सत्यमेव जयते

भारत सरकार

Government of India

विद्युत मंत्रालय

Ministry of Power

उत्तर क्षेत्रीय विद्युत समिति

Northern Regional Power Committee

संख्या: उ.क्षे.वि.स./प्रचालन/106/01/2022/103-144 दिनांक: 05.01.2022

विषय: उत्तर क्षेत्रीय विद्युत समिति की प्रचालन समन्वय उप-समिति की 190वीं बैठक का कार्यवृत |

Subject: Minutes of 190th OCC meeting of NRPC.

उत्तर क्षेत्रीय विद्युत समिति की प्रचालन समन्वय उप-समिति की 190वीं बैठक दिनांक 21.12.2021 को आयोजित की गयी थी। उक्त बैठक का कार्यवृत्त उत्तर क्षेत्रीय विद्युत समिति की वेबसाइट http://164.100.60.165 पर उपलब्ध है। यदि कार्यवृत पर कोई टिप्पणी हो तो कार्यवृत जारी करने के एक सप्ताह के अन्दर इस कार्यालय को भेजें |

190th meeting of the Operation Co-ordination Sub-Committee of NRPC was held on 21.12.2021. The Minutes of this meeting has been uploaded on the NRPC website http://164.100.60.165. Any comments on the minutes may kindly be submitted within a week of issuance of the minutes.

संलग्नक: यथोपरि

सौमित्र 05/01/2021.

(सौमित्र मजूमदार)

अधीक्षण अभियंता (प्रचालन)

सेवा में,

उ.क्षे.वि.स. के प्रचालन समन्वय उप-समिति के सभी सदस्य

उत्तर क्षेत्रीय विद्युत समिति की प्रचालन समन्वय उप-समिति की **190**वीं बैठक का कार्यवृत्त

190th meeting of OCC of NRPC was held on 21.12.2021 through video conferencing.

खण्ड-क: उ.क्षे.वि.स. **PART-A:NRPC**

1. Confirmation of Minutes

Minutes of 189th OCC meeting was issued on 03.12.2021. OCC confirmed the minutes.

2. Review of Grid operations of November 2021

2.1. Anticipated vis-à-vis Actual Power Supply Position (Provisional) for November 2021

Reasons submitted by states for significant deviation of actual demand from anticipated figures during the month of November 2021 are as under:

- **Delhi**

1950 MUs was anticipated energy consumption for Nov'2021. However, the actual energy consumption met for Nov'2021 was 1819.037 MUs. The variation between actual and anticipated energy consumption is (-) 6.7 %.

Energy consumption for Nov'2019 was 1899 MUs. Similarly, energy consumption for Nov-2020 was 1783 MUs.

Projection for Nov'2021 was made considering the energy consumption of pre-Covid time i.e., Nov'2019 keeping in view that situation may improve in coming days leading to increase in power demand. However, due to comparatively cold weather condition during Nov'2021, demand did not pick up.

- **Haryana**

The anticipation in Energy requirement in respect of Haryana for the month of Nov'2021 came on the lower side as agriculture consumption was less.

- **Punjab**

Actual maximum demand was more as compared to anticipated maximum demand because of long dry spell in the state of Punjab during month of Nov'2021.

- **Rajasthan**

The energy consumption decreased by 8.8% with respect to anticipated energy requirement due to less increment in agriculture load during first fortnight in the month of Nov'2021 and peak demand was 14,253 MW on 17.11.2021 for Nov'2021 which 5.6% more with respect to anticipated peak demand due to two block supply in day hours to agriculture consumer in phasing manner.

- **Himachal Pradesh**

The anticipation in energy requirement in respect of Himachal Pradesh for the month of Nov'2021 came on the higher side due to dry weather and early winter.

- **Uttar Pradesh**

Actual peak demand and availability in terms of MW is less than anticipated due to less demand during Diwali festival.

2.2. **Power Supply Position for NCR:**

Representative of Rajasthan explained the methodology adopted by Rajasthan for calculating hourly load shedding and mentioned that feeder-wise MW shortfall in each hourly block is computed by dividing MU of the disconnected feeder by duration of disconnection during that block. It was also mentioned that duration of feeder disconnection in some of the hourly blocks was incorrectly considered in the initial computation due to which 5033MW was reported as maximum shortfall in the state on 7th October.

Rajasthan SLDC was advised to share the computation sheet of hourly feeder-wise MW shortfall along with Power Supply Position data to NRPC Sectt. on monthly basis.

2.3. **Power Supply Position for NCR:**

The Sub-Committee was informed that the NCR Planning Board (NCRPB) is closely monitoring the power supply position of National Capital Region. Monthly power supply position for NCR till the month of November, 2021 was enclosed in the agenda and same was discussed in the meeting.

No significant deviation in any of the states was observed.

3. Maintenance Programme of Generating Units and Transmission Lines

3.1. The maintenance programme of generating units and transmission lines for the month of January 2022 was deliberated in the meeting on 20.12.2021.

3.2. Following shutdown requests were also discussed in the OCC meeting:

Element Name	Owner	Daily/ Cont.	Reason	Requested From	Requested To	Decision of OCC
500 MW RIHAND-III STPS - UNIT 1	NTPC	C	Boiler+ Nox Modification +FGD+LPT+ TG vibration issue	05-Jan-2022 00:00	19-Feb-2022 23:59	UP has given consent. S/d is approved from 13.01.2022 for 45 days

4. Planning of Grid Operation

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

The updated anticipated Power Supply Position for January 2022 is as below:

State / UT	Availability / Requirement	Revised Energy (MU)	Revised Peak (MW)	Date of revision
CHANDIGARH	Availability	100	230	Revision not submitted
	Requirement	130	280	
	Surplus / Shortfall	-30	-50	
	% Surplus / Shortfall	-23.1%	-17.9%	
DELHI	Availability	3559	5300	20-Dec-21
	Requirement	2350	5300	
	Surplus / Shortfall	1209	0	
	% Surplus / Shortfall	51.4%	0.0%	
HARYANA	Availability	4870	10860	21-Dec-21
	Requirement	4090	7627	
	Surplus / Shortfall	780	3233	
	% Surplus / Shortfall	19.1%	42.4%	
HIMACHAL PRADESH	Availability	996	1975	14-Dec-21
	Requirement	995	1980	
	Surplus / Shortfall	1	-5	
	% Surplus / Shortfall	0.1%	-0.3%	
J&K and LADAKH	Availability	980	3610	Revision not submitted
	Requirement	2090	2920	
	Surplus / Shortfall	-1110	690	
	% Surplus / Shortfall	-53.1%	23.6%	
PUNJAB	Availability	4780	9100	20-Dec-21
	Requirement	4024	7368	
	Surplus / Shortfall	756	1732	
	% Surplus / Shortfall	18.8%	23.5%	
RAJASTHAN	Availability	8510	18870	20-Dec-21
	Requirement	8480	15500	
	Surplus / Shortfall	30	3370	
	% Surplus / Shortfall	0.4%	21.7%	
UTTAR PRADESH	Availability	9610	19500	15-Dec-21
	Requirement	9920	19500	
	Surplus / Shortfall	-310	0	
	% Surplus / Shortfall	-3.1%	0.0%	

State / UT	Availability / Requirement	Revised Energy (MU)	Revised Peak (MW)	Date of revision
UTTARAKHAND	Availability	1246	2242	10-Dec-21
	Requirement	1271	2350	
	Surplus / Shortfall	-25	-108	
	% Surplus / Shortfall	-2.0%	-4.6%	
NORTHERN REGION	Availability	34651	67200	
	Requirement	33350	58900	
	Surplus / Shortfall	1301	8300	
	% Surplus / Shortfall	3.9%	14.1%	

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
Haryana	Apr-2018	Oct-2021
Himachal Pradesh	Apr-2018	Nov-2021
Punjab	Apr-2018	Jul-2021
Rajasthan	Apr-2018	Oct-2021
Uttar Pradesh	Apr-2018	Oct-2021

5.2. OCC forum again raised expressed concern on non-submission of energy breakup data by Uttarakhand, UTs of J&K & Ladakh, and Chandigarh despite repeated reminders.

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

6.1. OCC forum was intimated that NRPC in its 48th meeting 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. Accordingly, CPRI have submitted the system study 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.

6.2. 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 sub-group 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.

6.3. In 181st OCC, forum decided that sub-group comprising of following officers would study the report and submit the recommendation report within two weeks:

6.4. NRPC Sectt. sought comments/observations on the CPRI report from all the states via e-mail. Comment from Delhi was received. Rajasthan, HP, Punjab, Haryana submitted NIL comment. Comment from rest of the members was not received.

6.5. 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.

6.6. The meeting of sub-group was held on 03.05.21. In the meeting, sub-group members decided to get PSSE file from CPRI for better understanding, which was later shared with them.

6.7. In 183rd OCC meeting, 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. 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.

6.8. 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.

6.9. 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.

6.10. In the 185th OCC, NRPC stated that CPRI has submitted on 28th June 2021 its point-wise reply on the observations of sub-group along with updated report. OCC forum decided that a video-conferencing meeting may be held within sub-group members and CPRI for further discussion on reply of CPRI.

6.11. In the 186th OCC meeting, NRPC representative apprised the forum that in line with decisions of 185th OCC, a meeting was held on 06.08.2021 under the

chairmanship of MS, NRPC through Video Conferencing. It was attended by members of the sub-group, CPRI representatives, and officials from NRPC Sectt & NRLDC.

6.12. It was also stated that in the meeting dt. 06.08.2021, comments of the sub-group on the latest version of CPRI report were deliberated in detail. After weighing the merits of the original & 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 base-case 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.

6.13. It was further intimated that base case file (11.07.2018 00:45 hrs) and CPRI's Sep'2020 report were e-mailed to all sub-group members on 10.08.2021 along with the request to submit comments/observations thereon, latest by 24.08.2021.

6.14. In the meeting (187th OCC), forum was apprised that although last date for submission of comments was 24.08.2021, NRPC Sectt. received comments from Himachal Pradesh, Punjab, Rajasthan, Delhi, and NRLDC vide mails dtd. 24.08.2021, 25.08.2021, 26.08.2021, 31.08.2021, and 03.09.2021 respectively. As the received comments were also on the base-case data, a meeting was held on 06.09.2021 among officers of NRPC Sectt, NRLDC and above four states for discussing comments before sending to CPRI. After detailed discussions, following were decided:

A. Himachal Pradesh:

a) It was apprised by NRLDC that generation data of micro IPPs has not been modelled by them in base-case due to their small quantity. Further, Capacitor at Baddi needs to be removed from base-case.

b) HP was requested to submit within 3 days data regarding (11.07.2018 00:45 HRS):

i. Generation break-up along with details of micro IPPs.

ii. Capacitors at 132 kV level.

iii. Nodes of major voltage profile mismatch

iv. Load factor of state (current scenario if data of past is not available)

c) It was decided that after getting above data from HP, base-case will be tuned by NRLDC before sending to CPRI.

B. Punjab:

a) All switched reactors/capacitors to be converted into fixed & net shunt capacitor value in the base-case to be corrected as per Punjab's comment.

b) Punjab was requested to submit low voltage nodes (11.07.2018 00:45 HRS) within 3 days.

c) Based on data from Punjab, initial tuning to be done by NRLDC for Q values of generators. CPRI may be required to do further tuning.

C. Rajasthan:

a) Except low voltage points, power factor needs to be upgraded in the base-case.

b) Rajasthan representative confirmed that most of the capacitors were off during the time for which modelling is done, so lumped capacitor at 132kV needs to be deleted.

c) Rajasthan was requested to submit

i. List of bus-wise capacitors and their status (OFF/ON condition) on 11.07.2018 00:45 HRS.

ii. Voltage profile of generator buses.

D. Delhi:

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

6.15. 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.

6.16. In 188th OCC, it was apprised that CPRI vide e-mail dtd. 23.09.2021, requested to send comments at the earliest.

6.17. NRPC Sectt. vide e-mail dtd. 23.09.2021 apprised the CPRI that as per decisions of meeting dtd. 06.09.2021, tuning of base-case file is being done by NRLDC so that no new issue arises in future.

6.18. 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.

6.19. 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.

6.20. 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.

6.21. 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.

6.22. Tuned base-case has been received from NRLDC vide mail dtd 10.11.2021.

6.23. In 189th OCC, NRPC representative apprised that tuned base-case received from NRLDC is under examination in NRPC Sectt. After examination, the same will be sent to CPRI for correction in the report along with the comments submitted by states.

6.24. In the meeting (190th OCC), NRPC representative informed that tuned base-case along with comments of states has been sent to CPRI vide mail dated 30.11.2021 for correction in the report.

7. Automatic Demand Management System

7.1. Forum was informed that as decided in the 175th OCC meeting, to conduct separate meeting with states, nominations are pending from PuVVNL, PVVNL, MVVNL, DVVNL, UPPTCL, UPCL, PTCUL, SLDC Uttarakhand, and J&K. They were requested on 01.03.2021 to submit nominations for the meeting.

7.2. Meetings on ADMS implementation roadmap have been held with the officers of Haryana, HP, 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.

7.3. As per the 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.

7.4. In 186th OCC, In-charge, NRLDC stated that as per IEGC, implementation of ADMS is mandatory. It helps in reducing DSM charges also. States must take it seriously.

7.5. MS, NRPC stated that non-implementation of ADMS by states is indistinguishably non-adherence to directions of CERC. He enquired from NRLDC whether POSOCO has made any communication with CERC regarding non-adherence of its deadline i.e., 31.06.2016. NRLDC representative stated that he would look into and inform in next meeting.

7.6. 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 dt. 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

7.7. Forum decided that NRLDC may file a report to CERC based on compiled status of ADMS implementation in states of Northern Region.

7.8. In 187th OCC, NRLDC representative quoted the texts of CERC order dt. 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.

7.9. In 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.

7.10. 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.

7.11. 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.

7.12. In the meeting (190th OCC), NRLDC representative informed that vide letter dated 09.12.2021 (enclosed as Annexure-A.I), CERC has been apprised about the latest status of ADMS as per the updated information available with them.

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

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

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 states shall submit MIS report before every OCC meeting so that same may be discussed. Format was circulated vide agenda of 187th OCC.

9.3. 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.

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

9.5. 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.

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

9.7. 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.

9.8. 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.

9.9. 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.

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

9.11. 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.

9.12. In the meeting (190th OCC), NRPC representative informed that SOP data in respect of Delhi and RAPS have been received.

9.13. UPSLDC vide letter dated 01.12.2021 has submitted the names of islands for which system study from CPRI is required. 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.

9.14. HPSLDC vide letter dtd. 18.12.2021 has intimated that a meeting was held on 26.11.2021 between HPSLDC and HPSEBL wherein a team of officers from HPSLDC and HPSEBL has been formed to carry out transient study of all islands within a month.

9.15. UPSLDC representative informed that CPRI has asked for some additional details and technical commercial offer would be provided to them by CPRI by 15th Jan 22.

9.16. NRLDC representative informed that report received from Rajasthan regarding the Jodhpur-Barmer-Rajwest islanding scheme and Suratgarh islanding scheme is in order and Rajasthan SLDC can proceed ahead. Further, NRLDC submitted that they use PSSE software for system study but Rajasthan has submitted details of Islands in MI Power Software, therefore, they are not able to access the file.

9.17. Rajasthan SLDC representative informed that they have given the details in the hard copy of the load and generation to be considered for islanding scheme, and based on that have requested NRLDC to simulate it in PSSE software for validation. NRLDC representative agreed to the request of the Rajasthan SLDC.

9.18. Uttarakhand SLDC representative informed that hydro stations near Dehradun are peaking stations and the proposed Dehradun islanding scheme appears to be infeasible. NRPC representative informed that some schemes in NR have been proposed by considering Hydro stations and Dehradun islanding scheme was proposed by the state SLDC itself in view of all factors. Thus, Uttarakhand SLDC shall immediately conduct study on the proposed Islanding Scheme having Khodri & Chibro units and provide status on the feasibility of scheme with supporting data so that same may be communicated to the Ministry.

10. Coal Supply Position of Thermal Plants in Northern Region

10.1. In the meeting, NRPC representative apprised the forum about the coal stock position of generating stations in northern region during current month (till 10th December 2021).

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 Company 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. 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.

11.2. PPGCL representative expressed its concern of 660 MW unit tripping due to 765 Line-2 tripping for any reason and requested to expedite commissioning work of 2nd ICT being executed by UPPTCL. PPGCL representative further expressed concern for non-availability of "One and Half Breaker scheme" in place at Mainpuri end of 765 kV Bara-Mainpuri Line-2.

11.3. UPPTCL representative, assured to get One and half Breaker scheme ready (by making available 2nd Breaker) at the earliest. UPSLDC agreed to facilitate early shut-down by co-ordinating with PPGCL and UPPTCL for line shut-down after preparatory work.

11.4. UP representative informed that the concerned company for installing 2nd 765kV line is undergoing insolvency proceeding and hence the work is pending.

11.5. NRLDC representative suggested that PPGCL can take up the matter with CEA as it monitors the progress of these lines.

12. CEA Inspection of transmission lines diversion works under regulation 43(4) of CEA (Measures relating to Safety and Electric Supply) Regulations (Additional Agenda)

12.1. POWERGRID representative informed the forum that massive diversion works of 765 kV & 400kV Transmission Lines are being carried out by POWERGRID on request of various utilities like NHAI, DFCCIL, NCRTC, UPEIDA etc. These projects of National Importance are to be completed in scheduled time manner.

12.2. Diversion works of 400kV Single Circuit and Double circuit are generally completed within 10 days and 15 days respectively and online application for CEA inspection is filed on completion of diversion works in all respect. The inspection by Electrical Inspector is carried out within 4-5 days after filing of application due to their busy schedule. Subsequently, final charging clearance is given within 3-4 days after inspection on compliance of minor observations which takes 1-2 days.

12.3. POWERGRID representative mentioned that restoration of Transmission Line is getting delayed by 7-8 days due to CEA inspection, compliance of inspection reports and final charging clearance by CEA after completion of diversion works which is resulting threat to reliability of National Grid as well as safety of Transmission Line assets. Recently approximate I.6 km ACSR Moose conductor has been theft in span of tower nos. 52-54 of 400kV S/C

Bhiwadi-Gurugram TL which was under shut down for diversion work resulting partial damage to the tower, which was taken additional 02 days for restoration.

12.4. In view of above, POWERGRID requested that provisional CEA clearance for energization of Transmission Line after completion of diversion works may be issued immediately based on self-certification by POWERGRID. However, the final CEA clearance can be issued later based on site inspection, compliances etc. as the case may be.

12.5. MS, NRPC stated that CEA is the appropriate body to decide on the provisional clearance for energization of Transmission Line after completion of diversion works. In this regard letter may be written to Member Power System, CEA to apprise him about the opinion of OCC forum of NR. Further, Member GO&D, CEA may be apprised about the opinion of OCC forum of NR and his guidance on deemed availability for the matters related to diversion works for national highways would be sought.

13. Reverse Power Flow testing of +/- 500KV, 2500 MW HVDC Ballia- Bhiwadi bipole link Approval for System Test Schedule (Additional Agenda)

13.1. NRPC POWERGRID representative intimated that NRSCT in its 5th meeting held on 13.09.2019 discussed power reversal on + 500 KV, 2500 MW, Ballia–Bhiwadi line up to 2000 MW from Bhiwadi to Ballia. The same has been mentioned in 6th NCT meeting dated 30.09.2019 at sl.no. 4.3.12 under "Transmission system strengthening scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under phase-II – Power Reversal in Ballia-Bhiwadi HVDC Line"

13.2. Accordingly, purchase order had been placed to M/s Siemens Ltd for "Technical support for reverse power flow studies for POWERGRID on HVDC Ballia-Bhiwadi link", both Offsite and Onsite system testing.

13.3. M/S Siemens has proposed for Onsite system testing on Ballia-Bhiwadi link from 24.01.2022 to 03.02.2022 for which shutdown of Bi-pole shall be required as per given test schedule with number of tests, their duration (day & time) and required power flow schedule. Further above-mentioned work of HVDC Ballia -Bhiwadi link is being carried out for reliability of flexible system operation, hence outage period for scheduled testing shall be considered deemed available.

13.4. POWERGRID representative mentioned that testing shall be performed as per approval and real-time coordination with NRLDC for change of power order in Pole/Bipole during system tests for about 7-8 days. During the reverse power flow, deemed availability of poles may be considered.

13.5. In view of the NCT decision, OCC forum agreed to facilitate reverse power flow testing of Bhalia-Bhiwadi bipole link.

14. Grid Highlights for November 2021

Grid highlights for the month of November 2021 were as follows:

- 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.
- Average energy consumption per day of Northern Region was 916 Mus which is 3.20 % higher than 888 Mus per day in November 2020.
- Maximum Demand met of Northern Region was 49319 MW on 26th Nov'21 at 11:00 hours (Based on data submitted by Constituents) as compared to 48166 MW on 27th Nov'20 at 09:40 hours.
- Comparison of Average Energy Consumption (MUs/Day) of NR States for November 2021 vis-a-vis November 2020

Region/State	Nov- 2020	Nov-2021	% Of Variation
Punjab	104.52	112.23	7.37
Haryana	114.21	115.18	0.85
Rajasthan	236.12	239.41	1.39
Delhi	60.83	60.44	-0.65
Uttar Pradesh	258.45	270.74	4.76
Uttarakhand	34.26	33.92	-1.00
Himachal Pradesh	28.25	29.91	5.87
Jammu & Kashmir	48.05	51.30	6.76
Chandigarh	3.03	2.98	-1.52
Northern Region	887.73	916.11	3.20

- 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.

NRLDC representative stated that in November 21, frequency remained within IEGC band for 74% and below the IEGC band for 8.02% of the time. There were number of excursions below 49.90 Hz and at that time emergent contingency events such as large generation outage, could result in further drop in frequency and therefore, overdrawals below 49.90 Hz must be controlled quickly in order to keep system secure.

Frequency profile for last one year is given below*:*

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**

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
<49.8 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 NR states such as Rajasthan, Haryana and J&K also had overdrawal contributing to low frequency operation. NRLDC has been continuously requesting all these states to maintain drawl within their respective schedules at all times, as mandated by IEGC sub clauses 6 and 7 of section 6.4 and also take necessary measures for revival of intrastate generating units.

NR Constituents were once again requested to take actions such as minimise sudden load changeovers at hourly boundaries, stagger loads in different blocks instead of supply during few blocks (Rajasthan) and also monitor performance of generators under their jurisdiction when the frequency is having large excursions. All utilities were 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.

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

NRLDC representative stated that 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 other states such as Haryana and Uttarakhand are only providing partial data as per the format. States such as

Rajasthan, Punjab, Delhi, HP, J&K and Chandigarh are not furnishing the reasons for load shedding.

Sample formats as submitted by Haryana, Rajasthan, UP were also presented in the meeting. Delhi SLDC representative highlighted that there is delay in report being received from DISCOMs and the data is generally available at 0800am. NRLDC representative stated that Delhi SLDC should immediately communicate with all the DISCOMs in their control area citing NRLDC's letter/MOP directive and OCC discussion to submit the data by 02:00 AM to SLDC for onward submission to RLDC/NLDC and Ministry of Power.

The data submission by UP were appreciated by OCC forum and other SLDCs were advised to furnish the reasons for load shedding as per the approved format by Ministry of Power. States agreed to submit the required data in format as already communicated from 01.01.2022 onwards.

16. Action Plan for Winter Preparedness 2021-22

NRLDC representative stated that as discussed in 187thand 188thOCC 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 190th 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 January' 2022. Punjab SLDC was asked to expedite the work as same has not been completed as per the timelines promised in 47th TCC and 49th NRPC meeting.***

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 representative stated that after analysing scatter plots of 400/220kV stations based on November 2021 data, it was proposed to carry out tap change exercise at (Increase by 2 tap positions) at 400/220kV Jaipur South and Agra(UP). ***OCC agreed for the same.***

NRLDC representative stated that out of 66 line tripping between 13.12.2021 to 20.12.2021, 43 have occurred between 09pm-09am. There have also been many fog suspected tripping in Punjab state control area. The importance for carrying out prewinter maintenance cleaning and insulator replacement was once again highlighted. Transmission licensees were asked to share details about the prewinter maintenance activities including insulator replacement carried out/planned by them for this winter.

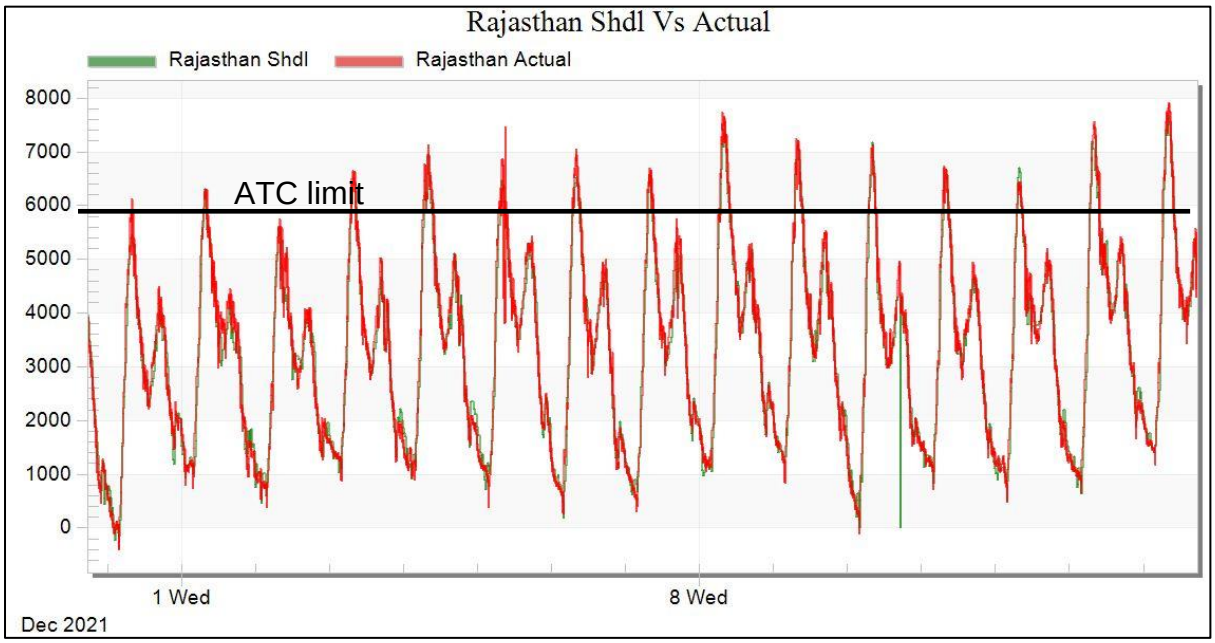
Punjab SLDC representative stated that tripping were observed when severe fog was observed during night for last 2-3 days. However, the system is operating normal afterwards and no tripping have been reported. Punjab and Haryana SLDC representative stated that they shall submit latest status of pre-winter maintenance activities carried out by them.

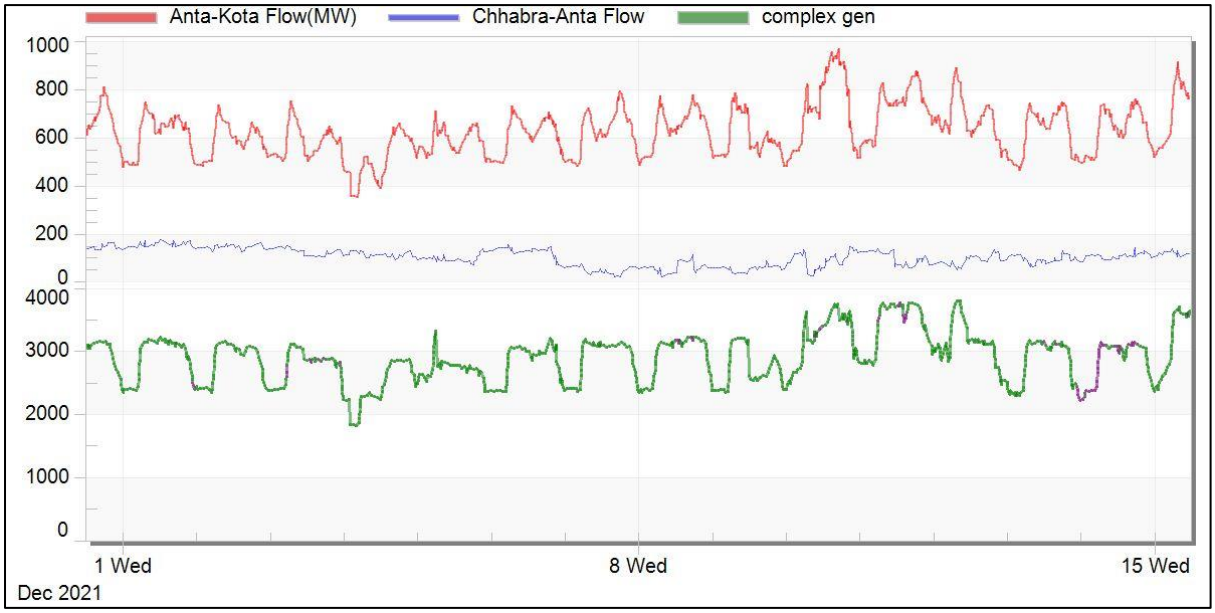
In 190th OCC meeting, utilities were asked to share action plan for measures to be taken by them for carrying out pre-winter maintenance activities and other actions agreed in 187th, 188thand 189thOCC meeting.

17. Reliability issues related to Rajasthan control area

NRLDC representative stated that Rajasthan has met maximum demand of 15900MW on 21st December 2021. However, some reliability issues are being observed in Rajasthan control area during this high demand season. Following issues were discussed in detail:

- **Severe low voltages are observed in Hindaun and Alwar area.**
- **N-1 non-compliance observed at 400/220kV Ajmer, Merta, Chittorgarh, Jodhpur, Bikaner, Bhinmal ICTs. Plots are attached as Annexure-B.I of agenda.**
- **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.**





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

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.

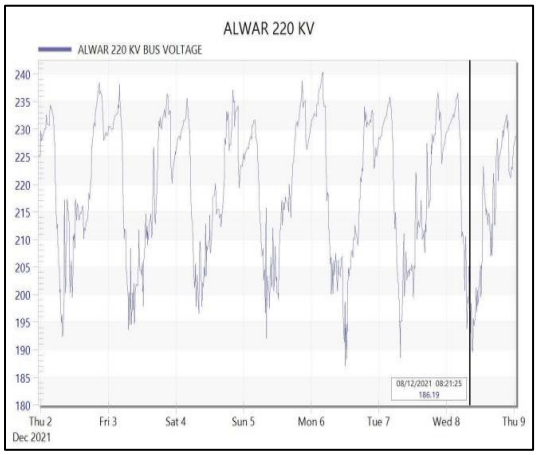
In 190th OCC meeting, Rajasthan SLDC representative stated that to limit the loading of 400kV Anta-Kota, the line is being used as 400kV Chhabra-Kota line by opening main bays at Anta end. This has increased flows towards Hindaun/Alwar area. Rajasthan SLDC representative also suggested in next outage of 400kV Hindaun-Chhabra line the line reactor would be taken under outage which is likely to slightly improve the voltage profile in the area.

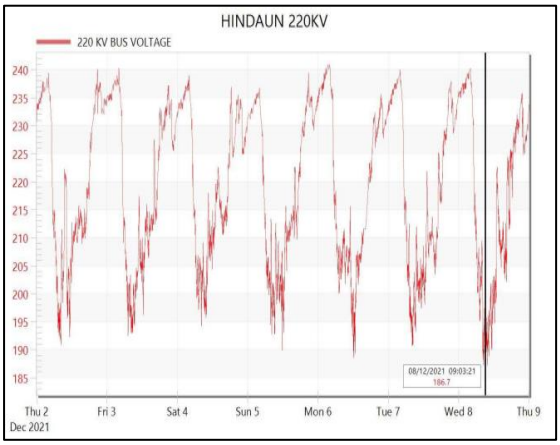
NRLDC representative suggested that as discussed in 47th TCC and 49th NRPC meeting, till implementation of these schemes, if considerable generation is maintained at Dholpur GTPS , the voltages at Hindaun and Alwar can be improved to some extent. Rajasthan representative replied that generation cost 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.

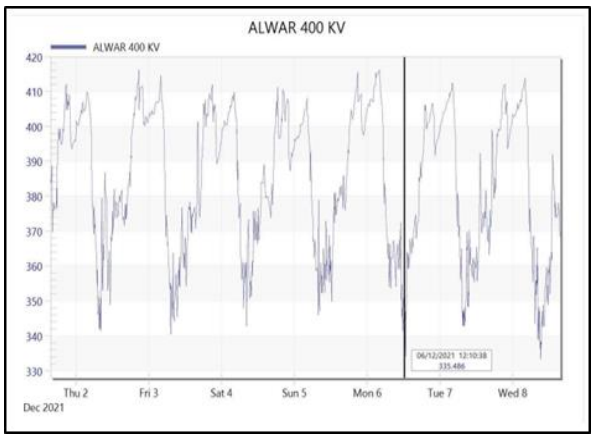
SE, Rajasthan Urja Vikar Nigam stated the cost of power from Dholpur is around 20-21 Rs/unit. Supply is being given in two time periods during day-time as per government policy. Moreover, intrastate generators are able to back down only upto 25-28% capacity. All these issues are aggravating the low voltages in Hindaun and Alwar area.

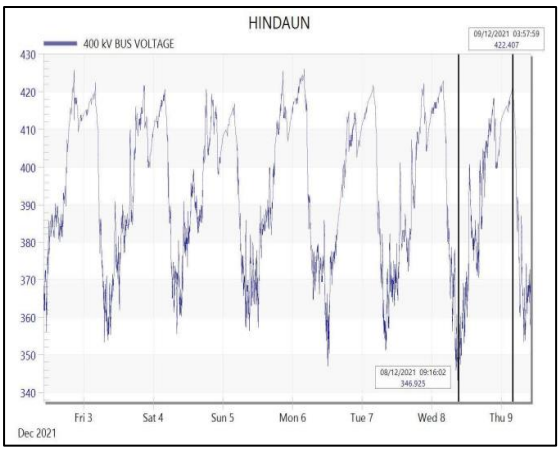
NRLDC representative stated that the load in Dholpur-Hindaun-Alwar area needs to be supplied in more blocks including night which would improve voltage profile in the

area during day-time at time of peak demand. Moreover, it was also mentioned that the issue of low voltage in Hindaun and Alwar area is being discussed since last many years. Rajasthan is well aware of the issues and should have asked Dholpur to tie-up for cheap gas as other NR-NTPC plants are doing Jul-Sep months. Even for the remaining season, availability of cheap gas may be explored and Dholpur GPS may be asked to run.









Rajasthan was 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 was also advised to control loading of 400/220kV ICTs within their N-1 contingency limits and also expedite implementation of SPS at constrained locations.

NRLDC representative stated that it has already been deliberated in many past OCC meetings that while requisitioning power from various sources, states should take care to limit their scheduled drawl as well as actual drawl in real time within the Available Transfer Capability (ATC) limits assessed by SLDC and NRLDC.

18. 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 was 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. MVAr performance of following plants were discussed in detail:

S.No.	Station	Unit No.	Capacity	Geographical location	MVAR capacity as per capability curve	MVAR performance (-) Absorption (+) Generation	Voltage absorption above (in KV)
1	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
2	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
3	Kalisindh RS	1	600	Rajasthan	-180 to 360	data error	
		2	600		-180 to 360		
4	Anpara C UP	1	600	UP	-180 to 360	-	-
		2	600		-180 to 360	-120 to 40	765
5	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	-	-
6	Kawai RS	1	660	Rajasthan	-198 to 396	-100 to 0	400
		2	660		-198 to 396	-100 to 0	400
7	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	-	-
8	Rajpura (NPL)	1	700	Punjab	-210 to 420	-130 to 0	404

		2	700		-210 to 420	-	-
9	MGTPS	1	660	Haryana	-198 to 396	-140 to 0	406
		2	660		-198 to 396	-160 to 40	410
10	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
11	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
12	Lalitpur TPS	1	660	UP	-198 to 396	-	-
		2	660		-198 to 396	0 to 150	785
		3	660		-198 to 396	-	-
13	Anpara D UP	1	500	UP	-150 to 300	-140 to 20	767
		2	500		-150 to 300	-100 to 20	765
14	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

NRLDC representative stated that they have written letters to IGSTPP Jhajjar, Delhi SLDC (Bawana), UP SLDC (Bara and Lalitpur) to improve their reactive power performance.

Rajasthan SLDC representative agreed to look into the telemetry issues of Kalisindh TPS.

IGSTPP Jhajjar representative stated that they have shared GT tap postion and AVR setting with NRLDC. They are trying to extract data from their end and observe the performance of the machine. They shall also share this data with NRLDC within one week.

Delhi SLDC representative stated that they are regularly sending messages and asking CCGT-Bawana to absorb MVAr as per its capability curve, however they are not absorbing sufficient MVAr. SLDC representative stated that they shall take up the issue again with Bawana and share the actions taken by plant with NRLDC/NRPC.

Lalitpur representative stated that new bus reactor is expected to be commissioned shortly which would reduce the MVAr requirement from machine. MVAr absorption by plant has to be limited due to the limitation of increased voltage at 11kV side.

NRLDC representative asked Lalitpur representative to submit in detail the reasons for the lower MVAr absorption along with plant Single line diagram. Also, the GT tap position and AVR settings and any other relevant settings may also be shared with NRLDC.

Bara TPS was also requested to share reasons for limited MVAr absorption and not as per their capability curve and grid requirements. UP SLDC and Bara agreed to share the reasons and ensure MVAR performance as per grid requirement and capability curve of machines.

Data as received from Rampur HEP is attached as **Annexure-B.I**.

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. Presently, only UP SLDC is developing and sharing MVAR vs voltage plots. Other SLDCs were also asked to develop such plots and regularly take up the matter of required MVAr absorption by intrastate generators.

Other generating stations such as Kalisindh TPS, Chhabra TPS, Rajpura TPS, Talwandi Saboo were requested to resolve any issues related to telemetry and make sure that correct MVAR data from all units are available at RLDC/ SLDC 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 was also requested to share these details with NRLDC/NRPC.

19. MVAR support from solar/wind generators

As already discussed in TCC/NRPC meeting, subgroup was formed at NRPC level to look after RE integration to 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 189th 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.

In 190th OCC meeting, it was informed that 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.

The key points from SRLDC report were presented in the meeting.

- Inverters are having reactive capability of 33%, 66% and 88%, or in some case up to 100% of active power depending upon the manufacturer and model.
- 986MVAR dynamic reactive capability is available in the PV inverters at Pavagada Ultra Mega Solar Park.
- Night Mode facility is available in 1575MW out of 2050MW installed capacity.
- For 775MW having reactive power capability of 441.5MVAR, the night mode/Static VAR Generator (SVG) feature can be enabled during generation hours only Whereas Night mode/SVG Feature can be enabled at any time of the day for 800MW of installed Capacity of inverters having reactive capability of 544.5MVAR
- A total of 4.16MUs of energy has been consumed for this exercise which was included in regional loss during the two months trial period.
- Maximum active power of 14.5MW was consumed from the grid at 220kV level during the trial operation when maximum 456MVAR was absorbed at 220kV level PoC
- Active power consumption per 100MVAR of reactive power absorption is in the range of ~2 to 2.5MW which is ~2% to 2.5%.
- All lines at 400kV Pavagada were in closed condition during this experiment period except on few occasions which was due to issues at other connected station
- Night mode feature may be made mandatory by including the requirement of facility in the CEA Technical Standards for Connectivity

NRLDC and NRPC representatives stated that separate meeting may be called with solar ISGS by sub-group formed at NRPC level so that such capability of NR plants may be discussed and accordingly further course of action may be decided.

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

NRLDC representative stated that most of the NR states except J&K U/T and Ladakh U/T and Chandigarh are sharing basecase and ATC/TTC assessment with NRLDC. SLDCs were once again requested to go through the tentative ATC/TTC limits for January 2022 (**Annexure-B.IV of agenda**) and provide comments. However, ATC/TTC assessment has only been received 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 were also requested to upload the limits for winter 2021-22 in their respective websites.

Punjab

Punjab SLDC was 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 along with 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 representative stated that the limits would be reassessed for next summer season shortly with commissioning of 400/220kV Dwarka substation and accordingly revised ATC/TTC limits would be uploaded on website. NRLDC representative suggested that present ATC/TTC limits may be uploaded on SLDC website and with commissioning of 400/220kV Dwarka substation, revised ATC/TTC may be uploaded.

Delhi SLDC was asked to implement SPS at Mundka and Bamnoli to save supercritical loads under N-1 contingency of one ICT. Delhi representative stated 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.

J&K and Ladakh U/Ts were once again requested to advise the concerned officers to evaluate their ATC/TTC limits in coordination with NRLDC after procurement of PSSe and share latest assessment with NRLDC and NRPC. ***N-1 violations at 400/220kV Amargarh and ATC violations observed in Nov-Dec 2021 were presented in the meeting.***

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

It was 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 was requested that the revised ATC/TTC limits for winter 2021 along with anticipated generation scenario is timely shared with NRLDC***.***

All SLDCs were 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 10th 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 20th 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 was also requested that SLDCs shall ensure that net scheduled power requisitioned and scheduled by states is within their ATC limits.

OCC agreed for the proposed timelines and states assured to share basecase as well as ATC/TTC assessment timely with NRLDC.

21. 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. Update on the status of these elements from last OCC meeting is attached as **Annexure-B.II**.

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

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

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

Utilities were 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 190th OCC meeting, following details have been received from UP SLDC:

1. LILO of 765 kV Mainpuri- Greater noida Line at Jawaharpur TPS.
2. LILO of 220 kV Sohawal (PG) - New tanda line at 220 kv Ayodhaya.
3. LILO of 220 kV Gorakhpur (PG)- Bansi line at 220 kv Dulhipar.
4. 765 kV S/C Ghatampur TPS - Hapur line (including 330 MVAr line reactor at Hapur end)
5. 125 MVAR bus reactor at 400 kV Mau.
6. 3*110 MVAr bus reactor-II at 765 kV Lalitpur TPS

In line with the above decisions, all utilities were 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:

NRLDC representative stated that 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 were requested to analyze 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 were also requested to share action plan for high voltage management during winter 2021-22.

Delhi and Punjab STUs were asked to expedite charging of reactors approved for controlling voltages in Delhi and Punjab state control area.

(iv) SPS Implementation at Bhadla (PG)

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. Following is status of SPS implementation as deliberated in OCC meetings:

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

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.

190 OCC meeting, POWERGRID representative stated that two bids have been received and price bid will be opened shortly and the contract is likely to be awarded in January 2021.

(v) Calculation of actual drawalby states based on SLDC end SCADAdata

As discussed in the 6thTeST 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 until 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, no response from SLDCs was received.

In 190th OCC meeting, Punjab SLDC representative informed that data calculation from SLDC end data is complete and display for difference between the values from NRLDC end and Punjab SLDC end data is also available at SLDC control room. Punjab SLDC will share screen shot of display available at their control center with NRLDC.

Haryana SLDC representative stated that data from some stations such as 220kV Bawal is not available at SLDC. It was also informed that drawl data is being monitored from both NRLDC and HVPN end data. Data from 56 points out of 101

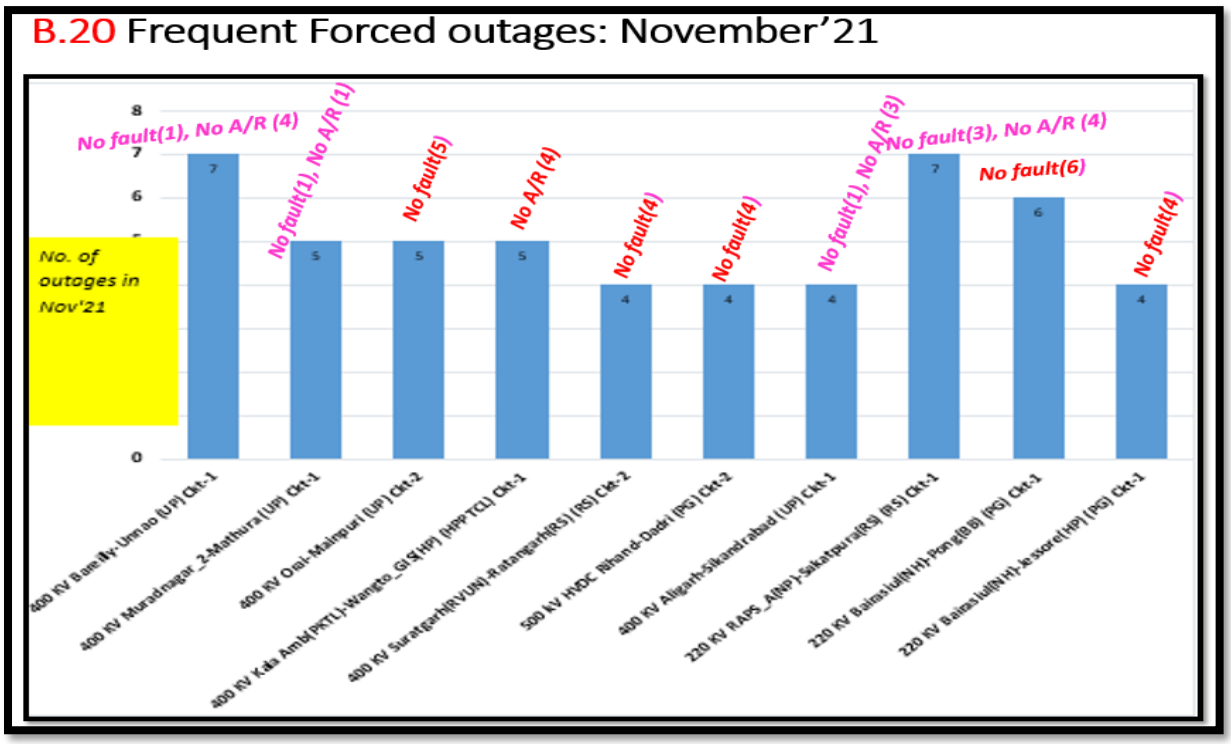
points of Haryana end data is telemetered while for remaining data they are using NRLDC end data only due to telemetry issues and other issues such as 220/66kV station being BBMB station, 66kV data is not available.

Uttarakhand SLDC representative stated that at 2-3 stations, RTU is faulty and replacement work is being carried out which would ensure availability of SLDC end data for drawl calculation. Till the replacement work, they are relying on NRLDC end data. NRLDC representative asked Uttarakhand to expedite replacement of faulty RTUs and ensure drawl data availability from SLDC end data also.

22. 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**:

S. 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. II of the Agenda.**

Discussion during the meeting:

- **400 KV Bareilly-Unnao (UP) Ckt-1:** *UPPTCL representative informed that multiple issues like non-functioning of A/R at Bareilly end, CB pole discrepancy are found in trippings of this line due to which an expert visit has been planned to Bareilly Substation for detailed analysis of the trippings. He further informed that they will update the findings of analysis to NRLDC & NRPC office latest by first week of January, 2022.*
- **400 KV Muradnagar_2-Mathura (UP) Ckt-1:** *UPPTCL representative informed that during tripping A/R operated in this line and line tripped due to persistent fault. He further informed that PID test was done in this line and it was observed that insulators are damaged in some locations. The insulator replacement work is already under process and is expected to be completed soon.*
- **400 KV Orai-Mainpuri (UP) Ckt-2:** *UPPTCL representative informed that tripping in this line occurred due to overvoltage. He further informed that during testing it was found that there was an error of around 4 to 5 kV in CVT at Mainpuri end, which was rectified on 18th December, 2021 and now it is expected that line will not trip on false overvoltage .*
- **400 KV Suratgarh (RVUN)-Ratangarh (RS) (RS) Ckt-2:** *Rajasthan representative informed that multiple times tripping occurred in this line due to transient fault. He further informed that A/R was in off condition in this line and expected to be enabled in next month after taking shutdown of the line. NRLDC representative suggested to ensure healthiness/ in service of A/R in*

all 220 kV and above transmission lines in compliance to CEA Grid Standards. Rajasthan representative agreed for the same.

- **400 KV Aligarh-Sikandrabad (UP) Ckt-1:** *UPPTCL representative informed that tripping on 4th November, 2021 occurred on overvoltage. He further informed that during patrolling it was found that corridor was clear.Ninety five (95%) of the insulators have already been changed however, due to slaughter houses near Aligarh end of this line, dense bird zones are formed leading to frequent fault in the line. He informed that A/R was not operating in this line due to loose breaker contacts which has been already rectified.*
- **220 KV RAPS_A (NP)-Sakatpura (RS) (RS) Ckt-1:** *Rajasthan representative informed that there is clearance issue in some section of the line due to which frequent fault is occurring.. He further informed that A/R was in off condition in this line due to connection of RAPS generation. He said that RAPS informed that line CVT is not available at their end and due to limitation of Generator it is not possible to enable A/R operation at RAPS end. RAPS representative was not available in the meeting for any comment. NRLDC representative suggested to ensure healthiness/ in service of A/R in all 220 kV and above transmission lines in compliance to CEA Grid Standards. Rajasthan representative agreed for the same.*
- **220 KV Bairasiul (NH)-Pong (BB) (PG) Ckt-1 & 220 KV Bairasiul (NH)-Jessore (HP) (PG) Ckt-1:** *NHPC representative informed that overvoltage problem occurring in this corridor during winter when machines are in off condition. He informed that manual opening of these lines on high voltage are being done after 20th December, 2021 to avoid tripping.*

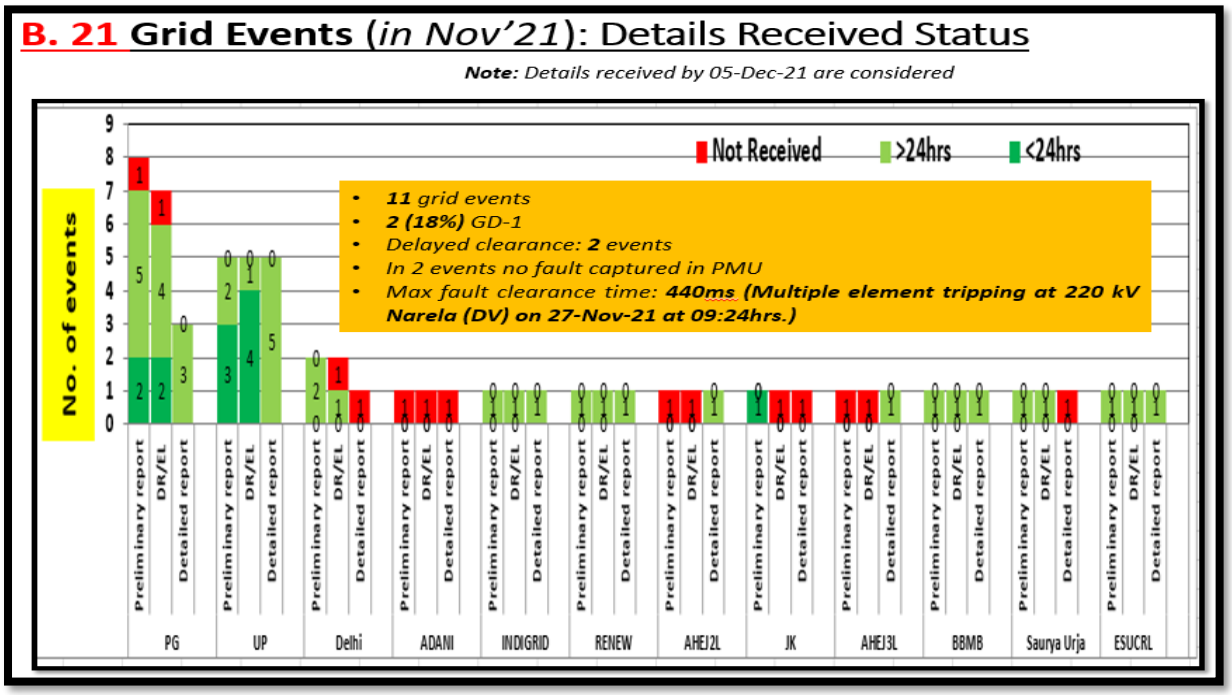
NRLDC representative emphasized that A/R (auto reclosure) issue was found in many of these tripping. He further sensitized all the utilities to ensure healthiness/ in service of A/R in 220 kV and above transmission lines in compliance to CEA Grid Standards. He further informed that most of the tripping are transient in nature but due to non-operation of A/R, it resulted into tripping of the transmission element thus and reducing the reliability of the grid. All the utilities shall endeavor to keep auto reclosure in service and in healthy condition for 220 kV and above voltage level transmission line.

Frequent outages of such elements affect the reliability and security of the grid. Hence, utilities are once again requested to look into such frequent outages and share the remedial measures taken/being taken in this respect.

23. 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.III of the Agenda.**



Further, despite persistent discussions/follow-up in various OCC/PSC 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.

NRLDC representative stated that in the event of tripping at 220 kV Narela (DV) on 27-Nov-21 at 09:24hrs delayed clearance of around 440ms is observed in the system. He further informed that as per report received from SLDC Delhi, R-Y phase fault is observed in this tripping leading to tripping of 200kV Narela-Panipat ckt- 1, 2 & 3 and 220kV Narela-Mandola ckt-1 & 2 on operation of zone 2 protection. DTL representative informed that BBMB had taken shutdown of Bus for replacement of Isolator MoM and during shifting of Bus and changeover of one Rohtak Road ckt, Bus coupler tripped leading to sparking. It was further informed that Bus Bar protection not operated at Narela end leading to delayed clearance and tripping of lines on Zone-2.

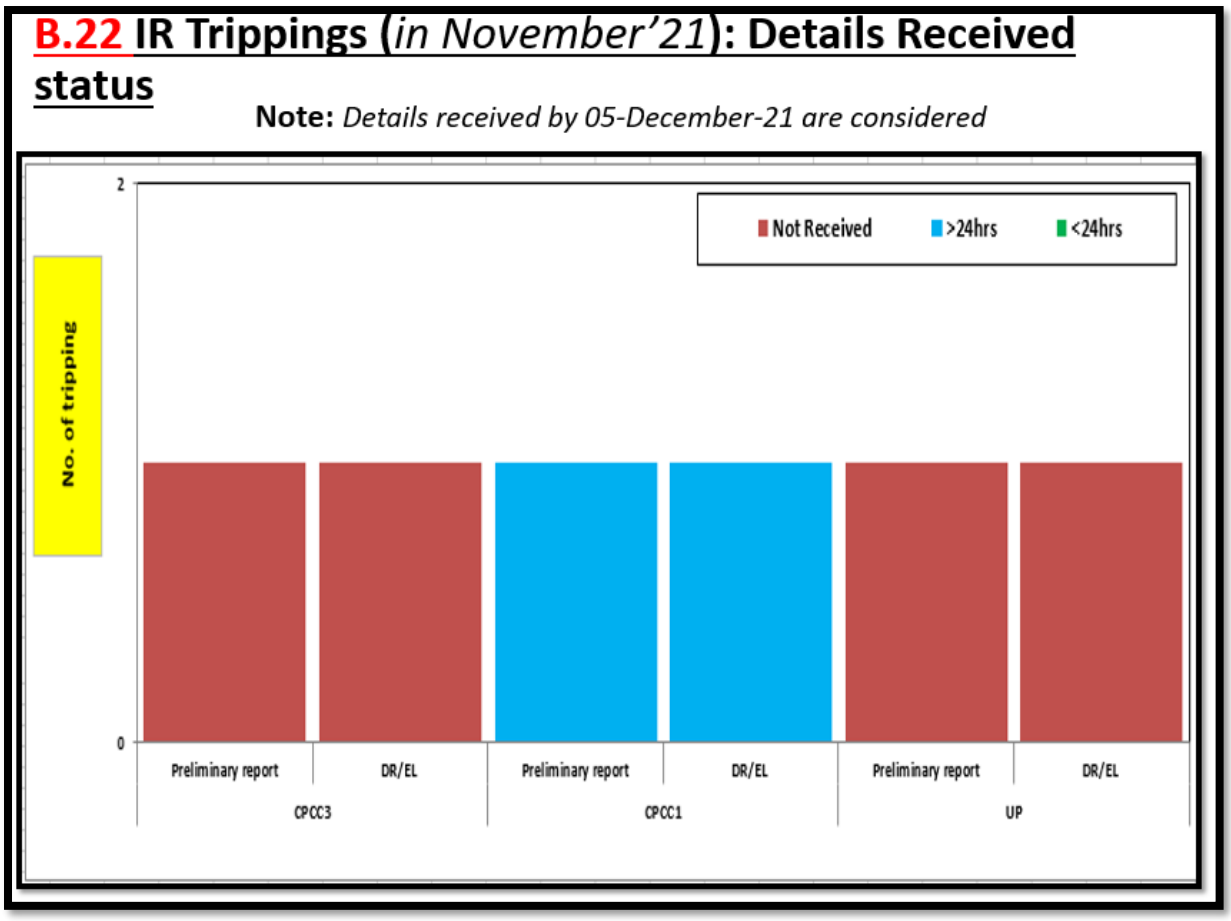
NRLDC representative raised concern about poor status of report updation by Solar IPPs and Delhi on the tripping portal. He further stated that timely report submission is an important activity and all constituents are advised to take this on priority and upload the reports.

OCC suggested all the NR constituents to update the information on tripping portal developed by NRLDC. All the constituents agreed to take proactive actions in this regard to minimize the tripping.

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

24. 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. IV of the Agenda.



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.

NRLDC representative raised concern about poor status of report updation by POWERGRID CPCC3 and UP on the tripping portal. He further stated that timely report submission is an important activity and all constituents are advised to take this on priority and upload the reports.

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

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

NRLDC representative informed the current status (as on 05th December 2021) of DR/EL and tripping report of utilities for the month of November 2021. Consolidated information is tabulated below:

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	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	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(RSw	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**

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, POWERGRID NR3, Delhi and HP in Nov, 2021 compared to the previous month.

All the members were once again requested to provide timely details of the grid events, detailed report in desired format along with remedial measure report. DR/EL of all the tripping needs to 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.

Members agreed for the same.

26. 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 HEP	-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.

NRLDC representative informed that during the event good response has been observed from units of Talwandi sabo plant. It was further added that units of Rosa, Koteshwar and Singrauli plant are showing poor/unsatisfactory response.

NTPC Singrauli representative informed that they will further analyise the response and update the details to NRLDC/NRPC office. Koteshwar representative informed that only one unit of Koteshwar HEP was running during the event and generation was about 70 MW. He further informed that forbidden zone of Koteshwar HEP falls near 70MW to 90 MW due to which response of the unit was not satisfactory.

NRLDC representative asked BBMB representative to expedite process for award of LoA for PFR testing of BBMB machines. BBMB representative stated that they are taking up the matter with higher management and they would be able to award the LoA shortly.

All the concerned utilities may please go through the details and share the detailed reply considering all the points and supporting plant wise data to check the FRC response of the generator within week time to RPC/ RLDC.

27. 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. V of the Agenda.**

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.

NRLDC representative informed that all the units who have done Step response test before 2018 were requested to plan the exciter step-response test in Quarter 4 of 2021-22 and submit the tentative schedule of step-response test on the units with NRPC/ NRLDC. He further informed that till date Schedule has been received from Rajasthan and UP Control area. He further requested that members may kindly accord due priority in this regard and update about their future plan for PSS tuning by 30th December, 2021 as there is no progress despite including this agenda in every OCC meeting and a separate meeting may be call for detail discussion on this matter.

Members agreed for the same.

THDC representative stated that PSS tuning exercise has been carried out for four units of Tehri plant. NRLDC representative appreciated the same and requested THDC to share the PSS tuning report with NRLDC.

28. Mock black start exercises in NR

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

Mock Black-start exercise of power stations therefore needs to be carried out in-order to ensure healthiness of black start facility. The winter months are 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. Integration of Mock black start exercise in SCADA system at Kishanganga power station yet to be done by BHEL (OEM).

Date	Revised Schedule date	Name of stations	Comment and Remarks
			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 December,21	* 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 15 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 per the schedule provided by NHPC.
31-Dec-21	19th January, 2022	Koteshwar	As per the schedule provided Koteshwar HEP.
05-Jan-22	After 25 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	Rajasthan	Mahi-I&II	2x25+2x45
12		Rana Pratap Sagar	4x43
13		Jawahar Sagar	3x33
14		Gandhi Sagar	5x23
15		Dholpur GPS	3x110
16		Ramgarh GPS	1x35.5+2x37.5+1x110
17	UP	Rihand	6x50
18		Obra	3x33
19		Vishnuprayag	4x100
20			
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.

UP representative informed that Dhauliganga Mock start exercise may be carried out on 28th December, 2021. NHPC agreed for the same.

NHPC representative informed that for Black start exercise of Bairasiul there is an issue of Isolator at Jessore end which needs to be resolved. HP representative informed that they will update the likely date of Jessore readiness on mail.

NTPC representative informed that Black start exercise of Dadri GPS was carried out on 28th October, 2021.

NRLDC representative suggested to all the constituents to adhere with the planned schedule. State control area were again requested to conduct the mock black start exercise in their respective area. All utilities were requested to share the schedule of mock exercise within 15 days to NRPC/NRLDC.

29. 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, bursted. 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. VI of the Agenda.) 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.

UP representative informed that detailed analysis of the event carried out at their end and detailed report has been sent to NRLDC/ NRPC office. The details of report are –

Reasons of non-operation of protection:

A) Bus Reactor:

Bus reactor`s R phase bushing top of busted and caught fire causing R phase to earth fault which later converted into two phase fault (R phase & Y phase). All the Bus reactor protections i.e. REF, differential protection and back up impedance protection have been provided through turret bushing CTs of CTR 100/1A.

a) There was no fault inside the reactor. Fault was above R phase turret top hence REF and differential protection did not operate.
b) Phase sequence of Back up impedance protection was not correct due to which back up impedance protection also did not operate.
c) Further over current and earth fault protection in back up impedance protection relay also not found enabled due to which this protection also did not operate.

B) 400 kv bus Bar protection:

400 kv Bus Bar protection at 400 kv s/s Moradabad is installed of SEL make having type SEL-487B relay. 400 kv bus reactor has no independent bay and fed through transfer bus coupler bay. CT connected for BBP has a CTR of 2000/1A while 50 MVAR, 400 kv reactor`s full load current is 69 Amp. As per BBP manufacturer's recommendations, relay pick up value is 1.3 times of 2000A .i.e. 2600A and for 69A of reactor at which BBP will not operate. 400 kv reactor should have independent bay for proper operation. An alternate to this being worked out for proper functioning of BBP.

C) 3*400/220 KV transformers:

Over current and earth fault relays (MiCOM P14D) of HV side of 2*500 MVA transformers-1&2 have pickedup while there was no flag on 240 MVA transformer-3 relay panel (both HV & LV side) having Siemens relay. On checking it was found that CT star points of 220 kv side CT core meant for back up protection relays of 500 MVA transformer-2 and 240 MVA transformer-3 was formed wrongly towards 220 kv bus side. Due to above reasons LV side protection did not operate not even picked up.

D) **220 kv Sambhal- Moradabad line:**
Distance protection of this line wrongly operated in Zone-2. On checking it was found that impedance setting in distance relay ABB make REL-670 was quite high due to which tripping took place in Zone-2.

E) **220 kv Amroha-Moradabad line:**
Distance protection of this line operated in Zone-3. On checking tripping was found to be in order. Parallel impedance of all the three 400/220 kv transformers was checkedin this condition and 220 kv longest line impedance at Moradabad taken into consideration tripping found to be in order.

Action taken to remove the deficiencies:

a) Settings of 50 MVAR, 400 KV bus reactor have been reviewed. Over current and earth fault protection has been enabled in the back up impedance relay.
b) Phase sequence in back up impedance relay has been corrected.
c) Testing of bus reactor back up impedance relay also done and all results have been found in order.
d) CT star point of 220 kv CT core meant for back up over current and earth fault relays of 500 MVA T/F-2 and 240 MVA T/F-3 have been corrected. Now currents phase angles of HV & LV currents have been checked and found to be in order.
e) Zone-2 impedance setting including all settings of 220 kv Sambhal- Moradabad line distance relay have been reviewed and reviewed.

Further action required to be taken:

a) Integration of bus reactor with 400 kv BBP is yet to be done.
b) Wrong pickup of 400 kv side over current and earth fault relays (MiCOM P14D) of 2*500 MVA, 400/220 kv T/F-1&2 is to be investigated as this problem is being faced at other sub-stations also.
c) Non-operation of 220 kv side of back up protection of 500 MVA T/F-1 is to be investigated.

Enclosures:

1) All settings of 50 MVAR bus reactor back up impedance relay, 3*400/220 kv transformers, 220 kv Amroha and Sambhal lines are enclosed as desired.
2) Single line diagram of 400 KV Moradabad with CT locations for 400 KV Bus Bar protection.
3) 50 MVAR bus reactor name plate indicating CT locations for differential protection etc is enclosed.
4) DR of 50 MVAR bus reactor.

Regarding the above mentioned Incident involving Multiple Trippings at 400/220kV Moradabad S/S on 03/12/2021 at 22:18 hrs, excellent efforts were made by UP - SLDC team for detailed analysis of the sequence of events, finding the deficiencies, analyzing the root cause of non-operation of protection system, expediting removal of the deficiencies and planning further remedial actions to be taken. This modus-operandi may be adopted as the Benchmark, for the Best Practices of all utilities for all Incidents involving multiple tripping of power system elements in Northern Region.

30. 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 & updated document link is as below:

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

NRLDC letter in this regard is attached as Annexure-B.VII of agenda.

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

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

All the members agreed to share the details/ feedback.

NRLDC representative once again requested to all the utilities to prepare the internal document for utilities own use.

System restoration procedure document for Northern region has been revised on 31stJan 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 asked to provide the feedback, suggestion and updated information by 31st Dec 2021

All the members agreed to share the details/ feedback.

Utilities are requested to share the details.

NRLDC representative once again requested to all the utilities to prepare the internal document for utilities own use.

*****

Annexure-A.I

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

उत्तरी क्षेत्रीय भार प्रेशण केन्द्र / NORTHERN REGIONAL LOAD DESPATCH CENTRE
कार्यालय : 18-ए, शहीद जीत सिंह सनसनवाल मार्ग, कटवारिया सराय, नई दिल्ली- 110016
OFFICE : 18-A, Shaheed Jeet Singh Sansanwal Marg, Katwaria Sarai, New Delhi- 110016
CIN : U40105DL2009GOI188682, Website : www.nrldc.org, www.nrldc.in, Tel.: 011- 26519406, 26523869, Fax : 011- 26852747

Ref: NRLDC\TS-09\1907-1908 Date: 9th December 2021

To,

Secretary,
Central Electricity Regulatory Commission
Third & Fourth Floor
Chanderlok building, 36 Janpath, New Delhi-110001

Subject: Status of Automatic Demand Management Scheme (ADMS) implementation in Northern region

Sir,

In compliance to the Hon'ble commission order 005\SM\2014 dated 31.12.2015 wherein RLDCs were directed to submit report with regard to Automatic Demand Management Scheme (ADMS) implementation, NRLDC had submitted the report vide letters NRLDC\TS-09\1309-1320 and NRLDC\TS-09\1422 dated 30.08.2016 and 08.09.2016 respectively (Annexure-I).

No significant progress on the matter is observed even after continuous follow-ups in NR-OCC meetings. Further, separate meetings with states such as Haryana, Himachal Pradesh, Punjab and UP were organized for assisting states in expediting ADMS implementation work.

In 186th OCC meeting held on 18.08.2021, it was decided that NRLDC may submit a report to CERC based on latest status of ADMS implementation in states of Northern Region. Accordingly, states were requested to submit the latest status of implementation of Automatic Demand Management Scheme (ADMS) to NRPC/NRLDC so that the same could be intimated to CERC as decided in 186th OCC meeting.

The issue was subsequently discussed in 187th, 188th and 189th OCC meetings in which states were sensitized on the importance of complying with regulation 5.4.2 of the Indian Electricity Grid Code, which mandates every state to formulate its automatic demand management scheme to maintain frequency within the stipulated band and to ensure network security. All states were requested to submit the latest status of ADMS implementation.

The latest status as available with NRLDC based on discussions held in 189th OCC meeting on 23.11.2021, is attached as Annexure-II. This is being submitted as per the decision of 186th and subsequent OCC meetings of NRPC.

This is for your kind information please.

Thanking you.

Yours faithfully

9/12/21

(N. Nallarasan)
CGM(I/C) NRLDC

Copy to:

1. Member Secretary, NRPC, New Delhi
2. Chairman & Managing Director, POSOCO, Nehru Place.

पावर सिस्टम ऑपरेशन कारपोरेशन लिमिटेड
(पावरग्रिड की पूर्ण स्वामित्व प्राप्त सहायक कंपनी)
POWER SYSTEM OPERATION CORPORATION LIMITED
(A wholly owned subsidiary company of POWERGRID)
NORTHERN REGIONAL LOAD DESPATCH CENTRE
18/A, Shaheed Jeet Singh Sansanwal Marg, Katwaria Sarai, New Delhi - 110 016
Tel: 26854861,26854015,26569504 Fax: 011- 265852747, Website : www.nrldc.org,
CIN: U40105DL2009GOI188682

संदर्भ संख्या: NRLDC\TS-09\ 1309-1320

दिनांक: 29 अगस्त 2016
30

सेवा में,
सचिव,केंद्रीय विद्युत विनियामक आयोग(सीईआरसी)
तीसरा तथा चौथा तल,
चन्द्रलोक बिल्डिंग, 36 जनपथ, नई दिल्ली - 110001,

विषय: Report on Automatic Demand Management Scheme (ADMS) status of Northern Region in compliance of CERC order in 005/SM/2014 dated 31.12.2015

महोदया,

Please refer to the Hon'ble Central Electricity Regulatory Commission (CERC) order dated 31st December 2015 in suomotu petition no 05/SM/2014 in the matter of "Non-compliance of Regulation 5.4.2 (d) of the Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2010" wherein following have been directed as quoted below:

*".....However, considering the request of the respondents to grant time to implement ADMS, we grant time till 31.6.2016 to the respondents to implement ADMS, failing which they will be liable for action under Section 142 of the Act for noncompliance of the Regulation 5.4.2 (d) of the Grid Code and order of the Commission. **RLDCs are directed to submit the report in this regard by 31.8.2016."***

In compliance to the above order of the Hon'ble commission, the report on the status of ADMS in Northern region as communicated by respective SLDCs to NRLDC is enclosed herewith.

धन्यवाद,

भवदीय

(पी के अग्रवाल)
महाप्रबंधक

प्रतिलिपि विनम्र सूचनार्थ:
1. सदस्य सचिव, उत्तर क्षेत्रीय विद्युत समिति, 18 ए, SJSS मार्ग, कटवारिया सराय, नई दिल्ली- 110 016
2. मुख्य कार्यकारी अधिकारी, पोसोको, बी-9, कुतुब इन्स्टीट्यूशनल एरिया, नई दिल्ली - 110 016
3. SLDC प्रमुख-Punjab/Haryana/HP/Rajasthan/UP/Delhi/J&K/Uttrakhand/UT Chandigarh

005/SM/2014

पावर सिस्टम ऑपरेशन कारपोरेशन लिमिटेड
(पावरग्रिड की पूर्ण स्वामित्व प्राप्त सहायक कंपनी)
POWER SYSTEM OPERATION CORPORATION LIMITED
(A wholly owned subsidiary company of POWERGRID)
NORTHERN REGIONAL LOAD DESPATCH CENTRE
18/A, Shaheed Jeet Singh Sansanwal Marg, Katwaria Sarai, New Delhi - 110 016
Tel: 26854861,26854015,26569504 Fax: 011- 265852747, Website : www.nrldc.org,
CIN: U40105DL2009GOI188682

संदर्भ संख्या: NRLDC\TS-09\1422

दिनांक: 08 सितंबर 2016

सेवा में,
सचिव,केंद्रीय विद्युत विनियामक आयोग(सीईआरसी)
तीसरा तथा चौथा तल,
चन्द्रलोक बिल्डिंग, 36 जनपथ, नई दिल्ली - 110001.

विषय: Supplementary Report on Automatic Demand Management Scheme (ADMS) status of Northern Region in compliance of CERC order in 005/SM/2014 dated 31.12.2015

महोदया,

In compliance to the Hon'ble commission order in 005/SM/2014 dated 31.12.2015. NRLDC has submitted the report vide letter NRLDC/TS-09/1309-1320 dated 30.08.2016 on the status of ADMS in Northern region as communicated by respective SLDCs.

Further NRLDC has received information from Haryana & Rajasthan also. As per information received from Haryana and Rajasthan, it is clear that ADMS is yet to be formulated in these states. Summary of the responses is given below along with copy of their response enclosed as Annex-VI & VII

NR State responses to NRLDC/NRPC regarding implementation of ADMS, in compliance of CERC order dated 31.12.2015 in 05/SM/2014

NR SLDC	Date of response	Summary of Scheme/	Load relief (MW)	Details of feeder	Remarks	Detail Enclosure
Haryana	24-Aug-16 (Received on 02.09.2016)	HVPNL submitted that DISCOMs have been sensitized for the implementation of ADMS.	NA	NA	Schemes is yet to be formulated	Annex-VI
Rajasthan	30-Aug-16 (Received on 05.09.2016)	A committee was constituted by the Director (PT), RPDDC, Jaipur for preparation and implementation of ADMS in all three distribution schemes.	NA	NA	Schemes is yet to be formulated	Annex-VII

धन्यवाद,

भवदीय

(पी के अग्रवाल)
महाप्रबंधक

प्रतिलिपि विनम्र सूचनार्थ:
1. सदस्य सचिव, उत्तर क्षेत्रीय विद्युत समिति, 18 ए, SJSS मार्ग, कटवारिया सराय, नई दिल्ली- 110 016
2. मुख्य कार्यकारी अधिकारी, पोसोको, बी-9, कुतुब इन्स्टीट्यूशनल एरिया, नई दिल्ली - 110 016
3. SLDC प्रमुख-Punjab/Haryana/HP/Rajasthan/UP/Delhi/J&K/Uttrakhand/UT Chandigarh

OIC

005/SM/2014

Annexure-II

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

State/ Utility	Status
Punjab	**Scheme not implemented.** At SLDC level, remote tripping of 100 feeders at 66 kV is possible. At 11 kV feeder level, ADMS is to be implemented by Distribution Company.
Delhi	**Fully implemented** by TPDDL, BRPL and BYPL. NDMC implementation was scheduled to be completed by 31.03.2020 but got delayed due to some changes incorporated in the scheme.
Rajasthan	**Under implementation.** LoA placed on 12.12.2018 with an execution period of 18 months for ADMS at the level of 33 kV feeders at EHV Substation of RVPN under SCADA / EMS part of project. Supply is in progress. Work is under execution and likely to completed by June'2021. ADMS functionality at 11 kV feeders from 33/11 kV substation is under the jurisdiction of the DISCOMs.
UP	**Scheme implemented by NPCL only.** Remote operation of 50 feeders at 132 kV level being operated from SLDC. Further, the solution proposed by M/s Siemens was found to be non- economical and was not accepted by the management. Noida Power Company Ltd have implemented Intelligent Load Shedding (ILS) scheme, in compliance of IEGC requirements for automatic demand management.
Haryana	**Scheme not implemented.** More than 1700 feeders were tested from SLDC control room for remote operation. Regarding the implementation of ADMS at DISCOM level, the matter is being taken up with the DISCOMs.
HP	**Scheme not implemented.** 02 feeders could be operated from SLDC through manual intervention. Letter has been sent by HPSEB to HP-SLDC for making its operation automatic.

Tot. Gen. 9/12/21.

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.II.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: ◎ CHANDIGARH — Sep-2019 ◎ DELHI — Nov-2021 ◎ HARYANA — Apr-2021 ◎ HP — Mar-2021 ◎ J&K and LADAKH — Not Available ◎ PUNJAB — Aug-2021 ◎ RAJASTHAN — Nov-2021 ◎ UP — Oct-2021 ◎ UTTARAKHAND — Nov-2021 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: ◎ CHANDIGARH — Not Available ◎ DELHI — Sep-2021 ◎ HARYANA — Sep-2021 ◎ HP — Oct-2021 ◎ J&K and LADAKH — Not Available ◎ PUNJAB — Mar-2021 ◎ RAJASTHAN — Sep-2021 ◎ UP — Sep-2021 ◎ UTTARAKHAND — Mar-2021 ◎ BBMB — Sep-2021 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. 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: ◎ HARYANA — Feb-2021 ◎ PUNJAB — Nov-2021 ◎ RAJASTHAN — Dec-2021 ◎ UP — Nov-2021 ◎ NTPC — Dec-2021 FGD status details are enclosed as **Annexure-A. II.II** 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. 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 forwarded to NLDC, POSOCO on dt. 29.04.2021. Targeted to be completed by March' 2022.
xii	RAJASTHAN	Bikaner	1x25 MVAr	LOA placed on dt. 4.1.2021. Agreement signed on dt. 8.02.2021. Case for 2nd installment forwarded to NLDC, POSOCO on dt. 29.04.2021. Targeted to be completed by March' 2022.
xiii	RAJASTHAN	Suratgarh	1x25 MVAr	LOA placed on dt. 4.1.2021. Agreement signed on dt. 8.02.2021. Case for 2nd installment forwarded to NLDC, POSOCO on dt. 29.04.2021. Targeted to be completed by March' 2022.

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 dt.22.10.2021. Now, the shortfalls in the bids have been uploaded and are
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 dt.22.10.2021. Now, the shortfalls in the bids have been uploaded and are

Annexure-A-II-I

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 Commissioning of Bays 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 1st -Dec'13 2nd - Mar'14 3rd - Mar'19 Commissioning of Bays 4 bays - Dec'13 2 bays - Mar'14 2 bays - Mar'19	220 kV D/C Hamirpur-Dehan line. 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

FGD Status

Updated status of FGD related data submission

NTPC (21.12.2021)
MEJA Stage-I
RIHAND STPS
SINGRAULI STPS
TANDA Stage-I
TANDA Stage-II
UNCHAHAR TPS
UPRVUNL (20.12.2021)
ANPARA TPS
HARDUAGANJ TPS
OBRA TPS
PARICHHA TPS

PSPCL (20.12.2021)
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

Lalitpur Power Gen. Co. Ltd. (22.10.2021)
Lalitpur TPS
Lanco Anpara Power Ltd. (22.10.2021)
ANPARA-C TPS

HGPCL (17.12.2021)
PANIPAT TPS
RAJIV GANDHI TPS
YAMUNA NAGAR TPS

Adani Power Ltd. (28.10.2021)
KAWAI 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

Talwandi Sabo Power Ltd.
TALWANDI SABO TPP
L&T Power Development Ltd.
Nabha TPP (Rajpura TPP)
GVK Power Ltd.
GOINDWAL SAHIB

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)
HGPCL	PANIPAT TPS U#6 (Target: 31-12-2022), PANIPAT TPS U#7 (Target: 31-12-2022), PANIPAT TPS U#8 (Target: 31-12-2022), RAJIV GANDHI TPS U#1 (Target: 31-12-2024), RAJIV GANDHI TPS U#2 (Target: 31-12-2024), YAMUNA NAGAR TPS U#1 (Target: 31-12-2024), YAMUNA NAGAR TPS U#2 (Target: 31-12-2024)

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#1 (Target:), TANDA Stage-I U#2 (Target:), TANDA Stage-II U#3 (Target: 31-12-2022), TANDA Stage-II U#1 (Target: 31-12-2022), TANDA Stage-I U#3 (Target:), TANDA Stage-I U#4 (Target:)

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)
Lalitpur Power Gen. Company Ltd.	LALITPUR TPS U#1 (Target: 01-01-2024), LALITPUR TPS U#2 (Target: 01-01-2024), LALITPUR TPS U#3 (Target: 01-01-2024)
Lanco Anpara Power Ltd.	ANPARA C TPS U#1 (Target: 31-12-2023), ANPARA C TPS U#2 (Target: 31-12-2023)
Prayagraj Power Generation Company Ltd.	PRAYAGRAJ TPP U#1 (Target: 31-05-2024), PRAYAGRAJ TPP U#2 (Target: 30-09-2024), PRAYAGRAJ TPP U#3 (Target: 31-12-2024)
PSPCL	GH TPS (LEH.MOH.) U#1 (Target: 31-12-2024), GH TPS (LEH.MOH.) U#2 (Target: 31-12-2024), GH TPS (LEH.MOH.) U#3 (Target: 31-12-2024), GH TPS (LEH.MOH.) U#4 (Target: 31-12-2024), GGSSTP, Ropar U#3 (Target: 31-03-2022), GGSSTP, Ropar U#4 (Target: 31-05-2022), GGSSTP, Ropar U#5 (Target: 31-07-2022), GGSSTP, Ropar U#6 (Target: 30-09-2022)

Rosa Power Supply Company	ROSA TPP Ph-I U#1 (Target: 31-12-2024), ROSA TPP Ph-I U#2 (Target: 31-12-2024), ROSA TPP Ph-I U#3 (Target: 31-10-2024), ROSA TPP Ph-I U#4 (Target: 31-10-2024)
RRVUNL	KOTA TPS U#5 (Target: 31-12-2022), KOTA TPS U#6 (Target: 31-12-2022), KOTA TPS U#7 (Target: 31-12-2022), SURATGARH TPS U#1 (Target: 31-12-2024), SURATGARH TPS U#2 (Target: 31-12-2024), SURATGARH TPS U#3 (Target: 31-12-2024), SURATGARH TPS U#4 (Target: 31-12-2024), SURATGARH TPS U#5 (Target: 31-12-2024), SURATGARH TPS U#6 (Target: 31-12-2024), SURATGARH SCTPS U#7 (Target: 31-12-2024), SURATGARH SCTPS U#8 (Target: 31-12-2024), CHHABRA TPP U#1 (Target: 31-12-2024), CHHABRA TPP U#2 (Target: 31-12-2024), CHHABRA TPP U#3 (Target: 31-12-2024), CHHABRA TPP U#4 (Target: 31-12-2024), CHHABRA SCPP U#5 (Target: 31-12-2024), CHHABRA SCPP U#6 (Target: 31-12-2024), KALISINDH TPS U#1 (Target: 31-12-2024), KALISINDH TPS U#2 (Target: 31-12-2024)
Talwandi Sabo Power Ltd.	TALWANDI SABO TPP U#1 (Target: 28-02-2021), TALWANDI SABO TPP U#2 (Target: 31-12-2020), TALWANDI SABO TPP U#3 (Target: 31-10-2020)
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: 22-03-2022), 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-B.I

एसजेवीएन लिमिटेड
SJVN Limited
(भारत सरकार एवं हिमाचल प्रदेश सरकार का संयुक्त उद्यम)
(A Joint Venture of Govt. of India & Govt. of Himachal Pradesh)
मिनी रत्न एवं अनुसूची 'ए' पी. एस. यू.
A Mini Ratna & Schedule 'A' P.S.U.
CIN No. : L40101HP1988GOI008409

संदर्भ: एसजेवीएन/सीसी/सीएवंएसओ/ 05052-2455 दिनांक: 07.12.2021

महाप्रबंधक (NRLDC)
उत्तरी क्षेत्रीय भार प्रेषण केन्द्र, 18 / ए,
शहीद जीत सिंह सनसनवाला मार्ग,
कटवरिया सराय, नई दिल्ली -1100 16

विषय : रामपुर एचपीएस की जनरेटर रिएक्टिव पावर डेटा।
Subject: **Generator Reactive power data of Rampur HPS.**

श्रीमान,

कृपया इस पत्र के साथ माह November, 2021 के लिए रामपुर एचपीएस की इकाइयों के रिएक्टिव पावर डेटा की रिपोर्ट संलग्न प्राप्त करें ।

यह जानकारी आपकी आगामी आवश्यक कार्रवाई हेतु सादर प्रेषित है ।

सधन्यवाद,

एसजेवीएन लिमिटेड की ओर से,
भवदीय,

7/12/2021
(अमन कटोच)
उप महाप्रबंधक (सी एंड एसओ)

संलग्न: यथोपरि ।

CGM (SO-II)
15/12/21

कारपोरेट मुख्यालय : शक्ति सदन, शनान,
शिमला–171006, (हि.प्र.) www.sjvn.nic.in
शीघ्रकरण कार्यालय : ऑफिस ब्लॉक टावर–1, 6वी मंजिल,
एनबीसीसी कॉम्पलेक्स, पूर्वी किदवई नगर, नई दिल्ली–110023
दूरभाष : 011–61901919 फैक्स : 011–61901915

Corporate H.Q. : Shakti Sadan, Shanan,
Shimla-171006, (H.P.) www.sjvn.nic.in
Expediting Office : NBCC Complex, Tower-1
(6th Floor), East Kidwai Nagar, New Delhi-110023
Tele : 011-61901919, Fax : 011-61901915

जनरेटर प्रतिक्रियाशील ऊर्जा की मोनिटरिंग (Generator Reactive power Monitoring)									01.11.2021
पावर स्टेशन का नाम: 412 मेगावाट रामपुर एच.पी. एस. (Name of Power Station: 412 MW RAMPUR HPS)									
जनरेटर इकाई (Generating Unit)			समय (Time)	जनरेटर टर्मिनल पर मेगावाट (MW at Generator Terminal)	जनरेटर टर्मिनल पर MVAR लीड / अंतराल (MVAR Lead/Lag at Generator Terminals)	जनरेटर ट्रांसफार्मर टैप स्थिति (Generator Transformer Tap Position)	जनरेटर टर्मिनल पर वोल्टेज (Voltage at the Generator Terminal) (KV)	एचवी बस बार पर वोल्टेज (Voltage at the HV Bus Bar) (KV)	एवीआर की Vref सेटिंग्स (Vref settings of AVR)
	क्षमता वक्र के अनुसार,यूनिट की अधिकतम एमवीएआर क्षमता।		घंटा:मिनट						
	Max MVAR capabilty of Unit as per Capabilty Curve.		hh:mm						
	Generation (+)	अवशोषण (-)							
	Generation (+)	Absorpation (-)							
इकाई#१ (Unit # 1)	68.67 मेगावाट पर 33 एमवीएआर (33 MVAR at 68.67MW)	68.67 मेगावाट पर 33 एमवीएआर (33 MVAR at 68.67MW)	1:00	74	-1	2 नोमिनल टैप [2 (Nominal Tap)]	10.71	427	11 केवी (11 KV)
			2:00	75	-1	2 नोमिनल टैप [2 (Nominal Tap)]	10.70	424	11 केवी (11 KV)
			3:00	75	-1	2 नोमिनल टैप [2 (Nominal Tap)]	10.70	424	11 केवी (11 KV)
			4:00	75	0	2 नोमिनल टैप [2 (Nominal Tap)]	10.73	423	11 केवी (11 KV)
			5:00	75	1	2 नोमिनल टैप [2 (Nominal Tap)]	10.60	418	11 केवी (11 KV)
			6:00	75	1	2 नोमिनल टैप [2 (Nominal Tap)]	10.55	416	11 केवी (11 KV)
			7:00	75	1	2 नोमिनल टैप [2 (Nominal Tap)]	10.50	414	11 केवी (11 KV)
			8:00	74	-2	2 नोमिनल टैप [2 (Nominal Tap)]	10.37	415	11 केवी (11 KV)
			9:00	74	-2	2 नोमिनल टैप [2 (Nominal Tap)]	10.40	415	11 केवी (11 KV)
			10:00	75	0	2 नोमिनल टैप [2 (Nominal Tap)]	10.41	413	11 केवी (11 KV)
			11:00			2 नोमिनल टैप [2 (Nominal Tap)]		416	11 केवी (11 KV)
			12:00			2 नोमिनल टैप [2 (Nominal Tap)]		415	11 केवी (11 KV)
			13:00			2 नोमिनल टैप [2 (Nominal Tap)]		421	11 केवी (11 KV)
			14:00			2 नोमिनल टैप [2 (Nominal Tap)]		420	11 केवी (11 KV)
			15:00			2 नोमिनल टैप [2 (Nominal Tap)]		418	11 केवी (11 KV)
			16:00	73	3	2 नोमिनल टैप [2 (Nominal Tap)]	10.69	419	11 केवी (11 KV)
			17:00	75	0	2 नोमिनल टैप [2 (Nominal Tap)]	10.63	416	11 केवी (11 KV)
			18:00	66	0	2 नोमिनल टैप [2 (Nominal Tap)]	10.54	412	11 केवी (11 KV)
			19:00	69	0	2 नोमिनल टैप [2 (Nominal Tap)]	10.60	411	11 केवी (11 KV)
			20:00	69	-1	2 नोमिनल टैप [2 (Nominal Tap)]	10.49	413	11 केवी (11 KV)
			21:00	69	0	2 नोमिनल टैप [2 (Nominal Tap)]	10.60	416	11 केवी (11 KV)
			22:00	68	0	2 नोमिनल टैप [2 (Nominal Tap)]	10.66	419	11 केवी (11 KV)
			23:00	75	-1	2 नोमिनल टैप [2 (Nominal Tap)]	10.70	421	11 केवी (11 KV)
			0:00	75	-1	2 नोमिनल टैप [2 (Nominal Tap)]	10.59	416	11 केवी (11 KV)

इकाई#२ (Unit # 2)	68.67 मेगावाट पर 33 एमवीएआर (33 MVAR at 68.67MW)	68.67 मेगावाट पर 33 एमवीएआर (33 MVAR at 68.67MW)	1:00			2 नोमिनल टैप [2 (Nominal Tap)]		427	11 केवी (11 KV)
			2:00			2 नोमिनल टैप [2 (Nominal Tap)]		424	11 केवी (11 KV)
			3:00			2 नोमिनल टैप [2 (Nominal Tap)]		424	11 केवी (11 KV)
			4:00			2 नोमिनल टैप [2 (Nominal Tap)]		423	11 केवी (11 KV)
			5:00			2 नोमिनल टैप [2 (Nominal Tap)]		418	11 केवी (11 KV)
			6:00			2 नोमिनल टैप [2 (Nominal Tap)]		416	11 केवी (11 KV)
			7:00			2 नोमिनल टैप [2 (Nominal Tap)]		414	11 केवी (11 KV)
			8:00			2 नोमिनल टैप [2 (Nominal Tap)]		415	11 केवी (11 KV)
			9:00			2 नोमिनल टैप [2 (Nominal Tap)]		415	11 केवी (11 KV)
			10:00			2 नोमिनल टैप [2 (Nominal Tap)]		413	11 केवी (11 KV)
			11:00			2 नोमिनल टैप [2 (Nominal Tap)]		416	11 केवी (11 KV)
			12:00			2 नोमिनल टैप [2 (Nominal Tap)]		415	11 केवी (11 KV)
			13:00			2 नोमिनल टैप [2 (Nominal Tap)]		421	11 केवी (11 KV)
			14:00			2 नोमिनल टैप [2 (Nominal Tap)]		420	11 केवी (11 KV)
			15:00			2 नोमिनल टैप [2 (Nominal Tap)]		418	11 केवी (11 KV)
			16:00			2 नोमिनल टैप [2 (Nominal Tap)]		419	11 केवी (11 KV)
			17:00	75	0	2 नोमिनल टैप [2 (Nominal Tap)]	10.66	416	11 केवी (11 KV)
			18:00	65	0	2 नोमिनल टैप [2 (Nominal Tap)]	10.55	412	11 केवी (11 KV)
			19:00	64	0	2 नोमिनल टैप [2 (Nominal Tap)]	10.60	411	11 केवी (11 KV)
			20:00	69	0	2 नोमिनल टैप [2 (Nominal Tap)]	10.53	413	11 केवी (11 KV)
			21:00	69	-1	2 नोमिनल टैप [2 (Nominal Tap)]	10.60	416	11 केवी (11 KV)
			22:00	68	-1	2 नोमिनल टैप [2 (Nominal Tap)]	10.69	419	11 केवी (11 KV)
			23:00			2 नोमिनल टैप [2 (Nominal Tap)]		421	11 केवी (11 KV)
			0:00			2 नोमिनल टैप [2 (Nominal Tap)]		416	11 केवी (11 KV)
इकाई#३ (Unit # 3)	68.67 मेगावाट पर 33 एमवीएआर (33 MVAR at 68.67MW)	68.67 मेगावाट पर 33 एमवीएआर (33 MVAR at 68.67MW)	1:00			2 नोमिनल टैप [2 (Nominal Tap)]		427	11 केवी (11 KV)
			2:00			2 नोमिनल टैप [2 (Nominal Tap)]		424	11 केवी (11 KV)
			3:00			2 नोमिनल टैप [2 (Nominal Tap)]		424	11 केवी (11 KV)
			4:00			2 नोमिनल टैप [2 (Nominal Tap)]		423	11 केवी (11 KV)
			5:00			2 नोमिनल टैप [2 (Nominal Tap)]		418	11 केवी (11 KV)
			6:00			2 नोमिनल टैप [2 (Nominal Tap)]		416	11 केवी (11 KV)
			7:00			2 नोमिनल टैप [2 (Nominal Tap)]		414	11 केवी (11 KV)
			8:00			2 नोमिनल टैप [2 (Nominal Tap)]		415	11 केवी (11 KV)
			9:00			2 नोमिनल टैप [2 (Nominal Tap)]		415	11 केवी (11 KV)
			10:00			2 नोमिनल टैप [2 (Nominal Tap)]		413	11 केवी (11 KV)
			11:00			2 नोमिनल टैप [2 (Nominal Tap)]		416	11 केवी (11 KV)
			12:00			2 नोमिनल टैप [2 (Nominal Tap)]		415	11 केवी (11 KV)
			13:00			2 नोमिनल टैप [2 (Nominal Tap)]		421	11 केवी (11 KV)
			14:00			2 नोमिनल टैप [2 (Nominal Tap)]		420	11 केवी (11 KV)
			15:00			2 नोमिनल टैप [2 (Nominal Tap)]		418	11 केवी (11 KV)
			16:00			2 नोमिनल टैप [2 (Nominal Tap)]		419	11 केवी (11 KV)
			17:00	58	-1	2 नोमिनल टैप [2 (Nominal Tap)]	10.81	416	11 केवी (11 KV)
			18:00	65	0	2 नोमिनल टैप [2 (Nominal Tap)]	10.69	412	11 केवी (11 KV)
			19:00	64	0	2 नोमिनल टैप [2 (Nominal Tap)]	10.70	411	11 केवी (11 KV)
			20:00	69	-1	2 नोमिनल टैप [2 (Nominal Tap)]	10.66	413	11 केवी (11 KV)
			21:00	68	0	2 नोमिनल टैप [2 (Nominal Tap)]	10.80	416	11 केवी (11 KV)
			22:00			2 नोमिनल टैप [2 (Nominal Tap)]		419	11 केवी (11 KV)
			23:00			2 नोमिनल टैप [2 (Nominal Tap)]		421	11 केवी (11 KV)
			0:00			2 नोमिनल टैप [2 (Nominal Tap)]		416	11 केवी (11 KV)

इकाई#४ (Unit # 4)	68.67 मेगावाट पर 33 एमवीएआर (33 MVAR at 68.67MW)	68.67 मेगावाट पर 33 एमवीएआर (33 MVAR at 68.67MW)	1:00			2 नोमिनल टैप [2 (Nominal Tap)]		427	11 केवी (11 KV)
			2:00			2 नोमिनल टैप [2 (Nominal Tap)]		424	11 केवी (11 KV)
			3:00			2 नोमिनल टैप [2 (Nominal Tap)]		424	11 केवी (11 KV)
			4:00			2 नोमिनल टैप [2 (Nominal Tap)]		423	11 केवी (11 KV)
			5:00			2 नोमिनल टैप [2 (Nominal Tap)]		418	11 केवी (11 KV)
			6:00			2 नोमिनल टैप [2 (Nominal Tap)]		416	11 केवी (11 KV)
			7:00			2 नोमिनल टैप [2 (Nominal Tap)]		414	11 केवी (11 KV)
			8:00			2 नोमिनल टैप [2 (Nominal Tap)]		415	11 केवी (11 KV)
			9:00			2 नोमिनल टैप [2 (Nominal Tap)]		415	11 केवी (11 KV)
			10:00			2 नोमिनल टैप [2 (Nominal Tap)]		413	11 केवी (11 KV)
			11:00			2 नोमिनल टैप [2 (Nominal Tap)]		416	11 केवी (11 KV)
			12:00			2 नोमिनल टैप [2 (Nominal Tap)]		415	11 केवी (11 KV)
			13:00			2 नोमिनल टैप [2 (Nominal Tap)]		421	11 केवी (11 KV)
			14:00			2 नोमिनल टैप [2 (Nominal Tap)]		420	11 केवी (11 KV)
			15:00			2 नोमिनल टैप [2 (Nominal Tap)]		418	11 केवी (11 KV)
			16:00			2 नोमिनल टैप [2 (Nominal Tap)]		419	11 केवी (11 KV)
			17:00			2 नोमिनल टैप [2 (Nominal Tap)]		416	11 केवी (11 KV)
			18:00	66	0	2 नोमिनल टैप [2 (Nominal Tap)]	10.49	412	11 केवी (11 KV)
			19:00	64	0	2 नोमिनल टैप [2 (Nominal Tap)]	10.50	411	11 केवी (11 KV)
			20:00	69	-1	2 नोमिनल टैप [2 (Nominal Tap)]	10.48	413	11 केवी (11 KV)
			21:00	70	-1	2 नोमिनल टैप [2 (Nominal Tap)]	10.58	416	11 केवी (11 KV)
			22:00			2 नोमिनल टैप [2 (Nominal Tap)]		419	11 केवी (11 KV)
			23:00			2 नोमिनल टैप [2 (Nominal Tap)]		421	11 केवी (11 KV)
			0:00			2 नोमिनल टैप [2 (Nominal Tap)]		416	11 केवी (11 KV)
इकाई#५ (Unit # 5)	68.67 मेगावाट पर 33 एमवीएआर (33 MVAR at 68.67MW)	68.67 मेगावाट पर 33 एमवीएआर (33 MVAR at 68.67MW)	1:00			2 नोमिनल टैप [2 (Nominal Tap)]		427	11 केवी (11 KV)
			2:00			2 नोमिनल टैप [2 (Nominal Tap)]		424	11 केवी (11 KV)
			3:00			2 नोमिनल टैप [2 (Nominal Tap)]		424	11 केवी (11 KV)
			4:00			2 नोमिनल टैप [2 (Nominal Tap)]		423	11 केवी (11 KV)
			5:00			2 नोमिनल टैप [2 (Nominal Tap)]		418	11 केवी (11 KV)
			6:00			2 नोमिनल टैप [2 (Nominal Tap)]		416	11 केवी (11 KV)
			7:00	75	1	2 नोमिनल टैप [2 (Nominal Tap)]	10.86	414	11 केवी (11 KV)
			8:00	75	-2	2 नोमिनल टैप [2 (Nominal Tap)]	10.35	415	11 केवी (11 KV)
			9:00	75	-2	2 नोमिनल टैप [2 (Nominal Tap)]	10.39	415	11 केवी (11 KV)
			10:00			2 नोमिनल टैप [2 (Nominal Tap)]		413	11 केवी (11 KV)
			11:00			2 नोमिनल टैप [2 (Nominal Tap)]		416	11 केवी (11 KV)
			12:00			2 नोमिनल टैप [2 (Nominal Tap)]		415	11 केवी (11 KV)
			13:00			2 नोमिनल टैप [2 (Nominal Tap)]		421	11 केवी (11 KV)
			14:00			2 नोमिनल टैप [2 (Nominal Tap)]		420	11 केवी (11 KV)
			15:00			2 नोमिनल टैप [2 (Nominal Tap)]		418	11 केवी (11 KV)
			16:00			2 नोमिनल टैप [2 (Nominal Tap)]		419	11 केवी (11 KV)
			17:00			2 नोमिनल टैप [2 (Nominal Tap)]		416	11 केवी (11 KV)
			18:00	70	0	2 नोमिनल टैप [2 (Nominal Tap)]	10.47	412	11 केवी (11 KV)
			19:00	65	0	2 नोमिनल टैप [2 (Nominal Tap)]	10.48	411	11 केवी (11 KV)
			20:00	70	-2	2 नोमिनल टैप [2 (Nominal Tap)]	10.46	413	11 केवी (11 KV)
			21:00	71	-3	2 नोमिनल टैप [2 (Nominal Tap)]	10.53	416	11 केवी (11 KV)
			22:00	69	-1	2 नोमिनल टैप [2 (Nominal Tap)]	10.66	419	11 केवी (11 KV)
			23:00			2 नोमिनल टैप [2 (Nominal Tap)]		421	11 केवी (11 KV)
			0:00			2 नोमिनल टैप [2 (Nominal Tap)]		416	11 केवी (11 KV)

इकाई#६ (Unit # 6)	68.67 मेगावाट पर 33 एमवीएआर (33 MVAR at 68.67MW)	68.67 मेगावाट पर 33 एमवीएआर (33 MVAR at 68.67MW)	1:00			2 नोमिनल टैप [2 (Nominal Tap)]		427	11 केवी (11 KV)
			2:00			2 नोमिनल टैप [2 (Nominal Tap)]		424	11 केवी (11 KV)
			3:00			2 नोमिनल टैप [2 (Nominal Tap)]		424	11 केवी (11 KV)
			4:00			2 नोमिनल टैप [2 (Nominal Tap)]		423	11 केवी (11 KV)
			5:00			2 नोमिनल टैप [2 (Nominal Tap)]		418	11 केवी (11 KV)
			6:00	75	1	2 नोमिनल टैप [2 (Nominal Tap)]	10.63	416	11 केवी (11 KV)
			7:00	75	0	2 नोमिनल टैप [2 (Nominal Tap)]	10.52	414	11 केवी (11 KV)
			8:00	73	-1	2 नोमिनल टैप [2 (Nominal Tap)]	10.49	415	11 केवी (11 KV)
			9:00	73	-1	2 नोमिनल टैप [2 (Nominal Tap)]	10.51	415	11 केवी (11 KV)
			10:00			2 नोमिनल टैप [2 (Nominal Tap)]		413	11 केवी (11 KV)
			11:00			2 नोमिनल टैप [2 (Nominal Tap)]		416	11 केवी (11 KV)
			12:00			2 नोमिनल टैप [2 (Nominal Tap)]		415	11 केवी (11 KV)
			13:00			2 नोमिनल टैप [2 (Nominal Tap)]		421	11 केवी (11 KV)
			14:00			2 नोमिनल टैप [2 (Nominal Tap)]		420	11 केवी (11 KV)
			15:00			2 नोमिनल टैप [2 (Nominal Tap)]		418	11 केवी (11 KV)
			16:00			2 नोमिनल टैप [2 (Nominal Tap)]		419	11 केवी (11 KV)
			17:00	75	0	2 नोमिनल टैप [2 (Nominal Tap)]	10.71	416	11 केवी (11 KV)
			18:00	65	0	2 नोमिनल टैप [2 (Nominal Tap)]	10.59	412	11 केवी (11 KV)
			19:00	64	0	2 नोमिनल टैप [2 (Nominal Tap)]	10.64	411	11 केवी (11 KV)
			20:00	69	-1	2 नोमिनल टैप [2 (Nominal Tap)]	10.55	413	11 केवी (11 KV)
			21:00	73	-1	2 नोमिनल टैप [2 (Nominal Tap)]	10.65	416	11 केवी (11 KV)
			22:00	68	-1	2 नोमिनल टैप [2 (Nominal Tap)]	10.71	419	11 केवी (11 KV)
			23:00	75	-2	2 नोमिनल टैप [2 (Nominal Tap)]	10.71	421	11 केवी (11 KV)
			0:00	75	-1	2 नोमिनल टैप [2 (Nominal Tap)]	10.69	416	11 केवी (11 KV)

जनरेटर प्रतिक्रियाशील ऊर्जा की मोनिटरिंग (Generator Reactive power Monitoring)								10.11.2021
पावर स्टेशन का नाम: 412 मेगावाट रामपुर एच.पी. एस. (Name of Power Station: 412 MW RAMPUR HPS)								
जनरेटर इकाई (Generating Unit)			समय (Time)	जनरेटर टर्मिनल पर मेगावाट (MW at Generator Terminal)	जनरेटर टर्मिनल पर MVAR लीड / अंतराल (MVAR Lead/Lag at Generator Terminals)	जनरेटर ट्रांसफार्मर टैप स्थिति (Generator Transformer Tap Position)	जनरेटर टर्मिनल पर वोल्टेज (Voltage at the GeneratorTerminal) (KV)	एचवी बस बार पर वोल्टेज (Voltage at the HV Bus Bar) (KV)	एवीआर की Vref सेटिंग्स (Vref settings of AVR)
	क्षमता वक्र के अनुसार,यूनिट की अधिकतम एमवीएआर क्षमता।		घंटा:मिनट						
	Max MVAR capabilty of Unit as per Capabilty Curve.		hh:mm						
	Generation (+)	अवशोषण (-)							
	Generation (+)	Absorpation (-)							
इकाई#१ (Unit # 1)	68.67 मेगावाट पर 33 एमवीएआर (33 MVAR at 68.67MW)	68.67 मेगावाट पर 33 एमवीएआर (33 MVAR at 68.67MW)	1:00			2 नोमिनल टैप [2 (Nominal Tap)]		426	11 केवी (11 KV)
			2:00			2 नोमिनल टैप [2 (Nominal Tap)]		427	11 केवी (11 KV)
			3:00			2 नोमिनल टैप [2 (Nominal Tap)]		428	11 केवी (11 KV)
			4:00			2 नोमिनल टैप [2 (Nominal Tap)]		429	11 केवी (11 KV)
			5:00	53	1	2 नोमिनल टैप [2 (Nominal Tap)]	10.60	416	11 केवी (11 KV)
			6:00	67	-1	2 नोमिनल टैप [2 (Nominal Tap)]	10.30	408	11 केवी (11 KV)
			7:00	72	-2	2 नोमिनल टैप [2 (Nominal Tap)]	10.15	405	11 केवी (11 KV)
			8:00	66	-2	2 नोमिनल टैप [2 (Nominal Tap)]	10.12	407	11 केवी (11 KV)
			9:00	21	-3	2 नोमिनल टैप [2 (Nominal Tap)]	10.16	408	11 केवी (11 KV)
			10:00			2 नोमिनल टैप [2 (Nominal Tap)]		410	11 केवी (11 KV)
			11:00			2 नोमिनल टैप [2 (Nominal Tap)]		412	11 केवी (11 KV)
			12:00			2 नोमिनल टैप [2 (Nominal Tap)]		408	11 केवी (11 KV)
			13:00			2 नोमिनल टैप [2 (Nominal Tap)]		419	11 केवी (11 KV)
			14:00			2 नोमिनल टैप [2 (Nominal Tap)]		417	11 केवी (11 KV)
			15:00			2 नोमिनल टैप [2 (Nominal Tap)]		413	11 केवी (11 KV)
			16:00	65	-6	2 नोमिनल टैप [2 (Nominal Tap)]	10.46	415	11 केवी (11 KV)
			17:00	73	-5	2 नोमिनल टैप [2 (Nominal Tap)]	10.45	413	11 केवी (11 KV)
			18:00	74	-3	2 नोमिनल टैप [2 (Nominal Tap)]	10.30	408	11 केवी (11 KV)
			19:00	63	-7	2 नोमिनल टैप [2 (Nominal Tap)]	10.31	410	11 केवी (11 KV)
			20:00	66	-12	2 नोमिनल टैप [2 (Nominal Tap)]	10.39	415	11 केवी (11 KV)
			21:00	61	-8	2 नोमिनल टैप [2 (Nominal Tap)]	10.46	418	11 केवी (11 KV)
			22:00			2 नोमिनल टैप [2 (Nominal Tap)]		429	11 केवी (11 KV)
			23:00			2 नोमिनल टैप [2 (Nominal Tap)]		416	11 केवी (11 KV)
			0:00			2 नोमिनल टैप [2 (Nominal Tap)]		425	11 केवी (11 KV)

इकाई#२ (Unit # 2)	68.67 मेगावाट पर 33 एमवीएआर (33 MVAR at 68.67MW)	68.67 मेगावाट पर 33 एमवीएआर (33 MVAR at 68.67MW)	1:00			2 नोमिनल टैप [2 (Nominal Tap)]		426	11 केवी (11 KV)
			2:00			2 नोमिनल टैप [2 (Nominal Tap)]		427	11 केवी (11 KV)
			3:00			2 नोमिनल टैप [2 (Nominal Tap)]		428	11 केवी (11 KV)
			4:00			2 नोमिनल टैप [2 (Nominal Tap)]		429	11 केवी (11 KV)
			5:00			2 नोमिनल टैप [2 (Nominal Tap)]		416	11 केवी (11 KV)
			6:00	61	-1	2 नोमिनल टैप [2 (Nominal Tap)]	10.34	408	11 केवी (11 KV)
			7:00	72	1	2 नोमिनल टैप [2 (Nominal Tap)]	10.27	405	11 केवी (11 KV)
			8:00			2 नोमिनल टैप [2 (Nominal Tap)]		407	11 केवी (11 KV)
			9:00			2 नोमिनल टैप [2 (Nominal Tap)]		408	11 केवी (11 KV)
			10:00			2 नोमिनल टैप [2 (Nominal Tap)]		410	11 केवी (11 KV)
			11:00			2 नोमिनल टैप [2 (Nominal Tap)]		412	11 केवी (11 KV)
			12:00			2 नोमिनल टैप [2 (Nominal Tap)]		408	11 केवी (11 KV)
			13:00			2 नोमिनल टैप [2 (Nominal Tap)]		419	11 केवी (11 KV)
			14:00			2 नोमिनल टैप [2 (Nominal Tap)]		417	11 केवी (11 KV)
			15:00			2 नोमिनल टैप [2 (Nominal Tap)]		413	11 केवी (11 KV)
			16:00			2 नोमिनल टैप [2 (Nominal Tap)]		415	11 केवी (11 KV)
			17:00	59	-3	2 नोमिनल टैप [2 (Nominal Tap)]	10.55	413	11 केवी (11 KV)
			18:00	68	-3	2 नोमिनल टैप [2 (Nominal Tap)]	10.34	408	11 केवी (11 KV)
			19:00	64	-6	2 नोमिनल टैप [2 (Nominal Tap)]	10.33	410	11 केवी (11 KV)
			20:00	72	-10	2 नोमिनल टैप [2 (Nominal Tap)]	10.41	415	11 केवी (11 KV)
			21:00			2 नोमिनल टैप [2 (Nominal Tap)]		418	11 केवी (11 KV)
			22:00			2 नोमिनल टैप [2 (Nominal Tap)]		429	11 केवी (11 KV)
			23:00			2 नोमिनल टैप [2 (Nominal Tap)]		416	11 केवी (11 KV)
			0:00			2 नोमिनल टैप [2 (Nominal Tap)]		425	11 केवी (11 KV)
इकाई#३ (Unit # 3)	68.67 मेगावाट पर 33 एमवीएआर (33 MVAR at 68.67MW)	68.67 मेगावाट पर 33 एमवीएआर (33 MVAR at 68.67MW)	1:00			2 नोमिनल टैप [2 (Nominal Tap)]		426	11 केवी (11 KV)
			2:00			2 नोमिनल टैप [2 (Nominal Tap)]		427	11 केवी (11 KV)
			3:00			2 नोमिनल टैप [2 (Nominal Tap)]		428	11 केवी (11 KV)
			4:00			2 नोमिनल टैप [2 (Nominal Tap)]		429	11 केवी (11 KV)
			5:00			2 नोमिनल टैप [2 (Nominal Tap)]		416	11 केवी (11 KV)
			6:00	52	0	2 नोमिनल टैप [2 (Nominal Tap)]	10.69	408	11 केवी (11 KV)
			7:00	73	-1	2 नोमिनल टैप [2 (Nominal Tap)]	10.50	405	11 केवी (11 KV)
			8:00	50	-1	2 नोमिनल टैप [2 (Nominal Tap)]	10.54	407	11 केवी (11 KV)
			9:00			2 नोमिनल टैप [2 (Nominal Tap)]		408	11 केवी (11 KV)
			10:00			2 नोमिनल टैप [2 (Nominal Tap)]		410	11 केवी (11 KV)
			11:00			2 नोमिनल टैप [2 (Nominal Tap)]		412	11 केवी (11 KV)
			12:00			2 नोमिनल टैप [2 (Nominal Tap)]		408	11 केवी (11 KV)
			13:00			2 नोमिनल टैप [2 (Nominal Tap)]		419	11 केवी (11 KV)
			14:00			2 नोमिनल टैप [2 (Nominal Tap)]		417	11 केवी (11 KV)
			15:00			2 नोमिनल टैप [2 (Nominal Tap)]		413	11 केवी (11 KV)
			16:00			2 नोमिनल टैप [2 (Nominal Tap)]		415	11 केवी (11 KV)
			17:00			2 नोमिनल टैप [2 (Nominal Tap)]		413	11 केवी (11 KV)
			18:00	65	-4	2 नोमिनल टैप [2 (Nominal Tap)]	10.50	408	11 केवी (11 KV)
			19:00	64	-7	2 नोमिनल टैप [2 (Nominal Tap)]	10.49	410	11 केवी (11 KV)
			20:00			2 नोमिनल टैप [2 (Nominal Tap)]		415	11 केवी (11 KV)
			21:00			2 नोमिनल टैप [2 (Nominal Tap)]		418	11 केवी (11 KV)
			22:00			2 नोमिनल टैप [2 (Nominal Tap)]		429	11 केवी (11 KV)
			23:00			2 नोमिनल टैप [2 (Nominal Tap)]		416	11 केवी (11 KV)
			0:00			2 नोमिनल टैप [2 (Nominal Tap)]		425	11 केवी (11 KV)

इकाई#४ (Unit # 4)	68.67 मेगावाट पर 33 एमवीएआर (33 MVAR at 68.67MW)	68.67 मेगावाट पर 33 एमवीएआर (33 MVAR at 68.67MW)	1:00			2 नोमिनल टैप [2 (Nominal Tap)]		426	11 केवी (11 KV)
			2:00			2 नोमिनल टैप [2 (Nominal Tap)]		427	11 केवी (11 KV)
			3:00			2 नोमिनल टैप [2 (Nominal Tap)]		428	11 केवी (11 KV)
			4:00			2 नोमिनल टैप [2 (Nominal Tap)]		429	11 केवी (11 KV)
			5:00			2 नोमिनल टैप [2 (Nominal Tap)]		416	11 केवी (11 KV)
			6:00	68	2	2 नोमिनल टैप [2 (Nominal Tap)]	10.33	408	11 केवी (11 KV)
			7:00	74	-2	2 नोमिनल टैप [2 (Nominal Tap)]	10.22	405	11 केवी (11 KV)
			8:00	71	-2	2 नोमिनल टैप [2 (Nominal Tap)]	10.20	407	11 केवी (11 KV)
			9:00			2 नोमिनल टैप [2 (Nominal Tap)]		408	11 केवी (11 KV)
			10:00			2 नोमिनल टैप [2 (Nominal Tap)]		410	11 केवी (11 KV)
			11:00			2 नोमिनल टैप [2 (Nominal Tap)]		412	11 केवी (11 KV)
			12:00			2 नोमिनल टैप [2 (Nominal Tap)]		408	11 केवी (11 KV)
			13:00			2 नोमिनल टैप [2 (Nominal Tap)]		419	11 केवी (11 KV)
			14:00			2 नोमिनल टैप [2 (Nominal Tap)]		417	11 केवी (11 KV)
			15:00			2 नोमिनल टैप [2 (Nominal Tap)]		413	11 केवी (11 KV)
			16:00			2 नोमिनल टैप [2 (Nominal Tap)]		415	11 केवी (11 KV)
			17:00			2 नोमिनल टैप [2 (Nominal Tap)]		413	11 केवी (11 KV)
			18:00	67	-3	2 नोमिनल टैप [2 (Nominal Tap)]	10.34	408	11 केवी (11 KV)
			19:00	66	-6	2 नोमिनल टैप [2 (Nominal Tap)]	10.33	410	11 केवी (11 KV)
			20:00	75	-9	2 नोमिनल टैप [2 (Nominal Tap)]	10.39	415	11 केवी (11 KV)
			21:00			2 नोमिनल टैप [2 (Nominal Tap)]		418	11 केवी (11 KV)
			22:00			2 नोमिनल टैप [2 (Nominal Tap)]		429	11 केवी (11 KV)
			23:00			2 नोमिनल टैप [2 (Nominal Tap)]		416	11 केवी (11 KV)
			0:00			2 नोमिनल टैप [2 (Nominal Tap)]		425	11 केवी (11 KV)
इकाई#५ (Unit # 5)	68.67 मेगावाट पर 33 एमवीएआर (33 MVAR at 68.67MW)	68.67 मेगावाट पर 33 एमवीएआर (33 MVAR at 68.67MW)	1:00			2 नोमिनल टैप [2 (Nominal Tap)]		426	11 केवी (11 KV)
			2:00			2 नोमिनल टैप [2 (Nominal Tap)]		427	11 केवी (11 KV)
			3:00			2 नोमिनल टैप [2 (Nominal Tap)]		428	11 केवी (11 KV)
			4:00			2 नोमिनल टैप [2 (Nominal Tap)]		429	11 केवी (11 KV)
			5:00			2 नोमिनल टैप [2 (Nominal Tap)]		416	11 केवी (11 KV)
			6:00			2 नोमिनल टैप [2 (Nominal Tap)]		408	11 केवी (11 KV)
			7:00	75	-1	2 नोमिनल टैप [2 (Nominal Tap)]	10.11	405	11 केवी (11 KV)
			8:00	73	-1	2 नोमिनल टैप [2 (Nominal Tap)]	10.10	407	11 केवी (11 KV)
			9:00			2 नोमिनल टैप [2 (Nominal Tap)]		408	11 केवी (11 KV)
			10:00			2 नोमिनल टैप [2 (Nominal Tap)]		410	11 केवी (11 KV)
			11:00			2 नोमिनल टैप [2 (Nominal Tap)]		412	11 केवी (11 KV)
			12:00			2 नोमिनल टैप [2 (Nominal Tap)]		408	11 केवी (11 KV)
			13:00			2 नोमिनल टैप [2 (Nominal Tap)]		419	11 केवी (11 KV)
			14:00			2 नोमिनल टैप [2 (Nominal Tap)]		417	11 केवी (11 KV)
			15:00			2 नोमिनल टैप [2 (Nominal Tap)]		413	11 केवी (11 KV)
			16:00			2 नोमिनल टैप [2 (Nominal Tap)]		415	11 केवी (11 KV)
			17:00			2 नोमिनल टैप [2 (Nominal Tap)]		413	11 केवी (11 KV)
			18:00	67	-4	2 नोमिनल टैप [2 (Nominal Tap)]	10.27	408	11 केवी (11 KV)
			19:00	68	-7	2 नोमिनल टैप [2 (Nominal Tap)]	10.26	410	11 केवी (11 KV)
			20:00	75	-9	2 नोमिनल टैप [2 (Nominal Tap)]	10.35	415	11 केवी (11 KV)
			21:00	56	-6	2 नोमिनल टैप [2 (Nominal Tap)]	10.43	418	11 केवी (11 KV)
			22:00			2 नोमिनल टैप [2 (Nominal Tap)]		429	11 केवी (11 KV)
			23:00			2 नोमिनल टैप [2 (Nominal Tap)]		416	11 केवी (11 KV)
			0:00			2 नोमिनल टैप [2 (Nominal Tap)]		425	11 केवी (11 KV)

इकाई#५ (Unit # 6)	68.67 मेगावाट पर 33 एमवीएआर (33 MVAR at 68.67MW)	68.67 मेगावाट पर 33 एमवीएआर (33 MVAR at 68.67MW)	1:00			2 नोमिनल टैप [2 (Nominal Tap)]		426	11 केवी (11 KV)
			2:00			2 नोमिनल टैप [2 (Nominal Tap)]		427	11 केवी (11 KV)
			3:00			2 नोमिनल टैप [2 (Nominal Tap)]		428	11 केवी (11 KV)
			4:00			2 नोमिनल टैप [2 (Nominal Tap)]		**429**	11 केवी (11 KV)
			5:00	51	-2	2 नोमिनल टैप [2 (Nominal Tap)]	10.61	416	11 केवी (11 KV)
			6:00	60	-3	2 नोमिनल टैप [2 (Nominal Tap)]	10.34	408	11 केवी (11 KV)
			7:00	72	-2	2 नोमिनल टैप [2 (Nominal Tap)]	10.25	**405**	11 केवी (11 KV)
			8:00	69	-2	2 नोमिनल टैप [2 (Nominal Tap)]	10.24	407	11 केवी (11 KV)
			9:00			2 नोमिनल टैप [2 (Nominal Tap)]		408	11 केवी (11 KV)
			10:00			2 नोमिनल टैप [2 (Nominal Tap)]		410	11 केवी (11 KV)
			11:00			2 नोमिनल टैप [2 (Nominal Tap)]		412	11 केवी (11 KV)
			12:00			2 नोमिनल टैप [2 (Nominal Tap)]		**408**	11 केवी (11 KV)
			13:00			2 नोमिनल टैप [2 (Nominal Tap)]		**419**	11 केवी (11 KV)
			14:00			2 नोमिनल टैप [2 (Nominal Tap)]		417	11 केवी (11 KV)
			15:00			2 नोमिनल टैप [2 (Nominal Tap)]		413	11 केवी (11 KV)
			16:00			2 नोमिनल टैप [2 (Nominal Tap)]		415	11 केवी (11 KV)
			17:00	74	-3	2 नोमिनल टैप [2 (Nominal Tap)]	10.53	413	11 केवी (11 KV)
			18:00	72	-4	2 नोमिनल टैप [2 (Nominal Tap)]	10.33	**408**	11 केवी (11 KV)
			19:00	66	-7	2 नोमिनल टैप [2 (Nominal Tap)]	10.33	410	11 केवी (11 KV)
			20:00	71	-8	2 नोमिनल टैप [2 (Nominal Tap)]	10.41	415	11 केवी (11 KV)
			21:00	68	-6	2 नोमिनल टैप [2 (Nominal Tap)]	10.54	418	11 केवी (11 KV)
			22:00			2 नोमिनल टैप [2 (Nominal Tap)]		**429**	11 केवी (11 KV)
			23:00			2 नोमिनल टैप [2 (Nominal Tap)]		416	11 केवी (11 KV)
			0:00			2 नोमिनल टैप [2 (Nominal Tap)]		425	11 केवी (11 KV)

जनरेटर प्रतिक्रियाशील ऊर्जा की मोनिटरिंग (Generator Reactive power Monitoring)									20.11.2021
पावर स्टेशन का नाम: 412 मेगावाट रामपुर एच.पी. एस. (Name of Power Station : 412 MW RAMPUR HPS)									
जनरेटर इकाई (Generating Unit)			समय (Time)	जनरेटर टर्मिनल पर मेगावाट (MW at Generator Terminal)	जनरेटर टर्मिनल पर MVAR लीड / अंतराल (MVAR Lead/Lag at Generator Terminals)	जनरेटर ट्रांसफार्मर टैप स्थिति (Generator Transformer Tap Position)	जनरेटर टर्मिनल पर वोल्टेज (Voltage at the Generator Terminal (KV)	एचवी बस बार पर वोल्टेज (Voltage at the HV Bus Bar) (KV)	एवीआर की Vref सेटिंग्स (Vref settings of AVR)
	क्षमता वक्र के अनुसार,यूनिट की अधिकतम एमवीएआर क्षमता।		घंटा:मिनट						
	Max MVAR capabilty of Unit as per Capabilty Curve.		hh:mm						
	Generation (+)	अवशोषण (-)							
	Generation (+)	Absorpation (-							
इकाई#१ (Unit # 1)	68.67 मेगावाट पर 33 एमवीएआर (33 MVAR at 68.67MW)	68.67 मेगावाट पर 33 एमवीएआर (33 MVAR at 68.67MW)	1:00			2 नोमिनल टैप [2 (Nominal Tap)]		423	11 केवी (11 KV)
			2:00			2 नोमिनल टैप [2 (Nominal Tap)]		424	11 केवी (11 KV)
			3:00			2 नोमिनल टैप [2 (Nominal Tap)]		426	11 केवी (11 KV)
			4:00			2 नोमिनल टैप [2 (Nominal Tap)]		425	11 केवी (11 KV)
			5:00	70	0	2 नोमिनल टैप [2 (Nominal Tap)]	10.34	418	11 केवी (11 KV)
			6:00	74	0	2 नोमिनल टैप [2 (Nominal Tap)]	10.14	410	11 केवी (11 KV)
			7:00	71	0	2 नोमिनल टैप [2 (Nominal Tap)]	10.11	407	11 केवी (11 KV)
			8:00	71	-1	2 नोमिनल टैप [2 (Nominal Tap)]	10.10	407	11 केवी (11 KV)
			9:00	50	-3	2 नोमिनल टैप [2 (Nominal Tap)]	10.11	405	11 केवी (11 KV)
			10:00			2 नोमिनल टैप [2 (Nominal Tap)]		406	11 केवी (11 KV)
			11:00			2 नोमिनल टैप [2 (Nominal Tap)]		407	11 केवी (11 KV)
			12:00			2 नोमिनल टैप [2 (Nominal Tap)]		410	11 केवी (11 KV)
			13:00			2 नोमिनल टैप [2 (Nominal Tap)]		421	11 केवी (11 KV)
			14:00			2 नोमिनल टैप [2 (Nominal Tap)]		419	11 केवी (11 KV)
			15:00			2 नोमिनल टैप [2 (Nominal Tap)]		416	11 केवी (11 KV)
			16:00			2 नोमिनल टैप [2 (Nominal Tap)]		419	11 केवी (11 KV)
			17:00	55	-3	2 नोमिनल टैप [2 (Nominal Tap)]	10.54	419	11 केवी (11 KV)
			18:00	69	-1	2 नोमिनल टैप [2 (Nominal Tap)]	10.38	413	11 केवी (11 KV)
			19:00	69	-2	2 नोमिनल टैप [2 (Nominal Tap)]	10.36	414	11 केवी (11 KV)
			20:00	73	-5	2 नोमिनल टैप [2 (Nominal Tap)]	10.41	420	11 केवी (11 KV)
			21:00	40	-6	2 नोमिनल टैप [2 (Nominal Tap)]	10.52	420	11 केवी (11 KV)
			22:00			2 नोमिनल टैप [2 (Nominal Tap)]		422	11 केवी (11 KV)
			23:00			2 नोमिनल टैप [2 (Nominal Tap)]		422	11 केवी (11 KV)
			0:00			2 नोमिनल टैप [2 (Nominal Tap)]		423	11 केवी (11 KV)

इकाई#२ (Unit # 2)	68.67 मेगावाट पर 33 एमवीएआर (33 MVAR at 68.67MW)	68.67 मेगावाट पर 33 एमवीएआर (33 MVAR at 68.67MW)	1:00			2 नोमिनल टैप [2 (Nominal Tap)]		423	11 केवी (11 KV)
			2:00			2 नोमिनल टैप [2 (Nominal Tap)]		424	11 केवी (11 KV)
			3:00			2 नोमिनल टैप [2 (Nominal Tap)]		426	11 केवी (11 KV)
			4:00			2 नोमिनल टैप [2 (Nominal Tap)]		425	11 केवी (11 KV)
			5:00	70	0	2 नोमिनल टैप [2 (Nominal Tap)]	10.38	418	11 केवी (11 KV)
			6:00	73	0	2 नोमिनल टैप [2 (Nominal Tap)]	10.17	410	11 केवी (11 KV)
			7:00	68	0	2 नोमिनल टैप [2 (Nominal Tap)]	10.11	407	11 केवी (11 KV)
			8:00			2 नोमिनल टैप [2 (Nominal Tap)]		407	11 केवी (11 KV)
			9:00			2 नोमिनल टैप [2 (Nominal Tap)]		405	11 केवी (11 KV)
			10:00			2 नोमिनल टैप [2 (Nominal Tap)]		406	11 केवी (11 KV)
			11:00			2 नोमिनल टैप [2 (Nominal Tap)]		407	11 केवी (11 KV)
			12:00			2 नोमिनल टैप [2 (Nominal Tap)]		410	11 केवी (11 KV)
			13:00			2 नोमिनल टैप [2 (Nominal Tap)]		421	11 केवी (11 KV)
			14:00			2 नोमिनल टैप [2 (Nominal Tap)]		419	11 केवी (11 KV)
			15:00			2 नोमिनल टैप [2 (Nominal Tap)]		416	11 केवी (11 KV)
			16:00			2 नोमिनल टैप [2 (Nominal Tap)]		419	11 केवी (11 KV)
			17:00			2 नोमिनल टैप [2 (Nominal Tap)]		419	11 केवी (11 KV)
			18:00	73	-2	2 नोमिनल टैप [2 (Nominal Tap)]	10.39	413	11 केवी (11 KV)
			19:00	73	-3	2 नोमिनल टैप [2 (Nominal Tap)]	10.37	414	11 केवी (11 KV)
			20:00			2 नोमिनल टैप [2 (Nominal Tap)]		420	11 केवी (11 KV)
			21:00			2 नोमिनल टैप [2 (Nominal Tap)]		420	11 केवी (11 KV)
			22:00			2 नोमिनल टैप [2 (Nominal Tap)]		422	11 केवी (11 KV)
			23:00			2 नोमिनल टैप [2 (Nominal Tap)]		422	11 केवी (11 KV)
			0:00			2 नोमिनल टैप [2 (Nominal Tap)]		423	11 केवी (11 KV)
इकाई#३ (Unit # 3)	68.67 मेगावाट पर 33 एमवीएआर (33 MVAR at 68.67MW)	68.67 मेगावाट पर 33 एमवीएआर (33 MVAR at 68.67MW)	1:00			2 नोमिनल टैप [2 (Nominal Tap)]		423	11 केवी (11 KV)
			2:00			2 नोमिनल टैप [2 (Nominal Tap)]		424	11 केवी (11 KV)
			3:00			2 नोमिनल टैप [2 (Nominal Tap)]		426	11 केवी (11 KV)
			4:00			2 नोमिनल टैप [2 (Nominal Tap)]		425	11 केवी (11 KV)
			5:00			2 नोमिनल टैप [2 (Nominal Tap)]		418	11 केवी (11 KV)
			6:00	72	0	2 नोमिनल टैप [2 (Nominal Tap)]	10.51	410	11 केवी (11 KV)
			7:00	66	0	2 नोमिनल टैप [2 (Nominal Tap)]	10.43	407	11 केवी (11 KV)
			8:00	65	-5	2 नोमिनल टैप [2 (Nominal Tap)]	10.47	407	11 केवी (11 KV)
			9:00			2 नोमिनल टैप [2 (Nominal Tap)]		405	11 केवी (11 KV)
			10:00			2 नोमिनल टैप [2 (Nominal Tap)]		406	11 केवी (11 KV)
			11:00			2 नोमिनल टैप [2 (Nominal Tap)]		407	11 केवी (11 KV)
			12:00			2 नोमिनल टैप [2 (Nominal Tap)]		410	11 केवी (11 KV)
			13:00			2 नोमिनल टैप [2 (Nominal Tap)]		421	11 केवी (11 KV)
			14:00			2 नोमिनल टैप [2 (Nominal Tap)]		419	11 केवी (11 KV)
			15:00			2 नोमिनल टैप [2 (Nominal Tap)]		416	11 केवी (11 KV)
			16:00			2 नोमिनल टैप [2 (Nominal Tap)]		419	11 केवी (11 KV)
			17:00			2 नोमिनल टैप [2 (Nominal Tap)]		419	11 केवी (11 KV)
			18:00	68	-3	2 नोमिनल टैप [2 (Nominal Tap)]	10.55	413	11 केवी (11 KV)
			19:00	70	-4	2 नोमिनल टैप [2 (Nominal Tap)]	10.56	414	11 केवी (11 KV)
			20:00			2 नोमिनल टैप [2 (Nominal Tap)]		420	11 केवी (11 KV)
			21:00			2 नोमिनल टैप [2 (Nominal Tap)]		420	11 केवी (11 KV)
			22:00			2 नोमिनल टैप [2 (Nominal Tap)]		422	11 केवी (11 KV)
			23:00			2 नोमिनल टैप [2 (Nominal Tap)]		422	11 केवी (11 KV)
			0:00			2 नोमिनल टैप [2 (Nominal Tap)]		423	11 केवी (11 KV)

इकाई#४ (Unit # 4)	68.67 मेगावाट पर 33 एमवीएआर (33 MVAR at 68.67MW)	68.67 मेगावाट पर 33 एमवीएआर (33 MVAR at 68.67MW)	1:00			2 नोमिनल टैप [2 (Nominal Tap)]		423	11 केवी (11 KV)
			2:00			2 नोमिनल टैप [2 (Nominal Tap)]		424	11 केवी (11 KV)
			3:00			2 नोमिनल टैप [2 (Nominal Tap)]		426	11 केवी (11 KV)
			4:00			2 नोमिनल टैप [2 (Nominal Tap)]		425	11 केवी (11 KV)
			5:00			2 नोमिनल टैप [2 (Nominal Tap)]		418	11 केवी (11 KV)
			6:00	72	0	2 नोमिनल टैप [2 (Nominal Tap)]	10.12	410	11 केवी (11 KV)
			7:00	66	0	2 नोमिनल टैप [2 (Nominal Tap)]	10.11	407	11 केवी (11 KV)
			8:00	67	-2	2 नोमिनल टैप [2 (Nominal Tap)]	10.13	407	11 केवी (11 KV)
			9:00			2 नोमिनल टैप [2 (Nominal Tap)]		405	11 केवी (11 KV)
			10:00			2 नोमिनल टैप [2 (Nominal Tap)]		406	11 केवी (11 KV)
			11:00			2 नोमिनल टैप [2 (Nominal Tap)]		407	11 केवी (11 KV)
			12:00			2 नोमिनल टैप [2 (Nominal Tap)]		410	11 केवी (11 KV)
			13:00			2 नोमिनल टैप [2 (Nominal Tap)]		421	11 केवी (11 KV)
			14:00			2 नोमिनल टैप [2 (Nominal Tap)]		419	11 केवी (11 KV)
			15:00			2 नोमिनल टैप [2 (Nominal Tap)]		416	11 केवी (11 KV)
			16:00			2 नोमिनल टैप [2 (Nominal Tap)]		419	11 केवी (11 KV)
			17:00			2 नोमिनल टैप [2 (Nominal Tap)]		419	11 केवी (11 KV)
			18:00	71	-3	2 नोमिनल टैप [2 (Nominal Tap)]	10.32	413	11 केवी (11 KV)
			19:00	71	-4	2 नोमिनल टैप [2 (Nominal Tap)]	10.32	414	11 केवी (11 KV)
			20:00	69	-4	2 नोमिनल टैप [2 (Nominal Tap)]	10.45	420	11 केवी (11 KV)
			21:00			2 नोमिनल टैप [2 (Nominal Tap)]		420	11 केवी (11 KV)
			22:00			2 नोमिनल टैप [2 (Nominal Tap)]		422	11 केवी (11 KV)
			23:00			2 नोमिनल टैप [2 (Nominal Tap)]		422	11 केवी (11 KV)
			0:00			2 नोमिनल टैप [2 (Nominal Tap)]		423	11 केवी (11 KV)
इकाई#५ (Unit # 5)	68.67 मेगावाट पर 33 एमवीएआर (33 MVAR at 68.67MW)	68.67 मेगावाट पर 33 एमवीएआर (33 MVAR at 68.67MW)	1:00			2 नोमिनल टैप [2 (Nominal Tap)]		423	11 केवी (11 KV)
			2:00			2 नोमिनल टैप [2 (Nominal Tap)]		424	11 केवी (11 KV)
			3:00			2 नोमिनल टैप [2 (Nominal Tap)]		426	11 केवी (11 KV)
			4:00			2 नोमिनल टैप [2 (Nominal Tap)]		425	11 केवी (11 KV)
			5:00			2 नोमिनल टैप [2 (Nominal Tap)]		418	11 केवी (11 KV)
			6:00	72	0	2 नोमिनल टैप [2 (Nominal Tap)]	10.07	410	11 केवी (11 KV)
			7:00	63	0	2 नोमिनल टैप [2 (Nominal Tap)]	10.09	407	11 केवी (11 KV)
			8:00	64	-2	2 नोमिनल टैप [2 (Nominal Tap)]	10.09	407	11 केवी (11 KV)
			9:00			2 नोमिनल टैप [2 (Nominal Tap)]		405	11 केवी (11 KV)
			10:00			2 नोमिनल टैप [2 (Nominal Tap)]		406	11 केवी (11 KV)
			11:00			2 नोमिनल टैप [2 (Nominal Tap)]		407	11 केवी (11 KV)
			12:00			2 नोमिनल टैप [2 (Nominal Tap)]		410	11 केवी (11 KV)
			13:00			2 नोमिनल टैप [2 (Nominal Tap)]		421	11 केवी (11 KV)
			14:00			2 नोमिनल टैप [2 (Nominal Tap)]		419	11 केवी (11 KV)
			15:00			2 नोमिनल टैप [2 (Nominal Tap)]		416	11 केवी (11 KV)
			16:00			2 नोमिनल टैप [2 (Nominal Tap)]		419	11 केवी (11 KV)
			17:00	51	-4	2 नोमिनल टैप [2 (Nominal Tap)]	10.44	419	11 केवी (11 KV)
			18:00	71	-5	2 नोमिनल टैप [2 (Nominal Tap)]	10.24	413	11 केवी (11 KV)
			19:00	71	-3	2 नोमिनल टैप [2 (Nominal Tap)]	10.30	414	11 केवी (11 KV)
			20:00	72	-4	2 नोमिनल टैप [2 (Nominal Tap)]	10.40	420	11 केवी (11 KV)
			21:00			2 नोमिनल टैप [2 (Nominal Tap)]		420	11 केवी (11 KV)
			22:00			2 नोमिनल टैप [2 (Nominal Tap)]		422	11 केवी (11 KV)
			23:00			2 नोमिनल टैप [2 (Nominal Tap)]		422	11 केवी (11 KV)
			0:00			2 नोमिनल टैप [2 (Nominal Tap)]		423	11 केवी (11 KV)

इकाई#६ (Unit # 6)	68.67 मेगावाट पर 33 एमवीएआर (33 MVAR at 68.67MW)	68.67 मेगावाट पर 33 एमवीएआर (33 MVAR at 68.67MW)	1:00			2 नोमिनल टैप [2 (Nominal Tap)]		423	11 केवी (11 KV)
			2:00			2 नोमिनल टैप [2 (Nominal Tap)]		424	11 केवी (11 KV)
			3:00			2 नोमिनल टैप [2 (Nominal Tap)]		426	11 केवी (11 KV)
			4:00			2 नोमिनल टैप [2 (Nominal Tap)]		425	11 केवी (11 KV)
			5:00			2 नोमिनल टैप [2 (Nominal Tap)]		418	11 केवी (11 KV)
			6:00	70	0	2 नोमिनल टैप [2 (Nominal Tap)]	10.26	410	11 केवी (11 KV)
			7:00	72	0	2 नोमिनल टैप [2 (Nominal Tap)]	10.22	407	11 केवी (11 KV)
			8:00	74	-1	2 नोमिनल टैप [2 (Nominal Tap)]	10.21	407	11 केवी (11 KV)
			9:00	56	-3	2 नोमिनल टैप [2 (Nominal Tap)]	10.16	405	11 केवी (11 KV)
			10:00			2 नोमिनल टैप [2 (Nominal Tap)]		406	11 केवी (11 KV)
			11:00			2 नोमिनल टैप [2 (Nominal Tap)]		407	11 केवी (11 KV)
			12:00			2 नोमिनल टैप [2 (Nominal Tap)]		410	11 केवी (11 KV)
			13:00			2 नोमिनल टैप [2 (Nominal Tap)]		421	11 केवी (11 KV)
			14:00			2 नोमिनल टैप [2 (Nominal Tap)]		419	11 केवी (11 KV)
			15:00			2 नोमिनल टैप [2 (Nominal Tap)]		416	11 केवी (11 KV)
			16:00			2 नोमिनल टैप [2 (Nominal Tap)]		419	11 केवी (11 KV)
			17:00	49	-2	2 नोमिनल टैप [2 (Nominal Tap)]	10.53	419	11 केवी (11 KV)
			18:00	75	-2	2 नोमिनल टैप [2 (Nominal Tap)]	10.40	413	11 केवी (11 KV)
			19:00	71	-4	2 नोमिनल टैप [2 (Nominal Tap)]	10.40	414	11 केवी (11 KV)
			20:00	73	-4	2 नोमिनल टैप [2 (Nominal Tap)]	10.52	420	11 केवी (11 KV)
			21:00	75	-5	2 नोमिनल टैप [2 (Nominal Tap)]	10.50	420	11 केवी (11 KV)
			22:00			2 नोमिनल टैप [2 (Nominal Tap)]		422	11 केवी (11 KV)
			23:00			2 नोमिनल टैप [2 (Nominal Tap)]		422	11 केवी (11 KV)
			0:00			2 नोमिनल टैप [2 (Nominal Tap)]		423	11 केवी (11 KV)

LONG OUTAGES REPORT AS ON 14-12-2021

S. No`	Element Name	Type	Owner	Outage Date and Time		Outage days	Reason / Remarks	As per 190 OCC discussion
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.	March-2022
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.	March-2022
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.	January-2022
B	**BAYS**							**As per 190 OCC discussion**
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	As per 190 OCC discussion
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.	REC pending for approval. No timeline provided
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.	March 2022
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	April-2022
7	400/220 kV 315 MVA ICT 4 at Mundka(DV)	ICT	DTL	13-11-2021	19:15	30	Buchholz trip.	
D	**BUS REACTOR**							**As per 190 OCC discussion**
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**							**As per 190 OCC discussion**
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							As per 190 OCC discussion
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.	

OUTAGE SUMMARY OF LAST THREE MONTHS

MONTH	PLANNED	FORCED OUTAGES	EMERGENCY SHUTDOWNS	TRIPPING	% PLANNED as of TOTAL S/D	% EMERGENCY SHUTDOWNS	TOTAL OUTAGES (A+B)
	(A)	(B=C+D)	(C)	(D)	(A/(A+C))	(C/(A+C))	
Aug-21	401	645	259	386	60.8%	39.2%	1046
Sep-21	647	657	232	425	73.6%	26.4%	1304
Oct-21	942	567	238	329	79.8%	20.2%	1509
Nov-21	**863**	**515**	**240**	**275**	**78.24%**	**21.76%**	**1378**

G	GENERATING UNITS						As per 190 OCC discussion
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	
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	