सत्यमेव जयते

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

सं: उ.क्षे.वि.स./प्रचालन/106/01/2021/11482-11523 दिनांक: 16.12.2021

**विषय: प्रचालन समन्वय उप-समिति की190वीं बैठक की कार्यसूची।**
**Subject: Agenda of 190th OCC meeting.**

प्रचालन समन्वय उप-समिति की **190वीं** बैठक का आयोजन वीडियो कॉन्फ्रेंसिंग के माध्यम से दिनांक **21.12.2021** 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।

**190th** meeting of the Operation Co-ordination sub-committee will be conducted through Video Conferencing on **21.12.2021** 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.

सौमित्र 16/12/2021.

(सौमित्र मजूमदार)
अधीक्षण अभियंता (प्रचालन)

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

## 1. Confirmation of Minutes

The minutes of the 189th OCC meeting were issued vide letter of even number dated 03.12.2021.

***Sub-committee may deliberate and kindly confirm the Minutes.***

## 2. Review of Grid operations

### 2.1 Power Supply Position (Provisional) for November 2021

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

| State / UT | Req. / Avl. | Energy (MU) | | | Peak (MW) | | |
|---|---|---|---|---|---|---|---|
| | | Anticipated | Actual | % variation | Anticipated | Actual | % variation |
| CHANDIGARH | (Avl) | 110 | 89 | -18.7% | 260 | 194 | -25.4% |
| | (Req) | 100 | 89 | -10.6% | 210 | 194 | -7.6% |
| DELHI | (Avl) | 3237 | 1819 | -43.8% | 4904 | 3831 | -21.9% |
| | (Req) | 1950 | 1819 | -6.7% | 3800 | 3831 | 0.8% |
| HARYANA | (Avl) | 4390 | 3427 | -21.9% | 9590 | 6785 | -29.2% |
| | (Req) | 3750 | 3433 | -8.4% | 6700 | 6785 | 1.3% |
| HIMACHAL PRADESH | (Avl) | 850 | 893 | 5.1% | 1762 | 1819 | 3.2% |
| | (Req) | 858 | 904 | 5.4% | 1742 | 1819 | 4.4% |
| J&K and LADAKH | (Avl) | 1070 | 1590 | 48.6% | 3740 | 2591 | -30.7% |
| | (Req) | 1630 | 1646 | 1.0% | 2550 | 2841 | 11.4% |
| PUNJAB | (Avl) | 4270 | 3399 | -20.4% | 8540 | 6349 | -25.7% |
| | (Req) | 3280 | 3427 | 4.5% | 5740 | 6349 | 10.6% |
| RAJASTHAN | (Avl) | 7770 | 7180 | -7.6% | 17910 | 14253 | -20.4% |
| | (Req) | 7880 | 7187 | -8.8% | 13500 | 14253 | 5.6% |
| UTTAR PRADESH | (Avl) | 8400 | 8211 | -2.3% | 17000 | 16119 | -5.2% |
| | (Req) | 8100 | 8231 | 1.6% | 17000 | 16119 | -5.2% |
| UTTARAKHAND | (Avl) | 981 | 1005 | 2.5% | 1890 | 1967 | 4.1% |
| | (Req) | 1020 | 1006 | -1.4% | 1950 | 1967 | 0.9% |
| NORTHERN REGION | (Avl) | 31078 | 27613 | -11.1% | 67700 | 49300 | -27.2% |
| | (Req) | 28568 | 27743 | -2.9% | 48400 | 50300 | 3.9% |

As per above, negative / significant variation (≥5%) in Actual Power Supply Position(Provisional) vis-à-vis Anticipated figures is observed for the month of November-2021 in terms of Energy Requirement for Chandigarh, Delhi, Haryana, HP, Rajasthan, and Uttarakhand and in terms of Peak Demand similar variation is noted for Chandigarh, UTs of J&K and Ladakh, Punjab, Rajasthan, UP. These states/UTs are requested to submit reason for such variations so that the same can be deliberated in the meeting.

The Energy Requirement for the states/UT of Chandigarh, Delhi, Haryana, and Punjab was nearly 30% lower in November 2021 as compared to October 2021. Reasons for the said quantum reduction, which is beyond the normal reduction witnessed in the past years, may kindly be clarified by respective state/UT.

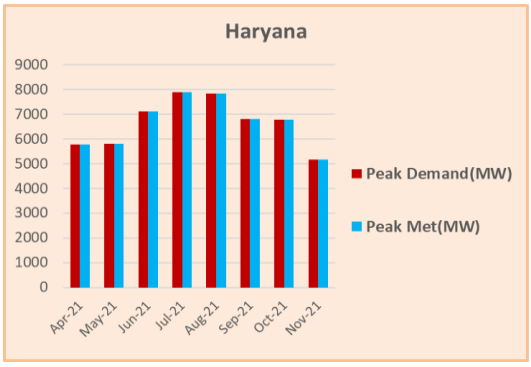
All SLDCs are requested to furnish provisional and revised power supply position in prescribed formats on NRPC website portal by 2nd and 15th day of the month respectively for the compliance of Central Electricity Authority (Furnishing of Statistics, Returns and Information) Regulations, 2007.

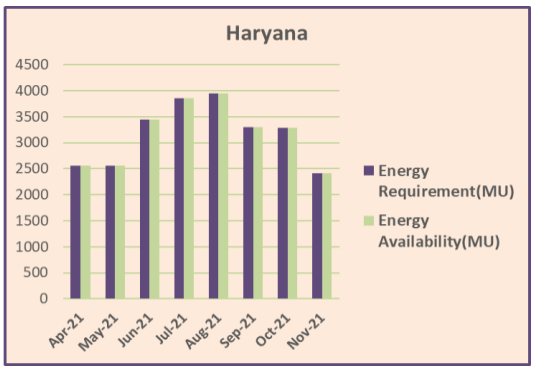
## 2.2 Power Supply Position for October 2021

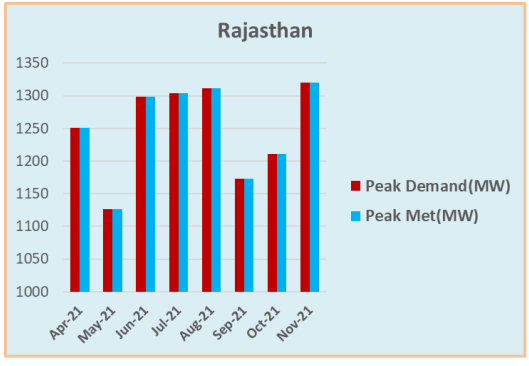
The Peak Demand of Rajasthan for October 2021 (Revised) was stated as 12,767 MW. The power cut figure was reported as 5033 MW by Rajasthan SLDC for 7th October 2021 at 19:00 hrs. This figure of power cut was evidently on a very high side. On seeking clarification, Rajasthan SLDC submitted that the earlier figure needs to be corrected from 5033 MW to 3637 MW. Rajasthan SLDC had further intimated that reported power cut was due to coal shortage, forced/planned generation outages. However, the power cuts need to be reported based on the load shedding actually undertaken while meeting the load at any point of time and it will not be reasonable to compute the same with the generating capacity which may be out on account of low demand. Methodology for calculation of hourly load shedding may be discussed for holistic reporting in the power supply data.

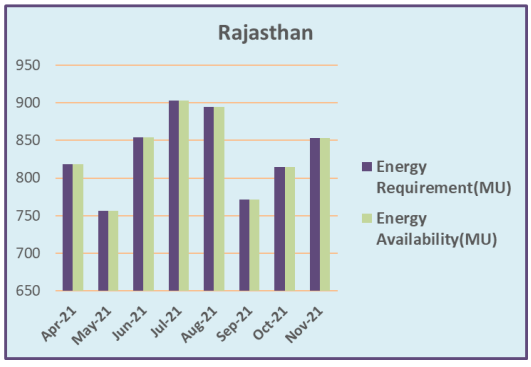
## 2.3 Power Supply Position of NCR

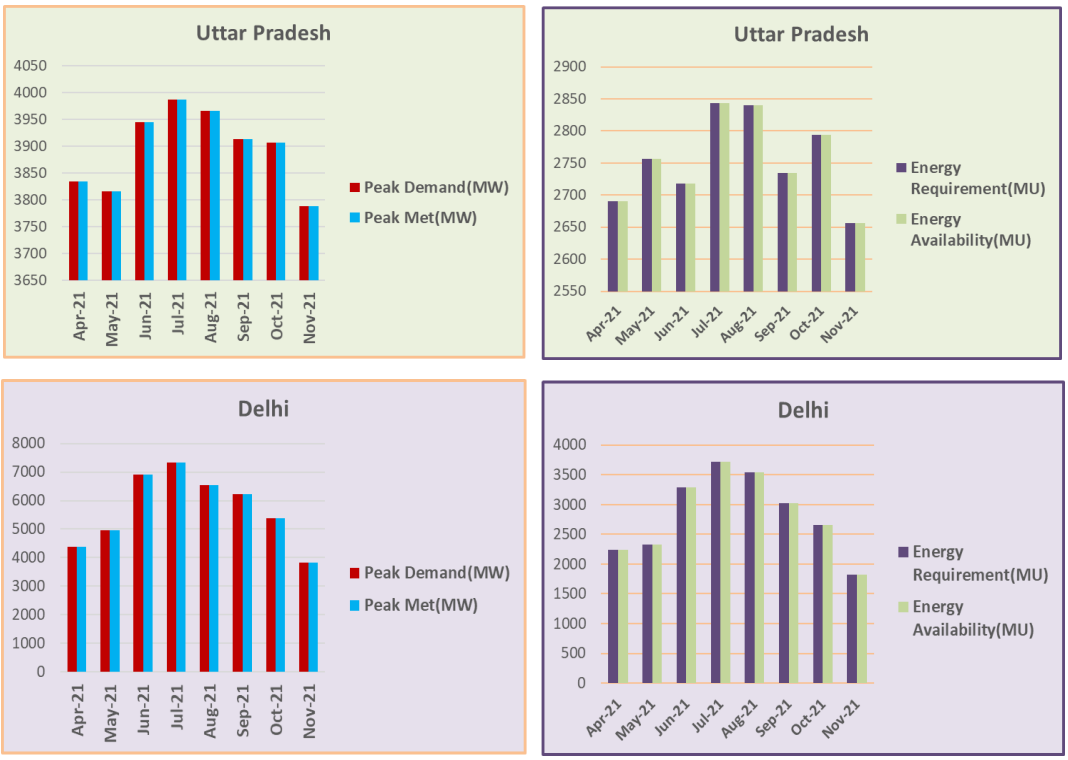
NCR Planning Board (NCRPB) is closely monitoring the power supply position of National Capital Region. Monthly power supply position for NCR till the month of November-2021 is available on NRPC website (http://164.100.60.165). Power supply position during the current financial year is shown as under:






## 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 January-2022 is scheduled on 20-December-2021 via Video Conferencing.

### 3.2. Outage Programme for Transmission Elements

The meeting on proposed outage programme of Transmission elements for the month of January-2022 is scheduled on 20-December-2021 via Video conferencing.

## 4. Planning of Grid Operation

### 4.1. Anticipated Power Supply Position in Northern Region for January 2022

The Anticipated Power Supply Position in Northern Region for January 2022 is as under:

| State / UT | Availability / Requirement | Revised Energy (MU) | Revised Peak (MW) |
|---|---|---|---|
| CHANDIGARH | Availability | 100 | 230 |
| | Requirement | 130 | 280 |
| | Surplus / Shortfall | -30 | -50 |
| | % Surplus / Shortfall | -23.1% | -17.9% |
| DELHI | Availability | 3010 | 6230 |
| | Requirement | 2350 | 5400 |
| | Surplus / Shortfall | 660 | 830 |
| | % Surplus / Shortfall | 28.1% | 15.4% |
| HARYANA | Availability | 4870 | 10860 |

| State / UT | Availability / Requirement | Revised Energy (MU) | Revised Peak (MW) |
|---|---|---|---|
| | Requirement | 4090 | 7320 |
| | Surplus / Shortfall | 780 | 3540 |
| | % Surplus / Shortfall | 19.1% | 48.4% |
| HIMACHAL PRADESH | Availability | 996 | 1975 |
| | Requirement | 995 | 1980 |
| | Surplus / Shortfall | 1 | -5 |
| | % Surplus / Shortfall | 0.1% | -0.3% |
| J&K and LADAKH | Availability | 980 | 3610 |
| | Requirement | 2090 | 2920 |
| | Surplus / Shortfall | -1110 | 690 |
| | % Surplus / Shortfall | -53.1% | 23.6% |
| PUNJAB | Availability | 4780 | 9900 |
| | Requirement | 3840 | 6670 |
| | Surplus / Shortfall | 940 | 3230 |
| | % Surplus / Shortfall | 24.5% | 48.4% |
| RAJASTHAN | Availability | 8510 | 18870 |
| | Requirement | 8480 | 14400 |
| | Surplus / Shortfall | 30 | 4470 |
| | % Surplus / Shortfall | 0.4% | 31.0% |
| UTTAR PRADESH | Availability | 9610 | 19500 |
| | Requirement | 9920 | 19500 |
| | Surplus / Shortfall | -310 | 0 |
| | % Surplus / Shortfall | -3.1% | 0.0% |
| UTTARAKHAND | Availability | 1246 | 2242 |
| | Requirement | 1271 | 2350 |
| | Surplus / Shortfall | -25 | -108 |
| | % Surplus / Shortfall | -2.0% | -4.6% |
| NORTHERN REGION | Availability | 34102 | 68800 |
| | Requirement | 33166 | 57000 |
| | Surplus / Shortfall | 936 | 11800 |
| | % Surplus / Shortfall | 2.8% | 20.7% |

SLDCs are requested to update the anticipated power supply position of their respective state / UT for the month of January-2022 and submit the measures proposed to be taken to bridge the gap between demand & availability, as well to dispose off the surplus, if any, in the prescribed format.

## 5. Submission of breakup of Energy Consumption by the states

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

| State / UT | From | To |
|---|---|---|
| DELHI | Apr-2018 | Sep-2021 |

| State / UT | From | To |
|---|---|---|
| HARYANA | Apr-2018 | Sep-2021 |
| HIMACHAL PRADESH | Apr-2018 | Nov-2021 |
| PUNJAB | Apr-2018 | Jul-2021 |
| RAJASTHAN | Apr-2018 | Oct-2021 |
| UTTAR PRADESH | Apr-2018 | Oct-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 | Traction 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 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 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. NRPC Sectt. vide e-mail dtd. 23.09.2021 apprised the CPRI that as per decisions

6.25 of meeting dtd. 06.09.2021, tuning of base-case file is being done by NRLDC so

6.26 that no new issue arises in future.

6.27 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.

6.28 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.

6.29 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.

6.30 In 188th OCC meeting, NRLDC representative informed that tuned base-case will be submitted by NRLDC by 28.10.2021. It was decided that the same will be sent to CPRI for necessary correction in report.

6.31 NRLDC vide e-mail dtd. 10.11.2021 submitted the tuned base-case to NRPC Sectt. mentioning that Basecase has been tuned considering the feedback/inputs received from states (Punjab, Delhi, Rajasthan, HP and UP) and considering NRLDC SCADA data of 11th July 2018.

6.32 In 189th OCC, NRPC representative apprised that tuned base-case along with comments of states will be sent to CPRI for necessary correction in the report.

6.33 Tuned base case along with comments of states has been sent to CPRI vide mail dtd 30.11.2021 for correction in the report.

***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.**<br>At SLDC level, remote tripping of 100 feeders at 66 kV is possible.<br>At 11 kV feeder level, ADMS is to be implemented by Distribution Company. |
| **Delhi** | **Fully implemented** by TPDDL, BRPL and BYPL.<br>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.**<br>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.<br>ADMS functionality at 11 kV feeders from 33/11 kV substation is |

| State/ Utility | Status |
|---|---|
| | under the jurisdiction of the DISCOMs. |
| **UP** | **Scheme implemented by NPCL only.**<br>Remote operation of 50 feeders at 132 kV level being operated from SLDC.<br>Further, the solution proposed by M/s Siemens was found to be non-economical and was not accepted by the management.<br>Noida Power Company Ltd have implemented Intelligent Load Shedding (ILS) scheme, in compliance of IEGC requirements for automatic demand management. |
| **Haryana** | **Scheme not implemented.**<br>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. |
| **HP** | **Scheme not implemented.**<br>02 feeders could be operated from SLDC through manual intervention. Letter has been sent by HPSEB to HP-SLDC for making its operation automatic. |

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-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 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.

7.10 In the 188th OCC, NRLDC informed that it has not received comments from states in this matter. 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.

7.11 In the 189th OCC, NRLDC informed that status of ADMS has been sent to CERC twice (Aug'16 and Sep'16) in the past. The same is recorded in MoM of 127th OCC also.

7.12 In 189th OCC, NRLDC representative informed that CERC will be apprised again within next 10 days about the latest status of ADMS as per the updated information available with them.

***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.

9.2. In 187th OCC, it was decided that respective states would 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 DPR for the same. Further, a sample DPR on implementation of Islanding scheme for PSDF funding has been already circulated vide email dated 07.10.2021 and requested to expedite the preparation of DPR.

9.3. Utilities were requested to refer and submit SOP for every Islanding scheme in their control area.

9.4. A meeting was also taken by Honorable 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. MoM has been issued and copy of the same was enclosed as Annexure-A.II of 189th OCC agenda.

9.5. In 189th OCC, NRPC representative highlighted no progress from states of Punjab, Uttarakhand, Himachal, J&K, Ladakh.

9.6. In the meeting, UP and Punjab representatives stated that they have sent the offer along with data to CPRI for study of Islanding Schemes. HP intimated that system study is under process at DISCOM end. Rajasthan SLDC assured the submission of RAPS SCADA display on the same day.

9.7. NRLDC submitted that they use PSSE software for system study but Rajasthan has submitted details of Islands in MI Power Software, therefore, they are exploring whether they can use that file.

9.8. MS, NRPC desired to know the reason for sending data to CPRI for system study. He stated that it may be done at state level itself.

9.9. UP representative stated that they are not able to perform dynamic system study as it involves parameters like rotor inertia, hunting, etc.

9.10. MS, NRPC expressed concern regarding apathy of states in implementation of Islanding Schemes. He stated that all SLDCs will intimate the names of Islands for which system study from CPRI is required along with justification for the same by 30th Nov, 2021. He also set timeline of 30th Nov, 2021 for Delhi to submit SOP data. He stated that communication may be sent to RAPS for submission of SOP data at the earliest.

9.11. UPSLDC vide email dated 01.12.2021 has submitted the names of islands for which system study from CPRI is required (enclosed as ***Annexure-A.II.).*** UPSLDC has highlighted, *inter-alia*, that involvement of long length 765kV line and high number of buses necessitates them to go for system study by CPRI. It has mentioned that SLDC/STU has no expertise in such studies and before doing any investment on the project, proper study is must for successful implementation and operation of Islands.

***Members may kindly deliberate.***

## 10. Coal Supply Position of Thermal Plants in Northern Region

10.1. In 186th OCC meeting, it was agreed 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 December 2021) is as follows:

| Station | Capacity (MW) | PLF % (prev. months) | Normative Stock Reqd (Days) | Actual Stock (Days) |
|---|---|---|---|---|
| ANPARA C TPS | 1200 | 76.78 | 15 | 6.3 |
| ANPARA TPS | 2630 | 79.65 | 15 | 15.7 |
| BARKHERA TPS | 90 | 9.22 | 20 | 5.0 |
| CHHABRA TPP | 500 | 65.84 | 25 | **3.7** |
| DADRI (NCTPP) | 1820 | 26.02 | 30 | 27.8 |
| GH TPS (LEH.MOH.) | 920 | 17.13 | 30 | 25.6 |
| GOINDWAL SAHIB TPP | 540 | 23.48 | 30 | **2.6** |
| HARDUAGANJ TPS | 605 | 10.12 | 30 | 31.4 |
| INDIRA GANDHI STPP | 1500 | 57.82 | 30 | 14.0 |

| | | | | |
|---|---|---|---|---|
| KAWAI TPS | 1320 | 58.50 | 25 | 5.9 |
| KHAMBARKHERA TPS | 90 | 10.20 | 20 | 5.0 |
| KOTA TPS | 1240 | 81.43 | 30 | 5.8 |
| KUNDARKI TPS | 90 | 14.65 | 25 | 12.0 |
| LALITPUR TPS | 1980 | 33.76 | 25 | 16.4 |
| MAHATMA GANDHI TPS | 1320 | 58.74 | 25 | **3.9** |
| MAQSOODPUR TPS | 90 | 4.18 | 20 | 13.0 |
| MEJA STPP | 1320 | 59.61 | 20 | 19.3 |
| OBRA TPS | 1094 | 43.72 | 20 | 9.4 |
| PANIPAT TPS | 710 | 52.55 | 30 | 9.6 |
| PARICHHA TPS | 1140 | 9.20 | 30 | 26.3 |
| PRAYAGRAJ TPP | 1980 | 63.90 | 20 | **1.5** |
| RAJIV GANDHI TPS | 1200 | 23.10 | 30 | 29.4 |
| RAJPURA TPP | 1400 | 70.31 | 25 | 20.6 |
| RIHAND STPS | 3000 | 89.65 | 15 | 8.4 |
| ROPAR TPS | 840 | 10.53 | 30 | 16.8 |
| ROSA TPP Ph-I | 1200 | 39.35 | 25 | 22.7 |
| SINGRAULI STPS | 2000 | 84.17 | 15 | 13.0 |
| SURATGARH TPS | 1500 | 29.66 | 30 | 4.1 |
| TALWANDI SABO TPP | 1980 | 55.80 | 25 | **0.9** |
| TANDA TPS | 1760 | 42.28 | 25 | 18.2 |
| UNCHAHAR TPS | 1550 | 45.88 | 25 | 16.4 |
| UTRAULA TPS | 90 | 15.62 | 20 | 7.0 |
| YAMUNA NAGAR TPS | 600 | 25.23 | 25 | 29.0 |

**11. Frequent tripping of 765 kV Bara-Mainpuri line at Mainpuri end and Commissioning of 2nd ICT at PPGCL Switchyard (Agenda by PPGCL)**

11.1. Prayagraj Power Generation Corporation Ltd (PPGCL) vide its email dated 10.12.2021 submitted that PPGCL, Bara is operating 3X660 MW Super-critical units at Prayagraj (UP). Its 90% power is tied-up with U.P. DISCOMs and 10% is available for merchant sale. The generated power is evacuated through one - 765kV Bara-Mainpuri line and two 400kV Bara-Meja lines.

11.2. Due to evacuation constraint, since 2nd 765kV line is not yet commissioned, SPS protection is in place. UPPTCL is also in the process of installing 2nd ICT at PPGCL Switch yard.

11.3. Further, PPGCL have intimated that recently on 1st Dec'21 due to manual tripping of 765kV line at Mainpuri end; Bara Unit #2 tripped as SPS acted. Frequent line tripping is leading to unit trip whenever total generation is higher than 1250 MW. The station is

operating for last 5 years and still units of PPGCL are at risk due to inadequate power evacuation infrastructure.

***Members may kindly deliberate***.

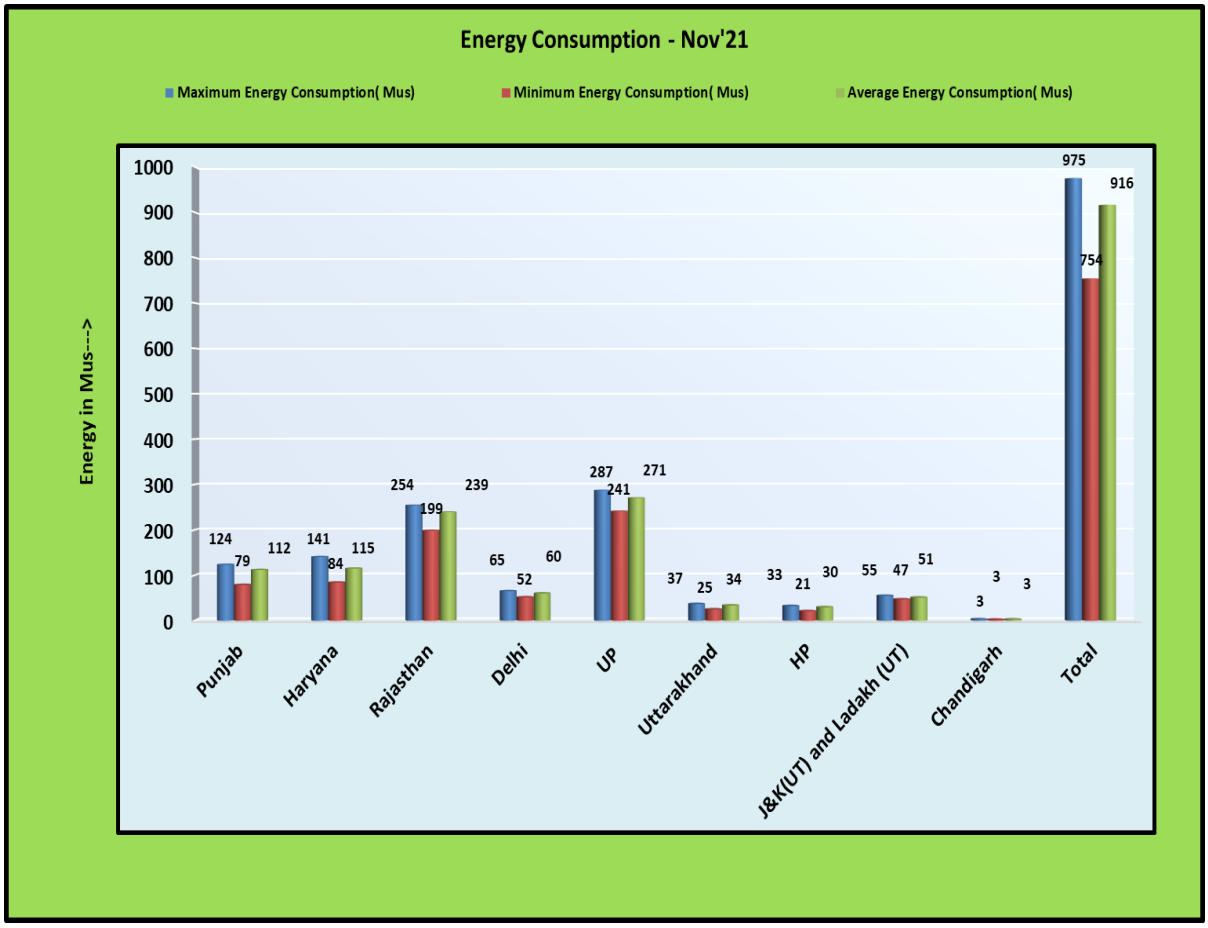
| खण्ड-ख: उ.क्षे.भा.प्रे.के. | Part-B: NRLDC |
|---|---|

## 12. Grid Highlights for November 2021

- In Nov'21, the Maximum energy consumption of Northern Region was 975 Mus on 26th Nov'21 which is 1.9 % higher than 956 Mus on 12th November 2020.

- In Nov'21, the Average energy consumption per day of Northern Region was 916 Mus which is 3.20 % higher than 888 Mus per day in November 2020.

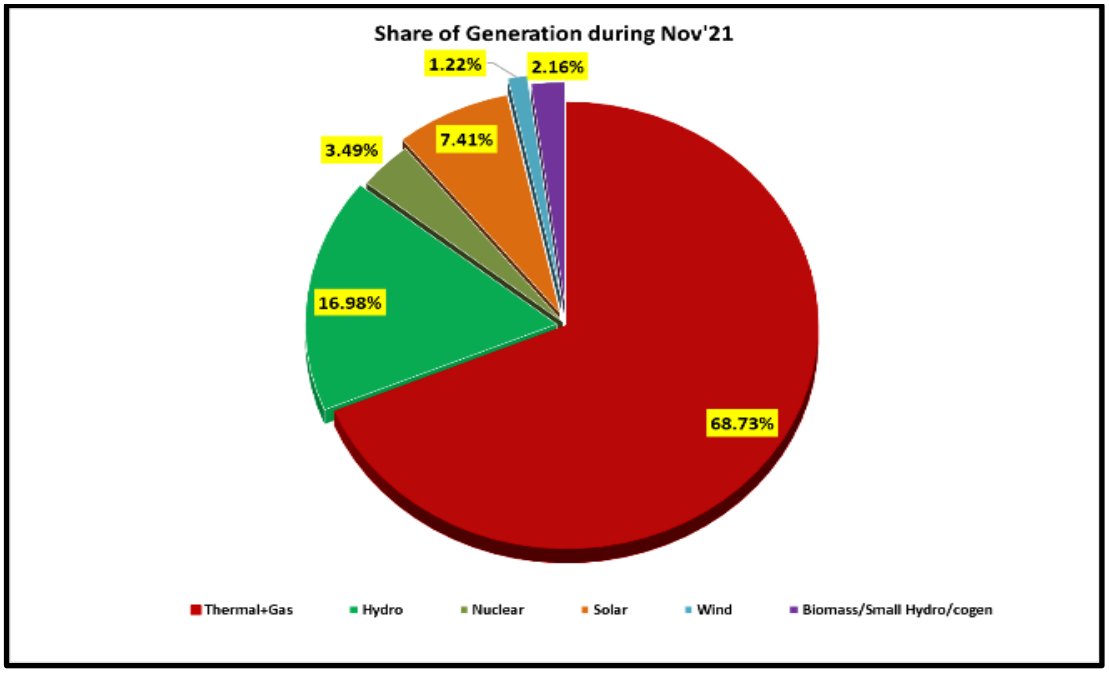
- In Nov'21, the Maximum Demand met of Northern Region was 49319 MW met on 26th Nov'21 at 11:00 hours (Based on data submitted by Constituents) as compared to 48166 MW met on 27th Nov'20 at 09:40 hours.

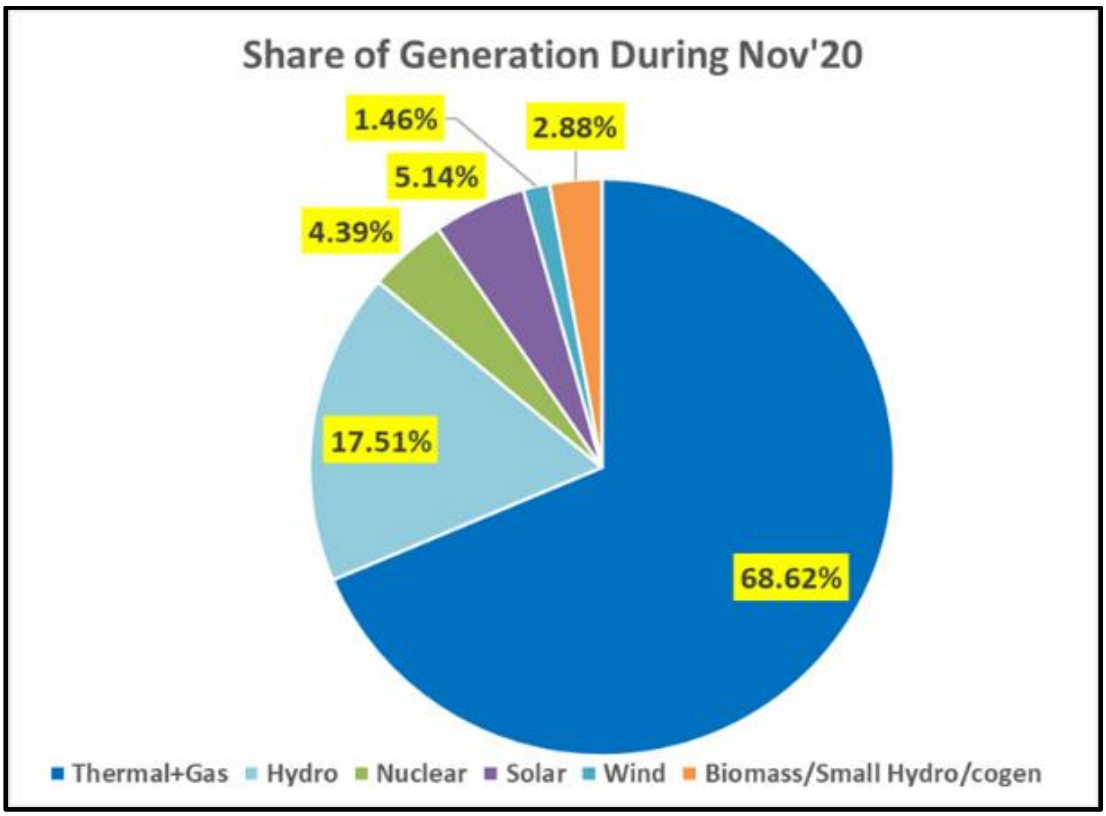



- Comparison of Average Energy Consumption (MUs/Day) of NR States for the Nov'2020 vs Nov 2021

| Region/State | Nov- 2020 | Nov-2021 | % Of Variation |
|---|---|---|---|
| पंजाब | 104.52 | 112.23 | 7.37 |
| हरियाणा | 114.21 | 115.18 | 0.85 |
| राजस्थान | 236.12 | 239.41 | 1.39 |
| दिल्ली | 60.83 | 60.44 | -0.65 |
| उत्तर प्रदेश | 258.45 | 270.74 | 4.76 |
| उत्तराखंड | 34.26 | 33.92 | -1.00 |
| हिमाचल प्रदेश | 28.25 | 29.91 | 5.87 |
| जम्मू और कश्मीर | 48.05 | 51.30 | 6.76 |
| चंडीगढ़ | 3.03 | 2.98 | -1.52 |
| उत्तरी क्षेत्र | 887.73 | 916.11 | 3.20 |

- In Nov'21, Frequency remained within IEGC band for 74.10% of the time only as compared to 79.81% of time in Nov'20.
- Total average per day energy generation by Northern region was 762.88 Mus in the month of Nov'21 as compared to 632.41 Mus in Nov'20. The fuel wise share of generation is shown below.






In November 21, Frequency remained within IEGC band for 74% of the time and below the IEGC band for 8.02%. Emergent contingency events during low frequency period 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.

| Freq. band | Nov 2020 | Dec 2020 | Jan 2021 | Feb 2021 | Mar 2021 | Apr 2021 | May 2021 | Jun 2021 | Jul 2021 | Aug 2021 | Sep 2021 | Oct 2021 | **Nov 2021** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| < 49.7 Hz(%) | 0.01 | 0.01 | 0.00 | 0.02 | 0.01 | 0.00 | 0.02 | 0.07 | 0.04 | 0.17 | 0.21 | 0.31 | **0.09** |
| <49.8 Hz(%) | 0.17 | 0.36 | 0.24 | 0.46 | 0.65 | 0.93 | 0.50 | 1.06 | 0.67 | 1.3 | 0.69 | 2.43 | **1.17** |
| <49.9 Hz(%) | 4.46 | 4.79 | 4.86 | 7.12 | 7.13 | 7.96 | 6.63 | 6.12 | 5.35 | 7.67 | 4.18 | 11.10 | **8.02** |
| 49.90-50.05 Hz(%) | 79.81 | 75.72 | 76.10 | 76.27 | 72.78 | 75.06 | 74.49 | 74.81 | 75.06 | 76.93 | 77.01 | 74.38 | **74.10** |
| 50.05-50.10 Hz(%) | 13.82 | 16.42 | 15.82 | 14.10 | 16.78 | 13.51 | 15.41 | 14.74 | 16.71 | 14.14 | 15.83 | 12.70 | **14.77** |
| >50.10 Hz(%) | 1.87 | 3.20 | 3.16 | 2.52 | 3.21 | 2.49 | 2.89 | 3.18 | 2.78 | 1.25 | 2.26 | 1.81 | **3.05** |
| >50.20 Hz(%) | 0.03 | 0.05 | 0.06 | 0.08 | 0.10 | 0.04 | 0.07 | 0.09 | 0.10 | 0.01 | 0.03 | 0.06 | **0.07** |
| औसत आवृत्ति | 50.00 | 50.00 | 50.00 | 50.00 | 50.00 | 50.00 | 50.00 | 50.00 | 50.01 | 50.00 | 50.00 | 49.99 | **50.00** |

During this month some of the NR states also had overdrawal contributing to low frequency operation. NRLDC has been continuously requesting all states to maintain

drawl within their respective schedule at all times, as mandated by IEGC subclauses 6 and 7 of section 6.4 and also take necessary measures for revival of intrastate generating units

NR Constituents are once again requested to kindly inform the house actions taken by them to minimise sudden load changeovers at hourly boundaries and also monitor performance of generators under their jurisdiction when the frequency is having large excursions. All utilities are advised to ensure that RGMO/FGMO of generators under their control areas are in service and are responding to frequency changes in the desired manner.

**Members may like to discuss.**

**13. Sharing of hourly Load shedding under different categories on NRLDC Reporting Software**

As discussed in 189th OCC meeting, Secretary, Ministry of Power has emphasized the importance of ensuring accuracy of the hourly load shedding (MW) and energy not met (MU) figures being received from various SLDCs on daily basis in respect of their own states, and classifying them under different heads like low availability, transmission constraints, financial constraints, planned maintenance of transmission / distribution system within state, etc.

Although SLDCs are uploading the hourly load shedding figures of the previous day on the web-based reporting software of NRLDC the next day, but reason for the shedding or unserved demand at any hour is not segregated into the possible different categories. **UP is providing reasons whereas some states such as Haryana and Uttarakhand are only providing partial data as per format. Other states such as Rajasthan, Punjab, Delhi, HP, J&K and Chandigarh are not furnishing the reasons for load shedding.**

In view of the above, it is requested to kindly ensure that the reason of shedding in the detail sheet of hourly load shedding, in the daily power supply report, be properly classified as desired, before uploading it to the web-based reporting software on daily basis. **All SLDCs may please accord top priority in this regard, as the reports received from them are in turn submitted to Ministry, after compilation by NRLDC.**

**Members may like to discuss.**

**14. Action Plan for Winter Preparedness 2021-22**

In 187th and 188th OCC meeting, it was discussed that winter in Northern region is likely to start from mid of October and continues till February end, and the challenges faced during these months were also discussed in the meeting. The challenges expected and actions to be taken by utilities were discussed in the meeting along with actions to be taken by respective utilities. **Some of the utilities such as UP SLDC, NR-1 and NR-3**

**have shared actions being taken at their end.** However, other SLDCs / utilities are yet to share details regarding actions taken by them

**Action by SLDCs:**

- Optimally schedule hydro and gas generation to make sure that demand as well as ramp requirements are safely met
- Ensuring disconnection of capacitors in high voltage areas. To be confirmed by all STUs and SLDCs. Punjab and Haryana confirmed the same.
- Monitoring of reactive power of generators and exchange of reactive power with ISTS through SCADA displays. Injection of reactive power from 220kV network to 400kV system to be avoided as far as possible.
- ICT Tap Optimization at 400kV & above carried out by NRLDC. Same exercise needs to be carried out by SLDCs at 220kV & below levels.

**Action by ISGS, intrastate generators:**

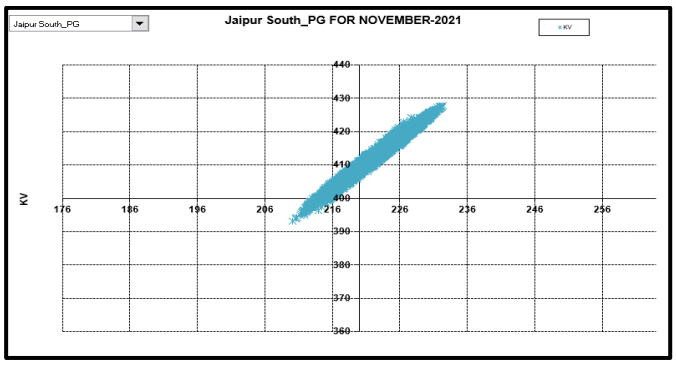
- Minimize generation to technical minimum based on RLDC/SLDC instructions as per IEGC guidelines /CERC directions during low demand
- Hydro generators to take care to declare their maximum DC particularly during non-solar period, to ensure better management of power portfolio by the beneficiaries
- Ensuring reactive power support (absorption) by generating stations by operating units upto their capability limits (at leading p.f.)
- Synchronous condenser mode of 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. Tehri unit has been tested successfully recently as well for synchronous condenser mode of operation. In 189$^{th}$ OCC meeting, Punjab SLDC had stated that work of magnetic float level indicator is still pending and utilization of RSD as synchronous condenser is expected by end of December' 2021. Punjab SLDC may please update the status.

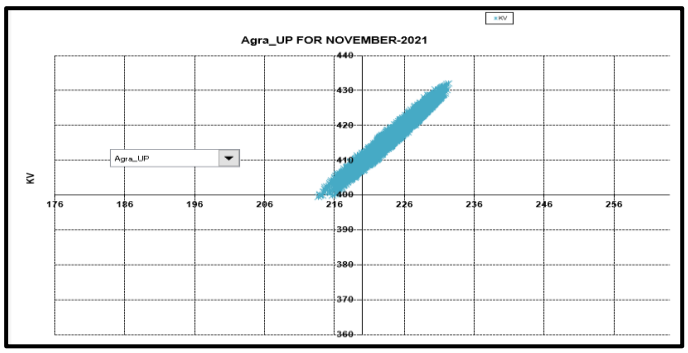
**Action by ISTS licensees/ STUs**

- Delay in charging the lines already kept open for voltage control after issuance of RLDC code (in the morning hours) to be avoided as far as possible.
- Ensuring healthiness of all commissioned reactors in the system
- Additional manpower if required, may be placed at critical substations for taking prompt action whenever required.
- Priority wise cleaning of line insulators & replacement of damaged insulators.
- Monitor progress of cleaning and replacement of porcelain insulator with polymer insulator and furnish updated status to NRPC/NRLDC.

NRLDC has one again analysed scatter plots of 400/220kV stations based on November 2021 data. Accordingly, it is proposed to carry out tap change exercise at following 400/220kV stations:

**Increase by 2 tap positions at 400/220kV Jaipur South and Agra(UP).**



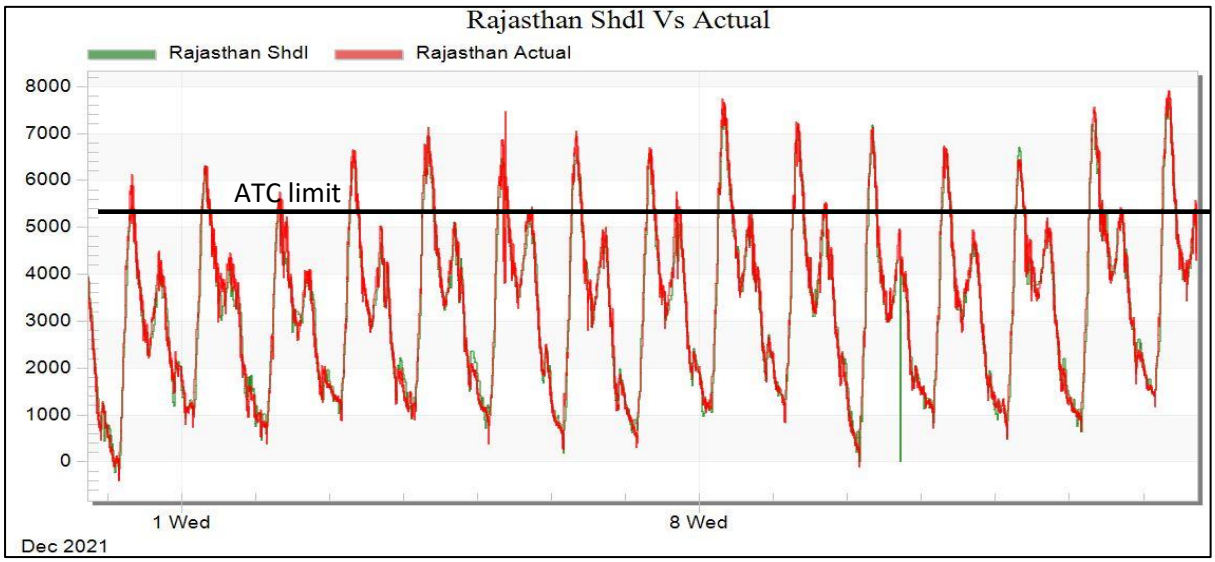

***As discussed and agreed in 187th, 188th and 189th OCC meeting, utilities are requested to share action plan for measures to be taken by them for carrying out pre-winter maintenance activities and other actions agreed in 187th, 188th and 189th OCC meeting.***

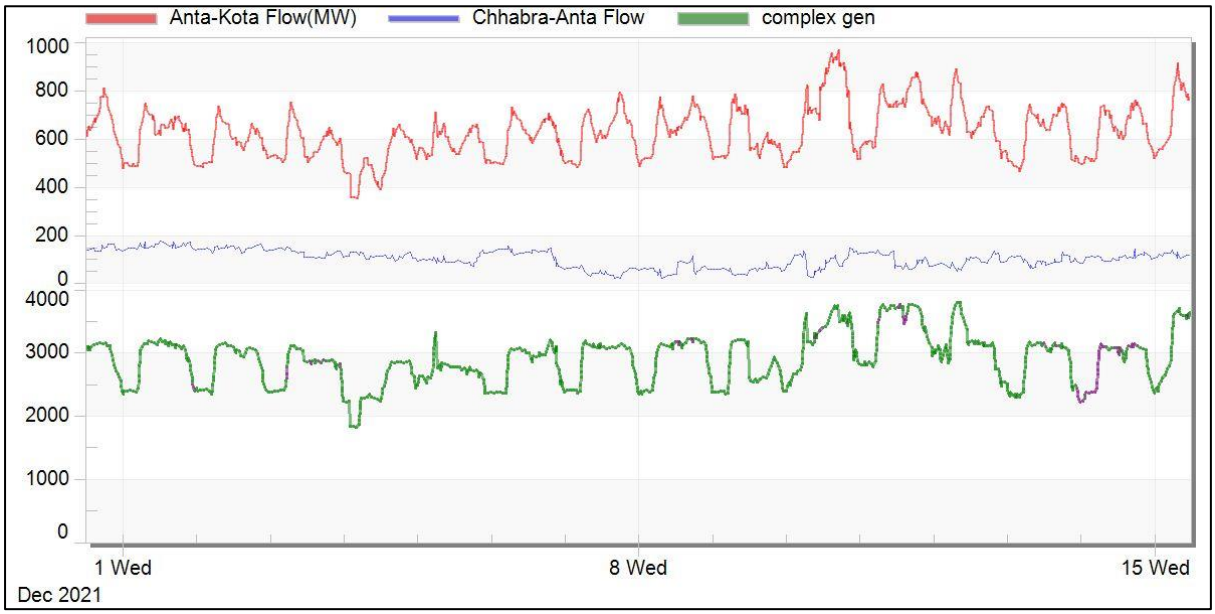
***Members may please discuss.***

## 15. Reliability issues related to Rajasthan control area

Rajasthan has met maximum demand of 14828MW on 9th December 2021. However, some reliability issues are being observed in Rajasthan control area during this high demand season. These are mentioned in detail:

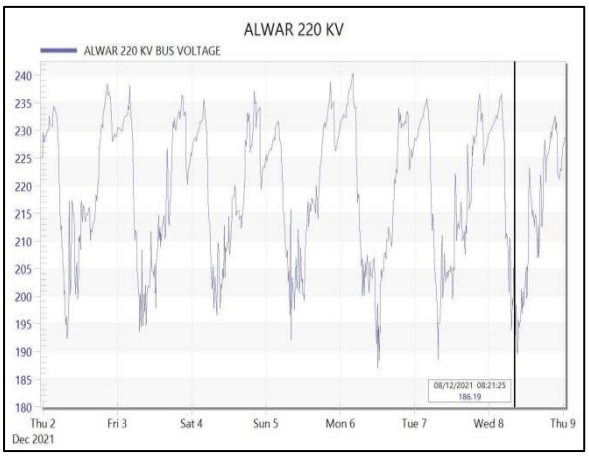
- Severe low voltages are observed in Hindaun and Alwar area.
- N-1 non-compliance observed at 400/220kV Ajmer, Merta, Chittorgarh and Jodhpur ICTs. Plots are attached as Annexure-B.I.
- High loading of 400kV Anta-Kota.
- It is also being observed that the net power requisitioned by SLDC Rajasthan is beyond their ATC limits for number of time blocks.
- It has already been deliberated in many past OCC meetings that while requisitioning power from various sources, states should take care to limit their drawl schedule as well as actual drawal in real time within their Available Transfer Capability (ATC) limits assessed by SLDC and NRLDC.

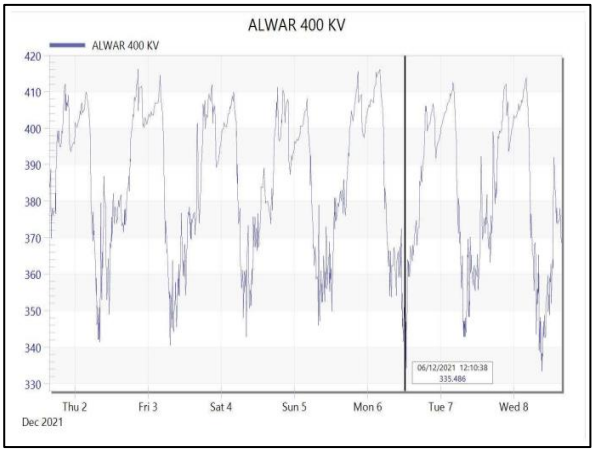


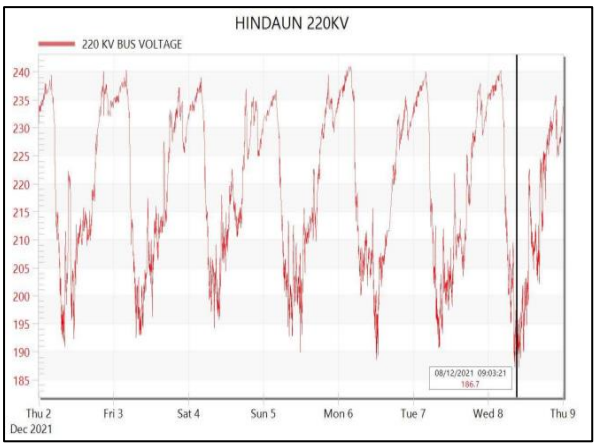



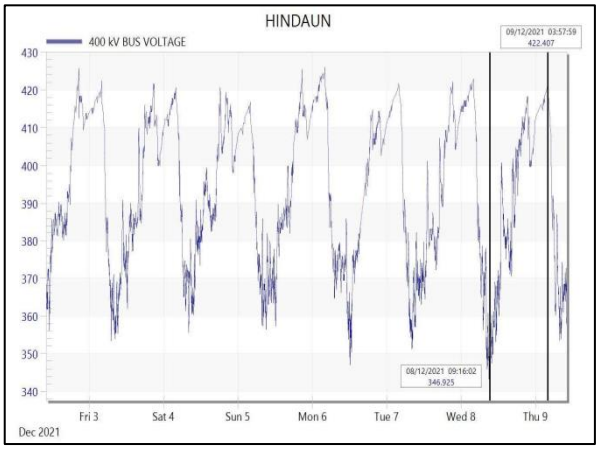

In 47th TCC and 49th NRPC meeting, Rajasthan representative had stated that ICTs at 400kV Chittorgarh, 400kV Merta and 400kV Jodhpur are already planned and send for augmentation to 500MVA capacity at each S/s. It was also mentioned that to mitigate the low Voltage issue at 400kV Alwar, LILO of 400kV Agra-Sikar line at Alwar was proposed by Rajasthan, Rajasthan has already approached to PGCIL and will raise the proposal in Standing committee meeting.

In the meeting, NRLDC representative suggested that till implementation of these schemes, if considerable generation is maintained at Dholpur GTPS, the voltages at Hindaun and Alwar can be improved to some extent. Rajasthan representative replied that generation cost of Dholpur being high, DISCOMs do not agree to requisition power from this station and due to non availability of cheap gas, Dholpur GTPS would not be running.




All these issues were also highlighted by NRLDC vide their letter NRLDC/SO-I/151/1910-1914 dated 10.12.2021 (***Annexure-B.II***).

Rajasthan is once again advised to explore the possibility of operating Dholpur GTPS units or take other necessary actions so that low voltages at Hindaun/Alwar is minimized. Rajasthan SLDC is also advised to control loading of 400/220kV ICTs within their N-1 contingency limits and also limit their schedule within ATC/TTC assessed by Rajasthan SLDC and NRLDC.

***Members may kindly discuss.***

**16. MVAR support from generators**

Following has been discussed and agreed in TCC /NRPC meetings and OCC meetings of the Northern region:

- All generators (including intrastate) shall absorb MVAr as per capability curve
- Reactive power support performance and MVAR telemetry issues will be reviewed in monthly OCC meetings.
- Reactive power capability testing will be carried out after discussion in OCC meeting.

Reactive power response of generating stations is being regularly discussed in OCC meetings.

Reactive power response in respect of MVAr vs Voltage for **past 15 days (01.12.2021 - 15.12.2021)** as per NRLDC SCADA data is enclosed as **Annexure-B.III** in agenda. Based on available data, it is observed that there are margins available as per capability curves for most of the generating stations. In addition, telemetry (sign and magnitude of MVAR) of various state generating station is yet to be corrected.

It was agreed in previous OCC meetings that states shall also develop MVAr vs voltage plots for generators under their jurisdiction. This would help to validate telemetry of MVAr data and eventually, more reliable MVAr vs voltage plots will be available at RLDC and the generators can be instructed accordingly.

All generating stations are requested to resolve any issues related to telemetry and make sure that correct MVAR data from all units are available at RLDC and MVAr is absorbed is as per grid requirement and capability curve of machine. Generating stations need to make sure that the AVR settings and GT tap positions are optimized to achieve the reactive power performance as per grid requirements. It is also requested to share these details with NRLDC.

**Members may like to discuss.**

**17. MVAR support from solar/wind generators**

Numerous tripping of RES plants have occurred in recent past indicating possible non-compliance of standards by RE generators or improper coordination of protection. As already discussed in TCC/NRPC meeting, subgroup formed at NRPC level to look after RE integration may immediately take up the issues at their level. Major areas for discussion include:

- Operation of solar plants in voltage control mode as per grid requirements
- Reactive power performance (absorption/generation) of solar plants during day & night time
- Harmonization of settings among different solar plants including protection settings at lower voltage levels (within plant) to avoid unintended disconnection/ generation reduction
- LVRT/HVRT compliance in real-time grid events
- Installation of adequate reactive compensation before project commissioning stage **as per CEA regulations**

In 189$^{th}$ OCC meeting, it was decided that separate sub-group meeting would be convened by NRPC to discuss all these issues and several actions have also been finalized. It was discussed that a working group has been constituted by Member (GO&D), CEA and this group would be submitting its recommendations shortly. As an interim measure, these recommendations may be implemented in NR.

In 189th OCC meeting, it was discussed that a pilot project has been carried out by SRLDC/SRPC and a report is being prepared in this regard and the same is expected in a week's time. SE (O), NRPC stated that sub group meeting would be called in November 2021 before next OCC meeting to discuss RE related issues and the report prepared by SRPC/SRLDC shall also be referred. Accordingly, SRLDC has issued the report which is available @

https://srldc.in/UploadFiles/NewsAndUpdate/Draft%20Report%20on%20Night%20Mode%20Operation%20(Trial)%20of%20PV%20Inverters.pdf.

**Members may like to discuss on further course of action.**

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

In 188th 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 are once again requested to go through the tentative ATC/TTC limits for January 2022 (**Annexure-B.IV**) and provide comments. However, ATC/TTC assessment has only been received only from HP so far. Rajasthan had shared ATC/TTC calculations with NRLDC on 22.10.2021. On 28.10.2021, NRLDC has shared their observations on basecase as well as simulation studies carried out by Rajasthan. If no comments are received, these limits will be assumed confirmed and uploaded on NLDC website. SLDCs are also requested to upload the limits for winter 2021-22 in their respective websites.

**Punjab**

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**

SPS for Sohawal and Lucknow to be expedited.

**Rajasthan**

Rajasthan had shared ATC/TTC calculations with NRLDC on 22.10.2021. On 28.10.2021, NRLDC has shared their observations on basecase as well as simulation studies carried out by Rajasthan.

Rajasthan was requested to share the revised simulation studies with NRLDC alongwith details of bus-split, other operational changes in system. Rajasthan SLDC was asked 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.

**Delhi**

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.

**In 189th OCC meeting, Delhi representative stated that ATC limits would be uploaded on website from next month onwards and SPS at Mundka would be implemented before next summer season.**

**Haryana**

Haryana SLDC was once again requested to expedite implementation of SPS at 400/220kV Deepalpur and Kurukshetra (PG) to enhance their ATC/TTC limits at the earliest

**HP**

HP has started sharing its ATC assessment since last 3 months in consultation with NRLDC. It was discussed that mostly intrastate constraints were highlighted by HP and the studies were done for lesser import values. HP was advised to assess possible tie-line/ICT constraints with import close to real-time values. **One to one meeting was organized on 03.12.2021 between NRLDC and HP SLDC officials to overcome the challenges being faced by SLDC in ATC/TTC assessment and other issues in PSSe.**

**Uttarakhand**

Uttarakhand has also shared its ATC assessment with NRLDC for winter 2021-22.

**J&K**

Not assessing its ATC. 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. It was informed telephonically that SLDC does not have PSSe software available.
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.punjabsldc.org/downloads/ATC-TTC0321.pdf |
| Haryana | https://hvpn.org.in/#/atcttc |
| Delhi | NA (real-time violation reporting available) |
| Rajasthan | https://sldc.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 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.

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/ November, 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. Basecase and ATC assessment shall be shared with NRLDC by the 10$^{th}$ of every month. NRLDC will incorporate these changes in All India basecase and share the updated basecase as well as observations on ATC/TTC by the 20$^{th}$ of every month. Monthly/ quarterly online meetings will also be organized involving reliability coordinators of SLDCs/RLDC to discuss reliability issues and measures required. It is also requested that net scheduled power requisitioned and scheduled 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.V**).

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.

***Members may please discuss.***

### (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, PSSe basecase, 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) MVAR flow from underlying network to 400kV grid:

Recently, it is being observed that there is MVAR flow from 220kV side to 400kV side due to high MVAR generation by lightly loaded lines. This leads to very high voltages in 400kV and 765kV grid and to manage these, even a large number of lines are being opened on regular basis. Based on SCADA data (Nov-2021) available at NRLDC, the list of several such 400/220kV substations is shown below:

| S. No. | Location | Substation Name |
|---|---|---|
| 1 | Punjab | Malerkotla |
| 2 | | Makhu |
| 3 | | Muktsar |
| 4 | | Nakodar |
| 5 | Delhi | Mandola |
| 6 | | Maharanibagh |
| 7 | | Bamnauli |
| 8 | | Mundka |
| 9 | | Bawana |
| 10 | Haryana | Kirori |

| | | |
|---|---|---|
| 11 | | Manesar |
| 12 | Rajasthan | Jaipur South |
| 13 | | Heerapura |
| 14 | UP | Kanpur (PG) |
| 15 | | Muradnagar |

Utilities are requested to analyse the reasons for MVAR flows from 220kV side to 400kV side and share their plan to mitigate this to minimize high voltages in the grid. Delhi, Haryana, Punjab and Rajasthan are requested to share action plan for high voltage management during winter 2021-22.

**(iv) SPS Implementation at Bhadla (PG)**

The SPS logic decided in the 45th TCC meeting and approved in the 48th NRPC meeting was The SPS logic decided in the 45th TCC meeting and approved in the 48th NRPC meeting was explained to OCC members in 181 OCC meeting. POWERGRID representative had intimated that QR for the SPS tender has already been finalized and NIT may be floated within next two weeks.

181 OCC: QR finalised, tender may be floated in next week

183 OCC: QR approved, tender documents being prepared

186 OCC: Tendering stage, likely to be awarded in Sep'2021

In 187 OCC meeting, POWERGRID representative stated that work is still in tendering stage and the bid opening is scheduled on 23.09.2021.

189 OCC meeting, POWERGRID representative stated that one bid has been received for the work. However, it is new party so evaluation is under process. On enquiry from NRLDC representative, it was stated that order is likely to be placed before next OCC meeting. OCC once again expressed concern on the slow progress of the work.

***POWERGRID to provide update on the latest status.***

**(v) Calculation of actual drawal by states based on SLDC end SCADA data**

As discussed in the 6th TeST meeting all SLDCs shall maintain and monitor their own drawal calculation (alternate calculation) based on the SLDC drawal points. SLDC shall compare its own calculated value of real-time drawal from the grid with drawal computed by RLDC based on ISTS end data to ensure correct assessment of drawal in real time. Corrective measures shall be taken whenever any anomaly is detected between the two drawal computations. 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 based on STU end SCADA also, so that same can be verified with NRLDC end value and any discrepancy can be rectified immediately.

In 188th OCC meeting, MS NRPC expressed concern and asked all the states which are only dependent on RLDC end data to take necessary actions and compute drawl values at SLDC end also. It was also suggested that the agenda be continued in OCC meeting till resolution of issue by all states.

In 189th OCC meeting, MS NRPC stated that NRLDC may request all SLDCs to confirm the status via email. Based on the feedback received, issue may be discussed in next OCC meeting.

Accordingly, an email was circulated to respective SLDCs on 10.12.2021. However, response from SLDCs is yet to be received.

***Members may please discuss.***

## 20. Frequent forced outages of transmission elements in the month of Nov'21

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

| Sl. No. | Element Name | No. of forced outages | Utility/SLDC |
|---|---|---|---|
| 1 | 400 KV Bareilly-Unnao (UP) Ckt-1 | 7 | UP |
| 2 | 400 KV Muradnagar_2-Mathura (UP) Ckt-1 | 5 | UP |
| 3 | 400 KV Orai-Mainpuri (UP) Ckt-2 | 5 | UP |
| 4 | 400 KV Kala Amb(PKTL)-Wangto_GIS(HP) (HPPTCL) Ckt-1 | 5 | PKTL/HP |
| 5 | 400 KV Suratgarh(RVUN)-Ratangarh(RS) (RS) Ckt-2 | 4 | Rajasthan |
| 6 | 500 kV HVDC Rihand-Dadri (PG) Ckt-2 | 4 | POWERGRID |
| 7 | 400 KV Aligarh-Sikandrabad (UP) Ckt-1 | 4 | UP |
| 8 | 220 KV RAPS_A(NP)-Sakatpura(RS) (RS) Ckt-1 | 7 | Rajasthan/NPCIL |
| 9 | 220 KV Bairasiul(NH)-Pong(BB) (PG) Ckt-1 | 6 | NHPC/BBMB/POWERGRID |
| 10 | 220 KV Bairasiul(NH)-Jessore(HP) (PG) Ckt-1 | 4 | NHPC/HP/POWERGRID |

The complete details are attached at **Annexure-B.VI.** 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.

***Members may like to discuss.***

## 21. Multiple element tripping events in Northern region in the month of Nov'21

A total of **11** grid events occurred in the month of Nov'21 of which **2** 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 detailed report received by NRLDC till 05-December-2021 is attached at **Annexure-B.VII.**

Further, despite persistent discussions/follow-up in various OCC/PCC meetings, it is observed that provisions 5.2(r) and 5.9.4(d) of the IEGC, pertaining to reporting of events / tripping to RLDC, is not being complied with by many utilities.

Maximum Fault Duration observed is **440ms** in the event of multiple element tripping at 220 kV Narela (DV) on 27-Nov-21 at 09:24hrs.)

Delayed clearance of fault (more than 100ms for 400kV and 160ms for 220kV system) observed in total **2** events out of **11** grid events occurred in the month. In 2 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 report actions taken by respective utilities in OCC & PSC forum. Moreover, utilities may impress upon all concerned for providing the Preliminary Report, DR/EL & Detailed Report of the events to RLDC in line with the regulations.

***Members may like to discuss***.

**22. Details of tripping of Inter-Regional lines from Northern Region for Nov'21**

A total of 3 inter-regional lines tripping occurred in the month of Nov'21. The list is attached at **Annexure-B.VIII.** Out of 3 number of tripping's, no tripping incident 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 from SLDCs / ISTS licensees / ISGSs is in violation of regulation 5.2(r) of IEGC and regulation 15(3) of CEA Grid Standards. 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 that mandated by CEA (Grid Standard) Regulations.

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

**23. Status of submission of DR/EL and tripping report of utilities for the month of Nov'21**

The status of receipt of DR/EL and tripping report of utilities for the month of Nov 2021 is attached at **Annexure-B.IX**. 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 POWERGRID NR2, HP, UP and Rajasthan in Nov, 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.

**24. Frequency response characteristic:**

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

| S. No. | Event Date | Time (In hrs.) | Event Description | Starting Frequency (in Hz) | End Frequency (in Hz) | *Δf* |
|---|---|---|---|---|---|---|
| 1 | 15-Nov-21 | 13:11hrs | At 13:11Hrs, 220 KV Bhadla (PG)-ESUCRL SL_BHD_PG (ESUCRL) (ESUCRL) Ckt-1 tripped due to snapping of conductor. At the same time, 220 KV Bhadla(PG)-Saurya Urja Solar(SU) (Saurya Urja) Ckt-1&2 and 220 KV Bhadla(PG) - Mahoba Solar(Adani) (Adani) Ckt-1 tripped from remote (solar plant) end. As per SCADA, total solar generation loss of approx. 1787MW is observed at Bhadla (PG) (1430MW), Fatehgarh2 (PG) (240MW) and Bhadla (RS) (117MW). | 50.00 | 49.91 | -0.09 |

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

| States | 15-Nov-21 event | Remarks |
|---|---|---|
| PUNJAB | 2% | |
| HARYANA | 30% | |
| RAJASTHAN | -70% | |
| DELHI | 4% | |
| UTTAR PRADESH | 35% | |
| UTTARAKHAND | 49% | |
| CHANDIGARH | 211% | |
| HIMACHAL PRADESH | 83% | |
| JAMMU & KASHMIR | 17% | |
| NR | 28% | |

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

| Generator | 15-Nov-21 event | Generator | 15-Nov-21 event |
|---|---|---|---|
| Singrauli TPS | 3% | Salal HEP | -4% |
| Rihand-1 TPS | 15% | Tanakpur HEP | -12% |
| Rihand-2 TPS | 7% | Uri-1 HEP | -51% |
| Rihand-3 TPS | 0% | Uri-2 HEP | Suspected SCADA data |
| Dadri-1 TPS | No Generation | Dhauliganga HEP | Suspected SCADA data |
| Dadri -2 TPS | No Generation | Dulhasti HEP | No generation |
| Unchahar TPS | No Generation | Sewa-II HEP | No generation |
| Unchahar stg-4 TPS | 108% | Parbati-3 HEP | No generation |
| Jhajjar TPS | 102% | Jhakri HEP | No generation |
| Dadri GPS | No Generation | Rampur HEP | No generation |
| Anta GPS | No Generation | Tehri HEP | No generation |
| Auraiya GPS | No Generation | Koteswar HEP | Suspected SCADA data |
| Narora APS | -47% | Karcham HEP | No generation |
| RAPS-B | -6% | Malana-2 HEP | No generation |
| RAPS-C | 4% | Budhil HEP | No generation |
| Chamera-1 HEP | No Generation | Bhakra HEP | 0% |
| Chamera-2 HEP | No Generation | Dehar HEP | No generation |
| Chamera-3 HEP | No Generation | Pong HEP | 11% |
| Bairasiul HEP | Suspected SCADA data | Koldam HEP | No generation |
| | | AD Hydro HEP | Suspected SCADA data |

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

| Generator | 15-Nov-21 event | Generator | 15-Nov-21 event |
|---|---|---|---|
| PUNJAB | | UP | |
| Ropar TPS | No generation | Obra TPS | Suspected SCADA data |
| L.Mohabbat TPS | No generation | Harduaganj TPS | No generation |
| Rajpura TPS | -40% | Paricha TPS | No generation |
| T.Sabo TPS | 3% | Rosa TPS | -3% |
| Goindwal Sahib TPS | No generation | Anpara TPS | -6% |
| Ranjit Sagar HEP | 20% | Anpara C TPS | 24% |
| Anandpur Sahib HE | -14% | Anpara D TPS | 15% |
| HARYANA | | Bara TPS | -3% |
| Panipat TPS | 0% | Lalitpur TPS | -15% |
| Khedar TPS | No generation | Meja TPS | 0% |
| Yamuna Nagar TPS | No generation | Vishnuprayag HEP | Suspected SCADA data |
| CLP Jhajjar TPS | 34% | Alaknanda HEP | -2% |
| Faridabad GPS | No generation | Rihand HEP | No generation |
| RAJASTHAN | | Obra HEP | -3% |
| Kota TPS | 8% | UTTARAKHAND | |
| Suratgarh TPS | -5% | Gamma Infra GPS | No generation |
| Kalisindh TPS | -4% | Shravanti GPS | No generation |
| Chhabra TPS | No generation | Ramganga HEP | No generation |
| Chhabra stg-2 TPS | -10% | Chibra HEP | 23% |
| Kawai TPS | 33% | Khodri HEP | 10% |
| Dholpur GPS | No generation | Chilla HEP | Suspected SCADA data |
| Mahi-1 HEP | No generation | HP | |
| Mahi-2 HEP | No generation | Baspa HEP | -29% |
| RPS HEP | No generation | Malana HEP | No generation |
| JS HEP | -4% | Sainj HEP | No generation |
| DELHI | | Larji HEP | 12% |
| Badarpur TPS | No generation | Bhabha HEP | -23% |
| Bawana GPS | 116% | Giri HEP | No generation |
| Pragati GPS | -10% | J&K | |
| | | Baglihar-1&2 HEP | -5% |
| | | Lower Jhelum HEP | No generation |

| Status of Data received of FRC of Grid event occurred at Teesta III on 15.11.2021 | | | |
|---|---|---|---|
| Data Received from | | Data Not Received from | |
| UP | Singrauli NTPC (Field data) | HP | Rihand NTPC |
| Delhi | TSPL (Field data) | UK | APCPL Jhajjar |
| Haryana | NHPC | J&K | Tehri HEP |
| | Rosa(Reliance) (Field data) | Punjab | ADANI (Kawai) |
| | Koteshwar HEP (Field data) | BBMB | Others |
| | | Rajasthan | |
| | | | |
| | | | |

PFR as per Generator field data:

Primary Frequency Response by Generators during Grid Event at Bhadla(PG) on 15th Nov 2021:

| Sr. No | Generating stations | FRC as per generator data (in %) | FRC as per SCADA data at NRLDC (in %) | Response category/Remark |
|---|---|---|---|---|
| 1 | **Singrauli Unit 6** | 13.18 | 3 | Unsatisfactory response |
| 2 | **Singrauli Unit 7** | 15.29 | | |
| 3 | **TSPL** | 70 | 3 | Satisfactory response |
| 4 | **Rosa TPS** | 16.58 | -3 | Unsatisfactory response |
| 5 | **Koteshwar HEP** | 23.35 | Suspected SCADA data | 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 NHPC, Delhi, Haryana & UP control area.

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

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

In last 10 OCC meetings, 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 08th December 2021 is attached as **Annexure-B.X**

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-response test 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 nrldcso2@gmail.com respectively.

In 189th OCC meeting, Members were requested to accord due priority in this regard and update about their future plan for PSS tuning by 30th November, 2021. However, no further updates have been received till date. It is to be noted that as per regulation 5.2(k) of IEGC, Power System Stabilizers (PSS) in AVRs of generating units (wherever provided), shall be got properly tuned by the respective generating unit owner as per a plan prepared for the purpose by the CTU/RPC from time to time.

All concerned ISGSs and SLDCs are therefore once again requested to finalize their plan for PSS tuning and inform the same to NRPC & NRLDC by 30th December, 2021. A separate meeting may be call for detail discussion on this matter.

***Members may please discuss***.

**26. 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 lean hydro period and therefore appropriate 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 proposed schedule for the Mock Black start exercise is as follows:

Hydro Power Stations:

| Date | Revised Schedule date | Name of stations | Comment and Remarks |
|---|---|---|---|
| 26-Nov-21 | | * Uri-I, II HEP, Lower Jhelum HEP, Pampore GT's, Upper Sindh and Kishanganga. | Yet to be carried out. No information has been received from J&K about URI-I, Uri-II.<br><br>Integration of Mock black start exercise in SCADA system at Kishanganga power station yet to be done by BHEL (OEM). BHEL is being pursued for its expedition. Hence the Mock exercise at Kishanganga shall be possible only after completion of above by OEM. |
| 01-Dec-21 | 22-Dec-21 | * Dhauliganga | To be carried out. As discussed with NHPC & UP SLDC the exercise is planned to be carried out on 22nd December, 2021. |
| 04-Dec-21 | 23-Dec-21 | Bairasiul | To be carried out. As requested by HP SLDC. |
| 08-Dec-21 | | *Sewa-2 | Mock Black start exercise is not possible as Power Station is under complete shutdown due to HRT repair works.. |
| 10-Dec-21 | Last week of Dec 2021 | * N. Jhakri and Rampur | Yet to be carried out. As requested by Jhakri HEP & HP SLDC. |
| 15-Dec-21 | 24-Dec-21 | Karcham and Baspa | Yet to be carried out. As discuss with Karcham HEP & Baspa HEP. |
| 17-Dec-21 | After 15th Jan 2022 | *Budhil | Yet to be carried out. As discussed with Budhil HEP the exercise is planned to be carried out after 15th January, 2022. |
| 22-Dec-21 | | Parbati-3 and Sainj | Yet to be carried out. |
| 24-Dec-21 | | *Salal | Yet to be carried out. |
| 29-Dec-21 | During March 2022 | *Chamera-3 | As requested by NHPC. |

| Date | Revised Schedule date | Name of stations | Comment and Remarks |
|---|---|---|---|
| 31-Dec-21 | 19th Jan 2022 | Koteshwar | As requested by Koteshwar HEP. |
| 05-Jan-22 | After 25th Jan 2022 | Chamera-1 and Chamera-2 | Considering the proposed complete s/d of CH-1 PS for HRT inspection w.e.f. 01st Dec. 2021, the mock black start exercise may be postponed and same may be scheduled after 25 Jan 2022. |
| 08-Jan-22 | | Malana-2, AD Hydro and Phozal | Yet to be carried out. |
| 12-Jan-22 | | Tehri | Yet to be carried out. |
| 15-Jan-22 | | Koldam | Yet to be carried out. |

* 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 to be selected for black start, may preferably be different from the one tested during last year exercise. Also **Constituents are requested to adhere to the finalized schedule of mock exercises during the current season**.

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 | | Mahi-I&II | 2x25+2x45 |
| 12 | | Rana Pratap Sagar | 4x43 |
| 13 | | Jawahar Sagar | 3x33 |

| | | | |
|---|---|---|---|
| 14 | Rajasthan | 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<br>21 | | Srinagar (Alaknanda) | 4x82.5 |
| | 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 in respect of intra-state generators 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 may please be apprised to NRLDC.

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***.

**27. Multiple element tripping at 400/220kV Moradabad(UP):**

Multiple element tripping was reported from 400/220kV Moradabad S/S on 03/12/2021 at 22:20 hrs. As per SCADA, load loss of approx. 110MW is observed in UP control area. In antecedent condition, 400 KV Moradabad(UP)-Hapur(UP) (PG) Ckt-1, 400 KV Moradabad(UP)-Kashipur(UK) (UK) Ckt-1, 400 KV Bareilly(PG)-Moradabad(UP) (PG) Ckt-1 & Ckt-2 were carrying 120MW, 98MW, 200MW & 200MW respectively. The three 400/220kV ICTs were supplying a load of 181MW to the 220kV system downstream of Moradabad.

It was reported that the R-ph bushing of 50MVAR bus reactor which was charged through the transfer bus of 400/220kV Moradabad S/Stn, got burst. UP SLDC further reported that the fault was outside the protected zone of differential protection of the bus reactor and bus bar protection also did not operate. Thus the fault was isolated from 400kV system with the tripping of 400 KV Hapur(UP)-Moradabad(UP) (PG) Ckt-1, 400 KV Moradabad(UP)-Kashipur(UK) (UK) Ckt-1, 400 KV Bareilly(PG)-Moradabad(UP) (PG) Ckt-1 & Ckt-2 from respective remote ends by operation of Z-2 distance protection. 220kV feeders to Amroha and Sambhal also tripped from

remote ends in Z-2 protection (line to Rampur was not in service). 400/220 kV 500 MVA ICT 1, ICT 2 & 240MVA ICT 3 at Moradabad(UP) were hand tripped from LV side.

As per PMU data of Bareilly recorded at NRLDC, R-N phase to earth fault which later converted into three phase fault with delayed clearance in 440ms is observed.

In this regard, a letter (attached as **Annexure-B.XI**) has been sent from NRLDC requesting to clarify the following:

- Reason for non-operation of primary protection of the 50MVAR bus reactor at Moradabad end. Whether the fault was located outside the bus bar protection zone.
- The above may please be elaborated with the help of a detailed SLD of Moradabad 400/220kV S/Stn, with CT locations for busbar and reactor differential protections clearly indicated therein.
- As per PMU, delayed clearance of fault in 440ms is observed.
- Reason for tripping of the lines connected to 220kV side of 400/220KV Moradabad S/s before tripping of the 400/220kV ICTs and relay flags noted for these lines.
- It is also requested to kindly share the settings of reactor differential protection, busbar differential protection, backup over current & E/F protection of the 400/220kV ICTs and protection of the 220kV lines connected to Moradabad for assessing proper protection coordination of elements.

***Members may kindly discuss.***

**28. Revision of document for Reactive Power Management and System Restoration Procedure (SRP) for Northern Region:**

Reactive Power Management document for Northern region has been revised on 31st Dec 2020 and updated document link is as below:

https://nrldc.in/download/nr-reactive-power-management-2021/.

NRLDC letter in this regard was attached as Annexure in last OCC agenda.

Document is password protected and password was already informed to all the NR constituents through letter dated 31st Dec 2020.

- Constituents were requested to provide the feedback, suggestion and updated information by 15th Dec 2021.
- Data from POWERGRID-NR1 & NHPC has been received till date.

System restoration procedure document for Northern region has been revised on 31st January 2021& updated document link is as below:

https://nrldc.in/wp-content/uploads/2021/01/System-Restoration-Procedure_NR_2021.pdf

Document is password protected and for password request can be sent to nrldcso2@gmail.com Constituents are requested to go through the document and provide any modification/addition in respect of their system. SLDC/Generating utilities are requested to kindly update and share the restoration procedure in respect of their state/generating station.

- Constituents are requested to provide the feedback, suggestion and updated information by 31st Dec 2021

***All the NR constituent may kindly go through these documents and provide the feedback, suggestion if any. All the state SLDCs are also requested to kindly prepare these documents for their own control area.***

*****

## 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:<br>◎ CHANDIGARH — Sep-2019<br>◎ DELHI — Nov-2021<br>◎ HARYANA — Apr-2021<br>◎ HP — Mar-2021<br>◎ J&K and LADAKH — Not Available<br>◎ PUNJAB — Aug-2021<br>◎ RAJASTHAN — Nov-2021<br>◎ UP — Sep-2021<br>◎ UTTARAKHAND — Nov-2021<br>All States/UTs are requested to furnish updated status on monthly basis. |
| 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:<br>◎ CHANDIGARH — Not Available<br>◎ DELHI — Sep-2021<br>◎ HARYANA — Sep-2021<br>◎ HP — Oct-2021<br>◎ J&K and LADAKH — Not Available<br>◎ PUNJAB — Mar-2021<br>◎ RAJASTHAN — Sep-2021<br>◎ UP — Sep-2021<br>◎ UTTARAKHAND — Mar-2021<br>◎ BBMB — Sep-2021<br>All States/UTs are requested to furnish updated status on monthly basis. |
| 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.<br>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:<br>◎ HARYANA — Feb-2021<br>◎ PUNJAB — Sep-2021<br>◎ RAJASTHAN — Oct-2021<br>◎ UP — Sep-2021<br>◎ NTPC — May-2021<br>FGD status details are enclosed as **Annexure-A.I.II**.<br>All States/utilities are requested to furnish updated status of FGD installation progress on monthly basis. |
| 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 | 400kV Reactors - LOA issued on dated. 17.08.2021 and date of completion of project is 18 months from the date of LOA.<br>220kV Reactors - LOA issued on dated 19.07.2021 and date of completion of project is 18 months from the date of LOA. |
| ix | PUNJAB | Nakodar | 1x25 MVAr at 220 kV | 220kV Reactors - LOA issued on dated 19.07.2021 and date of completion of project is 18 months from the date of LOA. |
| 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 Mar' 22. |
| 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 Mar' 22. |
| 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 Mar' 22. |

| | | | | |
|---|---|---|---|---|
| xiv | RAJASTHAN | Barmer & others | 13x25 MVAr | Agreement signed on dt. 22.06.2020. Grant of Ist Installment received on dt.19.02.21. Technical bid opened on 22.10.2021 |
| xv | RAJASTHAN | Jodhpur | 1x125 MVAr | Agreement signed on dt. 22.06.2020. Grant of Ist Installment received on dt.19.02.21. Technical bid opened on 22.10.2021 |

| 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 | Commissioning of ICT<br>Commissioning of Bays<br>Jun/Sep'14 | Shajahnapur-Azimpur D/C line | | Connected to load on 28.07.2021 |
| | | | | LILO of 220kV Shajahanpur - Sitapur at Shajahanpur PG | Dec'21 | Updated in 188th 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 | Commissioning of ICT<br>1st -Dec'13<br>2nd - Mar'14<br>3rd - Mar'19<br>Commissioning of Bays<br>4 bays - Dec'13<br>2 bays - Mar'14<br>2 bays - Mar'19 | 220 kV D/C Hamirpur-Dehan line.<br>Original schedule: Dec' 2020 | Dec'21 | Updated in 188th OCC |
| 3 | Sikar 400/220kV, 1x 315 MVA S/s | 2 Nos. of 220 kV bays | Commissioned (date not available) | Not available | Dec'21 | Work order was placed on dt. 13.04.2020 to M/s A to Z Ltd. Work started on dt. 4.12.2020. S/S-32/32, T/E-31/32 (T/E at 27 no. location was pending due to Rajasthan High Court stay), T/S- 7.62/8.122 km completed. Now the stay has been vacated and balance work started. Tentative date of completion of work / line charging is 31.12.2021. |
| 4 | Bhiwani 400/220kV S/s | 6 nos. of 220kV bays | Commissioned (date not available) | 220kV Bhiwani (PG) - Isherwal (HVPNL) D/c line | Mar'22 | 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 |

Annexure-A.I.II

# FGD Status

## Updated status of FGD related data submission

| |
|---|
| **NTPC (30.09.2021)** |
| MEJA Stage-I |
| RIHAND STPS |
| SINGRAULI STPS |
| TANDA Stage-I |
| TANDA Stage-II |
| UNCHAHAR TPS |
| **UPRVUNL (22.11.2021)** |
| ANPARA TPS |
| HARDUAGANJ TPS |
| OBRA TPS |
| PARICHHA TPS |

| |
|---|
| **PSPCL (22.11.2021)** |
| GGSSTP, Ropar |
| GH TPS (LEH.MOH.) |
| **RRVUNL (09.12.2021)** |
| CHHABRA SCPP |
| CHHABRA TPP |
| KALISINDH TPS |
| KOTA TPS |
| SURATGARH SCTPS |
| SURATGARH TPS |

# Updated status of FGD related data submission

| |
|---|
| **Adani Power Ltd. (28.10.2021)** |
| KAWAI TPS |
| **Lalitpur Power Gen. Co. Ltd. (22.10.2021)** |
| Lalitpur TPS |
| **Lanco Anpara Power Ltd. (22.10.2021)** |
| ANPARA-C TPS |
| **Rosa Power Supply Company (22.10.2021)** |
| Rosa TPP Phase-I |
| **Prayagraj Power Generation Company Ltd. (22.10.2021)** |
| Prayagraj TPP |
| **APCPL (30.09.2021)** |
| INDIRA GANDHI STPP |

# Pending submissions

| |
|---|
| **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: 31-12-2024), KAWAI TPS U#2 (Target: 31-12-2024) |
| **APCPL** | INDIRA GANDHI STPP U#1 (Target: 30-06-2022), INDIRA GANDHI STPP U#2 (Target: 30-06-2022), 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: 30-06-2022), DADRI (NCTPP) U#6 (Target: 30-06-2022), 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: 31-03-2023), SINGRAULI STPS U#2 (Target: 31-03-2023), SINGRAULI STPS U#3 (Target: 31-03-2023), SINGRAULI STPS U#4 (Target: 31-03-2023), SINGRAULI STPS U#5 (Target: 31-03-2023), SINGRAULI STPS U#6 (Target: 31-01-2023), SINGRAULI STPS U#7 (Target: 31-01-2023), UNCHAHAR TPS U#1 (Target: 30-09-2023), UNCHAHAR TPS U#2 (Target: 30-09-2023), UNCHAHAR TPS U#3 (Target: 31-12-2023), UNCHAHAR TPS U#4 (Target: 31-12-2023), UNCHAHAR TPS U#5 (Target: 31-12-2023), UNCHAHAR TPS U#6 (Target: 30-09-2022), MEJA Stage-I U#1 (Target: 31-12-2022), MEJA Stage-I U#2 (Target: 31-12-2022), TANDA Stage-I U#3 (Target: ), TANDA Stage-I U#4 (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: 31-12-2024), LALITPUR TPS U#2 (Target: 30-09-2024), LALITPUR TPS U#3 (Target: 30-06-2024) |
| **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: 31-12-2024), PRAYAGRAJ TPP U#2 (Target: 31-12-2024), 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: 31-12-2024), ROSA TPP Ph-I U#4 (Target: 31-12-2024) |
| **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: 30-12-2021), ANPARA TPS U#7 (Target: 22-03-2021), 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) |

Annexure-A.II

उत्तर प्रदेश राज्य भार प्रेषण केन्द्र
उ0प्र0पॉवर ट्रांसमिशन कारपोरेशन लि0
(उत्तर प्रदेश सरकार का उपक्रम)
यू0पी0एस0एल0डी0सी0 परिसर, विभूति खण्ड–II
गोमती नगर, लखनऊ–226010
दूरभाष:
ई–मेल : cepso@upsldc.org

**U.P. State Load Despatch Centre**
U.P. Power Transmission Corporation Ltd.
(A U.P. Govt. Undertaking)
UPSLDC Complex, Vibhuti Khand – II
Gomti Nagar, Lucknow- 226010
Phone:
E-mail: cepso@upsldc.org

No: - 2925 /CE(PSO)/SE(R&A)/EE-II/ Islanding Dated: - 1 | 12 | 2021

**Member Secretary,**
**NRPC 18-A, SJSS Marg,**
**Katwaria Sarai, New Delhi – 110016**

**Subject: Regarding dynamic study for proposed Unchahar and Agra Islanding Scheme in UP Control Area.**

As per the discussion held in 189th OCC meeting of NRPC, New Delhi, details of proposed Islanding Schemes under implementation in Uttar Pradesh Control Area are as below:

| S.no | Name of Islanding Scheme | Reason for study |
|---|---|---|
| 1. | Agra Islanding Scheme | a) Involvement of Transmission line of 765kV Voltage.<br>b) Length of 765kV Transmission line is around 370km.<br>c) Involvement of 39 Buses system for the Islanding. |
| 2. | Unchahar Islanding Scheme | a) Involvement of additional 1x500MW unit at Unchahar TPS.<br>b) Involvement of around 30 Buses for Island.<br>c) As per the scheme, isolation of Island at 33kV has been proposed. This aspect need to be studied. |

It was deliberated in the above meeting that during any contingency for ensuring higher survival of Islands, dynamic study is essential. Also before doing any investment on the project, proper study and planning is must for successful implementation and operation.

As it is known that Central Power Research Institute, Bengaluru (An independent body under Ministry of Power GoI) is pioneer in the county for carrying out such studies.

Hence it would be better that all required studies should be done by CPRI, Bengaluru for ensuring a reliable and stable island during contingencies. It is also intimated that SLDC/STU don't have expertise in such studies.

**(Emaduddin khan)**
Chief Engineer (PSO)

O/c
01/12/21

No: - 2925 /CE(PSO)/SE(R&A)/EE-II/ Islanding Dated: - 1 | 12 | 2021

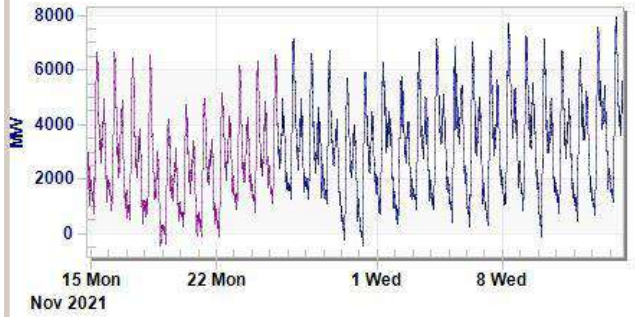
Copy forwarded to following for information and necessary action:-

1. Director (SLDC), Vibhuti Khand – II, Gomti Nagar, Lucknow.
2. Director (Operation), UPPTCL, 11th Floor, Shakti Bhawan Extn., Lucknow. (director_op@upptcl.org)
3. General Manager, NRLDC, 18 – A SJSS Marg, Katwaria Sarai, New Delhi, 110016.

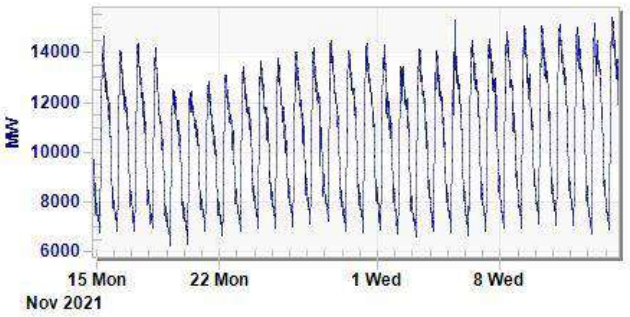
**(Emaduddin khan)**
Chief Engineer (PSO)

O/c

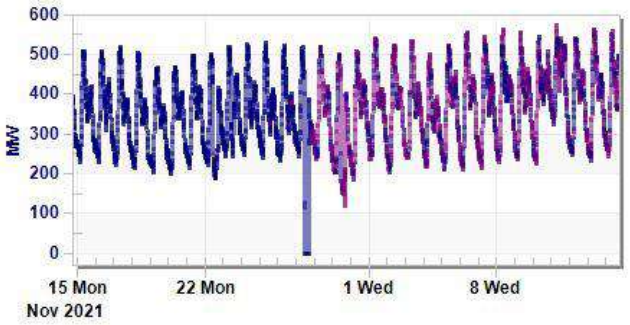
**Rajasthan import**



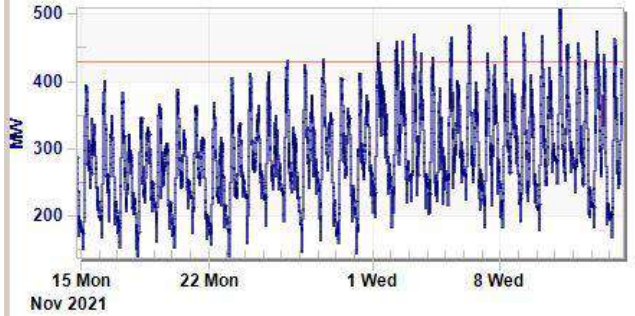

**Rajasthan Load**



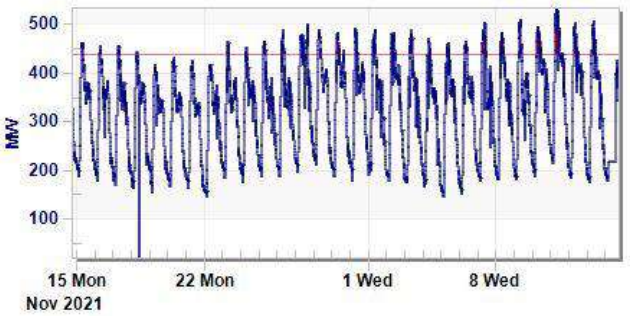

**Ajmer ICT loading**



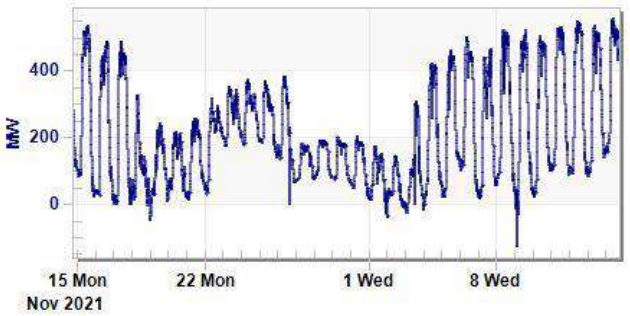

**Jodhpur ICT loading**



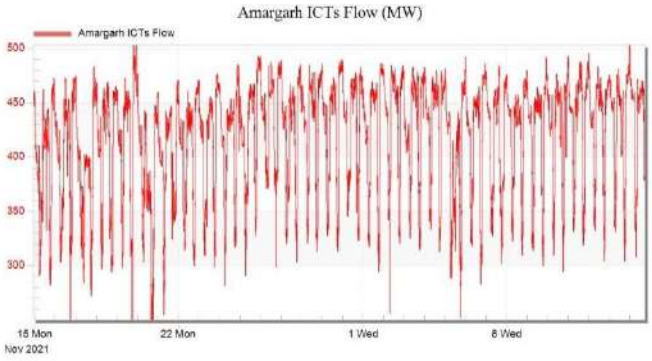

**Merta ICT loading**



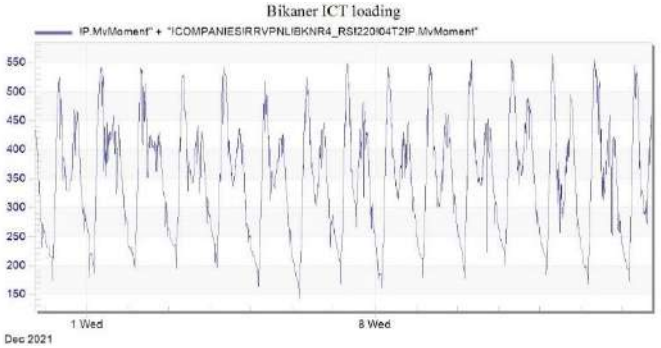

**Chittorgarh ICT loading**



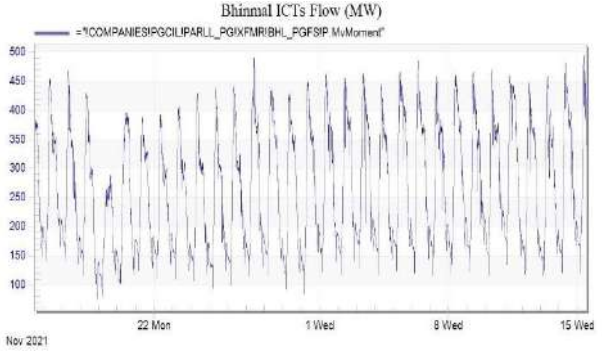

Amargarh ICTs Flow (MW)




Bikaner ICT loading




Bhinmal ICTs Flow (MW)



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 सं°:** NRLDC/SO-I/151/ 1910 -1914 **दिनांक:** 10th December 2021

**To**

Chief Engineer,
State Load Dispatch Centre.
Rajasthan Rajya Vidyut Prasaran Nigam Ltd.,
Ajmer Road, Heerapura, Jaipur-302024.

**Sub :** Low voltages at 400 kV Hindaun, Alwar.

Sir,

As we are aware that with onset of winters, the demand of Rajasthan is in increasing trend and it has touched the all time high 15077MW at 08:28Hrs on 09.12.2021 so far. The demand may further increase in the coming days which may certainly deteriorate voltages profile further. Any tripping of generation at (Kawai+Kalisindh+Chabra) complex at such low voltage may lead to voltage collapse in these pockets.

It is pertinent to mention that low voltage issue of Alwar and Hindaun has already been deliberated in various OCC, 44th TCC-47th NRPC, and 47th TCC-49th NRPC meetings also. Even after assurance given by SLDC Rajasthan that issue will be resolved before 2021-22 winters, the low voltage issue is still persisting at alarming level from the beginning of this winters itself.

The voltage profiles of Alwar and Hindaun for the last few days are attached for reference.

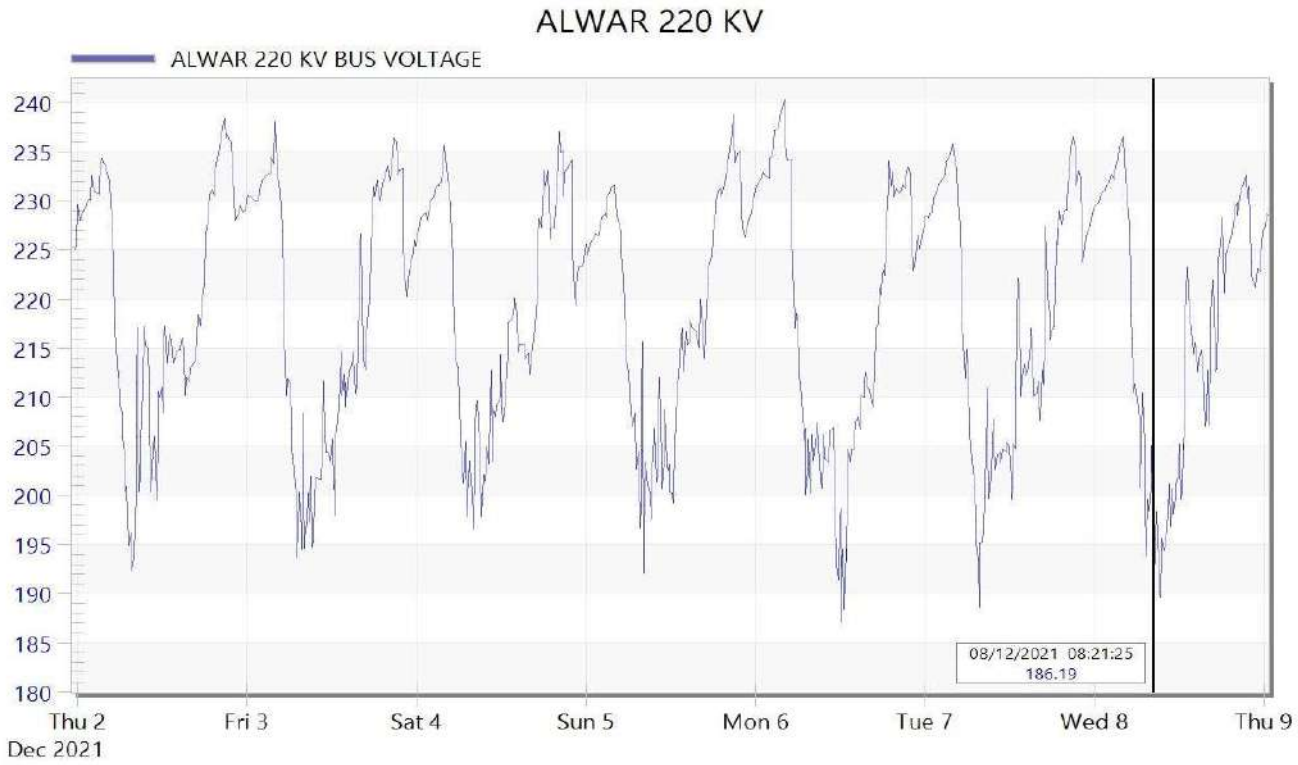
In view of above, it is requested to kindly look into the matter and take suitable measures to mitigate the low voltage issues at these stations for reliable and secure grid operation.

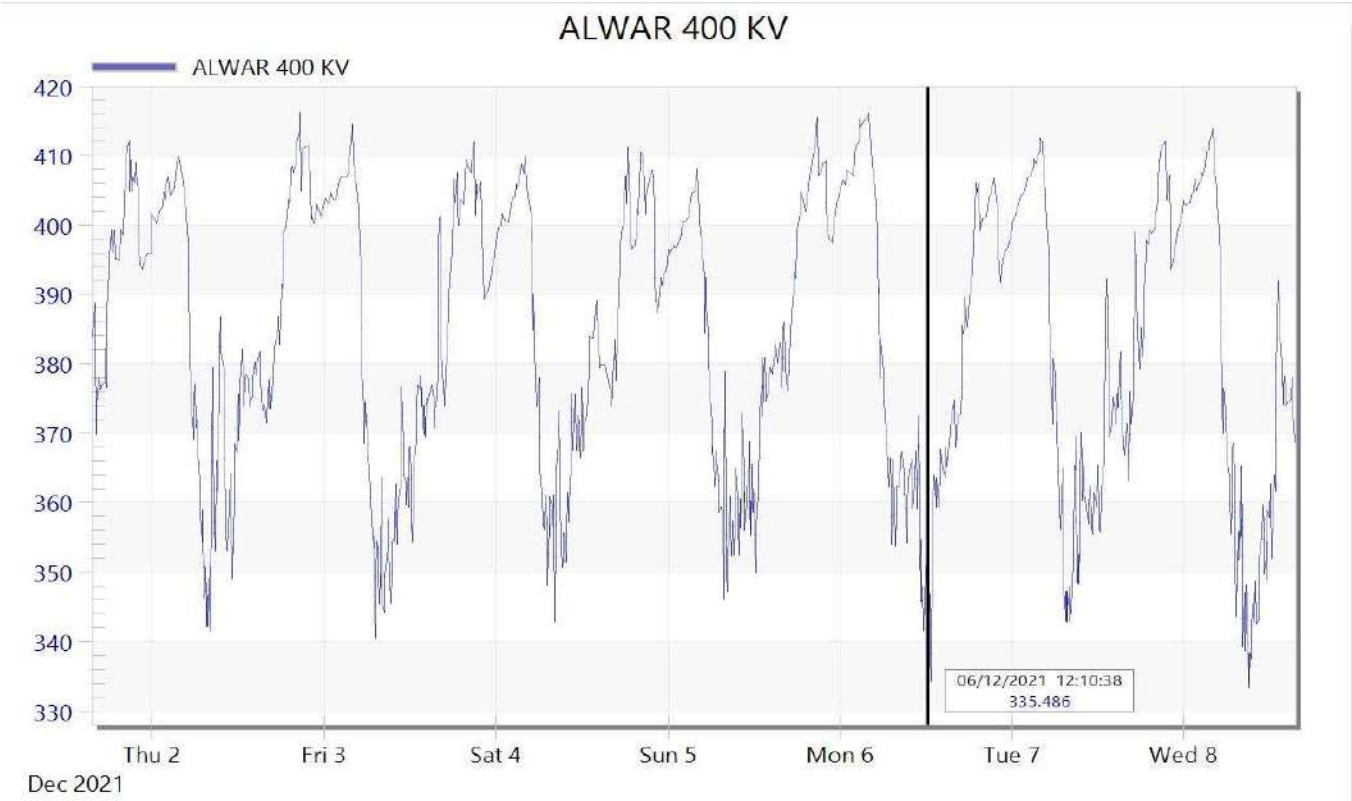
Thanks and Regards

M. M. Hassan
GM(SO-I), NRLDC

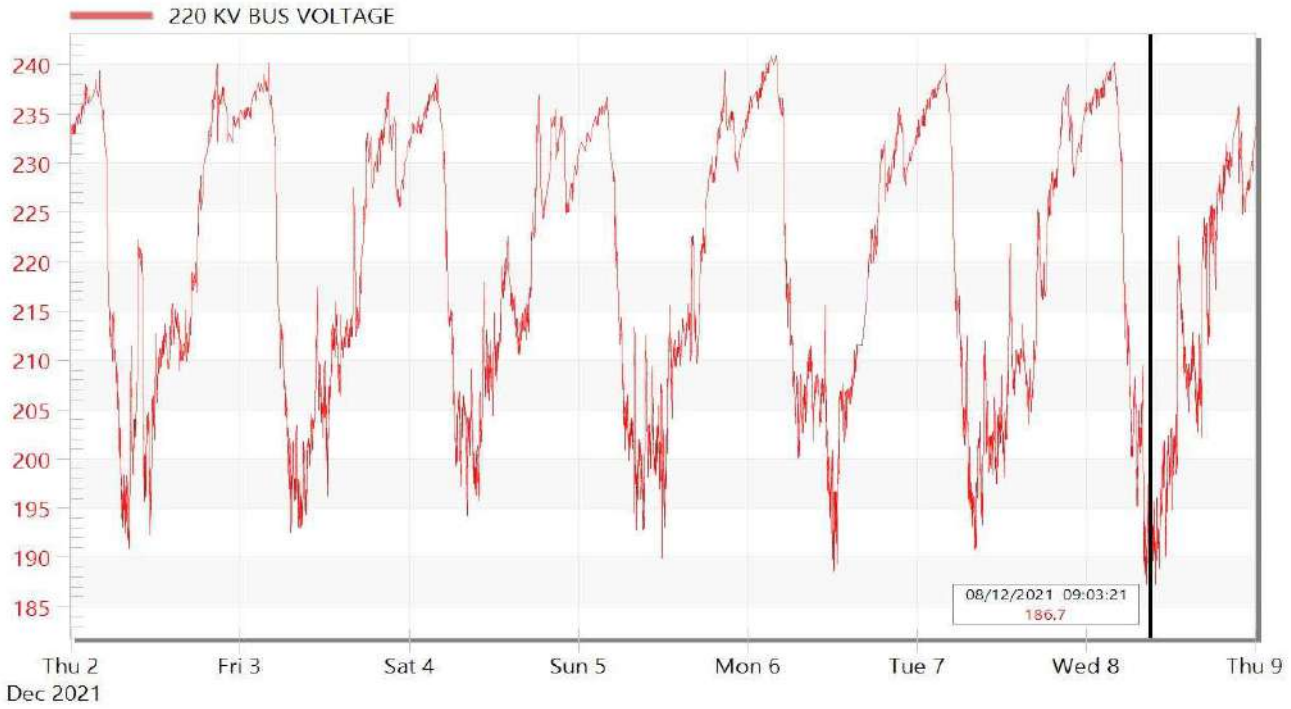
Copy for kind Information :
1. Member Secretary, NRPC
2. Executive Director, NLDC
3. CGM (I/C),NRLDC
4. CGM(SO-I/SL-II), NRLDC

ANNEXURE-I

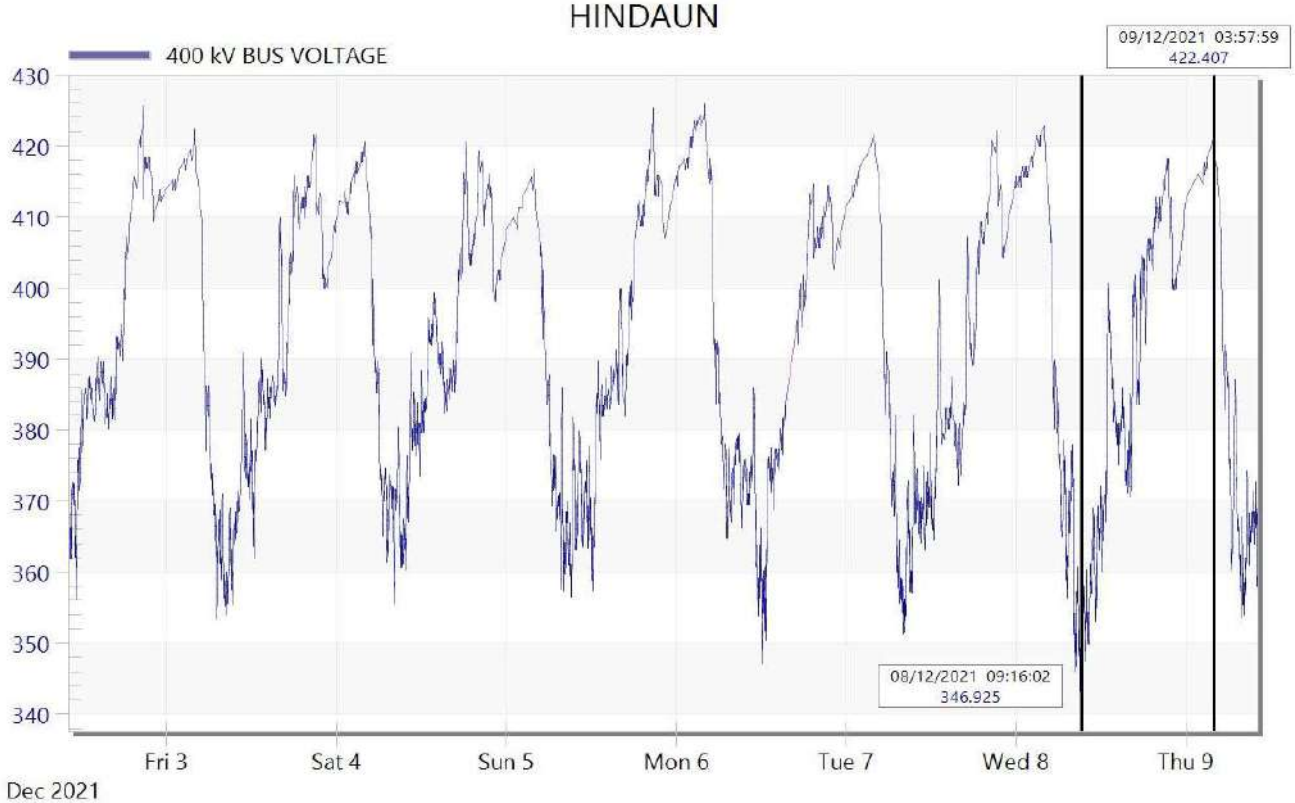

ALWAR 220 KV
ALWAR 220 KV BUS VOLTAGE
240
235
230
225
220
215
210
205
200
195
190
185
180
08/12/2021 08:21:25
186.19
Thu 2
Dec 2021
Fri 3
Sat 4
Sun 5
Mon 6
Tue 7
Wed 8
Thu 9


ALWAR 400 KV
ALWAR 400 KV
420
410
400
390
380
370
360
350
340
330
06/12/2021 12:10:38
335.486
Thu 2
Dec 2021
Fri 3
Sat 4
Sun 5
Mon 6
Tue 7
Wed 8

## HINDAUN 220KV

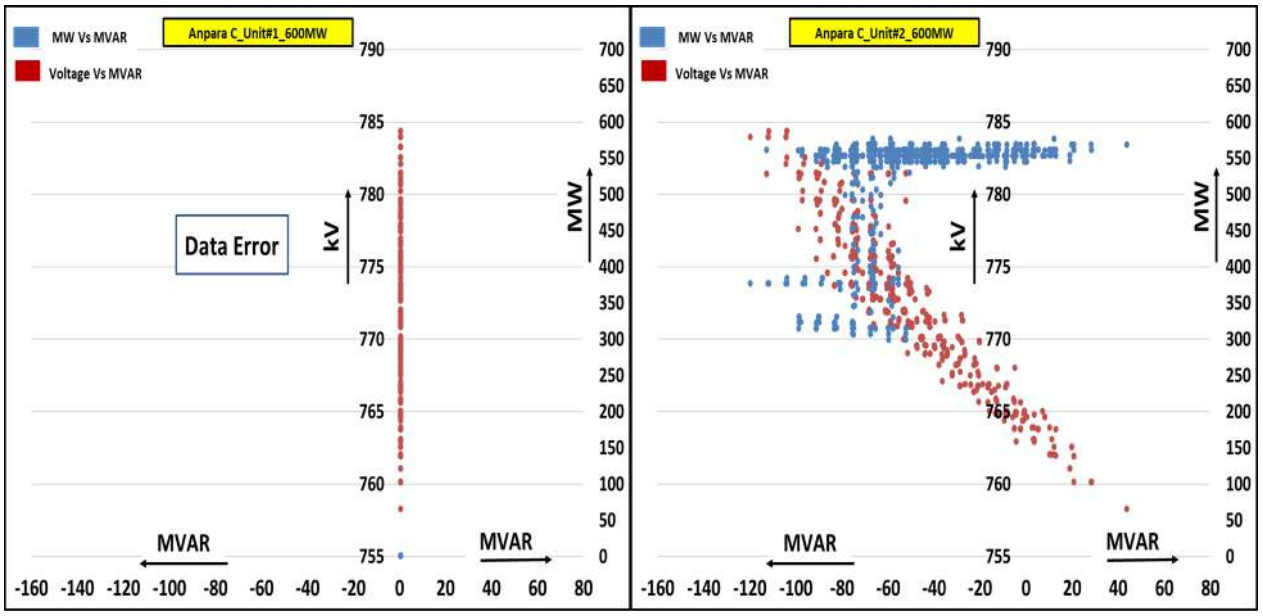



## HINDAUN

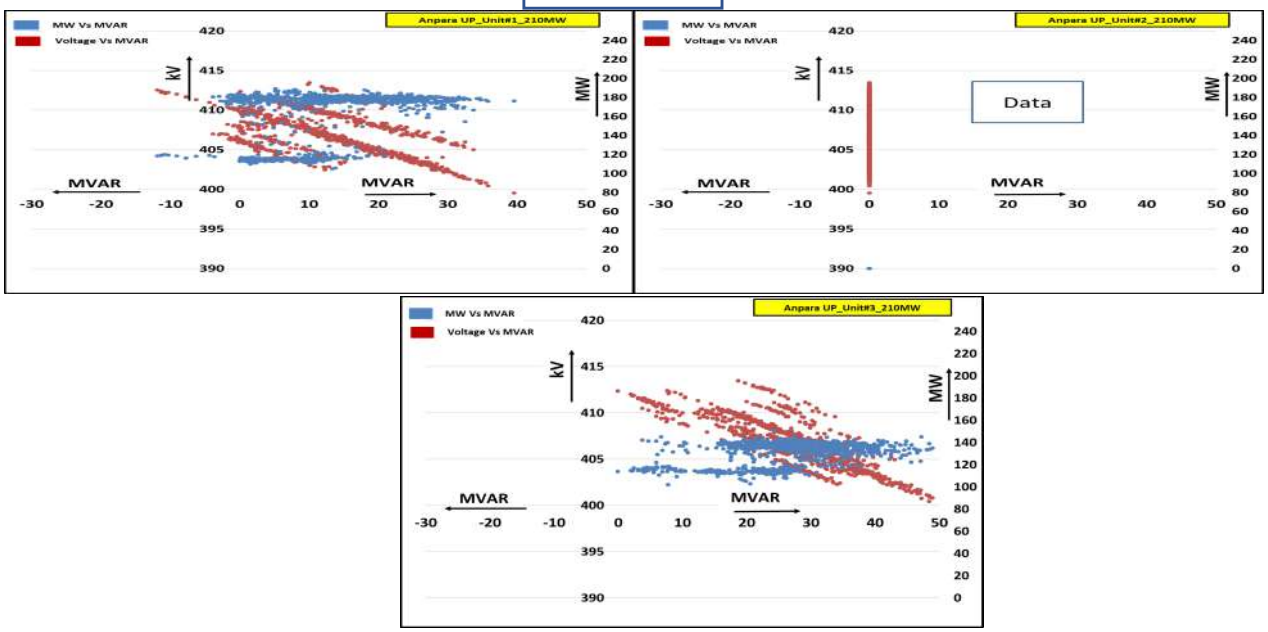


| S.No. | Station | Unit No. | Capacity | Geographical location | MVAR capacity as per capability curve | MVAR performance (-) Absorption (+) Generation | Voltage absorption above (in KV) |
|---|---|---|---|---|---|---|---|
| 1 | Dadri NTPC | **1** | 490 | Delhi-NCR | -147 to 294 | - | - |
| | | 2 | 490 | | -147 to 294 | - | - |
| 2 | Singrauli NTPC | 1 | 200 | UP | -60 to 120 | -25 to 5 | 404 |
| | | 2 | 200 | | -60 to 120 | -25 to 5 | 405 |
| | | 3 | 200 | | -60 to 120 | -15 to 15 | 408 |
| | | 4 | 200 | | -60 to 120 | -25 to 0 | 404 |
| | | 5 | 200 | | -60 to 120 | -20 to 0 | 402 |
| | | 6 | 500 | | -150 to 300 | -90 to 0 | 400 |
| | | 7 | 500 | | -150 to 300 | -90 to 0 | 402 |
| 3 | Rihand NTPC | 1 | 500 | UP | -150 to 300 | -100 to -40 | 402 |
| | | 2 | 500 | | -150 to 300 | -90 to 0 | 405 |
| | | 3 | 500 | | -150 to 300 | -100 to -50 | 400 |
| | | 4 | 500 | | -150 to 300 | -100 to -20 | 404 |
| 4 | Kalisindh RS | 1 | 600 | Rajasthan | -180 to 360 | data error | |
| | | 2 | 600 | | -180 to 360 | | |
| 5 | Anpara C UP | 1 | 600 | UP | -180 to 360 | - | - |
| | | 2 | 600 | | -180 to 360 | -120 to 40 | 765 |
| 6 | TalwandiSaboo PB | 1 | 660 | Punjab | -198 to 396 | -220 to 0 | 408 |
| | | 2 | 660 | | -198 to 396 | -220 to 0 | 408 |
| | | 3 | 660 | | -198 to 396 | - | - |
| 7 | Kawai RS | 1 | 660 | Rajasthan | -198 to 396 | -100 to 0 | 400 |
| | | 2 | 660 | | -198 to 396 | -100 to 0 | 400 |
| 8 | IGSTPP Jhajjar | 1 | 500 | Haryana | -150 to 300 | -100 to 120 | 420 |
| | | 2 | 500 | | -150 to 300 | -80 to 100 | 418 |
| | | 3 | 500 | | -150 to 300 | - | - |
| 9 | Rajpura (NPL) | 1 | 700 | Punjab | -210 to 420 | -130 to 0 | 404 |
| | | 2 | 700 | | -210 to 420 | - | - |
| 10 | MGTPS | 1 | 660 | Haryana | -198 to 396 | -140 to 0 | 406 |
| | | 2 | 660 | | -198 to 396 | -160 to 40 | 410 |
| 11 | Bawana | 1 | 216 | Delhi-NCR | -64.8 to 129.6 | - | - |
| | | 2 | 216 | | -64.8 to 129.6 | - | - |
| | | 3 | 216 | | -64.8 to 129.6 | - | - |
| | | 4 | 216 | | -64.8 to 129.6 | -40 to 40 | 418 |
| | | 5 | 253 | | -75.9 to 151.8 | - | - |
| | | 6 | 253 | | -75.9 to 151.8 | -20 to 40 | 420 |
| 12 | Bara PPGCL | 1 | 660 | UP | -198 to 396 | -20 to 40 | 780 |
| | | 2 | 660 | | -198 to 396 | -30 to 40 | 780 |
| | | 3 | 660 | | -198 to 396 | -40 to 40 | 780 |
| 13 | Lalitpur TPS | 1 | 660 | UP | -198 to 396 | - | - |
| | | 2 | 660 | | -198 to 396 | 0 to 150 | 785 |
| | | 3 | 660 | | -198 to 396 | - | - |
| 14 | Anpara D UP | 1 | 500 | UP | -150 to 300 | -140 to 20 | 767 |
| | | 2 | 500 | | -150 to 300 | -100 to 20 | 765 |
| 15 | Chhabra TPS | 1 | 250 | Rajasthan | -75 to 150 | -80 to 0 | 400 |
| | | 2 | 250 | | -75 to 150 | -70 to 0 | 400 |
| | | 3 | 250 | | -75 to 150 | - | - |
| | | 4 | 250 | | -75 to 150 | - | - |
| | | 5 | 660 | | -198 to 396 | -70 to 40 | 410 |
| | | 6 | 660 | | -198 to 396 | -100 to 40 | 407 |

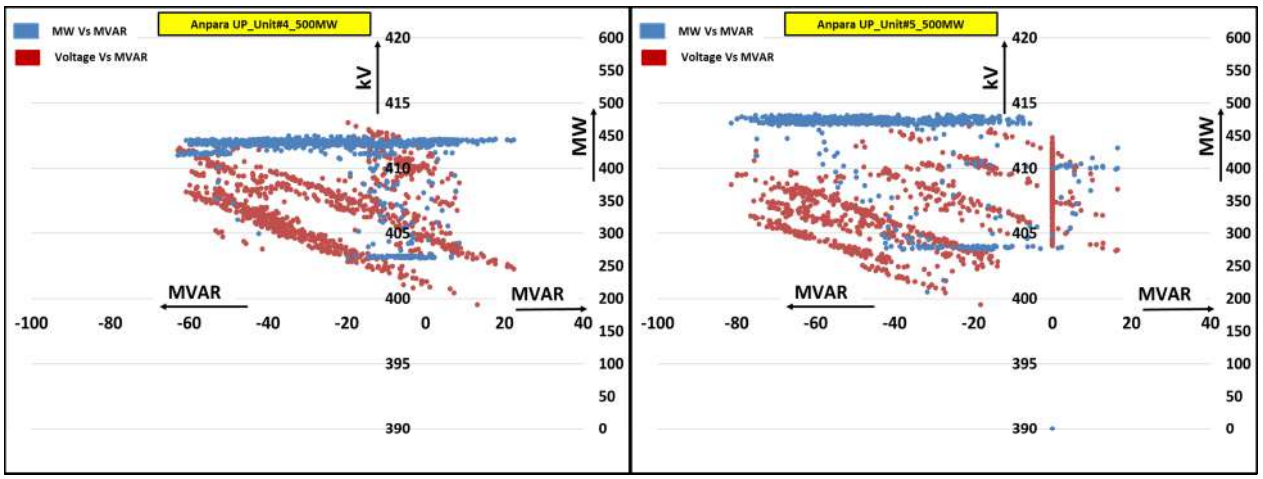
## Anpara C



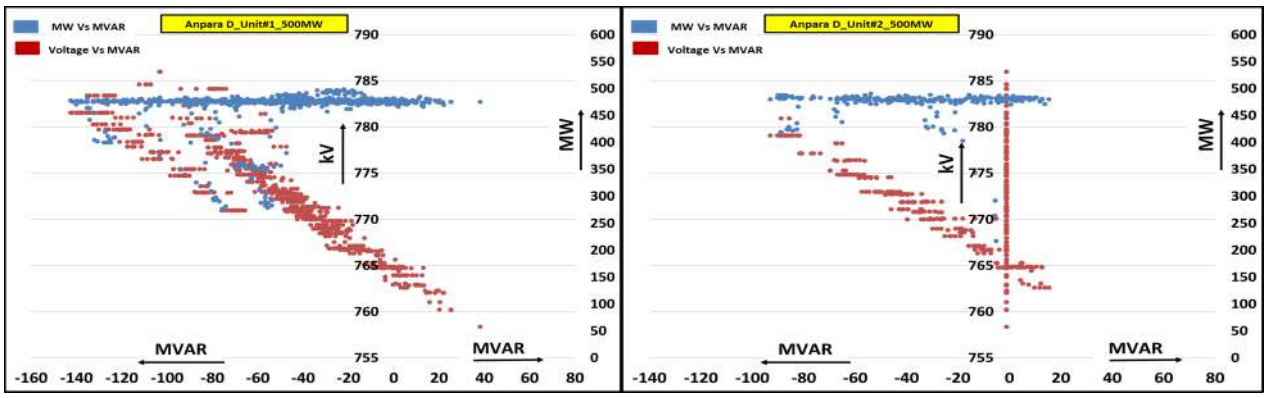

## Anpara UP



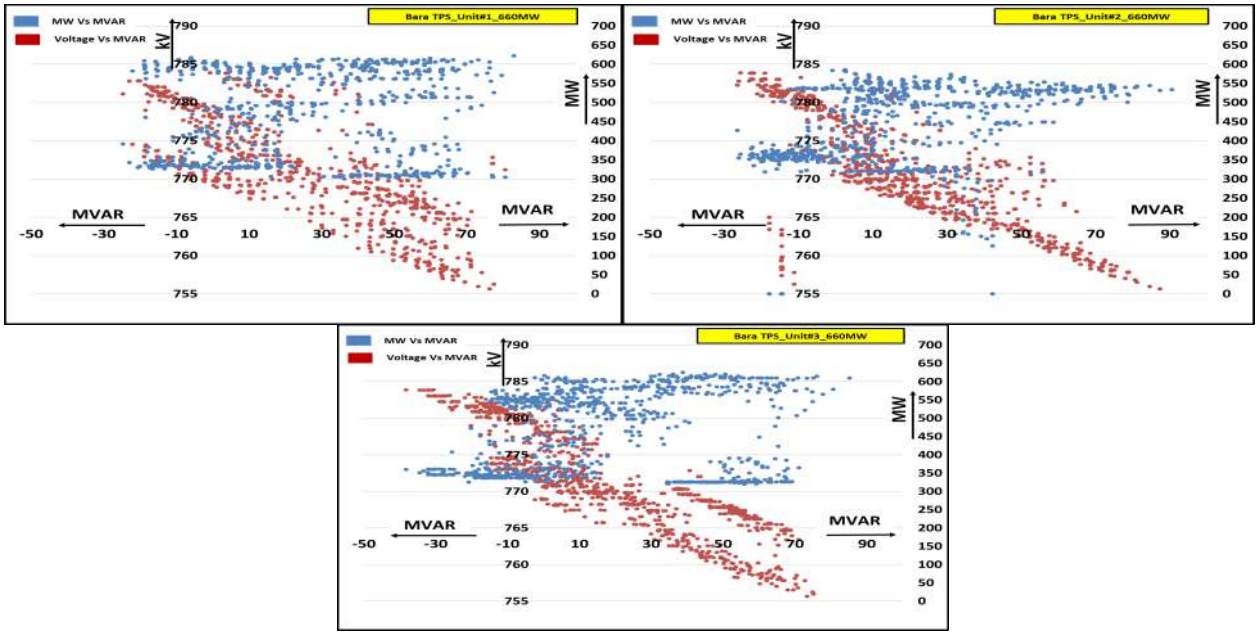
## Anpara UP



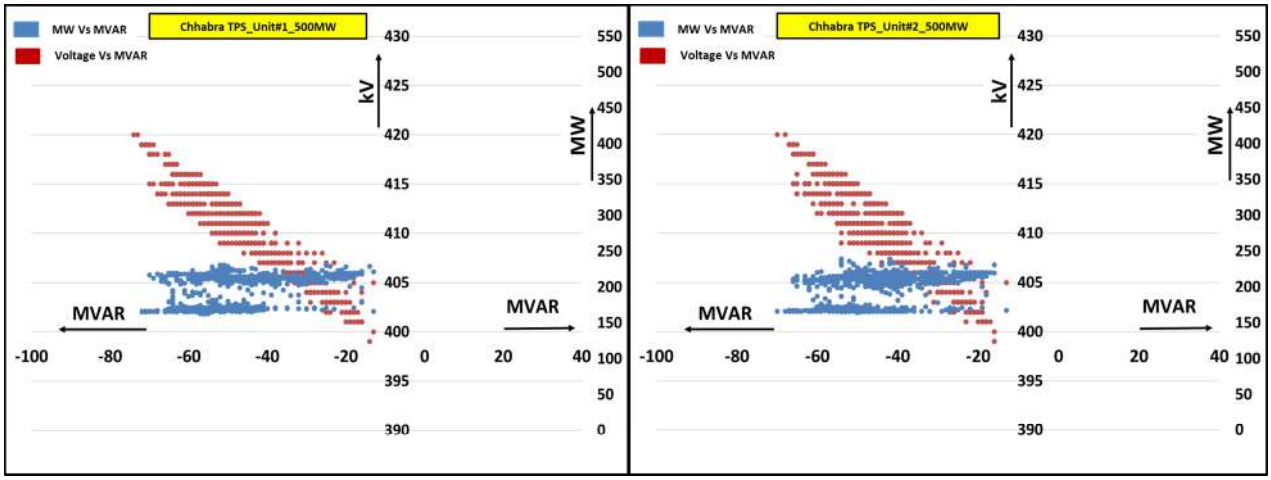

## Anpara D



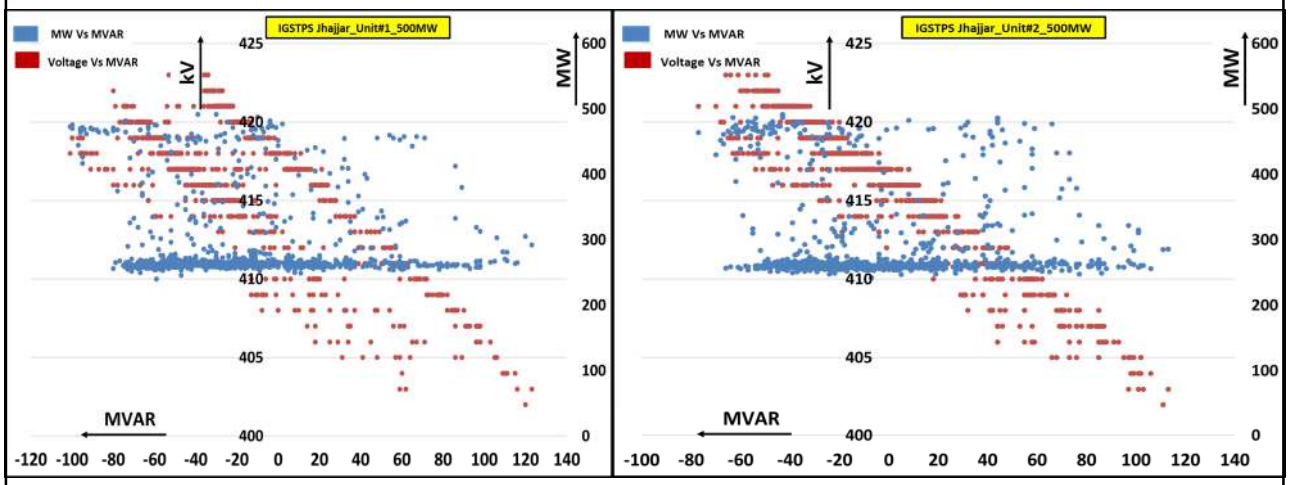
## Bara TPS



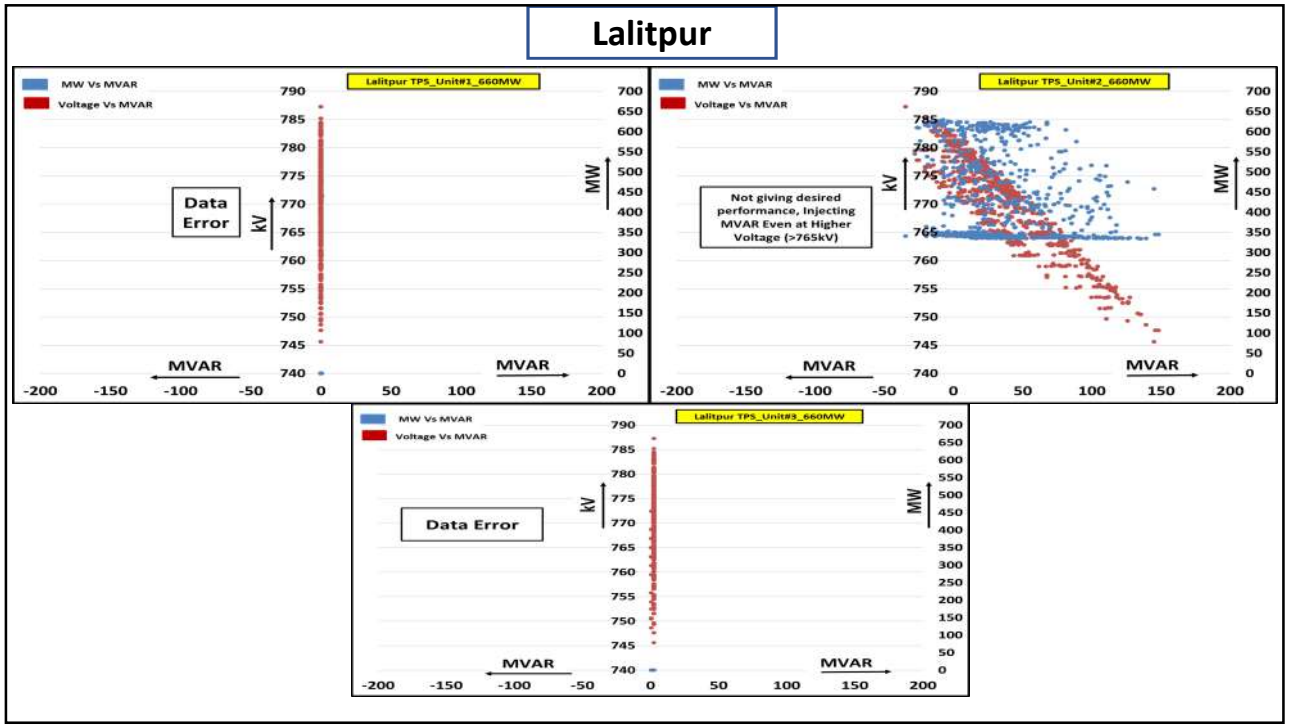

## Chhabra TPS



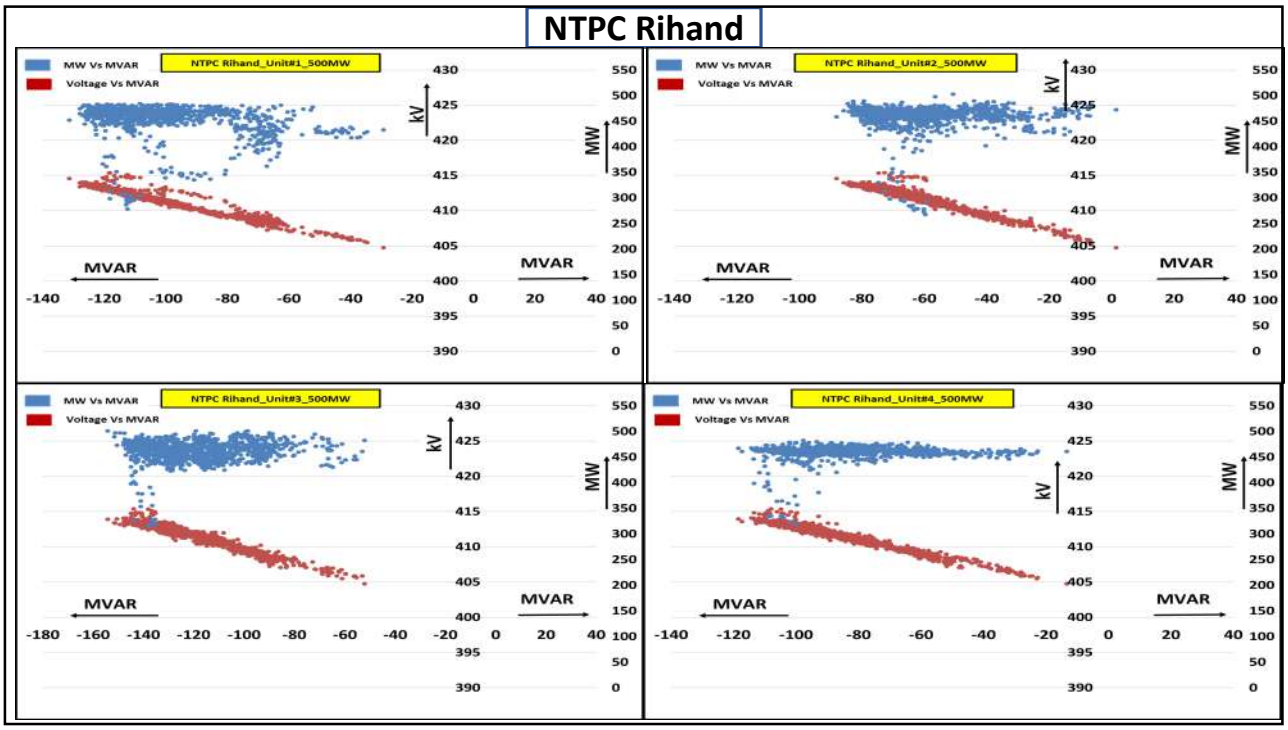
## IGSTPS Jhajjar



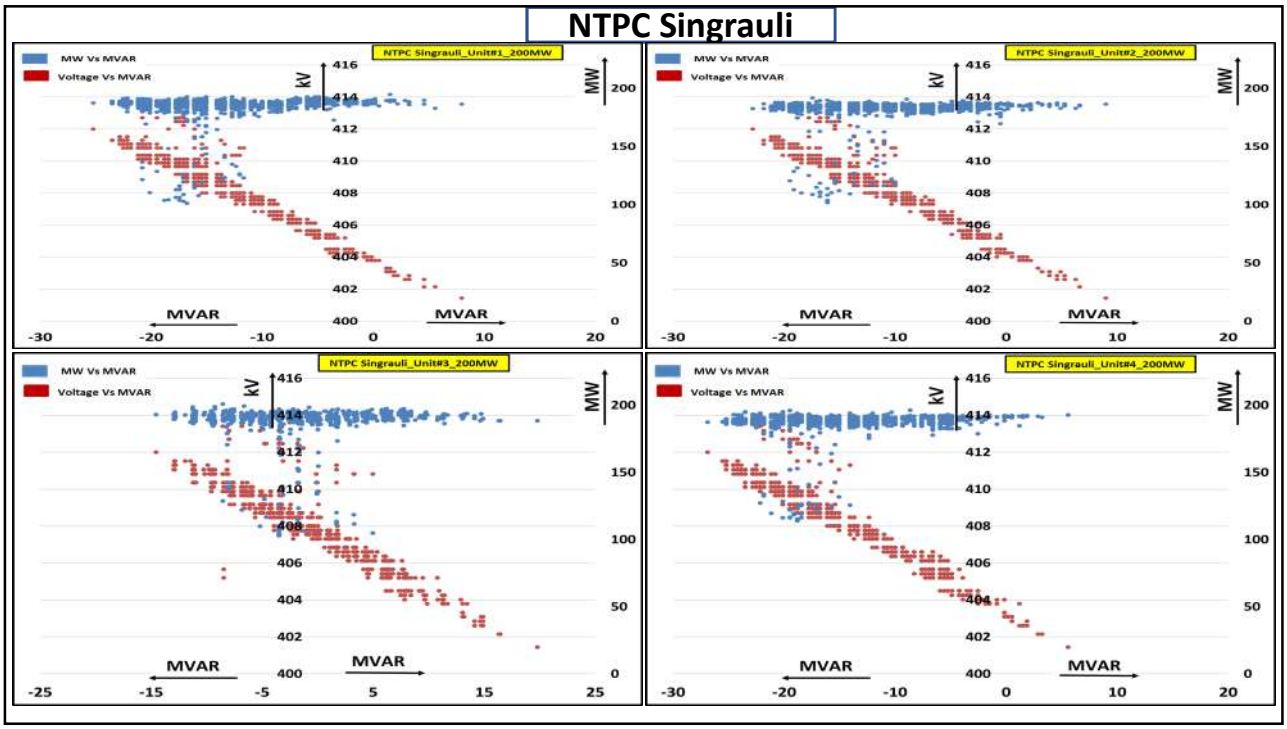

## Lalitpur



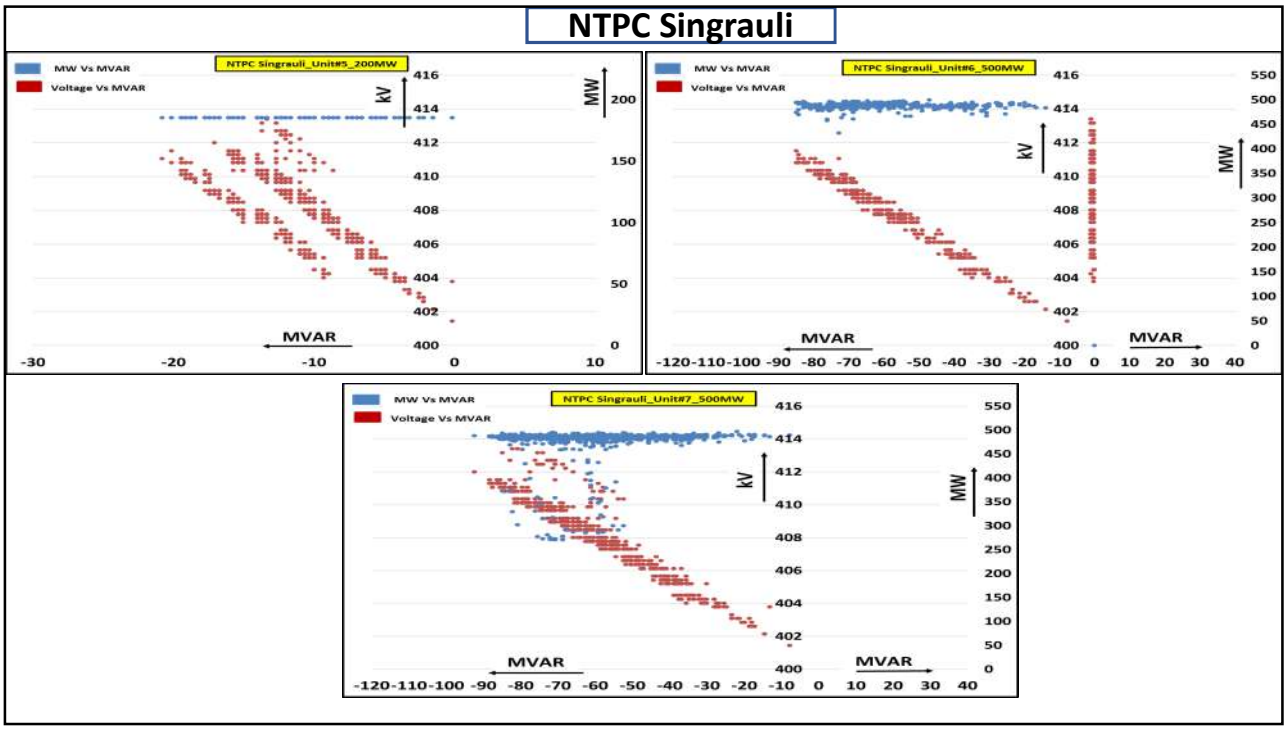
## NTPC Rihand



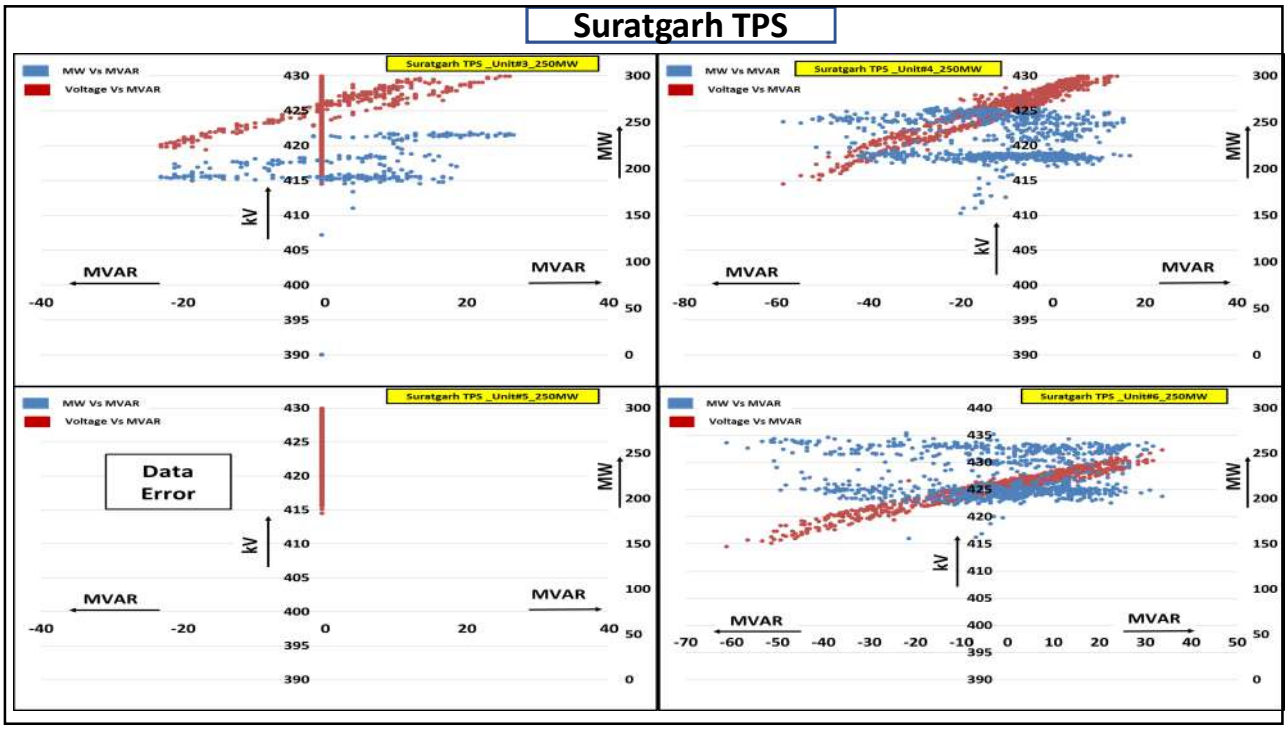

## NTPC Singrauli



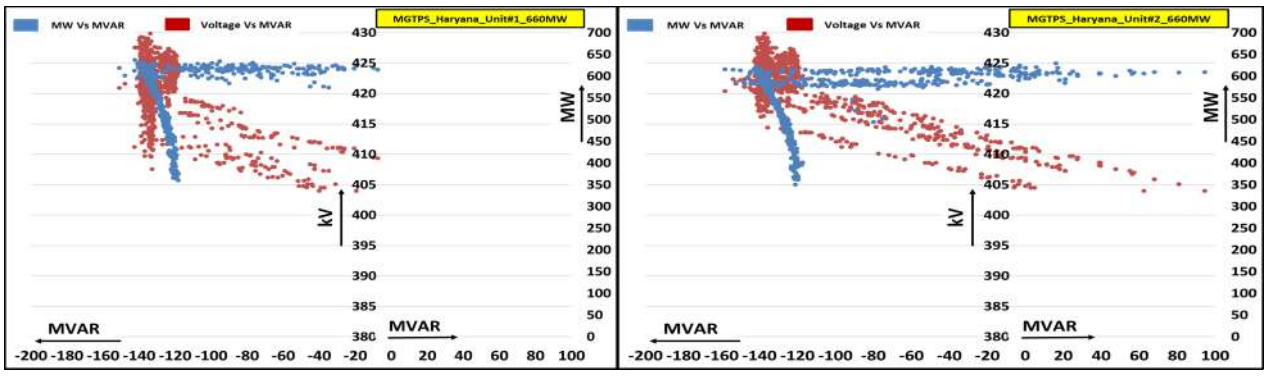
## NTPC Singrauli



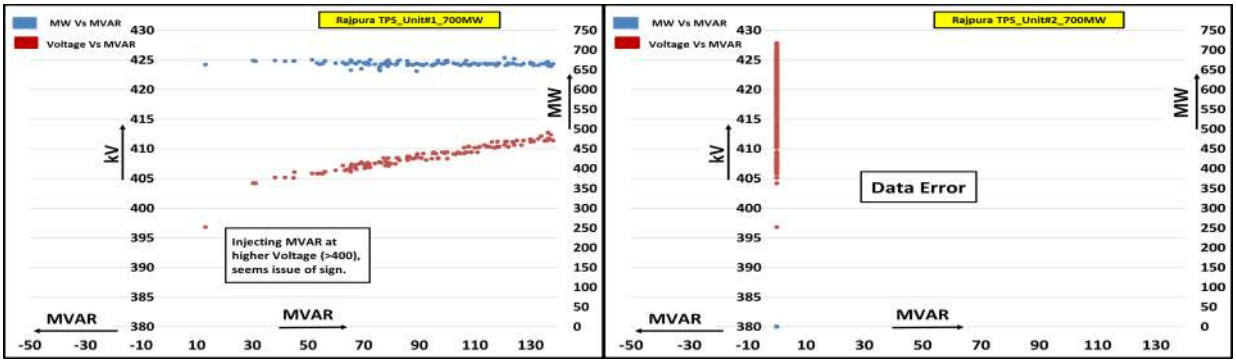

## Suratgarh TPS



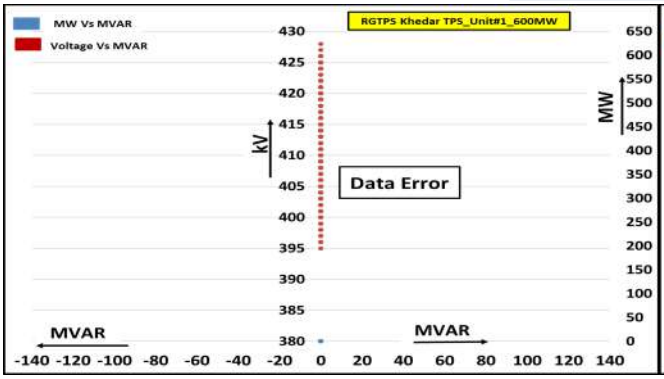
## MGTPS Haryana

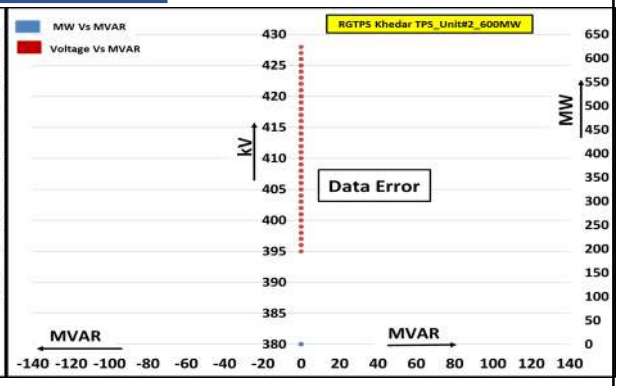



## Rajpura TPS

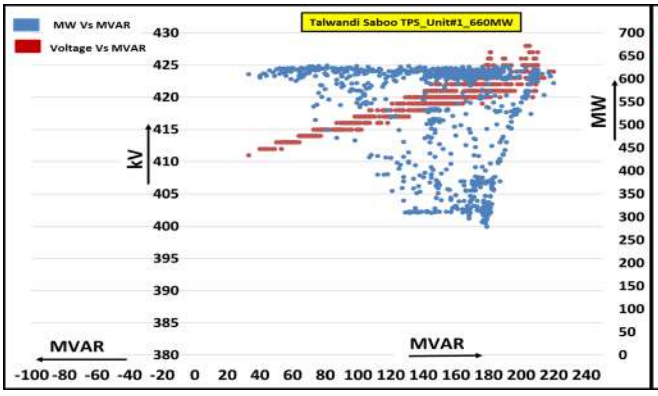


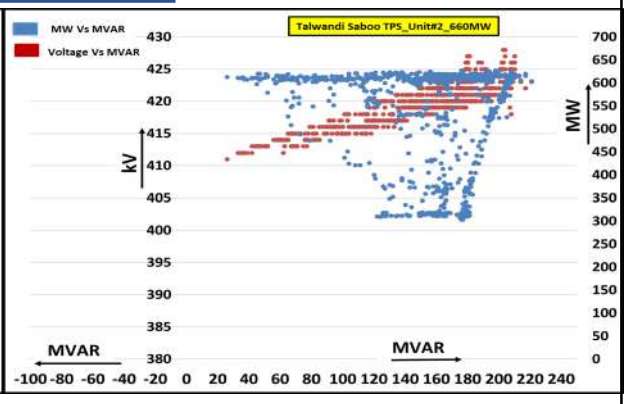
## RGTPS Khedar




## Talwandi Saboo



# National Load Despatch Centre

## Import of Uttar Pradesh Transfer Capability for January 2021

Issue Date: 16-12-2021 Issue Time: 1600 Revision No. 0

| Date | Time Period in IST (hrs) | Total Transfer Capability (TTC) (MW) | Reliability Margin (MW) | Available Transfer Capability (ATC) (MW) | Long Term Access (LTA)/ Medium Term Open Access (MTOA) (MW) | Margin Available for Short Term Open Access (STOA) (MW) | Changes in TTC w.r.t. Last Revision | Comments |
|---|---|---|---|---|---|---|---|---|
| 1st January 2021 to 31st January 2021 | 00-24 | 00-24 | 600 | 13200 | 8490 | 4710 | | https://www.upsldc.org/documents/20182/0/ttc_atc_24-11-16/4c79978e-35f2-4aef-8c0f-7f30d878dbde |
| **Limiting Constraints** | N-1 contingency of 400/220kV Sohawal (PG), Gorakhpur (UP), Sarnath, Lucknow (PG) ICTs | | | | | | | |

80% of LTA/MTOA/ISGS allocation capacity considered to account for machine outages

# National Load Despatch Centre

## Import of Rajasthan Transfer Capability for January 2021

Issue Date: 16-12-2021 Issue Time: 1600 Revision No. 0

| Date | Time Period in IST (hrs) | Total Transfer Capability (TTC) (MW) | Reliability Margin (MW) | Available Transfer Capability (ATC) (MW) | Long Term Access (LTA)/ Medium Term Open Access (MTOA) (MW) | Margin Available for Short Term Open Access (STOA) (MW) | Changes in TTC w.r.t. Last Revision | Comments |
|---|---|---|---|---|---|---|---|---|
| 1st January 2021 to 31st January 2021 | 00-24 | 6200 | 300 | 5900 | 3400 | 2500 | | https://sldc.rajasthan.gov.in/rrvpnl/scheduling/downloads |
| **Limiting Constraints** | | N-1 contingency of 400/220kV Chittorgarh, Jodhpur ICTs and Ajmer ICTs | | | | | | |

80% of LTA/MTOA/ISGS allocation capacity considered to account for machine outages

# National Load Despatch Centre

## Import of Haryana Transfer Capability for January 2021

Issue Date: 16-12-2021 Issue Time: 1600 Revision No. 0

| Date | Time Period in IST (hrs) | Total Transfer Capability (TTC) (MW) | Reliability Margin (MW) | Available Transfer Capability (ATC) (MW) | Long Term Access (LTA)/ Medium Term Open Access (MTOA) (MW) | Margin Available for Short Term Open Access (STOA) (MW) | Changes in TTC w.r.t. Last Revision | Comments |
|---|---|---|---|---|---|---|---|---|
| 1st January 2021 to 31st January 2021 | 00-24 | 8500 | 600 | 7900 | 3000 | 4900 | | https://hvpn.org.in/#/atcttc |
| **Limiting Constraints** | | N-1 contingency of 400/220kV ICTs at Deepalpur and Kurukshetra(PG) | | | | | | |

80% of LTA/MTOA/ISGS allocation capacity considered to account for machine outages

# National Load Despatch Centre
## Import of Delhi Transfer Capability for January 2021

Issue Date: 16-12-2021 Issue Time: 1600 Revision No. 0

| Date | Time Period in IST (hrs) | Total Transfer Capability (TTC) (MW) | Reliability Margin (MW) | Available Transfer Capability (ATC) (MW) | Long Term Access (LTA)/ Medium Term Open Access (MTOA) (MW) | Margin Available for Short Term Open Access (STOA) (MW) | Changes in TTC w.r.t. Last Revision | Comments |
|---|---|---|---|---|---|---|---|---|
| 1st January 2021 to 31st January 2021 | 00-24 | 6800 | 300 | 6500 | 4180 | 2320 | | |
| **Limiting Constraints** | | N-1 contingency of 400/220kV Mundka and Bamnauli ICTs. | | | | | | |

80% of LTA/MTOA/ISGS allocation capacity considered to account for machine outages

# National Load Despatch Centre

## Import of HP Transfer Capability for January 2021

Issue Date: 16-12-2021 Issue Time: 1600 Revision No. 0

| Date | Time Period in IST (hrs) | Total Transfer Capability (TTC) (MW) | Reliability Margin (MW) | Available Transfer Capability (ATC) (MW) | Long Term Access (LTA)/ Medium Term Open Access (MTOA) (MW) | Margin Available for Short Term Open Access (STOA) (MW) | Changes in TTC w.r.t. Last Revision | Comments |
|---|---|---|---|---|---|---|---|---|
| 1st January 2021 to 31st January 2021 | 00-24 | 1200 | 100 | 1100 | 1400 | -300 | | https://hpsldc.com/mrm_category/ttc-atc-report/ |
| **Limiting Constraints** | | N-1 contingency of 400/220kV Nallagarh ICTs. 132kV lines from Kangoo are also heavily loaded | | | | | | |

80% of LTA/MTOA/ISGS allocation capacity considered to account for machine outages

# National Load Despatch Centre

## Import of Uttarakhand Transfer Capability for January 2021

Issue Date: 16-12-2021 Issue Time: 1600 Revision No. 0

| Date | Time Period in IST (hrs) | Total Transfer Capability (TTC) (MW) | Reliability Margin (MW) | Available Transfer Capability (ATC) (MW) | Long Term Access (LTA)/ Medium Term Open Access (MTOA) (MW) | Margin Available for Short Term Open Access (STOA) (MW) | Changes in TTC w.r.t. Last Revision | Comments |
|---|---|---|---|---|---|---|---|---|
| 1st January 2021 to 31st January 2021 | 00-24 | 1600 | 100 | 1500 | 1200 | 300 | | |
| **Limiting Constraints** | | N-1 contingency of 400/220kV Nallagarh ICTs. 132kV lines from Kangoo are also heavily loaded | | | | | | |

80% of LTA/MTOA/ISGS allocation capacity considered to account for machine outages

| | LONG OUTAGES REPORT AS ON 14-12-2021 | | | | | | |
|---|---|---|---|---|---|---|---|
| **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 | 622 | 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 Abdullapur(PG)-RailwayHR(RLY) (HVPNL) Ckt-1 | Line | HVPNL | 13-05-2021 | 13:25 | 214 | For cleaning of allied equipment installed in the switchyard of 220kV S/Stn. Railway traction. |
| 3 | 220 KV Sohawal(PG)-Gonda(UP) (UP) Ckt-1 | Line | UPPTCL | 12-08-2021 | 09:00 | 124 | Emergency shutdown of line taken, as tower no. 34 is affected by flood. |
| 4 | 220 KV Sohawal(PG)-Bahraich(UP) (UP) Ckt-1 | Line | UPPTCL | 12-08-2021 | 09:12 | 124 | Emergency shutdown of line taken, as tower no. 34 is affected by flood. |
| 5 | 400 KV UNNAO-PANKI (UP) CKT-1 | Line | UPPTCL | 11-10-2021 | 10:02 | 64 | Shutdown required due to PTPS Panki (Diversion work due to Extension of PTPS Panki. |
| 6 | 220 KV JIND(PG)-MUND (HV) (HVPNL) CKT-1 | Line | HVPNL | 18-11-2021 | 11:42 | 26 | SD taken by Haryana for Augmentation of Conductor 0. Sq inch zebra to HTLS Conductor 1200A (D-3) |
| 7 | 220 KV JIND(PG)-MUND (HV) (HVPNL) CKT-2 | Line | HVPNL | 18-11-2021 | 11:44 | 26 | SD taken by Haryana for Augmentation of Conductor 0. Sq inch zebra to HTLS Conductor 1200A (D-3) |
| 8 | 220 KV AGRA(PG)-FEROZABAD(UP) (UP) CKT-1 | Line | UPPTCL | 27-11-2021 | 09:55 | 17 | Jumpering work for making Lilo point of 220 kv Firozabad(400)-Agra(765) PG line at 220 kv Tundla. FTC process completed but yet to be charged due to PLCC issue at Tundla end. |
| **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 | 525 | CEA clearance awaited |
| 2 | 40452B MAIN BAY - 400KV SURATGARH(RVUN)-RATANGARH(RS) (RS) CKT-1 AT Ratangarh(RS) | BAY | RRVPNL | 25-12-2020 | 17:05 | 353 | 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 | 400 KV Kadarpur (GPTL) - Bus 1 | BUS | GPTL | 17-04-2021 | 13:18 | 240 | E/S/D taken due to abnormal humming sound observed from 400KV B-phase BUS-1 CVT at Kadarpur. |
| 4 | 425 MAIN BAY - 400/220KV 500 MVA ICT 3 AT DADRI(NT) | BAY | NTPC | 20-11-2021 | 16:20 | 23 | Due to 400KV Main breaker 2552 of ICT 3 opening/ closing problem from remote the bay was kept out while ICT 3 was charged thru tie bay breaker 2652. |

| S.No | Element Name | Type | Owner | Outage | | Outage days | Reason / Remarks |
|---|---|---|---|---|---|---|---|
| **C** | **ICT** | | | | | | |
| 1 | 400/220 kV 315 MVA ICT 1 at Bhilwara(rs) | ICT | RRVPNL | 12-05-2019 | 23:42 | 946 | 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 | 641 | Buccholz 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 | 258 | 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 | 482 | 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 | 816 | Due to fire in ICT. |
| 6 | 765/400 kV 1500 MVA ICT 2 at Gr.Noida_2(UPC) | ICT | UPPTCL | 12-11-2021 | 14:22 | 31 | PRV- 1 & 2 Trip, Differential protection and Buchholz Trip. inspected our 1500 MVA ICT-2 (R-Ph), During inspection it is found that the IV Bushing got damaged and oil flowed out from the bushing. During complete internal inspection by OEM M/s BHEL winding found faulty |
| 7 | 400/220 kV 315 MVA ICT 4 at Mundka(DV) | ICT | DTL | 13-11-2021 | 19:15 | 30 | Buchholz trip. |
| **D** | **BUS REACTOR** | | | | | | |
| 1 | 80 MVAR Bus Reactor No 1 at 400KV Nathpa Jhakri(SJ) | BR | SJVNL | 17-10-2019 | 12:58 | 788 | Flashover/Fault in 80MVAR Bus Reactor cleared by Bus Bar Protection. Expected revival in Dec-2021. |
| **E** | **FSC** | | | | | | |
| 1 | FSC(40%) of 400 KV Kanpur-Ballabhgarh (PG) Ckt-2 at Ballabhgarh(PG) | FSC | POWERGRID | 23-10-2021 | 13:37 | 51 | Bypassed due to operation of R-phase capacitor unbalance protection. |

| F | LINE REACTOR | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 50 MVAR Non-Switchable LR on Agra-Unnao (UP) Ckt-1 @Agra(UP) | LR | UPPTCL | 28-10-2021 | 22:27 | 46 | R and Y phase bushing damaged at Agra(UP). |
| 2 | 50 MVAR Non-Switchable LR on Allahabad-Fatehpur (PG) Ckt-2 @Allahabad(PG) | LR | POWERGRID | 27-11-2021 | 00:32 | 17 | After multiple emails and telephonic conversations to furnish the reason for the outage no reply has been obtained from CPCC-3. |
| 3 | 50 MVAR Non-Switchable LR on Allahabad-Fatehpur (PG) Ckt-1 @Allahabad(PG) | LR | POWERGRID | 27-11-2021 | 00:32 | 17 | After multiple emails and telephonic conversations to furnish the reason for the outage no reply has been obtained from CPCC-3. |

| G | GENERATING UNITS | | | | | |
|---|---|---|---|---|---|---|
| S.No | Station | Owner | Outage Reason | Outage Date | Outage Time | Outage duration(in days) |
| 1 | 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 | 445 |
| 2 | 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 | 445 |
| 3 | 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 | 445 |
| 4 | 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 | 287 |
| 5 | 66 MW Pong HPS - UNIT 4 | BBMB | Failure of compressed air system of Breaking. Expected by Oct-2021 end. | 28-07-2021 | 15:00 | 138 |
| 6 | 250 MW Chhabra TPS - UNIT 4 | RRVPNL | Due to ESP structure damage | 09-09-2021 | 00:47 | 96 |
| 7 | 250 MW Chhabra TPS - UNIT 3 | RRVPNL | Due to ESP Structure damage | 09-09-2021 | 03:00 | 96 |
| 8 | 35 MW Budhil HPS (IPP) - UNIT 2 | Greenko Budhil | Flooding of power house due to damage of Main Inlet Valve at Budhil. | 26-10-2021 | 17:00 | 48 |
| 9 | 35 MW Budhil HPS (IPP) - UNIT 1 | Greenko Budhil | Flooding of power house due to damage of Main Inlet Valve at Budhil. | 26-10-2021 | 17:00 | 48 |

| G | GENERATING UNITS | | | | | |
|---|---|---|---|---|---|---|
| **S.No** | **Station** | **Owner** | **Outage Reason** | **Outage Date** | **Outage Time** | **Outage duration(in days)** |
| 10 | 100 MW Koteshwar HPS - UNIT 1 | THDC | due to fault in GT | 04-11-2021 | 22:58 | 39 |
| 11 | 220 MW RAPS-C - UNIT 2 | NPCIL | For Biennial Shutdown | 05-11-2021 | 23:52 | 38 |
| 12 | 660 MW Suratgarh SCTPS - UNIT 8 | RRVPNL | DUE TO STEAM LEAKAGE FROM SH-BELT | 06-11-2021 | 12:42 | 37 |

| Sr No | Element Name | Outage Date | Outage Time | Reason |
|---|---|---|---|---|
| 1 | 400 KV Bareilly-Unnao (UP) Ckt-1 | 10-Nov-21 | 8:34 | Over-voltage at Bareilly(UP). As per PMU, No fault observed. |
| | | 11-Nov-21 | 3:08 | R-Y fault. As per PMU, Y-N fault with unsuccessful auto-reclosing followed by R-N fault is observed. |
| | | 15-Nov-21 | 23:51 | B-N fault. As per PMU, B-N fault and unsuccessful auto-reclosing observed. |
| | | 17-Nov-21 | 18:54 | R-N fault, Zone-1, Fault current 2.79kA, Dist. 126.3km from Unnao & Fault current 2.6kA, Dist. 131.9km from Bareilly end. As per PMU, R-N fault occured, no auto-reclosing observed. |
| | | 25-Nov-21 | 2:21 | B-N fault, Zone-1, Dist. 48.7km, Fault current 6.55kA from Unnao. As per PMU, B-N fault occured, no auto-reclosing observed. |
| | | 30-Nov-21 | 0:46 | B-N fault, Zone 1, Dist. 99.1km, Fault current 3.57kA from Unnao & Zone-1, Dist. 159.81km, Fault current 2.305kA from Bareilly end. As per PMU, B-N fault occured, no auto-reclosing observed. |
| | | 30-Nov-21 | 15:29 | Y-N fault, Zone-1, Fault current 1.54kA, Dist. 238.8km from Bareilly. As per PMU, Y-N fault occured, no auto-reclosing observed. |
| 2 | 400 KV Muradnagar_2-Mathura (UP) Ckt-1 | 3-Nov-21 | 12:51 | R-N fault. As per PMU, R-N fault occured, no auto-reclosing observed. |
| | | 11-Nov-21 | 12:12 | R-N fault, Zone-1, Dist. 67.7km, Fault current 3.439kA from Mathura end. As per PMU, R-N fault and unsuccessful auto-reclosing observed. |
| | | 20-Nov-21 | 13:10 | R-N fault. As per PMU, R-N fault and unsuccessful auto-reclosing observed. |
| | | 24-Nov-21 | 0:52 | R-N fault, Zone-1, Fault current 4.122kA, Dist. 74.7km from Mathura (UP). As per PMU, R-N fault and unsuccessful auto-reclosing observed. |
| | | 24-Nov-21 | 19:42 | Overvoltage stage-1 operated at Mathura end. As per PMU, No fault observed. |
| 3 | 400 KV Orai-Mainpuri (UP) Ckt-2 | 12-Nov-21 | 2:00 | Over-voltage operated at Mainpuri (voltage 445kV). As per PMU, No fault observed. |
| | | 16-Nov-21 | 13:03 | Over voltage. As per PMU, No fault observed. |
| | | 17-Nov-21 | 13:01 | O/V Operated at Orai. As per PMU, No fault observed. |
| | | 29-Nov-21 | 13:03 | Over voltage. As per PMU, No fault observed. |
| | | 30-Nov-21 | 13:04 | Over voltage. As per PMU, No fault observed. |
| 4 | 400 KV Kala Amb(PKTL)-Wangto_GIS(HP) (HPPTCL) Ckt-1 | 2-Nov-21 | 6:27 | Line was opened on HV, Charging attempt failed at 06:27 Hrs from Wangtoo end. R-N Fault , Fault current 3.4kA, Dist. 121km from Wangtoo end. As per PMU, R-N fault occured, no auto-reclosing observed. |
| | | 7-Nov-21 | 5:09 | R-Y fault. As per PMU, R-Y fault is observed. |
| | | 12-Nov-21 | 13:56 | Line tripped during OPGW works. R-N fault, fault current 3kA, 168kms from Kala Amb. As per PMU, R-N fault occured, no auto-reclosing observed. |
| | | 14-Nov-21 | 5:18 | R-N fault. As per PMU, R-N fault occured, no auto-reclosing observed. |
| | | 14-Nov-21 | 7:21 | R-N fault. As per PMU, R-N fault occured, no auto-reclosing observed. |
| 5 | 400 KV Suratgarh(RVUN)-Ratangarh(RS) (RS) Ckt-2 | 3-Nov-21 | 0:16 | B-N fault, Zone-1, Dist. 95.3km, Fault current 3.35kA from Ratangarh end & Zone-1, Dist. 39.61km, Fault current 6.145kA from Suratgarh(RVUN). PMU data was not available. |
| | | 5-Nov-21 | 9:09 | B-N fault, Zone-1, Dist. 94.2km, Fault current 3.29kA from Ratangarh end & Dist. 41km from Suratgarh end. As per PMU, Y-N fault occured, no auto-reclosing observed. |
| | | 7-Nov-21 | 15:41 | Phase to Earth fault B-N. As per PMU, Y-N fault occured, no auto-reclosing observed. |
| | | 8-Nov-21 | 21:01 | B-N fault, Zone-1, Dist. 89.2km, Fault current 3.26kA from Ratangarh and Dist. 45.45km, Fault current 5.5kA from Suratgarh. As per PMU, B-N fault occured, no auto-reclosing observed. |
| 6 | 500 kV HVDC Rihand-Dadri (PG) Ckt-2 | 13-Nov-21 | 1:58 | Pole 2 tripped on last 11/13th filter tripping at Dadri end due to high voltage. As per PMU, No fault observed. |
| | | 19-Nov-21 | 12:08 | Pole 2 tripped due to false command of BFR initiated to Pole 2 breakers from MACH Control system at Dadri end. As per PMU, No fault observed. |
| | | 28-Nov-21 | 17:09 | Tripped on differential protection operation due to malfunction in controller. As per PMU, No fault observed. |
| | | 28-Nov-21 | 19:55 | Pole 2 tripped on Metallic return ground fault protection. As per PMU, No fault observed. |
| 7 | 400 KV Aligarh-Sikandrabad (UP) Ckt-1 | 4-Nov-21 | 1:56 | DT received at Sikandrabad end due to PLCC mal-operation at Aligarh end. As per PMU, B-N fault occured, no auto-reclosing observed. |
| | | 17-Nov-21 | 0:04 | R-N fault. As per PMU, R-N fault occured, no auto-reclosing observed. |
| | | 23-Nov-21 | 20:12 | R-N fault. As per PMU, R-N fault occured, no auto-reclosing observed. |
| | | 26-Nov-21 | 2:41 | Y-N fault. As per PMU, No fault observed. |
| 8 | 220 KV RAPS_A(NP)-Sakatpura(RS) (RS) Ckt-1 | 1-Nov-21 | 13:28 | B-N fault, Dist. 23.6km, Fault current 1.67KA from Sakatpura end. As per PMU, No fault observed. |
| | | 6-Nov-21 | 6:39 | R-N fault, Zone-1, Dist. 29.23km, , Fault current 4.77kA from RAPS-A end. As per PMU, No fault observed. |
| | | 18-Nov-21 | 20:08 | R-N fault. As per PMU, R-N fault occured, no auto-reclosing observed. |
| | | 18-Nov-21 | 22:43 | R-N fault. As per PMU, R-N fault occured, no auto-reclosing observed. |
| | | 21-Nov-21 | 22:13 | R-N Fault, Zone-1, Dist. 19.36km, Fault current 3.4kA from Sakatpura end. As per PMU, No fault observed. |
| | | 22-Nov-21 | 19:14 | R-N fault, Zone-1, Dist. 19.64km, Fault current 5.432kA from Sakatpura(RS). As per PMU, R-N fault occured, no auto-reclosing observed. |
| | | 25-Nov-21 | 6:09 | R-N fault, Zone-1, Dist. 13.46km, Fault current 4.69kA from Sakatpura(RS) & Zone-1, Dist. 26.10km, Fault current 4.99kA from RAPP-A. As per PMU, R-N fault occured, no auto-reclosing observed. |
| 9 | 220 KV Bairasiul(NH)-Pong(BB) (PG) Ckt-1 | 4-Nov-21 | 22:20 | Over voltage. As per PMU, No fault observed. |
| | | 6-Nov-21 | 3:03 | Over voltage. As per PMU, No fault observed. |
| | | 7-Nov-21 | 3:03 | Over voltage. As per PMU, No fault observed. |
| | | 10-Nov-21 | 1:27 | Over voltage. As per PMU, No fault observed. |
| | | 11-Nov-21 | 1:31 | Over voltage. As per PMU, No fault observed. |
| | | 14-Nov-21 | 21:42 | Over voltage. As per PMU, No fault observed. |
| 10 | 220 KV Bairasiul(NH)-Jessore(HP) (PG) Ckt-1 | 4-Nov-21 | 23:02 | Over voltage. As per PMU, No fault observed. |
| | | 8-Nov-21 | 2:37 | Over voltage. As per PMU, No fault observed. |
| | | 12-Nov-21 | 1:34 | Over voltage. As per PMU, No fault observed. |
| | | 20-Nov-21 | 1:43 | Over voltage. As per PMU, No fault observed. |

| 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 Unserved (in MU) | 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 | |
| 1 | NR | 1) 220 KV Mandola(PG)-South Wazirabad(DV) (DTL) Ckt-3<br>2) 400/220 kV 500 MVA ICT 3 at Mandola(PG) | NEW DELHI | DTL, POWERGRID | 2-Nov-21 | 16:44 | At 16:44 Hrs, LBB of 220 KV Mandola(PG)-South Wazirabad(DV) (DTL) Ckt-2 operated due to improper CT selection, which led to tripping Of all the circuit breakers connected to Bus-IV resulted into tripping of 220 KV Mandola(PG)-South Wazirabad(DV) (DTL) Ckt-3 and 400/220 kV 500 MVA ICT 3 at Mandola(PG). As per PMU, B-N phase to earth fault with delayed clearance in 440ms is observed. In antecedent condition, 220 KV Mandola(PG)-South Wazirabad(DV) (DTL) Ckt-3 and 400/220 kV 500 MVA ICT 3 at Mandola(PG) were carrying 154MW & 133MW respectively. | 0 | 0 | GI-2 | 0 | | Y(PG)<br>Y(Del) | | | Y(PG)<br>Y(Del) | | Y(PG) | | 440 |
| 2 | NR | 1) 400 KV Lucknow_1(PG)-Jehta_Hardoi Road (UP) (PG) Ckt-1<br>2) 400 KV Unnao(UP)-Jehta_Hardoi Road (UP) (PG) Ckt-1 | UTTAR PRADESH | UPPTCL, POWERGRID | 9-Nov-21 | 15:41 | At 15:42 hrs, bur bar relay of bus bar-1 maloperated on Gas Zone-1 flag which resulted into tripping of 400 KV Lucknow_1(PG)-Jehta_Hardoi Road (UP) (PG) Ckt-1, 400 KV Unnao(UP)-Jehta_Hardoi Road (UP) (PG) Ckt-1 and 400/220 kV 500 MVA ICT 1 at Jehta_Hardoi Road (UP) which were connected to 400kV Bus 1. As per PMU, no fault is observed. In antecedent condition, 400 KV Lucknow_1(PG)-Jehta_Hardoi Road (UP) (PG) Ckt-1, 400 KV Unnao(UP)-Jehta_Hardoi Road (UP) (PG) Ckt-1 and 400/220 kV 500 MVA ICT 1 at Jehta_Hardoi Road (UP) were carrying 51MW, 74MW & 24MW respectively. | 0 | 0 | GI-2 | 0 | Y(PG)<br>Y(UP) | | | Y(PG)<br>Y(UP) | | | Y(UP) | | NA |
| 3 | NR | 1) 400 KV Bareilly-Unnao (UP) Ckt-2<br>2) 400 KV Bareilly-Unnao (UP) Ckt-1 | UTTAR PRADESH | UPPTCL | 11-Nov-21 | 3:08 | 400 KV Bareilly-Unnao (UP) Ckt-2 tripped on Y-N phase to earth fault after unsuccessful A/R operation, fault distance was 239.5km(88%) from Unnao end. At the same time, 400 KV Bareilly-Unnao(UP) Ckt-1 also tripped on R-N phase to earth fault, fault distance was 164.9km from Unnao end and 61.98km from Bareilly end. As per PMU, Y-N phase to earth fault with unsuccessful A/R operation followed by R-N phase to earth fault is observed. In antecedent condition, 400 KV Bareilly-Unnao (UP) Ckt-1 & Ckt-2 were carrying 251MW & 249MW respectively. | 0 | 0 | GI-2 | 0 | | Y(UP) | | Y(UP) | | | Y(UP) | | 80 |
| 4 | NR | 1) 765 KV Anpara_D-Unnao (UP) Ckt-1<br>2) 765/400 kV 1000 MVA ICT 2 at Unnao(UP)<br>3) 765/400 kV 1000 MVA ICT 1 at Unnao(UP) | UTTAR PRADESH | UPPCL, UPPTCL | 11-Nov-21 | 20:35 | At 20:35 Hrs, 765 KV Anpara_D-Unnao (UP) Ckt-1 tripped on B-N phase to earth fault, fault distance was 117.2km and fault current was 3.77kA from Unnao end. At the same time, 765/400 kV 1000 MVA ICT 1 & ICT 2 at Unnao(UP) both tripped on Main-2 REF protection operation. Main 1 & Main 2 differential protection and Main 1 REF didn't operate. 765/400 kV 1000 MVA ICT 1 & ICT 2 at Unnao(UP) have been charged at 22:28Hrs & 23:28Hrs respectively by kept Main-2 REF protection disabled. As per PMU, B-N fault and no A/R operation is observed. In antecedent condition, 765 KV Anpara_D-Unnao (UP) Ckt-1, 765/400 kV 1000 MVA ICT 1 & ICT 2 at Unnao(UP) were carrying 809MW, 533MW & 536MW respectively. | 0 | 0 | GI-2 | 0 | Y(UP) | | | Y(UP) | | | Y(UP) | | 80 |
| 5 | NR | 1) 220 KV Azizpur (UP)-Shahjahanpur(PG) (UP) Ckt-2<br>2) 400 KV Badaune(UP)-Rosa(UPC) (OCBTL) Ckt-2<br>3) 400 KV Shahjahanpur(PG)-Rosa(UPC) (UP) Ckt-2<br>4) 400/220 kV 200 MVA ICT 1 at Rosa(UPC)<br>5) 400/220 kV 200 MVA ICT 2 at Rosa(UPC)<br>6) 220 KV Azizpur (UP)-Shahjahanpur(PG) (UP) Ckt-1<br>7) 400 KV Badaune(UP)-Rosa(UPC) (OCBTL) Ckt-1<br>8) 400 KV Shahjahanpur(PG)-Rosa(UPC) (UP) Ckt-1 | UTTAR PRADESH | UPPTCL | 12-Nov-21 | 11:25 | 400 KV Badaune(UP)-Rosa(UPC) (OCBTL) Ckt-1&2, 400 KV 400 KV Shahjahanpur(PG)-Rosa(UPC) (UP) Ckt-1&2, 400/220 kV 200 MVA ICT 1&2 at Rosa(UPC) and 220 KV Azizpur (UP)-Shahjahanpur(PG) (UP) Ckt-1&2 all tripped on tripping of both 400kV bus due to Bus bar protection operation at 400/220kV Rosa S/s. As per PMU, B-N phase to earth fault cleared in 120ms is observed. In antecedent condition, 400 KV Badaune(UP)-Rosa(UPC) (OCBTL) Ckt-1&2,400 KV Shahjahanpur(PG)-Rosa(UPC) (UP) Ckt-1&2, 400/220 kV 200 MVA ICT 1&2 at Rosa(UPC) were carrying 190MW, 84MW, 82MW, 77MW, 5MW & 5MW respectively. | 0 | 0 | GI-2 | 0 | | Y(PG)<br>Y(UP) | | | Y(PG)<br>Y(UP) | | Y(UP) | | 120 |
| 6 | NR | 1) 220 KV Bhadla(PG)-Saurya Urja Solar(SU) (Saurya Urja) Ckt-2<br>2) 220 KV Bhadla(PG)-Mahoba Solar(Adani) (Adani) Ckt-1<br>3) 220 KV Bhadla(PG)-ESUCRL SL_BHD_PG (ESUCRL) (ESUCRL) Ckt-1<br>4) 220 KV Bhadla(PG)-Saurya Urja Solar(SU) (Saurya Urja) Ckt-1 | RAJASTHAN | Adani, ESUCRL, Saurya Urja | 15-Nov-21 | 13:11 | 220 KV Bhadla(PG)-ESUCRL SL_BHD_PG (ESUCRL) (ESUCRL) Ckt-1 tripped due to snapping of conductor. At the same time, 220 KV Bhadla(PG)-Saurya Urja Solar(SU) (Saurya Urja) Ckt-1&2 and 220 KV Bhadla(PG)-Mahoba Solar(Adani) (Adani) Ckt-1 tripped from remote (solar plant) end which led to the loss of all solar generation of ESSEL solar (291MW), MAHOBA solar(279MW) and Saurya Urja solar(450MW). 220/33kV ICT 1&3 at MRPL(connected at Bhadla(PG)) also tripped which led to solar generation of 145MW at their end. Partial solar generation loss also observed at ACME solar(connected at Bhdala) and Adani(Bhadla) solar. At the same time, solar generation loss of approx. 240MW is observed at RENEW Sunwave Solar (connected at Fatehgarh2(PG)). Solar generation loss of approx. 170MW is also observed at Bhadla(Raj) As per PMU, R-Y phase to phase fault is observed and voltage was in permissible range during the event. As per SCADA, solar generation loss of approx. 1800MW is observed (aprrox. 1430MW at Bhadla(PG), 240MW at Fatehgarh2(PG) and 170MW at Bhadla(Raj). | 1800 | 0 | GD-1 | 1.68 | Y(PG)<br>Y(Saurya Urja)<br>Y(ESUCRL) | Y(ADANI) | | Y(Saurya Urja)<br>Y(ESUCRL) | Y(ADANI) | Y(ESUCRL) | Y(ADANI)<br>Y(Saurya Urja) | 80 |
| 7 | NR | 1) 220 KV Fatehgarh_II(PG)-Renew SunWave SL_FGRAH_PG (RSWPL) (RENEW SUN WAVE (RSWPL)) Ckt-1 | RAJASTHAN | POWERGRID, RENEW | 16-Nov-21 | 10:19 | 220kV Fatehgarh2-Renew Sunwave ckt and 220kV Fatehgarh2-Renew Jharkhand3 ckt tripped from RENEW end only on DT received from Fatehagarh2 end. Tripping of both lines led to loss of 423MW (as per SCADA) solar generation. As per PMU, fluctuation in voltage is observed. In antecedent condition, 220kV Fatehgarh2-Renew Sunwave ckt and 220kV Fatehgarh2-Renew Jharkhand3 ckt were carrying 204MW & 221MW respectively. | 426 | 0 | GD-1 | 0.1 | Y(RENEW) | Y(PG) | | Y(RENEW) | Y(PG) | Y(RENEW) | | NA |
| 8 | NR | 1) 220 KV Wagoora(PG)-Ziankote(JK) (PDD JK) Ckt-2<br>2) 220 KV Amargarh(NRSS XXIX)-Ziankote(JK) (PDD JK) Ckt-1<br>3) 220 KV Amargarh(NRSS XXIX)-Ziankote(JK) (PDD JK) Ckt-2 | J & K | PDD JK, POWERGRID | 19-Nov-21 | 18:11 | 220 KV Wagoora(PG)-Ziankote(JK) (PDD JK) Ckt-2 tripped on R-N phase to earth fault due to snapping of jumper. Fault distance was 20.53km from Wagoora end & 4.46km from Ziankote end and fault current was 4.8kA from Wagoora end & 6.72kA from Ziankote end. At the same time, 220 KV Amargarh(NRSS XXIX)-Ziankote(JK) (PDD JK) Ckt-1 & Ckt-2 both tripped from Ziankote end only. As per PMU, R-N fault with no A/R operation and cleared in 120ms is observed. In antecedent condition, 220 KV Wagoora(PG)-Ziankote(JK) (PDD JK) Ckt-2, 220 KV Amargarh(NRSS XXIX)-Ziankote(JK) (PDD JK) Ckt-1 & Ckt-2 were carrying 134MW, 174MW & 175MW respectively. | 0 | 0 | GI-1 | 0 | Y(PG)<br>Y(JK) | Y(INDIGRID) | | Y(PG) | Y(INDIGRID) | Y(JK) | Y(INDIGRID)<br>Y(PG) | Y(JK) | 120 |
| 9 | NR | 1) 400 KV Anpara_B(UPUN)-Sarnath(UP) (UP) Ckt-2<br>2) 400 KV Sarnath-Azamgarh (UP) Ckt-1 | UTTAR PRADESH | UPPTCL | 21-Nov-21 | 15:34 | 400 KV Anpara_B(UPUN)-Sarnath(UP) (UP) Ckt-2 tripped on B-N phase to earth fault with unsuccessful A/R operation. Fault distance was 16.8km & fault current was 4.2kA from Sarnath end and fault distance was 134.7km & fault current was 3.06kA from Anpara end. During patrolling, a kite thread was found at fault location. At the same time, 400 KV Sarnath-Azamgarh (UP) Ckt-1 tripped only from Azamgarh(UP) end. As per PMU, B-N fault with unsuccessful A/R operation is observed due to permanent fault. In antecedent condition, 400 KV Anpara_B(UPUN)-Sarnath(UP) (UP) Ckt-2 was carrying 270MW. | 0 | 0 | GI-2 | 0 | Y(UP) | | | Y(UP) | | | Y(UP) | | 80 |
| 10 | NR | 1) 220 KV Fatehgarh_II(PG)-AHEJOL PSS HB_FGRAH_PG (AHEJOL) (AHEJOL) Ckt-2<br>2) 220 KV Fatehgarh_II(PG)-AHEJOL PSS HB_FGRAH_PG (AHEJOL) (AHEJOL) Ckt-1<br>3) 220 KV Fatehgarh_II(PG)-AHEJ2L PSS HB_FGRAH_PG (AHEJ2L) (AHEJ2L) Ckt-1<br>4) 220 KV Fatehgarh_II(PG)-AHEJ3L PSS HB_FGRAH_PG (AHEJ3L) (AHEJ3L) Ckt-1<br>5) 400/220 kV 500 MVA ICT 1 at Fatehgarh_II(PG)<br>6) 400/220 kV 500 MVA ICT 2 at Fatehgarh_II(PG) | RAJASTHAN | POWERGRID, AHEJOL, AHEJ2L, AHEJ3L | 25-Nov-21 | 22:20 | 220 KV Fatehgarh_II(PG)-AHEJOL PSS HB_FGRAH_PG (AHEJOL) (AHEJOL) Ckt-1 & Ckt-2, 220 KV Fatehgarh_II(PG)-AHEJ2L PSS HB_FGRAH_PG (AHEJ2L) (AHEJ2L) Ckt-1, 220 KV Fatehgarh_II(PG)-AHEJ3L PSS HB_FGRAH_PG (AHEJ3L) (AHEJ3L) Ckt-1, 400/220 kV 500 MVA ICT 1 & ICT 2 at Fatehgarh_II(PG) all tripped due to tripping of 220kV Bus 1 & Bus 2 on bus bar protection operation. Bus bar protection operated on R-N phase to earth bus fault occurred due to failure of R-phase CT of Bus Coupler (208 Bay) at Fatehgarh_II(PG). As per PMU, R-N phase to earth fault is observed. | 0 | 0 | GI-2 | 0 | | Y(PG) | Y(AHEJ2L)<br>Y(AHEJ3L) | | Y(PG) | Y(AHEJ2L)<br>Y(AHEJ3L) | Y(AHEJ2L)<br>Y(AHEJ3L) | | 80 |
| 11 | NR | 1) 220 KV Mandola(PG)-Narela(DV) (DTL) Ckt-2<br>2) 220 KV Panipat(BB)-Narela(DV) (BBMB) Ckt-3<br>3) 220 KV Panipat(BB)-Narela(DV) (BBMB) Ckt-2<br>4) 220 KV Panipat(BB)-Narela(DV) (BBMB) Ckt-1<br>5) 220 KV Mandola(PG)-Narela(DV) (DTL) Ckt-1 | NEW DELHI | BBMB, DTL | 27-Nov-21 | 9:24 | 220 KV Mandola(PG)-Narela(DV) (DTL) Ckt-1 & Ckt-2 tripped on R-Y phase to phase fault from Mandola end in Z-2, fault distance was 138.2km & fault current was 1.5kA from Mandola end. At the same time, 220 KV Panipat(BB)-Narela(DV) (BBMB) Ckt-1, Ckt-2 & Ckt-3 all tripped on fault in Z-2 from Panipat(BB) end. As per PMU, R-Y phase to phase fault which converted into R-Y-B three phase fault with delayed clearance in 440ms is observed. In antecedent condition, 220 KV Mandola(PG)-Narela(DV) (DTL) Ckt-1 & Ckt-2 and 220 KV Panipat(BB)-Narela(DV) (BBMB) Ckt-1, Ckt-2 & Ckt-3 were carrying 154MW, 153MW, 56MW, 55MW & 57MW respectively. | 0 | 0 | GI-1 | 0 | | Y(PG)<br>Y(BBMB)<br>Y(Del) | | | Y(PG)<br>Y(BBMB) | Y(Del) | Y(PG)<br>Y(BBMB) | Y(Del) | 440 |

Annexure-B.VIII

## Northern Regional inter regional lines tripping for November-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 | 400 KV Balia-Patna (PG) Ckt-2 | POWERGRID | 12-Nov-21 | 14:58 | Nil | Tripped only from Ballia end due to problem in PLCC pannel at Ballia end. | NA | 12-Nov-21 | 16:24 | NA | NO | NO | | | From PMU, No fault observed in the system. |
| 2 | 400 KV Kankroli-Zerda (PG) Ckt-1 | POWERGRID | 20-Nov-21 | 4:02 | Nil | Tripped due to overvoltage at Zerda end, DT received at Kankroli end. | NA | 20-Nov-21 | 6:16 | NA | Yes(After 24Hrs) | Yes(After 24Hrs) | | Voltage and time grading of 400kV lines for Stage-I overvoltage tripping from Zerda station needs to be checked. | From PMU, No fault observed in the system. |
| 3 | 220 KV Sahupuri(UP)-Pusauli(BS) (UP) Ckt-1 | UPPTCL | 26-Nov-21 | 22:08 | Nil | PLCC maloperation | NA | 27-Nov-21 | 0:29 | NA | NO | NO | Details of the tripping yet to be received. | | From PMU, No fault 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 |
| 2 | DR/EL Not provided in 24hrs | 1. IEGC 5.2(r) 2. CEA Grid Standard 15.3 |
| 3 | FIR Not Furnished | 1. IEGC 5.9.6.a 2. CEA Grid Standard 12.2 (Applicable for SLDC, ALDC only) |
| 4 | Protection System Mal/Non Operation | 1. CEA Technical Standard of Electrical Plants and Electric Lines: 43.4.A 2. CEA (Technical Standards for connectivity to the Grid) Regulation, 2007: Schedule Part 1. (6.1, 6.2, 6.3) |
| 5 | A/R non operation | 1. CEA Technical Standard of Electrical Plants and Electric Lines: 43.4.C 2. CEA Technical Planning Criteria |

**Annexure-B.IX**

| S. No. | Utility | 1st Nov 2021 - 30th Nov 2021 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Total No. of tripping | First Information Report (Not Received) | | Disturbance Recorder (Not Received) | Disturbance Recorder (NA) as informed by utility | Disturbance Recorder (Not Received) | Event Logger (Not Received) | Event Logger (NA) as informed by utility | Event Logger (Not Received) | Tripping Report (Not Received) | Tripping Report (NA) as informed by utility | Tripping Report (Not Received) |
| | | | Value | % | Value | | % | Value | | % | Value | | % |
| 1 | ADANI | 3 | 3 | **100** | 3 | 0 | **100** | 3 | 0 | **100** | 3 | 0 | **100** |
| 2 | ANTA-NT | 3 | 3 | **100** | 3 | 0 | **100** | 3 | 0 | **100** | 3 | 0 | **100** |
| 3 | BAIRASUIL-NH | 10 | 0 | **0** | 0 | 0 | **0** | 0 | 0 | **0** | 0 | 0 | **0** |
| 4 | BBMB | 16 | 1 | **6** | 1 | 8 | **13** | 4 | 9 | **57** | 1 | 1 | **7** |
| 5 | CPCC1 | 52 | 17 | **33** | 14 | 11 | **34** | 20 | 10 | **48** | 17 | 5 | **36** |
| 6 | CPCC2 | 19 | 0 | **0** | 0 | 4 | **0** | 0 | 4 | **0** | 12 | 0 | **63** |
| 7 | CPCC3 | 25 | 8 | **32** | 8 | 1 | **33** | 8 | 2 | **35** | 8 | 1 | **33** |
| 8 | DADRI-NT | 5 | 0 | **0** | 0 | 1 | **0** | 0 | 1 | **0** | 0 | 1 | **0** |
| 9 | ESUCRL | 1 | 1 | **100** | 1 | 0 | **100** | 1 | 0 | **100** | 1 | 0 | **100** |
| 10 | INDIGRID | 2 | 0 | **0** | 0 | 0 | **0** | 0 | 0 | **0** | 2 | 0 | **100** |
| 11 | KARCHAM | 3 | 3 | **100** | 3 | 0 | **100** | 3 | 0 | **100** | 3 | 0 | **100** |
| 12 | KOTESHWAR | 1 | 0 | **0** | 0 | 0 | **0** | 0 | 0 | **0** | 0 | 1 | **0** |
| 13 | NAPP | 2 | 0 | **0** | 0 | 0 | **0** | 0 | 0 | **0** | 0 | 0 | **0** |
| 14 | NJPC | 1 | 1 | **100** | 1 | 0 | **100** | 1 | 0 | **100** | 1 | 0 | **100** |
| 15 | PKTSL | 1 | 1 | **100** | 1 | 0 | **0** | 1 | 0 | **0** | 1 | 0 | **100** |
| 16 | RAPPA | 11 | 10 | **91** | 11 | 0 | **100** | 11 | 0 | **100** | 11 | 0 | **100** |
| 17 | RAPPB | 5 | 3 | **60** | 2 | 0 | **40** | 2 | 0 | **40** | 2 | 0 | **40** |
| 18 | RAPPC | 1 | 1 | **100** | 1 | 0 | **100** | 1 | 0 | **100** | 1 | 0 | **100** |
| 19 | RENEW SUN WAVES(RSWPL) | 3 | 2 | **67** | 2 | 0 | **67** | 2 | 0 | **67** | 2 | 0 | **67** |
| 20 | RSEJ3PL | 2 | 1 | **50** | 1 | 0 | **50** | 1 | 0 | **50** | 1 | 0 | **50** |
| 21 | SAURYA | 2 | 0 | **0** | 0 | 0 | **0** | 0 | 0 | **0** | 0 | 0 | **0** |
| 22 | SHREE CEMENT | 1 | 0 | **0** | 0 | 0 | **0** | 0 | 0 | **0** | 0 | 0 | **0** |
| 23 | SLDC-DV | 14 | 1 | **7** | 9 | 3 | **82** | 9 | 3 | **82** | 9 | 0 | **64** |
| 24 | SLDC-HP | 12 | 1 | **8** | 1 | 7 | **20** | 1 | 7 | **0** | 1 | 0 | **8** |
| 25 | SLDC-HR | 5 | 2 | **40** | 4 | 0 | **80** | 4 | 0 | **80** | 2 | 0 | **40** |
| 26 | SLDC-JK | 6 | 0 | **0** | 6 | 0 | **100** | 6 | 0 | **100** | 5 | 0 | **83** |
| 27 | SLDC-PS | 8 | 0 | **0** | 2 | 3 | **40** | 2 | 2 | **33** | 8 | 0 | **100** |
| 28 | SLDC-RS | 51 | 0 | **0** | 16 | 2 | **33** | 17 | 2 | **35** | 20 | 0 | **39** |
| 29 | SLDC-UK | 6 | 5 | **83** | 5 | 0 | **83** | 6 | 0 | **100** | 5 | 0 | **83** |
| 30 | SLDC-UP | 120 | 17 | **14** | 19 | 7 | **17** | 20 | 8 | **18** | 19 | 1 | **16** |
| 31 | INDIGRID | 5 | 0 | **0** | 0 | 3 | **0** | 0 | 3 | **0** | 5 | 0 | **100** |
| 32 | TANAKPUR-NH | 1 | 0 | **0** | 0 | 0 | **0** | 0 | 0 | **0** | 0 | 0 | **0** |
| 33 | TANDA-NT | 1 | 0 | **0** | 0 | 0 | **0** | 0 | 0 | **0** | 0 | 0 | **0** |

| S. No. | Name of the Generatng 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 forwhich support for PSS tuning is not available from OEM (Mls Voith Hydro), although NJHPS, SJVN has placed work order on 08/12/201 5. Further being the critical component, it is not possible"io get the PSS tuning done from any other vender except OEM (Mls Voith Hydro) being the system and software specific job. Therefore, prpposal 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 forwhich support for PSS tuning is not available from OEM (Mls Voith Hydro), although NJHPS, SJVN has placed work order on 08/12/201 5. Further being the critical component, it is not possible"io get the PSS tuning done from any other vender except OEM (Mls Voith Hydro) being the system and software specific job. Therefore, prpposal 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 | 27.10.2020,10.02.2012 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 ) | 12/19/2018 | 12/19/2018 | 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.<br>No new line addition in vicinity of station | |
| | JHAJJAR(CLP) (2*660) | 5/20/2017 | 5/20/2017 | YES | -- | 3rd Quarter |
| **4** | **NTPC** | | | | | |
| | Rihand ( Unit1#500 ) | 3/3/2017 | 3/3/2017 | YES | Next test will be done during re-commissioning of unit after O/H | 3rd Quarter |
| | Rihand ( Unit2#500 ) | 7/2/2016 | 7/2/2016 | YES | Next test will be done during re-commissioning of unit after O/H | 3rd Quarter |
| | Rihand ( Unit3#500 ) | 8/15/2015 | 8/15/2015 | YES | Next test will be done during re-commissioning of unit after O/H | 3rd Quarter |
| | Rihand ( Unit4#500 ) | 5/25/2017 | 5/25/2017 | YES | Next test will be done during re-commissioning of unit after O/H | 3rd Quarter |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Rihand ( Unit4#500 ) | 12/11/2014 | 12/11/2014 | YES | Next test will be done during re-commissioning of unit after O/H | 3rd Quarter |
| | Rihand ( Unit5#500 ) | 12/11/2014 | 12/11/2014 | 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 |
| | UNCHAHAR I( 2 * 210 ) | 3/29/2016 | 3/29/2016 | YES | -- | 3rd Quarter |
| | UNCHAHAR II TPS( unit1# 210 ) | 7/13/2019 | 7/13/2019 | YES | -- | |
| | UNCHAHAR II TPS( unit2# 210 ) | 8/10/2018 | 10-08-2018 | YES | -- | 3rd Quarter |
| | UNCHAHAR UNIT6#500 | - | 31.03.2017 | YES | -- | 3rd Quarter |
| | KOLDAM HPS( 4 * 200 ) | 7/1/2015 | 7/1/2015 | YES | -- | 3rd Quarter |
| | DADRI GPS( 2 * 154.51) (ST- Steam Turbine) | - | 11/18/2015 | YES | -- | 3rd Quarter |
| | ANTA GPS( 3 * 88.71 )(GT- Gas Turbine) | 8/8/2014 | 8/8/2014 | YES | -- | 3rd Quarter |
| | ANTA GPS( 1 * 153.2 )(ST- Steam Turbine) | 8/8/2014 | 8/8/2014 | YES | -- | 3rd Quarter |
| **5** | **Aravali Power Company Private Ltd** | | | | | |
| | ISTPP (JHAJJAR)( 3 * 500 ) | - | 8/25/2015 | YES | -- | 3rd Quarter |
| **6** | **NHPC** | | | | | |
| | CHAMERA HPS (3*180 ) | 8/6/2020 | 12/27/2019 | YES | -- | |
| | CHAMERA II HPS( 3 * 100 ) | 10/11/2015 | 10/11/2015 | NO | Replacement of Excitation system in two units | 3rd Quarter |
| | CHAMERA III HPS( Unit1#77 ) | 10/29/2015 | 1/7/2012 | YES | -- | 3rd Quarter |
| | CHAMERA III HPS( Unit2,3#77 ) | 10/29/2015 | 6/19/2012 | YES | -- | 3rd Quarter |
| | PARBATI III HEP (Unit1# 130 ) | 1/21/2016 | 1/21/2016 | YES | Have been done recetly. The report on PSS turning shall be submitted seperately. | 3rd Quarter |
| | DULHASTI HPS( Unit2#130 ) | 1/21/2020 | 1/21/2020 | YES | -- | |
| | DULHASTI HPS( Unit1#130 ) | 12/29/2019 | 12/29/2019 | YES | -- | |
| | URI HPS( Unit3# 120 ) | 1/10/2021 | 1/10/2021 | YES | -- | |
| | URI HPS( Unit4# 120 ) | 2/15/2021 | 2/15/2021 | YES | -- | |
| | URI HPS( Unit2# 120 ) | 3/7/2016 | 3/7/2016 | 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 ) | 12/16/2014 | 12/16/2014 | YES | -- | 3rd Quarter |
| | KISHANGANGA( 3 * 110 ) | 18-05-20 18 | 18-05-20 18 | YES | -- | 3rd Quarter |
| | BAIRASIUL HPS( 3 * 60 ) | 7/30/2015 | 7/30/2016 | YES | -- | 3rd Quarter |
| | SEWA-II HPS( 3 * 40 ) | 7/9/2016 | 7/9/2016 | YES | -- | 3rd Quarter |
| | PARBATI III HEP( 4 * 130 ) | 12/16/2016 | 12/16/2016 | YES | -- | 3rd Quarter |
| | TANAKPUR HPS( Unit1# 31.42 ) | 1/9/2015 | 1/9/2015 | YES | -- | 3rd Quarter |
| | TANAKPUR HPS( Unit2,3#31.4) | 5/24/2014 | 5/24/2014 | YES | -- | 3rd Quarter |
| | DHAULIGANGA HPS(Unit1 ,2# 70 ) | 5/4/2014 | 4/17/2018 | YES | -- | 3rd Quarter |
| | DHAULIGANGA HPS(Unit3,4# 70 ) | 6/26/2014 | 4/17/2018 | YES | -- | 3rd Quarter |
| **7** | **PUNJAB** | | | | | |
| | RAJPURA(NPL) TPS( 2 * 700 ) | 4/22/2014 | 4/22/2014 | YES | -- | 3rd Quarter |
| **8** | **Rajasthan** | | | | | |
| | KAWAI TPS( Unt1# 660 ) | 8/8/2014 | 8/8/2014 | YES | -- | 3rd Quarter |
| | KAWAI TPS( Unt2# 660 ) | 10/9/2014 | 10/9/2014 | YES | -- | 3rd Quarter |
| | KOTA TPS (2*110+2*195+3*210) | 4/17/2015 | 4/17/2015 | 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 ) | 5/22/2018 | 5/22/2018 | NO | -- | 3rd Quarter |

| | | | | | | |
|---|---|---|---|---|---|---|
| | CHHABRA TPS( Unit 2,3,4#250 ) | 10/4/2015 | 10/4/2015 | NO | -- | 3rd Quarter |
| | CHHABRA TPS( Unit5# 660 ) | 2/10/2016 | 2/10/2016 | YES | -- | 3rd Quarter |
| | CHHABRA TPS( Unit6# 660 ) | 7/28/2018 | 7/28/2018 | YES | -- | 3rd Quarter |
| | KALISINDH TPS( Unit1# 600 ) | 2/10/2016 | 2/10/2016 | YES | -- | 3rd Quarter |
| | KALISINDH TPS( Unit2# 600 ) | 2/8/2016 | 2/8/2016 | YES | -- | 3rd Quarter |
| | KOTA TPS( Unit1#110 ) | 1/2/2015 | 1/2/2015 | NO | | 3rd Quarter |
| | KOTA TPS( Unit2#110 ) | 9/16/2014 | 9/16/2014 | NO | -- | 3rd Quarter |
| | KOTA TPS( Unit3#195) | 10/14/2019 | 10/14/2019 | NO | -- | |
| | KOTA TPS( Unit4#195) | 3/6/2020 | 3/6/2020 | NO | -- | |
| | KOTA TPS( Unit2#110 ) | 9/18/2014 | 9/18/2014 | NO | -- | 3rd Quarter |
| | KOTA TPS( Unit2#110 ) | 9/16/2014 | 9/16/2014 | NO | -- | 3rd Quarter |
| | KOTA TPS( Unit2#110 ) | 9/16/2014 | 9/16/2014 | NO | -- | 3rd Quarter |
| | SURATGARH TPS ( Unit1#250) | 3/14/2019 | 3/14/2019 | NO | -- | |
| | SURATGARH TPS ( Unit2#250) | 2/6/2016 | 2/6/2016 | Yes | -- | 3rd Quarter |
| | SURATGARH TPS ( Unit3,4,5,6#250) | 1/12/2016 | 1/12/2016 | Yes | -- | 3rd Quarter |
| | RAJWEST (IPP) LTPS( Unit1# 135 ) | 4/26/2016 | 4/26/2016 | No | -- | 3rd Quarter |
| | RAJWEST (IPP) LTPS( Unit2# 135 ) | 7/14/2016 | 7/14/2016 | No | -- | 3rd Quarter |
| | RAJWEST (IPP) LTPS( Unit3# 135 ) | 1/3/2014 | 1/3/2014 | No | -- | 3rd Quarter |
| | RAJWEST (IPP) LTPS( Unit4# 135 ) | 11/3/2015 | 11/3/2015 | No | -- | 3rd Quarter |
| | RAJWEST (IPP) LTPS( Unit5# 135 ) | 9/21/2014 | 9/21/2014 | No | -- | 3rd Quarter |
| | RAJWEST (IPP) LTPS( Unit6# 135 ) | 8/14/2014 | 8/14/2014 | No | -- | 3rd Quarter |
| | RAJWEST (IPP) LTPS( Unit7# 135 ) | 2/20/2016 | 2/20/2016 | No | -- | 3rd Quarter |
| | RAJWEST (IPP) LTPS( Unit8# 135 ) | 6/11/2014 | 6/11/2014 | No | | 3rd Quarter |
| **9** | **UTTAR PRADESH** | | | | | |
| | ANPARA-C TPS( Unit1# 600 ) | 8/22/2015 | 8/22/2015 | Yes | -- | 3rd Quarter |
| | ANPARA-C TPS( Unit2# 600 ) | 3/8/2016 | 3/8/2016 | Yes | -- | 3rd Quarter |
| | ROSA TPS( Unit1 #300 ) | 2/3/2017 | 2/3/2017 | Yes | -- | 3rd Quarter |
| | ROSA TPS( Unit2# 300 ) | 18/2/2018 | 18/2/2018 | Yes | -- | 3rd Quarter |
| | ROSA TPS( Unit3 # 300 ) | 2/3/2017 | 2/3/2017 | Yes | -- | 3rd Quarter |
| | ROSA TPS( Unit4# 300 ) | 2/3/2017 | 2/3/2017 | 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. | |

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 संख्या/NRLDC/TS-15 दिनाँक :09 दिसम्बर 2021

सेवा में,

Chief Engineer, SLDC
Uttar Pradesh Power transmission Corporation Ltd.,
Shakti Bhawan, 14-Ashok Marg, Lucknow-226001.

**विषय: Regarding vigilant and corrective actions to be taken to ensure proper operation of protection system in Uttar Pradesh control area.**

महोदय,

It is to bring to your kind notice that frequent events of multiple elements tripping have been observed in Uttar Pradesh control area. In a few cases, mal-operation or non-operation of protection system is responsible for such multiple tripping. Needless to emphasize that such frequent grid events are very detrimental to the security and reliability of the state grid as well as to that of the regional and national grid. In this connection, your kind attention is drawn to the event of multiple element tripping at 400/220kV Moradabad(UP) on 03-12-21, which is narrated as follows:

- Multiple element tripping was reported from 400/220kV Moradabad S/S on 03/12/2021 at 22:20 hrs. As per SCADA, load loss of approx. 110MW is observed in UP control area. In antecedent condition, 400 KV Moradabad(UP)-Hapur(UP) (PG) Ckt-1, 400 KV Moradabad(UP)-Kashipur(UK) (UK) Ckt-1, 400 KV Bareilly(PG)-Moradabad(UP) (PG) Ckt-1 & Ckt-2 were carrying 120MW, 98MW, 200MW & 200MW respectively. The three 400/220kV ICTs were supplying a load of 181MW to the 220kV system downstream of Moradabad.
- It was reported that the R-ph bushing of 50MVAR bus reactor which was charged through the transfer bus of 400/220kV Moradabad S/Stn, got burst. UP SLDC further reported that the fault was outside the protected zone of differential protection of the bus reactor and bus bar protection also did not operate. Thus the fault was isolated from 400kV system with the tripping of 400 KV Hapur(UP)-Moradabad(UP) (PG) Ckt-1, 400 KV Moradabad(UP)-Kashipur(UK) (UK) Ckt-1, 400 KV Bareilly(PG)-Moradabad(UP) (PG) Ckt-1 & Ckt-2 from respective remote ends by operation of Z-2 distance protection. 220kV feeders to Amroha and Sambhal also tripped from remote ends in Z-2 protection (line to Rampur was not in service). 400/220 kV 500 MVA ICT 1, ICT 2 & 240MVA ICT 3 at Moradabad(UP) were hand tripped from LV side.
- As per PMU data of Bareilly recorded at NRLDC, R-N phase to earth fault which later converted into three phase fault with delayed clearance in 440ms is observed.

In this regard, it is requested to kindly clarify the following:-

- Reason for non-operation of primary protection of the 50MVAR bus reactor at Moradabad end. Whether the fault was located outside the bus bar protection zone.
- The above may please be elaborated with the help of a detailed SLD of Moradabad 400/220kV S/Stn, with CT locations for busbar and reactor differential protections clearly indicated therein.
- As per PMU, delayed clearance of fault in 440ms is observed.
- Reason for tripping of the lines connected to 220kV side of 400/220KV Moradabad S/s before tripping of the 400/220kV ICTs and relay flags noted for these lines.
- It is also requested to kindly share the settings of reactor differential protection, busbar differential protection, backup over current & E/F protection of the 400/220kV ICTs and protection of the 220kV lines connected to Moradabad for assessing proper protection coordination of elements.

Violations of following regulations is observed:-

- Fault clearance delayed beyond limits specified in Clause 3(e) of CEA Grid Standards.

It is requested that the above-mentioned grid event in UP control may be analysed in detail and shortcomings in the protection system may be identified and rectified at the earliest. A confirmation of the corrective action taken along with the detailed tripping report may please be submitted to NRLDC/NRPC.

Matter may be treated as most serious and action taken report may please be shared with NRLDC at the earliest

धन्यवाद,

भवदीय

सुरजीत

(सुरजीत बनर्जी)
मुख्य महाप्रबंधक
संरक्षण विभाग
उ॰क्षे॰भा॰प्रे॰के

**प्रतिलिपि विनम्र सूचनार्थ:**

1. सदस्य सचिव, NRPC, -18ए, शहीद जीत सिंह मार्ग, कटवारिया सराय, नई दिल्ली110016 -
2. सदस्य (GO & D), केंद्रीय विद्युत प्राधिकरण, सेवा भवन, रामकृष्णापुरम, नई दिल्ली110003 -
3. मुख्य अभियन्ता, NPC div., केंद्रीय विद्युत प्राधिकरण,NRPC building, -18ए, शहीद जीत सिंह मार्ग, कटवारिया सराय, नई दिल्ली110016 -