed during special FOLD meeting held on 06.10.2021 and which are required for maintaining grid security:

- (i) Monitoring of state Area Control Error(ACE) and taking corrective measures to keep ACE close to zero
- (ii) Higher DC by coal-fired stations in morning and evening peak hours (instead of flat DC RTC)
- (iii) Peaking support from hydro generation and revival of hydro units under outage
- (iv) Revival of thermal units under forced outage
- (v) Revival of GT/ST under planned/forced outage
- (vi) Intra-state units in cold reserve to be brought on bar
- (vii) Intra-state gas plants operation (especially in evening peak hours)
- (viii) Review of planned generation outages for the Oct/Nov months
- (ix) Advance measures for demand management to be taken to reduce over reliance in market because large deviations if bids do not clear are threat to grid security. Planned load management measures may be taken to avoid over-drawal and low frequency operation
- (x) Monitoring and harnessing of captive generation
- (xi) No under injection by the generators from schedule
- (xii) Proper reporting of unit status and coal stock position to RLDC/NLDC/CEA
- (xiii) Reason of the unit outage must be reviewed (Less demand/ No schedule/ commercial reason etc.)
- (xiv) Healthiness of all defense mechanisms like under frequency relays, under voltage relays, inter trip schemes etc. to be ensured for safety of the grid

In this case, the list of radial feeders become very important. Utilities have been requested in last several OCC meetings and also vide NRLDC letters to update list of radial feeders which can be opened on the directions of NRLDC/SLDC to regulate the demand. List of such radial feeders is once again attached as **Annexure-B.III**. Utilities are requested to provide update on the same.

The opening of feeders shall be required in case of threat to grid security and non-adherence to RLDC instructions to manage over drawl by SLDCs/ DISCOMs. SLDC/Transmission Licensee may be directed (As per Clause 5.4.2 of IEGC) to open these radial feeders on the direction of NRLDC/SLDCs. All SLDCs/ISTS licensees/STUs need to adhere to instructions of NRLDC/ SLDC as the case maybe. All efforts would be taken to open the lines on rotational basis.

SLDCs are once again requested to review and share the list of the following:

- Intrastate 132kV feeders and 220/132 kV and 132kV / 33 kV transformers which supply load radially within the state and can be disconnected at the instruction of SLDC.
- Tie lines which supply load radially within the state, which can be switched off from the substation belonging to a different entity, at the instruction of RLDC.
- 400/220kV and 220/132kV ICTs at state boundary, which cater load radially and can be switched off from the substation belonging to ISTS or other entity.

Telemetry is to be ensured for all such feeders for monitoring in real time by SLDC/ NRLDC. Display has been created at NRLDC for monitoring of status and load of these radial feeders at NRLDC control room. SLDCs are also advised to develop such displays in their respective control rooms and monitor the loading of these radial feeders. Assistance if required may be taken from NRLDC.

NR Constituents are once again requested to take initiatives to minimise sudden load changeovers at hourly boundaries and also monitor performance of generators under their jurisdiction when the frequency is having large excursions.

Members may like to discuss.

16. Action Plan for Winter Preparedness 2021-22

In 187th OCC meeting, it was discussed that winter in Northern region is likely to start from mid of October till February end, and the challenges faced during these months were also discussed in the meeting. With decreasing temperatures and festivals, winter also brings some severe challenges to NR grid operators. The challenges expected and actions to be taken by utilities were discussed in the meeting.

a) Load generation balance:

- In line with section 5.3 of the IEGC, all constituents should develop in house or use third party Software tools for precision of load forecasting & generation planning on daily, weekly and monthly basis with hourly granularity for daily forecast, which may be subsequently improved to block-wise forecasting. Forecast of demand ramp has also become important and so SLDCs are advised to forecast ramp rate of demand for morning and evening peaks so that commensurate ramping of generation can also be planned (**Action by SLDCs**)
- ISGS hydro stations are already being scheduled by NRLDC to provide maximum support and requisite ramp rate during peak hours, keeping in view their forecasted daily energy availability as well as mechanical availability. SLDCs were also requested to optimally schedule hydro and gas generation to make sure that demand as well as ramp requirements are safely met (**Action by NRLDC/ SLDCs**).
- Minimize generation to technical minimum as per IEGC guidelines /CERC directions during low demand (**Action by ISGS, intrastate generators, NRLDC, SLDCs**).
- During winter season, transmission lines emanating from hydro generating stations are opened on High voltage during night hours and are closed before morning peak hours (next day). It has been observed that there used to be considerable delay in

charging the lines after issuance of code (in the morning hours). This causes power evacuation constraints in the hydro generation pockets and over-loading of the remaining transmission lines. (**Action by ISTS licensees/ STUs**)

- Hydro generators may ensure to declare their maximum DC particularly during non-solar period, to ensure better management of power portfolio by the beneficiaries. (**Action by ISGS, intrastate generators**)

b) *High voltage management:*

- Ensuring disconnection of capacitors (**Action by SLDCs/ STUs/DISCOMs**).
- Ensuring healthiness of all commissioned reactors in the system (**Action by ISTS licensees/ STUs**)
- Monitoring of reactive power of generators and exchange of reactive power with ISTS through SCADA displays (**Action by SLDCs**).
- Ensuring reactive power support (absorption) from generating stations by operating units upto their capability limits. (**Action by ISGS, intrastate generators, NRLDC, SLDCs**). **To be discussed in detail in agenda no. 2.**
- Synchronous condenser operation especially of hydro units during night hours for dynamic voltage support. Some of the generators have already been tested successfully (Tehri, Chamera, Pong etc.) in synchronous condenser mode and shall be available for condenser mode of operation as and when required. In 47th TCC and 49th NRPC meeting following was agreed:
 - Delhi SLDC to update on the feasibility of operating its old gas stations in condenser mode.
 - Separate meeting with IPPs and state generators to explore possibility of synchronous condenser operation.
 - Punjab suggested to explore possibility of utilizing old retired thermal plants as synchronous condenser.
- ICT Tap Optimization at 400kV & above to be carried out by NRLDC. Same exercise needs to be carried out by SLDCs at 220kV & below levels. Based on voltage data of September 2021, it is proposed to carry out tap change exercise at following 400/220kV nodes:

Increase by 2 Steps

POWERGRID: Bhiwadi, Sambha, Srinagar
DTL: Bamnauli
HVPNL: Nuhiyawali, Daultabad
RVPNL: Suratgarh
UPPTCL: Muradnagar

Decrease by 2 Steps

POWERGRID: Mainpuri, Kaithal
UPPTCL: Sultanpur

Scatter plots for these stations are attached as **Annexure-B. IV**. SLDCs are also requested to provide the tap change exercise carried out by them or proposed to be carried out before winter. (**Action by SLDCs**).

- Opening of EHV lines based on expected voltage reduction and also considering security & reliability of system. This exercise to be done at 400kV and above

voltage level by NRLDC and 220kV and below voltage level by SLDCs, but only as the last resort after utilizing all other resources (**Action by NRLDC/ SLDCs**).

- To ensure that line reactors are available even after opening of lines are optimally utilized it is necessary that updated details of all the stations where the provision of using line reactors as bus reactors exist, is available at all control centers. All utilities were requested to go through the document and report if any incorrect or missing information is noticed. The document is being utilized in real-time operation by control room operators at NRLDC, and thus it is necessary that list of all reactors where such provision is available are updated in the document. It was also agreed that additional manpower if required, may be placed at critical substations (**Action by ISTS licensees/ STUs**).

c) EHV line trip during fog/Smog

Utilities were requested to ensure:

- Priority wise cleaning & replacement of damaged insulators.
- Monitor progress of cleaning and replacement of porcelain insulator with polymer insulator and furnish updated status to NRPC/NRLDC. (**Action by ISTS licensees/ STUs**).

As agreed in 187th OCC meeting, utilities are requested to share action plan for measures to be taken by them for carrying out pre-winter maintenance activities and other actions agreed in 187th OCC meeting.

Members may please discuss.

17. MVAR support from generators

During winter season, demand of Northern region is low and high voltages are a common phenomenon predominantly in Punjab, Haryana and Delhi area. Even after several actions being taken by control centers, it is seen that there is persistent high voltage in Northern region, The reactive power absorption by generators becomes an important resource that helps in managing high voltages in the grid. However, even after continuous follow up in OCC meetings, it is seen that MVAR data telemetry is poor/ inaccurate from most of the generating stations. For some of the generators it is seen that there is inadequate reactive power absorption based on their capability curve especially during night hours. The performance of generators in absorption of reactive power for last 30 days (06 Sep 2021 – 06 Oct 2021) is shown below:

S.N	Station	Capacity	Fuel Type	Geographic location	MVAR performance (-) Absorption (+) Generation	Voltage absorption above (in KV)
1	Dadri NTPC	980	Ther	Delhi-NCR	-300 to 200	415
2	Singrauli	2000	Ther	UP	-250 to 50	402
3	Rihand NTPC	2000	Ther	UP	-250 to 50	402
4	Kalisindh RS	1200	Ther	Rajasthan	-250 to 100	

5	Rosa UP	1200	Ther	UP	-100 to 300	Voltage
6	Anpara C UP	1200	Ther	UP	-100 to 150	762
7	TalwandiSab	1980	Ther	Punjab	-300 to 300	415
8	Kawai RS	1320	Ther	Rajasthan	-250 to 200	405
9	Anpara TPS	1630	Ther	UP	-100 to 150	408
10	IGSTPP	1980	Ther	Haryana	-250 to 300	412
11	Tanda	1320	Ther	UP	-100 to 200	410
12	Rajpura (NPL)	1400	Thermal	Punjab	-100 to 400 (seems MVAR data)	410
13	Khedar	1200	Ther	Haryana	-150 to 100	410
14	MGTPS	1320	Ther	Haryana	-300 to 50	407
15	Bawana	1000	Ther	Rajasthan	-200 to 200	410
16	Bara PPGCL	1320	Thermal	UP	-130 to 50	410
17	Suratgarh TPS		Thermal	Rajasthan	-100 to 50 (seems MVAR data sign reversal)	420

The details of these performance is attached as Annexure-B.V(a). All generating stations are requested to resolve any issues related to telemetry and make sure that MVAR absorption is as per grid requirement and capability curve of machine.

Members may like to discuss.

Capability of solar plant based inverters can be used to provide voltage support during critical system needs on continuous basis and during night the entire inverter capacity can be used for reactive power support.

It has already been deliberated in OCC meetings that PV inverters generally have three modes of operation selectable by the plant:

1. Voltage control mode in which voltage of the reference point is monitored by inverters/PPC and reactive power draw/ injection is varied accordingly w.r.t a voltage set point.
2. Reactive Power or Q-control mode in which inverter supplies/absorbs a fixed amount of reactive power from the grid.
3. Power Factor control mode is one in which inverter operates within a defined power factor range.

Plots depicting ISGS Solar reactive power performance is attached as Annexure-B.V(b).

S.N o.	Solar Plant/ Developer	Capacity	MVAR performance (-) Absorption (+) Generation	Voltage absorption above (in KV)
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1	SauryaUrjaBhadla	500	-80 to 15	Generally, most of the solar plants are drawing MVAR from the grid. Some plants such as Tata (Bhadla), Mahoba (Bhadla) and Renew (Bikaner) are drawing minimal MVAR during peak solar generation. Most of the plants are generally operating in p.f. control mode with p.f. of (0.98-1)
2	Adani Bhadla	250	-40 to 10	
3	Tata Power Bhadla	300	-20 to 40	
4	Acme Bhadla	250	-50 to 5	
5	EsselBhadla	300	-120 to 20	
6	Mahindra Bhadla	250	-60 to 0	
7	MahobaBhadla	300	-80 to 20	

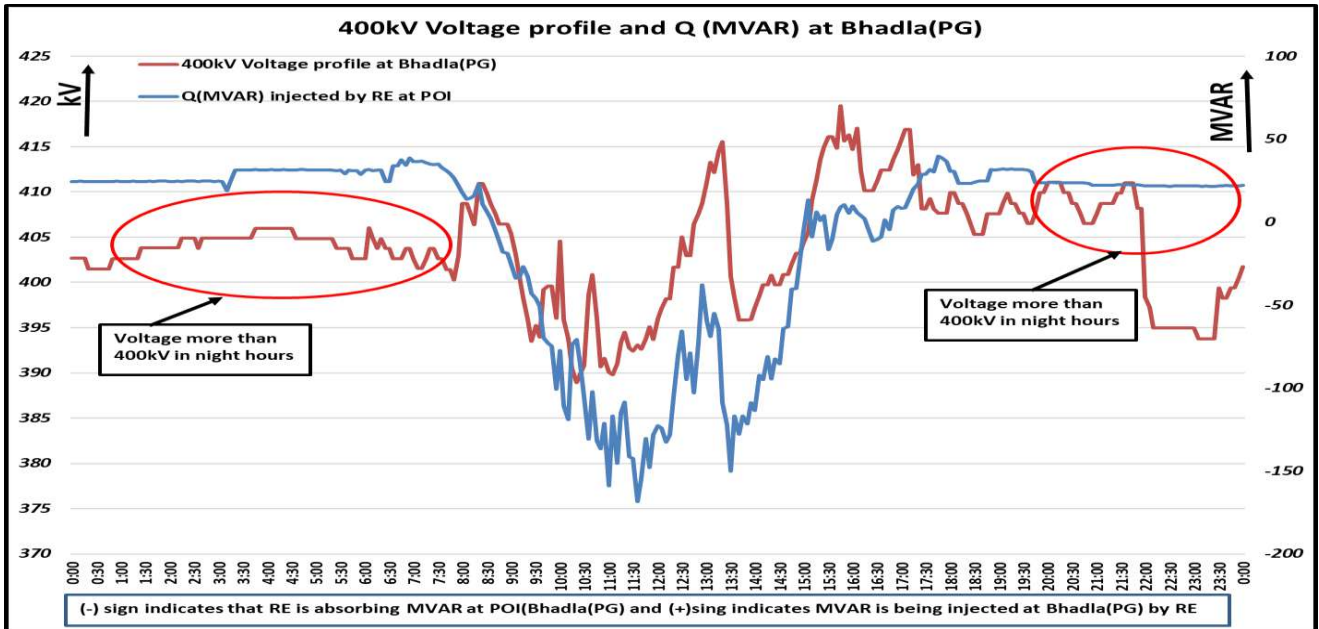
From data, it is being observed that the reactive power absorption of solar plant is increasing with increase in generated active power. Though the plant is keeping up with the recommended CEA connectivity standards by running within 0.95 limits but the effect of this plant along with other operating in same manner i.e. at lagging pf, is absorption of reactive power at POI proportional to real power output resulting in reduction of voltage to critically low levels during peak solar generation.

To meet the CEA standard of 0.95 lead/lag p.f. the solar plant operators are generally running in power factor control mode and maintaining unity pf at inverter terminals. This scenario is leading to all the reactive power required by inverter transformers, plant power transformers and dedicated line being absorbed from grid. A way out from this situation is to operate all the PV plants and other inverter-based resources in voltage control mode (taking POI voltage as reference voltage) thereby regulating reactive power injection/drawl as per grid condition.

In voltage control mode solar plant dynamically supports the grid by injecting/absorbing reactive power based on voltage. During peak solar generation period, the plant is injecting VARs to the POI to boost the dip in voltage. In situations where voltage control operation is not possible then solar developer may be asked to provide Shunt compensation devices so that they don't have to depend on grid for reactive power support.

With a high RE addition target set by India, huge quantum of Solar and Wind power parks are getting commissioned. RE generation at ISTS system is also being integrated at fast pace.

Consequently, voltage excursions are being experienced at RE pooling stations during day and night hours on daily basis. A typical day voltage profile of Bhadla (PG) (Aug'2021) is shown below:



It may be seen that High voltages are being experienced during night hours (No solar generation) at RE and nearby substations. These high voltages are despite utilising the available static reactive power support such as bus reactor and line reactors. Further EHV lines are being opened to control high voltages, which compromises reliability /security, high duty cycles on CBs causing failures especially in GIS SS etc.

The Reasons for persistent High Voltage are listed below

- i. Evacuation lines for RE are built considering the potential generation, that leads to surplus capacity especially when the RE projects are in nascent stage. HV are arising due to lightly loaded of lines during lean generation period from renewable generators and this issue gets further aggravated during low load period and nearby stations are also experiencing high voltages.
- ii. Solar generation is available only during daytime and Wind generation is available only during certain months of the year.
- iii. The underlying network (220kV & below) is connected with wind / solar generators without any loads.
- iv. Solar Panels/WTGs output are connected to pooling stations through underground cables.

Most of the inverters are designed with capability to absorb reactive power using a feature known as night mode. A typical inverter has a reactive power capacity of 33% capacity of active power capacity is available for absorption during night on most of the plants. Further the recently commissioned inverters are having a reactive capacity of around 70-75% of active power capacity.

To ascertain the technical and commercial aspects of operating in night mode of operation and its impact on the 400kV Grid, a test/trail run may be performed for any NR RE plants. Such test has already been performed in Southern region in coordination of SPRC/SRLDC and lots of RE plants at Southern region has already participated and contributed to for Voltage support as per grid requirement.

As per the minutes of special meeting hosted by SRPC on 27th July'21,

“a test was conducted on 16th and 17th February 2021 at Pavagada Solar Park in coordination with SRLDC. A capacity of 1750MW out of total 2050 MW participated in the testing where night mode facility was available. A total of 36Mvar (1 MVAR absorption per 50MW block) was implemented on 16th Feb and 180 Mvar absorption (5 MVAR absorption per 50MW block) was implemented on 17th February 2021. It was observed that voltage dip of 3 kV was observed for 128Mvar support measured at grid end. No technical constraint was observed during the testing period. The test has shown that Sufficient reactive capability is available at Pavagada Solar Park. There is a possibility of total reactive absorption support of appx 525 to 600 Mvar. The MVAR capability can be utilised to bring the voltage say below 427kV to 425kV and avoid opening of lines. Actual requirement would be there only for 4 to 5 hours. Accordingly, the cost may go down”.

Further understanding is required on aspect such as steps possible for controlling Q in night mode, Technical feasibility of operating for 4 to 5 hours during night, tap change requirement if any etc.

A test/trail may be planned and performed and observation may be shared to OCC forum, after test/trail, all the feedback and its technical and financial aspects may be reviewed and studied at NRPC/NRLDC level and accordingly test/trail for all the RE plants would be scheduled and performed. This would support the grid during winter months to reduce the issue to high voltage up to some extent.

Following may be the outline for carrying out such an exercise:

- A task force with participation from NRPC, NRLDC and some of the SPDs/SPPDs/HPDs/HPPDs to implement the pilot project may be formed.
- To work out a suitable mechanism to address excess power consumption due to night mode.
- To classify developers into two categories one who is having capability to provide constant Mvar and other with capability for dynamic Mvar support.
- To classify developers into two categories one who is having capability to provide short term (4 to 5 hours) per day based on requirement and continuous.

Possible steps for achieving the Terms of reference

1. Collection of Inverter details, user manual, reactive Capability curve, details of reactive control steps, facility available for control SCADA/PPC, PPA Rates, SLD. (Already collected for newly registered plants).
2. Site visit by NRLDC and NRPC.
3. Presentation by OEM/Developers.
4. Formation of committee.
5. Meetings as required.
6. Draft Recommendations.
7. Final Recommendations.
8. Approval of OCC, Commercial Committee and SRPC board if required.
9. Actual operation.

Sub-group constituted at NRPC level may take up these issues during their deliberations.

Members may like to discuss.

18. TTC/ATC of state control areas for winter 2021-22

In 187th OCC meeting, it was discussed that most of the NR states except Uttarakhand, J&K U/T and Ladakh U/T and Chandigarh are sharing basecase and ATC/TTC assessment with NRLDC. SLDCs were requested to go through the tentative ATC/TTC limits for October 2021 (Annexure-III of 187 OCC agenda) and provide comments. However, comments have been received only from HP so far. Accordingly, these limits are assumed confirmed and uploaded on NLDC website. SLDCs are also requested to upload the limits for winter 2021-22 in their respective websites.

State	Available Transfer Capability (ATC) (MW) (TTC-RM)	Limiting Constraints	Remarks
Punjab	7100 (Solar) 7400 (non-solar)	N-1 contingency of 400/220kV Rajpura, Nakodar, Moga and Ludhiana ICTs . 400kV Bus-split work at 765/400/220kV Mogahas been completed and it is likely to increase ATC/TTC of Punjab state control area by 300MW.	Punjab SLDC is requested to ensure sufficient intrastate generation on bar during winter months, which would help in providing the required MVAR absorption to limit high voltages during winter months
UP	13200	N-1 contingency of 400/220kV Sohawal (PG), Gorakhpur (UP), Sarnath, Obra and Agra(PG) ICTs, 400/132kV Mau ICTs	UP is assessing its ATC on regular basis in consultation with NRLDC and uploading it at its website. SPS for Sohawal and Lucknow to be expedited.
Rajasthan	5900	N-1 contingency of 400/220kV Chittorgarh, Merta, Jodhpur ICTs, Bhilwara and Ajmer ICTs	Rajasthan SLDC is requested to take up the matter for implementation of SPS at Jodhpur and other stations with STU and ensure loading below N-1 contingency limit at constrained 400/220kV ICTs.
Haryana	7900	N-1 contingency of 400/220kV ICTs at Deepalpur, Kurukshetra(PG), Sonapat(PG), Panipat	Haryana SLDC is once again requested to expedite implementation of SPS at 400/220kV Deepalpur and Kurukshetra (PG) to enhance their ATC/TTC limits at the earliest
Delhi	6500	N-1 contingency of 400/220kV Mundka and Bamnauli ICTs.	ATC is not being uploaded in website, only violation of ATC is being shown. Delhi SLDC to implement SPS at Mundka and Bamnoli to save supercritical

			loads under N-1 contingency of one ICT.
J&K and Ladakh	1550	N-1 contingency of 400/220kV Amargarh ICTs	Not assessing its ATC
HP	1100	N-1 contingency of 400/220kV Nallagarh ICTs and 220kV Nallagarh-Uperanangal D/C	HP started its ATC assesment from previous two months in consulation with NRLDC
Uttarakhand	1500	N-1 contingency of 400/220kV Dehradun and Kashipur ICTs	Not assessing its ATC

Uttarakhand and J&K representatives had intimated during 47th TCC and 49th NRPC meeting that they would be sharing ATC/TTC assessment with NRLDC from October 2021, however the same is still awaited.

As discussed in last several OCC meetings, all SLDCs need to furnish ATC/TTC details of their control area at respective SLDC websites. Now, it is being observed that most of the SLDCs except Uttarakhand, J&K and Delhi (real-time violation available) are uploading ATC/TTC limits on their websites.

SLDC	Link for ATC on website
UP	https://www.upsldc.org/documents/20182/0/ttc_atc_24-11-16/4c79978e-35f2-4aef-8c0f-7f30d878dbde
Punjab	https://www.punjabslcd.org/downloads/ATC-TTC0321.pdf
Haryana	https://hvpn.org.in/#/atcttc
Delhi	NA (real-time violation reporting available)
Rajasthan	https://slcd.rajasthan.gov.in/rrvpnl/scheduling/downloads
HP	https://hpsldc.com/mrm_category/ttc-atc-report/
Uttarakhand	NA
J&K and Ladakh U/T	NA

J&K and Ladakh U/Ts and Uttarakhand are once again requested to advise the concerned officers to evaluate their ATC/TTC limits in coordination with NRLDC and share latest assessment with NRLDC and NRPC.

Plots depicting N-1 non-compliance at several 400/220kV ICTs is attached as **Annexure-B.VI**. It is again requested that SLDCs may ensure that loading of ICTs and lines are below their N-1 contingency limits.

As discussed during last meeting, since from October, demand of most of the NR states starts changing, it is requested that the revised ATC/TTC limits for winter 2021 alongwith anticipated generation scenario may be timely shared with NRLDC.

All SLDCs are requested to share basecase as well as ATC/TTC assessment with NRLDC/NRPC on monthly basis as well as upload on their websites. It is also requested that net scheduled power requested by states is within their ATC limits.

Members may like to discuss.

19. Grid operation related issues

(i) Long outage of transmission elements/ generating units

Reasons and revival date for elements under long outage are being discussed regularly in OCC meetings. Any update on the status of these elements from last OCC meeting may be shared with the forum (**Annexure-B.VII**).

All utilities are requested to make it a practice to update status of elements under long outage in the NRLDC outage software portal. Utilities are requested to take necessary actions to revive elements which are under long outage.

(ii) Information about new transmission elements/ generating units to be commissioned in next 45 days

In 176th OCC meeting, it was discussed that first time charging procedure is not being diligently followed by some entities. The documents are being submitted at the last minute and thereafter it is being urged to NRLDC to give the code for charging. In the meeting it was also requested that utilities should inform about elements expected for first time charging in the next one month in advance in OCC meeting. This information would be helpful in carrying out studies, SPS requirement/modification etc in time.

Utilities are also requested to make sure that list of 220kV and underlying intra-state lines and ICTs is readily available with them, so that the same can be shared with NRLDC/NRPC as and when required. This data is to be shared with NRLDC/NRPC for timely updation of Powermaps, PSSbasecase, Protection analysis etc.

In line with the above decisions, all utilities are requested to share the information about transmission elements/ generating units which are expected to be first time charged in the next 45 days.

(iii) Switching operation of transmission elements without NRLDC code

This is with reference to the unilateral switching operation of 400kV Allahabad-FatehpurCkt 2 on 22.09.2021 by POWERGRID NR-III without NRLDC coordination. This is a gross violation of IEGC clauses 5.2 (b) and (c).

Sr. No.	Name of transmission element	Outage duration		
		Date	From	To
1	400 kV Allahabad-Fatehpur-2	22.09.2021	20:27 Hrs	to 20:28 Hrs
		22.09.2021	20:31 Hrs	to 20:43 Hrs

The subject matter has already been deliberated in 175th, 178th and 181st OCC meetings. It is once again requested to kindly look into the matter and advise the concerned not to repeat this in future in the interest of grid security and instruct them to follow grid discipline and adhere to the IEGC and CERC regulations.

(iv) Delay in charging of elements under SUO-MOTO outages

The following lines were manually opened due to high voltage under SUO-MOTO instruction of NRLDC. The lines were charged after a delay of more than 30 minutes after issuance of charging code.

S No	ELEMENT NAME	OUTAGE DATE TIME	REVIVAL DATE TIME	NRLDC Remarks	Total Delay
1	765KV BHIWANI-PHAGI(JPR)-I	16-08-21 19:08	17-08-21 10:21	Real time charging code NR2108-1991 (17-Aug-21 09:27) was issued.	00:56
2	765KV BIKANER-MOGA-I	03-08-21 02:25	03-08-21 07:57	Real time charging code NR2108-203 (03-Aug-21 06:25) was issued.	01:32
3	765KV BIKANER-MOGA-I	20-08-21 19:44	21-08-21 07:17	Real time charging code NR2108-2580 (21-Aug-21 06:15) was issued.	01:02
4	765KV BIKANER-MOGA-I	26-08-21 19:47	27-08-21 06:23	Real time charging code NR2108-3431 (27-Aug-21 05:26) was issued.	00:57
5	765KV BIKANER-MOGA-I	28-08-21 17:19	29-08-21 07:21	Real time charging code NR2108-3721 (29-Aug-21 06:19) was issued.	01:02
6	765KV BIKANER-MOGA-II	04-08-21 03:16	04-08-21 07:24	Real time charging code NR2108-312 (04-Aug-21 06:01) was issued.	01:23
7	400KV AGRA-SIKAR-I	25-08-21 04:04	25-08-21 10:04	Real time charging code NR2108-3140 (25-Aug-21 09:14) was issued.	00:50
8	765KV ORAI-ALIGARH-II	25-08-21 07:38	25-08-21 13:56	Real time charging code NR2108-3133 (25-Aug-21 09:07) was issued.	04:49
9	400KV ALLD-FATEHPUR-I	25-08-21 16:11	28-08-21 14:11	Real time charging code NR2108-3634 (28-Aug-21 13:20) was issued.	00:51
10	400KV ALLD-FATEHPUR-II	04-08-21 05:42	16-08-21 11:11	Real time charging code NR2108-1853 (16-Aug-21 10:22) was issued.	00:50
11	400KV FATEHPUR-MAINPURI-I	01-08-21 00:00	02-08-21 10:04	Real time charging code NR2108-113 (02-Aug-21 09:12) was issued.	00:52

As per approved NR Operating procedure, operation code issued by NRLDC for switching shall become invalid if the switching is not completed within half an hour of issuance of code. It is requested to avoid such delay in charging of elements.

Further, it is proposed to consider the delay period after half an hour of issuance of code as outage attributed to the transmission licensee.

20. Calculation of Drawal points based on SLDC end data

As discussed in the 6thTeST meeting all SLDCs shall maintain its own drawal calculation (alternate calculation based on the SLDC drawal points) for proper monitoring and SLDC also shall be responsible for calculation of its own drawl based on their drawal points at their respective feeders/ICTS. SLDC shall use its own calculated value of monitoring real-time drawal from the grid along with ISTS drawal to ensure the correctness and corrective measures shall be taken accordingly.

UP and Delhi are using their end calculation as primary calculation for monitoring of drawal whereas Rajasthan is entirely dependent on STU data.

However, **Punjab, Haryana, Jammu and Kashmir, Uttarakhand** are dependent on RLDC end drawal values. All concerned are requested to please compute drawal values at SLDC end also, so that same can be verified with NRLDC end value and any discrepancy can be rectified immediately.

Members may like to discuss.

21. Non-availability of data from PSTCL Stations

The matter of non-availability of real-time data was discussed in special meeting with PSTCL held on 05.02.2021, where in matter of non-availability of data from PSTCL stations were discussed. It is to inform data from 55 stations of PSTCL is yet to be integrated. During the meeting PSTCL informed that 9 stations data would be integrated by March 2021 and remaining stations would be integrated by December 2021. **Minutes of the meeting is attached in Annexure-B.VIII.a. NRLDC letter in this regard is also attached as Annexure-B.VIII.b.**

This is to inform that till date there is no improvement in this regard. It may be mentioned some of the critical interface data is also integrated. PSTCL is requested to please expedite the process of RTU Integration and update the status in this regard.

PSTCL may update.

22. Frequent forced outages of transmission elements in the month of Sep'21:

The following transmission elements were frequently under forced outages during the month of **Sep'21**:

S. NO.	Element Name	No. of forced outages	Utility/SLDC
1	400 KV Amritsar(PG)-Makhu(PS) (PSTCL) Ckt-1	4	Punjab/POWERGRID
2	400 KV Banda-Rewa Road (UP) Ckt-1	4	UP

3	400 KV Kala Amb(PKTL)-Wangto_GIS(HP) (HPPTCL) Ckt-1	4	HP/PKTL
4	400 KV Panki-Aligarh (UP) Ckt-1	4	UP
5	220 KV Debari(RS)-RAPS_A(NP) (RS) Ckt-1	7	NPCIL/Rajasthan
6	220 KV RAPS_A(NP)-Sakatpura(RS) (RS) Ckt-2	5	NPCIL/Rajasthan

The complete details are attached at **Annexure-B.IXa**. Frequent outages of such elements affect the reliability and security of the grid. Hence, utilities are requested to analyse the root cause of the trippings and share the remedial measures taken/being taken in this respect. Reports as received from utilities are attached as **Annexure-B.IXb**.

Members may like to discuss.

23. Multiple element tripping events in Northern region in the month of Sep'21:

A total of **22** grid events occurred in the month of Sep'21 of which **14** 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 05-October-2021 is attached at **Annexure-B.X**.

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 **680ms** in the event of multiple element tripping at 400/220 kV Akal (Raj) on 02-Sep-21 at 16:47hrs.)

Delayed clearance of fault (more than 100ms for 400kV and 160ms for 220kV system) observed in total **5** events out of **22** grid events occurred in the month. In 4 number of events, fault signature couldn't be captured from PMU data.

Members may take necessary preventive measures to avoid such grid incidents / disturbances

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.

24. Details of tripping of Inter-Regional lines from Northern Region for Sep'21:

A total of 12 inter-regional lines tripping occurred in the month of Sep'21. The list is attached at **Annexure-B.XI**. Out of 12 number of tripping's, 5 tripping incidents are related to HVDC system. 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 tripping as well as timely submission of the information.

25. Status of submission of DR/EL and tripping report of utilities for the month of Sep'21.

The status of receipt of DR/EL and tripping report of utilities for the month of Sep 2021 is attached at **Annexure-B.XII**. It is to be noted that as per the IEGC provision under clause 5.2 (r), detailed tripping report along with DR & EL has to be furnished within 24 hrs of the occurrence of the event. However, it is evident from the submitted data that reporting status is not satisfactory and needs improvement. Also, it is observed that reporting status has been improved from CPCC1, CPCC2, CPCC3, Delhi, HP, Rajasthan and Haryana in Sep, 2021 compared to the previous month.

Members may please note and advise the concerned for timely submission of the information. It is requested that DR/EL of all the trippings shall be **uploaded on Web Based Tripping Monitoring System “<http://103.7.128.184/Account/Login.aspx>”** within 24 hours of the events as per IEGC clause 5.2.r and clause 15.3 of CEA grid standard. Apart from prints of DR outputs, the corresponding COMTRADE files may please also be submitted in tripping portal / through email.

26. Frequency response characteristic:

One FRC based event has occurred in the month of **Sep-2021**. Description of the event is as given below:

Table:

S. No.	Event Date	Time (In hrs.)	Event Description	Starting Frequency (in Hz)	End Frequency (in Hz)	Δf
1	28-Sep-21	17:48hrs	At 17:48 Hrs on 28th Sept 2021, a disturbance occurred at load side of internal smelter which led to load loss of approx. 1500MW (as per SCADA data) at Sterlite Vedanta in Odisha.	49.96	50.03	0.07

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	28-Sep-21 event	Remarks
PUNJAB	2%	
HARYANA	8%	
RAJASTHAN	-15%	
DELHI	293%	
UTTAR PRADESH	21%	
UTTARAKHAND	-20%	
CHANDIGARH	-2%	
HIMACHAL PRADESH	-51%	
JAMMU & KASHMIR	-7%	
NR	19%	

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

Generator	28-Sep-21 event	Generator	28-Sep-21 event
Singrauli TPS	10%	Salal HEP	-7%
Rihand-1 TPS	Suspected SCADA data	Tanakpur HEP	-4%
Rihand-2 TPS	Suspected SCADA data	Uri-1 HEP	0%
Rihand-3 TPS	20%	Uri-2 HEP	Suspected SCADA data
Dadri-1 TPS	155%	Dhauliganga HEP	72%
Dadri -2 TPS	30%	Dulhasti HEP	10%
Unchahar TPS	0%	Sewa-II HEP	No generation
Unchahar stg-4 TPS	-352%	Parbati-3 HEP	0%
Jhajjar TPS	70%	Jhakri HEP	72%
Dadri GPS	24%	Rampur HEP	78%
Anta GPS	183%	Tehri HEP	15%
Auraiya GPS	-16%	Koteswar HEP	76%
Narora APS	-50%	Karcham HEP	117%
RAPS-B	-23%	Malana-2 HEP	Suspected SCADA data
RAPS-C	-3%	Budhil HEP	3%
Chamera-1 HEP	-20%	Bhakra HEP	0%
Chamera-2 HEP	3%	Dehar HEP	1%
Chamera-3 HEP	39%	Pong HEP	11%
Bairasiul HEP	Suspected SCADA data	Koldam HEP	167%
		AD Hydro HEP	-46%

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

Generator	28-Sep-21 event	Generator	28-Sep-21 event
PUNJAB		UP	
Ropar TPS	5%	Obra TPS	0%
L.Mohabbat TPS	-5%	Harduaganj TPS	5%
Rajpura TPS	30%	Paricha TPS	Suspected SCADA data
T.Sabo TPS	-13%	Rosa TPS	0%
Goindwal Sahib TPS	-59%	Anpara TPS	-11%
Ranjit Sagar HEP	29%	Anpara C TPS	102%
Anandpur Sahib HEP	No generation	Anpara D TPS	0%
HARYANA		Bara TPS	
Panipat TPS	-3%	Lalitpur TPS	-1%
Khedar TPS	6%	Meja TPS	0%
Yamuna Nagar TPS	No generation	Vishnuprayag HEP	Suspected SCADA data
CLP Jhajjar TPS	0%	Alaknanda HEP	4%
Faridabad GPS	No generation	Rihand HEP	0%
RAJASTHAN		Obra HEP	
Kota TPS	3%	UTTARAKHAND	
Suratgarh TPS	-8%	Gamma Infra GPS	Suspected SCADA data
Kalisindh TPS	0%	Shravanti GPS	-17%
Chhabra TPS	No generation	Ramganga HEP	No generation
Chhabra stg-2 TPS	14%	Chibra HEP	-4%
Kawai TPS	-16%	Khodri HEP	-6%
Dholpur GPS	No generation	Chilla HEP	No generation
Mahi-1 HEP	-8%	HP	
Mahi-2 HEP	No generation	Baspa HEP	4%
RPS HEP	No generation	Malana HEP	4%
JS HEP	-20%	Sainj HEP	-3%
DELHI		Larji HEP	
Badarpur TPS	No generation	Bhabha HEP	No generation
Bawana GPS	-12%	Giri HEP	5%
Pragati GPS	-1%	J&K	
		Baglihar-1&2 HEP	0%
		Lower Jhelum HEP	No generation

Status of Data received of FRC for 28.09.2021 Vedanta			
Data Received from		Data Not Received from	
Rajasthan	AD Hydro	HP	Karcham(JSW)
Delhi	ADANI (Kawai)	UK	Koteshwar HEP
UP	Singrauli NTPC	J&K	Rihand NTPC
	NJHPC	Punjab	Dadri-1 TPS
	NHPC	BBMB	Rampur HEP
	Tehri HEP	Haryana	APCPL Jhajjar
	Unchahhar		Others

Primary Frequency Response by Generators during Grid Event at STERLITE Vedanta on 28th Sept 2021:

Sr. No	Generating stations	FRC as per generator data (in %)	Response category/Remark
1	AD Hydro Unit 1	162.34	Satisfactory response
2	N. Jhakri Unit 1	80.61	Satisfactory response
3	N. Jhakri Unit 2	90.33	Satisfactory response
4	N. Jhakri Unit 3	80.51	Satisfactory response
5	N. Jhakri Unit 4	94.62	Satisfactory response
6	N. Jhakri Unit 5	87.31	Satisfactory response
7	N. Jhakri Unit 6	86.18	Satisfactory response
8	ADANI Kawai Unit 1	16.04	Unsatisfactory response
9	ADANI Kawai Unit 2	13.68	Unsatisfactory response

Primary Frequency Response by Generators during Grid Event at STERLITE Vedanta on 28th Sept 2021:

Sr. No	Generating stations	FRC as per generator data (in %)	Response category/Remark
10	Singrauli Unit 6	23.44	Unsatisfactory response
11	Singrauli Unit 7	14.70	Unsatisfactory response
12	Tehri HEP Unit 1	-2.89	Poor response
13	Tehri HEP Unit 2	124.01	Satisfactory response
14	Lalitpur	-0.67	Poor response (Raw data not received)
15	Obra-H	-19.45	
16	Obra-B	0	
17	Rosa-H	-7.12	
18	Kalisindh	11	Unsatisfactory response
19	KTPS	13	Unsatisfactory response

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 the above event and reason of poor response, if observed.

FRC information has been received from AD Hydro, NHPC, NJPC, Adani, Tehri, Singrauli, Delhi, UP& Rajasthan control area.

Other utilities are also requested to kindly share the FRC calculations and further action taken at their end.

27. Status of PSS tuning/ re-tuning and Step Response Test of generator

Maintaining properly tuned Power System Stabilizers in service is essential for damping of inter area and local mode of oscillations in the grid. As we all know, Indian electricity grid is continuously expanding and lots of Power Electronics devices were also commissioned in recent years changing the dynamics of grid. As possibility of development of power oscillations under certain operating conditions cannot be ruled out, PSS tuning /re-tuning is required for damping of oscillations.

In this regard one committee at NRPC level was formed in year 2014 and it was agreed that If results of Step Response Test on concerned grid connected generators indicate sufficient damping, generating company would perform next Step Test after three year or at the time of major overhauling of the machine, whichever will be earlier and Generating Companies would arrange for re-tuning of PSS, if Step Response Test indicates insufficient damping of oscillations.

In 180th, 181st, 182nd, 183rd, 184th, 185th 186th& 187thOCC meeting, this point was discussed and Utilities were requested to submit the present status of PSS tuning/re-tuning and Step Response Test of their respective generators as per the below mentioned format.

S. No.	Name of the Generating Station	Date of last PSS tuning / re-tuning performed (in DD/MM/YYYY format)	Date of last Step Response Test performed (in DD/MM/YYYY format)	Report submitted to NRLDC (Yes/ No)	Remarks (if any)

Status report in above format updated till 08thOctober 2021 is attached as **Annexure-B.XIII**

It may be noted that except Anpara-A U-3, Parichha-C U-5, Baspa U-2, Unchahar-II U-1, Jhakri U-1&3, all units of Tehri and Koteshwar, and all units of Rampur HPS, PSS of other major units were last tuned several years ago. Therefore, once again all utilities are requested to arrange exciter step-responsetest or tuning of their respective units

and submit the report of PSS tuning/ re-tuning/ Step Response Test through email to NRPC and NRLDC at seo-nrpc@nic.in and nrldco2@gmail.com respectively.

Members may kindly Accord due priority in this regard and update about their future plan for PSS tuning as there is no progress despite including this agenda in every OCC meeting.

28. Mock black start exercises in NR:

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

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

Therefore, the schedule of mock exercise dates for different hydro & Gas power station is proposed. The power stations may confirm and inform to all the concerned persons of control centre/ substations to facilitate the exercise.

The summary/schedule of mock black start exercise of ISGS hydro stations carried out in previous season is tabulated below:

Date	Revised Schedule date	Name of stations	Comment and Remarks
26-Nov-20		*Budhil	To be carried out
01-Dec-20		Dhauliganga	To be carried out
04-Dec-20	04-Dec-20	Bairasiul	Conducted Successfully
08-Dec-20	Not Possible this year	*Sewa-2	Power House is under complete shutdown due to leakage from HRT upto Oct'2021.
10-Dec-20	29-Dec-20	N. Jhakri and Rampur	Annual Planned Maintenance from 07th Dec to 26th Dec 2020. Yet to be carried out. Tentatively in the month of Feb-21
15-Dec-20	15-Dec-20	*Karcham and Baspa	Exercise was partially successful. Baspa didn't extend supply to Karcham (Same to be explored by Baspa). Thus, Baspa unit was black started and synchronized the supply made available at their bus.
17-Dec-20		*Uri-I, II HEP, Lower Jhelum HEP, Pampore GT's, Upper Sindh and Kishanganga	Deferred by J&K due to inclement weather.

17-Dec-20	2nd-3rd week of January 2021	Kishanganga	As per original contract, first time Black start exercise of Kishanganga need to be performed in the presence of OEM, i.e. M/s BHEL. The confirmation from BHEL is awaited.
22-Dec-20	22-Dec-20	*Parbati-3 and Sainj	Black start of only Parbati-3 was carried out successfully. Sainj to explore black start capability and want presence of OEM since it is the first instance of blackstart at Sainj.
24-Dec-20		*Salal	Deferred by J&K due to inclement weather.
29-Dec-20	2nd-3rd week of January 2021	*Chamera-3	As one Bus and one Line of Chamera-3 Power Station is under outage. The same is expected to be restored by the last week of Dec. 2020. Therefore, the mock black start exercise of Chamera-3 may be planned in the 2nd-3rd week of January 2021.
31-Dec-20	23-Dec-20	Koteshwar	Exercise carried out successfully.
05-Jan-21	08-Dec-20	#Chamera-1 and 2	Conducted but partially successful, during island formation, 400 kV Chamera1 (end)-Jalandhar ckt-1 tripped due to over voltage stage-1 protection. Chamera1 unit black started and successfully extended till the load centre at Kotla Jangan. Unit-3 of Chamera1 run in islanded mode, Unit-3 of Chamera2 also synchronized in the island. Just before unit island synchronization with the grid, unit-3 tripped on over flux protection during charging of bus reactor at Jalandhar (PG) end. It may be again planned.
08-Jan-21	08-Jan-21	*Malana-2, AD Hydro and Phozal	Due to shifting of Malana-2 evacuation and no black start capability w.r.t. Phozal generators black start of AD Hydro was carried out. Exercise was successful. Though, due to manual governing operation frequency variation was large
12-Jan-21	12-Jan-21	*Tehri	Exercise carried out successfully
15-Jan-21	22-Jan-21	*Koldam	Exercise was partially successful as during the island operation, due to fault at 220kV Jagraon feeder (distance protection operated), unit tripped as low forward power protection operated at Koldam and Island went black. Island was finally synchronized with grid by closing Main breaker of Koldam Ludhiana ckt-2 with Bus-1 at Ludhiana (PG).

19-Jan-21	09-Feb-21	*Anta GPS	Exercise was conducted successfully. First time black start of Gas Power station with load in NR made successful. However, as synchronization facility is not available at NTPC Anta & Sawai Madhopur (RS), Anta unit was taken out from the grid. Finally, Anta bus was charged by closing Bus Coupler at Anta then subsystem was charged by charging 220kV Anta-Sawai Madhopur ckt.
21-Jan-21		*Auraiya GPS	
28-Jan-21	18-Jan-21	*Dadri GPS	Black started of GT was successful. Island was not formed with load. It will be planned again with NTPC colony load and thermal auxiliary supply as conducted earlier

* Mock Black start exercise not carried out during Year 2019-20

Black start exercise done for Chamera-1 only

As informed by Bawana GPS, it does not have black start capability

Out of 19 planned exercises 9 were carried out. In addition, there was change in scheduled date in 9 out of 19 planned exercises. Thus, a large percentage of exercises were re-scheduled due to reasons like load not being available, plant personnel not ready, coordination problem among other reasons. **Constituents were being requested to adhere to the finalized schedule of mock exercises during the season.**

The proposed schedule for the Mock Black start exercise is as follows:

Hydro Power Stations:

Date	Name of stations
26-Nov-21	*Uri-I, II HEP, Lower Jhelum HEP, Upper Sindh and Kishanganga
01-Dec-21	* Dhauliganga
04-Dec-21	Bairasiul
08-Dec-21	*Sewa-2
10-Dec-21	* N. Jhakri and Rampur
15-Dec-21	Karcham and Baspa
17-Dec-21	*Budhil
22-Dec-21	Parbati-3 and Sainj
24-Dec-21	*Salal
29-Dec-21	*Chamera-3
31-Dec-21	Koteshwar
05-Jan-22	Chamera-1 and Chamera-2
08-Jan-22	Malana-2, AD Hydro and Phozal

12-Jan-22	Tehri
15-Jan-22	Koldam

* Mock Black start exercise not carried out during Year 2020-21

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

Gas Power Stations:

Date	Name of stations
19-Jan-22	Anta GPS
21-Jan-22	*Auraiya GPS
28-Jan-22	*Dadri GPS

As informed by Bawana GPS, it does not have black start capability.

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

S. NO.	Utility	Hydro Power Station	Installed Capacity(MW)
1	J&K	Baglihar	3x150
2		Baglihar stage-2	3x150
3		Lower Jhelum	3x35
4		Upper Sindh	2x11+3x35
5		Larji	3x42
6		Bhabha	3x40
7		Malana -I	2x43
8		Baspa	3x100
9	Punjab	Anandpur Sahib	4x33.5
10		Ranjit Sagar	4x150
11	Rajasthan	Mahi-I&II	2x25+2x45
12		Rana Pratap Sagar	4x43
13		Jawahar Sagar	3x33
14		Gandhi Sagar	5x23
15		Dholpur GPS	3x110

16		Ramgarh GPS	1x35.5+2x37.5+1x110	
17	UP	Rihand	6x50	
18		Obra	3x33	
19		Vishnuprayag	4x100	
20			Srinagar (Alaknanda)	4x82.5
21				
	Uttarakhand	Gamma Infra	2x76+1x73	
22		Shravanti	6x75	
23		Ramganga	3x66	
24		Chibro	4x60	
25		Khodri	4x30	
26		Chilla	4x36	
27		Maneri Bhali-I&II	3x30+4x76	
28		Delhi	IP Extn GTs	6x30+3x30
29	Pragati GPS		2x104.6+1x121.2	
30	Rithala		3x36	
31	Haryana	Faridabad GPS	2x137.75+1x156.07	

During last winter, SLDCs had been requested to carry out mock drills and share their reports. However, the report of such exercises was not received except for Rihand Hydro in Uttar Pradesh. The information may please be shared by SLDCs and program for this year's mock black start exercises shall also be shared.

SLDCs shall submit the reports of black start exercise in their respective control area. SLDCs may also identify further generating stations/unit for black start exercise.

Members may please discuss.

Follow up issues from previous OCC meetings

1	Sub-stations likely to be commissioned by next two years.	All the concerned states had been requested in past OCC meetings to submit the details of the downstream network associated specially with POWERGRID substations along with the action plan of their proposed / approved networks.	Status details of downstream networks mentioned in Annexure-A.I.I.																				
2	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.	Data upto following months, received from various states / UTs: <table border="1"> <tr><td>⊙ CHANDIGARH</td><td>Sep-2019</td></tr> <tr><td>⊙ DELHI</td><td>Aug-2021</td></tr> <tr><td>⊙ HARYANA</td><td>Apr-2021</td></tr> <tr><td>⊙ HP</td><td>Mar-2021</td></tr> <tr><td>⊙ J&K and LADAKH</td><td>Not Available</td></tr> <tr><td>⊙ PUNJAB</td><td>Mar-2021</td></tr> <tr><td>⊙ RAJASTHAN</td><td>Sep-2021</td></tr> <tr><td>⊙ UP</td><td>Jul-2021</td></tr> <tr><td>⊙ UTTARAKHAND</td><td>Sep-2021</td></tr> </table> All States/UTs are requested to furnish updated status on monthly basis.	⊙ CHANDIGARH	Sep-2019	⊙ DELHI	Aug-2021	⊙ HARYANA	Apr-2021	⊙ HP	Mar-2021	⊙ J&K and LADAKH	Not Available	⊙ PUNJAB	Mar-2021	⊙ RAJASTHAN	Sep-2021	⊙ UP	Jul-2021	⊙ UTTARAKHAND	Sep-2021		
⊙ CHANDIGARH	Sep-2019																						
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⊙ RAJASTHAN	Sep-2021																						
⊙ UP	Jul-2021																						
⊙ UTTARAKHAND	Sep-2021																						
3	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".	Data upto following months, received from various states / UTs: <table border="1"> <tr><td>⊙ CHANDIGARH</td><td>Not Available</td></tr> <tr><td>⊙ DELHI</td><td>Sep-2021</td></tr> <tr><td>⊙ HARYANA</td><td>Sep-2021</td></tr> <tr><td>⊙ HP</td><td>Sep-2021</td></tr> <tr><td>⊙ J&K and LADAKH</td><td>Not Available</td></tr> <tr><td>⊙ PUNJAB</td><td>Mar-2021</td></tr> <tr><td>⊙ RAJASTHAN</td><td>Jun-2021</td></tr> <tr><td>⊙ UP</td><td>Jun-2021</td></tr> <tr><td>⊙ UTTARAKHAND</td><td>Mar-2021</td></tr> <tr><td>⊙ BBMB</td><td>Sep-2021</td></tr> </table> All States/UTs are requested to furnish updated status on monthly basis.	⊙ CHANDIGARH	Not Available	⊙ DELHI	Sep-2021	⊙ HARYANA	Sep-2021	⊙ HP	Sep-2021	⊙ J&K and LADAKH	Not Available	⊙ PUNJAB	Mar-2021	⊙ RAJASTHAN	Jun-2021	⊙ UP	Jun-2021	⊙ UTTARAKHAND	Mar-2021	⊙ BBMB	Sep-2021
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⊙ BBMB	Sep-2021																						
4	Status of FGD installation vis-à-vis installation plan at identified TPS	List of FGDs to be installed in NR was finalized in the 36th TCC (special) meeting dt. 14.09.2017. All SLDCs were regularly requested since 144th OCC meeting to take up with the concerned generators where FGD was required to be installed. Further, progress of FGD installation work on monthly basis is monitored in OCC meetings.	Status of the information submission (month) from states / utilities is as under: <table border="1"> <tr><td>⊙ HARYANA</td><td>Feb-2021</td></tr> <tr><td>⊙ PUNJAB</td><td>Sep-2021</td></tr> <tr><td>⊙ RAJASTHAN</td><td>Sep-2021</td></tr> <tr><td>⊙ UP</td><td>Sep-2021</td></tr> <tr><td>⊙ NTPC</td><td>May-2021</td></tr> </table> FGD status details are enclosed as Annexure-A.I.II. All States/utilities are requested to furnish updated status of FGD installation progress on monthly basis.	⊙ HARYANA	Feb-2021	⊙ PUNJAB	Sep-2021	⊙ RAJASTHAN	Sep-2021	⊙ UP	Sep-2021	⊙ NTPC	May-2021										
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⊙ UP	Sep-2021																						
⊙ NTPC	May-2021																						
5	Information about variable charges of all generating units in the Region	The variable charges detail for different generating units are available on the MERIT Order Portal.	All states/UTs are requested to submit daily data on MERIT Order Portal timely.																				

6	Reactive compensation at 220 kV/ 400 kV level at 15 substations			
	State / Utility	Substation	Reactor	Status
i	POWERGRID	Kurukshetra	500 MVar TCR	Anticipated commissioning: Dec' 2021 (delay due to pending supplies by GE)
ii	DTL	Peeragarhi	1x50 MVar at 220 kV	PO awarded to M/s Kanohar Electricals Ltd. Drawings approved and under stage inspection. GIS Bay is already available. Work expected to be completed by Dec.21
iii	DTL	Harsh Vihar	2x50 MVar at 220 kV	PO awarded to M/s Kanohar Electricals Ltd. Drawings approved and under stage inspection. GIS Bay is already available. Work expected to be completed by Dec.21
iv	DTL	Mundka	1x125 MVar at 400 kV & 1x25 MVar at 220 kV	Bay work awarded to M/s. Ethos. Bay work is expected to be completed by Dec.21. Reactor part tender is dropped and at present same is under revision.
v	DTL	Bamnauli	2x25 MVar at 220 kV	Bay work awarded to M/s. Ethos. Bay work is expected to be completed by Dec.21. Reactor part tender is dropped and at present same is under revision.
vi	DTL	Indraprastha	2x25 MVar at 220 kV	Bay work awarded to M/s. Ethos. Bay work is expected to be completed by Dec.21. Reactor part tender is dropped and at present same is under revision.
vii	DTL	Electric Lane	1x50 MVar at 220 kV	Under Re-tendering due to Single Bid
viii	PUNJAB	Dhuri	1x125 MVar at 400 kV & 1x25 MVar at 220 kV	Retendering to be done for 400kV reactors. LOA placed for 220kV reactors.
ix	PUNJAB	Nakodar	1x25 MVar at 220 kV	Technical bids opened on 14.01.2021.
x	PTCUL	Kashipur	1x125 MVAR at 400 kV	Already submitted to PSDF. On hold due to policy decision
xi	RAJASTHAN	Akal	1x25 MVar	LOA placed on dt. 4.1.2021. Agreement signed on dt. 8.02.2021. Case for 2nd installment would be forwarded to NLDC, POSOCO. The target date is Nov' 2021.
xii	RAJASTHAN	Bikaner	1x25 MVar	LOA placed on dt. 4.1.2021. Agreement signed on dt. 8.02.2021. Case for 2nd installment would be forwarded to NLDC, POSOCO. The target date is Nov' 2021.
xiii	RAJASTHAN	Suratgarh	1x25 MVar	LOA placed on dt. 4.1.2021. Agreement signed on dt. 8.02.2021. Case for 2nd installment would be forwarded to NLDC, POSOCO. The target date is Nov' 2021.
xiv	RAJASTHAN	Barmer & others	13x25 MVar	Agreement signed on dt. 22.06.2020. Grant of Ist Installment received on dt.19.02.21. Bidding document is under approval.
xv	RAJASTHAN	Jodhpur	1x125 MVar	Agreement signed on dt. 22.06.2020. Grant of Ist Installment received on dt.19.02.21. Bidding document is under approval.

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Sl. No.	Substation	Downstream network bays	Commissioning status of ICTs / Bays	Planned 220 kV system	Revised Target	Remarks
1	Shahjahanpur, 2x315 MVA 400/220 kV	4 Nos. of 220 kV bays to be utilized	<u>Commissioning of ICT</u> <u>Commissioning of Bays</u> Jun/Sep'14	Shahjahanpur-Azimpur D/C line		Connected to load on 28.07.2021
				LILO of 220kV Shahjahanpur - Sitapur at Shahjahanpur PG	Oct'21	Updated in 187th OCC
2	Hamirpur 400/220 kV 2x 315 MVA S/s (Augmentation by 3x105 MVA ICT)	2 nos. bays utilized under ISTS. Balance 6 nos to be utilized	<u>Commissioning of ICT</u> 1st -Dec'13 2nd - Mar'14 3rd - Mar'19 <u>Commissioning of Bays</u> 4 bays - Dec'13 2 bays - Mar'14 2 bays - Mar'19	220 kV D/C Hamirpur-Dehan line. Original schedule: Dec' 2020	Oct'21	Updated in 186th OCC
3	Sikar 400/220kV, 1x 315 MVA S/s	2 Nos. of 220 kV bays	Commissioned (date not available)	Not available	Sep'21	Work order was placed on dt. 13.04.2020 to M/s A to Z Ltd. Works start on dt. 4.12.2020. S/S-32/32, T/E-31/32 (T/E at 27 no. location is pending due to Rajasthan High Court stay), T/S-2.09/8.122 km completed. Targeted to be completed by June'2021.
4	Bhiwani 400/220kV S/s	6 nos. of 220kV bays	Commissioned (date not available)	220kV Bhiwani (PG) - Isherwal (HVPNL) D/c line	Dec'21	Delayed due to RoW issue
5	400/220kV Tughlakabad GIS	10Nos. of 220kV bays	Commissioned (date not available)	RK Puram – Tughlakabad (UG Cable) 220kv D/c line	Jul'22	PO for supply and ETC of D/C UG cable awarded.
				Masjid Mor – Tughlakabad 220kv D/c line	Mar'22	PO for supply and ETC of D/C UG cable awarded.
6	400/220kV Kala Amb GIS (TBCB)	6 Nos. of 220kV bays	Commissioned in Jul'2017	220kV D/c line from Kala Amb 400/220kV S/s to 220/132kV Kala Amb S/s	Dec'21	Details for utilizing remaining 4 bays is not available

FGD Status

Updated status of FGD related data submission

NTPC (16.06.2021)

MEJA Stage-I

RIHAND STPS

SINGRAULI STPS

TANDA Stage-I

TANDA Stage-II

UNCHAHAR TPS

UPRVUNL (18.09.2021)

ANPARA TPS

HARDUAGANJ TPS

OBRA TPS

PARICHHA TPS

PSPCL (20.09.2021)

GGSSSTP, Ropar

GH TPS (LEH.MOH.)

RRVUNL (17.09.2021)

CHHABRA SCPP

CHHABRA TPP

KALISINDH TPS

KOTA TPS

SURATGARH SCTPS

SURATGARH TPS

Updated status of FGD related data submission

Lalitpur Power Gen. Co. Ltd.
(24.07.2021)

Lalitpur TPS

Lanco Anpara Power Ltd.
(24.07.2021)

ANPARA-C TPS

Rosa Power Supply Company
(24.07.2021)

Rosa TPP Phase-I

**Prayagraj Power Generation
Company Ltd. (24.07.2021)**

Prayagraj TPP

APCPL (17.08.2021)

INDIRA GANDHI STPP

Pending submissions

Adani Power Ltd.

KAWAI TPS

GVK Power Ltd.

GOINDWAL SAHIB

HGPCL

PANIPAT TPS

RAJIV GANDHI TPS

YAMUNA NAGAR TPS

NTPC

DADRI (NCTPP)

Talwandi Sabo Power Ltd.

TALWANDI SABO TPP

L&T Power Development Ltd.

Nabha TPP (Rajpura TPP)

Target Dates for FGD Commissioning (Utility-wise)

Adani Power Ltd.	KAWAI TPS U#1 (Target: 31-08-2020), KAWAI TPS U#2 (Target: 30-06-2020)
APCPL	INDIRA GANDHI STPP U#1 (Target: 31-12-2021), INDIRA GANDHI STPP U#2 (Target: 31-03-2022), INDIRA GANDHI STPP U#3 (Target: 30-06-2022)
GVK Power Ltd.	GOINDWAL SAHIB U#1 (Target: 30-04-2020), GOINDWAL SAHIB U#2 (Target: 29-02-2020) – initial target
HGPCL	PANIPAT TPS U#6 (Target: 30-04-2021), PANIPAT TPS U#7 (Target: 28-02-2021), PANIPAT TPS U#8 (Target: 31-12-2020), RAJIV GANDHI TPS U#1 (Target: 30-04-2022), RAJIV GANDHI TPS U#2 (Target: 28-02-2022), YAMUNA NAGAR TPS U#1 (Target: 31-12-2021), YAMUNA NAGAR TPS U#2 (Target: 31-10-2021) – initial target

NTPC

DADRI (NCTPP) U#1 (Target: 31-12-2020), DADRI (NCTPP) U#2 (Target: 31-10-2020), DADRI (NCTPP) U#3 (Target: 31-08-2020), DADRI (NCTPP) U#4 (Target: 30-06-2020), DADRI (NCTPP) U#5 (Target: 30-04-2020), DADRI (NCTPP) U#6 (Target: 29-02-2020), RIHAND STPS U#1 (Target: 28-02-2022), RIHAND STPS U#2 (Target: 31-12-2021), RIHAND STPS U#3 (Target: 31-12-2023), RIHAND STPS U#4 (Target: 31-12-2023), RIHAND STPS U#5 (Target: 30-06-2023), RIHAND STPS U#6 (Target: 30-06-2023), SINGRAULI STPS U#1 (Target: 31-08-2022), SINGRAULI STPS U#2 (Target: 31-08-2022), SINGRAULI STPS U#3 (Target: 31-08-2022), SINGRAULI STPS U#4 (Target: 31-08-2022), SINGRAULI STPS U#5 (Target: 31-08-2022), SINGRAULI STPS U#6 (Target: 31-08-2022), SINGRAULI STPS U#7 (Target: 31-08-2022), UNCHAHAR TPS U#1 (Target: 30-09-2023), UNCHAHAR TPS U#2 (Target: 30-09-2023), UNCHAHAR TPS U#3 (Target: 30-09-2023), UNCHAHAR TPS U#4 (Target: 30-09-2023), UNCHAHAR TPS U#5 (Target: 30-09-2023), UNCHAHAR TPS U#6 (Target: 31-03-2023), MEJA Stage-I U#1 (Target: 31-03-2022), MEJA Stage-I U#2 (Target: 31-03-2022), TANDA Stage-I U#1 (Target:), TANDA Stage-I U#2 (Target:), TANDA Stage-II U#3 (Target: 31-12-2022), TANDA Stage-II U#4 (Target: 31-12-2022)

L&T Power Development Ltd (Nabha)	Nabha TPP (Rajpura TPP) U#1 (Target: 30-04-2021), Nabha TPP (Rajpura TPP) U#2 (Target: 28-02-2021) – initial target
Lalitpur Power Gen. Company Ltd.	LALITPUR TPS U#1 (Target: 01-01-2024), LALITPUR TPS U#2 (Target: 01-01-2024), LALITPUR TPS U#3 (Target: 01-01-2024)
Lanco Anpara Power Ltd.	ANPARA C TPS U#1 (Target: 31-12-2023), ANPARA C TPS U#2 (Target: 31-12-2023)
Prayagraj Power Generation Company Ltd.	PRAYAGRAJ TPP U#1 (Target: 31-05-2024), PRAYAGRAJ TPP U#2 (Target: 30-09-2024), PRAYAGRAJ TPP U#3 (Target: 31-12-2024)
PSPCL	GH TPS (LEH.MOH.) U#1 (Target: 31-12-2024), GH TPS (LEH.MOH.) U#2 (Target: 31-12-2024), GH TPS (LEH.MOH.) U#3 (Target: 31-12-2024), GH TPS (LEH.MOH.) U#4 (Target: 31-12-2024), GGSSTP, Ropar U#3 (Target: 31-03-2022), GGSSTP, Ropar U#4 (Target: 31-05-2022), GGSSTP, Ropar U#5 (Target: 31-07-2022), GGSSTP, Ropar U#6 (Target: 30-09-2022)

Rosa Power Supply Company	ROSA TPP Ph-I U#1 (Target: 31-12-2024), ROSA TPP Ph-I U#2 (Target: 31-12-2024), ROSA TPP Ph-I U#3 (Target: 31-10-2024), ROSA TPP Ph-I U#4 (Target: 31-10-2024)
RRVUNL	KOTA TPS U#5 (Target: 31-12-2022), KOTA TPS U#6 (Target: 31-12-2022), KOTA TPS U#7 (Target: 31-12-2022), SURATGARH TPS U#1 (Target: 31-12-2024), SURATGARH TPS U#2 (Target: 31-12-2024), SURATGARH TPS U#3 (Target: 31-12-2024), SURATGARH TPS U#4 (Target: 31-12-2024), SURATGARH TPS U#5 (Target: 31-12-2024), SURATGARH TPS U#6 (Target: 31-12-2024), SURATGARH SCTPS U#7 (Target: 31-12-2024), SURATGARH SCTPS U#8 (Target: 31-12-2024), CHHABRA TPP U#1 (Target: 31-12-2024), CHHABRA TPP U#2 (Target: 31-12-2024), CHHABRA TPP U#3 (Target: 31-12-2024), CHHABRA TPP U#4 (Target: 31-12-2024), CHHABRA SCPP U#5 (Target: 31-12-2024), CHHABRA SCPP U#6 (Target: 31-12-2024), KALISINDH TPS U#1 (Target: 31-12-2024), KALISINDH TPS U#2 (Target: 31-12-2024)
Talwandi Sabo Power Ltd.	TALWANDI SABO TPP U#1 (Target: 28-02-2021), TALWANDI SABO TPP U#2 (Target: 31-12-2020), TALWANDI SABO TPP U#3 (Target: 31-10-2020) – initial target
UPRVUNL	ANPARA TPS U#1 (Target: 31-10-2022), ANPARA TPS U#2 (Target: 31-08-2022), ANPARA TPS U#3 (Target: 30-06-2022), ANPARA TPS U#4 (Target: 30-04-2022), ANPARA TPS U#5 (Target: 28-02-2022), ANPARA TPS U#6 (Target: 30-06-2021), ANPARA TPS U#7 (Target: 30-04-2021), HARDUAGANJ TPS U#8 (Target: 31-12-2021), HARDUAGANJ TPS U#9 (Target: 31-12-2021), OBRA TPS U#9 (Target: 31-08-2022), OBRA TPS U#10 (Target: 31-10-2022), OBRA TPS U#11 (Target: 31-12-2022), OBRA TPS U#12 (Target: 30-06-2022), OBRA TPS U#13 (Target: 30-04-2022), PARICHHA TPS U#3 (Target: 30-04-2022), PARICHHA TPS U#4 (Target: 30-04-2022), PARICHHA TPS U#5 (Target: 28-02-2022), PARICHHA TPS U#6 (Target: 31-12-2021)

Standard Operating Procedure for Islanding Schemes

1. Design Protocol

- i. As per Clause 10 of the Central Electricity Authority (Grid Standards), Regulations, 2010:

*“Islanding Schemes.- (1) The **Regional Power Committees** shall prepare Islanding schemes for separation of systems with a view to save healthy system from total collapse in case of grid disturbance. (2) The Entities shall ensure proper implementation of the Schemes referred to in sub regulation (1).”*

- ii. As per Indian Electricity Grid code amended from time to time, all regional constituents shall ensure that the islanding schemes are always functional.
- iii. Islanding Schemes may be designed:
 - for survival of some predefined generations and loads at the time of grid disturbance to avoid total blackout and quicker restoration of failed grid.
 - for major cities having loads of VIP areas, Defence, Space, Airport, Metro, ports and important industries etc.
- iv. Ministry of Defence(MoD) may be consulted to include their defense loads in such Islanding schemes. In case MoD requests any of their locations for which Islanding schemes is to be designed, the same would be considered. Only those defence establishments may be included in the Islanding Schemes for which MoD is agreed. The Ministry of Defence/Dept. of Military Affairs shall furnish information regarding their requirements as per format given at **Annexure I**. All the existing islanding scheme may be reviewed to include the Defence load in the scheme. Defence load of small capacity (upto 2 MW) not falling under any major cities may be continued with their arrangement of backup supply.
- v. The Essential loads falling under an Islanding schemes may be taken under consideration while designing Islanding schemes. Generally the essential loads are classified into two categories (i) Super critical Load and (ii) Critical loads. The super Critical load may cover the loads of Defence area, Raj Bhawan, Parliament house, residence of VIPs, Metro rails etc. The Critical loads may consist of loads of hospitals, Airport, Railways, Important Industries etc falling under the area covered in Islanding schemes. The critical and super critical load of the major city may be considered in consultation with the DISCOMs/SLDC and MoD.
- vi. If there is need to establish a power plant in/around such a city for the purpose, the proposal may be submitted for consideration of the concerned State /Utility under intimation to MoP. Possibility of installation of storage system at such location may also be explored. This provision may be suitably qualified for extremely sensitive loads only.

- vii. Islanding Schemes are to be formed with anticipated load-generation balance and with tripping of predetermined feeders/ ICTs/ generators. In every islanding scheme, adequate automated mechanism should be implemented for achieving load generation balance in the islanded sub-system.
- viii. Islanding schemes should not be taken as a system for continued supply to important loads. Necessary arrangement for emergency supply to important critical loads must be made separately.
- ix. Studies are to be carried out for verifying the operation of the Islanded system.
- x. The cyber security in the power system for Islanding schemes must be in accordance with the guidelines issued by Government of India.

2. Monitoring of Vital Parameters

- i. Since formation of Island can take place at any time, monitoring of the following vital parameters, which have a significant role in on successful Island formation, is of paramount interest:
 - a. Anticipated/ actual Generation within the electrical boundary of the Island.
 - b. Anticipated/ actual Load within the electrical boundary of the Island.
 - c. Voltage, Frequency & Power Flows along the peripheral lines which are required to be tripped to form the Island.
- ii. Above parameters are to be monitored in real-time basis in the Control Room/ Despatch Centre (i.e Sub SLDCs/SLDC/RLDC/NLDC) of the area by creating a dedicated page specific to the Islanding Scheme in the SCADA display. To accomplish this, provision should also be made, if required, for installing adequate measuring instruments (like PMU) at suitable locations within the Island.
- iii. The data in the formats at Annexures –II (Format I) may be submitted by RLDC/SLDCs to RPCs on monthly basis to certify the healthiness of communication system for monitoring the vital parameters of Islanding Schemes.

3. Certification of Healthiness of Islanding Scheme:

- i. Since healthiness of an integrated system depends on the healthiness of its constituting components, healthiness of Islanding Scheme has to be ascertained/ ensured by seeking monthly certificate for healthiness of batteries, installed at all Substations located within the electrical boundary of the Islanding Scheme. The idea is since these battery banks provide power supply to Relays, RTUs and PLCC equipment, healthiness of the former is critical to operation of the latter when called for.
- ii. It is to confirm the healthiness of islanding schemes by participating Generators as well as concerned transmission utilities for their respective portion in the monthly OCC meeting.
- iii. The data in the formats at **Annexures –II** (Format II to IV) may be submitted by Generators/Transmission utilities/Discoms etc to RPCs on monthly basis to certify the healthiness of Islanding Schemes.

4. Role and Responsibility and Coordination Activities:

- i. The Role and Responsibility of the Organizations / Officers/Officials in designing and operating the Islanding Schemes is defined at Annexure-III.
- ii. This is proposed to be achieved by having a Nodal Officer for each participating Utility in the Island [i.e., those who own assets (Generating stations, substations, transmission lines, distribution lines, etc.) within the Island], and a Chief Nodal Officer from the concerned Despatch/ Control Centre. The Chief Nodal Officer from LDC and Utility-specific Nodal Officers ensure free flow of information among them w.r.t. Islanding Scheme Operational status, and ensure correct & prompt communication between the SCADA Control Centre and various stations (Generating Stations/ Substations). There will be a coordination officer in each region from each RLDCs.
- iii. An updated list of contact details of all Nodal Officers as mentioned above shall be maintained with LDC & all Utilities involved. The Details of officials as mentioned above may be obtained in the in the Format V of Annexures –II:

5. Sensitization and Training of Officers involved:

- i. Even though chances of Island formation in a strongly integrated grid are remote, since the Islanding schemes are designed to protect major critical loads/ sensitive generation in the unfortunate event of failing of all other defence mechanisms, The Nodal Officers & concerned field staff associated with O& M of various stations (generating stations as well as substations) within the electrical boundary of the Island should be sufficiently sensitized about the colossal loss of those critical assets on account of Island failure, and consequent disruption to various sectors & businesses.
- ii. To ensure this, apart from conducting periodic orientation training programmes, the concerned Officers/ staff should also be involved in the activities concerning management of grid under stressed conditions, SCADA control, communication upkeep, and in the activities relating to audit/ inspection of critical loads & sensitive stations within the Island.
- iii. The Officials and Officers in the Generating Station/Substation/Utilities / LDC/ RLDC / RPCs would be sensitized about the (concerned) Islanding Scheme. They also to be trained to handle the Critical and Emergency Load Management in the system.
- iv. Training shall be focused on individual Islanding Schemes and integration of Islanding schemes with rest of the grid until restoration of normalcy to the regional grid.
- v. All the concerned utilities shall organise periodic training program for the nodal officers and concerned field officers. The training programs shall be in consultation and coordination with the RPCs. The training and sensitization program may be conducted once in six months.

6. Periodic Inspection/ Audit of Essential Components:

Inspection/ audit of all essential components as given below shall be carried out regularly (by third party) and inspection/Audit report may be submitted to respective RPCs:

- i. Under Frequency Relays (UFR) on Island forming elements (Lines & ICTs) – Quarterly.
- ii. Associated communication equipment at all stations within Island - Bi-monthly.
- iii. Associated DC supply for Control panel & communication system-Bi- monthly.

7. Review Plan of Islanding Schemes:

- i. Considering the fact that Network Changes (additions/ deletions/ reconfigurations of transmission elements & generators) in an evolving grid such as Indian electrical grid are unavoidable/ inevitable, it is but necessary to review the Islanding scheme operation w.r.t. prevailing grid conditions at regular intervals, and incorporate requisite changes so as to make them reliable & dependable.
- ii. In such review, all details as used in the existing scheme have to be re-collected including the new changes for studying the modifications to be carried out in the In-service Island. These details, among others, include participating generators, anticipated generation, participating loads, anticipated load, elements (lines and/ or ICT's) to be tripped to form the modified Island, geographical map & SLD of the modified Island, AUFR load relief, df/dt load relief, pumped loads details, etc. Using these details, system studies also need to be carried out to verify stability (including voltage profile & line loadings profile) of the modified Island.
- iii. It is recommended to carry out above review of the In-Service Islanding scheme once in six months by all concerned utilities. However, the review may also be carried out as soon as any network change, which may affect the operation of the Islanding Scheme, comes to notice.

8. Identification of Short-comings & Remedial action:

Based on the shortcomings noticed as a result of the activities performed in monitoring of vital parameters of the Island, ascertaining healthiness of Island, carrying out periodic inspection/ audit of essential components of the Island, prompt remedial action shall be taken to redress the observed deficiencies. The period of redressal from the instant of noticing shortcomings shall be at most one week/ fortnight. The compliance report may be submitted to RPCs in this regard.

9. Post Islanding survival:

In every islanding scheme, adequate automated mechanism should be implemented for achieving load generation balance in the islanded sub-system. Also, for frequency control of islanded subsystem there should be generating units in the island on restricted/ free governor mode of operation. Also, load connection/ disconnection should be possible remotely from the dispatch centre of the islanded sub-system. Health of all facilities in the islanding scheme should be closely monitored so as keep necessary electrical, mechanical, electronics and communication systems in good health all the time.

10. SOP Template for Islanding Schemes is at Annexure-IV

MINISTRY OF POWER
CENTRAL ELECTRICITY AUTHORITY

Details of information to be furnished by Defence installations for the purpose of designing the Electrical Islanding schemes:

Item No.	Description	Details
1	Basic Details:	
1.1	Service: Army/Navy/Airforce/MES etc.	
1.2	Name of the Establishment	
1.3	Location (State, District, Taluk & Village)	
1.4	Name of the nearest City & Distance from it	
2.	Power Supply Details:	
2.1	Name of the DISCOM (Power Supply Distribution Company) from which supply is being availed:	
2.2	Name of the DISCOM Substation from which supply is being availed:	
2.3	Number of incoming lines/feeders of supply and Voltage level	
3	Load Details:	
3.1	Contracted Capacity in kVA/MVA	
3.2	Maximum Demand in kVA/ MVA	
3.3	Connected Load in kW/MW	
3.4	Critical Load(kW/MW)/ Non Critical Load(kw/MW)	
3.5	Any other information on Load details	
4	Backup Power Supply:	

4.1	Details of DG sets: (Number of DG sets & their Rating in kVA/MVA & No. of hours they can run/sustain)	
4.2	Battery Banks/ UPS Rating:	
4.3	In-house Solar Generation in kW/MW	
4.4	Captive Generation, if any, in kW/ MW	
5	Specific Requirement from Ministry of Power, CEA/RPCs, NLDC, RLDC, ST, SLDC and Discoms wrt uninterrupted power supply to Defence installation	
6	Other Relevant Information, if any	

Formats for collection of information regarding Islanding Schemes:**a. Format - I** for RLDC/SLDCs

S.NO	Name of Islanding Scheme	Healthiness of Communication channel

b. Format - II for Generating Station

S.NO	Name of Islanding Scheme	Healthiness of Islanding Relay	Healthiness of Communication channel

c. Format - III for Transmission Utility/ DISCOMs

S.NO	Name of Islanding Scheme	Elements considered for tripping to from Island	For communication based tripping logic of feeders	For UFR based tripping logic of feeders	
			Healthiness of Communication channel	Healthiness of PT Fuse and status of DC supply to UFR relay*	Healthiness of Relay#

* Where dedicated UFR relay have been installed for tripping of the feeders under islanding scheme

Where UFR function have been enabled within backup protection relay of the line

d. Format - IV for collecting Relay details of the Islanding scheme.

The following format may be used to get Relay details of the Islanding scheme:

S.NO	Description	UFRs-for load relief (A)	df/dt -for load relief (B)	Relay for Island creation(C)
1	Relay location (S/s name)			
2	Relay make & model			

3	Frequency setting of the relay (at which load shedding is envisaged)			
4	Feeder name (voltage level and source-destination name) signalled by the Islanding Relay for separation /load shedding/separation from outside grid			
5	Quantum of load relief due to tripping of feeder (as per state's peak of previous year)			
6	Quantum of load (Min, Avg, Max in MW) on the feeder (as per state's peak of previous year)			

e. Format - V for Contact details of all Nodal Officers

Utility Name & Location	Name	Designation	Organization	Email ID	Mobile No.

Roles and Responsibilities of Officers involved in Islanding Schemes:

1.	RPCs	<ul style="list-style-type: none">i. In comply with CEA(Grid Standards) 2010 and its amendments, MS, RPCs shall be responsible for preparation of Islanding Schemes. The designing/ implementation and Review of Islanding Scheme may be discussed in appropriate Committee/Sub-Committee of RPCs or a separate Sub-group may be formed.ii. MS, RPC may Nominate Officer at the level of Superintending Engineer for Coordinating the Islanding Schemes in the Region.iii. MS, RPCs shall be responsible for periodic review of the Islanding Schemes to accommodate the network changes, load generation balance or constraints, if any.iv. MS, RPC shall be responsible for third party audit of the components of an Islanding Scheme.
2.	RLDCs	<ul style="list-style-type: none">i. There shall be a nodal officer at the level of General Manager & above appointed by the appropriate Authority of the RLDC. Nodal officer of RLDCs may act as Coordinating Nodal officer.ii. The Nodal officer of RLDCs shall coordinate the Chief Nodal officers of SLDCs in their respective regions.iii. Coordinating Nodal Officer shall ensure monitoring of the vital parameters of operational/implemented Islanding Schemes in their region, which have a significant role in successful Island formation at their SCADA system.iv. To ensure proper monitoring, measuring instruments (like PMUs etc.) and communication systems may be recommended by Co coordinating nodal officer to the concerned utility.v. Coordinating Nodal officers shall monitor and ensure the healthiness of the components involved in the Islanding Scheme like SCADA system, communication channel etc. at their end.vi. Coordinating Nodal officer shall conduct monthly self-certification of healthiness of the communication systems at their end and communicate it to the concerned RPCs in the format prescribed in the SOP.vii. Coordinating Nodal officer shall ensure follow-up of the recommendation of the third party Audit conducted by RPCs in a time bound manner.
3.	Nodal officer of LDCs	<ul style="list-style-type: none">i. There shall be a nodal officer at the level of Chief Engineer & above for all Islanding Schemes in the respective state appointed by the appropriate Authority of the LDCs.ii. Nodal officer of LDCs shall act as Chief Nodal officers for nodal officers of DISCOMs, TRANSCOS & GENCOs of the

		<p>state and shall ensure proper communication among all the nodal officers.</p> <ul style="list-style-type: none"> iii. The Chief Nodal officer shall coordinate and responsible for implementation of newly designed Islanding Schemes in coordinated manner with all utilities involved. iv. Chief Nodal officer is responsible for collection of data from the concerned utilities and submission the same to committee for study purpose in respect of existing/new IS for review/design purpose. v. Chief Nodal Officer shall ensure monitoring of the vital parameters of operational/implemented Islanding Schemes in the state, which have a significant role in successful Island formation. vi. To ensure proper monitoring, measuring instruments (like PMUs etc.) and communication system etc. may be recommended by nodal officer to the concerned utility vii. Chief Nodal officers shall ensure the healthiness of the components involved in the Islanding Scheme like SCADA system, communication channel etc. at their end. viii. Chief Nodal officer shall conduct monthly self-certification of healthiness of the components at their end involved in the Islanding scheme and communicate it to the concerned RPC in the format prescribed in the SOP. ix. Chief Nodal officer shall ensure follow-up of the recommendation of the third party Audit conducted by RPC in a time bound manner.
<p>4.</p>	<p>Nodal officer of Participating GENCOs</p>	<ul style="list-style-type: none"> i. There shall be a nodal officer at the level of General Manager / Chief Engineer & above for Islanding Schemes appointed by the appropriate Authority of the Generation Company. ii. Nodal officers shall be responsible for the implementation of newly designed Islanding Schemes for Genco's part and submission of data to Study committee wrt Islanding scheme. iii. Nodal officer is responsible for submission of data for Genco part to committee for study in respect of existing/new IS for review/design purpose. iv. Nodal officers shall ensure the healthiness of the components involved in the operational Islanding Scheme like Generating Units, Substations /Switch yards, Relays, communication channel etc. at their end. v. Nodal officer shall conduct monthly self-certification of healthiness the components at their end involved in the Islanding scheme and communicate it to the concerned RPCs in the format prescribed in the SOP. vi. Nodal officer shall ensure follow-up of the recommendation of the third party Audit conducted by RPCs in a time bound manner.

<p>5.</p>	<p>Nodal officer of STUs/PGCIL</p>	<ul style="list-style-type: none"> i. There shall be a nodal officer at the level of General Manager / Chief Engineer & above for all the Islanding Schemes appointed by the appropriate Authority of the Transmission Company. ii. Nodal officers shall be responsible for the implementation of newly designed Islanding Schemes at transmission part. iii. Nodal officer is responsible for submission of data to committee for study in respect of existing/new IS for review/design purpose for Transmission part . iv. Nodal officers shall ensure the healthiness of their components involved in the operational Islanding Scheme like Substations, Transmission Lines, Relays, communication channel etc. at their end. v. Nodal officer shall conduct monthly self-certification of healthiness of the components at their end involved in the Islanding scheme and communicate it to the concerned RPC in the format prescribed in the SOP. vi. Nodal officer shall ensure follow-up of the recommendation of the third party Audit conducted by RPC in a time bound manner.
<p>6.</p>	<p>Nodal officer of DISCOMs</p>	<ul style="list-style-type: none"> i. There shall be a nodal officer at the level of General Manager /Chief Engineer & above for each Islanding Schemes appointed by the appropriate Authority of the Distribution Company. ii. Nodal officer shall be responsible for identification of essential loads and defence load for the Islanding Scheme. iii. Nodal officers shall be responsible for the implementation of newly designed Islanding Schemes at their end. iv. Nodal officer is responsible for submission of data for their part to committee for study in respect of existing/new IS for review/design purpose. v. Nodal officers shall ensure the healthiness of the components involved in the Islanding Scheme like Feeders, Relays, communication channel etc. at their end. vi. Nodal officer shall conduct monthly self-certification of healthiness of the components involved in the Islanding scheme at their end and communicate it to the concerned RPC in the format prescribed in the SOP. vii. Nodal officer shall ensure follow-up of the recommendation of the third party Audit conducted by RPC in a time bound manner.

SOP Template for Islanding Schemes:

1. Purpose
2. Design
 - i. Generation
 - a. Coal
 - b. Gas
 - c. Nuclear
 - d. Hydro
 - e. Solar
 - f. Wind
 - g. Total generation
 - h. PLF or availability /scheduling
 - i. Generation considered
 - j. Generators on prolonged outage
 - k. Probability of the anticipated generation
 - l. Pumped storage?
 - m. ISGS
 - n. SGS
 - o. IPP/MPP
 - ii. Load
 - a. Drinking water
 - b. Irrigation
 - c. Agriculture
 - d. Industrial
 - e. Commercial
 - f. Domestic
 - g. Hospital
 - h. Railways/Metro
 - i. Defence
 - j. Lift Irrigation System/Scheme
- i. Load relief
 - a. df/dt-I
 - b. df/dt-II
 - c. AUFR-I
 - d. AUFR-II
 - e. AUFR-III
 - f. AUFR-IV
- ii. Transmission lines in the islanded area
 - a. 765 kV
 - b. 400 kV
 - c. 220/230 kV
 - d. 132/110 kV
 - e. 66 kV

- f. 11/22/33 kV
 - g. Inter regional lines
 - h. Inter-state lines
 - i. Intra-state lines o Substations in the area
 - j. CTU
 - k. STU
 - l. ISTS
- iii. Transmission lines that get disconnected on operation of df/dt and AUF relays
- 220/230 kV
 - 132/110 kV
 - 66 kV
 - 11/22/33 kV
- iv. Transmission lines to be tripped for forming Island
- a. 765 kV
 - b. 400 kV
 - c. 220/230 kV
 - d. 132/110 kV
 - e. 66 kV
 - f. 11/22/33 kV
- v. Name of the cities covered
- a. 10 million
 - b. 1 million
 - c. Defence locations
- vi. Diagrams
- a. SLD map of the island
 - b. Geographical map of the island with boundary
 - c. Major cities/critical loads/defence loads marked
 - d. Substations marked
3. SCADA mapping
Island generation and island loads on the SCADA display
4. Constraints
- a. Generation limits
 - b. Line loading limits
 - c. ICT loading limits o Frequency set points
 - d. df/dt-I
 - e. df/dt-II
 - f. AUFR-I
 - g. AUFR-II
 - h. AUFR-III
 - i. AUFR-IV
 - j. LIS relief frequency
 - k. RE generation disconnection frequency
 - l. Islanding frequency
5. Controlling generation in islanded area

- a. AGC
- b. RGMO/FGMO
- i. Controlling load in islanded area
 - a. Automatic
 - b. Flow based
 - c. Voltage based
 - d. Frequency based
 - e. Manual
- ii. Validation check list
 - Generation > Load?
 - Non-Hydro only islanding?
 - Less number of disconnecting lines?
 - All disconnecting lines with AUFR?
 - RE-solar/wind excluded?
 - LIS loads excluded?
 - LF studies for islanded area, converging?
 - In the converged LF studies, line loadings profile & voltage profile are within permissible limits?
 - All critical load/defence loads included?
 - Critical/defence loads are not part of SPS, df/dt or AUFR schemes?
 - Islanding frequency - (47.9 Hz)?
 - Adequate margin between lower frequency of IEGC band and first stage AUFR?
 - Adequate margin between islanding frequency and AUFR last stage?
 - Scheme was discussed & approved in OCC/ PCC?
 - Scheme approved in RPC?

50.20		
50.10		
50.05		
50.00		IEGC band
49.90		
49.80		
49.70		Urgent load Mgt.
49.60		
49.50		

49.40	Emergency Load Mgt.
49.30	
49.20	
49.10	
49.00	UFR load shedding
48.90	
48.80	
48.70	
48.60	
48.50	
48.40	
48.30	
48.20	
48.10	
48.00	
47.90	Islanding Frequency
47.80	

*** Above values are subject to change as per newly adopted frequency settings in NPC

6. Operation

i. Successful

- Generation in the islanded area
- Load in the islanded area
- Date & time island formation
- Date & time of island closed/shutdown
- Frequency of the islanded area
- Voltage profile of the buses
- Flows/ Loadings on critical lines
- Duration of island survival
- Whether anticipated generation was there?
- Whether anticipated load was there?

- All the lines were disconnected as per the plan?
 - Reason for islanding success
 - Any measures to further improve
- ii. Failure
 - a. Generation in the islanded area
 - b. Load in the islanded area
 - c. Date & time island formation
 - d. Date & time of island closed/shutdown
 - e. Duration of island survival
 - f. Whether anticipated generation was there?
 - g. Whether anticipated load was there?
 - h. All the lines were disconnected as per the plan?
 - i. Reason for islanding failure
 - j. Remedial measures

7. Review plan

- i. Island formed and approved date
- ii. Change in generation
 - Addition
 - Deletion
 - Alteration
- iii. Change in load
 - a. Addition
 - b. Deletion
 - c. Alteration
- iv. Change of the lines to be disconnected
- v. Any new lines to be included for disconnecting
- vi. Requirement of additional df/dt & AUFR relays

8. Nodal officers of Islanding Scheme

- i. RLDC
- ii. SLDC
- iii. STU
- iv. SGS
- v. ISGS
- vi. ISTS (SR-I, SR-II)

9. Sensitization Training of nodal officers

- i. Training by RLDC
- ii. Training by NPTI/PSTI
- iii. Training by SLDC
- iv. SRPC special meetings

10. Periodic Inspection of Essential components of Islanding Scheme

- i. Inspection of UF relays of disconnecting lines
- ii. Ensuring adequate relief under df/dt and AUFR stages

- iii. Ensuring relays for disconnecting RE sources
- iv. Ensuring relays for disconnecting LIS
- v. Ensuring critical/defence loads are not under df/dt & AUFR stages
- vi. Monitoring the anticipated generation and load in the islanded area

11. Mock drill

- i. Mock drill to follow any major or near miss incidents
- ii. Frequent heavy over drawl by states
- iii. Frequent Very low frequency of operation
- iv. Before peak period of the region
- v. Before peak period of the state
- vi. Loss of many lines due to cyclone/weather
- vii. Loss of generating plants due to cyclone/weather
- viii. RE is highest and entirely absorbed by states

12. Certifications of healthiness of IS

- i. Batteries
- ii. Relays
- iii. Lines within the islanded area

13. Identifications of short comings

14. Further updations.



न्यूक्लियर पावर कॉर्पोरेशन ऑफ इंडिया लिमिटेड
Nuclear Power Corporation of India Limited
 (भारतसरकारकाउद्यम A Govt. of India Enterprise)
 नरौरा परमाणु विद्युत केंद्र **Narora Atomic Power Station**
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No. : NAPS/51300/TSU-E&I/2021/124

दिनांक: 06.10.2021

To,

Sh. S. Mazumdar
 SE (Operation)
 NRLDC, New Delhi

Sub: Review for provision of **additional protection to 220kV lines** emanating from NAPS.

On 11.08.2021 at 13:25 hrs, both units (NAPS-1 and NAPS-2) had tripped subsequent to isolation of NAPS switchyard from grid due to fault caused by R-phase CVT of 220kV Line-1 (Narora-Sambhal).

In view of above incident, matter was discussed with designer, NPCIL, Mumbai and following additional protection for the 220kV lines were suggested. Detail along with technical justification is given below:-

SN	Additional protection	Technical basis
1	<p>Non directional phase over current: To detect close up faults.</p> <p>Pickup>15times CT rated current.</p> <p>Time delay=160msec</p>	<p>The non-directional phase over current does not require a voltage input, so faults in CVT that can result in providing wrong input to distance protection relay (as happened in recent NAPS CVT failure event) are take care by this protection.</p> <p>Time delay of 160 msec is properly co-ordinated such that.</p> <p>a) It gives first change to line distance protection Zone-1 to operate. Current setting is such that this protection does not interface for faults beyond Zone-1</p> <p>b) If the line distance protection doesn't operate in Zone-1 then this protection operates before other lines trip on remote end Zone-2 or our end Zone-4 protection operates. Thus avoiding 220kV switchyard isolation from grid.</p> <p>c) And it won't interfere with bus bar protection.</p>

1/3

Sh. S. Mazumdar
 5/10/2021

SN	Additional protection	Technical basis
2	<p>Over voltage protection: To detect early failure of CVT.</p> <p>Stage-1: Pickup > 1.25 times rated voltage with time delay 5sec.</p> <p>Stage-2 : Pickup > 1.45 times rated voltage with time delay 150msec</p>	<p>Over voltage protection will help in early detection of faults in CVT. CVT failures that result in shattering of CVT mostly develop in capacitor (as per grid feedback) that is towards phase side of CVT HV and in IVT HV winding of CVT (as inter-turn faults). Both results in over voltage in CVT secondary. This developing fault can be detected in early stages by providing over voltage protection.</p> <p>Setting well beyond normal operating voltage of 220kV transmission line. This early detection avoids shattering and in minimizes post-fault damage.</p>

In view of above, NRPC is requested to review the NAPS proposal for implementation of additional protection (ref:-Ann-1) to 220kV lines emanating from NAPS.

Regards,

H.S. Singh
05/10/2021
H.S.Singh
STE-E&I

CC:-

NRPC, New Delhi	NRLDC, New Delhi	UPSLDC, Lucknow	NAPS
Sh. Naresh Bhandari, MS	Sh. M.M. Hasan, GM Sh. Mavavir Prasad singh, DGM Sh. Neetin Yadav, CM Sh. Amit Gupta SO-II	A.J. Siddiqui, SE-SC	SD: -for kind information please. CS: -for kind information please. TSS/MS/OS Sh. S.K. Goyal, SO/G (TSU-E&I) Smt. Arpita Chakravorty, SO/E (TSU-E&I)

ANN-1

Following changes proposed in distance protection relay (MICOM P442) to initiate tripping as per designer recommendations for all 220KV line feeders:-

(A1) Configuration section (relay settings)

SN	Protection function as given by Designer	Purpose	Protection function description in the numerical relay	Present Configuration in the relay	Proposed change in Configuration
1	Non directional phase over current	Provided to detect close up faults	Back-up I>	Disabled	Enabled
2	Over voltage Stage-I & Stage-II	Provided to detect early failure of CVT	Volt Protection	Disabled	Enabled

(A2) Group-1 section (relay settings)

SN	Protection function as given by Designer	Protection function description in numerical relay	Present setting in the numerical relay	Proposed setting in the relay	CT /PT Ratio	Tripping configuration in PSL
1	Non directional phase over current	Group-1 Back-up I> (I>3 is fixed as non-directional)				
		I>1 function	Disabled	Disabled	800/1	3-phase trip on I>3 (To trip 86T-Line trip & lockout relay)
		I>2 function	Disabled	Disabled		
		I>3 status	Disabled	Enabled		
		I>3 Current Set	-	15A		
		I>3 Time delay	-	160 ms		
I>4 status	Disabled	Disabled				
2	Over voltage	Group-1 Over Voltage Protection (V>1 Function not chosen as it has options of DT and IDMT. Voltage setting step size is 1 Volt)				
		V> Measur't mode	-	Phase_Neutral		
		V>1 Function	Disabled	Disabled		
	O/Voltage Stage-I	V>2 status	Disabled	Enabled	220KV/ 110V	3-phase trip on V>2 and V>3 (To trip 86T-Line trip & lockout relay)
		V>2 Voltage set	-	79 V		
		V>2 Time delay	-	5 sec		
	O/Voltage Stage-II	V>3 status	Disabled	Enabled		
		V>3 Voltage set	-	92 V		
		V>3 Time delay	-	150 ms		
		V>4 status	Disabled	Disabled		

(B) Programmable Scheme Logic: - PSL will be modified to include tripping on above protection functions.

3/3

Edw 5/26
08/10/2011

67 Road Constr Coy (GREF)
PIN-930067
C/O 56 APO

2069/Gen / 78 /E2


04 Sep 2021

Sandeep Kothari ✓
Chief Manager
Power Grid Corporation
Jauljibi

**TRANSPORTATION OF 25 MVAR REACTOR FROM NHPC DHAULIGANGA TO 400/220
KV GIS, JAULJIBI**

1. Refer your letter No. NR3/JJB/SS/101/1403 dated 03.09.2021.
2. It is intimated that 48 Mtr span PSC Box girder bridge at Km 100.570 on Pithoragarh-Tawaghat road was washed out on 07-08 Jul 2021 due to flash flood and rolling down of huge stone boulders in the Kulagad Nallah. After that 170 feet DDR BB has been launched at same location on 20 Jul 2021. This Bailey Bridge has capacity of only 24 MT. Hence the transportation of the loads mentioned in your ibid letter is cannot be permitted to cross over the above mentioned bridge.
3. In this context, your above cited letter is being forwarded to higher HQ for their direction and same will be informed to you on receipt.




(Debashis Ash)
AE (Civ)
2IC
For Officer Commanding

Copy to:-

HQ 765 BRTF - Photo copy of above referred letter is forwarded herewith
Pin-930765 for your necessary direction please.
C/O 56 APO

Headquarters

765 Border Roads Task Force
PIN 930 765
C/o 56 APO

2019/Gen Corrs/ 41 /E2

07 Oct 2021

Power Grid Corporation of India Ltd
Chief Manager
Jauljibi

**TRANSPORTATION OF 25 MVAR REACTOR FROM NHPC DHAULIGANGA
TO 400/220 KV GIS, JAULJIBI**

1. Refer your letter No.NR3/JJB/SS/101/1416 dated 24 Sep 2021.
2. The Bailey Bridge at the location Km 100.57 has capacity of 24 MT only, whereas the weight of reactor to be transported is 41.40 MT including weight of hydraulic Trailer. So permission cannot be granted in view of structural safety and avoid probable collapse of Bailey Bridge due to overweight and at present there is no proposal for new construction of Bridge. Initiation of proposal and construction of new Bridge will take several years depending upon approval of higher Competent Authority.
3. Hence, it is advisable to explore possibility of carrying reactor after dismantling it within the safe limit of Bailey Bridge carrying capacity of 24 MT. At present permission for transportation of the load mentioned in the ibid letter mentioned Para 1 cannot be granted over the said Bailey Bridge.
4. This is for your information and further action from your end accordingly.



(SK Singh)
EE (Civ)
2IC
For Commander

Copy to :-

HQ STF Hirak
Pin-931724
C/o 56 APO

HQ 67 RCC (GREF)
Pin-930067
C/o 56 APO

Copy of POWERGRID letter under reference is forwarded herewith for your info please.

List of generating Unit commissioned in Sept-21:

S.No.	Name of Plant	Installed Capacity in MW	Fuel Type	Make	Agency/ Owner	Actual date of charging
1	Himachal Sorang Power Pvt Ltd #Unit2	50	Hydro	M/s Voith	HSPPL	10.09.2021
2	Himachal Sorang Power Pvt Ltd #Unit1	50	Hydro	M/s Voith	HSPPL	18.09.2021

List of ISTS connected solar plants commissioned in Sep-21:

S.No.	Name of Plant	Installed Capacity in MW	Capacity commissioned in MW	Fuel Type	Inverter Make	Agency/ Owner	Actual date of charging
1	Re New Sun Wave	300	50	Solar	Sungrow	ReNew	03.09.2021
2	SBSR Power Cleantech Eleven Pvt Ltd	300	22	Solar	Kehua Tech	SBSR	14.09.2021
3	Azure Power Forty Three Pvt Ltd(PSS)	300	100	Solar	Sungrow	ReNew	14.09.2021
4	AHEJOL(HYBRID) Solar	390	50	Solar	HAUWEI	AHEJOL	22.09.2021
5	ReNew Jharjhand Three	300	50	Solar	Sungrow	ReNew	25.09.2021

Transmission Lines/LILO Lines/Bay/Bus**List of 765 kV Transmission Line commissioned in Sep-21:**

Sl.No.	Element Name	Voltage	Owner	Date of Charging	Line Length KMs.
1.	765kV Khetri (PKTSL)-Jhatikara(PG)-1	765	PKTSL	25.09.2021	146.02
2.	765kV Khetri (PKTSL)-Jhatikara(PG)-2	765	PKTSL	01.10.2021	146.02
Total Length					292.40

List of 400 kV Transmission Line commissioned in Sep-21:

Sl.No.	Element Name	Voltage	Owner	Date of Charging	Line Length in KMs.
1.	400kV Bhadla(PG)-Bhadla_2 (PG)-2	400	PGCIL	03.09.2021	52.046
2.	400kV Khetri (PG)-Sikar(PG)-1	400	PKTSL	07.09.2021	78.083

3	400kV Khetri (PG)-Sikar(PG)-2	400	PKTSL	07.09.2021	78.083
Total Length					208.21

List of 220 kV LILO Transmission Line commissioned Sep-21:

Sl.No.	Element Name	Voltage	Owner	Date of Charging	Line Length (In Km) before LILO	Line Length (In Km) After LILO	LILO Line Length (In Km)
1.	220kV Faridabad(NT)-Faridabad Sec-58 (HV)-1(After LILO of 220kV D/Ckt Faridabad (NT) - Samaypur (BB) Power grid lines at 220kV Sector 58 Faridabad)	220	HVPNL	20.09.2021	17.5	16.303	1.511
2.	220kV Faridabad(NT)-Faridabad Sec-58 (HV)-2(After LILO of 220kV D/Ckt Faridabad (NT) - Samaypur (BB) Power grid lines at 220kV Sector 58 Faridabad)	220	HVPNL	21.09.2021	17.5	16.303	1.511
3.	220kV Samaypur(BB)-Faridabad Sec-58 (HV)-1(After LILO of 220kV D/Ckt Faridabad (NT) - Samaypur (BB) Power grid lines at 220kV Sector 58 Faridabad)	220	HVPNL	20.09.2021	17.5	4.302	1.511
4.	220kV Samaypur(BB)-Faridabad Sec-58 (HV)-2(After LILO of 220kV D/Ckt Faridabad (NT) - Samaypur (BB) Power grid lines at 220kV Sector 58 Faridabad)	220	HVPNL	21.09.2021	17.5	4.302	1.511
Total Length							6.04

List of ICT commissioned in Sep-21

Sl.No.	Element Name	Voltage Level	Make	Agency/ Owner	Date of Charging(on no load)	Capacity (MVA)
1	500 MVA, ICT- 5 at Fatehgarh_II(PG)	400/220/33kV	T&R	POWERGRID	09.09.2021	500
2	500 MVA ICT- 3 at Makhu(PS)	400/220/33kV	KANHOR	PSTCL	16.09.2021	500

3	315 MVA ICT-1 at Kankani(RS)	400/220/33kV	TELK make	RRVPNL	17.09.2021	315
4	3*500 MVA, ICT- 1 at Khetri (PKTSL)	765/400/33kV	T&R	PKTSL	26.09.2021	1500
	3*500 MVA, ICT- 2 at Khetri (PKTSL)	765/400/33kV	T&R	PKTSL	30.09.2021	1500
	Total					4315

**List of GT&ST commissione
in Sep-21**

Element Name	Voltage Level	Make	Agency/ Owner	Date of Charging(on no load)	Capacity (MVA)
100 MVA STATION TRANSFORMER -I AT 400 KV OBRA C	400/11.5	BHEL	UPRVUNL	09.09.2021	100
68.4 MVA Generator Transformer-1 at Sorang Power	400/11	CGL	Sorang	16.09.2021	68.40
68.4 MVA Generator Transformer-2 at Sorang Power	400/11	CGL	Sorang	17.09.2021	68.40
Total					236.80

List of Line Reactor commissioned in Sep-21:

Sl.No.	Element Name	Voltage Level	Make	Agency/ Owner	Date of Charging	Capacity (MVA)
1	3*80 MVAR Switchable LINE_REACTOR of 765KV Jhatikara(PG)-Khetri (PKTSL) Ckt-1 at Jhatikara(PG)	765	BHEL	PKTSL	24.07.2021	240
2	240 MVAR Switchable LINE_REACTOR of Khetri Line - 2 of 765 kV DC	765	ABB Power Products and Systems India Ltd	BKTL	23.07.2021	240

	Bikaner (PG) - Khetri Ss Transmission Line at Bikaner(PG)					
3	240 MVAR Switchable LINE_REACTOR of Khetri line - 1 of 765 kV DC Bikaner (PG) - Khetri Ss Transmission Line at Bikaner(PG)	765	ABB Power Products and Systems India Ltd	BKTL	24.07.2021	240
Total Capacity						720

List of Bus Reactor commissioned in Sep-21

Sl. No.	Element Name	Voltage Level	Make	Agency/ Owner	Date of Charging	Capacity (MVA)
1	125 Bus Reactor BR2 at Moga(PG)	400	Siemens	FBTL	16.07.2021	125
2	125 MVAR Bus Reactor 1 at Khetri (PG)	400	BHEL	PKTSL	26.07.2021	125
3	25 Bus Reactor 01 at Fatehabad(PG)	220	ABB	PGCIL	27.07.2021	25
4	3*80 MVAR Bus Reactor 2 at Khetri (PKTSL)	765	ABB	PKTSL	27.07.2021	240
Total Capacity						515

List of Antitheft Transmission Line Charged in Sept21

Sl.No.	Element Name	Voltage	Owner	Date of Charging	Line Length
1.	Antitheft charging of 765kV Bikaner(PG)-Khetri (PG)-1 from Bikaner(PG) Upto Khetri (PG) Gantry	765	BKTSL	01.09.2021	240.65
Total Length					240.65

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 सं०: NRLDC/SO-I/151/

दिनांक: 8th October 2021

To

Chairman & Managing Director,
Rajasthan Rajya Vidyut Prasaran Nigam Limited,
Vidyut Bhawan, Janpath,
Jaipur- 302005

Sub: Low Frequency excursions vis-à-vis overdrawal by Rajasthan

Sir,

This is in reference to overdrawal by Rajasthan at low frequency excursions. Table and trend of low frequency excursions (5 minutes' average) and corresponding overdrawal by Rajasthan from 5th october 2021 to 7th october 2021 is attached as Annexure-I. From the annexure, it may be seen that at low frequency excursions, Rajasthan is overdrawing from the Grid, which has crossed even 500 MW at some instances.

It has been taken up with Rajasthan multiple times in the form of operational messages and deviation messages from NRLDC control room, however Rajasthan is still unable to maintain its drawal within schedule during low frequency instances. These overdrawal at low frequency excursions occurring almost on daily basis are reducing the grid reliability and endangering the grid security.

As you are aware, persistent high demand of Northern Region, coupled with forced outage of multiple thermal machines due to coal shortage has already resulted alarming situation for the grid operators. In addition to above, hydro and wind generation of Northern region have also started depleting. In such a scenario, any generation reduction due to tripping of machines and overdrawal by beneficiaries may result NR Interregional imports breaching ATC/TTC limits may leads to serious threat to grid security.

In addition to above, around 5365 MW of thermal machines in Rajasthan control area are under outage due to various reasons (details attached as annexure-II). Revival of some of these machines is of utmost important at this critical juncture.

Therefore, It is requested to kindly advise the concerned to take following measures to restrict these low frequency excursions: -

1. Meticulous load forecasting and operational planning may please be carried out.
2. Restrict the load variation to the tune of limits specified in IEGC through staggering of load.
3. Maintain adequate spinning reserves to meet immediate shortage due to closure/ reduction in generation of thermal machines on account of coal problem.
4. Expedite the revival of intra-state thermal machines under reserve shutdown and minor maintenance.

[Handwritten Signature]

5. Scheduling of available state hydro generation shall be carried out during evening peak hours to mitigate overdrawal.
6. Maintain drawal from the grid as per schedule by proper ramping of on bar own generation in consonance with the demand variation.
7. Expedite the possibility of bringing gas based generating stations i.e Dholpur and schedule the URS in Anta, Auraiya, Dadri available in RLNG and Liquid fuel.
8. Real time portfolio management through sale/purchase of power in STOA (bilateral contingency and Real time market) and requisition of available URS may please be expedited.

Your constant support is solicited for maintaining grid parameters within permissible limits.

Thanks and Regards



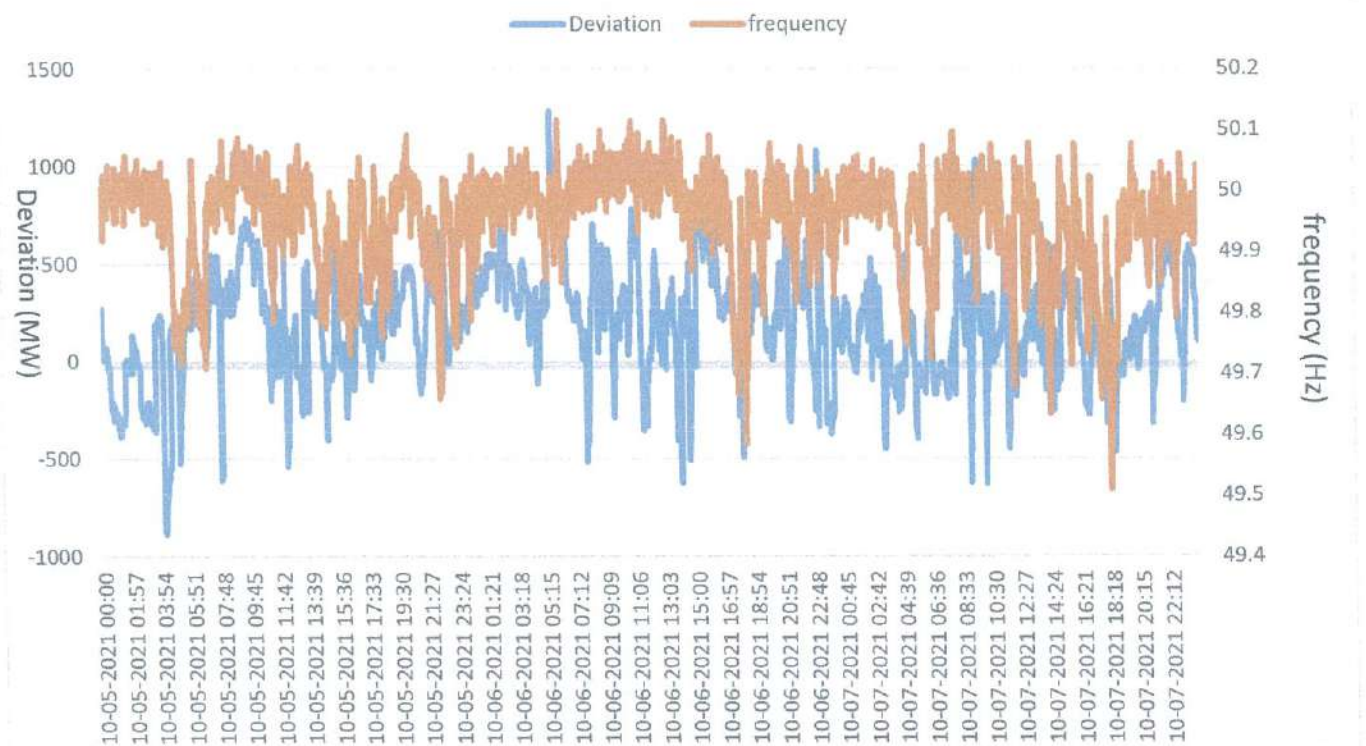
N. Nallarasana
CGM (I/C), NRLDC

Copy for kind Information: -

1. Member Secretary, NRPC
2. Director System Operation, POSOCO
3. Executive Director, NLDC

Date	Deviation(MUs)	Minimum Frequency	Time	Raj OD/UD
05-10-2021	3.730	49.66	22:14:20	648.51
06-10-2021	7.090	49.60	18:13:40	133.12
07-10-2021	3.210	49.50	18:14:50	415.82

Rajasthan Deviation vs Frequency



ANNEXURE-II

GENERATING UNITS OUTAGE IN RAJASTHAN CONTROL AREA							
S.No	Station	Owner	Unit No	Capacity MW	Reason(s)	Outage	
1	Dholpur GPS	RRVPNL	1	110	Reserve Shutdown	25-08-2020	05:48
2	Dholpur GPS	RRVPNL	2	110	Reserve Shutdown	05-12-2020	00:35
3	Dholpur GPS	RRVPNL	3	110	Reserve Shutdown	05-12-2020	00:40
4	Chhabra SCTPS	RRVPNL	6	660	TO INSPECT RAPH (Regenerative air pre heaters)-6B under annual shutdown	03-08-2021	08:57
5	Chhabra TPS	RRVPNL	2	250	Due to ESP(Electrostatic Precipitator) Structure damage	05-09-2021	23:04
6	Chhabra TPS	RRVPNL	4	250	Due to ESP structure damage	09-09-2021	00:47
7	Chhabra TPS	RRVPNL	3	250	Due to ESP Structure damage	09-09-2021	03:00
8	Kota TPS	RRVPNL	6	195	Due to the ruptured metallic expansion bellow of LP turbine	22-09-2021	23:59

9	Rajwest (IPP) LTPS	RRVPNL	2	135	Bed Material Leakage	23-09-2021	04:18
10	Suratgarh TPS	RRVPNL	4	250	Coal Shortage	26-09-2021	16:49
11	Suratgarh TPS	RRVPNL	3	250	Coal Shortage	27-09-2021	09:31
12	Suratgarh TPS	RRVPNL	6	250	Coal Shortage	27-09-2021	21:55
13	Kawai TPS	RRVPNL,APL	1	660	Coal Shortage	28-09-2021	23:59
14	Suratgarh TPS	RRVPNL	5	250	Coal Shortage	02-10-2021	18:34
15	Suratgarh TPS	RRVPNL	2	250	Coal Shortage	03-10-2021	18:00
16	Kalisindh TPS	RRVPNL	2	600	Due to Boiler tube leakage	05-10-2021	11:17
17	Suratgarh SCTPS	RRVPNL	7	660	Coal Shortage	05-10-2021	11:59
18	Barsingsar (NLC)	RRVPNL	1	125	M/T DUE TO Boiler refractory damage	06-10-2021	12:00
	Total			5365			

Annexure**FEEDERS FOR PHYSICAL REGULATION OF SUPPLY IN UTTAR PRADESH**

Sl. No	Transmission element to be opened	Affected Area	Approx load relief (MW)	Remarks
1	220kV Meerut- Gajraula	Gajraula	100	Radial feeder, Alternate supply available from 220kV Sambhal, MW loading limited to 25MW.
2	220kV Baghat (PG)- Baghat (UP) D/C	Baghat	60	Radial feeder, Alternate supply available from 132kV Source
3	220kV Allahabad (PG)- Jhusi	Jhusi	200	Radial feeder, Alternate supply available from 220kV Phoolpur
4	220kV Sohawal (PG)- Barabanki D/C	Barabanki	120	Radial feeder
5	220KV Mainpuri (PG)- Neemkarori D/C	Farrukhabad	120	--do--
6	220kV Gorakhpur (PG)- Gola D/C	Gorakhpur	80	--do--
7	132kV Balia (PG)- Bansdeeh	Balia	15	--do--
8	132kV Balia (PG)- Sikandrapur	Balia	30	--do--

FEEDERS FOR PHYSICAL REGULATION OF SUPPLY IN PUNJAB

S No.	Transmission element to be opened	Power supply interruption in	Approx Relief (MW)	Remarks
1	132 kV Jamalpur- Ghulal D/C	Ghulal	91	No alternate supply available
2	66 kV Jamalpur – Chandigarh Road, Ludhiana	Chandigarh Road, Ludhiana	37	These feeders are replacement of Jamalpur-Miliarganj D/C as reported by PSTCL by Memo No. 1162/T-257 dated 23-11-12. In review, it was found that df/dt and UFR was already installed on Jamalpur-Miliarganj D/C
	66 kV Jamalpur- Sherpur, Ludhiana	Sherpur, Ludhiana	13	
3	220/66 kV ICT1, 2 & 3 at Sangrur	Sangrur and adjoining areas	166	No alternate supply available
4	132 kV Amritsar- Naraingarh D/C	Amritsar and Adjoining areas	100	No alternate supply available
5	220 kV Jalandhar- Kanjli D/C	Kapoorthala	64	No alternate supply available

FEEDERS FOR PHYSICAL REGULATION OF SUPPLY IN JAMMU & KASHMIR

S No.	Transmission element to be opened	Power supply interruption in	Approx Relief (MW)	Remarks
1	220 kV Kishenpur-Udhampur D/C	Udhampur	100-150	Limited alternate feed may be available from 132 kV. Generation at Chenani HEP may be affected.
	220 kV Sarna-Udhampur			
2	220 kV Kishenpur-Barn D/C	Jammu	100	Limited alternate feed may be available from Jammu
3	220 kV Sarna-Hiranagar	Jammu & Hiranagar	300-400	Entire Jammu region could be affected. Alternate feed may be available from Barn and Udhampur. Generation at Sewa HEP may get affected
	220 kV Salal-Jammu D/C			
4	220 kV Wagoora-Ziankote D/C	Kashmir valley	200-300	Limited alternate feed may be available from Pampore. Generation at Lower Jhelum could get affected
5	220 kV Wagoora-Ziankote D/C	Kashmir valley	400-500	Though Uri generation may be evacuated through 400 kV Wagoora-Kishenpur D/C but the security would be affected.
	220 kV Wagoora-Pampore D/C			
	220 kV Kishenpur-Mir Bazar			
	220 kV Kishenpur-Ramban			

FEEDERS FOR PHYSICAL REGULATION OF SUPPLY IN RAJASTHAN

S No.	Transmission element to be opened	Power supply interruption in	Approx Relief (MW)	Remarks
1	220 kV Bhiwadi (PG)-Kushkhera	Kushkhera and Kishangarh Bas	170	Limited alternate supply may be available. 220 kV Alwar-K. G. Bas-Kushkhera line may get overloaded
	220 kV Neemrana (PG)-Kushkhera			
2	220 kV Neemrana (PG)-Neemrana	Neemrana	180	Limited alternate supply may be available from Kotputli & Behror.
	220 kV Bhiwadi (PG)-Neemrana			
3	220 kV Khelna (PG)-Manoharpur	Manoharpur	100	Limited alternate supply of Manoharpur may be available from Kotputli
4	220 kV Anta-Lalsot	Lalsot Sawaimadhapur	180	Limited alternate supply may be available from Dausa
	220 kV Anta-Sawai Madhopur			
5	220 kV Dadri-Khetri-I	Khetri Chirawa	120	Limited alternate supply of Khetri and Chirawa may be available from other station
	220 kV Dadri-Khetri-II			
	220 kV Hissar-Chirawa			

FEEDERS FOR PHYSICAL REGULATION OF SUPPLY IN HARYANA

S No.	Transmission element to be opened	Power supply interruption in	Approx Relief (MW)	Remarks
1	Feeders in Schedule A Panipat: a) 33kV Panipat-Swah(Chhajpur) b) 33kV Panipat-Untla c) 33kV Panipat-Israna d) 33kV Panipat-Narayana e) 33kV Panipat-Sanoli road	Panipat	150 (Approximately)	Radial Lines
2	Feeders in Schedule B Kurukshetra: a) 33kV Kurukshetra-Mathana b) 33kV Kurukshetra-Ajrana c) 33kV Kurukshetra-Kirmich	Kurukshetra, Dhulkote,	150 (approximately)	Radial Lines
	d) 11kV Kurukshetra-Bahadurpura e) 11kV Kurukshetra-Pipli Dhulkote: a) 66kV Dhulkote-Ambala b) 66kV Dhulkote-Babyal			
3	132kV Kundli line emanating from Narela BBMB	Rai-Sonepat	55	No alternate supply to Kundli
4	220/132kV, 220/66 kV ICTs at BBMB stations such Hissar, Ch. Dadri, Kurukshetra, Jagadri. Dhulkote, can be opened. However, many 132kV, 66 kV and below feeder are covered under Schedule A & B			

FEEDERS FOR PHYSICAL REGULATION OF SUPPLY IN HIMACHAL PRADESH

S.No.	Transmission element to be opened	Power supply interruption in	Approx. Relief (MW)	Remarks
1	66kV Bhakra-Rakkar	Rakkar/Una	10-18	Details awaited
2	66kV Pong- Sansarpur	Sansarpur Terrace	2-5	Details awaited
3	220kV Dehar-Kangoo	Kunihar/Shimla	80-140	Limited alternate supply available from 132kV Hamirpur. 400/220kV Dehar ICT may be overloaded.
	132kV Dehar-Kangoo			
4	220kV Khodri-Majri	Giri/Solan	80-140	Limited Alternate supply may be available from 132kV Kunihar. Essential load at Majri: Oxygen plant, administrative offices etc.
	132kV Kulhal-Giri			
5	220kV Nallagarh-Nangal D/C	Nangal/Nallagarh/Baddi	180-315	Industrial load of Nangal may be affected.
6	66kV Pinjore-Parwanoo	Parwanoo	5-13	Alternate supply from Solan.

FEEDERS FOR PHYSICAL REGULATION OF SUPPLY IN UT CHANDIGARH

S No.	Transmission element to be opened	Power supply interruption in	Approx Relief (MW)	Remarks
1	220 kV Nalagarh-Kishengarh-D/C	Chandigarh	100-200	No alternate supply available
2	66 kV Mohali- Sector 39 D/C	Chandigarh	30-60	No alternate supply available
3	66 kV Mohali- Sector 56 Ckt-1	Chandigarh	20-50	No alternate supply available

FEEDERS FOR PHYSICAL REGULATION OF SUPPLY IN UTTARAKHAND

S No.	Transmission element to be opened	Power supply interruption in	Approx Relief (MW)	Remarks
1	220 kV Bareilly- Pantnagar	Pant Nagar/ Haldwani	200	Limited alternate supply may be available from 132 kV Kashipur to Haldwani
2	132 kV Nazibad-Kotdwar	Kotdwar	20-50	Generation of Chilla P/H may be interrupted
3	220/132 kV Sitarganj ICTs	Sitarganj, Kichha	50-100	Generation of Khatima will interrupt
	132 kV Dohna-Sitarganj			
	132 kV Dohna -Kichha			
4	400/220 kV Roorkee ICTs	Roorkee	100-200	Grid disturbance may occur due to overloading of 220kV Rishikesh-Sidkul & 240MVA ICT at 400kV Rishikesh
	220 kV Nara-Roorkee			

FEEDERS FOR PHYSICAL REGULATION OF SUPPLY IN BBMB PREMISES

SCHEDULE A LINES

1. PANIPAT

1) 132 KV PANIPAT - ISRANA

2) 132 KV PANIPAT - KARNAL

3) 132 KV PANIPAT - SAMALAKHA

33 4) ~~132~~ KV PANIPAT - UNTLA

5) 33 KV PANIPAT - SEWAH (CHHAJPUR) ✓

6) 33 KV PANIPAT - ISRANA ✓

7) 33 KV PANIPAT - SEC-29 (CHANDOLI) ✓

8) 33 KV PANIPAT - NARAYANA ✓

9) 33 KV PANIPAT - SANOLI ROAD ✓

NORMAL

33KV

5 feeders
Radial

2. KURUKSHETRA

1) 132 KV KURUKSHETRA - PEHOWA

Normal

3. AGADHARI

1) 66 KV SADHAURA-I

2) 66 KV SADHAURA-II

Talakaw

NORMAL

4. HISSAR

1) 33 KV HISSAR TEXTILE MILLS

NORMAL

SCHEDULE B LINES

1. PANIPAT

1) 132 KV PANIPAT - SONEPAT ✓

2. KURUKSHETRA

1) 33 KV KURUKSHETRA - MATHANA

2) 33 KV KURUKSHETRA - AJRANA

3) 33 KV KURUKSHETRA - KIRMICH

4) 11 KV KURUKSHETRA - BAHADURPURA (HSEB)

5) 11 KV KURUKSHETRA - PIPLI

5 NO
Radial

3. GULKOTE

1) 66 KV AMBALA-II

2) 66 KV BABYAL

Radial

4. ELHI-NARELA

1) 11 KV NARELA - NANGAL KALAN

2) 11 KV NARELA - KUNDLI

NORMAL

3) 132KV BAHADURGARH (LINE PERMANENTLY EXCLUDED FROM SCHEDULE BE AS INTIMATED BY NRLDC ON DATED 19.09.2013)

4) 132 KV SONEPAT

06.10.2021

Tap position changes suggested based on scatter plots for September 2021 data

Increase by 2 Steps

POWERGRID: Bhiwadi, Sambha, Srinagar

DTL: Bamnoli

HVPL: Nuhiyawali, Daultabad

RVPNL: Suratgarh

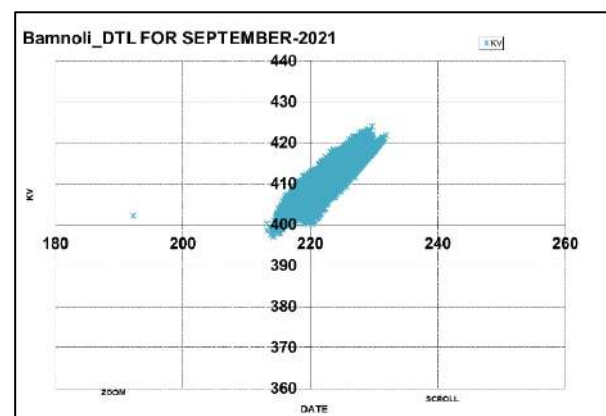
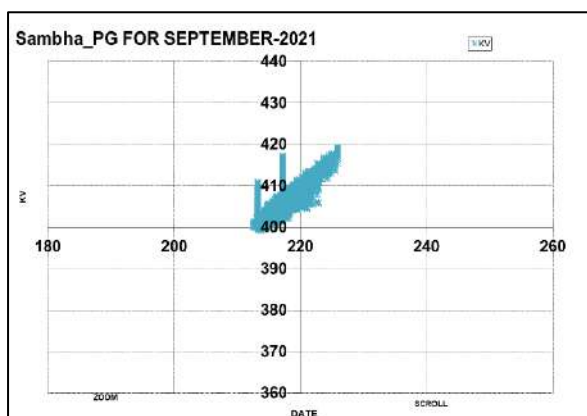
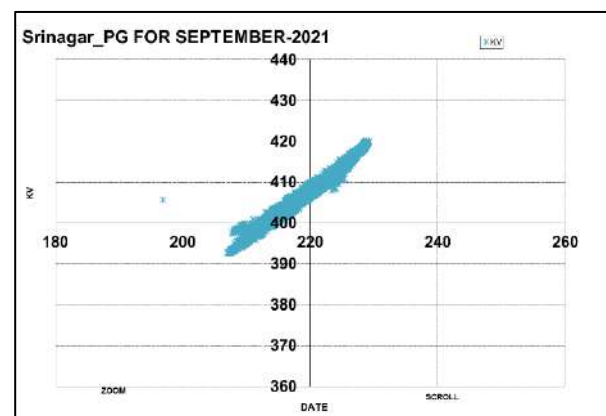
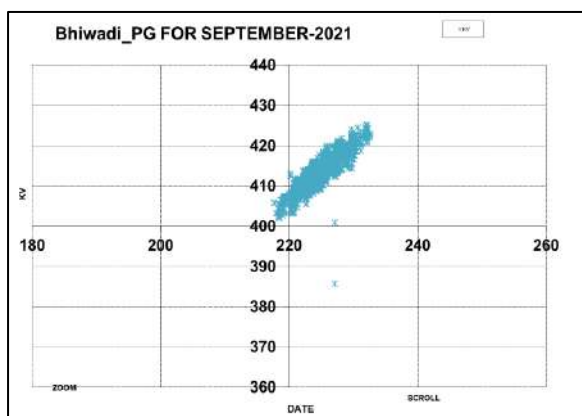
UPPTCL: Muradnagar

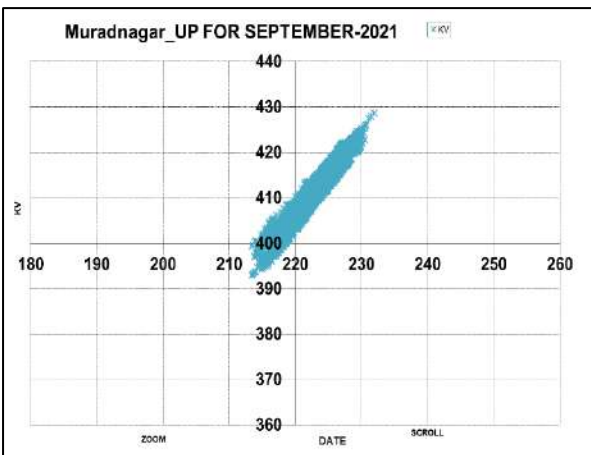
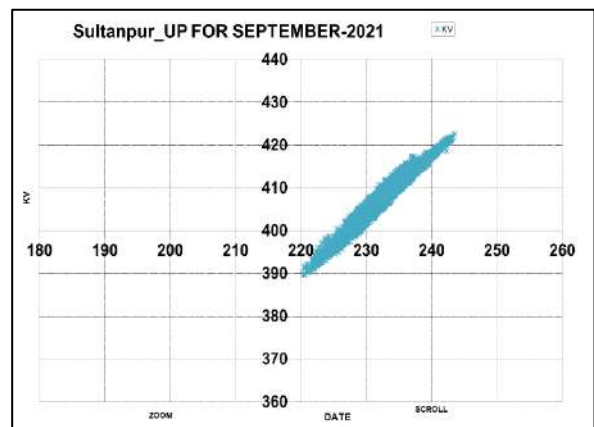
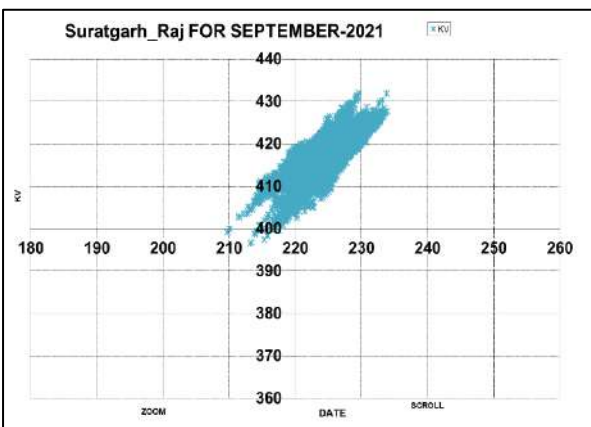
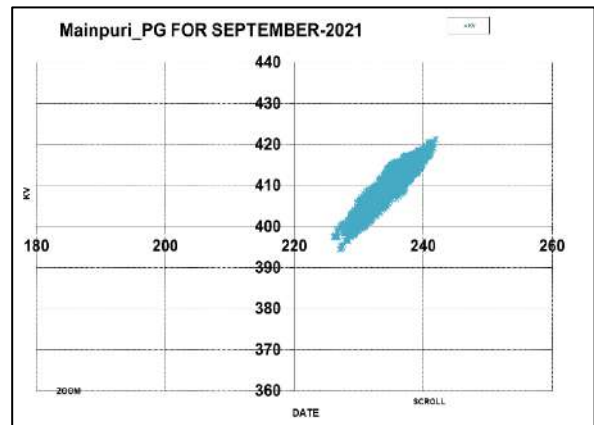
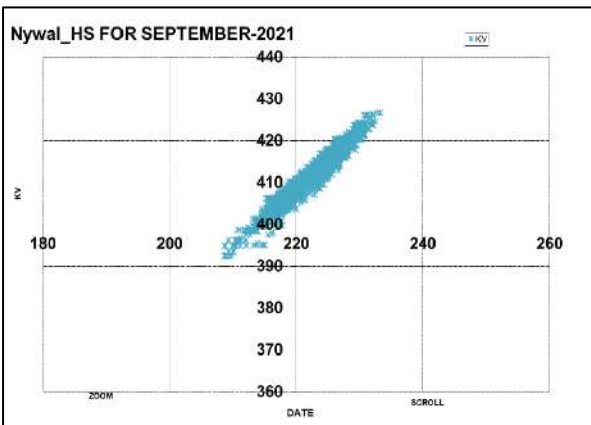
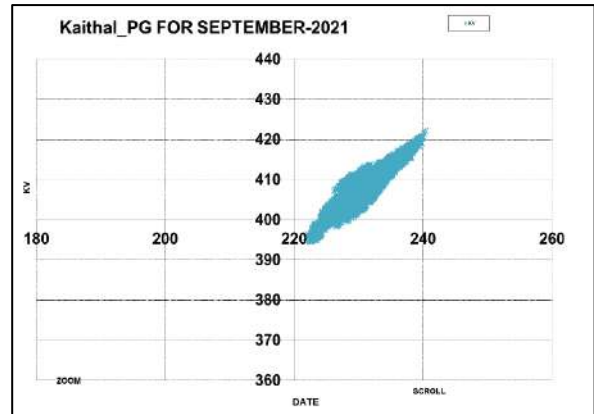
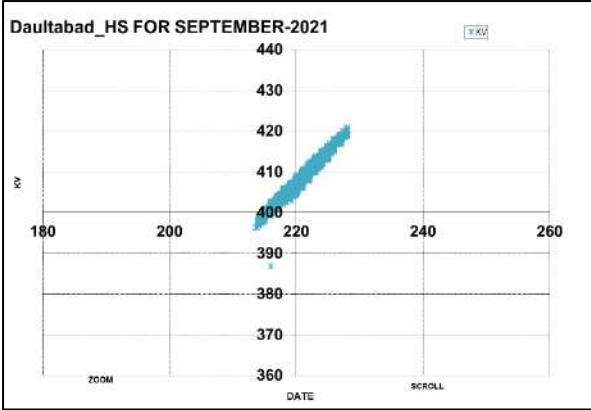
Decrease by 2 Steps

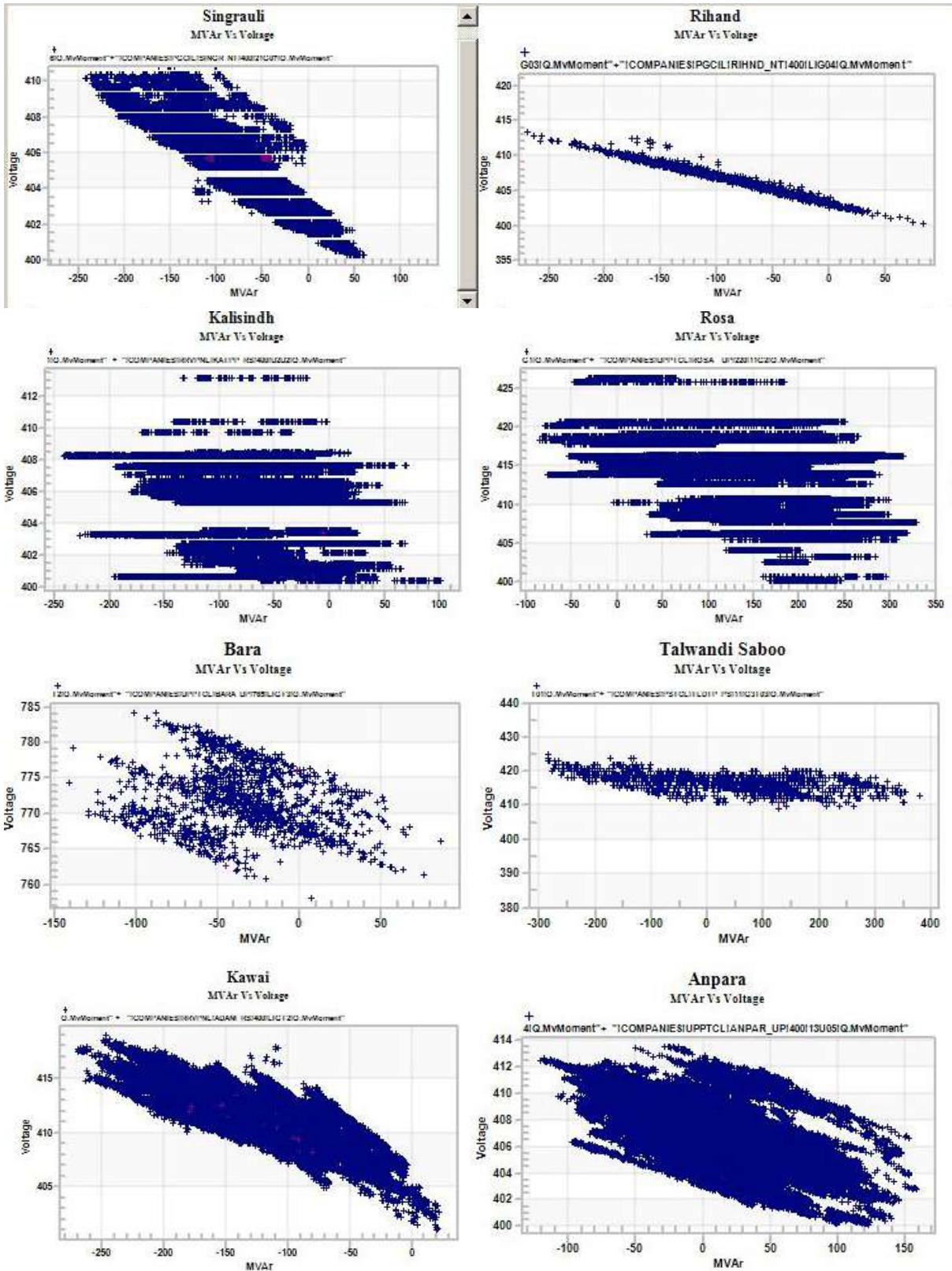
POWERGRID: Mainpuri, Kaithal

UPPTCL: Sultanpur

Scatter plots (September-2021 data)

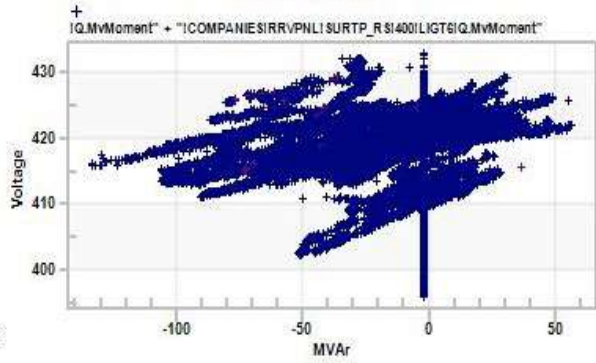






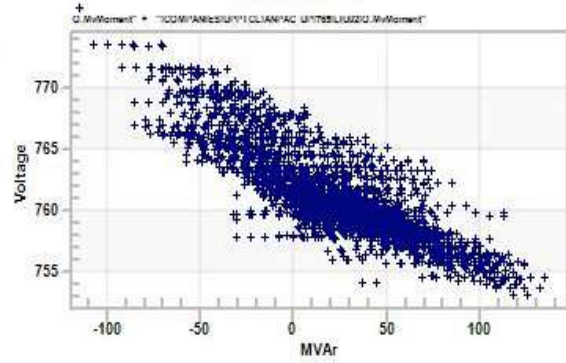
Suratgarh

MVAr Vs Voltage



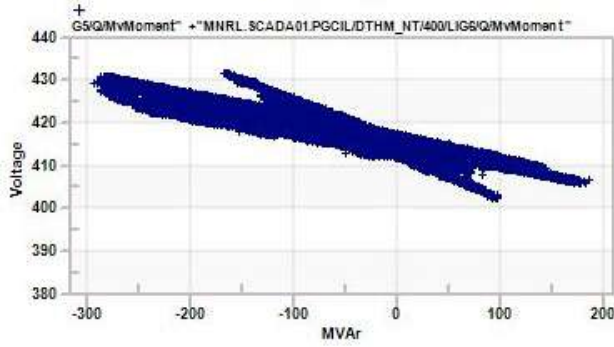
Anpara C

MVAr Vs Voltage



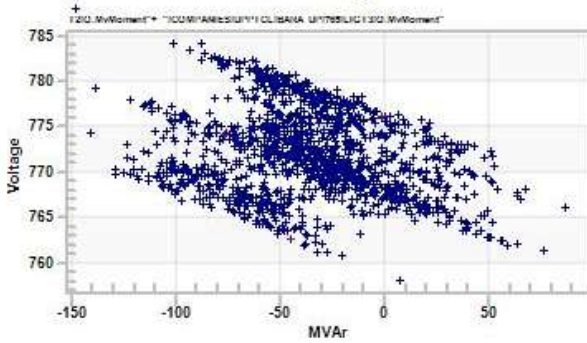
Dadri 400

MVAr Vs Voltage



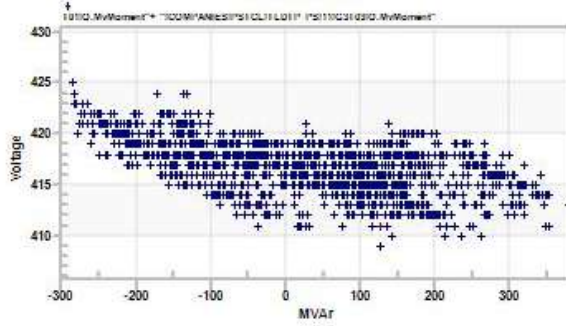
Bara

MVAr Vs Voltage



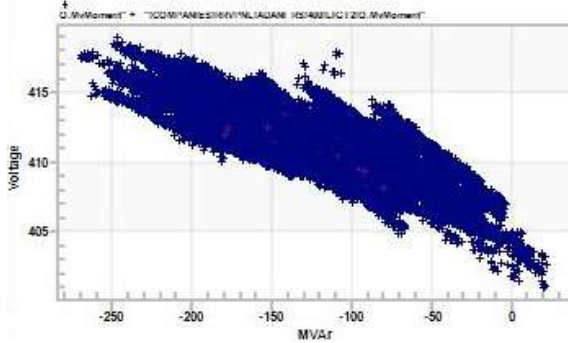
Tahwandi Saboo

MVAr Vs Voltage



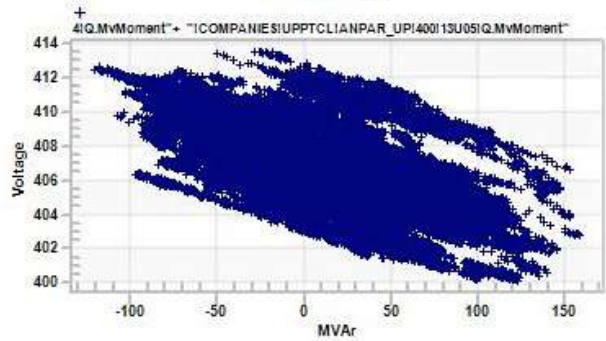
Kawai

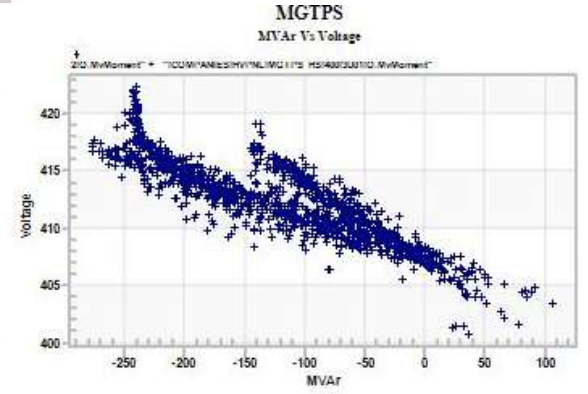
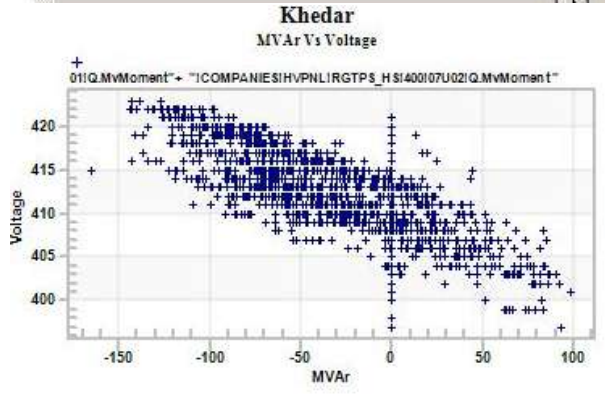
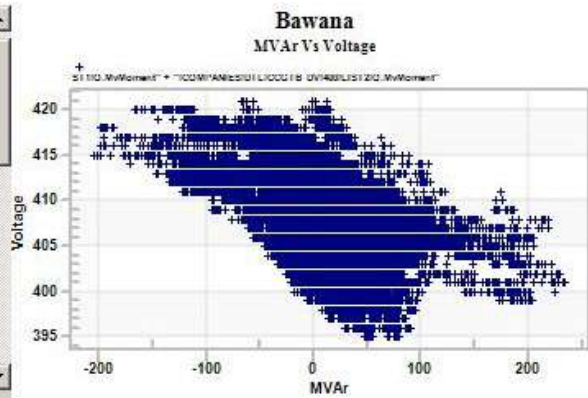
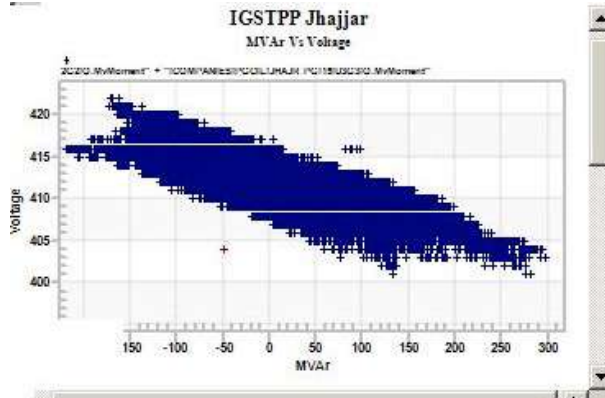
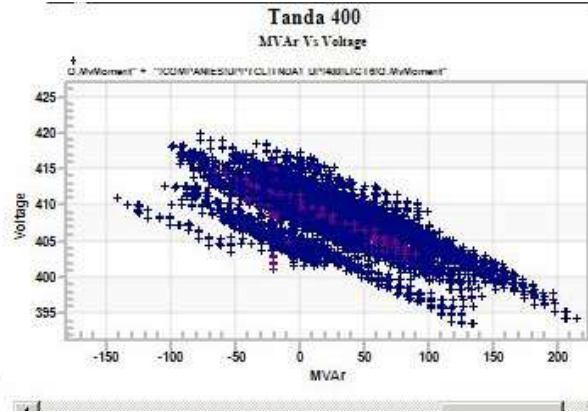
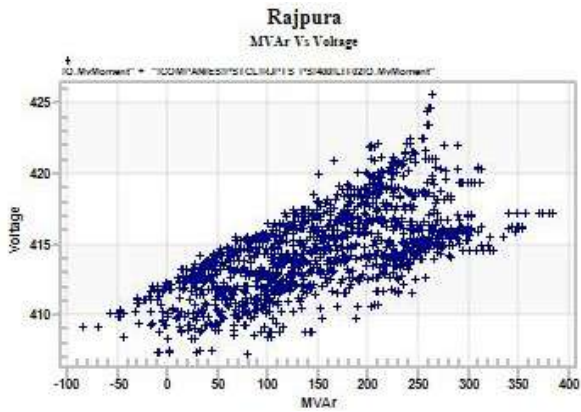
MVAr Vs Voltage

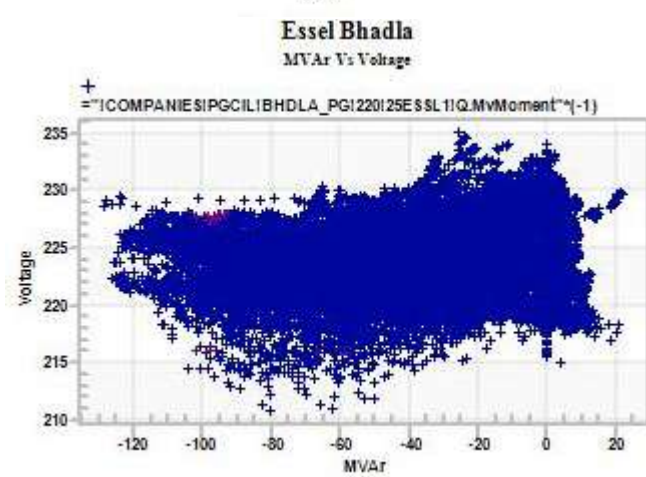
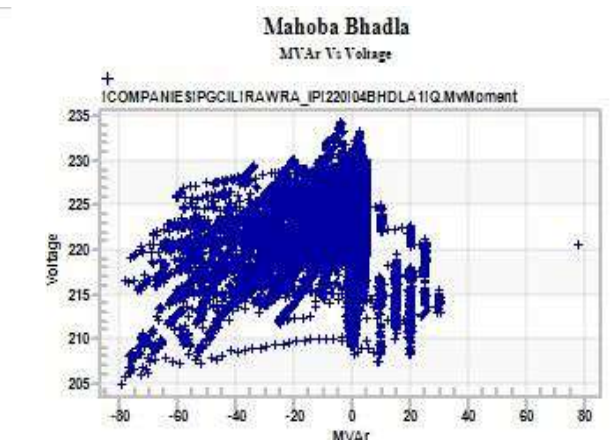
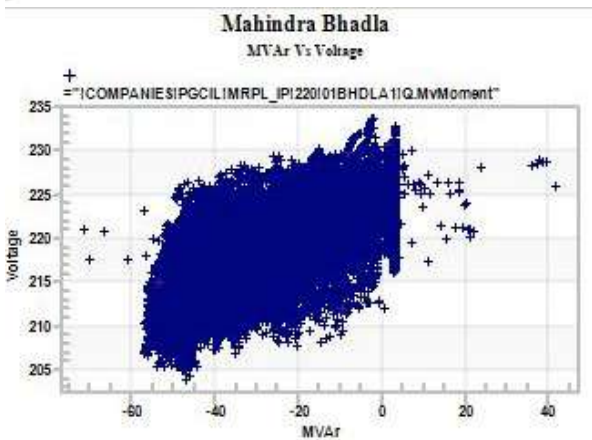
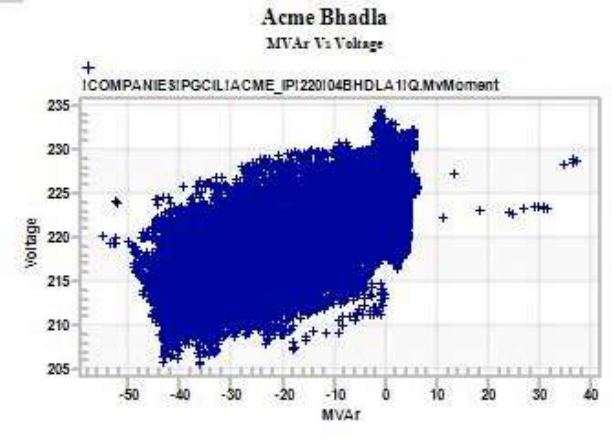
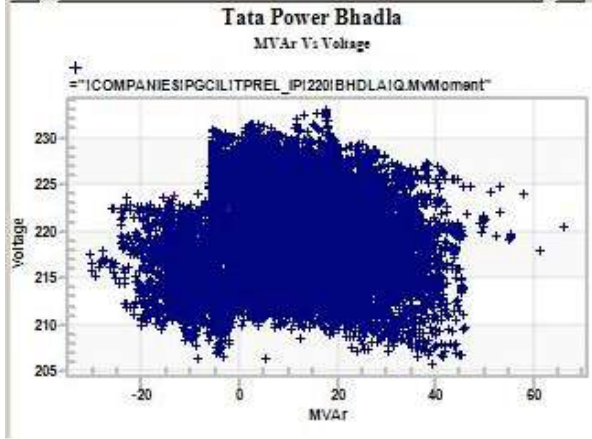
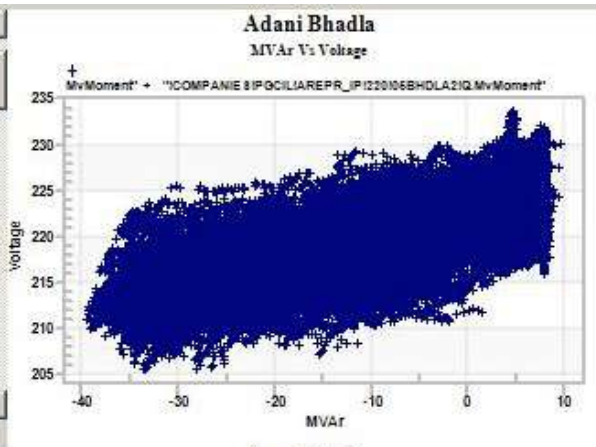
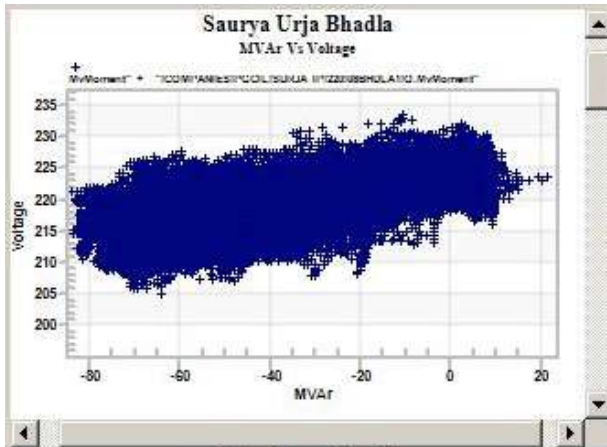


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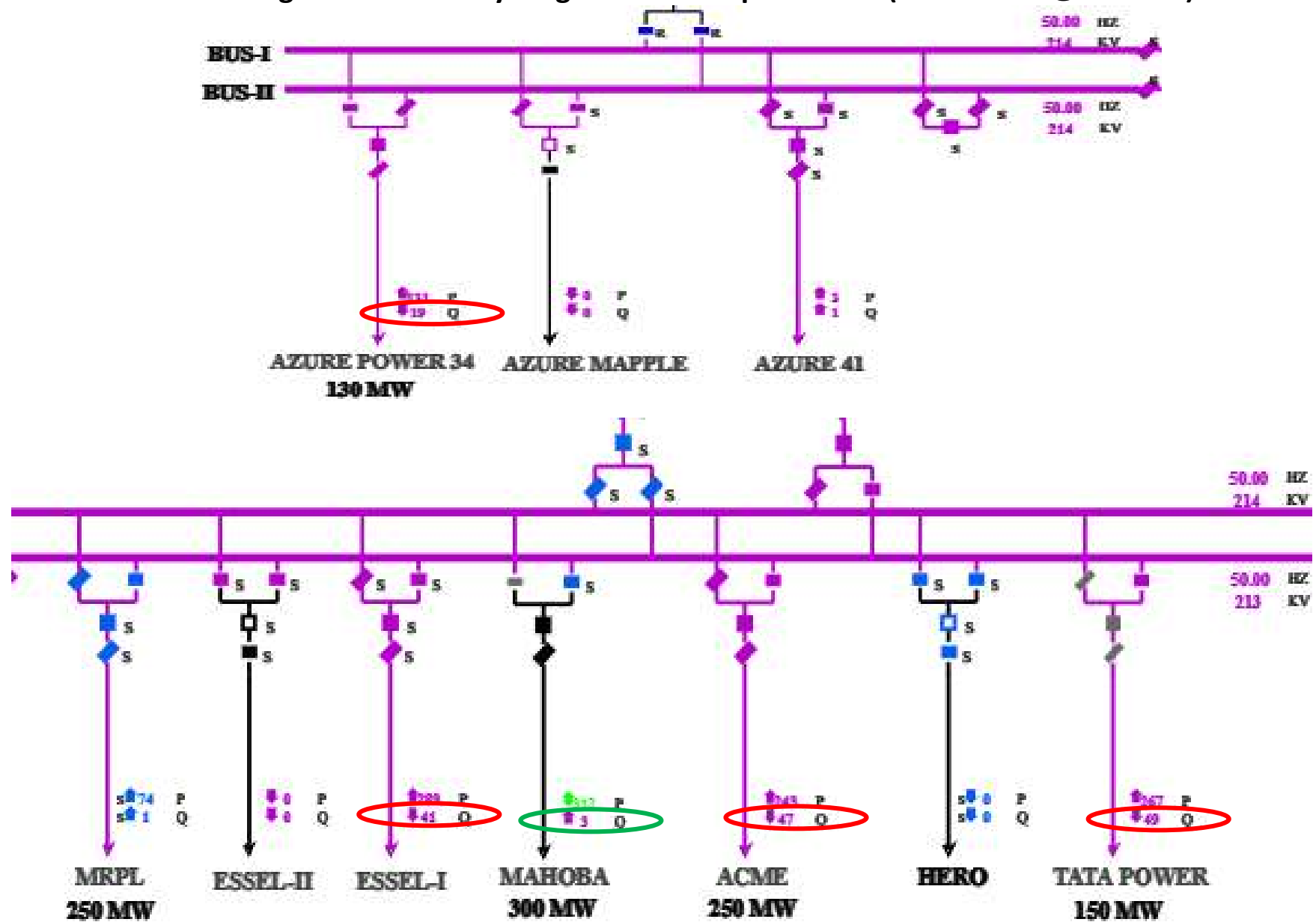
MVAr Vs Voltage



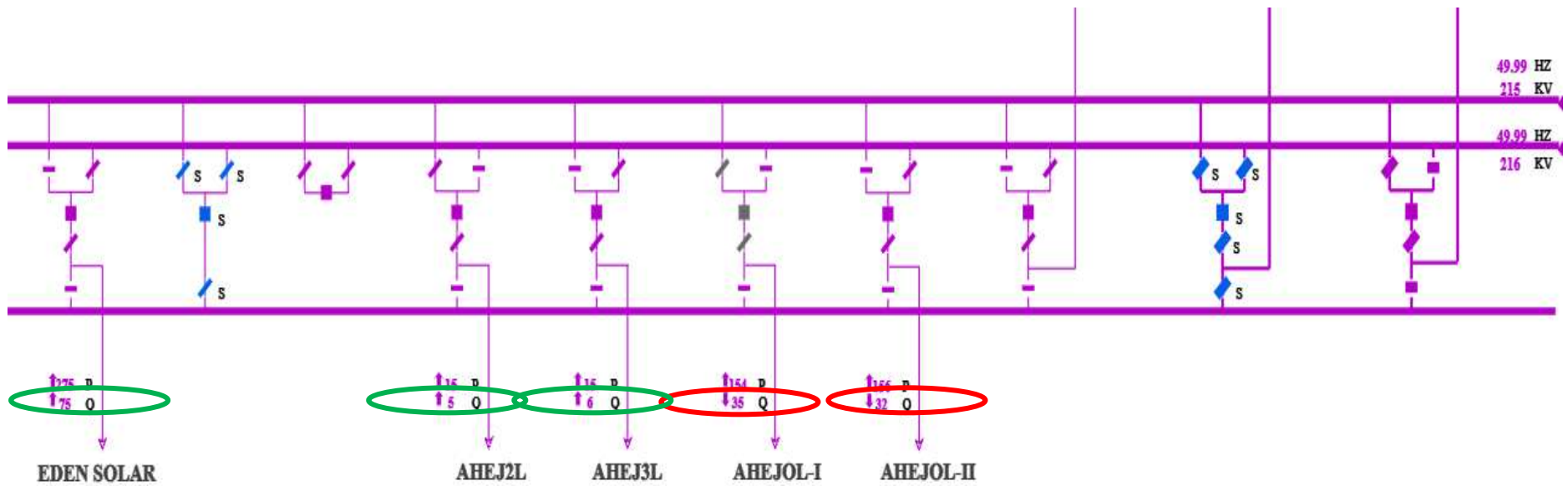
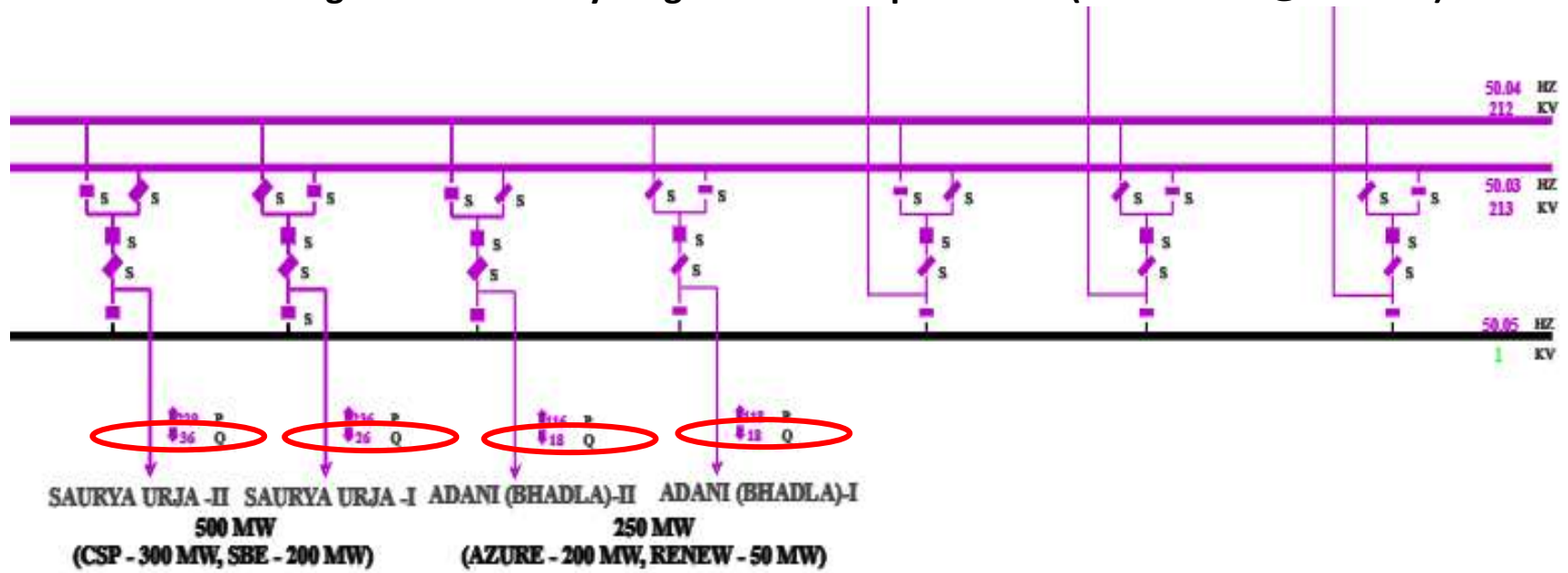




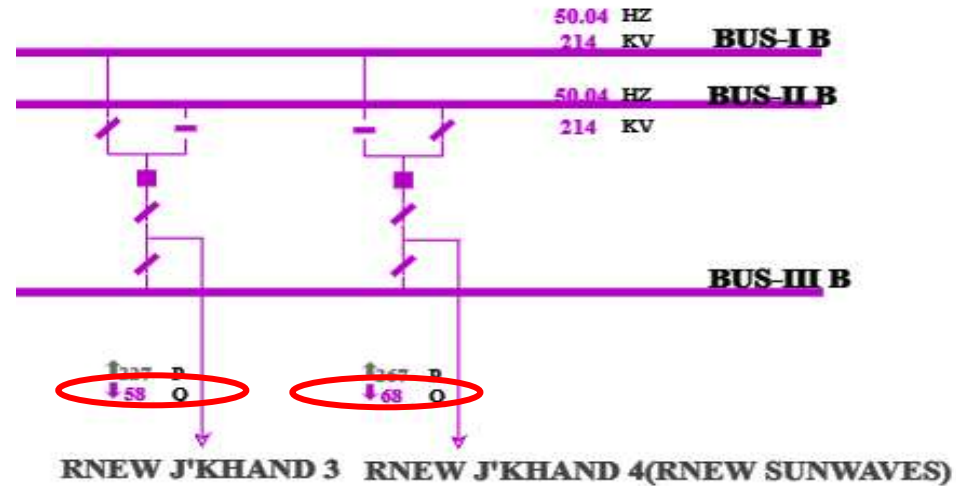
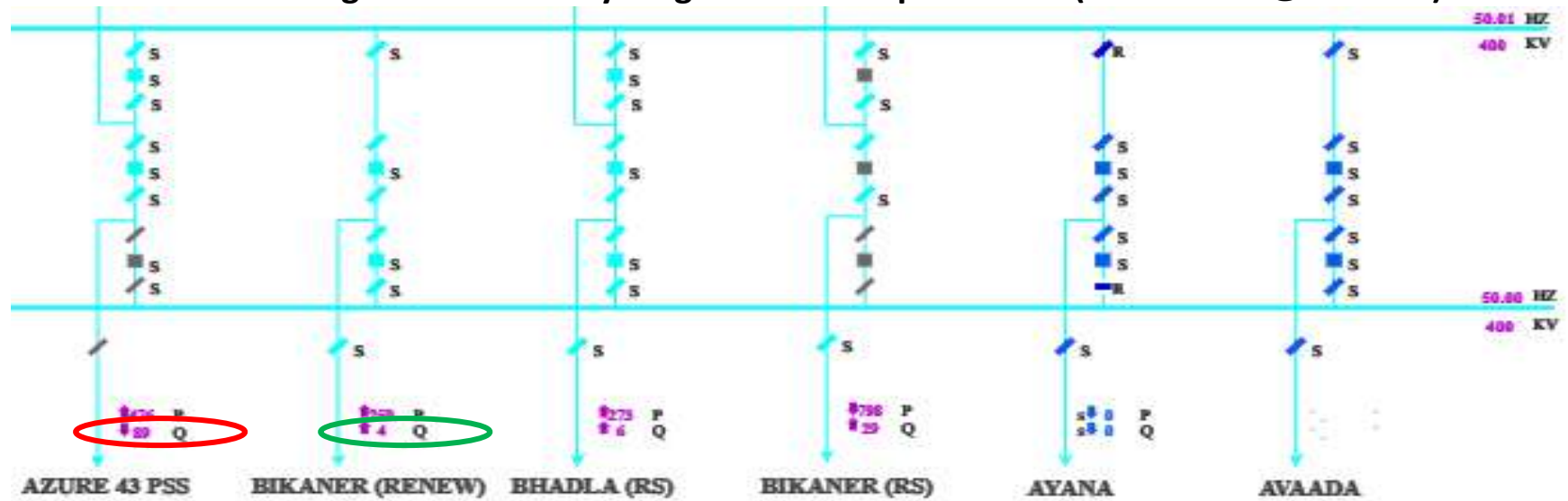
SLD showing MVAR drawl by RE generators at peak Solar (08.10.2021 @1200hrs)



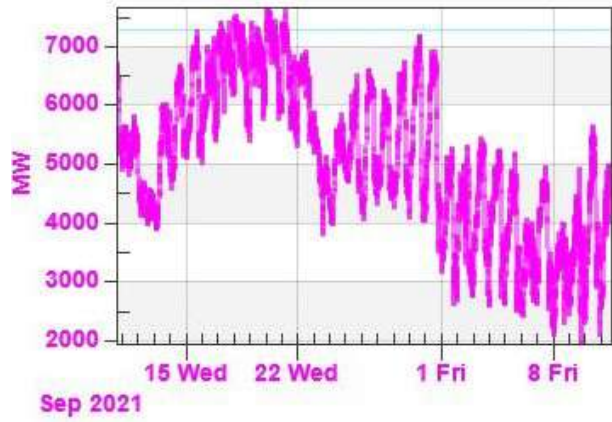
SLD showing MVAR drawl by RE generators at peak Solar (08.10.2021 @1200hrs)



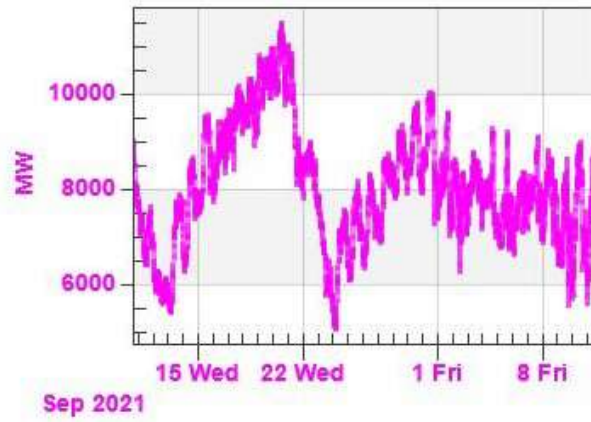
SLD showing MVAR drawl by RE generators at peak Solar (08.10.2021 @1200hrs)



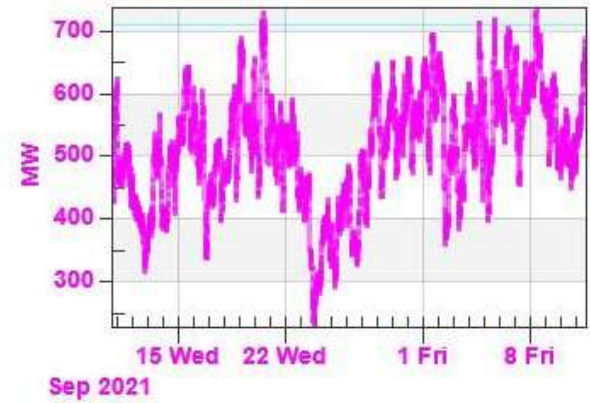
Punjab Import



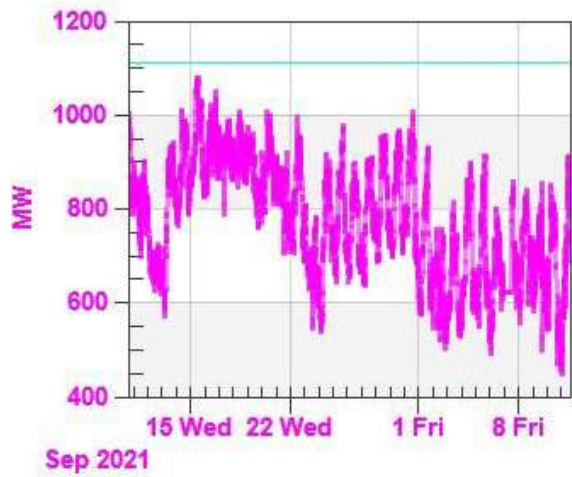
Punjab load



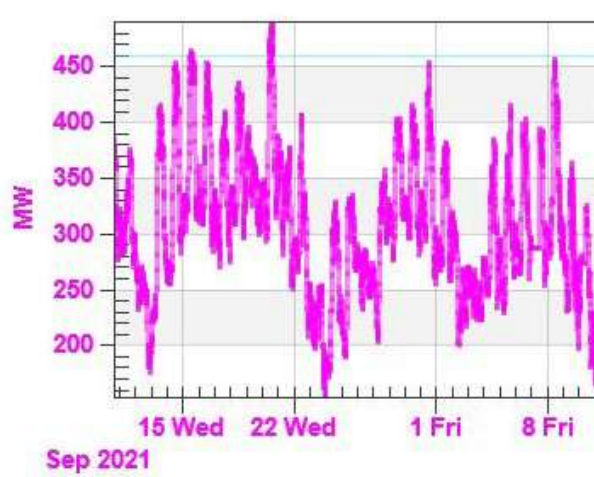
Rajpura ICT load



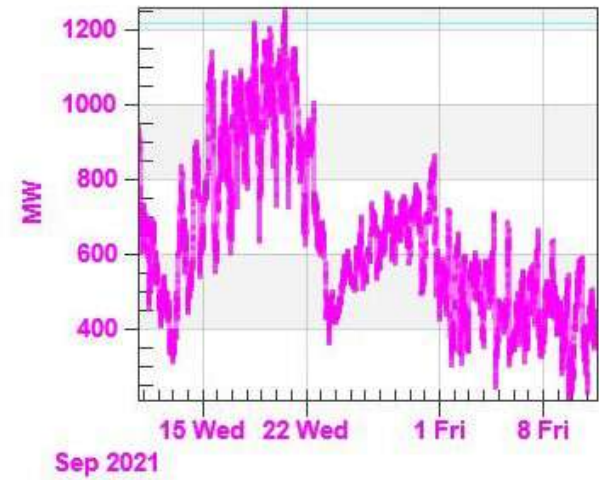
Ludhiana ICT load



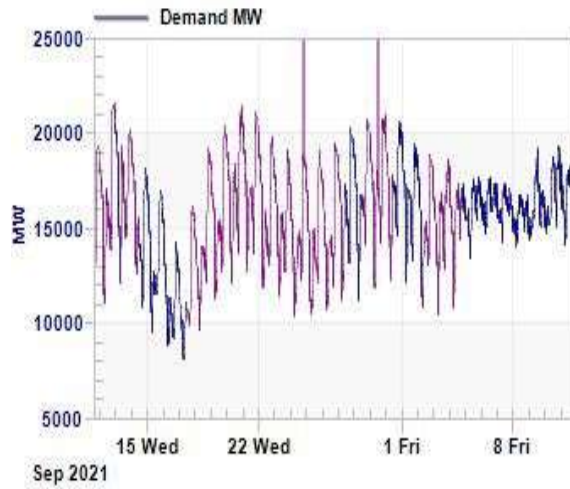
Nakodar ICT load



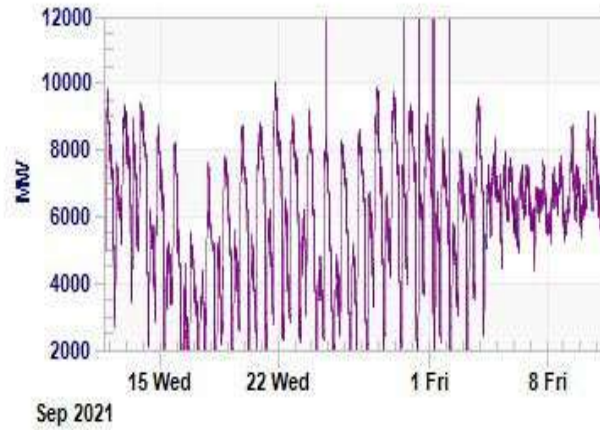
Moga ICT load



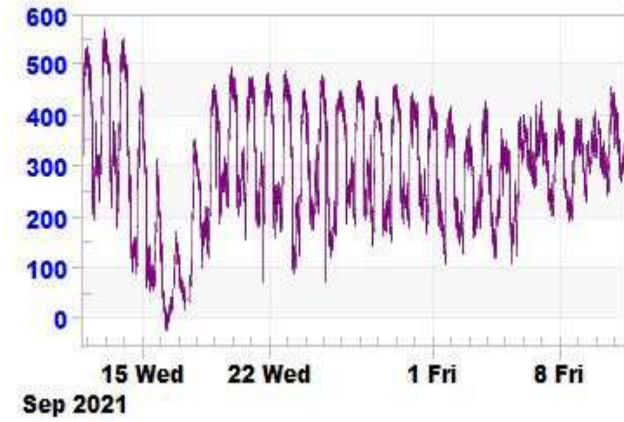
UP Demand



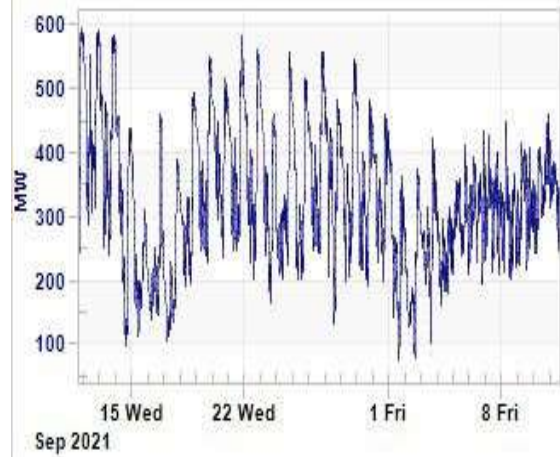
UP Import



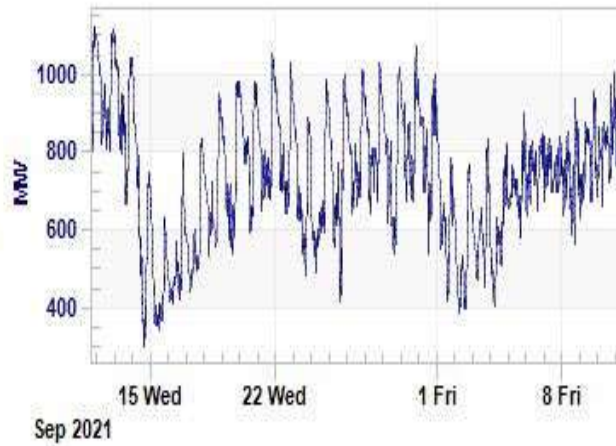
Sohawal ICTs MW



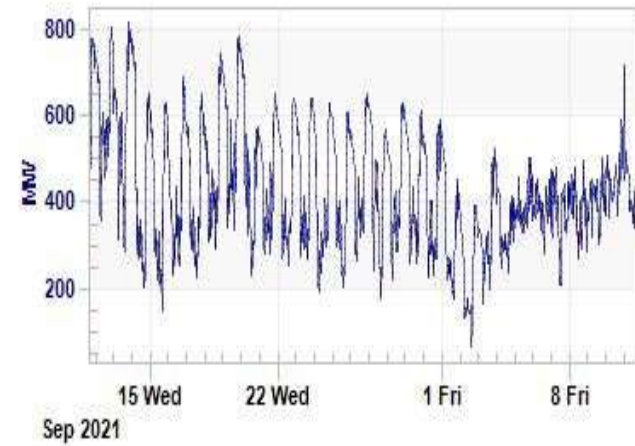
Azamgarh ICT loading



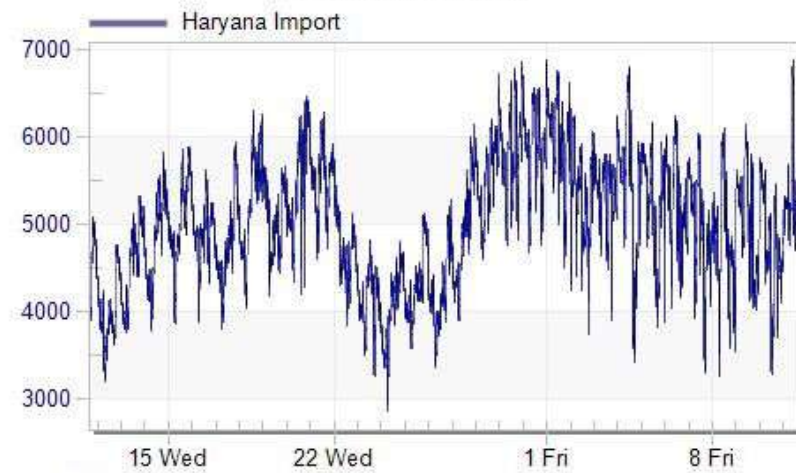
Sarnath ICT loading



Gorakhpur UP ICT loading

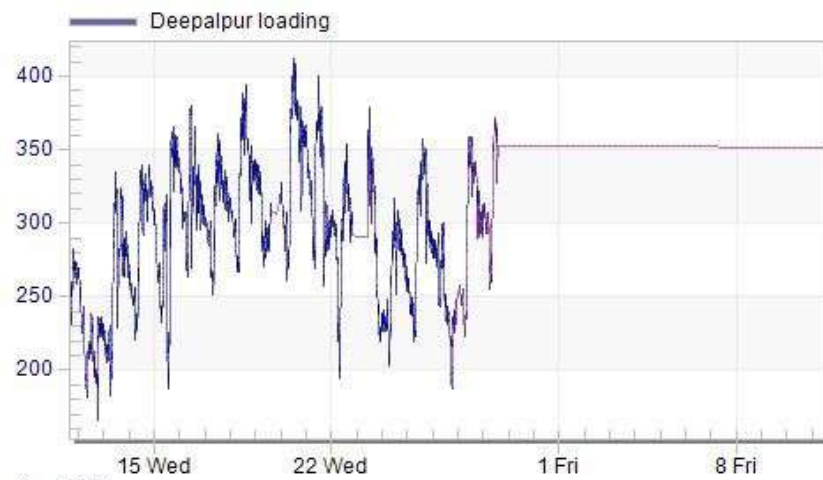


Haryana Import



Sep 2021

Deepalpur ICT loading



Sep 2021

Long Outage Report

As on 14.10.2021

S. No`	Element Name	Type	Owner	Outage Date and Time	Outage days	Reason / Remarks	
A	LINE						
1	220 KV Kishenpur(PG)-Ramban(PDD) (PDD) Ckt-1	Line	PDD JK	31-03-2020	16:43	561	Due to heavy land slide near village Dalwas at Ramban damages occurred to 220 KV D/C KPTL at Location No :-187,188 &189 and there is every apprehension of collapsing Tower Loc No 189 .
2	220 KV New Tanda (UP)-Sohawal(PG) (UP) Ckt-1	Line	UPPTCL	06-09-2021	23:37	37	Phase to phase fault Y-B Fault current ly 4.28kA, Ib 4.24kA, Dist. 39.3km from new Tanda end.Tower damage reported.
3	220 KV New Tanda (UP)-Sohawal(PG) (UP) Ckt-2	Line	UPPTCL	06-09-2021	23:37	37	Phase to earth fault B-N , Fault current 2.49kA, Dist. 35.6 km from new Tanda end. Tower damage reported.
4	220 KV KISHENPUR(PG)-MIR BAZAR(PDD) (PDD) CKT-1	Line	PDDJK	25-09-2021	11:30	19	for dismantling and erection of superstructure, laying and stringing of conductor at tower location no 34 (SZ+6) (OCC 187)
5	220 KV Sohawal(PG)-Gonda(UP) (UP) Ckt-1	Line	UPPTCL	12-08-2021	09:00	35	Emergency shutdown of line taken, as tower no. 34 is affected by flood.
6	220 KV Sohawal(PG)-Bahraich(UP) (UP) Ckt-1	Line	UPPTCL	12-08-2021	09:12	35	Emergency shutdown of line taken, as tower no. 34 is affected by flood.
B	BAYS						
1	419 MAIN BAY - 50 MVAR BUS REACTOR NO 1 AT 400KV AMARGARH(NRSS XXIX) AND 400KV BUS 2 AT AMARGARH(NRSS XXIX)	BAY	NRSS XXIX	07-07-2020	09:34	464	Relay maloperation
2	40452B MAIN BAY - 400KV SURATGARH(RVUN)-RATANGARH(RS) (RS) CKT-1 AT Ratangarh(RS)	BAY	RRVPNL	25-12-2020	17:05	292	Emergency shutdown for refilling of SF6 gas in R-phase of Circuit Breaker. Later leakage found. Revival delayed due to non-availability of required spare parts.
3	402 MAIN BAY - 400/220 KV 315 MVA ICT 2 AT LAHAL(HP) (HPSEB)	BAY	HPSEB	23-08-2021	09:52	52	For attending SF6 gas leakage in 402 main bay.
4	416 MAIN BAY - 400 KV MEJA TPS(MUN)-MASOLI(UP) (UP) CKT-1 (UPPTCL)	BAY	UPPTCL	15-09-2021	17:12	28	To attend SF6 gas pressure low alarm in 416 main bay CB.
5	429 BUS SECTIONALIZER BAY - 400KV BUS 1 AT MOGA(PG) (POWERGRID) AND 400KV BUS 3 AT MOGA(PG) AT 400 KV MOGA(PG) (POWERGRID)	BAY	POWERGRID	22-09-2021	11:38	22	For segregation of GIS & AIS Bus at Moga.
6	428 BUS SECTIONALIZER BAY - 400KV BUS 2 AT MOGA(PG) (POWERGRID) AND 400KV BUS 4 AT MOGA(PG) AT 400 KV MOGA(PG) (POWERGRID)	BAY	POWERGRID	22-09-2021	11:39	22	For segregation of GIS & AIS Bus at Moga.
7	704-52A MAIN BAY - 765 KV ANTA-PHAGI (RS) CKT-1 (RRVPNL) AT 765KV ANTA(RS)	BAY	RRVPNL	23-09-2021	18:04	20	Mechanical fault in the main Circuit Breaker 704-52A at Anta(RS).
8	408 TIE BAY - 400KV ROORKEE(PG)-KASHIPUR(UK) (PG) CKT 1 AND FUTURE AT ROORKEE(PG)	BAY	POWERGRID	24-09-2021	10:06	20	for 500MVA ICT-III main bay commissioning.

S.No	SElement Name	Type	Owner	Outage		Outage days	Reason / Remarks
C	ICT						
1	400/220 kV 315 MVA ICT 1 at Bhilwara(rs)	ICT	RRVPLN	12-05-2019	23:42	885	Oil leakage in transformer. Expected revival in Dec-2021.
2	400/220 kV 315 MVA ICT 1 at Muradnagar_1(UP)	ICT	UPPTCL	13-03-2020	02:46	580	Bucholz relay alarm and Local Breaker Backup protection operated. Tripped along with Hapur-Muradnagar line. Flags are not reset because of cable flashover. To be replaced by 500 MVA ICT. Expected revival in Dec-2021.
3	400/220 kV 315 MVA ICT 2 at Bawana(DV)	ICT	DTL	30-03-2021	17:35	197	400kV side B-phase bushing blasted. Tripped on differential protection, REF protection. ICT catches fire and damaged.
4	400/220 kV 500 MVA ICT 2 at Noida Sec 148(UP)	ICT	UPPTCL	19-08-2020	16:30	421	500 MVA ICT-I also got damaged due to fire in ICT-II, for protection testing. Expected revival in Oct-2021.
5	400/220 kV 315 MVA ICT 2 at Mundka(DV)	ICT	DTL	20-09-2019	00:419	755	Due to fire in ICT.
6	220/33 kV 125 MVA ICT 1 at Saurya Urja Solar(SU)	ICT	Saurya Urja	27-05-2021	23:42	140	Operation of transformer protection
D	BUS						
1	400 KV Kadarapur (GPTL) - Bus 1	BUS	GPTL	17-04-2021	13:18	179	E/S/D taken due to abnormal humming sound observed from 400KV B-phase BUS-1 CVT at Kadarapur.
2	400 KV Lahal(HP) - Bus 1	BUS	HPSEB	23-08-2021	09:52	52	For attending SF6 gas leakage C04 GIS chamber.
E	BUS REACTORS						
1	80 MVAR Bus Reactor No 1 at 400KV Nathpa Jhakri(SJ)	BR	SJVNL	17-10-2019	12:58	727	Flashover/Fault in 80MVAR Bus Reactor cleared by Bus Bar Protection. Expected revival in Nov-2021.

F	SVC						
1	SVC No 1(-140/+140MVAR) at 400 KV Kanpur(PG)	SVC	POWERGRID	24-08-2020	17:33	415	Hand tripped at 17:33hrs on 24.08.2020 after observation of heavy sparking in TSC Capacitor bank. Due to non support from OEM, the element has been decapitalized by Powergrid.
G	FSC						
1	FSC of 400 kV Kanpur-I at Ballabgarh	FSC	POWERGRID	14-03-2017	10:58	1638	B-phase Signal column blast. Contract awarded and expected to be revived by Sep'21

G	GENERATING UNITS					
S.No	Station	Owner	Outage Reason	Outage Date	Outage Time	Outage duration(in days)
1	126 MW Bhakra HPS - Unit 3	BBMB	Renovation and Maintenance work. Expected by Oct-2021 end.	01-04-2019	09:20	927
2	126 MW Bhakra HPS - Unit 7	BBMB	Renovation and Maintenance work. Expected by Oct-2021 end.	05-10-2020	08:43	374
3	40 MW Sewa-II HPS - UNIT 2	NHPC	Excessive leakage in HRT between audit-II and Dam. Expected by Jan-2022.	25-09-2020	00:00	384
4	40 MW Sewa-II HPS - UNIT 3	NHPC	Excessive leakage in HRT between audit-II and Dam. Expected by Jan-2022.	25-09-2020	00:00	384
5	40 MW Sewa-II HPS - UNIT 1	NHPC	Excessive leakage in HRT between audit-II and Dam. Expected by Jan-2022.	25-09-2020	00:00	384
6	600 MW RGTPP (Khedar) - UNIT 2	HVPNL	Capital Overhauling. Expected date to be confirmed from HVPNL. Expected by Dec-2021.	02-03-2021	00:00	226
7	210 MW Panipat TPS - UNIT 6	HPGCL	Tariff not approved by HERC	23-07-2020	13:33	447

S.No	Station	Owner	Reason(s)	Outage Date & Time		Outage duration(in days)
8	165 MW Dehar HPS - UNIT 4	BBMB	Penstock Inspection. Expected by 15-Oct 2021.	28-10-2020	11:50	351
9	300 MW DCRTTP (Yamuna Nagar) - UNIT 1	HVPNL	Furnace pressure high. Expected by Oct-2021 end.	08-07-2021	17:16	97
10	66 MW Pong HPS - UNIT 4	BBMB	Failure of compressed air system of Breaking. Expected by Oct-2021 end.	28-07-2021	15:00	77
11	660 MW Chhabra SCTPS - UNIT 6	RRVNL	Annual Maintenance for 75 days	03-08-2021	08:57	72
12	500 MW Rihand-II STPS - UNIT 1	NTPC	Over hauling	25-08-2021	22:38	49
13	210 MW Guru Gobind Singh TPS (Ropar) - UNIT 3	PSPCL	Rotor earth fault. Fault rectified now closed on coal shortage since 07.10.2021 14:30 hrs	27-08-2021	20:07	47
14	250 MW Chhabra TPS - UNIT 2	RRVNL	Due to ESP(Electrostatic Precipitator) Structure damage	05-09-2021	23:04	38
15	250 MW Chhabra TPS - UNIT 4	RRVNL	Due to ESP structure damage	09-09-2021	00:47	35
16	250 MW Chhabra TPS - UNIT 3	RRVNL	Due to ESP Structure damage	09-09-2021	03:00	35

Minutes for Meeting with PSTCL

Meeting was conducted between PSTCL and NRLDC on 05.02.2021 through WEBEX to discuss telemetry issues. Participants present during the meeting were:

PSTCL

1. Sh. Kamal , Sr.XEN SCADA SLDC
2. Sh.Manjit Singh , Sr.XEN SLDC
3. Sh.Prince Sharma , AEE T&C
4. Sh.Ankit Bedi , AE SCADA

NRLDC

1. Sh.N.Nallarasan , CGM(I/c)
2. Sh.Somara Lakra , GM (SL-II)
3. Sh.Ankur Gulati , CM (SL-II)

Minutes of the meeting is as below:

S.No.	Issue	Discussion
1.	Non-Integration of Telemetry Data - Out of Total 181 Stations, telemetry of 56 stations is not integrated and data not available at SLDC/RLDC. List of RTUs where telemetry not integrated is given in Annexure-I	-NRLDC requested PSTCL to update the status of RTU integration. -Representative from PSTCL informed that 9 RTU will be commissioned in next month. NRLDC requested to share the list of 9 RTUs NRLDC requested to share the same, PSTCL agreed for the same. -Further , PSTCL informed that 45 RTUs are in final stage of tendering and expected commissioning schedule is by December 2021
2.	Intermittent SCADA data: Data from following stations of PSTCL is highly intermittent causing difficulty in grid operation. PSTCL is requested to please arrange for rectification of telemetry from these stations. Details in Annexure-II	-NRLDC requested PSTCL to take actions to improve the intermittency of data for smooth grid operation. - Representative from PSTCL informed that they are in process of improving intermittency and around 1400 km OPGW is being for PSTCL under Project 1 (a) and project completion schedule is Feb 2021and in Phase-II there is plan for 2000 Km of OPGW. - NRLDC requested PSTCL to expedite the commissioning of OPGW
3.	Non-availability of Digital data: Due to non-availability of proper telemetry from many substations of PSTCL system which has significant impact on successful running of state estimator. Correct telemetry is essential for running State Estimator/ Contingency analysis in EMS, better SE output which will aid in situational awareness of the system operators of NRLDC/PSTCL	-NRLDC requested PSTCL for correction of digital data for smooth operation of grid. -PSTCL informed that they are in process of rectification of digital data and major issue is due to semaphore issue. - NRLDC requested PSTCL to submit timelines for rectification. -PSTCL confirmed that they will submit action plan for rectification within 10 days.

Ankur Gulati
(ANKUR GULATI)
CH. MGR, NRLDC

S. Lakra
(S. LAKRA)
SR. GM, NRLDC

4.	<p>Incorrect Solar Generation data: This is to inform that NRLDC is receiving non-zero Solar data from Punjab during night hours. Data for Month of January 2021 is given in Annexure-III</p>	<p>-NRLDC requested PSTCL to please take suitable actions for reliable telemetry from Solar Generating plants, so that correct data can be captured in reports and SCADA.</p> <p>- PSTCL confirmed that they will take up with solar generators for reliable solar data</p>
5.	<p>Availability of RTU /PMU data through redundant Channel</p>	<p>-NRLDC requested PSTCL please submit the channel details of RTU / PMU data being received at Punjab SLDC.</p> <p>- PSTCL confirmed that they will submit desired details within 10 days.</p>

(Signature)
 CHAIRMAN (S.G.M.)
 CH-MGR. NRLDC

(Signature)
 (S. LATRA)
 (SR GM, NRLDC)

Annexure -I

Sl. No.	User Name	Name of sub-Stations	Voltage level	Target date as per User in Monthly Status Report
1	Punjab	Bangan	220KV	Jun-20
2		Ajitwal	220KV	Jun-20
3		Jadla	220KV	Jun-20
4		Rashiana	220KV	Jun-20
5		Sandhwan	220KV	Jun-20
6		Nur Mahal	220KV	Jun-20
7		Kotkpura-1	132KV	Dec-20
8		Moga-1	132KV	Dec-20
9		Moga-2	132KV	Dec-20
10		Nakodar	132KV	Dec-20
11		Swaddi Kalan	132KV	Dec-20
12		Ekal Gadda	132KV	Dec-20
13		IGC Bathinda	132KV	Dec-20
14		Jandiala Guru	132KV	Dec-20
15		PIMS Jalandhar	132KV	Dec-20
16		Abohar	220KV	Dec-20
17		Badal	220KV	Dec-20
18		Bassi Pathana	220KV	Dec-20
19		Bhawanigarh	220KV	Dec-20
20		Chajli	220KV	Dec-20
21		Devigarh	220KV	Dec-20
22		Dhanaula	220KV	Dec-20
23		Dhandari Kalan-2	220KV	Dec-20
24		Gaunsgarh	220KV	Dec-20
25		Ghulal	220KV	Dec-20
26		Gobindgarh G-4	220KV	Dec-20
27		Hoshiarpur	220KV	Dec-20
28		Ladowal	220KV	Dec-20
29		Majitha	220KV	Dec-20
30		Maur	220KV	Dec-20
31		Mastewal	220KV	Dec-20
32		Chogawan	220KV	Dec-20
33		Sandour	220KV	Dec-20
34		Science City	220KV	Dec-20

Arulati
NRDC

35	Talwandi Sabo	220KV	Dec-20
36	Beas	132KV	Jun-20
37	Faridkot	132KV	Jun-20
38	Gholia Kalan	132KV	Jun-20
39	GT Road Amritsar	132KV	Jun-20
40	Jallalabad	132KV	Jun-20
41	Kotkapura-2	132KV	Jun-20
42	Mamoon	132KV	Jun-20
43	Mana Singh Wala	132KV	Jun-20
44	Nakkian	132KV	Jun-20
45	Pakharpara	132KV	Jun-20
46	Panj Grain	132KV	Jun-20
47	Power Colony Asr	132KV	Jun-20
48	Sakatri Bagh	132KV	Jun-20
49	Samadh Bhai	132KV	Jun-20
50	Seh	132KV	Jun-20
51	Shamashpur	132KV	Jun-20
52	Sihora	132KV	Jun-20
53	Soshan	132KV	Jun-20
54	Tanda	132KV	Jun-20
55	Tangra	132KV	Jun-20
56	Tarn Taran	132KV	Jun-20

Arati
NRDC

% Availability for Nov-20 - Jan 21		
Station Name	Voltage Level	% Availability
BARNALA	220	0
BATALA	132	0
FP NABHA	220	0
GOBINDGARH-1	220	0
KHASSA	220	0
SULTANPUR (PS)	220	0
BAGHAPURANA	220	15
NAWANSHAHR	132	27
MAJRA (PS)	220	28
JOGIN NAGAR	132	36
MOGA	220	40
SADIQ	220	41
VERKA	132	49
BHOGPUR	132	64
MUKTSAR 400kV	400	75
DERABASSI	220	77
BUTARI	220	78
DHURI 400kV	400	80
MUKTSAR 220kV	220	80
GUBAYA	220	81
UBDC-2	132	82
CIVIL LINE AMRITSAR	220	84
GOBINDGARH-2	220	85
SUNAM	220	85
BANGA	132	86
GORAYA	220	88
ALGAON	220	90
RAJLA	220	90
MALOUT	220	90
CHOHAL	132	90
FATEHGARH CHURIAN	220	91
PATTI	220	92
BAJAKHANA	220	92

Prabir
(11.1.2021)

BANUR	220	92
GNDTP	220	94

Annexure-III

Solar Generation during Night Hours for month of January 2021 till date

	Punjab
01-Jan	32
02-Jan	40
03-Jan	35
04-Jan	24
05-Jan	24
06-Jan	20
07-Jan	24
08-Jan	20
09-Jan	30
10-Jan	22
11-Jan	36
12-Jan	11
13-Jan	15
14-Jan	13
15-Jan	24
16-Jan	30
17-Jan	24
18-Jan	32
19-Jan	32
20-Jan	11
21-Jan	14
22-Jan	18
23-Jan	17
24-Jan	17
25-Jan	31
26-Jan	30
27-Jan	26
28-Jan	61
29-Jan	19

*Pulati
ENERGY*

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

Ref:/NRLDC/Telemetry

Date: - 05.10.2021

To,

Director Technical
PSTCL, Patiala

Sub: - Regarding non-availability of data from PSTCL 220 kV Sub-stations (Interface stations)

Sir,

This letter is pertaining to non-availability of data drawal calculation of Punjab based on PSTCL data points and non-availability of data from 220 kV Interface points of PSTCL.

As you may be aware that during TeST Meetings and recent meeting it was decided that it is essential SLDC should also compute drawal based on its station data, so that drawal computed that other end could be verified. The matter of drawal computation was also discussed in CERC where Punjab was also present. During the meeting it was also emphasized that SLDC shall also compute its own drawal value and SLDC shall use its own calculated value of real-time drawal from the grid and compare the same with drawal based on ISTS end values to ensure the correctness and corrective measures shall be taken accordingly. Any variation in the drawal calculation could be identified immediately if other end data is also available.

However, this practice could not be achieved from Punjab due to non-availability of accurate/reliable data from interface stations of PSTCL. It is pertinent to mention that other states are also calculating drawal calculation based on its end value and regularly comparing with ISTS end data. In this regard it is requested to please arrange for sending drawal value through ICCP to NRLDC. Further it can be seen that data from any interface stations from PSTCL is either not available or inaccurate. List of such data points is given in **Annexure-I**.

It may be noted that as per IEGC cl 4.6.2 Reliable and efficient speech and data communication systems shall be provided to facilitate necessary communication and data exchange, and supervision/control of the grid by the RLDC, under normal and abnormal conditions.

Also it is requested to please maintain availability as per clause 12 of Communication Regulations, 2017 "All users of CTU, NLDC, RLDCs, SLDCs, and STUs shall maintain the communication channel availability at 99.9% annually: Provided that with back up communication system, the availability of communication system should be 100%."

Also as per communication regulation, 2017 The State Load Despatch Centres shall be nodal agency for integration of Communication System in the intra-State network, distribution system and generating stations at SLDC end for monitoring, supervision and control of Power System and adequate data availability in real time

Registered Office : B-9, Qutab Institutional Area, Katwaria Sarai, New Delhi -110 016

पंजीकृत कार्यालय : बी-9, कृतब इंस्टीट्यूशनल एरिया, कटवारिया सराय, नई दिल्ली -110 016

Corporate Identification Number : U40105DL2009GOI188682

स्वाहत एव राष्ट्राहत म ऊजा बचाए

Save Energy for Benefit of Self and Nation

In this regard your intervention is required for the improvement of data and may advise the concern officer for rectification of the telemetry at Punjab SLDC/NRLDC.

Your corporation is highly solicited.

Thanking You,

Regards


(N. Nallarasani) 5/10/21

CGM (In charge), NRLDC

1. Member Secretary, NRPC, New Delhi

ICTs Name	220kv side SACADA Point (Punjab end)	Remarks
Jalandhar	220 kV kanjal-Jalandhar-1	ok
	220 kV Kanjal-Jalandhar-2	ok
	220 kV Dasuya-Jalandhar-1	ok
	220 kV Dasuya-Jalandhar-1	ok
	220 kV kartarpur-Jalandhar-1	ok
	220 kV kartarpu-Jalandhar-2	ok
Moga	220 kV Mehalkalan-Moga-1	Data incorrect
	220 kV Mehalkalan-Moga-2	Data incorrect
	220 kV Badhni-Moga	ok
	220 kV Moga-Moga-1	Data incorrect
	220 kV Moga-Moga-2	Data incorrect
	220 kV Moga-Moga-3	Data incorrect
	220 kV Moga-Moga-4	Data incorrect
	220 kV Moga-Ajitwal	Data not available
Ludhiana	220 kV Laltokalan-Ludhiana1	ok
	220 kV Laltokalan-Ludhiana2	ok
	220 kV Laltokalan-Ludhiana3	ok
	220 kV Jagraon-Ludhiana	ok
	220 kV Pahkawal-Ludhiana	ok
	220 kV Doraha-Ludhiana	ok
	220 kV Sahnewal-Ludhiana	Data Suspected
	220 kV Dhandhari-Ludhiana	Data Suspected
Malerkotla	220 kV Malerkotla-Barnala	ok
	220 kV MALrekotla-Amloh	ok
	220 kV Malerkotla-Dhuri1	ok
	220 kV Malerkotla-Dhuri2	ok
	220 kV Malerkotla-Pakhowal	ok
	220 kV Malerkotla-Kolaha	ok
	220/66 ICT1 at Malerkotla	ok
	220/66 ICT2 at Malerkotla	ok
	220/66 ICT3 at Malerkotla	ok
Amritsar	220 kV Verpal-Amritsar-1	Data Suspected
	220 kV Verpal-Amritsar-2	Data Suspected
	220 kV Khasa-Amritsar-1	ok
	220 kV Khasa-Amritsar-2	ok
	220 kV Naraingarh-Amritsar1 &2	Data Not available
Patiala	220 kV Nabha-Patiala-1	ok
	220 kV Nabha-Patiala-2	ok
	220 kV Ablowal-Patiala-1	Incorrect value
	220 kV Ablowal-Patiala-2	Incorrect value
	220 KV Bahadurgarh-Patiala	ok

Sr No	Element Name	Outage Date	Outage Time	Reason
1	400 KV Amritsar(PG)-Makhu(PS) (PSTCL) Ckt-1	09-Sep-21	11:16	R-N fault, Fault current 8.91kA, Dist. 34km from Makhu end. As per PMU, R-N fault and unsuccessful auto-reclosing observed.
		24-Sep-21	19:21	Y-N fault. As per PMU, Y-N fault and unsuccessful auto-reclosing observed.
		25-Sep-21	16:52	Y-N fault. As per PMU, Y-N fault and unsuccessful auto-reclosing observed.
		26-Sep-21	18:33	Y-N fault. As per PMU, Y-N fault and unsuccessful auto-reclosing observed.
2	400 KV Banda-Rewa Road (UP) Ckt-1	12-Sep-21	08:42	R-N fault. As per PMU, R-N fault occurred, no auto-reclosing observed.
		20-Sep-21	12:49	R-N fault. As per PMU, R-N fault occurred, no auto-reclosing observed.
		26-Sep-21	06:57	R-N fault. As per PMU, R-N fault occurred, no auto-reclosing observed.
		30-Sep-21	11:52	DT received, 86 A , 86 B master trip relay operated at Banda end. As per PMU, No fault observed.
3	400 KV Kala Amb(PKTL)-Wangto_GIS(HP) (HPPTCL) Ckt-1	10-Sep-21	02:18	Line tripped alongwith tripping of 400kV Wangto-Sorang line. As per PMU, Y-N fault occurred, no auto-reclosing observed.
		13-Sep-21	12:58	Line tripped during charging of 410 bay at Wangtoo_GIS(HP) S/s. As per PMU, Y-N fault and unsuccessful auto-reclosing observed.
		20-Sep-21	00:10	B-N fault. As per PMU, B-N fault occurred, no auto-reclosing observed.
		28-Sep-21	04:56	Y-N fault. As per PMU, Y-N fault and unsuccessful auto-reclosing observed.
4	400 KV Panki-Aligarh (UP) Ckt-1	11-Sep-21	12:15	B-N fault. As per PMU, Y-N fault occurred, no auto-reclosing observed.
		11-Sep-21	13:22	Y-N fault. As per PMU, Y-N fault occurred, no auto-reclosing observed.
		19-Sep-21	10:47	R-N fault. As per PMU, R-N fault occurred, no auto-reclosing observed.
		19-Sep-21	13:39	R-N fault. As per PMU, R-N fault and unsuccessful auto-reclosing observed.
5	220 KV Debari(RS)-RAPS_A(NP) (RS) Ckt-1	07-Sep-21	12:26	B-N fault, Zone-1, Dist. 10.8km, Fault current 1.56kA from Debari end. As per PMU, No fault observed.
		08-Sep-21	14:08	R-Y fault. As per PMU, No fault observed.
		10-Sep-21	11:08	R-N fault. As per PMU, R-N fault occurred, no auto-reclosing observed.
		10-Sep-21	14:03	R-B fault. As per PMU, R-B fault is observed.
		13-Sep-21	02:14	R-B fault, Zone-1, Dist. 3.79km from RAPP-A end. As per PMU, R-B fault is observed.
		27-Sep-21	12:04	Snapping of earth wire. As per PMU, No fault observed.
6	220 KV RAPS_A(NP)-Sakatpura(RS) (RS) Ckt-2	10-Sep-21	11:35	R-N fault, 34.61km from Sakatpura(RS) end. As per PMU, R-N fault occurred, no auto-reclosing observed.
		13-Sep-21	06:12	R-N fault, Zone-1, Dist. 25.1km, fault current 2.72kA from Sakatpura(RS). As per PMU, R-N fault occurred, no auto-reclosing observed.
		21-Sep-21	11:56	R-N fault, Dist. 2.1km, fault current 5.85kA from Sakatpura(RS). As per PMU, R-N fault occurred, no auto-reclosing observed.
		30-Sep-21	00:22	R-N fault, Zone-1, Dist. 8.5km, Fault current 4.57kA from Sakatpura(RS) and Dist. 25.43km, Fault current 3.6kA from RAPP-A. As per PMU, R-N fault occurred, no auto-reclosing observed.
		30-Sep-21	18:44	R-Y-B fault, Zone-1, Dist. 37.8km, Fault current Ir 4.89kA, Iy 2.97kA, Ib 3.14kA from Sakatpura(RS) end. As per PMU, R-Y-B fault is observed.

Name of Sub-Station

TRIPPING

SL NO	NO. OF BREAKER AND FEEDER	DATE & TIME OF TRIPPING	DATE & TIME OF CLOSING	FLAGS NOTED
				AT THIS END
				RXEG-21 Start MR from main I protection OK MR from main I protection BGA, BCB, BCC CAB, F/L-3% Bus Gen trip, B+, Zone-1, UV Alarm, CIS Start MR from main II protection OK MR from main II protection BGA, BCB, BCC RXEG-21 (Y & B) / 1g-1
③	315 MVA ICT	01/09/2021 11:39	01/09/2021 13:31 Hrs	HV side CB protection trip LV side ICT-3 LV BCU Gmp B trip relay opd ICT-3 LV BCU Gmp A trip relay opd
④	315 MVA ICT-II	01/09/2021 11:39 Hrs	01/09/2021 13:08 Hrs	No flags
⑤	400kV Unstar- Saketa - I Bus	01/09/2021 11:39 Hrs	01/09/2021 13:28 Hrs	CB CB tripper 1/2 fault
⑥	7000 MVA ICT I 400kV side	01/09/2021 11:39 Hrs	01/09/2021 13:45 Hrs	CB CB open Bus Bus trip relay 696

REMARKS

Whether & Load Condition	If any other breaker at This end/other end also Tripped along with Flag	Remedial measures taken to avoid repetition	Fault analysis of Tripping & remark if any
		Done ASD GMP	Bus Bus protection operated
		Done ASD GMP	Bus Bus protection operated
		Done ASD GMP	Bus Bus protection operated
		Done ASD GMP	Bus Bus protection operated

Event no 2

Analysis Report of 500MVA ICT-IV BALLABGARH at 12:14Hrs on
02nd Sep, 2021

Name of Element: 765KV AJMER-PHAGI(JPR)-II

Date & Time of Tripping: 02-09-2021 12:14

Date & Time of Restoration: 02-09-2021 13:58

Details of Fault: ICT-4 tripped due to operation of overflux protection on 220 KV side of ICT-4.

Event no 3

DETAILED ANALYSIS REPORT FOR TRIPPING AT 400 KV GSS AKAL

A. INTRODUCTION

1. Time & Date of Event:- 16:46 HRS dated 02/09/2021

2. Substation affected along with voltage level: - 400 KV GSS AKAL AND CONNECTED 220 KV GSS

3. Brief event summary:- A JUMPER OF 220 KV AKAL- BHU I LINE SNAPPED CAUSING A SERIES OF TRIPPING OF 220 KV LINES AT 400 KV GSS AKAL.

B. ANTECEDENT CONDITION

1. Weather Information: - NORMAL

2. Additional relevant Information: -

C. EVENT DATA

1. Change in Frequency: - NIL

2. Generation Loss: - ABOUT 600 MW

3. Single Line Diagram of affected area:-

4. Name and time of the tripped elements in the time chronology:-

S.No	Name of GSS	Name of Line / Equipment	Trip		Close		Relay indication	
			Date	Time	Date	Time	One end/HV	Other end/LV
1	400 kV GSS Akal	220 kV Akal-Bhu Line-1	02.09.2021	4:46 PM	05.09.2021	3:58 PM	RYB-Ph, Zone-2 (12.54 km)	
2		220 kV Akal-Mada Line	02.09.2021	4:46 PM	02.09.2021	7:32 PM	Y-Ph, Zone-4 (1.146 km)	
3		220 kV Akal-Barmer Line	02.09.2021	4:46 PM	02.09.2021	7:35 PM	Y-Ph, Zone-4	
4		220 kV Akal-Amarsagar Line	02.09.2021	4:46 PM	02.09.2021	7:42 PM	Y-Ph, Zone-4 (1.480 km)	
5		220 kV Akal-Giral Line	02.09.2021	4:46 PM	03.09.2021	6:45 PM	Y-Ph, Zone-4 (1.606 km)	
6		220 kV Bus-coupler	02.09.2021	4:46 PM	02.09.2021	7:30 PM	E/F	
7		220 kV ICT-1	02.09.2021	4:46 PM	02.09.2021	7:21 PM	E/F	Inter-trip

8		220 kV ICT-3	02.09.2021	4:46 PM	02.09.2021	7:40 PM	E/F	Inter-trip
9		220 kV ICT-4	02.09.2021	4:46 PM	02.09.2021	7:16 PM	E/F	Inter-trip

5. Location and type of fault: - . EARTH FAULT NEAR BHU STATION

6. Flag Detail, DR and EL for each affected element:

7. Appropriate Graphical plot.

8. Equipment Failure: - NIL

D. Event Description /Analysis of the event

9. Description:- There was fault on 220 kV AKal-Bhu Line-1 in Zone-2 which was cleared in 360ms meanwhile multiple faults developed on the same bay between Bus & CT and 220 kV Bus Bar is Out of Service due to defective PU resulting tripping of remaining lines & ICTs connected to the same Bus in Zone-4 & E/F respectively.

E. RESTORATION

10. Restoration Time of Tripped elements in time chronology:- mentioned above

11. Special finding/issues identified during restoration: - NIL

F. REMEDIAL ACTION

12. Remedial action taken: -

13. Remedial action to be taken along with the frame: - fault rectified

G. Lesson Learnt-

H. Any other Information: - nil

Event no 4

B B m

From : SSE 220 kv GSS
B3M13 JMP
To : PC B3M13
(A-5).

At 08.56 hrs on dtd. 03/09/21, 220 kv

(A-5) tripped off with indications in

milcom P4U2 :- Started bh. - BN, F. due in SS. wms
Relay trip time :- 0.000 sec.

REL 650 :- Trip, Red bh & yellow bh. trip, zone I, Aided trip
Fault abscond :- -1000 m, Fault loop :- L1-L2
Yard checked & found Red bh. CNT got busted.

With this tripping, simultaneously 220 kv Bus-
Bar prod. op'd. with indications :-

Central Unit :- Bus Bar Prod. Bus-Bar zone I op'd.
check zone op'd, fault bh. B

Due to this following feeders trip :-
indications :-

Feeder	Indication	Restore time
(1) 220 kv JMP - SNG-I (A-2)	Master trip - 96	11.05 hr
(2) 220 kv Bus Coupler - 2 (A-17)	do	11.06 hr
(3) 220 kv Bus Coupler - I (A-7)	do	11.07 hr
(4) 220/66 kv, 100MVA T/F - II (A-14)	do	11.08 hr
(5) do T/F - III (A-15)	do	11.08 hr
(6) 220/132 kv, 100MVA T/F - I (A-8)	do	11.10 hr
(7) 220 kv JMP - GWL - I (A-11)	do	12.48 hr
(8) 220 kv JMP - DND cut - I (A-10)	do	13.41 hr
(9) 220 kv BHK - JMP - I (A-4)	do	Under PTO
(10) 220 kv JMP - JLD - I (A-5)	As per above	Under PTO

This is for your kind information pl.

Copy of the above is forwarded to following for info. please

- (1) SE O&M Circle, B3M13, JMP
- (2) Sr. Xen + M DWR, B3M13, JMP
- (3)

SSE 220 kv GSS Trip

2021/9/13

REDMINOTE 5 PRO 16:51
MIDUAL GAME

Event no 5

Detailed Analysis Report for tripping of 220KV IP-PGT Ckt-2 at 220KV IP Sub-Station on Dated 04.09.2021 at 13:13 Hrs.	
A. Introduction	
1. Time & Date of Event.	04.09.2021 at 13:13 Hrs.
2. Substation(s) Affected along with voltage level	220KV Sub-Station IP
3. Brief Event Summary	220KV IP-PGT Ckt-2 tripped on zone-1
B. Antecedent Conditions	
1. Weather Conditions	clear and sunny
2. Additional relevant information viz. power flow, shutdowns etc.	220 kV Bus Coupler was in closed position.
C. Event Data	
1. Change in Frequency	NIL
2. Generation Loss/Load Loss	NIL
3. Single Line Diagram (SLD) of affected Area: SLD depicting bus scheme/configuration of all the affected stations along with digital open/close status of all CB/Isolator of affected voltage level buses indicating availability of various elements viz. Buses, Lines, ICT, Reactor etc.	separately annexed
4. Name and time of the tripped elements in time chronology: Based upon time	220KV IP-PGT Ckt-2 on Dated 04.09.2021 at 13:13 Hrs
5. Location and type of fault	R-Ph LA Blast on 160MVA Tr-2 at 220KV Pragati S/Stn
6. Flag details, DR and EL for each affected element: To be filled in Format 1	86 & ZONE-1
7. Appropriate graphical plot: Including SCADA data/print out of DR and EL details. It may be separately annexed.	NA
8. Equipment Faliure (If any)	NA
D. Event Description/Analysis of the Event	

1. Description: Detailed description including the reference of DR/EL and explanation based on <i>pt. C. Event data</i>	
E. Restoration	
1. Restoration time of tripped elements in time chronology.	220KV IP-PGT Ckt-2 on Dated 04.09.2021 at 16:30 Hrs
Special finding/issues identified during restoration	
F. Remedial Action	
1. Remedial Action Taken	NA
2. Remedial Action to be taken along with time frame.	NA
G. Lesson Learnt	NA
H. Any Other Information	NA

Event no 6

Constituent FIR Report

First Information Report Upon Tripping of Line/ Bus/ ICT		
1	Event	220 KV Wagoora(PG)-Ziankote(JK) (PDD JK) Ckt-1
2	Document Type	Sending End FIR
3	Control Area	J & K
4	Station	Wagoora(PG)
5	Utility/Agency	CPCC2
6	Date & Time of Tripping	05-Sep-2021 14:23

Antecedent Conditions

7	i	Whether any other line/equipment was under shutdown	NO
	ii	Weather Conditions	
	iii	Other Information	

Details of tripping

8	Type of fault	Phase to Earth
9	Equipment failure	nil
10	Fault clearing time	30
11	In case of single phase fault whether A/R Operated or Not	not
12	Elements which got tripped/ de-energized	NO

13	Reason for Tripping	Line tripped on B-N fault.
14	Load loss (MW)	0.00
15	Generation loss (MW)	0.00
16	Energy Unserved	0.00
17	SPS/ (df/dt) Operations (if any)	
18	Any other information	
19	Restoration Date & Time	05-Sep-2021 17:15

Relay/PLCC/LA Operation details

Control Panel Annunciation	Main-I Relay indications	Main-II Relay indications	Other Relay indications	PLCC counter		Value of fault current	L A Counter
				I/T	D/T		
Line tripped on B-N fault.	Line tripped on B-N fault, FLR Wagoorra : 23.12 Km 4.85 kA	Line tripped on B-N fault, FLR Wagoorra : 23.12 Km 4.85 kA					

Event no 7

REPORTING PROCEDURE TO NRPC IN LINE WITH IEGC-2010 CLAUSE 5.9.6								Doc No. : TS/SS/F/0211 Issue No. : 03 Page : 01 of 01 Page Rev No.: 0 Date : 1 ST JAN.2018				
DATE & TIME OF EVENT		LOCATION	PLANT AND/OR EQUIPMENT DIRECTLY INVOLVED	DESCRIPTION AND CAUSE OF EVENT	ANTECEDENT CONDITION OF LOAD AND GENERATION INCLUDING FREQUENCY, VOLTAGE AND THE FLOWS IN AFFECTED AREA AT THE TIME OF TRIPPING INCLUDING THE WEATHER CONDITION PRIOR TO THE EVENT	DURATION OF INTERRUPTION AND DEMAND AND/OR GENERATION (IN MW & MWH) INTERRUPTED	ALL RELEVANT SYSTEM DATA INCLUDING COPIES OF RECORDS OF ALL RECORDING INSTRUMENT INCLUDING DISTURBANCE RECORDER, EVENT LOGGER, DAS ETC.	SEQUENCE OF TRIPPINGS WITH TIME	DETAILS OF RELAY FLAGS	REMEDIAL MEASURE	Restoration	
1	2	3	4	5	6	7	8	9	10	Date	Time	
06.09.2021	02:39:00	400 KV SUB STATION BBMB PANIPAT	220 KV PNP NARELA CKT I	AT 02:39 HRS 220 KV PNP THERMAL CKT III TRIPPED WITH 220 KV BUS I DUE TO FIRE/BURST OF R PHASE CT OF 220 KV PNP THERMAL CKT. III.ALL THE FEEDER CONNECTED TO BUS I TRIPPED.AFTER ISOLATING 220 KV PNP THERMAL CKT. III BUS I AND ALL FEEDER OF BUS I CHARGED ONE BY ONE.	Load : 35MW Weather : Clear	02:14:00	Attached	AT 02:39 HRS 220 KV PNP THERMAL CKT III TRIPPED WITH 220 KV BUS I DUE TO FIRE/BURST OF R PHASE CT OF 220 KV PNP THERMAL CKT. III.ALL THE FEEDER CONNECTED TO BUS I TRIPPED.AFTER ISOLATING 220 KV PNP THERMAL CKT. III BUS I AND ALL FEEDER OF BUS I CHARGED ONE BY ONE.	Control Panel Annunciation:- TRIP RELAY OPTD. A-15,A-18,A-21,BUS BAR Z-1 OPERATED,TRIP RELAY OPTD.A-1,A3,A6,A7,PU RELAY OPTD.A-1,A3,A6,A7,TRIP RELAY OPTD. A-16,A8,A9,A13,PU RELAY OPTD. A-8,A-9,A-13,A-16,TRIP RELAY OPTD. A17,A19,A20,A22,PU RELAY OPTD. A17,A19,A20,A22,TRIP RELAY OPTD. A2,A4,A5,PU RELAY OPTD. A2,A4,A5,LBB OPTD. C.B A17,A19,A20,A22,PU RELAY OPTD. A15,A18,A21,LBB OPTD. C.B A15,A18,A21,BOTH ISOLATOR CLOSED,LBB OPTD. C.B A8,A9,A13,A16,BOTH ISOLATOR CLOSED. Main-I Relay indications: CU RELAY:- ACTIVE GROUP 1,STARTED PHASE A,87 BB TRIP,FAULT ALARM NO,SYSTEM FREQ. 50HZ,FAULD DURATION 3.00ms,IACZ diff. 26.34 KA,IBCZ DIFF. 217.1 A,ICZ DIFF. 626.7 A,INCZ DIFF. 25.61 KA,IACZ BIAS 26.34 KA,IBCZ BIAS 3.885 KA,ICZ BIAS 4.113KA,INCZ BIAS 25.61 KA,FAULT IN ZONE 1,TRIP ZONE 1. Main-II Relay indications: BUS BAR RELAY 1396,1396.1396,1396.1396. PU RELAY:- ACTIVE GROUP 1,TRIP PHASE ABC,87 BB TRIP,RTT 203.0ms,la MAG. 410.2A,lb MAG. 133.6A,lc MAG. 311.7 A,ln MAG. 860.2A,TRIP ZONE 10000000.	-	06.09.2021	04:53:00

Event no 8

ELECTRICITY TEST AND COMMISSIONING DIVISION - Gr.Noida										
FAULT ANALYSIS STATEMENT OF PROTECTIVE GEARS FOR THE MONTH OF Sept-2021										
SI NO.	Tripping Date/Time	Closing Date/Time	Name of Substation	C.B.No. with Direction (Code)	Type of Relay Scheme	Flags & Indications Observed	F/L, D/R, S/R, A/R, C/I etc.	Analysis with discrepancy in flags if any	Load	
1	06.09.2021 16:39:24	06.09.2021 Shutdown	400KV Gr.Noida	T-87 220KV Gr.Noida- Noida sec20 ckt-2	CSC-101 CSC-211	CP-Dist prot optd,A/R,CS,B/B optd RP-Z-1 trip,Ph R,A/R, X=0.0786 ohm,R=0.0938 ohm, 21- XR,96	0.38KM	220kV Noida sec-20 ckt-2 relay attempted A/R on R Phase fault from 400kV Gr.Noida end.As soon as breaker reclosed,same phase fault current persist resulting into R-phase LA blast of the same line.At the same time bus fault due to 220kV Noida Sec-20 ckt-2 line,R-phase line isolator damage(arm broken) and R-phase Bus-A isolator damage at Gr.Noida end resulted into 200kV busbar operation in Zone-1 thus tripping the respective elements of 220kV bus-A.	214A	
	06.09.2021 16:39hrs	06.09.2021 Shutdown	220kV Noida	T-81 220KV Noida- Gr.Noida ckt- 2	REL-670	CP-Dist prot optd,CS RP-Z-1 trip,Ph-R	19.83KM			
2	06.09.2021 16:39:25		400KV Gr.Noida	220kV Busbar	SEL-487	CP-BB Z-1 optd Z-1 trip,87 (diff)	RP-			
	06.09.2021 16:39hrs	06.09.2021 17:44hrs		T-81 220KV Gr.Noida-RC Green ckt-3	P444 P-14D	CP-busbar prot optd RP-96				206A
	06.09.2021 16:39hrs	06.09.2021 17:14hrs		T-82 220KV Gr.Noida- Noida sec129	P444 P-14D	CP-busbar prot optd RP-96				425A
	06.09.2021 16:39hrs	06.09.2021 17:12hrs		T-86 220KV Gr.Noida- Noida Sec20 ckt-1	CSC-101 CSC-211	CP-busbar prot optd RP-96			214A	
	06.09.2021 16:39hrs	06.09.2021 17:10hrs		T-881 400/220KV 315MVA ICT- 01	P-14D	CP(LV):-busbar ptot optd RP(LV):-96			366A	

06.09.2021 16:39hrs	06.09.2021 17:11hrs	T-885 400/220KV 500MVA ICT- 03	P-14D	CP(LV):-busbar ptot optd RP(LV):-96		546A
06.09.2021 16:39hrs	06.09.2021 17:11hrs	T-85 220kV Gr.Noida- Bus coupler		CP-busbar prot optd RP-96		140A
06.09.2021 16:39hrs	07.09.2021 01:58hrs	T-986/886 400/220KV 500MVA ICT- 04	CSC-211	CP(HV):-PRD trip RP(HV):-30E,86A,86B CP(LV):-Nil RP(LV):-86	ICT-04 tripped along with 220KV bus fault on PRD,charged succesfully after teting.	330A

Event no 9

JAYPEE VISHNUPRAYAG HYDRO-ELECTRIC PLANT (4X100MW)

(A Division of Jaiprakash Power Ventures Limited)

Trippings/ Shut-down Details (Feeders & Units)

Report for the week ending 07.09.2021

Sl. No.	Name of Feeder/ Unit	Date & Time of Tripping/ Shutdown	Date & Time of Normalisation	Outage Duration Hrs:Mts	Details of Alarm/Trip	Fault/Shut down analysis by Operation wing	Analysis by Protection wing
1	400 kV VP - MZN Line	<u>07.09.2021</u> 01:50 Hrs	<u>07.09.2021</u> 03:02 Hrs	01 Hrs 12 Mts	<p>VP end: CP: Main 1/2 prot. operated, A/R lockout RP: Main-1: B, N, Z1 (Dist.- 30.6 KM) Main-1 trip, Main-2 trip, M1 carrier send, A/R Lockout, ZM1 trip Main-2: U, R, Y, B Z1 (Dist. - 61.46 KM) 186R2, 186Y2, 186B2, 286R2, 286Y2, 286B2 CH-1 Tx, CH-2 Tx Fault Current:- R- 1800 A, Y- 645 A, B- 3228 A, I₄- 4554 A MZN end: CP: Main- 1 prot. optd., Main- 2 prot. optd., Main 1/2 Carrier Rx. RP: Main-1: Inst C, A-N trip, (Distance- 276.34 Km) Fault Current:- IA - 1.825 kA, IC - 2.229 kA Main-2: A- Ph trip, C- Ph trip, Zone-2 A,B,C ground (Dist.- 270.7 Km) 21-2XR, 21-2XY, 21-2XB, 21-1XB, 30L, 30M, 30N, 30P Fault Current:- I_A- 1.118kA, I_C- 2.184 kA</p>	<p>400 kV VP-MZN tripped on B – N fault (Dist- 30.6 Km) & 400 kV VP-ALK line tripped & auto reclosed on R–N fault (Dist- 40.39 Km) at 01:50 Hrs respectively on 07.09.2021 , Simultaneously running Units 1, 2, 3 & 4 tripped on QSD on Electrical over speed. After receiving line charging codes from SLDC LKO, 400 kV VP -MZN line was charged from MZN end at 03:01 Hrs and CB at VP end was closed at 03:02 Hrs on 07.09.2021</p> <p>Unit 1, 2, 3 & 4 were synchronised with grid at 04:10, 03:33, 04:39 & 04:30 Hrs respectively on 07.09.2021.</p> <p>After receiving line charging codes from SLDC LKO, 400 kV VP -ALK line was charged from ALK end at 07:07 Hrs and CB at VP end was closed at 07:08 Hrs on 07.09.2021</p>	<p>400 kV VP-MZN tripped on B – N fault (Dist- 30.6 Km) & 400 kV VP-ALK line tripped & auto reclosed on R–N fault (Dist- 40.39 Km) at 01:50 Hrs respectively on 07.09.2021 , Simultaneously running Units 1, 2, 3 & 4 tripped on QSD on Electrical over speed. After receiving line charging codes from SLDC LKO, 400 kV VP -MZN line was charged from MZN end at 03:01 Hrs and CB at VP end was closed at 03:02 Hrs on 07.09.2021</p> <p>Unit 1, 2, 3 & 4 were synchronised with grid at 04:10, 03:33, 04:39 & 04:30 Hrs respectively on 07.09.2021.</p> <p>After receiving line charging codes from SLDC LKO, 400 kV VP -ALK line was charged from ALK end at 07:07 Hrs and CB at VP end was closed at 07:08 Hrs on 07.09.2021</p>
	Unit - 1	<u>07.09.2021</u> 01:50 Hrs	<u>07.09.2021</u> 04:10 Hrs	02 Hrs 20 Mts	QSD on Electrical overspeed		
	Unit - 2	<u>07.09.2021</u> 01:50 Hrs	<u>07.09.2021</u> 03:33 Hrs	01 Hrs 43 Mts	QSD on Electrical overspeed		
	Unit - 3	<u>07.09.2021</u> 01:50 Hrs	<u>07.09.2021</u> 04:39 Hrs	02 Hrs 49 Mts	QSD on Electrical overspeed		
	Unit - 4	<u>07.09.2021</u> 01:50 Hrs	<u>07.09.2021</u> 04:30 Hrs	02 Hrs 40 Mts	QSD on Electrical overspeed		

Event no 10

Detailed Analysis Report	
A. Introduction:	
1. Time and Date of Event	On 07/09/2021 at 12:22 hrs.
2. Substation(s) Affected along with voltage level	Bairasuil पावर स्टेशन
3. Brief Event summary	The Bairasuil-Pong line tripped on operation of DPR in Z1. Similarly Bairasuil-Jessure Line tripped on operation of DPR in Z1. Due to unavailability of power evacuation path, unit#2 tripped on operation of over speed protection. Unit#3 was tripped on operation of REF protection.
B. Antecedent Conditions:	
1. Weather Information	Rainy
2. Additional relevant information viz. power flow, shutdown etc.	NA
C. Event Data:	
1. Change in Frequency.	N.A.
2. Generation Loss/Load Loss.	100 MW
3. Single Line Diagram (SLD) of affected Area:	NA
4. Name and time of the tripped elements in time chronology:	220 KV Bairasuil-Pong Line#1 at 12:22:00 hrs. on 07-Sep-2021 ,220 KV Bairasuil-Jessure Line#2 at 12:22:00 hrs. on 07-Sep-2021,Unit#2 at 12:22:00 hrs. on 07-Sep-2021,Unit#3 at 12:22 hrs. on 07-Sep-2021
5. Location and type of fault.	Bairasuil-Pong & bairasuil-Jessure line
6.Flag Details, DR and EL for each affected element:	Enclosed.
7. Appropriate Graphical Plot:	N.A.
8. Equipment failure (if any):	NIL.
D. Event Description/ Analysis of the Event	<p>1. 220 KV Bairasuil-Pong Line#1:-From the DR of Distance protection relay of Bairasuil-Pong Line#1 installed at Bairasuil end, it is evident that R-Phase voltage decreased to 25.36 KV & R-phase current increased to 677 Amp . Accordingly distance protection relay sensed the fault in Z1 at 12:22:45.831 Hrs in R-N phase & single phase auto reclose operation initiated in R-Phase. However at 12:22:45.936 Hrs remaining two phase got opened due to initiation of CB retrip command received from LBB/Busbar relay. The R-Phase (faulted phase) current to the tune of more than 200 Amp was persisting for more than 80ms leads to the operation of LBB retrip at 50 ms. Accordingly auto reclose operation was blocked & three phase tripping was occurred from Bairasuil end.</p> <p>2. 220 KV Bairasuil-Jessure Line#2:-From the DR of Distance protection relay of Bairasuil-Jessure Line#2 installed at Bairasuil end, it is evident that R-Phase & Y-Phase voltage were decreased to 27.13 KV & 48.36 KV respectively. Similarly R-phase & Y-Phase current were increased to 764 Amp & 3480 Amp. Accordingly distance protection relay sensed the fault in Z1 at 12:17:12.142 Hrs in R-Y phase & three phase tripping was occurred from Bairasuil end.</p> <p>3.Unit#2:- Due to unavailability of power evacuation path, the running unit#2 tripped on operation of over speed protection.</p> <p>4. Unit#3:-From the DR of GT protection relay of Unit#3 installed at Bairasuil end, it is evident that REF protection got initiated only in Main-2 relay, simultaneously with the faults on Lines and issued trip command to Unit#3. The transformer was thoroughly tested and found in order. It is envisaged that the main-2 relay was not stable during the though fault on both the lines.</p>
E. Restoration	
1. Restoration time of tripped elements in time chronology	220 KV Bairasuil-Pong Line#1 at 13:44:00 hrs. on 07-Sep-2021 220 KV Bairasuil-Jessure Line#2 at 13:46:00 hrs. on 07-Sep-2021 Unit#2 at 13:53:00 hrs. on 07-Sep-2021 Unit#3 at 13:53 hrs. on 07-Sep-2021
2. Special finding/ issues identified during restoration	<p>1. The CB Fail1 timer setting shall be revised to 100 ms from 50 ms.</p> <p>2. GPS time synchronization of all protection relays of Units & lines shall be done.</p>
A. Remedial Action	
1. Remedial Action Taken.	NIL.
2. Remedial Action to be taken along with time frame.	Dec-21
G. Lesson Learnt	
A. Any other Information	NIL.

Event no 11



HIMACHAL PRADESH POWER TRANSMISSION CORPORATION LTD.

(A state Govt. undertaking)

HPPTCL 400/220/66 kV GIS Sub-station, Wangtoo, Kinnaur(HP)

E-mail: wangtoosubstation@hpptcl.in, Contact: 8629020977, 7876279519

TRIPPING REPORT

Sr No	Description	Detail
1	Trip Time& Date	02: 18 Hrs.(10.09.2021)
2	Relay Operated/Alarm	21M1 Relay, Operated at Wangtoo Substation at Bay 412.
3	Fault Parameter	<ul style="list-style-type: none">• Fault Type : Earth Fault• Phases Intricate : Y Phase to N• Fault Current : IY=5.6KA IN=6.9 KA• Distance from Wangtoo End :31.80 KM
4	Action Taken	Line was checked at both the ends for any fault
5	Sequence of Events	Tripping occurred at Bay 412 which resulted in further tripping of tie bay (411) through which power of Wangtoo Kala-Amb ckt-1 (410) is flowing as per temporary arrangement. Fault parameters were checked. Intimation to SLDC & JPL team as well was done. JPL team was asked for patrolling & after taking clearance from the team both the lines were successfully charged after receiving codes from SLDC.
6	Shutdown	Not required
7	Restoration Time& Date	Ckt-2 at 4:03 & ckt-1 at 4:21 Hrs (10.09.2021)

**Shift In-charge
400/220/66 kV GIS Substation
Wangtoo, Kinnaur (HP)**

Event no 12

TRIPPING REPORT AT 'B' TPS SWITCHYARD, UNL OBRA

1.	Feeder Name	:	315MVA, 400/220/33kV ICT-II		
2.	Time and Date of Event	:	Date		Time
			12.09.2021.		22:12Hrs
3.	Location	:	400 kV BTPS OBRA		
4.	Plant and/or equipment directly involved	:	220kV ATPS Obra.		
5.	Antecedent Conditions	:	Running on 400kV BUS-II		
6.	Description and cause of event	:	Over-Current -R, Y Phase operated.		
7.	Demand (MW) interrupted and duration of interruption	:			
8.	All relevant system data including copies of records of all recording instruments including DR, EL, DAS etc.	:			
9.	Sequence of tripping with time	:	Firstly 240 MVA 400/220 KV tripped on Over-current Protection (during tripping load on ICT-III 233MW) and after this 315 MVA 400/220 KV ICT-II Tripped on Also Over-Current (Load Approximately increased upto 515 MW)		
10.	Details of relay flags.	:	400kV, C&R Panel		220kV C&R Panel
			RA Panel	RB Panel	
			Over-Current trip 86 A Trip	86 B Trip	86 A Trip 86 B Trip
11.	Remedial measures	:	SLDC-UP ensure that both ICT Load will limit in permissible limit before tripping repeatedly informed about to reduce the load on ICTS by verbal and by emil-ID		
12.	Estimated time of return to service	:	12.09.2021 23:40Hrs		
13.	Any other relevant information	:			

AE, EMD-I
BTPS OBRA

EE, EMD-I
BTPS OBRA

SE-III
BTPS OBRA

Event no 14



HIMACHAL PRADESH POWER TRANSMISSION CORPORATION LTD.

(A state Govt. undertaking)

HPPTCL 400/220/66 kV GIS Sub-station, Wangtoo, Kinnaur (HP)

E-mail: wangtoosubstation@hpptcl.in, Contact: 8629020977, 7876279519

TRIPPING REPORT

Sr No	Description	Detail
1	Trip Time& Date	12:58 Hrs (13.09.2021)
2	Relay Operated/Alarm	Earth Fault
3	Fault Parameter	Substation Fault (Wangtoo – Kala Amb) <ul style="list-style-type: none">• Fault Type : Earth Fault• Phases Intricated : Y Phase• Fault Current : 24 kA
4	Action Taken	Fault parameters were checked in Relay at Wangtoo Substation, Y phase earth fault observed which was further followed by SF6 gas analysis of connected bays at 410 and 411
5	Sequence of Events	After receiving charging clearance from M/S GE for replaced CB at Bay 410, charging process was followed as per SOPs of substation events. Following operations were carried out: <ol style="list-style-type: none">1) <u>Earth switch 410 – ESB was opened</u>2) <u>Earth switch 410 – ESA was opened</u>3) <u>Isolator (410 – 89 A) was closed</u>4) <u>Isolator (410 – 89 B) was closed (Just after closing the isolator fault occurred which operated CB of Tie Breaker (Bay 411) and remote end CB at Kala Amb Substation.</u>5) <u>This created the suspicion of persistent fault in Isolator section of 410 – 89 B</u>6) <u>Following the above events SF6 gas analysis was done and high amount of SO2 was found in isolator compartment of Bay 410 (410-89B)</u>7) <u>Analyzing the above results line charging is not possible from substation bus.</u>



HIMACHAL PRADESH POWER TRANSMISSION CORPORATION
LTD.
(A state Govt. undertaking)

HPPTCL 400/220/66 kV GIS Sub-station,
Wangtoo, Kinnaur (HP)

E-mail: wangtoosubstation@hpptcl.in, Contact: 8629020977, 7876279519

6	Shutdown	<u>Shutdown on Wangtoo – Kala Amb Ckt is required for fault rectification.</u>
7	Restoration Time& Date	Line not charged yet

Shift In-charge
400/220/66 kV GIS Substation
Wangtoo, Kinnaur (HP)

Event no 15

<p>HIMACHAL PRADESH STATE ELECTRICITY BOARD LIMITED (A State Government undertaking) Registered Office: Vidyut Bhawan, Kumar House, Shimla-171004 (HP) Number (CIN) U40109HP2009 SGC031255 GST No. HPSEBL 02 AACCH4894EHZB Telephone Number 0177-2803600, 2801675 (Office), 2658984 (Fax) Website address www.hpseb.com E-Mail cmd@hpseb.in & directorfa@hpseb.in</p>

No. HPSEBL Dated:11.07.2021

TRIPPING REPORT

Circuit Name: 220 kV khodri ckt 1&2

Sr. No.	Description	Detail
1	Trip Time & Date	220 kv khodri ckt 1 at (13:09) Hrs. (13.09.2021) from both khodri end & Giri End
2	Relay Operated/Alarm	P40 Relay,86A,86B, REF relay615 operated at Giri end
3	Fault Parameter	Distance prot. Operated R phase EARTH FUALT with Unbalancing current R=252.5A,Y=7.967A,B=7.424A from Giri end
4	Action Taken	<ul style="list-style-type: none">• CB tripped From both khodri end & Giri End circuit 1, Khodri circuit 2 breaker was not triped at Giri End.•
5	Shutdown	Nil
6	Restoration Time	220kv Khodri ckt (1) at 15:21 Hrs. (13.09.2021) from Giri End & 19:09Hrs khodri circuit 1 line Energized from khodri End. 220kv khodri ckt (2) at 15:15 Hrs. (13.09.2021) from khodri end
7	Generation /Load Loss	Khodri circuit 1&2=94 MVA , Machine=50 MVA Total=144 MVA <ul style="list-style-type: none">• 132 KV GONDPUR= 46MVA• 132 KV KALAMB= 46MVA

		<ul style="list-style-type: none">•• TRANSFORMER NO 2(25/31.5MVA)= 18MVA• VISCO=2 MVA
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Assistant Engineer
220/132 KV S/Stn mtc S/Division
HPSEBL Giri Nagar

Email: ae220kvhpsebl@gmail.com

Event no 16

Analysis Report of 765KV FATEHGARH_2-BHADLA_2 Ckt-I at 13:06Hrs on 13th Sep, 2021

Name of Element: 765KV FATEHGARH_2-BHADLA_2 Ckt-I

Date & Time of Tripping: 13-09-2021 13:06

Date & Time of Restoration: 13-09-2021 13:23

Details of Fault: Tripped on over-Voltage stage-1 Protection operated at Bhadla-II end and DT received at Fatehgarh-II (PG) end. This line was tripped during charging of 765KV Ajmer Bhadla--2 ckt-1 .Ajmer-800KV,Bhadla-2-782kV

Event no 17

<p>HIMACHAL PRADESH STATE ELECTRICITY BOARD LIMITED (A State Government undertaking) Registered Office: Vidyut Bhawan, Kumar House, Shimla-171004 (HP) Number (CIN) U40109HP2009 SGC031255 GST No. HPSEBL 02 AACCH4894EHZB Telephone Number 0177-2803600, 2801675 (Office), 2658984 (Fax) Website address www.hpseb.com E-Mail cmd@hpseb.in & directorfa@hpseb.in</p>

No. HPSEBL Dated:14.09.2021

TRIPPING REPORT

Circuit Name: 220 kV khodri ckt II

Sr. No.	Description	Detail
1	Trip Time & Date	220 kv khodri ckt 1 at (19:55) Hrs. (14.09.2021) Tripped from khodri end .
2	Relay Operated/Alarm	No Relay operate at Giri End
3	Fault Parameter	No fault occur at Giri end
4	Action Taken	<ul style="list-style-type: none">• CB tripped From khodri end. Khodri circuit 1 breaker was not tripped at Giri End.•
5	Shutdown	Nil
6	Restoration Time	220kv Khodri ckt (1) at 21:40 Hrs. (14.09.2021) from khodri End & 19:09Hrs khodri circuit 1 line Energized from khodri End.
7	Generation /Load Loss	<ul style="list-style-type: none">• Nil(khodri circuit II was energies due to which there was no load loss.)

Assistant Engineer
220/132 KV S/Stn mtc S/Division
HPSEBL Giri Nagar

Email: ae220kvhpsebl@gmail.com

Event no 19

Detailed Report on tripping of 800 kV HVDC Champa Kurukshetra Pole-1 & Pole-2 at 10:10 Hrs. on 21.09.2021.

A. Introduction

1. **Time & Date of Event:** 10:10 Hrs. on 21.09.2021
2. **Substation Name:** HVDC Kurukshetra
3. **Antecedent Condition:** Pole-1 and Pole-2 in Normal Mode at 237.5 MW each
Pole-2 and Pole-4 in Normal Mode at 237.5 MW each
Weather: Clear
Grid Frequency: 50 Hz

B. Name of the tripped elements & time of tripped elements:

- a) 800kV HVDC Champa Kurukshetra Pole-1 tripped at 10:10 Hrs.
- b) 800kV HVDC Champa Kurukshetra Pole-2 tripped at 10:10 Hrs.

C Event data :

1. Change in Frequency: Nil
2. Generation Loss/Load Loss: 0 MW
3. Single Line Diagram (SLD) of affected Area: NA
4. Flag Details, DR and EL for each affected element: Attached in DR and EL Section
5. Appropriate Graphical Plot: N/A
6. Equipment failure (if any): N/A

Sl. No.	Name of the Element (along with voltage level)	Details to be filled in case of Equipment failure					Reason
		Element type	Rating	Make	Year of Manufacturing	Year of Commissioning	
1	NA	NIL					

D. Event Description / Analysis of the Event :

At 10:10 Hrs. dt. 21.09.2021, Pole-1 & Pole-2 tripped from other end. CAT-A2 protection received in both Poles from Champa. At Champa end, Filter Power Limit Protection operated. Pole-3 & Pole-4 compensated total power of Pole-1 & Pole-2.

- E. **Restoration time:** Pole-1 : 10:43 Hrs. dt 21.09.2021
Pole-2 : 10:58 Hrs. dt 21.09.2021

F. Special finding/ issues identified during restoration: Nil

G. Remedial Action:

S. No.	Name of the Element (along with voltage level)	Corrective Action Implemented		Corrective Action Recommended		Time frame for pending Recommendation		Remarks
		End A	End B	End A	End B	End A	End B	
1	NA	NIL	-	-	-	-	-	

J. Any other Information: Nil.

Event no 20



HIMACHAL PRADESH POWER TRANSMISSION CORPORATION LTD.

(A state Govt. undertaking)

HPPTCL 33/220KV, 100MVA GIS sub-station Phojal, Kullu-175129

E-mail: dmphojal@hpptcl.in, phojalsubstation@hpptcl.in

TRIPPING REPORT

Circuit Name: Bay No 201 Phojal-ADHPL ckt 2A Transmission Line

Sr. No.	Description	Detail
1	Trip Time& Date	15:15 Hrs (25.09.2021)
2	Relay Operated/Alarm	REL 670 Relay
3	Fault Parameter	L2 - E (Line & Earth fault)
4	Action Taken	Fault was in Ckt 2B Phojal to Nalagarh(Bay no 205) section and ckt 2A Phojal - ADHPL (Bay no 201) was Healthy and tripped due to the fault in Bay no 205. So try taken on Bay no 201 and line charged.
5	Shutdown	Nil
6	Restoration Time	16:32hrs
7	Generation /Load Loss	14MW (Kanchanjunga HEP)



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TRIPPING REPORT

Circuit Name: HPSEBL 33 kV Phojal-Kullu Transmission Line

Sr. No.	Description	Detail
1	Trip Time& Date	13:15 Hrs. (19.07.2021)
2	Relay Operated/Alarm	REC 670 Relay
3	Fault Parameter	L3 - E (Line & Earth Fault)
4	Action Taken	Shutdown availed by HPSEBL at 13:29 Hrs for line maintenance
5	Shutdown	Line Shutdown availed for maintenance
6	Restoration Time	Not hold
7	Generation /Load Loss	



HIMACHAL PRADESH POWER TRANSMISSION CORPORATION LTD.

(A state Govt. undertaking)

HPPTCL 33/220KV, 100MVA GIS sub-station Phojal, Kullu-175129

E-mail: dmphojal@hpptcl.in, phojalsubstation@hpptcl.in

TRIPPING REPORT

Circuit Name: Kanchanjuanga HEP 33 kV Phojal-Badagran Transmission Line

Sr. No.	Description	Detail
1	Trip Time& Date	13:11 Hrs. (19.07.2021)
2	Relay Operated/Alarm	REC 670 Relay
3	Fault Parameter	L2 - E (Line & Earth Fault)
4	Action Taken	try given at 13:21 Hrs but line does not hold. (Shutdown availed by IPP at 14:10 Hrs for line maintenance)
5	Shutdown	Line Shutdown availed for maintenance
6	Restoration Time	Not hold
7	Generation /Load Loss	

Event no 21

Preliminary Trip Analysis Report (765/400kV Ballia Substation)

Date & Time of tripping	28.09.2021 @07:20:49 Hrs		
Tripped Element	1) 400kV Bus bar-II 2) 400kV Ballia Mau-I 3) 765/400kV ICT-I 4) 400kV Ballia Patna-I line 5) 400kV Ballia Biharsarif-II Line		
1. Triggering Incident:	B phase to earth fault in Bus bar Zone-2.		
2. Flag Details, DR/EL	Attached		
3. Event Description	As per below:		
Tripping Details			
Tripped Elements	Time of tripping	Restoration Time	Remarks
400kV Bus bar-II	07:20:49:560	11:59:00	B phase to earth fault in Bus bar Zone-2
400kV Ballia Mau-I	07:20:49:560	09:11:00	Main CB tripped due to 400kV Busbar-2 Operation. Subsequently Tie bay CB tripped on Over voltage stage 2 operation.
765/400kV ICT-I	07:20:49:712	14:19:00	Main bay 421 tripped on 400kV Busbar-2 operation and Tie bay CB tripped on during 400kV Ballia Biharsarif-II-line tripping. ICT-I remained charged from 765kV End.
400kV Ballia Patna-I line,	07:20:49:640	08:37:00	During 400kV Busbar-2 Operation Line successfully auto-reclosed from Ballia end through Tie bay CB on B-N fault and tripped from Remote end.
400kV Ballia - Biharsarif-II Line	07:20:49:673	11:59:00	Overvoltage stage 2 in Y-Ph. DT was sent to Remote end.

Event no 22

ELECTRICITY TEST & COMMISSIONING CIRCLE, AGRA

DIV-T&C AGRA

FAULT ANALYSIS STATEMENT OF PROTECTIVE GEARS 400 KV FOR THE M/O -SEP 2021

S/DIV-400KV S/S T&C AGRA

Sno	TRIPPING	CLOSING	CB NO	COUNTER		TYPE OF RLY	OUR / OTHER END FLG	F/L D/R S/R A/R	TRIP VALUES		F/T ANALYSIS
	DT/TIME	DT/TIME	DIR	OUR	OTHER				KV	AMP	
1	30.09.21 05:45	30.09.21 07:01	T-96 AGRA- UNNAO-4	TX=00 RX=00 TX=00 RX=00 TX=00 RX=00 TX=01 RX=00	TX=00 RX=00 TX=00 RX=00 TX=00 RX=00 TX=00 RX=01	CGL ZLV & REL 670	CP: MII-DPT, MII-C/S, RP:-MI:- NIL. M2:-GT, Z1 TRIP, B PH TRIP, ZCOM C/S, ST A/R, L3-N, MII-C/S, 86C2, CBPD.	M2:F/D=275.00 KM F/R=100 %	R=231.59 Y=232.18 B=206.99 N=12.08	R=471.20 Y=125.88 B=1438.64 N=907.40	CBPD
			T-98 UNNAO- AGRA-4		MICOM & SIPROTEC	LINE NORMAL AT UNNAO END					

S.No.	Region	Name of Elements (Tripped/Manually opened)	Affected Area	Owner/ Agency	Outage		Event (As reported)	Generation Loss(MW)	Load Loss(MW)	Category as per CEA Grid Standards	Energy Unsaved (in MWh)	Preliminary Report receipt status			DR/EL receipt status			Detailed Report receipt status		Fault Clearance time (in ms)		
					Date	Time						within 24Hours	after 24Hours	Not Received	within 24Hours	after 24Hours	Not Received	Received	Not Received			
16	HR	1) 765 KV Bhadla_2_Falagarh_III (PG) Ck-1	Rajasthan	POWERGRID	13-Sep-21	13:06	240MVA bus reactor at 400KV Bhadla(PG) was opened, during antecedent condition 765KV bus voltage at Bhadla_2 & Falagarh_2 was in the range of 775-777kV. After further 30seconds, 765KV Bhadla_2_Amer ckt-1 was changed from Bhadla_2 end only, resulted into sudden short-circuit voltage at Bhadla_2(PG). Due to over voltage, 765 KV Bhadla_2_Falagarh_2 (PG) Ck-1 tripped on over voltage stage-1 operation at Bhadla_2(PG) end & DT received at Falagarh_2(PG) end. At the same time, 220/33KV Transformer:182 at Renew.Barkhad Three Solar & Renew Surmawa Solar (connected at Falagarh_2) tripped on over voltage protection operation at 33kV end resulted into loss of 500MW solar generation. Voltage at 220kV & 765KV Bus at Falagarh_2 were in permissible range 220kV @ 788kV respectively. As per PMU, no fault is observed and voltage shoot up of approx. 45kV (777kV to 824kV approx.) is observed at Bhadla_2 end. As per SCADA, solar generation loss of approx. 500MW is observed. Approx. at 14:45hrs, 220/33KV Transformer:182 at Renew.Barkhad Three Solar & Renew Surmawa Solar (connected at Falagarh_2) tripped on over voltage protection operation at 33kV end resulted into loss of 700MW solar generation. As per PMU, no fault is observed and voltage shoot up is observed. As per SCADA, 765KV Bhadla_2_Amer ckt-1 was changed from Bhadla_2 end before tripping of transformer at Solar plants. Changing of 765KV Bhadla_2_Amer ckt-1 might have led to shoot up of voltage. As per SCADA, solar generation loss of approx. 700MW is observed.	500	0	GD-1	0.12	Y(PG)		Y(PG)								NA
17	NR	1) 220 KV Khodir(LJK) Majri(YHP) (LJK) Ck-1 2) 220 KV Sarawan(LPJ) Khodir(LK) (LJP) Ck-1 3) 220 KV Saharanpur(LPJ) Khodir(LK) (LJP) Ck-1	UTTARAHAND	PTCLUL UPPCL	14-Sep-21	18:55	220 KV Khodir(LJK) Majri(YHP) (LJK) Ck-1, 220 KV Sarawan(LPJ) Khodir(LK) (LJP) Ck-1, 220 KV Saharanpur(LPJ) Khodir(LK) (LJP) Ck-1, 220/220KV ICT at Khodir and 220KV Khodir-Chibro ckt-1 all tripped on bus bar protection operation at 220KV Khodir S/C. As per PMU, no fault is observed during the event. In antecedent condition, 220 KV Khodir(LJK) Majri(YHP) (LJK) Ck-1, 220 KV Sarawan(LPJ) Khodir(LK) (LJP) Ck-1, 220 KV Saharanpur(LPJ) Khodir(LK) (LJP) Ck-1, 220/220KV ICT at Khodir and 220KV Khodir-Chibro ckt-1 carrying 444MW, 4MW, 6MW, 26MW & 2MW respectively.	0	0	GD-1	0	Y(LPJ)	Y(LK) Y(YHP)				Y(LK)				NA	
18	NR	1) 220 KV Wagora(PG) Pampore(PDG) (PG) Ck-2 2) 220 KV Kishanpur(PG) Mir Bazar(PDG) (PDG) Ck-1 3) 220 KV Wagora(PG) Zankote(PG) (PG) Ck-1 4) 220 KV Wagora(PG) Zankote(PG) (PG) Ck-1 5) 220 KV Wagora(PG) Pampore(PDG) (PG) Ck-1	I & K	POD K	20-Sep-21	14:31	At 14:31 Hrs CB clamp of 220 KV Wagora(PG) Pampore(PDG) (PG) Ck-1 burnt at Pampore end. 220 KV Wagora(PG) Pampore(PDG) (PG) Ck-1 tripped from pampore end during this fault on earth fault protection operation as bus bar protection is not in service at 220KV pampore. As fault still persisted, 220 KV Wagora(PG) Pampore(PDG) (PG) Ck-1 tripped in 2.3 from Wagora end and on overcurrent protection at Pampore end. At the same time, 220KV Wagora-Zankote ckt-182 both tripped from Zankote end only in 2.3 and 220KV Kishanpur-Mirbazar ckt tripped in 2.3 from Kishanpur end. As per PMU, B-N phase to earth fault with delayed clearance in 450ms is observed. As per SCADA, load loss of approx. 400MW is observed. In antecedent condition, 220KV Wagora-Zankote ckt-182, 220 KV Wagora(PG) Pampore(PDG) (PG) Ck-18 and 220KV Kishanpur-Mirbazar ckt were carrying 57MW, 39MW, 21.1MW, 22.1MW & 69MW respectively.	0	550	GD-1	0.20	Y(PG) Y(K)		Y(PG)	Y(K)	Y(PG)	Y(K)				400	
19	HR	1) 800 KV HVDC Kurukshetra(PG) Pole-1 2) 800 KV HVDC Kurukshetra(PG) Pole-2	HARYANA	POWERGRID	21-Sep-21	10:10	800 KV HVDC Kurukshetra(PG) Pole-1 & Pole-2 blocked due to filter control block alarm on filter power limit. As per PMU, no fault is observed. In antecedent condition, 800 KV HVDC Kurukshetra(PG) Pole-1 & Pole-2 carrying 250MW each.	0	0	GD-2	0	Y(PG)		Y(PG)		Y(PG)				NA		
20	NR	1) 220 KV Phozal(HY) Nalagarh(PG) (ADHP) Ck-1 2) 220 KV AD hyd(AD) Phozal(HY) (ADHP) Ck-1	HIMACHAL PRADESH	ADHP	25-Sep-21	15:15	220 KV Phozal(HY) Nalagarh(PG) (ADHP) Ck-1 & 220 KV AD hyd(AD) Phozal(HY) (ADHP) Ck-1 both tripped on B-Y phase to phase fault. Fault distance was 133km(100%)-2.3 & fault current was 1.8kA from Nalagarh(PG) end. As per PMU, B-Y phase to phase fault is observed. As per SCADA, 220 KV AD hyd(AD) Phozal(HY) (ADHP) Ck-1 tripped only from Phozal(HY) end. In antecedent condition, 220 KV Phozal(HY) Nalagarh(PG) (ADHP) Ck-1 & 220 KV AD hyd(AD) Phozal(HY) (ADHP) Ck-1 were carrying 49MW & 26MW respectively.	0	0	GD-1	0	Y(PG)	Y(AD-Phozal) Y(YHP)		Y(PG)	Y(YHP)		Y(PG) Y(YHP)		120		
21	NR	1) 400 KV Balu Patna (PG) Ck-1 2) 400 KV Mau(LPJ) Balu(PG) (PG) Ck-1 3) 400KV Bus 2 at Balu(PG) 4) 400 KV Balu-Biharsharif (PG) Ck-1 5) 765/400 KV 1500 MVA ICT 1 at Balu(PG)	UTTAR PRADESH	POWERGRID	28-Sep-21	07:20	At 7:20 hrs on 28th Sept, 400KV Bus 2 at Balu(PG) tripped on bus bar protection operation on B-N fault. 400 KV Mau(LPJ) Balu(PG) (PG) Ck-1, 400 KV Balu-Biharsharif (PG) Ck-1 and 765/400 KV 1500 MVA ICT 1 at Balu(PG) also tripped during bus bar protection operation. At the same time, 400 KV Balu Patna (PG) Ck-1 tripped from Patna end only. As per PMU, B-N phase to earth fault is observed. As per SCADA, SOC, Main CB (connected at bus 2) & Tie CB of 400KV Balu-Biharsharif ckt-1 tripped which led to tripping of 765/400 KV 1500 MVA ICT 1. Also, in antecedent condition, 400 KV Mau(LPJ) Balu(PG) (PG) Ck-1, 400 KV Balu-Biharsharif (PG) Ck-1, 400 KV Balu Patna (PG) Ck-1 & 400 KV Balu Patna (PG) Ck-1 were carrying 150MW, 72MW, 78MW & 146MW respectively.	0	0	GD-2	0	Y(PG) Y(LPJ)		Y(PG) Y(LPJ)		Y(PG) Y(LPJ)		Y(PG) Y(LPJ)			80	
22	NR	1) 400 KV Agra-Utnao (LJP) Ck-1 2) 400 KV Utnao(LJP) Jhda_Hardoi Road (LJP) (PG) Ck-2	UTTAR PRADESH	UPPCL	30-Sep-21	05:45	400 KV Utnao(LJP) Jhda_Hardoi Road (LJP) Ck-2 tripped on B-N phase to earth fault after unsuccessful A/R operation. At the same time, 400 KV Agra-Utnao (LJP) Ck-1 also tripped from Agra end only on pole discrepancy relay operation during A/R operation. Fault distance was 27km(100%) from Agra end. As per PMU, B-N phase to earth fault with unsuccessful A/R is observed. In antecedent condition, 400 KV Utnao(LJP) Jhda_Hardoi Road (LJP) Ck-2 & 400 KV Agra-Utnao (LJP) Ck-1 were carrying 60MW & 145MW respectively.	0	0	GD-2	0	Y(LPJ)		Y(LPJ)		Y(LPJ)				80		

Northern Regional inter regional lines tripping for September-21

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	500 KV HVDC Mahindergarh(APL)-Adani Mundra(APL) (ATIL) Ckt-1	APL	2-Sep-21	17:47	Nil	HVDC P-1 tripped under 87HV ESOF protection. Flashover in P-1 HV Voltage Divider secondary box at Mahindergarh.	NA	5-Sep-21	10:03	NA	Yes(After 24Hrs)	Yes(After 24Hrs)			From PMU, No AC system fault observed.
2	220 KV Auraiya(NT)-Malanpur(MP) (PG) Ckt-1	POWERGRID	3-Sep-21	05:30	Nil	R-N fault.	NA	3-Sep-21	06:33	NO	Yes	Yes(After 24Hrs)	No auto-reclosing observed.	A/R needs to be checked and corrected.	From PMU, R-N fault is observed in the system and auto-reclosing not observed.
3	800 KV HVDC Agra-Bishwanath Chariali (PG) Pole-2	POWERGRID	16-Sep-21	10:34	Nil	Line tripped due to DC line earth fault. Dist. 125.6km from Agra end.	NA	16-Sep-21	18:53	NA	Yes(After 24Hrs)	Yes(After 24Hrs)			From PMU, No AC system fault observed.
4	800 KV HVDC Kurukshetra(PG) Pole-1	POWERGRID	21-Sep-21	10:10	Nil	Bi-Pole 1 blocked due to Filter control Block Alarm.	GI-2	21-Sep-21	10:51	NA	Yes(After 24Hrs)	Yes			From PMU, No AC system fault observed.
5	800 KV HVDC Kurukshetra(PG) Pole-2	POWERGRID	21-Sep-21	10:10	Nil	Bi-Pole-1 blocked due to Filter control Block Alarm.	GI-2	21-Sep-21	10:58	NA	Yes(After 24Hrs)	Yes			From PMU, No AC system fault observed.
6	220 KV Auraiya(NT)-Malanpur(MP) (PG) Ckt-1	POWERGRID	21-Sep-21	20:46	Nil	Phase to earth fault R-N	NA	21-Sep-21	21:30	NA	Yes(After 24Hrs)	Yes			From PMU, No fault is observed in the system. Mismatch in reported time and actual tripping.
7	800 KV HVDC Agra-Bishwanath Chariali (PG) Ckt-2	POWERGRID	22-Sep-21	10:12	Nil	Tripped due to DC line earth fault. Distance 666.2km from from Agra (Tower no. 2743/A-6)(115/0). Fault in ER-1 jurisdiction.	NA	22-Sep-21	11:18	NA	Yes(After 24Hrs)	Yes(After 24Hrs)			From PMU, No AC system fault observed.
8	220 KV Sahupuri(UP)-Pusauli(BS) (UP) Ckt-1	UPPTCL	25-Sep-21	11:06	Nil	ZONE-1 B-PHASE, DISTANCE = 54.94km & FC = 2.57KA from Sahapuri end	NA	25-Sep-21	12:25	NO	NO	NO		Details of the tripping yet to be received.	From PMU, B-N fault is observed in the system and auto-reclosing not observed.
9	220 KV Auraiya(NT)-Malanpur(MP) (PG) Ckt-1	POWERGRID	27-Sep-21	18:01	Nil	R-N fault.	NA	27-Sep-21	19:59	NO	Yes	Yes	No auto-reclosing observed.	A/R needs to be checked and corrected.	From PMU, R-N fault is observed in the system and auto-reclosing not observed.
10	400 KV Ballia-Patna (PG) Ckt-1	POWERGRID	28-Sep-21	07:20	Nil	Line tripped only from Patna end & charged from Ballia end. (400KV Bus-2 at Ballia tripped at 0720 hrs)	GI-2	28-Sep-21	08:37	NO	Yes	Yes	No auto-reclosing observed at Patna end.	A/R needs to be checked and corrected at Patna end.	From PMU, B-N fault is observed in the system and auto-reclosing not observed.
11	400 KV Ballia-Biharshariff (PG) Ckt-2	POWERGRID	28-Sep-21	07:20	Nil	B-N fault.	GI-2	28-Sep-21	11:59	NO	Yes	Yes			From PMU, B-N fault is observed in the system.
12	400 KV Kankrolli-Zerda (PG) Ckt-1	POWERGRID	30-Sep-21	09:48	Nil	Breaker tripped due to mal-functioning of PDR (pole discrepancy relay) at Kankrolli.	NA	30-Sep-21	12:12	NA	NO	NO		Details of the tripping yet to be received.	From PMU, No fault is observed in the system.
# 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													

Northern Regional inter regional lines tripping for September-21

Annexure-I

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

S. No.	Name of the Generating Station (Capacity in MW)	Date of last PSS tuning / re-tuning performed (in DD/MM/YYYY format)	Date of last Step Response Test performed (in DD/MM/YYYY format)	Report submitted to NRLDC/NRPC (Yes/ No)	Remarks (if any)	Tentative schedule for PSS tuning / re-tuning in FY 2021-22
1	THDC					
	TEHRI HPS(4 * 250)	07/01/2019 to 10/01/2019	07/01/2019 to 10/01/2019	Yes	(Report shared vide email dt.19.01.2019)	
	KOTESHWAR HPS(4 * 100)	17/03/2019 to 19/03/2019	17/03/2019 to 19/03/2019	Yes	(Report shared vide email dt.11.02.2021)	
2	SJVNL					
	NATHPA-JHAKRI HPS(Unit1 #250)	10.03.2020	-	No	Excitation system upgraded in 2020	
	NATHPA-JHAKRI HPS(Unit2 #250)	14.03.2013	-	No	The existing excitation system is very old and obsoleted for which support for PSS tuning is not available from OEM (M/s Voith Hydro), although NJHPS, SJVN has placed work order on 08/12/2015. Further being the critical component, it is not possible to get the PSS tuning done from any other vendor except OEM (M/s Voith Hydro) being the system and software specific job. Therefore, proposal for upgradation of the excitation system of this unit is under process and PSS tuning shall be carried out during upgradation of excitation system.	3rd Quarter
	NATHPA-JHAKRI HPS(Unit3 #250)	03.03.2020	-	No	Excitation system upgraded in 2020	
	NATHPA-JHAKRI HPS(Unit4 #250)	14.03.2013	-	NO	The existing excitation system is very old and obsoleted for which support for PSS tuning is not available from OEM (M/s Voith Hydro), although NJHPS, SJVN has placed work order on 08/12/2015. Further being the critical component, it is not possible to get the PSS tuning done from any other vendor except OEM (M/s Voith Hydro) being the system and software specific job. Therefore, proposal for upgradation of the excitation system of this unit is under process and PSS tuning shall be carried out during upgradation of excitation system.	3rd Quarter
	NATHPA-JHAKRI HPS(Unit5 #250)	14.05.2016	14.05.2016	NO	Excitation system upgraded in 2013	3rd Quarter
	NATHPA-JHAKRI HPS(Unit6 #250)	14.05.2017	14.05.2017	NO	Excitation system upgraded in 2013	3rd Quarter
	RAMPUR HEP(6 * 68.67)	29.11.2014	27.10.2020,10.02.2021 1	YES	PSS tuning was done at the time of commissioning of Excitation System by OEM (M/s BHEL). Since then response of PSS is checked regularly and found satisfactory.	
3	HVPNL					
	PANIPAT TPS(unit1# 250)	29.03.2016	29.03.2016	YES	--	3rd Quarter
	PANIPAT TPS(unit2# 250)	15.01.2018	15.01.2018	YES	--	3rd Quarter
	DCRTPP (YAMUNA NAGAR)(unit1#300)	19-12-2018	19-12-2018	YES	(Report attached)	3rd Quarter
	DCRTPP (YAMUNA NAGAR)(unit1#300)				Will be carried out shortly	
	RGTPP(KHEDAR) (2*600)	5th to 6th July 2013	5th to 6th July 2013	Report attached. Previous record being looked into	No MW capacity addition after 2013 at RGTPP Khedar. No new line addition in vicinity of station	
	JHAJJAR(CLP) (2*660)	20-05-2017	20-05-2017	YES	--	3rd Quarter
4	NTPC					
	Rihand (Unit1#500)	03-03-2017	03-03-2017	YES	Next test will be done during re-commissioning of unit after O/H	3rd Quarter
	Rihand (Unit2#500)	02-07-2016	02-07-2016	YES	Next test will be done during re-commissioning of unit after O/H	3rd Quarter
	Rihand (Unit3#500)	15-08-2015	15-08-2015	YES	Next test will be done during re-commissioning of unit after O/H	3rd Quarter
	Rihand (Unit4#500)	25-05-2017	25-05-2017	YES	Next test will be done during re-commissioning of unit after O/H	3rd Quarter
	Rihand (Unit4#500)	11-12-2014	11-12-2014	YES	Next test will be done during re-commissioning of unit after O/H	3rd Quarter
	Rihand (Unit5#500)	11-12-2014	11-12-2014	YES	Next test will be done during re-commissioning of unit after O/H	3rd Quarter
	SINGRAULI STPS(Unit1#200)	-	-	-	Not done in last three years	
	SINGRAULI STPS(Unit2#200)	-	-	-	Not done in last three years	
	SINGRAULI STPS(Unit3#200)	-	-	-	Not done in last three years	
	SINGRAULI STPS(Unit4#200)	-	-	-	Not done in last three years	
	SINGRAULI STPS(Unit5#200)	-	-	-	Not done in last three years	

	SINGRAULI STPS(Unit6#500)	02.05.2018	02.05.2018	NO	--	3rd Quarter
	SINGRAULI STPS(Unit7#500)	15.07.2018	15.07.2018	NO	--	3rd Quarter
	UNCHAHAHAR I(2 * 210)	29-03-2016	29-03-2016	YES	--	3rd Quarter
	UNCHAHAHAR II TPS(unit1# 210)	13-07-2019	13-07-2019	YES	--	
	UNCHAHAHAR II TPS(unit2# 210)	10-08-2018	10-08-2018	YES	--	3rd Quarter
	UNCHAHAHAR UNIT6#500	-	31.03.2017	YES	--	3rd Quarter
	KOLDAM HPS(4 * 200)	01-07-2015	01-07-2015	YES	--	3rd Quarter
	DADRI GPS(2 * 154.51)(ST- Steam Turbine)	-	18-11-2015	YES	--	3rd Quarter
	ANTA GPS(3 * 88.71)(GT- Gas Turbine)	08-08-2014	08-08-2014	YES	--	3rd Quarter
	ANTA GPS(1 * 153.2)(ST- Steam Turbine)	08-08-2014	08-08-2014	YES	--	3rd Quarter
5	Aravali Power Company Private Ltd					
	ISTPP (JHAJJAR)(3 * 500)	-	25-08-2015	YES	--	3rd Quarter
6	NHPC					
	CHAMERA HPS(3*180)	06-08-2020	27-12-2019	YES	--	
	CHAMERA II HPS(3 * 100)	11-10-2015	11-10-2015	NO	Replacement of Excitation system in two units	3rd Quarter
	CHAMERA III HPS(Unit1#77)	29-10-2015	07-01-2012	YES	--	3rd Quarter
	CHAMERA III HPS(Unit2,3#77)	29-10-2015	19-06-2012	YES	--	3rd Quarter
	PARBATI III HEP (Unit1# 130)	21-01-2016	21-01-2016	YES	Have been done recetly. The report on PSS turning shall be submitted seperately.	3rd Quarter
	DULHASTI HPS(Unit2#130)	21-01-2020	21-01-2020	YES	--	
	DULHASTI HPS(Unit1#130)	29-12-2019	29-12-2019	YES	--	
	URI HPS(Unit3# 120)	10-01-2021	10-01-2021	YES	--	
	URI HPS(Unit4# 120)	15-02-2021	15-02-2021	YES	--	
	URI HPS(Unit2# 120)	07-03-2016	07-03-2016	YES	--	3rd Quarter
	URI-II HPS(4 * 60)	Mar-14	Mar-14		Re-tunning& Step response test shall be carriedout in 2021-22	
	SALAL HPS (Unit-3,4,5,6 # 115)	16-12-2014	16-12-2014	YES	--	3rd Quarter
	KISHANGANGA(3 * 110)	18-05-20 18	18-05-20 18	YES	--	3rd Quarter
	BAIRASIUL HPS(3 * 60)	30-07-2015	30-07-2016	YES	--	3rd Quarter
	SEWA-II HPS(3 * 40)	09-07-2016	09-07-2016	YES	--	3rd Quarter
	PARBATI III HEP(4 * 130)	16-12-2016	16-12-2016	YES	--	3rd Quarter
	TANAKPUR HPS(Unit1# 31.42)	09-01-2015	09-01-2015	YES	--	3rd Quarter
	TANAKPUR HPS(Unit2,3#31.4)	24-05-2014	24-05-2014	YES	--	3rd Quarter
	DHAULIGANGA HPS(Unit1 ,2# 70)	04-05-2014	17-04-2018	YES	--	3rd Quarter
	DHAULIGANGA HPS(Unit3,4# 70)	26-06-2014	17-04-2018	YES	--	3rd Quarter
7	PUNJAB					
	RAJPURA(NPL) TPS(2 * 700)	22-04-2014	22-04-2014	YES	--	3rd Quarter
8	Rajasthan					
	KAWAI TPS(Unt1# 660)	08-08-2014	08-08-2014	YES	--	3rd Quarter
	KAWAI TPS(Unt2# 660)	09-10-2014	09-10-2014	YES	--	3rd Quarter
	KOTA TPS (2*110+2*195+3*210)	17-04-2015	17-04-2015	YES	This is date of last test performed on unit 4 and 5 ,other units test were performed at earlier date.	3rd Quarter
	CHHABRA TPS(Unit 1#250)	22-05-2018	22-05-2018	NO	--	3rd Quarter
	CHHABRA TPS(Unit 2,3,4#250)	04-10-2015	04-10-2015	NO	--	3rd Quarter
	CHHABRA TPS(Unit5# 660)	10-02-2016	10-02-2016	YES	--	3rd Quarter
	CHHABRA TPS(Unit6# 660)	7/28/2018	7/28/2018	YES	--	3rd Quarter
	KALISINDH TPS(Unit1# 600)	10-02-2016	10-02-2016	YES	--	3rd Quarter
	KALISINDH TPS(Unit2# 600)	08-02-2016	08-02-2016	YES	--	3rd Quarter
	KOTA TPS(Unit1#110)	02-01-2015	02-01-2015	NO	--	3rd Quarter
	KOTA TPS(Unit2#110)	16-09-2014	16-09-2014	NO	--	3rd Quarter
	KOTA TPS(Unit3#195)	14-10-2019	14-10-2019	NO	--	
	KOTA TPS(Unit4#195)	06-03-2020	06-03-2020	NO	--	
	KOTA TPS(Unit2#110)	18-09-2014	18-09-2014	NO	--	3rd Quarter
	KOTA TPS(Unit2#110)	16-09-2014	16-09-2014	NO	--	3rd Quarter
	KOTA TPS(Unit2#110)	16-09-2014	16-09-2014	NO	--	3rd Quarter
	SURATGARH TPS (Unit1#250)	14-03-2019	14-03-2019	NO	--	

	SURATGARH TPS (Unit2#250)	06-02-2016	06-02-2016	Yes	--	3rd Quarter
	SURATGARH TPS (Unit3,4,5,6#250)	12-01-2016	12-01-2016	Yes	--	3rd Quarter
	RAJWEST (IPP) LTPS(Unit1# 135)	26-04-2016	26-04-2016	No	--	3rd Quarter
	RAJWEST (IPP) LTPS(Unit2# 135)	14-07-2016	14-07-2016	No	--	3rd Quarter
	RAJWEST (IPP) LTPS(Unit3# 135)	03-01-2014	03-01-2014	No	--	3rd Quarter
	RAJWEST (IPP) LTPS(Unit4# 135)	03-11-2015	03-11-2015	No	--	3rd Quarter
	RAJWEST (IPP) LTPS(Unit5# 135)	21-09-2014	21-09-2014	No	--	3rd Quarter
	RAJWEST (IPP) LTPS(Unit6# 135)	14-08-2014	14-08-2014	No	--	3rd Quarter
	RAJWEST (IPP) LTPS(Unit7# 135)	20-02-2016	20-02-2016	No	--	3rd Quarter
	RAJWEST (IPP) LTPS(Unit8# 135)	11-06-2014	11-06-2014	No	--	3rd Quarter
9	UTTAR PRADESH					
	ANPARA-C TPS(Unit1# 600)	22-08-2015	22-08-2015	Yes	--	3rd Quarter
	ANPARA-C TPS(Unit2# 600)	08-03-2016	08-03-2016	Yes	--	3rd Quarter
	ROSA TPS(Unit1 #300)	03-02-2017	03-02-2017	Yes	--	3rd Quarter
	ROSA TPS(Unit2# 300)	18/2/2018	18/2/2018	Yes	--	3rd Quarter
	ROSA TPS(Unit3 # 300)	03-02-2017	03-02-2017	Yes	--	3rd Quarter
	ROSA TPS(Unit4# 300)	03-02-2017	03-02-2017	Yes	--	3rd Quarter
	Anpara-A (Unit1#210)	01.05.2016	19.02.2021	No	--	3rd Quarter
	Anpara-A(Unit2#210)	17.11.2017	17.11.2017	No	--	3rd Quarter
	Anpara-A(Unit3#210)	25.09.2020	25.09.2020	No	--	3rd Quarter
	Anpara-B(Unit4#500)	07.12.2014	07.12.2014	Yes	Overhauling is overdue since 2014 and is proposed in Nov., 2021 PSS tuning/SRT will be done at same time.	3rd Quarter
	Anpara-B (Unit5#500)	17.08.2014	Dec., 2019	Yes	--	
	Anpara-D(Unit6#500)	15.11.2016	15.11.2016	No	--	3rd Quarter
	Anpara-D (Unit7#500)	15.04.2017	15.04.2017	No	--	3rd Quarter
	Obra-B(Unit9#200)	22.03.2016	22.03.2016	Yes	Report enclosed.	3rd Quarter
	Obra-B(Unit10#200)	28.06.2016	20.06.2016	Yes	Report enclosed.	3rd Quarter
	Obra-B (Unit11#200)	21.01.2017	21.01.2017	Yes	Report enclosed.	3rd Quarter
	Obra-B (Unit12#200)	Unit taken on load after R&M on 22 January,		-	PSS tuning and SRT scheduled in April, 2021.	
	Obra-B(Unit13#200)	Unit closed under R&M.		-	PSS tuning and SRT scheduled in April, 2021.	
	Parichha-B(Unit3#210)	08.01.2016	08.01.2016	Yes	--	3rd Quarter
	Parichha-B (Unit4#210)	08.01.2016	08.01.2016	Yes	--	3rd Quarter
	Parichha-C (Unit5#250)	08.02.2020	08.02.2020	No	--	
	Parichha-C(Unit3#250)	09.01.2016	09.01.2016	No	--	3rd Quarter
	Harduaganj (Unit8#250)	20.08.2015	20.08.2015	No	--	3rd Quarter
	Harduaganj (Unit3#250)	13.04.2016	13.04.2016	No	--	3rd Quarter
	Harduaganj(Unit7#105)	16.07.2021	16.07.2021	yes	--	
	Harduaganj(Unit9#250)	16.07.2021	16.07.2021	yes	--	
	LALITPUR TPS(Unit1# 660)	19.05.2017	19.05.2017	yes	--	3rd Quarter
	LALITPUR TPS(Unit1# 660)	30.03.2021	30.03.2021	yes	--	
	LALITPUR TPS(Unit1# 660)	24.08.2017	24.08.2017	yes	--	3rd Quarter
	ALAKHANANDA HEP(Unit1# 82.5)	12.072017	12.072017	No	--	3rd Quarter
	ALAKHANANDA HEP(Unit2# 82.5)	12.072017	12.072017	No	--	3rd Quarter
	ALAKHANANDA HEP(Unit3# 82.5)	12.072017	12.072017	No	--	3rd Quarter
	ALAKHANANDA HEP(Unit4# 82.5)	12.072017	12.072017	No	--	3rd Quarter
	MEJA TPS(Unit1#660)	16.10.2018	05.09.2017	yes	--	3rd Quarter
	MEJA TPS(Unit2#660)	16.01.2021	18.05.2020	yes	--	
10	BBMB					
	BHAKRA HPS(Unit1#108)	--	--	No	PSS is not provided ,shall be provided in ongoing RM&U	
	BHAKRA HPS(Unit1#108)	24.07.2015	24.07.2015	No	--	3rd Quarter
	BHAKRA HPS(Unit3#126)	--	--	No	PSS is not provided ,shall be provided in ongoing RM&U	
	BHAKRA HPS(Unit4#126)	--	--	No	--	
	BHAKRA HPS(Unit5#126)	--	--	No	--	
	BHAKRA HPS(Unit6#157)	--	--	No	The original Rusian excitation system is under replacement PO issued Hence,PSS not got tuned.	
	BHAKRA HPS(Unit7#157)	--	--	No	The original Rusian excitation system is under replacement PO issued Hence,PSS not got tuned.	

	BHAKRA HPS(Unit7#157)	--	--	No	The original Rusian excitation system is under replacement PO issued Hence,PSS not got tuned.	
	BHAKRA HPS(Unit7#157)	18.02.2016	18.02.2016	No	--	3rd Quarter
	BHAKRA HPS(Unit7#157)	18.02.2017	18.02.2017	No	--	3rd Quarter
	DEHAR HPS(Unit#1 165)	08.08.2017	08.08.2017	No	--	3rd Quarter
	DEHAR HPS(Unit#2 165)	08.08.2018	08.08.2018	No	--	3rd Quarter
	DEHAR HPS(Unit#3 165)	08.08.2019	08.08.2019	No	--	
	DEHAR HPS(Unit#4 165)	02.07.2017	02.07.2017	No	--	3rd Quarter
	DEHAR HPS(Unit#5 165)	08.08.2019	08.08.2019	No	--	
	DEHAR HPS(Unit#6 165)	02.07.2017	02.07.2017	No	--	3rd Quarter
	PONG HPS(6 * 66)	--	--	--	PSS not provided.RM&U agenda under considration.	