I/33317/2024

सत्यमेव जयते

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

विषय: उत्तर क्षेत्रीय विद्युत समिति की प्रचालन समन्वय उप-समिति की 215वीं बैठक का कार्यवृत |

Subject: Minutes of the 215th OCC meeting of NRPC.

उत्तर क्षेत्रीय विद्युत समिति की प्रचालन समन्वय उप-समिति की 215वीं बैठक दिनांक 12.01.2024 को वाराणसी (उ. प्र.) में 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 |

The 215th meeting of the Operation Co-ordination Sub-Committee (OCC) of NRPC was held on 12.01.2024 in Varanasi (U. P.). 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।

Signed by D. K. Meena
Date: 26-01-2024 12:57:37
Reason: Approved

(डी. के. मीना)
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 215 वीं बैठक का कार्यवृत्त

Director (Operation), UPPTCL welcomed all the dignitaries of Northern Region to the 215th OCC meeting of NRPC in the holy city of Varanasi. He conveyed special thanks to Member Secretary NRPC for giving opportunity to UPPTCL to hold the meeting. He stated that OCC forum has been serving as a platform to review the grid operations. He mentioned that OCC forum provides an opportunity to its members to resolve technical as well as commercial issues which otherwise are not sorted out at state level. He further mentioned that by virtue of this forum, NRPC has been constantly keeping an eye on status of implementation of various schemes being implemented at state level such as Automatic Demand Management System and Islanding Scheme etc for safe and secure grid operation. He requested participants to make this meeting very successful and memorable.

Member Secretary, NRPC welcomed all the participants to the 215th OCC meeting. He thanked UPPTCL for hosting the meeting and for the wonderful arrangements for meeting. He hoped that the deliberations in the meeting would help in resolving the issues affecting the Northern Region. He stated that that the agenda's approved in this meeting would be taken up for approval in the upcoming NRPC meeting. Thereafter, he requested that the agenda may be presented and deliberated.

List of participants of 215th OCC meeting is attached at ***Annexure-A.X.***

खण्ड-क:उ.क्षे.वि.स. PART-A:NRPC

A.1. Confirmation of Minutes

Minutes of the 214th OCC meeting was issued on 29.12.2023. OCC confirmed the minutes of the meeting.

A.2. Review of Grid operations of December 2023

Anticipated vis-à-vis Actual Power Supply Position (Provisional) for November 2023

Reasons submitted by States for significant deviation of actual demand from anticipated figures during the month of December 2023 are as under:

- **Delhi**

Delhi experienced a warmer December in 2023 as compared to last five-six years, with temperatures that were higher than usual. So, peak demand was on lower side than expected.

- **Punjab**

  It is intimated that actual maximum demand and actual energy requirement are less as compared anticipated maximum demand and anticipated energy requirement because of less demand of all categories of consumers due to delayed onset of winters in the state of Punjab during the month of December 2023.

- **Rajasthan**

  The Actual Energy requirement w.r.t. Anticipated Energy requirement for the month December' 2023 decreased by 4.9% because of reduced Agriculture load during first week of December 2023 due to scattered rains in the Rajasthan state and the Actual peak demand w.r.t. Anticipated peak demand for the month December' 2023 decreased by 0.3 % which is within permissible limit.

- **Uttar Pradesh**

  During the month of December 2023, actual energy requirement and peak demand was less as compared to forecasted energy requirement and peak demand due to lesser heating load on account of mild winters. Minimum temperature in UP Control Area was around 10 degree Celsius which usually remains between 04 - 07 degree Celsius during the month of December 2023.

A.3. Maintenance Programme of Generating units and Transmission Lines

The maintenance programme of generating units and transmission lines for the month of February 2024 was deliberated in the meeting on 09.01.2024.

A.4. Anticipated Power Supply Position in Northern Region for February 2024

The updated anticipated Power Supply Position for February 2024 is as below:

State / UT	Availability / Requirement	Revised Energy (MU)	Revised Peak (MW)	Date of revision
CHANDIGARH	Availability	110	300	No Revision submitted
	Requirement	126	260	
	Surplus / Shortfall	-16	40	
	% Surplus / Shortfall	-12.7%	15.4%	
DELHI	Availability	3047	5000	

State / UT	Availability / Requirement	Revised Energy (MU)	Revised Peak (MW)	Date of revision
	Requirement	1950	5000	10-Jan-24
	Surplus / Shortfall	1097	0	
	% Surplus / Shortfall	56.3%	0.0%	
HARYANA	Availability	4790	11610	No Revision submitted
	Requirement	4039	8900	
	Surplus / Shortfall	751	2710	
	% Surplus / Shortfall	18.6%	30.4%	
HIMACHAL PRADESH	Availability	1062	2063	08-Jan-24
	Requirement	1063	2115	
	Surplus / Shortfall	-1	-52	
	% Surplus / Shortfall	-0.1%	-2.5%	
J&K and LADAKH	Availability	1110	4130	No revision submitted
	Requirement	1810	3090	
	Surplus / Shortfall	-700	1040	
	% Surplus / Shortfall	-38.7%	33.7%	
PUNJAB	Availability	5000	10930	11-Jan-24
	Requirement	4305	8500	
	Surplus / Shortfall	695	2430	
	% Surplus / Shortfall	16.1%	28.6%	
RAJASTHAN	Availability	8030	18590	10-Jan-24
	Requirement	8845	17000	
	Surplus / Shortfall	-815	1590	
	% Surplus / Shortfall	-9.2%	9.4%	
UTTAR PRADESH	Availability	9570	19000	03-Jan-24
	Requirement	9425	19000	
	Surplus / Shortfall	145	0	
	% Surplus / Shortfall	1.5%	0.0%	
UTTARAKHAND	Availability	1177	2340	08-Jan-24
	Requirement	1204	2390	

State / UT	Availability / Requirement	Revised Energy (MU)	Revised Peak (MW)	Date of revision
	Surplus / Shortfall	-26	-50	
	% Surplus / Shortfall	-2.2%	-2.1%	
NORTHERN REGION	Availability	33896	69000	
	Requirement	32767	61800	
	Surplus / Shortfall	1130	7200	
	% Surplus / Shortfall	3.4%	11.7%	

A.5. Follow-up of issues from various OCC Meetings - Status update

A.5.1. The updated status of agenda items is enclosed at ***Annexure-A.I.***

A.5.2. In 215th OCC, SLDCs were requested again to coordinate with respective Transmission Utilities of states/UTs and submit details about the updated status of Down Stream network by State Utilities from ISTS Station (enclosed as ***Annexure-A-I.I***) before every OCC meeting.

A.6. NR Islanding scheme

A.6.1. In the meeting (215th OCC), UPSLDC representative apprised forum that UFR have been installed at PGCIL and UPPCL S/s, however, work is pending from NTPC Unchahar end for Lucknow- Unchahar islanding scheme. Representative of NTPC informed that there is some issue in the installation of relay panels and representative of NTPC and UPPTCL are currently at the site to resolve the issue.

A.6.2. With regard to Agra islanding scheme, UPSLDC representative apprised forum that a meeting was held in the office of MD, UPPTCL on 19.12.2023. In that meeting LPGCL informed that out of 18 cases, in 5 cases island may not survive. Further, in the said meeting it was agreed that barring these five cases we may proceed with the islanding scheme and scheme may be put up for approval in NRPC meeting.

A.6.3. NRLDC representative stated that since the scheme is likely to survive in more than 70% of the cases, we may go ahead with the scheme.

A.6.4. MS, NRPC stated that since the scheme is likely to survive in majority of the cases, the scheme may be approved and it may be taken up for approval in next NRPC meeting.

A.6.5. Representative from RRVPNL intimated forum that draft DPR for Jodhpur-Barmer Rajwest and Suratgarh Islanding scheme is under approval from their

management and it would be shared with NRPC Secretariat and NRLDC by January, 2024.

A.6.6. With regard to Patiala-Nabha Power Rajpura islanding scheme representative from Punjab SLDC informed that DPR for PSDF funding has been prepared and it will be submitted for PSDF funding in the next 15 days.

A.6.7. With regard to Kullu-Manali Islanding scheme, representative from HPSLDC apprised forum that nodal officer of HPSEB for islanding schemes has requested System Planning wing of HPSEB for funding for procurement of UFR.

A.6.8. With regard to Shimla-Solan Islanding scheme representative from HPSLDC intimated that information from GE related to the control system of Bhaba HEP is awaited.

A.6.9. MS, NRPC requested HPSLDC to follow up with HPSEB and GE for early resolution of the issue.

Decision of the OCC forum

- *Forum approved the Agra islanding scheme and agreed that it may be put up for approval in the next NRPC meeting.*

A.7. Coal Supply Position of Thermal Plants in Northern Region

A.7.1. In the meeting, NRPC representative apprised forum about the coal stock position of generating stations in northern region during current month (till 10th January 2024).

A.7.2. Average coal stock position of generating stations in northern region, having critical stock, during first ten days of January 2024 is as follows:

Station	Capacity (MW)	PLF % (prev. months)	Normative Stock Reqd. (Days)	Actual Stock (Days)
GOINDWAL SAHIB TPP	540	0.62	24	2.1
CHHABRA-I PH-1 TPP	500	0.74	24	1.2
CHHABRA-I PH-2 TPP	500	0.83	24	0.9

A.13.1. In the meeting, above mentioned generating station was requested to take adequate measures.

A.8. Status of availability of ERS towers in Northern Region (Agenda by NRPC Sectt.)

A.8.1. In the meeting, EE(O) NRPC apprised forum updated inputs received from utilities are attached as **Annexure-A.II.**

A.8.2. MS, NRPC asked transmission utilities of NR that have not submitted the status of ERS set/towers available with them to submit the requisite information before next OCC meeting.

Decision of the OCC forum

- *Forum asked the transmission utilities of NR that have not submitted the status of ERS set/towers available with them to submit the requisite information before next OCC meeting.*

A.9. Draft Outage Planning procedure of Northern region (Agenda by NRPC Sectt.)

A.9.1. In the meeting, EE(O) NRPC apprised forum that as per Regulation 32(4) of Indian Electricity Grid code (IEGC) 2023, RPCs are required to formulate a common outage planning procedure. In compliance of this a draft procedure was prepared and attached with agenda.

Sl No.	Clause / Para no.	Existing Para in NRPC agenda for Common Outage Planning Procedure	NLDC Suggested change/alteration/addition	NLDC Remarks	Discussion in 215 OCC meeting
1	6.2	Indenting Agency shall submit the proposed shutdown for the next calendar month latest by 05th day of the current month to the NRPC Secretariat via Outage Management Software (OMS) Portal of NRLDC as per Format I.	Indenting Agency shall submit the proposed shutdown for the next calendar month latest by 05th day of the current month to the NRPC Secretariat via Outage Management Software (OMS) Portal of NRLDC as per Format I. Indenting agency/NRPC shall also ensure to send the list of Inter regional shutdown and intra-regional lines affecting the transfer capability of any inter regional corridor to NPC/concerned RPCs by 5th day of current month as per Format I.	This is already a practice in NRPC. No reason to discontinue. As for now RPC is sending the list to NLDC instead of NPC which is an interim arrangement till the NPC is functional.	***Already being practiced in NRPC. In case NPC is assigned the role, revised procedure would be issued.***
2	6.7	Any transmission element approved by OCC may be allowed to be re-scheduled by NRLDC in the	Any transmission element approved by OCC may be allowed to be re-scheduled by NRLDC in the same calendar month for	Just for clarity	UP SLDC stated that any transmission element Outage approved by

		same month for which it was approved considering the grid scenario and genuineness of deferment by indenting agency. After getting approval from NRLDC, the indenting agency would reschedule the outage.	which it was approved considering the grid scenario and genuineness of deferment by indenting agency. After getting approval from NRLDC, the indenting agency would reschedule the outage.		OCC from 24th day onwards may be allowed to be re-scheduled by NRLDC up to 7th day of the next month. MS, NRPC stated agreed with the suggestion of UP SLDC.
3	14.1	Any maintenance work on opportunity basis proposed to be carried out by related agencies during the period of a shutdown already approved by NRLDC would need the approval of NRLDC. The same if approved would also be intimated by NRLDC to the agency, which initially applied for the planned shutdown. The delay or extension of time in returning the shutdown attributable to such opportunity shutdown shall also be indicated separately.	Any maintenance work on opportunity basis proposed to be carried out by ~~related~~ any other ~~agencies~~ agency/ies during the period of a shutdown already approved by NRLDC ~~would need the approval of NRLDC~~ may do the work in consent with intending agency with intimation to NRLDC/NLDC. No separate code shall be issued for opportunity shutdown. ~~The same if approved would also be intimated by NRLDC to the agency, which initially applied for the planned shutdown.~~ The delay or extension of time in returning the shutdown attributable to such opportunity shutdown shall also be indicated separately.	Consent of opportunity shutdown shall be obtained from intending agency by the agency who is availing the opportunity shutdown. No involvement of NRLDC/NLDC in obtaining the such approval.	NRLDC representative stated that the intending agency may request and discuss with agency availing shutdown beforehand so that required planning is carried out before shutdown. OCC forum agreed that no separate code shall be issued by NRLDC. It shall be the responsibility of the intending agency to complete their work within timeline of approved shutdown. NRLDC would mention that

					other agency would also be carrying out work on opportunity in remarks column while approving shutdown.
4		Flow chart	Attached as annexure 1	Flow chart May be added for better understanding	As discussed in the meeting, Flow chart may not be required
5	17.4	In case shutdown is extended beyond one day, then utility should approach for consent/approval with proper reason and justification of delay to SLDC/NRLDC/NLDC with a copy to NRPC. SLDC/NRLDC/NLDC would take appropriate decision considering the grid situation.	In case shutdown is extended beyond one day, then utility should approachfor consent/approval with proper reason and justification of delay to ~~SLDC/NRLDC/NLDC~~ NRPC Forum with a copy to ~~NRPC~~ NRLDC/NLDC. ~~SLDC/NRLDC/NLDC would take appropriate decision considering the grid situation.~~ Extension of shutdown will be allowed only after obtaining consent from NRPC.	Maintenance/ outage plan of grid elements is an important task for reliable & secure grid operation. This is duly mentioned in IEGC and therefore, responsibility of outage planning has been entrusted to RPC in consultation with NLDC/RLDCs **and all the stakeholders**. Hence, approval/facilitation of any shutdown is a collective responsibility of RPCs, RLDCs and NLDC, so that all concern utilities/stakeholders remain well aware and chalk out the plan without compromise the demand generation scenario during the shutdown. This issue has gained more importance post grid disturbances in July 2012 and Hon'ble **CERC vide order**	In the meeting NRLDC representative stated that incase of delay of return of shutdown by utilities, other shutdowns already approved by NRPC may be impacted. NRPC representative suggested that extension upto 3 days may be approved by NRLDC with intimation to NRPC and for extension beyond 3 days NRPC approval may be required. NRLDC agreed with the suggestion of NRPC representative.

				passed in petition No. 008/SM/2014 expressed the concern regarding way of facilitating the shutdown of some lines without due consultation of stakeholders.	MS NRPC stated that considering maximum duration of 30 days Shutdown are approved in OCC, considering 10% slippage, 3 days seem reasonable. OCC forum agreed that for extension upto 3 days, Utilities shall apply to NRLDC with copy to NRPC for shutdown extension, and such extension shall be provided by NRLDC with intimation to NRPC. For any extension beyond 3 days, would require approval from NRPC. Such extension shall only be applicable for original shutdown only for one time (one extension).

Decision of the OCC forum

- *Forum approved the draft Outage Planning procedure of Northern Region*

*attached at **Annexure-A.III.***

A.10. Furnishing requirements of number of licenses by utilities for protection setting calculation tool (Agenda by NRPC Sectt.)

A.10.1. EE(P) NRPC apprised that in 48th TCC & 70th NRPC Meeting (held on 17-18 Nov 2023), NRPC Committee has approved for development of a portal through PSDF for Centralized database containing details of relay settings for grid elements connected to 220 kV and above. Portal shall have other features including protection setting calculation tool. Approved scope of portal is attached as **Annexure-IV.**

A.10.2. In above meeting, utilities were requested to give their requisition for number of licences latest by 30.11.2023 required for calculation tool for preparation of estimate of work as project cost will depend on number of license required in Northern Region.

A.10.3. NRPC Secretariat is taking up the modalities of tendering with POWERGRID. Utilities may finalize their requirement of licences.

A.10.4. Utilities asked about use of portal and need of license.

A.10.5. EE(P) NRPC apprised that there are two modules of the project:

i. Database module (shall be used for storage of protection settings, audit reports, DR/EL etc): License is not required for this module and login shall be made available to utilities based on requirement

ii. Protection Setting Calculation Tool (shall be used for protection settings co-ordination study based on database available): License is required for this tool.

A.10.6. After deliberation, utilities were shown number of licenses considered for each utility. The same is attached as **Annexure-V.**

A.10.7. Utilities were requested to update requirement of number of licenses latest by 24.01.2023 so that same can be discussed and finalized in 49th Protection Sub-Committee meeting scheduled on 25.01.2024.

Decision of the OCC forum

- *Utilities were requested to update requirement of number of licenses latest by 24.01.2023 so that same can be discussed and finalized in 49th Protection Sub-Committee meeting scheduled on 25.01.2024.*

A.11. Proposed SPS for 2X315 MVA, 400/220kV ICTs at Suratgarh Thermal Power Station (Agenda by RVPN)

A.11.1. EE(O), NRPC apprised forum that RVPN vide letter dated 21.12.2023 has proposed a SPS for 2X315 MVA, 400/220kV ICTs at Suratgarh Thermal Power Station.

A.11.2. NRLDC representative stated that comments from NRLDC side were submitted on 10.01.2024 on logic attached in agenda. It was mentioned that SPS operation is not able to provide the relief to save one ICT and it was suggested that simulation studies may also be carried out at RVPN end.

A.11.3. RVPN representative stated that they have submitted the revised SPS logic with NRLDC and NRPC.

A.11.4. NRLDC representative stated that NRLDC would study and submit their comments on revised scheme within one week. NRLDC representative also requested RVPN to study for requirement of new ICT at 400/220kV Suratgarh TPS S/s.

A.11.5. MS NRPC stated that based on comments received from NRLDC, the revised logic may be discussed in upcoming Protection Sub-committee meeting on 25th Jan'2024.

Decision of the OCC forum

Forum decided that revised SPS may be put up for discussion in the next Protection Sub-committee meeting of NRPC.

A.12. Tapping Tertiary of 765/400/33 kV ICT-2 (by connecting the same at the point of connection of the UPPCL supply) for Reliable Auxiliary Power Supply to ±500kV HVDC Ballia SubStation. (Agenda by Powergrid NR-3)

A.12.1. In the meeting, EE(O) NRPC apprised forum that this agenda was also discussed in the 213th OCC meeting of NRPC wherein forum asked UPPTCL to get the through faults detected by the relay examined internally by UPPTCL.

A.12.2. POWERGRID representative highlighted that the two auxiliary supplies to HVDC are not reliable and there is continuous risk of loss of HVDC due to auxiliary failure. In the meeting, Powergrid representative gave a brief presentation to the forum on this matter. (Presentation attached at **Annexure-A.VI**)

A.12.3. Representative from UPPTCL informed that they have examined the matter internally and it was found that the relay is sensing faults due to trippings in the associated 33kV feeders. However, in the last four months, there has been no tripping in the said 132kV feeder. Further, POWERGRID may also check sensitivity of 132kV feeder relays.

A.12.4. MS NRPC stated that as per CEA regulations only two reliable sources are to be provided. Accordingly, in case of new connection for auxiliary by POWERGRID, one of the existing supply has to be surrendered by POWERGRID.

A.12.5. NRLDC representative stated that the last tripping of Ballia-Bhiwadi HVDC due to auxiliary supply failure was reported on 14.07.2022. With increase in RE generation in Western Rajasthan, there would be requirement of frequent power order change in Ballia-Bhiwadi HVDC, including change in direction of power flow even in single day. Thus, importance of Ballia-Bhiwadi HVDC would increase in future.

A.12.6. MS NRPC suggested that since tripping of 33kV feeder have reduced and further CEA regulations specify two reliable sources, a committee may be formed under the chairmanship of Sr. GM(SO), NRLDC with members from POWERGRID, CTUIL and UPPTCL to assess the present situation and submit recommendations to OCC forum.

Decision of the OCC forum

OCC Forum decided to form a committee under the chairmanship of Sr. GM(SO), NRLDC with members from POWERGRID, CTUIL and UPPTCL to examine the requirement of additional Auxiliary Power Supply to ±500kV HVDC Ballia Substation. The committee will submit its report to OCC forum within one month.

A.13. Additional Agenda No.1: Feasibility of Varanasi Islanding Scheme (Agenda by UPSLDC)

A.13.1. In the meeting, EE(O) NRPC apprised forum UPSLDC vide letter dated 06.01.2024 has intimated that they have planned Varanasi Islanding Scheme using generation of Anpara BTPS.

A.13.2. Representative of UP SLDC gave a brief presentation (attached as **Annexure-A.VII**) to the forum on this matter.

A.13.3. Representative of NRLDC stated that the scheme looks doable in general. He suggested that UP SLDC may conduct the steady state study and submit it to NRPC Sectt. And NRLDC.

A.13.4. MS, NRPC asked UP SLDC to conduct the steady state study of the proposed Varanasi islanding scheme for further discussion in the OCC meeting.

Decision of the OCC forum

Forum asked UP SLDC to conduct the steady state study of the proposed Varanasi islanding scheme and submit it to NRPC Sectt. And NRLDC. Thereafter, it may be discussed in the OCC meeting.

A.14. Additional Agenda No.1: Frequent Switching Operations of Reactor at 765kV Hapur and 765kV Gr. Noida substations (Agenda by UPSLDC)

A.14.1. In the meeting, EE(O) NRPC apprised forum that Western U.P Power Transmission Co. Ltd. has intimated that as per IEC standards, 24 switching operations per year are permitted for Reactors. However, more than 24 switching operations have been observed on 3X80 MVAr Reactors installed at 765 kV Hapur and 765kV G. Noida substations.

A.14.2. NRLDC representative stated that presently generally two operations of bus reactors in RE complex are being carried out on daily basis. Same is required due to the profile of RE generation and accordingly variation of grid voltages.

A.14.3. Representative of CTU stated that Technical Specification of Circuit Breaker refers to IEC 62271-100. Two classes of Operation are defined in this IEC i.e. Class M1 and Class M2. Class M1 is defined for 2000 operations over the life cycle whereas Class M2 is defined for 10000 operations. As per the practice in RTM and TBCB projects of Powergrid, Class M2 is followed. He further stated that if 24 switching operations are made per year than 840 switching operations would be done in a life cycle. In that case the equipment would not be used for its full potential.

A.15. Table Agenda 1. Noida Islanding Scheme (Agenda by UPSLDC)

A.15.1. Representative of UPSLDC informed that they are planning Noida Islanding Scheme using generation of Harduaganj TPS (250X2+600X1 MW) and selective load of Noida region. Details of proposed Islanding Scheme is attached **Annexure-A.VIII**.

A.15.2. Representative of UPSLDC informed that five 765kV lines outgoing lines from Greater Noida substation of WUPPTCL would need to be isolated for the scheme.

A.15.3. Representative of NRLDC stated that the scheme needs to be examined in details as it involves isolation of 765kV lines.

A.15.4. MS, NRPC asked UP SLDC to submit the scheme to NRLDC for its examination.

A.16. Table Agenda 2. Implementation of AGC in UP control area for Intra-state generators (Agenda by PPGCL)

A.16.1. Representative of PPGCL informed that PPGCL (Tata Power) has done all preparations at their end and ready to volunteer for implementation of AGC, as Pilot, if necessary, support is extended by other stakeholders. He further informed that the matter was also discussed recently in the State Power

Committee meeting. Relevant extracts of MoM of this meeting is attached as **Annexure-A.IX.**

A.16.2. Representative of UP SLDC informed that they are gearing up for implementation of AGC. He stated that implementation of AGC would require AGC software and associated computer hardware at UP SLDC end. He further mentioned that procurement of the same is being done by Powergrid for UP SLDC and it is expected to be completed by March'25.

A.16.3. NRLDC representative stated that plants need to establish a bi-directional communication between NLDC and Plant for communication and control for providing services under AGC at national level.

A.16.4. NRLDC representative suggested that PPGCL may approach NLDC in this regard. It was also mentioned that Pragati Power (Delhi) has already requested for participation in AGC and procurement of RTU is under process by Pragati Power.

A.16.5. MS, NRPC asked PPGCL to approach NLDC for implementation of AGC for their Power Station.

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

B.1 NR Grid Highlights for December 2023

Detailed presentation on grid highlights of Dec'2023 was shared by NRLDC in OCC meeting. The presentation as discussed in the meeting is attached as Annexure-I.

B.2 Grid Operation related issues

I. Suspected tripping of lines during fog

The issues related to challenge during winter months regarding tripping of EHV lines due to fog has been deliberated in last three OCC meetings. OCC forum asked utilities to furnish the utility-wise latest status of washing of insulators & replacement of porcelain insulators with polymer insulators in 212 & 213 OCC meeting.

In the 214 OCC meeting, following was discussed:

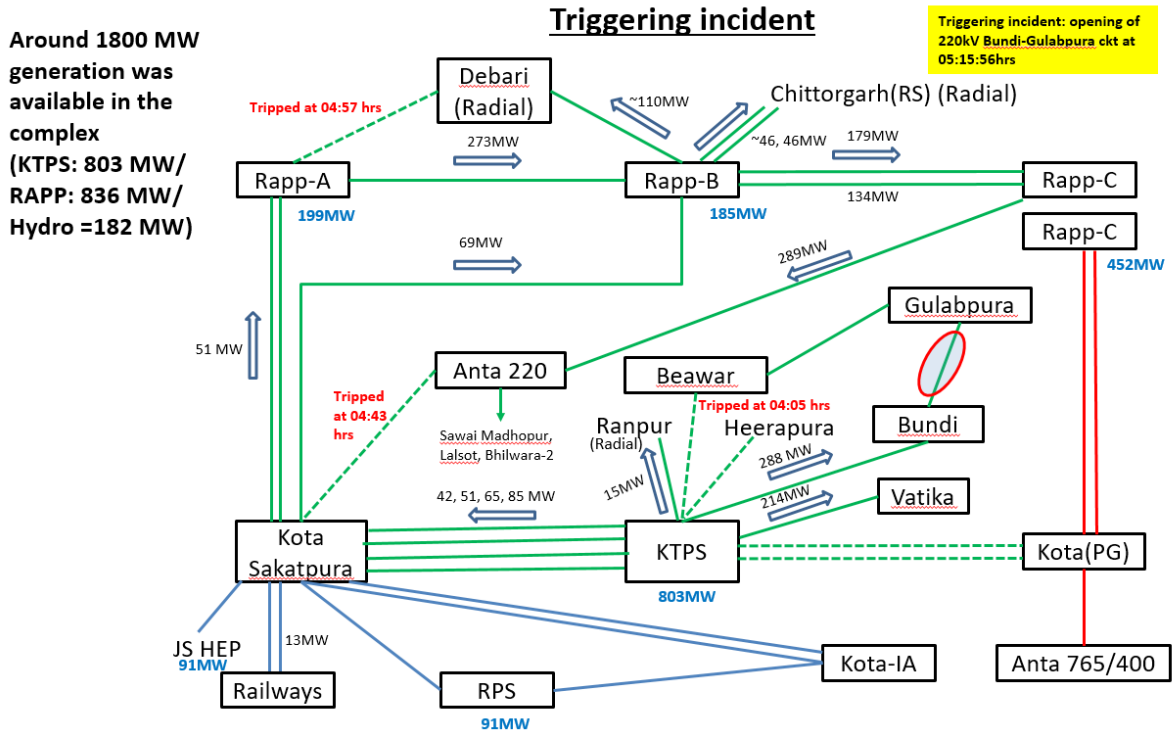
- Special actions required by RVPN, UPPTCL and PSTCL.
- RVPN needs to proactively take actions for avoiding tripping of lines from RAPS as nuclear generation evacuation is effected.
- RVPN representative stated that 220kV Raps-Sakatpura lines & 220kV Raps-Debari have been taken under shutdown and necessary maintenance has been done by RVPN team.
- To accord priority to insulator washing & cleaning of the lines highlighted by NRLDC at the earliest, if not already done.
- For the lines in the list for which polymer replacement is pending, the replacement of the insulators may be expedited.
- In the lines for which insulator washing & cleaning has been done, it was also requested to mention the portion/length of line for which such exercise has been completed, including any vulnerable pockets left, if any.

As per data available at NRLDC, each of following lines have tripped on multiple occasions from 24.12.2023 to 02.01.2024 during night/ early morning hours:

400 KV Amritsar(PG)-Makhu(PS) (PSTCL) Ckt-2	PSTCL
400 KV Muktsar-Makhu (PS) Ckt-2	
400 KV Talwandi Saboo(PSG)-Muktsar(PS) (PS) Ckt-1	
400 KV Roorkee(PG)-Muzaffarnagar(UP) (PTCUL) Ckt-1	PTCUL
400 KV Suratgarh(RVUN)-Ratangarh(RS) (RS) Ckt-1	RRVPNL
400 KV Anta-Chhabra SCTPS (RS) Ckt-1	
400 KV Chhabra-Chhabra SCTPS (RS) Ckt-1	
400 KV Aligarh-Muradnagar_1 (UP) Ckt-1	UPPTCL
400 KV Banda-Orai (UP) Ckt-1	
400 KV Harduaganj -Sikandrabad (UP) Ckt-1	

NRLDC representative stated that lines such as 400 KV Amritsar(PG)-Makhu(PS) (PSTCL) Ckt-2, 400 KV Muktsar-Makhu (PS) Ckt-2, 400 KV Talwandi Saboo(PSG)-Muktsar(PS) (PS) Ckt-1, 400 KV Suratgarh(RVUN)-Ratangarh(RS) (RS) Ckt-1, 400 KV Aligarh-Muradnagar_1 (UP) Ckt-1 and 400 KV Banda-Orai (UP) Ckt-1 were also highlighted by NRLDC in last OCC meeting and special actions were requested for these lines.

NRLDC representative further highlighted major grid event dated 05.01.2024 wherein generation loss to the tune of 1800MW was reported.



NRLDC representative further described the grid event to the forum:

1. During the antecedent condition, the following lines were out of service: 220kV Kota(PG)-KTPS(RVUN) (RS) Ckt-1 & 2 (lines were out since 09-09-2023 on emergency shutdown to attend/repair damaged 220kV main bus-4 of KTPS), 220kV KTPS-Heerapura Ckt (tripped on 01-01-2024 on phase to earth fault), 220kV KTPS-Beawar Ckt (tripped at 04:05hrs on fault), 220 KV Debari(RS)-RAPP_A(NP) (RS) Ckt (tripped at 04:57 hrs on B-N fault, A/R off in line) and 220 KV Anta(NT)-Sakatpura(RS) (RS) Ckt (tripped at 04:43hrs on B-N fault, A/R operated at Sakatpura end, 3-ph trip from Anta end).
2. The following units were under service during antecedent condition: 110MW Unit-1, 210MW Unit 4 & 5 and 195MW Unit 6 & 7 at 220kV KTPS (generating total ~803MW), 200MW Unit-2 at RAPP-A (generating ~200MW), 220MW Unit-4 at RAPP-B (generating ~185MW), 220MW Unit-5 & 6 at RAPP-C (generating total ~452MW), 43MW Unit-1, 3 & 4 at RPS HEP (generating total ~91MW) and 33MW Unit-1, 2 & 3 at JS HEP (generating total ~91MW).

3. Before the event, at 05:15 hrs, 220kV KTPS-Bundi Ckt, 220kV KTPS-Vatika Ckt, 220kV RAPP-A-RAPP-B Ckt and 220kV RAPP-C-Anta220 Ckt were already carrying 288MW, 214MW, 273MW and 289MW respectively and limited connectivity with the grid was available (220kV Vatika, Bundi and Anta).
4. As reported, at 05:15:56 hrs, 220kV Bundi-Gulabpura (RS) ckt was manually opened on SLDC instruction to avoid line tripping on overloading.
5. On this, as per DR, 220kV KTPS-Vatika Ckt current reached ~850A (~320MW) and tripped on over-current protection operation from KTPS end. At the same time, as per DR, 220kV RAPP-C(NP)-Anta(NT) ckt current reached ~1800A (~600MW) and tripped due to over-loading (exact protection operation yet to be received).
6. Due to tripping of above lines, connectivity to main load centre was cut off and only radial load available for RAPP-A, RAPP-B and KTPS generation was 220kV Debari and 220kV Chittorgarh and system got isolated from main Grid. This load generation scenario led to over frequency; frequency reached to 51.63Hz.
7. Subsequent to this, RAPP-B unit-4 tripped on over frequency and came to house load. RAPP-B unit-4 operated on house load for approx. 1.5 hours but couldn't able to come back to grid mode due to issue in governing system (as intimated by RAPP)
8. RAPP-A unit-2 (no provision to come to house load) and KTPS Units also tripped on over frequency protection.
9. RAPP-C unit-5&6 tripped due to loss of auxiliary supply (auxiliary supply changeover from 220kV to 400kV blocked due to frequency mismatch).
10. Another major observation in this event was that SCADA data at RAPS-A, RAPS_B & RAPS-C got freezed just after the event. Tripping status and MW flow value in few of the line was not correct (220kV RAPS_A-Debari ckt from RAPP-A and 220kV RAPS_A-RAPS_B ckt from RAPS-A end.

Rajasthan SLDC representative stated that they had asked KTPS to charge the 220kV Kota(PG)-KTPS D/C line, but KTPS did not agree due to issues at their switchyard end.

SLDC was asked to study the scenario for which closing of this line is required and accordingly take up the matter with STU.

NRLDC representative stated that NRLDC has been continuously highlighting the frequent tripping of 220kV lines from RAPS in OCC meeting and same was also discussed in detail in 214 OCC meeting. In the meeting, it was also mentioned that special attention is required form RVPN side as the lines are evacuating power from nuclear generation. In the meeting, RVPN had confirmed that line shutdown was taken and necessary maintenance has been done.

NRLDC representative stated that as per requirement, Rajasthan SLDC may increase manpower in shift operation as N-1 non-compliances and high loadings are being observed during day time and fog related tripping are being reported in night time.

Following actions were requested in the meeting:

i. Necessary actions need to be taken by RVPN for RTU healthiness at site to ensure healthiness of SCADA data.
ii. Priority to insulator washing & cleaning of the lines need to be accorded at the earliest. As per requirement insulator replacement may be explored by RVPN.
iii. RAPS-B to share event analysis and details of actions taken after the event. Reason of not able to come to grid mode from house load operation need to be shared along with action taken to ensure successful synchronization with the grid from house load operation in future.
iv. RAPS-C to share the mechanism, design and schematic diagram of the system of auxiliary supply changeover from 220kV to 400kV level. RAPS-C will also look after necessary changes in designing of auxiliary supply switchover mechanism to avoid such grid incident in future.

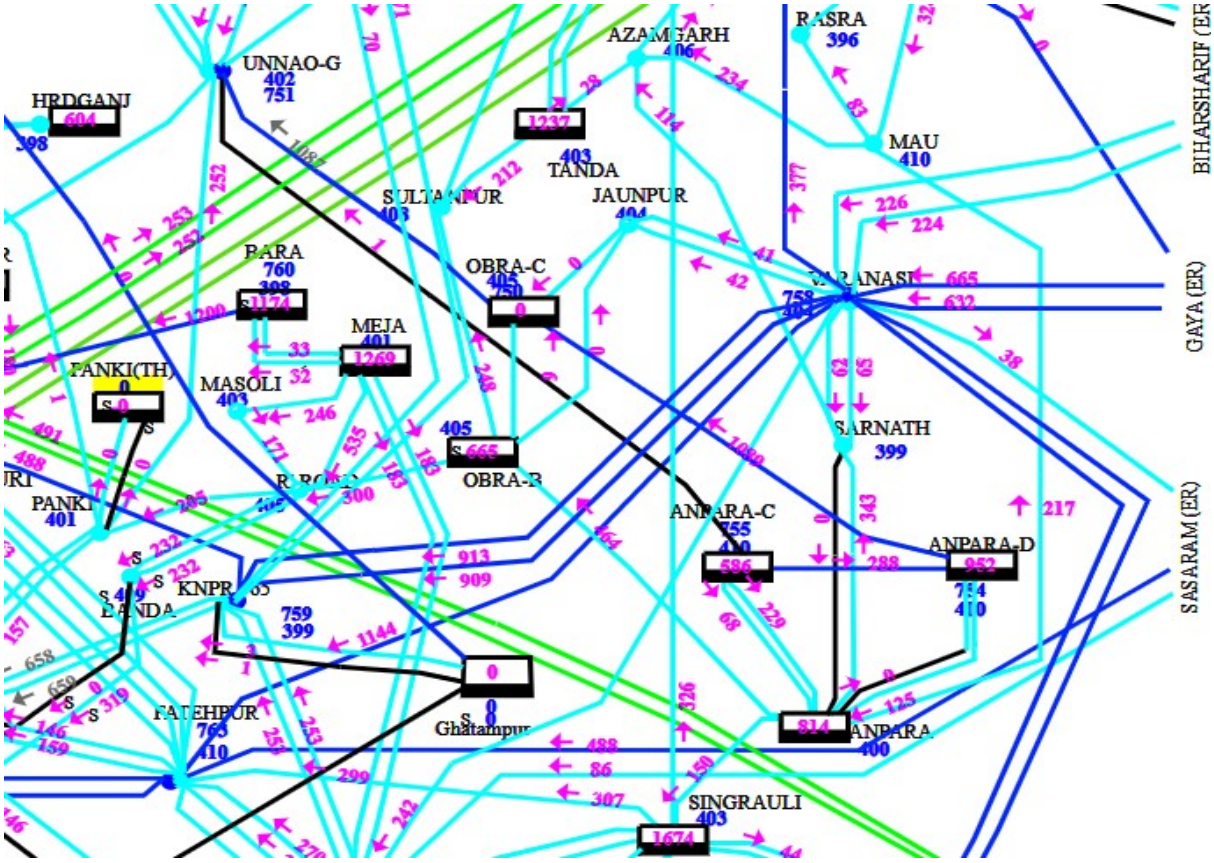
UPPTCL representative stated that necessary maintenance has been carried out for 400 KV Banda-Orai (UP) Ckt-1 and 400 KV Harduaganj -Sikandrabad (UP) Ckt-1 after tripping were reported. Further, for 400 KV Aligarh-Muradnagar_1 (UP) Ckt-1 A/R successfully.

PSTCL representative stated that insulators will be changed for 400 KV Amritsar(PG)-Makhu(PS) (PSTCL) Ckt-2 & 400 KV Muktsar-Makhu (PS) Ckt-2 to long rod polymer insulators by Mar'2024. Further, in next stage 400 KV Talwandi Saboo(PSG)-Muktsar(PS) (PS) Ckt-1 tender will be awarded.

OCC forum asked all utilities to accord priority for washing and cleaning of insulators of these lines and other suitable measures for avoiding tripping of these lines due to fog.

II. Prolonged outage of 765kV Anpara C-Unnao line:

Singrauli-Anpara complex in Eastern UP comprises of major pit head thermal generating stations which are generally scheduled for the available capacity even during winter months. Major evacuation of intrastate thermal generating stations is being done by 765kV AnparaC-Unnao and 765kV AnparaD-Unnao lines.



Shutdown of 765kV AnparaC-Unnao line was availed on 23-11-2023 for height raising of 765 kV Anpara C - Unnao line and A/R testing of protection relays at Unnao end.

NRLDC representative stated that it was expected that line would be revived before fog starts in Northern region, as during previous years number of fog related trippings were also observed. Although, this year fog related tripping have reduced, it is important that 765kV AnparaC-Unnao line is revived at the earliest, as incase of any line planned/ emergency shutdown in the complex, there is possibility of high loadings for the remaining lines. Moreover, the SPS implemented in the complex, utilizes antecedent loading of 765kV AnparaC-Unnao line for SPS logic, therefore unavailability of line leads to effective non-availability of SPS in the complex. Letter from NRLDC side in this regard dated 29.12.2023 is attached as Annexure-B.I of agenda.

UPPTCL representative stated that there were 9 crossing location for this line and accordingly the work was slightly delayed. Line has been charged on 09.01.2024. Further, for 765 KV OBRAC_TPS-UNNAO (UP) shutdown will be taken from 15.01.2024 and likely to be returned by 30.01.2024.

III. Expediting commissioning of transmission system in line with upcoming intrastate generation in UP control area:

660MW generating units at both Jawaharpur TPS, Ghatampur TPS and Obra C TPS are under commissioning process and are expected to be in continuous operation from summer 2024. Presently, Jawaharpur TPS is operating and injecting

infirm power to the grid. Similarly, Obra C Unit has also generated to its full capacity in December 2023. The planned transmission system for these generating units is delayed and it has been discussed to evacuate generation from these units through present available transmission system. It is to be noted that the generation evacuation is not N-1 secure and SPS have also been proposed in these generating complexes. Therefore, it is requested to expedite the planned transmission system for these generating stations as listed below:

Evacuation network of 2x660 MW Obra 'C' TPS (deliberated in 38th SCM dated 30.05.2016)

- 2x1000 MVA 765/400kV ICTs at Obra C
- LILO of Anpara "D" – Unnao 765 kV S/C line at Obra "C" – 40 km
- LILO of one ckt of 400kV DC Obra B-Obra C line at Jaunpur(400 kV)-190 km with Line Reactor of 63 MVAR for each ckt at Obra C end

Evacuation network of 2x660MW Jawaharpur Thermal Power Plant (deliberated in 38th SCM dated 30.05.2016)

- 765/400 kV, 2x1000 MVA ICTs at Jawaharpur TPS
- LILO of Mainpuri – Greater Noida 765 kV S/C line at Jawaharpur TPS - 30 km
- 400/220 kV 2x500 MVA ICT at Jawaharpur TPS
- Jawaharpur TPS–Firozabad 400 kV D/C (Quad) line – 80 km
- LILO of one circuit of Fatehabad (Agra 765 kV)- Agra South 400kV D/C line at Firozabad -20km

Evacuation system of Ghatampur (Kanpur) 3x660 MW TPS is as under:

- Ghatampur TPS –Agra (UP) 765kV S/C Line- 240 km (with Line reactors of 189 MVAR at both ends)
- Agra (UP) -Greater Noida (UP) 765kV S/C Line - 200 km (with Line reactor of 240 MVAR at Agra end)
- Ghatampur TPS - Hapur 765 kV S/C Line - 400 km with line reactors of 330MVAR at both ends.
- Ghatampur TPS – Kanpur (PG) 400 kV D/C line- 60 km
- 330 MVAR, 765 kV and 125 MVAR, 400 kV Bus Reactors at Ghatampur TPS switchyard

NRLDC representative stated that of all these transmission elements, for Jawaharpur TPS and Obra TPS, it is seen that 2x1000 MVA 765/400kV ICTs are yet to be commissioned at Jawaharpur TPS as well as Obra C. It is important that commissioning of these generating units, transmission elements and the associated network of Ghatampur TPS is commissioned at the earliest. This is important from the resource adequacy point of view for summer 2024 for UP state as well as NR region.

UPPTCL representative stated that one ICT at Jawaharpur & Obra_C are expected to be charged in Feb 2024 while second ICT are expected to be charged in May 2024. One unit at Jawaharpur and Obra C are on bar and

injecting power to the grid. It was assured that there would not be any transmission related issues for generation evacuation of these generating units.

IV. Low voltage related issues in J&K control area:

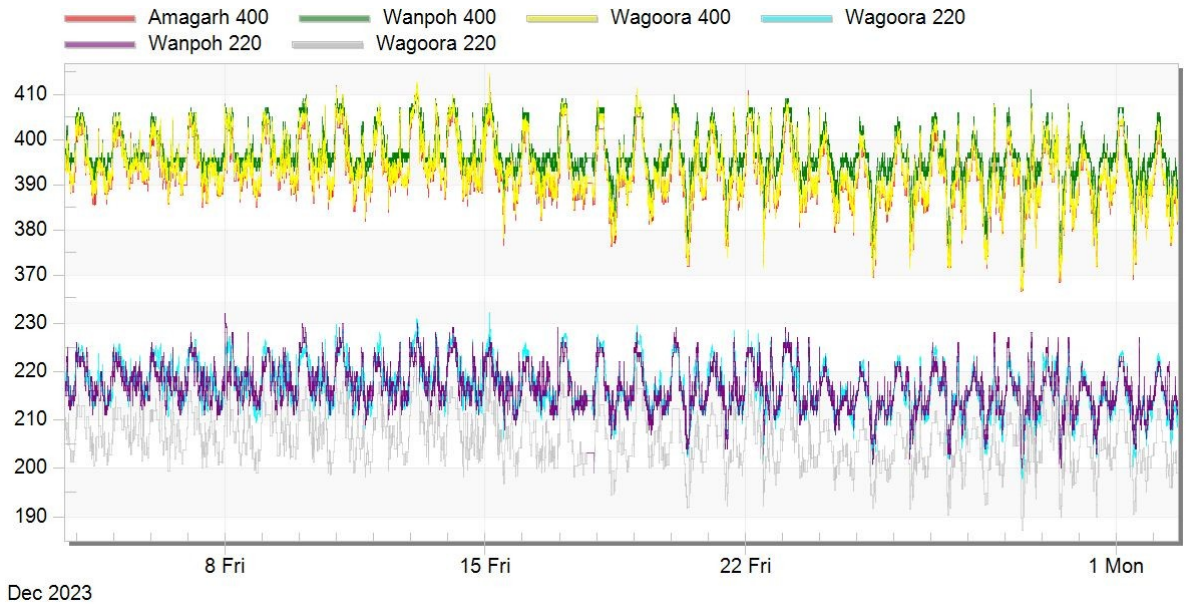
J&K grid being weakly connected from the rest of the grid and due to its isolated location suffers from issues of severe low voltage. During winter months when hydro generation is not available and demand in J&K control area is high due to heating load requirements, the issue of low voltage gets aggravated. J&K also has to pay large amounts as reactive energy charges to pool due to high MVAr drawl from ISTS grid at the time of low voltage.

It has been discussed and suggested to J&K to plan & expedite commissioning of reactive power devices especially capacitors at lower voltage level to improve the voltage profile in valley area and also avoid large sums payable as reactive energy charges.

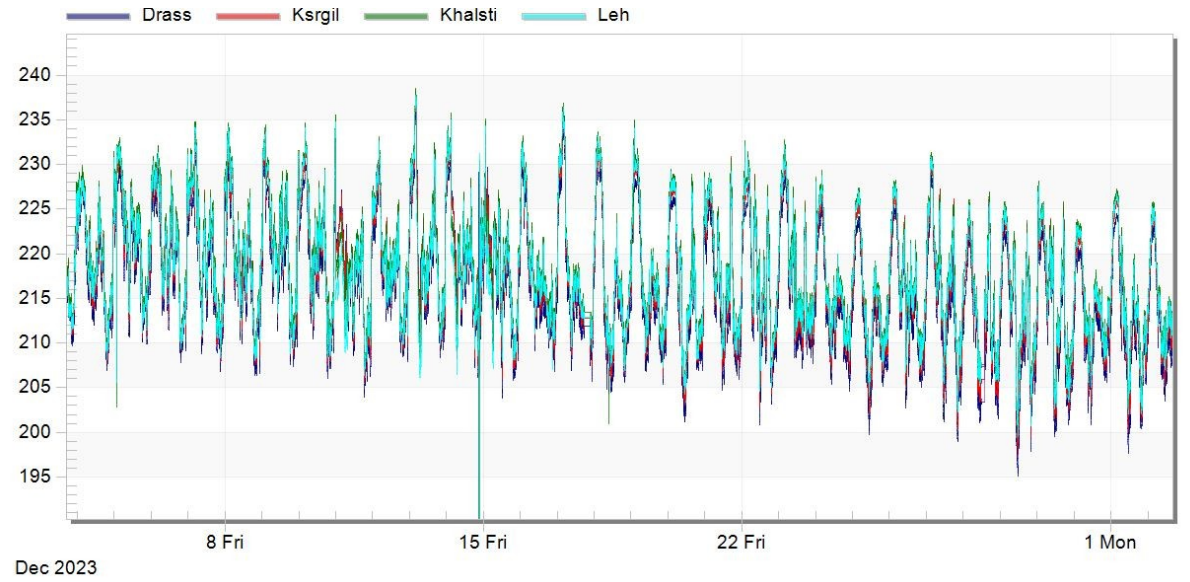
Low voltage related issues of J&K and Ladakh (UT) has been regularly shared by NRLDC with CEA and CTUIL in Grid-India's quarterly operational feedback report. The issue has been continuously raised in NRPC as well as OCC meetings still the issues of low voltage persist in J&K especially Kashmir valley.

As can be seen from recent trends, 400kV voltages are reaching 370kV at Amargarh, Wagoora and Wanpoh substations. Even the SVC at New Wanpoh is being fully utilized and no margin is available for dynamic support. Plots of 400kV and 220kV bus voltages of Amargarh, Wagoora and Wanpoh substations for last 30 days are shown below:

`



Further, low voltages are also being observed in Ladakh area also during winter months:



In special meeting taken by NRPC with J&K, following was discussed w.r.t. low voltags J&K control area:

NRLDC representative requested that following may be shared by J&K:

- List of nodes & node wise capacitor bank requirement (as finalised by JPDCL, KPDCL & JKPTCL)
- Tentative timeline for tendering and commissioning of capacitor banks

- List of nodes in J&K and Ladakh facing low voltage issues along with the voltage profile
- Status of 350MVAr capacitor bank at 11 kV under progress.

JPDCL representative informed that at present 392MVAr capacitor is functional. Further, 720 MVAr capacitors are also under proposal/implementation as per RDSS (Revamped Distribution Sector Scheme) scheme.

JKPTCL representative informed that at present 323MVAR is commissioned in transmission level out of which 240MVAR is functional. The faulty capacitors would be readied by end of this year. Further, new capacitors have been proposed under capital expenditure.

MS NRPC expressed concern on the issue highlighted by NRLDC and asked J&K to expedite their actions. It was also informed that if required, PSDF proposal may also be submitted by J&K.

NRLDC representative stated that for the first time Baglihar HEP is providing peaking support during evening hours.

JKPTCL, JPDCL and J&K SLDC were requested to provide update. Representative from J&K was not available for comments. Accordingly, it was agreed to take up the agenda in upcoming 71st NRPC meeting.

V. Delay in return of shutdown of 400kV Uri1-Amargarh & Expediting revival of 400kV Jodhpur-Kankroli:

Shutdown of 400 KV URI_1(NH)-AMARGARH(NRSS XXIX) (NRSS XXIX) ckt 1 was availed by POWERGRID for Replacement of 400KV Oil filled cable with XLPE type Cable on 27.09.2023. At the time of shutdown it was expected that the works would be completed and line would be available before December when load of J&K picks up and there is severe low voltage issues in the valley area.

However, the line is yet to be revived and the voltages in the valley area continue to be on the lower side.

NHPC representative stated that line has been revived & charged on 10.01.2024.

Similarly, S/D of 400kV Jodhpur (RVPNL)-Kankroli (PGCIL) (PGCIL) was approved from 1st Oct'23 for re-conductoring work of entire 188km for 4 months. Due to outage of 400kV Akal-Kankani, 400kV Jaiselmer-Kankani lines, there was delay in providing shutdown of 400kV Jodhpur-Kankroli line.

400kV Jodhpur-Kankroli is an important line for evacuation of wind generation from intrastate network of RVPN. With the commissioning of 400kV Fatehgarh II – FatehgarhIII – Jaisalmer link, the flow on intrastate network has also increased. To avoid any possibility of intrastate/ interstate RE generation curtailment due to other

shutdowns in the complex, it is requested to expedite revival of 400kV Jodhpur-Kankroli line.

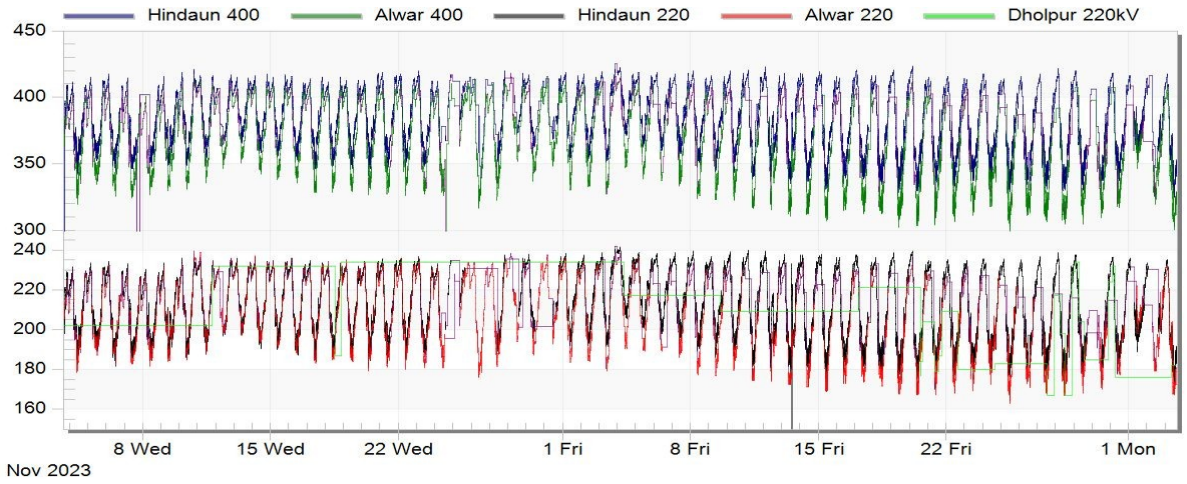
POWERGRID representative agreed to expedite the restoration of line.

VI. Critically low voltage at 400/220kV Hindaun & Alwar substations:

Serious concerns have been raised by NRLDC on the transmission related issues being observed in RVPN control area in various forums including NRPC and OCC forum. Sustained low voltage operations in several Rajasthan system pockets, like voltage dropping to 340 & 330 kV level at the 400kV Hindaun & Alwar substations respectively, are leading to risky & vulnerable grid operation, apart from the more serious concerns in the down-stream distribution sector.

It is to be noted that the issues is being highlighted by NRLDC since 2019-20, still the issue is pending and requires quick action from RVPN side as the situation is degrading with every passing day.

NRLDC representative stated that in 70 NRPC meeting held in Nov 2023, RVPN representative agreed to run Dholpur generating units for improving voltage profile in the area. However, the same is not being done and as a result drastically low voltages are being observed in these area during the day time as shown below:



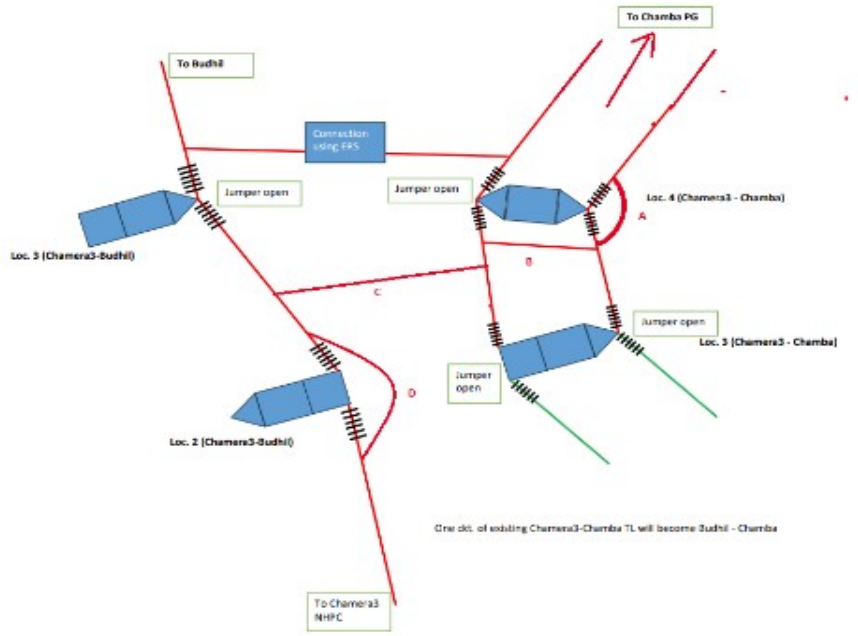
RVPN representative stated that they have taken up the matter with higher officials for running Dholpur generation. Same is expected to be approved shortly. Further, works for 400kV Dholpur S/s are also under progress. Capacitors have been approved from PSDF side and final approval is awaited from MoP side. Further, proposal for LILO of 400kV Agra-Sikar has also been taken up internally from RVPN side.

OCC forum asked to expedite actions for improving the voltage profile at 400/220kV Hindaun & Alwar and nearby area.

VII. Revival of 220kV Chamera3-Chamba to normal configuration

220 KV Chamera_3(NH)-Chamba(PG) (PG) Ckt-1 and ckt-2 were out due to tower collapse on 09-07-2023. Tower collapse was reported at Loc no. 1 from Chamera-3

end and subsequently an interim arrangement was worked out in separate meeting between NRPC, PGCIL(NR2), Chamera3(NHPC), Budhil(Grenko), HPPTCL and NRLDC.



New circuits after installation of the alternative mechanism are in service as:

a) 220 kV Budhil-Chamba transmission line
b) 220 kV Chamera III-Chamba line

As the interim arrangement was done to facilitate safe evacuation of hydropower during the peak hydro season, it is requested that the works on collapsed tower may be expedited and the line may be restored to its normal configuration.

NHPC representative stated that tower has been damaged and washed away, accordingly proposal is being worked out to directly string the conductor to gantry. Proposal is being taken up between NHPC and POWERGRID and it is expected that the line would be charged before monsoon season. Work from NHPC side is expected to be completed by Apr 2024.

VIII. Long outage of transmission elements:

Following important grid lines are out since long time:

S.No	Element Name	Owner	Outage Date
1	220 KV Charkhi Dadri(BB)-Mahindergarh(HV) Ckt-1	BBMB,HVPNL	13-03-2023
2	220 KV Charor(HP)-Parbati Pooling Banala(PG) Ckt-1	HPPTCL	06-06-2023
3	220 KV Samaypur(BB)-Palli(HV) (HVPNL) Ckt-2	HVPNL	12-01-2023
4	220 KV Kishenganga(NH)-Delina(PDD) (PG) Ckt-1	POWERGRID	09-06-2023

5	220 KV Kanpur(PG)-KanpurNaubasta(UP) (PG) Ckt-1		20-12-2023
6	220 KV Tanakpur(NH)-Sitarganj(PG) (PG) Ckt-1		23-05-2023
7	220 KV Agra(PG)-Sikandra(UP) (PG) Ckt-1		17-05-2023
8	220 KV Roorkee(PG)-Roorkee(UK) (PTCUL) Ckt-1	PTCUL	08-09-2023
9	220 KV Kota(PG)-KTPS(RVUN) (RS) Ckt-1	RRVPNL	09-09-2023
10	220 KV Kota(PG)-KTPS(RVUN) (RS) Ckt-2		09-09-2023
11	220 KV Badarpur(NT)-Alwar MIA(RS) (RS) Ckt-1		14-06-2023
12	132 KV Sheopur(MP)-Khandar(RS) (MPSEB) Ckt-1		05-08-2022
13	220 KV Gazipur(DTL)-Noida Sec62(UP) (UP) Ckt-1	UPPTCL	30-04-2022
14	220 KV Gazipur(DTL)-Shahibabad(UP) (UP) Ckt-2		30-04-2022
15	400 KV Noida Sec 148-Noida Sec 123 (UP) Ckt-2		09-03-2023
16	220 KV Agra(PG)-Tundla (UP) (UP) Ckt-1		03-05-2023
17	220 KV Khara(UP)-Saharanpur(PG) (UP) Ckt-1		28-08-2023
18	132 KV Chandoli(UP)-Karamnasa(BS) (UP) Ckt-1		09-09-2023
19	220 KV Baghpat(PG)-Baghpat(UP) (UP) Ckt-2		26-12-2023

Similarly, some important ICTs under UPPTCL are under long outage since long time:

400/220 kV 315 MVA ICT 1 at Sarnath(UP)
400/220 kV 500 MVA ICT 2 at Noida Sec 148(UP)
400/220 kV 315 MVA ICT 1 at Muradnagar_1(UP)
400/220 kV 240 MVA ICT 2 at Orai(UP)
400/220 kV 315 MVA ICT 2 at Gonda(UP)
400/220 kV 240 MVA ICT 1 at Muradnagar_2(UP)
400/220 kV 500 MVA ICT 1 at Rasra (UP)
400/220 kV 240 MVA ICT 3 at Gorakhpur(UP)

Further, some important 400kV buses such as 400kV Bus 2 at Parbati_3(NHPC), 400KV Bus 1 at Vishnuprayag(JPVL) and buses such as 400kV Bus 2 at Aligarh(UP) and 400KV Bus 2 at Noida Sec 148(UP) are also under long outage.

It was requested to expedite restoration of the above-mentioned Grid elements at the earliest and also provide an update regarding their expected restoration date/time on NRLC OMS portal.

B.3 Sharing of ATC/TTC assessment and basecase with NRLDC

All NR states Chandigarh U/Ts are sharing basecase and ATC/TTC assessment with NRLDC. OCC has advised all states to timely declare TTC/ATC for prospective months and revise the figures as per requirement.

CERC vide their order dated 29.09.2023 has granted approval of "'Detailed Procedure for Allocation of Transmission Corridor for Scheduling of General Network Access and Temporary General Network Access under Central Electricity

Regulatory Commission (Connectivity and General Network Access to the inter-State Transmission System) Regulations, 2022".

Detailed roles and responsibilities for State Load Dispatch Centers in various timelines of the approved procedure are provided in the table below.

Purpose	***Sl No***	***Action of Stakeholder***	***Responsibility***	***Submission to***	***Data/ Information Submission Time line***
1. Revision 0 TTC/ATC Declaration for Month 'M'	*1(a)*	*Submission of node wise Load and generation data along with envisaged scenarios for assessment of transfer capability Assessment of TTC/ATC of the import/export capability of the state and intra-state system and sharing of updated network simulation models*	*SLDC*	*RLDC*	*10th Day of 'M-12' month*
	1(b)	*Declaration of TTC/ATC of the intra-state system by SLDC in consultation with RLDC*			*26th Day of 'M-12' month*
2. Interconnection Studies for elements to be integrated in the month 'M'	*2(a)*	*Submission of node-wise load and generation data & sharing of network simulation models for intra-state elements coming in the next six months*	*SLDC*	*RLDC*	*8th Day of 'M- 6' month*
	2(b)	*Sharing of inter-connection study results*			*21st Day of 'M-6' month*
3. Month Ahead TTC/ATC Declaration & Base case for Operational Studies for Month 'M'	*3(a)*	*Submission of node wise Load and generation data along with envisaged scenarios for assessment of transfer capability Assessment of TTC/ATC of the intra-state system and sharing of updated network simulation models*	*SLDC*	*RLDC*	*8th Day of 'M- 1' month*
	3(b)	*Declaration of TTC/ATC of the intra-state system in consultation with RLDC*	*SLDC*	*RLD*	*22nd Day of 'M-1' month*

B.3.1 ATC/TTC assessment sharing 11 months in advance

The procedure mentions that:

"SLDCs in consultation with RLDCs shall declare the import and export TTC, ATC, and TRM of the individual control/bid areas within the region in accordance with Regulation 44 (3) of the Grid Code 2023. RLDCs shall assess the import and export TTC, TRM and ATC for the group of control/bid areas within the region (if required). The computed TTC, TRM and ATC figures shall be published on the website of respective SLDCs and RLDCs, along with the details of the basis of calculations, including assumptions, if any, **at least eleven (11) months in advance**. The specific constraints indicated in the system study shall also be published on the website."

Accordingly, SLDCs are requested to send the PSSE cases for four scenarios for January'25 i.e. Morning Peak, Solar Peak, Evening Peak & Off-Peak hours as given below

S. No.	Scenario	Time of Scenario
1	Off-Peak	03:00 Hrs
2	Morning Peak	10:30 Hrs
3	Evening Peak	18:45 Hrs
4	Solar Peak	12:00 Hrs

It is requested that the basecases as well as ATC/TTC assessments may be shared with NRLDC as per CERC approved procedure. Further, above exercise needs to be carried out regularly on monthly basis.

Basecase & ATC/TTC assessment was received from only Haryana SLDC for M-11 scenarios.

NRLDC representative stated that online sessions were taken on 31.08.2023 & recently another session was also conducted on 10.01.2024.

In 215 OCC meeting, all states were requested to share basecase as well as ATC/TTC assessments for M-11 scenarios on monthly basis with NRLDC as per CERC approved procedure. Accordingly, it is requested to submit the basecase as well as ATC/TTC assessments.

In the meeting, it was discussed that data has been received from J&K, Punjab.

B.3.2 Sharing of Data and study results for interconnection studies

As per **Regulation 33 of IEGC 2023,**

(9) Each SLDC shall undertake a study on the impact of new elements to be commissioned in the intra-state system in the next six (6) months on the TTC and ATC for the State and share the results of the studies with RLDC.
(10) Each RLDC shall undertake a study on the impact of new elements to be commissioned in the next six (6) months in (a) the ISTS of the region and (b) the intra-state system on the inter-state system and share the results of the studies with NLDC.

(11) NLDC shall undertake study on the impact of new elements to be commissioned in the next six (6) months in (a) inter-regional system, (b) cross-border link and (c) intra-regional system on the inter-regional system.

In line with above, utilities are requested to share the list of **elements/LGB data/interconnection study results** etc as per the approved procedure which are expected to be commissioned up to **July 2024, before 4.1.2023. Above was also requested vide mails dated 26.12.2023 by NRLDC. This needs to be practised as monthly exercise on regular basis.**

Data regarding M-6 scenarios are pending from the utilities.

In 215 OCC meeting, all states were requested to share list of elements/LGB data/interconnection study results etc as per the approved procedure on monthly basis.

For NRLDC mail dated 26.12.2023, data has been received from Punjab, Haryana, UP, POWERGRID NR-2 as of now.

In the meeting, it was discussed that basecases have been received from UP.

B.3.3 ATC/TTC of states for winter 2023-24 (M-1)

Latest ATC/TTC figures as available with NRLDC for the month of February 2024 is attached as Annexure-B.II of agenda. States are requested to go through these figures and provide any comments.

ATC/TTC assessment for winter 2023-24 has only been received from Rajasthan, HP, Haryana, J&K and Uttarakhand as of now.

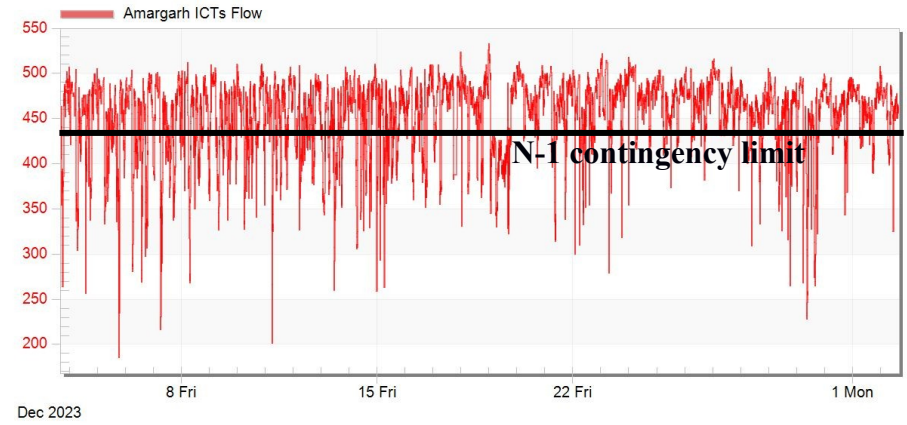
NRLDC has submitted their response to ATC/TTC limits assessed by Rajasthan SLDC whereas for other states such as HP, Haryana, J&K and Uttarakhand the ATC/TTC limits have been finalised.

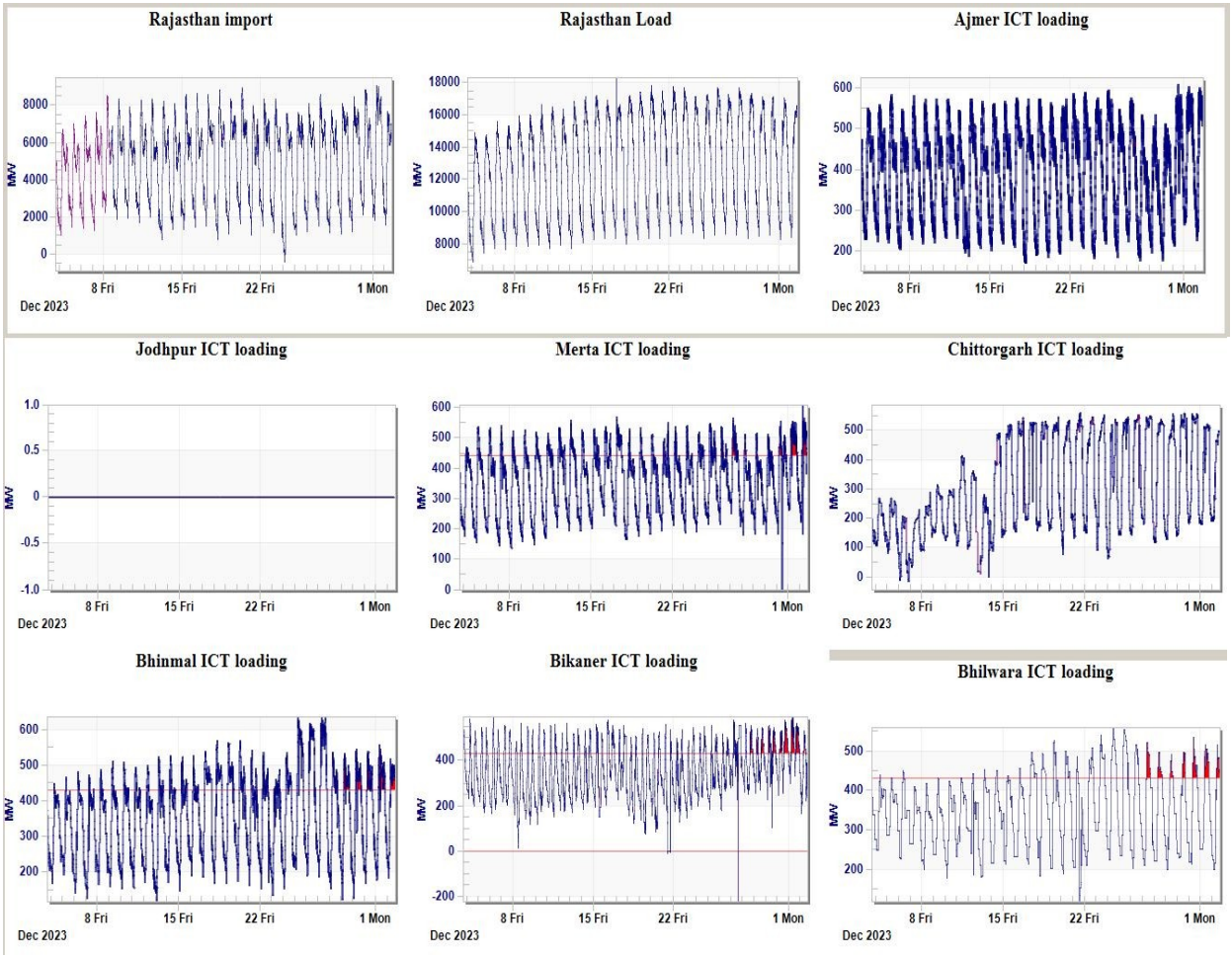
UP SLDC representative stated that they have shared their ATC/TTC limits for winter 2024.

Punjab & Delhi were requested to share their ATC/TTC limits for winter 2024 at the earliest.

B.3.4 Constraints observed during last month

NRLDC representative stated that loading of 400/220kV ICTs at number of RVPN substations and Amargarh ICTs continue to be on the higher side. Some of the such stations are shown below along with loading of 400/220kV ICTs for last 30 days:





OCC members agreed to submit the data as well as basecases as per timelines discussed in 10.01.2024 & as per the CERC approved procedure.

B.4 Reactive power performance of generators

During winter season, demand of Northern region is low and high voltages are a common phenomenon predominantly in Punjab, Haryana and Delhi area. Even after several actions being taken by control centers, it is seen that there is persistent high voltage in Northern

region. The reactive power absorption by generators becomes an important resource that helps in managing high voltages in the grid. However, even after continuous follow up in OCC meetings, it is seen that MVAR data telemetry is poor/ inaccurate from most of the generating stations. For some of the generators it is seen that there is inadequate reactive power absorption based on their capability curve especially during night hours. The performance of generators in absorption of reactive power for last 30 days (10 Nov 2023 – 10 Dec 2023) is shown below:

S.No.	Station	Unit No.	Capacity	Geographical location	MVAR capacity as per capability curve (on LV side)	MVAR performance (-) Absorption (+) Generation (HV side data)	Voltage absorption above (in KV)
1	Dadri NTPC	1	490	Delhi-NCR	-147 to 294	-170 to 70	405
		2	490		-147 to 294	-170 to 80	405
2	Singrauli NTPC	1	200	UP	-60 to 120	-20 to 10	402
		2	200		-60 to 120	-20 to 10	402
		3	200		-60 to 120	-	-
		4	200		-60 to 120	-15 to 10	403
		5	200		-60 to 120	-25 to 5	402
		6	500		-150 to 300	-70 to 0	400
		7	500		-150 to 300	-70 to 10	402
3	Rihand NTPC	1	500	UP	-150 to 300	-100 to 0	398
		2	500		-150 to 300	-120 to 20	400
		3	500		-150 to 300	-90 to 10	400
		4	500		-150 to 300	-100 to 0	400
4	Kalisindh RS	1	600	Rajasthan	-180 to 360	-130 to 130	-
		2	600		-180 to 360	-90 to 50	-
5	Anpara C UP	1	600	UP	-180 to 360	-	-
		2	600		-180 to 360	-80 to 100	770
6	Talwandi Saboo PB	1	660	Punjab	-198 to 396	-160 to 50	412
		2	660		-198 to	-220 to 30	412

					396		
		3	660		-198 to 396	-	-
7	Kawai RS	1	660	Rajasthan	-198 to 396	-80 to 80	404
		2	660		-198 to 396	-80 to 80	404
8	IGSTPP Jhajjar	1	500	Haryana	-150 to 300	-100 to 100	412
		2	500		-150 to 300	-110 to 60	415, 405
		3	500		-150 to 300	-	-
9	Rajpura (NPL)	1	700	Punjab	-210 to 420	-200 to 60	406
		2	700		-210 to 420	-200 to 50	406
10	MGTPS	1	660	Haryana	-198 to 396	-150 to 50	408
		2	660		-198 to 396	-150 to 120	412
11	Bawana	1	216	Delhi-NCR	-65 to 130	-70 to 40	412
		2	216		-65 to 130	-60 to 30	410
		3	216		-65 to 130	-	-
		4	216		-65 to 130	-50 to 40	410
		5	253		-65 to 130	-50 to 60	415
		6	253		-65 to 130	-40 to 40	412
12	Bara PPGCL	1	660	UP	-198 to 396	-50 to 80	770
		2	660		-198 to 396	-60 to 70	770
		3	660		-198 to 396	-80 to 70	770
13	Lalitpur TPS	1	660	UP	-198 to 396	-130 to 100	760
		2	660		-198 to 396	-70 to 80	765
		3	660		-198 to 396	-130 to 100	760
14	Anpara D UP	1	500	UP	-150 to 300	-	-
		2	500		-150 to 300	-170 to 30	760
15	Chhabra TPS	1	250	Rajasthan	-75 to 150	-40 to 20	406
		2	250		-75 to 150	-60 to 10	402
		3	250		-75 to 150	-50 to 20	404
		4	250		-75 to 150	-50 to 30	406
		5	660		-198 to	-70 to 120	410

					396		
		6	660		-198 to 396	-70 to 120	408

In 215 OCC meeting, it was discussed that:

- For some of the generating stations it is seen that even after the machines are on bar, there is high voltage at these stations such as IGSTPP Jhajjar (421kV), CCGT Bawana (425kV), Bara (782kV) and MGTPS Jhajjar (422kV). Although, in general performance has improved in December 2023 as compared to November 2023.
- All generating stations were requested to resolve any issues related to telemetry and make sure that MVAr absorption is as per grid requirement and capability curve of machine.
- Since with IEGC 2023 implementation, reactive energy performance also has financial impact, it is desirable that all generating stations continue to support grid voltages by having reactive power performance as per their capability curve and grid requirement.
- MS NRPC suggested that based on performance of generators, separate meeting may also be conducted by NRLDC with generators for which performance needs to be improved.
- Rampur HEP and THDC representative expressed concern related to the CVT rating and recording of reactive energy by energy meter.
- MS NRPC requested SJVN and THDC representative to send their concerns to NRPC Sectt and NRLDC and thereafter online meeting may be convened with participation from concerned members.
- Thereafter, the decision may be finalised in upcoming sub-commercial meeting.

B.5 Frequent forced outages of transmission elements in the month of December'23:

The following transmission elements were frequently under forced outages during the month of **December'23**:

S. NO.	Element Name	No. of forced outages	Utility/SLDC
1	220 KV Baghpat(PG)-Baghpat(UP) (UP) Ckt-2	3	PG/UP
2	220 KV RAPS_A(NP)-Sakatpura(RS) (RS) Ckt-2	5	Rajasthan/RAPS
3	220 KV RAPS_A(NP)-Sakatpura(RS) (RS) Ckt-1	5	Rajasthan/RAPS
4	220 KV RAPS_B(NP)-Sakatpura(RS) (RS) Ckt-1	8	Rajasthan/RAPS
5	220 KV Saharanpur(PG)-Shamli(UP) (UP) Ckt-1	3	PG/UP
6	400 KV Aligarh-Muradnagar_1 (UP) Ckt-1	3	UP
7	400 KV Suratgarh(RVUN)-Ratangarh(RS) (RS)	4	Rajasthan

	Ckt-1		

The complete details are attached at Annexure-B.III of agenda.

It may be noted that frequent outages of such elements affect the reliability and security of the grid.

UPPTCL representative stated that for 220kV Baghpat(PG)-Baghpat(UP) (UP) Ckt-2 issues are at POWERGRID end and no issues are at UPPTCL end.

OCC forum reiterated that frequent outages of such elements affect the reliability and security of the grid. Members were requested to look into such frequent outages and share the remedial measures taken/being taken in this respect.

B.6 Multiple element tripping events in Northern region in the month of December '23:

A total of 08 grid events occurred in the month of Dec'23 of which **04** are of GD-1 category and **04** are of GI-2 Category. The tripping report of all the events have been issued from NRLDC. A list of all these events is attached at Annexure-B.IV of agenda**.**

Maximum delayed clearance of fault observed in event of multiple elements tripping at 400/220kV Ramgarh(RS) on 31st December, 2023 (As per PMU at Jodhpur(RS), Y-B phase to phase fault is observed with delayed fault clearance time of 520ms.

Delayed clearance of fault (more than 100ms for 400kV and 160ms for 220kV system) observed in total **02** events out of **08** grid events occurred in the month.

Remedial actions taken by constituents to avoid such multiple elements tripping may be shared.

As per IEGC clause 37.2 (c), Disturbance Recorder (DR), station Event Logger (EL), Data Acquisition System (DAS) shall be submitted within 24 hrs of the event and as per IEGC clause 37.2 (e), the user shall submit a detailed report in the case of grid disturbance or grid incidence within one (1) week of the occurrence of event to RLDC and RPC.

However, DR/EL of the following grid events not received for events occurred at Avada(ASEPL) RE plant on 03rd Dec'23, Merta & Kankani(Rajasthan) and Ramgarh(Rajasthan) on 31st Dec'23 Detailed report not received for any of the Grid event occurred in Dec'23.

OCC forum suggested all the NR constituents to update the information on tripping portal developed by NRLDC. All the constituents agreed to take proactive remedial 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 were further requested to ensure the time syncing of recording devices (DR, EL etc.) with GPS/NAVIK at substation of their respective control area. Members agreed to take action in this regard.

B.7 Grid event in RE complex in Rajasthan on 17th December, 2023:

On 17.12.23 at 13:01:03hrs & at 13:14:25hrs, 400kV Bhadla-Bikaner (Rajasthan) ckt-1 & 2 respectively tripped on L-L fault. During fault, RE generation dip of ~1600MW observed, out of ~1600MW, approx. 1300MW RE generation recovered within 02-03 minutes. Due to significant dip in RE generation frequency dropped by 0.15Hz (from 50.09Hz to 49.94Hz). Some of the RE plants were found Non-compliant w.r.t CEA clause B2(3) and B2(7) (LVRT & HVRT requirement at Interconnection point). Details of the LVRT & HVRT response during the event is attached as Annexure-B.V of agenda.

In view of above, RE plants were requested to share the root cause analysis (RCA report) of LVRT/HVRT Non-compliance at POI of their respective plants along with DR/EL & inverter logs data showing clearly the cause of generation loss/inverters tripping.

A standard format has also been circulated in the mail to report any such events (enclosed as Annexure-B.VI of agenda).

MS NRPC suggested that NRLDC may conduct separate meeting with RE developers to assess and analyse the performance of RE plants for these tripping event.

B.8 Details of tripping of Inter-Regional lines from Northern Region for December' 23:

A total of 08 inter-regional lines tripping occurred in the month of December'23. The list is attached at Annexure-B.VII of agenda. 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 37.2(c) 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 requested members to advise the concerned for taking corrective action to avoid such tripping as well as timely submission of the information. Members agreed for the same.

OCC forum emphasized the importance of inter- regional links and requested all the concerned utilities to take necessary corrective to minimise such tripping in future.

B.9 Status of submission of DR/EL and tripping report of utilities for the month of December'23.

The status of receipt of DR/EL and tripping report of utilities for the month of December'2023 is attached at Annexure-B.VIII of agenda. It is to be noted that as per the IEGC provision under clause 37.2 (c), 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 improved however, reporting status from Delhi, Rajasthan, RAPP A, RAPP B & J&K need further improvement.

Members may please note and advise the concerned for timely submission of the information. It is requested that DR/EL of all the trippings shall be **uploaded on Web Based Tripping Monitoring System "http://103.7.128.184/Account/Login.aspx"** within 24 hours of the events as per IEGC clause 37.2(c) and clause 15.3 of CEA grid standard. Apart from prints of DR outputs, the corresponding COMTRADE files may please also be submitted in tripping portal / through email.

NRLDC representative stated that reporting status from Punjab, Delhi, Rajasthan & J&K need further improvement.

OCC forum emphasized the importance of DR/EL & tripping report data for analysis of the trippings. In addition, these data are also base for the availability verification. Unavailability of these details delays the availability verification process also. Hence, timely submission of DR/EL & tripping report is very much necessary. Members were requested to comply the IEGC 37.2(c) and submit the details in time. Members agreed to take necessary follow-up actions to improve the reporting status

Members may please note and advise the concerned for timely submission of the information. It is requested that DR/EL of all the trippings shall be uploaded on Web Based Tripping Monitoring System "http://103.7.128.184/Account/Login.aspx" within 24 hours of the events as per IEGC clause 37.2.c and clause 15.3 of CEA grid standard. Apart from prints of DR outputs, the corresponding COMTRADE files may please also be submitted in tripping portal / through email.

B.10 Mock black start exercises in NR:

As per Indian Electricity Grid Code (IEGC) clause 34.3

" Detailed procedures for restoration post partial and total blackout of each user system within a region shall be prepared by the concerned user in coordination with the concerned SLDC, RLDC or NLDC, as the case may be. The concerned user shall review the procedure every year and update the same. The user shall carry out a mock trial run of the procedure for different sub-systems including black-start of generating units along with grid forming capability of inverter based generating station and VSC based HVDC black-start support at least once a year under intimation to the concerned SLDC and RLDC. Diesel generator sets and other standalone auxiliary supply source to be used for black start shall be tested on a weekly basis and the user shall send the test reports to the concerned SLDC, RLDC and NLDC on a quarterly basis".

Mock Black-start exercise of power stations therefore needs to be carried out in-order to ensure healthiness of black start facility.

The winter months are off peak hydro period and therefore good time to carry out such exercises. Therefore, the schedule of mock exercise dates for different hydro & Gas power station need to be finalized. The power stations may propose the tentative date for mock black start exercise of their generating units. Power stations may confirm and inform to all the concerned persons of control centre/ substations to facilitate the exercise.

Hydro Power Stations:

Name of stations	Tentative Date for Mock Black start exercise (proposed by power plants)
Uri-I, II HEP & Lower Jhelum HEP	Jan'24
Dhauliganga	Jan'24
Bairasiul	Feb'24
Sewa-2	Feb'24
N. Jhakri and Rampur	20th Dec'23
Karcham and Baspa	
Budhil	
Parbati-3 and Sainj	Mar'24
Salal	Mar'24
Chamera-3	
Kishenganga	Jan'24
Koteshwar	Jan'24
Chamera-1 and Chamera-2	Jan'24

Malana-2, AD Hydro and Phozal	29th Jan'24
Tehri	**Conducted successfully on 07th Nov'23**
Koldam	03rd week of Jan'24

Gas Power Stations:

Name of stations	Tentative Date for Mock Black start exercise (proposed by power plants)
Anta GPS	12th Feb'24
Auraiya GPS	11th Mar'24
Dadri GPS	**Conducted successfully on 16th Dec'23**

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.

Members are requested to share the tentative schedule of mock black start exercise of generating stations in their respective control area. 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.

NRLDC representative stated that black start exercise has been conducted successfully for Tehri HEP and Dadri Gas during this season and many other black start exercises are planned during Jan 2024 month. NHPC representative agreed to share proposed dates for mock black start exercise of NHPC plants.

As per communication received from SLDC UP vide mail dt. 16th Jan'24, mock blackstart exercise of Rihand and Obra HEP is scheduled in Feb'24, though exact date and details of nodal officer is yet to be received from plant end.

OCC forum requested members to share tentative schedule for mock black start exercise of generating stations of their control area. Also share the report/observation of the mock exercise.

B.11 Revision of document for Reactive Power Management of Northern Region:

NRLDC has been issuing 'Reactive Power document of Northern Region' on annual basis. Reactive Power Management document for Northern region has been revised and updated. The document has been published on 29th Dec'23 and same is available on NRLDC website on below link:

https://en.nrldc.in/download/nr_reactive-power-management_2024/?wpdmdl=13136

Document is password protected and password has already informed to all the NR constituents through letter dated 29th Dec 2023.

OCC forum noted the same.

B.12 Revision of System Restoration Procedure document of Northern Region:

NRLDC has been issuing 'System Restoration Procedure document of Northern Region' on annual basis. The document for Northern region was last revised on 31st Jan 2023 & updated document link is as below:

https://en.nrldc.in/download/nr-system-restoration-document/?wpdmdl=11999

Document is password protected and password was already informed to all the NR constituents through letter dated 31st Jan 2023.

In view of new addition/modification of transmission & generation element in NR grid since Jan'23, the document is being review for update.

Details received from Uttarakhand and Uttar Pradesh. Constituents were requested to share the details at the earliest on priority, by 20th Jan 2024. Constituents agreed for the same.

OCC forum requested constituents to provide the feedback, suggestion and updated information at the earliest.

Follow up issues from previous OCC meetings

Annexure-A.I

<table>
<tr><td>1</td><td>Down Stream network by State utilities from ISTS Station</td><td>Augmentation of transformation capacity in various existing substations, addition of new substations along with line bays as well as requirement of line bays by STUs for downstream network are under implementation at various locations in Northern Region. Further, 220kV bays have already been commissioned at various substations in NR. For its utilization, downstream 220kV system needs to be commissioned.</td><td>List of downstream networks is enclosed in Annexure-A.I.I.</td></tr>
<tr><td>2</td><td>Progress of installing new capacitors and repair of defective capacitors</td><td>Information regarding installation of new capacitors and repair of defective capacitors is to be submitted to NRPC Secretariat.</td><td>Data upto following months, received from various states / UTs:
◎ CHANDIGARH — Sep-2019
◎ DELHI — Sep-2023
◎ HARYANA — Sep-2023
◎ HP — Oct-2023
◎ J&K and LADAKH — Not Available
◎ PUNJAB — Dec-2023
◎ RAJASTHAN — Dec-2023
◎ UP — Dec-2023
◎ UTTARAKHAND — Dec-2023
All States/UTs are requested to update status on monthly basis.</td></tr>
<tr><td>3</td><td>Healthiness of defence mechanism: Self-certification</td><td>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”.</td><td>Data upto following months, received from various states / UTs:
◎ CHANDIGARH — Not Available
◎ DELHI — Sep-2023
◎ HARYANA — Dec-2023
◎ HP — Oct-2023
◎ J&K and LADAKH — Not Available
◎ PUNJAB — Sep-2023
◎ RAJASTHAN — Sep-2023
◎ UP — Dec-2023
◎ UTTARAKHAND — Dec-2023
◎ BBMB — Dec-2023
All States/UTs are requested to update status for healthiness of UFRs on monthly basis for islanding schemes and on quartely basis for the rest .</td></tr>
<tr><td></td><td></td><td>In compliance of NPC decision, NR states/constituents agreed to raise the AUFR settings by 0.2 Hz in 47th TCC/49th NRPC meetings.</td><td>Status:
◎ CHANDIGARH — Not Available
◎ DELHI — Increased
◎ HARYANA — Increased
◎ HP — Increased
◎ J&K and LADAKH — Increased
◎ PUNJAB — Increased
◎ RAJASTHAN — Increased
◎ UP — Increased
◎ UTTARAKHAND — Increased
◎ BBMB — Increased
J&K and LADAKH were requested to update status for increasing settings of UFRs.</td></tr>
</table>

<table>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td>4</td><td>Status of FGD installation vis-à-vis installation plan at identified TPS</td><td>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.</td><td>Status of the information submission (month) from states / utilities is as under:
<table><tr><td>◎</td><td>HARYANA</td><td>Sep-2023</td></tr><tr><td>◎</td><td>PUNJAB</td><td>Oct-2023</td></tr><tr><td>◎</td><td>RAJASTHAN</td><td>Jul-2023</td></tr><tr><td>◎</td><td>UP</td><td>Jan-2024</td></tr><tr><td>◎</td><td>NTPC</td><td>Feb-2023</td></tr></table>FGD status details are enclosed as Annexure-A.I.II.
All States/utilities are requested to update status of FGD installation progress on monthly basis.</td></tr>
<tr><td>5</td><td>Submission of breakup of Energy Consumption by the states</td><td>All states/UTs are requested to submit the requisite data as per the billed data information in the format given as under:
<table><tr><td>Category→</td><td>Consumption by Domestic Loads</td><td>Consumption by Commercial Loads</td><td>Consumption by Agricultural Loads</td><td>Consumption by Industrial Loads</td><td>Traction supply load</td><td>Miscellaneous / Others</td></tr><tr><td><Month></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table></td><td>Status of the information submission (month) from states / utilities is as under:
<table><tr><td></td><td>State / UT</td><td>Upto</td></tr><tr><td>◎</td><td>CHANDIGARH</td><td>Not Submitted</td></tr><tr><td>◎</td><td>DELHI</td><td>Dec-23</td></tr><tr><td>◎</td><td>HARYANA</td><td>Nov-23</td></tr><tr><td>◎</td><td>HP</td><td>Dec-23</td></tr><tr><td>◎</td><td>J&K and LADAKH</td><td>Not Submitted</td></tr><tr><td>◎</td><td>PUNJAB</td><td>Sep-23</td></tr><tr><td>◎</td><td>RAJASTHAN</td><td>Oct-23</td></tr><tr><td>◎</td><td>UP</td><td>Jul-23</td></tr><tr><td>◎</td><td>UTTARAKHAND</td><td>Sep-23</td></tr></table>J&K and Ladakh and Chandigarh are requested to submit the requisite data w.e.f. April 2018 as per the billed data information in the given format</td></tr>
<tr><td>6</td><td>Information about variable charges of all generating units in the Region</td><td>The variable charges detail for different generating units are available on the MERIT Order Portal.</td><td>All states/UTs are requested to submit daily data on MERIT Order Portal timely.</td></tr>
<tr><td>7</td><td>Status of Automatic Demand Management Sysytem in NR states/UT's</td><td>The status of ADMS implementation in NR, which is mandated in clause 5.4.2 (d) of IEGC by SLDC/SEB/DISCOMs is presented in the following table:</td><td>Status:
<table><tr><td>◎</td><td>DELHI</td><td>Scheme Implemented but operated in manual mode.</td></tr><tr><td>◎</td><td>HARYANA</td><td>Scheme not implemented</td></tr><tr><td>◎</td><td>HP</td><td>Scheme not implemented</td></tr><tr><td>◎</td><td>PUNJAB</td><td>Scheme not implemented</td></tr><tr><td>◎</td><td>RAJASTHAN</td><td>Under implementation. Likely completion schedule is 31.12.2023.</td></tr><tr><td>◎</td><td>UP</td><td>Scheme implemented by NPCIL only</td></tr><tr><td>◎</td><td>UTTARAKHAND</td><td>Scheme not implemented</td></tr></table></td></tr>
</table>

8	Reactive compensation at 220 kV/ 400 kV level at 15 substations			
	State / Utility	Substation	Reactor	Status
i	POWERGRID	Kurukshetra	500 MVAr TCR	500 MVAr TCR at Kurukshetra has been commissioned on dated 15th December 2023
ii	DTL	Peeragarhi	1x50 MVAr at 220 kV	1x50 MVAr Reactor at Peeragarhi has been commissioned on dated 18.09.2023
iii	DTL	Harsh Vihar	2x50 MVAr at 220 kV	2x50 MVAR Reactor at Harsh Vihar has been commissioned on dated 31th March 2023.
iv	DTL	Mundka	1x125 MVAr at 400 kV & 1x25 MVAr at 220 kV	Bay work completed on 25.03.2023. Reactor part tender is dropped and at present same is under revision.
v	DTL	Bamnauli	2x25 MVAr at 220 kV	Bay work completed on 25.03.2023. Reactor part tender is dropped and at present same is under revision.
vi	DTL	Indraprastha	2x25 MVAr at 220 kV	Bay work completed on 07.11.2023. 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 - 1x125 MVAR Reactor at Dhuri has been commissioned on dated 30th March 2023. 220kV Reactors - 1x25 MVAR Reactor at Dhuri has been commissioned on dated 27th January 2023.
ix	PUNJAB	Nakodar	1x25 MVAr at 220 kV	1x25 MVAR Reactor at Nakodar has been commissioned on dated 13th February 2023.
x	PTCUL	Kashipur	1x125 MVAR at 400 kV	SLDC informed that PTCUL has intimated that tender has been scrapped. Retendering will
xi	RAJASTHAN	Akal	1x25 MVAr	1x25 MVAR Reactor at Akal has been commissioned on dated 25th July' 2022.

xii	RAJASTHAN	Bikaner	1x25 MVAr	1x25 MVAR Reactor at Bikaner has been commissioned on dated 24th June 2023.
xiii	RAJASTHAN	Suratgarh	1x25 MVAr	1x25 MVAR Reactor at Suratgarh has been commissioned on dated 25th November 2022.
xiv	RAJASTHAN	Barmer & others	13x25 MVAr	Agreement signed on dt. 22.06.2020. Grant of Ist Instalment received on dt.19.02.21 & work order placed on dt. 7.04.2022 to M/s Kanohar Electricals Ltd. Schedule time is 18 months. Out of 13 Nos. of reactors, 10 Nos. have been erected and three are under erection. Tentative charging plan is
xv	RAJASTHAN	Jodhpur	1x125 MVAr	Agreement signed on dt. 22.06.2020. Grant of Ist Instalment received on dt.19.02.21 & work order placed on dt. 7.04.2022 to M/s Kanohar Electricals Ltd. Schedule time is 18 months. 01 No. of 125 MVAR reactor is under final inspection. Tentaive charging plan is 31.03.2024.

Annexure-A-I.I

1. Down Stream network by State utilities from ISTS Station:

Sl. No.	Substation	Downstream network bays	Status of bays	Planned 220 kV system and Implementation status	Revised Target	Remarks
1	400/220kV, 3x315 MVA Samba	Commissioned: 8 Total: 8	Utilized: 6 Unutilized: 2	• Network to be planned for 2 bays.	Mar'24	02 No. of bays shall be utilized for LILO-II of 220kV Jatwal-Bishnah Transmission Line, the work of which is delayed due to severe ROW problem at Location No. 1 near Grid Substation Jatwal where the Land owner is not allowing erection of Tower. The Deputy Commissioner Samba has been approached for intervention and facilitating the erection of Tower. He is persuading the Land owner to get the work completed. Updated in 210th OCC by JKPTCL.
2	400/220kV, 2x315 MVA New Wanpoh	Commissioned: 6 Total: 6	Utilized: 2 Unutilized: 4	• 220 kV New Wanpoh - Alusteng D/c Line	Mar'25	02 No. of bays are to be utilized for connecting 220kV New Wanpoh-Alusteng D/c Line. RoW issues persisting; At present new-wampoh-mirbazar 5km and harwan-alstung 16km have been completed, expected date of completion is Mar 2025 subject to availability of funds and resolving of RoW issues), Updated in 214th OCC by JKPTCL.
				• 220 kV New Wanpoh - Mattan D/c Line	End of 2024	02 No. of bays are to be utilized for connecting 220kV New Wanpoh-Mattan D/c Line. The funding source for the project is being identified and the project is expected to be completed by ending 2024. Updated in 204th OCC by JKPTCL.
3	400/220kV, 2x315 MVA Amargarh	Commissioned: 6 Total: 6	Utilized: 4 Unutilized: 2	• 220kV D/C line from 400/220kV Kunzar - 220/33kV Sheeri	End of 2024	02 No. of bays are proposed to be utilized for connecting 220/132 kV GSS Loolipora. The funding source for the project is being identified and the project is expected to be completed by ending 2024. Updated in 204th OCC by JKPTCL.
4	400/220kV, 2x500 MVA Kurukshetra (GIS)	Commissioned: 8 Total: 8	Utilized: 6 Unutilized: 2	• 220kV Bhadson (Kurukshetra) – Ramana Ramani D/c line	Jul'24	Updated in 205th OCC by HVPNL
5	400/220 kV, 2x315 MVA Dehradun	Commissioned: 6 Total: 6	Utilized: 2 Unutilized: 4	• Network to be planned for 4 bays	-	PTCUL to update the status.
6	Shahjahanpur, 2x315 MVA 400/220 kV	Commissioned: 6 Approved/Under Implementation:1 Total: 7	Utilized: 7	• 220 kV D/C Shahajahanpur (PG) - Gola line	Commissioned	Energization date: 26.10.2023 updated by UPPTCL in 215th OCC
				• LILO of Sitapur – Shahjahanpur 220 kV SC line at Shahjahanpur (PG)	Commissioned	Energization date: 25.02.2022 updated by UPPTCL in 196th OCC
7	Hamirpur 400/220 kV Sub-station	Commissioned: 8 Total: 8	Utilized: 4 Unutilized: 4	• 220 kV Hamirpur-Dehan D/c line	Commissioned	HPPTCL has commissioned the Planned 220kV Dehan-Hamirpur TL utilizing 2 No. 220kV Bays.Commisioned date: 09.06.2022. Updated in 198th OCC by HPPTCL
				• Network to be planned for 4 bays	-	HPPTCL to update the status.
8	Sikar 400/220kV, 1x 315 MVA S/s	Commissioned: 8 Total: 8	Utilized: 6 Unutilized: 2	• LILO of 220 kV Sikar (220 kV GSS)-Dhod S/c line at Sikar (PG)	Commissioned	LILO of 220 kV S/C Sikar-Dhod line at 400 kV GSS PGCIL, Sikar has been charged on dt. 31.03.2022
				• Network to be planned for 2 bays.	-	Against the 3rd ICT at 400 kV GSS Sikar, only 2 bays were constructed and same has been utilized by RVPN by constructing LILO of 220 kV S/C Sikar – Dhod line as updated by RVPNL in 195th OCC
				• 220 kV D/C line Bhiwani (PG) – Bhiwani (HVPNL) line	Commissioned	Updated in 202nd OCC by HVPNL

Sl. No.	Substation	Downstream network bays	Status of bays	Planned 220 kV system and Implementation status	Revised Target	Remarks
9	Bhiwani 400/220kV S/s	Commissioned: 6 Total: 6	Utilized: 2 Unutilized: 4	• 220 kV Bhiwani (PG) - Isherwal (HVPNL) D/c line.	Apr'24	Issue related to ROW as intimated in 215th OCC by HVPNL.
				• 220 kV Bhiwani (PG) - Dadhibana (HVPNL) D/c line.	Apr'24	Issue related to ROW as intimated in 192nd OCC by HVPNL.
10	Jind 400/220kV S/s	Commissioned: 4 Approved:4 Total: 8	Utilized: 4 Unutilized: 0	• LILO of both circuits of 220 kV Jind HVPNL to PTPS D/C line at 400 kV substation PGCIL Khatkar (Jind) with 0.5 sq inch ACSR conductor	May'24	Tender is under process Updated in 205th OCC by HVPNL.
11	400/220kV Tughlakabad GIS	Commissioned: 6 Under Implementation: 4 Total: 10	Utilized: 6 Unutilized: 0 Under Implementation:4	• RK Puram – Tughlakabad (UG Cable) 220kV D/c line – March 2023.	-	DTL to update the status.
				• Masjid Mor – Tughlakabad 220kV D/c line.	-	DTL to update the status.
12	400/220kV Kala Amb GIS (TBCB)	Commissioned: 6 Total: 6	Utilized: 2 Unutilized: 2 Under Implementation:2	• HPPTCL has planned one no. of 220kV D/c line from Kala Amb 400/220kV S/s to 220/132kV Kala Amb S/s	Jan'24	Updated in 214th OCC by HPPTCL
				• HPPTCL has planned one no. of 220kV D/c line from Kala Amb 400/220kV S/s to 220/132kV Giri S/s	-	HPPTCL to update the status.
				• Network to be planned for 2 bays	-	HPPTCL to update the status.
13	400/220kV Kadarpur Sub-station	Commissioned: 8 Total: 8	Utilized: 0 Unutilized: 8	• LILO of both circuits of 220 KV Pali - Sector 56 D/C line at Kadarpur along with augmentation of existing conductor from 220 KV Sector-56 to LILO point with 0.4 sq inch AL-59 conductor.	Mar'24	Forest approval is pending for 220 KV Pali - Sector 56 D/C line. Updated in 215th OCC by HVPNL
				• LILO of both circuits of 220KV Sector 65 - Pali D/C line at Kadarpur along with augmentation of balance 0.4 sq. inch ACSR conductor of 220 kV Kadarpur - Sector 65 D/C line with 0.4sq inch AL-59 conductor	Mar'24	Updated in 205th OCC by HVPNL
14	400/220kV Sohna Road Sub-station	Commissioned: 8 Total: 8	Utilized: 4 Unutilized: 4	• LILO of both circuits of 220kV D/c Sohna-Rangla Rajpur at Roj Ka Meo line at 400kV Sohna Road	Jan'24	Updated in 208th OCC by HVPNL
				• LILO of both circuits of 220kV D/c Badshahpur-Sec77 line at 400kV Sohna Road	-	The matter is subjudice in Hon'ble Punjab & Haryana High court, Chandigarh Updated in 205th OCC by HVPNL. **Status:-** Earlier 02 nos 220 kV line bays were to be utilized for the 220 kV GIS S/Stn. Sec-77, Gurugram but due to denotification of land of the 220 kV GIS S/Stn. Sec-77 the said substation is now going to be dismantled and a new substation is proposed at Sec-75A, Gurugram. Now, these 02 no. 220 kV line bays may be utilized at 220 kV GIS S/Stn Sec-75A, Gurugram.
15	400/220kV Prithla Sub-station	Commissioned: 8 Aprroved: 2 Total: 10	Utilized: 4 Unutilized: 4 Under Implementation:2	• 220kV D/C line from Prithla to Harfali with LILO of one circuit at 220kV Meerpur Kurali	31.03.2024	Updated in 205th OCC by HVPNL
				• LILO of both ckt of 220kV D/c Ranga Rajpur – Palwal line	Commissioned	Commisioned date: 31.12.2021. Updated in 198th OCC by HVPNL
				• 220kV D/C for Sector78, Faridabad	31.03.2024	Issue related to ROW and Pending crossing approval from Northern Railways and DFCCIL. as intimated in 205th OCC by HVPNL.
				• Prithla - Sector 89 Faridabad 220kV D/c line	31.03.2024	Updated in 205th OCC by HVPNL

Sl. No.	Substation	Downstream network bays	Status of bays	Planned 220 kV system and Implementation status	Revised Target	Remarks
16	400/220kV Sonepat Sub-station	Commissioned: 6 Under Implementation:2 Total: 8	Utilized: 2 Unutilized: 4 Under Implementation:2	• LILO of both circuits of 220kV Samalkha - Mohana line at Sonepat	Feb'24	Updated in 205th OCC by HVPNL. **Status:** Work was held up due to ROW at T.L. No. 7,8,11,12 & 13 by the farmers of Jajji villagers during July'23 and now the matter has been resolve and work under progress from 01.08.2023. The erection work of T.no. 1 is pending due to non availability of shut down at 220KV Mohana-Smk line and 220KV Jajji-Mohana line. • PLCC protection coupler and Forest approval is also pending.
				• Sonepat - HSIISC Rai 220kV D/c line	Mar'24	Updated in 212th OCC by HVPNL. **Status:** Due to non-performance of work of 220KV GIS Rai S/Stn, the Contract has been terminated & blacklisted by O/o XEN/WB O/o CE/PD&C, HVPNL, Panchkula vide Ch-100/HDP-2418/REC-254/Xen(WB) Dated 24.02.2023. Now pending work will be caried out by HVPNL/ Departmentely. Now, the matter is under approval from competent authority of Nigam.,
				• Sonepat - Kharkhoda Pocket A 220kV D/c line	31.07.2024	Updated in 212th OCC by HVPNL. **Status:** Work order has been issued to M/s R.S Infra on dated 09.08.2023 by O/o CE/PD&C, Panchkula for construction of line. The Survey work has been completed.
17	400/220kV Neemrana Sub-station	Commissioned: 6 Total: 6	Utilized: 4 Unutilized: 2	• LILO of Bhiwadi - Neemrana 220kV S/c line at Neemrana (PG)	-	Work is under progres. Stub Setting: 02/2017. Permission for forest, Highway & pipeline crossing is awaited from concerned department as updated in 215th OCC by RVPNL.
18	400/220kV Kotputli Sub-station	Commissioned: 6 Total: 6	Utilized: 4 Unutilized: 2	• Kotputli - Pathreda 220kV D/c line	-	Date of bid opening has been extended up to 22.01.2024 as updated in 215th OCC by RVPNL.
19	400/220kV Jallandhar Sub-station	Commissioned: 10 Total: 10	Utilized: 8 Unutilized: 2	• Network to be planned for 2 bays	May'24	LILO of 220 kV BBMB Jalandhar - Butari line at 400 kV PGCIL Jalandhar being planned. Work expected to be completed by May 2024. Updated in 198th OCC by PSTCL.
20	400/220kV Roorkee Sub-station	Commissioned: 6 Total: 6	Utilized: 4 Unutilized: 2	• Roorkee (PG)-Pirankaliyar 220kV D/c line	Commissioned	Roorkee (PG)-Pirankaliyar 220kV D/c line commissioned in 2020 as intimated by PTCUL in 197th OCC
21	400/220kV Lucknow Sub-station	Commissioned: 8 Total: 8	Utilized: 4 Unutilized: 4	• Network to be planned for 2 bays	Commissioned	• Lucknow -Kanduni, 220 kV D/C line work energized on 05.10.2023. Updated in 212th OCC by UPPTCL. _____ • No planning for 2 no. of bays upated by UPPTCL in 196th OCC. The same has been communicated to Powergrid.
22	400/220kV Gorakhpur Sub-station	Commissioned: 6 Total: 6	Utilized: 4 Unutilized: 2	• Network to be planned for 2 bays	Commissioned	• Gorakhpur(PG)- Maharajganj, 220 kV D/C line energized on 27.09.2023 updated by UPPTCL in 212th OCC

Sl. No.	Substation	Downstream network bays	Status of bays	Planned 220 kV system and Implementation status	Revised Target	Remarks
23	400/220kV Fatehpur Sub-station	Commissioned: 8 Under Implementation:2 Total: 10	Utilized: 6 Unutilized: 2 Under Implementation:2	• Network to be planned for 2 bays	-	• UPPTCL intimated that 02 no. of bays under finalization stage. In 201st OCC, UPPTCL intimated that it is finalized that Khaga s/s will be connected (tentative time 1.5 years). • No planning for 2 no. of bays updated by UPPTCL in 196th OCC. The same has been communicated to Powergrid.
24	400/220kV Abdullapur Sub-station	Commissioned: 10 Under Implementation:2 Total: 12	Utilized: 10 Unutilized: 0 Under Implementation:2	• Abdullapur – Rajokheri 220kV D/c line	Mar'24	SCDA System & PLCC work pending at 220 KV S/stn. Rajokheri Updated in 215th OCC by HVPNL
25	400/220kV Pachkula Sub-station	Commissioned: 8 Under tender:2 Total: 10 Out of these 10 nos. 220kV Line Bays, 2 bays would be used by the lines being constructed by POWERGRID (Chandigarh-2) and balance 8 nos. bays would be used by HVPNL	Utilized: 2 Unutilized: 4 Under Implementation:2	• Panchkula – Pinjore 220kV D/c line	Jan'24	Updated in 211th OCC by HVPNL
				• Panchkula – Sector-32 220kV D/c line	Feb'24	Updated in 211th OCC by HVPNL
				• Panchkula – Raiwali 220kV D/c line	Commissioned	Updated in 194th OCC by HVPNL
				• Panchkula – Sadhaura 220kV D/c line: Sep'23	Jul'24	Updated in 205th OCC by HVPNL
26	400/220kV Amritsar S/s	Commissioned:7 Approved in 50th NRPC- 1 no. Total: 8	Utilized: 6 Under Implementation:2	• Amritsar – Patti 220kV S/c line	Jan'24	Work is near completion expected to be completed by January 2024. Updated in 215th OCC by PSTCL.
				• Amritsar – Rashiana 220kV S/c line (2 bays shall be required for above lines. However, 1 unutilized bay shall be used for Patti and requirement of one additional bay approved for Rashiana by NRPC)	Jan'24	Work is near completion expected tobe completed by January 2024. Updated in 215th OCC by PSTCL.
27	400/220kV Bagpat S/s	Commissioned: 8 Total: 8	Utilized:6 Unutilized: 2	• Bagpat - Modipuram 220kV D/c line	Commissioned	Updated in 201st OCC by UPPTCL
28	400/220kV Bahardurgarh S/s	Commissioned: 4 Approved: 4 Total: 8	Utilized:2 Unutilized: 2	• LILO of 220 kV Nunamajra-Daultabad S/c line at 400 kV Bahadurgarh PGCIL	31.03.2024	Updated in 205th OCC by HVPNL. **Status:** Tentative route stands submitted by TS wing and accordingly BOQ has been submitted by design wing to contracts wing for award of work.
				• Bahadurgarh - METL 220kV D/c line (Deposit work of M/s METL)	31.03.2024	Updated in 205th OCC by HVPNL. **Status:** Tentative route stands submitted by TS wing and accordingly BOQ has been submitted by design wing to contracts wing for award of work.
				• Bahadurgarh - Kharkhoda Pocket B 220kV D/c line	31.07.2024	Updated in 212th OCC by HVPNL. **Status:** Work order has been issued to M/s R.S Infra on dated 09.08.2023 by O/o CE/PD&C, Panchkula for construction of line. The Survey work has been completed.
29	400/220kV Jaipur (South) S/s	Commissioned: 4 Total: 4	Utilized:2 Unutilized: 2	• LILO of 220 kV S/C Dausa – Sawai Madhopur line at 400 kV GSS Jaipur South (PG)	06.10.2025	Work order has been issued on 06.10.2023, work under progress as updated by RVPNL in 215th OCC
		Commissioned: 8	Utilized: 8	• Sohawal - Barabanki 220kV D/c line	Commissioned	Energization date: 14.04.2018 updated by UPPTCL in 196th OCC
				• Sohawal - New Tanda 220kV D/c line	Commissioned	Energization date: 28.05.2019 updated by UPPTCL in 196th OCC

Sl. No.	Substation	Downstream network bays	Status of bays	Planned 220 kV system and Implementation status	Revised Target	Remarks
30	400/220kV Sohawal S/s	Commissioned: 8 Total: 8	Utilized: 8	• Network to be planned for 2 bays	Commissioned	• Sohawal - Gonda 220kV S/c line (Energization date: 27.04.2020) updated by UPPTCL in 196th OCC _____ • Sohawal - Bahraich 220kV S/c line (Energization date: 15.02.2021) updated by UPPTCL in 196th OCC
31	400/220kV, Kankroli	Commissioned: 6 Total: 6	Utilized: 4 Unutilized: 2	• 220 kV D/C Kankroli(PG) - Nathdwara line	-	Technical bid for the line has been opened on 14.12.2023, under evaluation.
32	400/220kV, Manesar	Commissioned: 8 Total: 8	Utilized: 4 Unutilized: 4	• Network to be planned for 2 bays	-	Status:- 2nos bays are being utilised for 220 kV D/C Panchgaon (PGCIL)-Panchgaon Ckt-I & 220 kV D/C Panchagon (PGCIL)-Panchgaon Ckt-II, charged on dated 05.09.2022 & 20.10.2022 respectively. The 2nos bays may be utilised by HVPNL in future.
33	400/220kV, Saharanpur	Commissioned: 6 Under Implementation:2 Total: 8	Utilized: 6 Unutilized: 0 Under Implementation:2	• Network to be planned for 2 bays	Commissioned	Saharanpur(PG)-Devband D/c line (Energization date: 20.04.2023) updated by UPPTCL in 207th OCC
34	400/220kV, Wagoora	Commissioned: 10 Total: 10	Utilized: 6 Unutilized: 4	• Network to be planned for 4 bays	-	PDD, J&K to update the status.
35	400/220kV, Ludhiana	Commissioned: 9 Total: 9	Utilized: 8 Unutilized: 1	• Network to be planned for 1 bay	Feb'24	Direct circuit from 220 kV Lalton Kalan to Dhandari Kalan to be diverted to 400 kV PGCIL Ludhiana. Work completed only jumpering reamins to be done.Updated in 215th OCC by PSTCL.
36	400/220kV, Chamba (Chamera Pool)	Commissioned: 3 Under tender:1 Total: 4	Utilized:3 Unutilized: 0 Under tender:1	• Stringing of 2nd ckt of Chamera Pool – Karian 220kV D/c line	-	Stringing of 2nd Circuit of Chamera Pool-Karian Tansmission line has been completed & terminal bay at 400/220 kV chamera pooling substation (PGCIL) is ready for commissioning. Case for Initial Charging is in process at NRLDC..Updated in 214th OCC by HPPTCL
37	400/220kV, Mainpuri	Commissioned: 6 Under Implementation:2 Total: 8	Utilized: 6 Unutilized: 0 Under Implementation:2	• Network to be planned for 2 bays	-	• 02 no. of bays under finalization stage updated by UPPTCL in 196th OCC. Mainpuri S/s planned. Land is not finalized, therefore timeline not available as intimated by UPPTCL in 201st OCC.
38	400/220kV, Patiala	Commissioned: 8 Total: 8	Utilized: 6 Unutilized: 2	• Network to be planned for 2 bays	May'24	2 Nos. bays for 400 kV PGCIL Patiala - 220 kV Bhadson (D/C) line being planned. Work expected to be completed by May 2024. Updated in 198th OCC by PSTCL.

Status of availability of ERS towers in NR

Sl. No.	Transmission Utility	Voltage Level (220kV/400kV/765kV/ 500 kV HVDC etc.)	Length of the transmission lines owned by the Utility (Ckt. Kms.)	Number of ERS Sets (towers) available (Nos.)	ERS Set (towers) required as per the Govt. norms.	Location	Remarks
1	PTCUL	400kV	418.394	NIL	1		DPR Under preparation.
		220kV	1045.135	NIL	1		DPR Under preparation.
2	Powergrid NR-1	220 KV	1842.88	NIL	1		
		400 KV	11074.26	12 Towers	3	All 400kV ERS at Ballabhgarh	make-Lindsey
		765 KV	4721.85	15 Towers	1	All 765kV ERS at Meerut	Make-SBB
		500 KV HVDC	653.88	NIL	1		
		800 KV HVDC	416.58	NIL	1		
3	Powergrid NR-2	66 KV	37.56	Nil	1		ERS tower available for 400KV rating can be used in place of lower as well as higher voltage Towers. In case used for 765KV Line, No of towers can be erected will reduce due to increase in Tower Hight.
		132 KV	262.7	Nil	1		
		220 KV	2152	Nil	1		
		400 KV	8097.3	02 Set (32 Towers)	2	Kishenpur & Jalandhar	
		765 KV	337.5	Nil	1		
4	Powergrid NR-3	800KV HVDC	2205	NIL	1		400KV ERS will be also be used in other voltage level lines
		500KV HVDC	2566	NIL	1		
		765KV	4396	NIL	1		
		400KV	12254	26 Towers	3	Kanpur	
		220KV	1541	NIL	1		
		132KV	207	NIL	1		
5	PARBATI KOLDAM TRANSMISSION COMPANY LIMITED	400kV	457	NIL	1		Procurement under process.
6	PATRAN TRANSMISSION COMPANY LTD	400kV	0.4	NIL	1	It is kept in Bhopal and on need basis is moved across region	Not available, will tie up based on the requirements in future. However the parent company IndiGrid owns one set of ERS for all five regions.
7	NRSS-XXIX TRANSMISSION LTD	400kV	853	NIL	1		
8	GURGAON PALWAL TRANSMISSION LTD	400kV	272	NIL	1		
9	RAPP Transmission Company Limited.	400kV	402	NIL	1		
10	NRSS XXXVI Transmission Limited	400kV	301.924	NIL	1		Element I - Operational comprising of 3 kms. Element II - Work Under Progress comprising of 221.924 kms. Element II - Work Under Progress comprising of 77 kms.
11	HPPTCL	220 kV	659	NIL	1		
		400 kV	75.7	NIL	1		
12	RVPN	132 kV	18969.958	1	4	01 No. ERS available at 220 kV GSS Heerapura, Jaipur	ERS proposed : 01 Set at 400 kV GSS, Jodhpur. 01 set at 400 kV GSS Bikaner
		220 kV	16227.979		3		
		400 kV	6899.386		2		
		765 kV	425.498		1		
13	DTL	220kV	915.498	NIL	1	400kV Bamnauli Sub station	ERS tower available for 400KV rating can also be used for lower voltage lines as well
		400kV	249.19	02 Sets (32 towers)	1		
14	JKPTCL						

Sl. No.	Transmission Utility	Voltage Level (220kV/400kV/765kV/ 500 kV HVDC etc.)	Length of the transmission lines owned by the Utility (Ckt. Kms.)	Number of ERS Sets (towers) available (Nos.)	ERS Set (towers) required as per the Govt. norms.	Location	Remarks
15	HVPN						HVPN does not have ERS Set. Technical Specifications have been finalized
16	PSTCL	400 kV	1666.43	2	2		
		220 kV	7921.991				
17	UPPTCL 1- Meerut	132KV	27508.321	24 Nos(15 Running+9 Angle)		400 kV S/s Gr. Noida	ERS will be also be used in other voltage level lines.
		220KV	14973.453				
		400KV	6922.828				
	UPPTCL 2-Prayagraj	765KV	839.37	24 Towers		220 kv S/s phulpur	ERS will also be used in other voltage lines.
		400KV	1804.257				
		220KV	2578.932				
		132KV	4714.768				
18	POWERLINK						
19	POWERGRID HIMACHAL TRANSMISSION LTD						
20	Powergrid Ajmer Phagi Transmission Limited						
21	Powergrid Fatehgarh Transmission Limited						
22	POWERGRID KALA AMB TRANSMISSION LTD						
23	Powergrid Unchahar Transmission Ltd						
24	Powergrid Khetri Transmission Limited						
25	POWERGRID VARANASI TRANSMISSION SYSTEM LTD						
26	ADANI TRANSMISSION INDIA LIMITED		2090	1 Set (12 towers)	1 set (12 towers)	Sami (Gujarat)	Make-Lindsey ERS set available for 400KV & 500KV rating can be used for lower as well as higher voltage Towers. In case used for 765KV Line, No of towers can reduce due to increase in Tower Height & nos of conductors.
27	BIKANER KHETRI TRANSMISSION LIMITED		482				
28	FATEHGARH BHADLA TRANSMISSION LIMITED	500 kV HVDC 400 kV HVAC	291				
29	NRSS-XXXI(B) TRANSMISSION LTD	400 kV	577.74	Not Available	Not Available		In the advance stage of process of finalising arrangement for providing ERS on need basis with other transmission utility (M/s INDIGRID).
30	ARAVALI POWER COMPANY PVT LTD	765 kv HVAC					

*The transmission Utility with line length less than 500 ckt kms (of 400 KV lines) may be given option either to procure ERS or have agreement with other transmission utilities for providing ERS on mutually agreed terms, when need arises. (As per MoP directions)

सामान्य आउटेज योजना प्रक्रिया

Common Outage Planning Procedure

उत्तर क्षेत्रीय विदयुत समिति

Northern Regional Power Committee

जनवरी 2024

January 2024

Contents

1. Background

1.1. This procedure is in accordance with *clause 32 (4) of the Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2023*.

1.2. The procedure lays down the guidelines for proposal of grid element outages by indenting agency and facilitation of coordinated planned and emergency outages.

2. Introduction

Reliable operation of the All India grid is important from the view point of Quality Of Service (QoS) to the customers and other stakeholders. Proper coordination of transmission element outages in the system is one of the key aspects to ensuring reliability. Outages in the transmission network could either be on account of planned maintenance activities or construction related activities or any emergency conditions arising in the field. Proper coordination of transmission element outage is important mainly due to the following factors:

a) Reliability of operation of the All India grid
b) Certainty to the electricity markets.
c) Proper crew resource mobilization at the work sites to ensure that outage time is minimized.
d) Proper coordination of works by different entities to ensure that outage time is optimised.

Outage planning shall be prepared for the grid elements in a coordinated and optimal manner keeping in view the system operating conditions and grid security. The coordinated generation and transmission outage plan for the national and regional grid shall take into consideration all the available generation resources, demand estimates, transmission constraints, and factor in water for irrigation requirements, if any. To optimize the transmission outages of the national and regional grids, to avoid grid operation getting adversely affected and to maintain system security standards, the outage plan shall also take into account the generation outage schedule and the transmission outage schedule.

Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2023. Operating Code: Regulation No. 32(4) stipulate that “To facilitate coordinated planned outages of grid elements, a common outage planning procedure shall be formulated by each RPC in consultation with the NLDC, concerned RLDC and concerned users.

Major time line for annual outage plan is as follows:

Table 1: Timeline for processing of shutdown plan

Activity	Agency	Cut-off date
Submission of proposed outage plan for the next financial year to RPC with the earliest start date and latest finishing date	STUs, transmission licensees, generating stations and other entities directly connected to ISTS	31st October
Submission of LGBR of the control area to RPC for both peak and off-peak scenarios	SLDC	31st October

Publishing draft LGBR and draft outage plan of regional grid for next financial year on the concerned RPC's website for inviting suggestions, comments, objections of stakeholders.	RPC	30th November
Publishing final LGBR and final outage plan of regional grid for next financial year on the concerned RPC's website	RPC	31st December

3. Objective

At present, following outage categories are being followed

I. ***Planned Outage Category:*** Planned outages are being discussed in Operation Coordination Committee (OCC) meeting of NRPC on monthly basis and availed based on the actual grid conditions.

II. ***Post OCC Category:*** Under exceptional cases such as construction activities or urgent nature of works, outage for maximum of two days shall be proposed by indenting agency after the OCC meeting under Post OCC category.

III. ***Emergency Category:*** For attending emergency nature of works, asset owner shall send the proposal directly to NRLDC control room and shutdown may be facilitated based on the actual grid conditions.

The approval of planned/Post OCC as well as emergency outages in the transmission network level in real time is being coordinated by NRLDC and NLDC based on system conditions. The procedure aims to streamline the process of outage coordination between SLDCs, NRLDC, NLDC, NRPC, owners of transmission assets and transmission element outage Indenting Agencies. As outage planning is an important part of operational planning, multi-layered checks would help in ensuring reliability of the power system. These checks need to be at the following levels:

- ✓ Due diligence between the agencies involved in the transmission asset maintenance through bilateral discussion.
- ✓ Operation Co-ordination sub-Committee of NRPC
- ✓ Off-line simulations and planning at SLDCs/RLDCs/NLDC level
- ✓ Real time check at SLDCs/RLDCs/NLDC level

4. Scope

The procedure is applicable to NRPC, NRLDC, NLDC, SLDCs, STUs, load serving entities and indenting agency. It would be applicable once the annual outage plan is finalized by 31st December of each year for the next financial year by the NRPC as per the IEGC.

5. Applicability

The procedure is applicable to important grid elements including bays published by NRLDC/NLDC. This procedure shall also be applicable to other grid elements for the proposed outage period more than 2 days.

6. Procedure for discussing outages in OCC meeting

6.1. ***Indenting Agency:*** The agency which gives the requisition for outage of any transmission element shall be called Indenting Agency. Any of the following may request for outage of any transmission elements:

6.1.1. Transmission Licensees / State Transmission Utilities
6.1.2. Generating Companies
6.1.3. NRLDC/NLDC for defence mechanism testing / blackstart mock drills

6.2. Indenting Agency shall submit the proposed shutdown for the next calendar month latest by 05th day of the current month to the NRPC Secretariat via Outage Management Software (OMS) Portal of NRLDC as per ***Format I.*** Indenting agency/NRPC shall also ensure to send the list of Inter regional shutdown and intra-regional lines affecting the transfer capability of any inter regional corridor to NLDC/concerned RPCs by 5th day of current month as per **Format I.**

6.3. In case of shutdown of inter-regional lines and intra-regional lines affecting the transfer capability of any inter regional corridor, the Indenting agency shall submit the shutdown proposal in all the concerned RPCs latest by 05th day of the current month. To facilitate this broad list of such lines is indicated at ***Annexure-I*** which will be reviewed and updated by NLDC from time to time. The indenting agency may do an internal screening of its outage plan centrally to avoid multiple outages in the same corridor simultaneously. Bilateral discussion between the agencies involved may also be done to minimize outage duration before submitting the outage plan to RPCs.

6.4. NRPC Secretariat shall compile all the received proposals and put up the same on its website by 7th day of the month as per ***Format II.***

6.5. NRLDC/NLDC shall study the impact of these outages and furnish its comments/observations to NRPC Secretariat for discussion in the OCC meeting.

6.6. While approving the shutdowns it shall be ensured that outages in the same corridor shall not be approved simultaneously. It also needs to be ensured that all other concerned entities should also complete their work during the shutdown period so as multiple shutdowns of same element for work by multiple agencies are avoided. The multiple outages of the transmission element for the same work during the year may also be avoided.

6.7. Any transmission element outage approved by OCC may be allowed to be re-scheduled by NRLDC in the same calendar month for which it was approved considering the grid scenario and genuineness of deferment by indenting agency. Further, any transmission element outage approved by OCC from 24th day onwards may be allowed to be re-scheduled by NRLDC upto 7th day of next month for which it was approved considering the grid scenario and genuineness of deferment by indenting agency. After getting approval from NRLDC, the indenting agency would reschedule the outage.

6.8. All the Members of Operation Coordination Sub-Committee of NRPC to ensure participation in OCC Meeting, otherwise it will be treated as deemed concurred.

6.9. The list of approved/rejected outages would be uploaded on the NRPC website within 3 working days of OCC meeting. as per ***Format III.***

6.10. Any shutdown proposal which requires approval of more than one RPCs shall be considered approved only if it is approved in all the RPCs.

6.11. All testing related to SPS /HVDC / Mock drill for black start operation (including toggling of SPS) shall be approved in all concerned RPC's and shall be requested as per outage planning procedure.

7. Procedure for proposing Post OCC Category outages

Under exceptional cases such as construction activities or urgent nature of works, outage shall be proposed by indenting agency to NRPC on D-5 basis. Indenting agency shall propose the outage to concerned RPCs in case of inter-regional (IR)/intra-regional transmission elements affecting IR TTC/ATC on D-5 basis. NRPCwould also consult respective SLDCs/NRLDC/NLDC before approval on D-4. Only after approval from NRPC, shutdown will be facilitated by NRLDC/NLDC based on the real time grid condition. Outage facilitation priority may be given to OCC approved outages. Indenting Agency shall submit the proposed shutdown as per ***Format I.***

8. Procedure for proposing Emergency Category outages

All outages which are not approved in the OCC meeting / Post OCC category, however having impact on human and equipment safety shall be considered under Emergency Outage category. Indenting Agency shall submit the proposed shutdown to NRLDC/NLDC as per **Format IV.**

9. Approving Load Despatch Centre and Consenting Load Despatch Centre

9.1. **Approving Load Despatch Centre:** The Load Despatch Centre responsible for approving any transmission outage shall be called Approving Load Despatch Centre.

9.2. **Consenting Load Despatch Centre:** The Load Despatch centre whose consent is required by Approving Load Despatch Centre for approving any outage shall be called Consenting

Load Despatch Centre. Once the NRPC approve the monthly outage plan and Post OCC category outages, the responsibility of approval of outages shall be as under:

S No	Type of Outage	Consenting Load Despatch Centre	Approving Load Despatch Centre
1	765 kV or above Lines	Concerned RLDCs	NLDC
2	Inter-Regional Lines	Concerned RLDCs	NLDC
3	HVDCs	Concerned RLDCs	NLDC
4	International Interconnections	Concerned RLDCs	NLDC
5	Intra-Regional Lines affecting transfer capability of any inter regional corridor	Concerned RLDCs	NLDC
6	Intra-Regional Lines which does not affect transfer capability of any inter regional corridor and included in the list of important elements of RLDCs (excluding lines covered under S No.1,3,4 and 5)	SLDCs	NRLDC
7	All other lines (excluding S No. 1,2,3,4,5,6)	SLDCs	SLDC
8	Lines having impact on major generating station (having major shareholders in other regions) and chicken neck area	NLDC	NRLDC

10. Procedure for approval of outage on D-3 basis

10.1. Planned Outages which have been approved in the OCC meeting or under Post OCC category of a region shall be considered for approval by NRLDC/NLDC on D-3 basis. If an outage is to be availed on say 10th of the month, the indenting agency would punch the readiness in Web portal / forward such requests to the NRLDC from 10:00 hrs/06th to 10:00 hrs/07th of the month. In case the request for transmission element outage is not received within the timeline prescribed above, it will be assumed that the indenting agency is not availing the outage.

10.2. In case the owner is not availing the OCC or Post OCC approved outage, the same shall be punched in Web portal / intimated to the NRLDC from 10:00 hrs of D-4 to 10:00 hrs of D-3.

10.3. Planned Outages which are approved in OCC meeting or Post OCC outages shall only be considered for approval on D-3 basis and priority shall be given to OCC approved outages.

10.4. For all testing or operation related to automatic voltage regulators (AVRs), Power System Stabilizers (PSSs), Power Plant Controllers (PPC), RGMO, etc. indenting agency would send request to NRLDC through Web portal /google sheet / through mail from 10:00 hrs of D-4 to 10:00 hrs of D-3.

10.5. **Approval of Outage where Approving Authority is NLDC**

10.5.1. NRLDC shall forward the request for shutdown along with their consent and observations/contingency plan in web portal to NLDC by 10:00hours of D-2 day. Other concerned RLDCs would forward their observations/consent/reservations by 18:00 hours of D-2

10.5.2. NLDC shall approve the outage along with the clear precautions/measures to be taken during the shutdown and inform all concerned RLDCs.

10.5.3. The proposed outages shall be reviewed on day ahead basis depending upon the system conditions and the outages shall be approved/refused latest by 12:00 Hrs of D-1 day through web portal.

10.5.4. In case the outage is approved precautions/measures to be taken during the shutdown shall be stated. In case of refusal, reasons for the same shall be stated by the RLDCs/NLDC.

Sl No	**Activity**	**Day & Time**
1	Request of shutdown from Indenting agency to NRLDC.	10:00 hrs/D-4 to 10:00 hrs/D-3
2	Forwarding request of shutdown requiring NLDC approval from NRLDC to other concerned RLDCs and NLDC (along with the recommendations and study result)	10:00 hrs/D-3 to 10:00hrs/D-2
3	Comments of other RLDCs or NLDC	18:00hrs/D-2
4	Approval or Rejection of Request	12:00hrs/D-1

10.6. **Approval of Outage where Approving Authority is RLDC**

10.6.1. In case the indenting agency is a state entity, the request for transmission element outage shall be submitted to respective state load despatch centre (SLDC). SLDC shall forward the request for shutdown along with their consent and observations in web portal to NRLDC.

10.6.2. In all other cases, the request for transmission element outage shall be submitted to NRLDC.

10.6.3. NRLDC shall study the impact of proposed outages and approve / refuse the outage latest by 12:00 Hrs of D-1 day. A copy of the approval / refusal shall also be sent to NLDC (for 400 kV and above lines) through web portal/email.

10.6.4. In case the outage is approved precautions/measures to be taken during the shutdown shall be stated. In case of refusal, reasons for the same shall be stated by the SLDCs/NRLDC

10.6.5. Outages in the same corridor shall not be approved simultaneously and shall be rescheduled. Proposal to be updated in web portal by utility from 10:00 hrs/D-4 to 10:00 hrs/D-3 of rescheduled date within approved month only.

10.7. **Approval of Outage where Approving Authority is SLDC**

10.7.1. SLDC shall study the impact of proposed outages on the system and approve the outage latest by 12:00 Hrs of D-1 day. A copy of the approval / refusal list shall also be sent to NRLDC through E-mail.

10.7.2. Outages in the same corridor shall not be approved simultaneously and shall be rescheduled accordingly.

10.8. In case of any system constraint or any other reason, approving authority may decline the proposed outage by giving the reasons for the same and tentative dates for the shutdown.

10.9. In case, any approved outage is not availed in real time, the same may not be allowed again in that month except the shutdown is not availed due to bad Weather conditions. In such a scenario, indenting agency shall be required to submit a fresh proposal in the next OCC meeting.

10.10. A list of all approved outages for the next day must be available in the NRLDC/NLDC control room by 12:00 hours with a copy of the study results and actions to be taken, if any. This would be studied by the night shift engineers so that the outage can be facilitated the next day morning.

11. Approval for other grid elements (Outage period less than 2 days)

Indenting agency shall punch the request in Web portal / through E-mail from 10:00 hrs/D-4 to 10:00 hrs/D-3 to NRLDC for availing the outage of other grid elements published by NRLDC. Outage facilitation priority may be given to OCC/Post OCC approved outages. Indenting Agency shall submit the proposed shutdown as per ***Format I.***

12. Approval of Emergency Outages

12.1. All outages which are not approved in the OCC meeting but having impact on human and equipment safety shall be considered under Emergency Outage category.

12.2. The request for emergency outage shall be submitted to NRLDC/NLDC along with the details like nature of emergency, proof of emergency, relevant photograph, impacts due to emergency situation, reasons and associated facts for not considering in the outage planning process.

12.3. Emergency outages shall be allowed subject to system conditions and its severity. In this case, if required, planned outage may be deferred, if possible.

12.4. Emergency outages shall be allowed immediately or within the short possible time, based on the severity of the emergency and system condition on instance to instance basis.

13. Availing Outages in real time

13.1. The agencies involved shall ensure availing of outages as per the approved schedule time.

13.2. On the day of outage, the outage availing agency shall seek the code for availing outage from respective RLDC(s) /NLDC (wherever applicable). The agencies involved shall endeavour to avail the outage within 15 minutes of availing the code but not later than 30 minutes. In case, due to any contingency, the outage could not be availed within 30 minutes but not later than 60 minutes, a fresh code needs to be obtained by all concerned agencies stating the reason there of Record of scheduled and actual time of outage and restoration shall be maintained at NRLDC/NLDC.

13.3. Each user shall obtain the final clearance from NLDC or the concerned RLDC, prior to the planned outage of any grid element. The clearance shall also be obtained from SLDC for a grid element of the State Control areas.

13.4. In case of grid disturbances, system isolation, partial black-out in a State or any other event in the system that may have an adverse impact on the system security due to a proposed outage,

(i) NLDC, RLDC or SLDC, as the case may be, shall have the authority to defer the planned outage;

(ii) SLDC, RLDC or NLDC, as the case may be, before giving clearance of the planned outage may conduct studies again.

13.5. As any deviation in the outage from the schedule can affect other planned outages as well as affect reliability and electricity markets, indenting agency must strictly adhere to the shutdown timings.

13.6. The status of transmission elements planned vs. availed by the indenting agency shall be prepared by NRLDC and same to be discussed in ensuing OCC for better planning or coordination by requesting agencies. A suggestive format is enclosed as ***Format V***

14. Maintenance Work on Opportunity Basis

14.1. Any maintenance work on opportunity basis proposed to be carried out by any other agency/ies during the period of a shutdown already approved by NRLDC may do the work in consent with intending agency with intimation to NRLDC/NLDC. NRLDC While approving shutdown NRLDC would mention in remarks column that other agency would also be carrying out work on opportunity basis. The delay or extension of time in returning the shutdown attributable to such opportunity shutdown shall also be indicated separately.

15. Hotline Maintenance

15.1. In view of maintaining system availability and reliability of Transmission system, Transmission licensee can do rectification of critical/shutdown nature defects by HOT LINE MAINTENANCE techniques with trained personnel for hotline maintenance.

15.2. All Safety norms specified in Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2023 of Hot line maintenance works, shall be followed. Link for the document is https://cea.nic.in/wp-content/uploads/regulations_cpt/2023/06/pdf_100_183_English-1.pdf Section 21 and Schedule-1 of Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2023 are attached as Annexure-III.

15.3. All responsibility of safety measures to be followed lies with the transmission licensee and along with the application of Auto reclosure to be switched to non-auto mode, written declaration from the appropriate authority (not below the level of Deputy General Manager/ Executive Engineer/ Substation In-charge) stating that all safety precautions are being followed.

15.4. Auto reclosure of transmission line shall be kept “Auto reclosure – Non auto mode” position for the line at both ends in which HOT LINE maintenance work is to be carried out.

15.5. Format of Declaration for hotline maintenance is attached as Annexure-II of this document.

16. Safety Measures and Switching Operations during Outage

16.1. The operation code issued by NRLDC for opening / revival of the transmission element signifies such approval only from the system point of view notwithstanding anything contained in respect of safety measures and other switching operations to be carried out locally. The related line / substation personnel would be responsible for ensuring all safety precautions to be followed while opening / closing of any element to avoid any threat to operating personnel and equipment.

17. Normalization of Outages

17.1 All effort shall be made by the Indenting agency to normalise the shut down within approved time period so that the transmission element is normalised within the approved time period.

17.2. On completion of the outage work, the outage availing agency shall seek the code for normalisation of elements from respective RLDC(s)/NLDC (wherever applicable). The agencies involved shall endeavour to normalise the outage within 15 minutes of availing the code but not later than 30 minutes. In case, due to any contingency, the normalisation could not be done within 30 minutes but not later than 60 minutes, a fresh code needs to be obtained by all concerned agencies stating the reason thereof.

17.3. In case of extension of a shutdown, the Indenting agency would furnish the reasons of extension, and expected normalisation time to NRLDC/SLDC at least two hour before the scheduled normalisation time.

17.4. In case shutdown is extended beyond one day and upto three days, then utility should approach for consent/approval with proper reason and justification of delay to NRLDC/NLDC with a copy to NRPC. NRLDC/NLDC would take appropriate decision considering the grid situation with intimation to NRPC. Any extension beyond 3 days, would require approval from NRPC. Such extension shall only be applicable for original shutdown only for one time (one extension).

17.5. Under such circumstances SLDCs/NRLDC/NLDC shall review the impact of such delay on the shutdown already approved transmission system and would reserve the right to review for according/cancellation of the shutdown.

17.6. In case of repeated delay in normalisation of outages by any agency, the same shall be reported by SLDCs/NRLDC/NLDC to NRPC.

18. Revision of Procedure

18.1. The procedure shall be reviewed and revised by NRPC after stakeholder consultation and with intimation to the Commission.

18.2. Under exigencies, the procedure shall be reviewed and revised by NRPC with intimation to the Commission. Stakeholder consultation shall follow subsequently.

List of Annexures:

Sl No.	Annexure No	Title
1	Annexure I	Important Elements of NLDC
2	Annexure II	Hotline Maintenance

List of Formats:

Sl No.	Format	Title	From (Agency)	To (Agency)
1	Format I	Request for Transmission Element Outage	Indenting Agency	RPC
2	Format II	List of monthly proposed shutdowns of Transmission elements	RPC	Website
3	Format III	List of monthly approved shutdowns of Transmission elements	RPC	Website
4	Format IV	Request for emergency outage	Indenting Agency	RLDC
5	Format V	Status of transmission elements planned vs. availed	RLDC	RPC

Annexure I

NR to WR:

S No	Element Name	TTC/ATC Impact
1	Mundra Mahindragarh single pole	NR-WR
2	Mundra Mahindragarh Bipole	NR-WR
3	400 kV Kankroli - Zerda	NR-WR
4	one circuit of 765 kV Chhitorgarh - Banaskantha D/C	NR-WR
5	one circuit of 765 kV Chhitorgarh - Ajmer D/C	NR-WR
6	400 kV Kankroli - Jodhpur	NR-WR
7	HVDC Balia- Bhiwadi Monopole	NR-WR
8	One Circuit of Bikaner - Khetri D/C	NR-WR
9	One Circuit of Bhadla II - Ajmer D/C	NR-WR
10	One Circuit of RAPP-C - Shujalpur D/C	NR-WR
11	One Circuit of 400 kV Banaskatha - Veloda D/C	NR-WR
12	HVDC Vindhyanchal HVDC Monopole (NR - WR)	NR-WR
13	765 kV Dhule - Vadodara S/C	NR-WR
14	765 kV Indore - Vadodara S/C	NR-WR
15	one 765/400 kV, 1500 MVA ICT at Banaskantha	NR-WR

WR to NR and ER-NR:

S No	Element Name	TTC/ATC Impact	
1	Mundra Mahindragarh single pole	NA	ER-NR
2	Mundra Mahindragarh Bipole	WR-NR	ER-NR
3	Champa Kurukshetra single pole	WR-NR	ER-NR
4	Champa Kurukshetra bipole	WR-NR	ER-NR
5	Champa Kurukshetra Pole 1, 2 & 3	WR-NR	ER-NR

6	Champa Kurukshetra Pole 1, 2, 3 & 4	WR-NR	ER-NR
7	APD - Agra Pole single pole	NA	ER-NR
8	765 kV Vindhyachal - Varanasi S/C	WR-NR	ER-NR
9	765 kV Agra - Jhatikara S/C	NA	ER-NR
10	765 kV Aligarh-Jhatikara S/C	NA	ER-NR
11	765 kV Phagi - Gwalior S/C	NA	ER-NR
12	765 kV Agra - Gwalior S/C	WR-NR	ER-NR
13	765 kV Agra - Fatehpur S/C	NA	ER-NR
14	765 kV Phagi-Bhiwani S/C	NA	ER-NR
15	765 kV Phagi-Ajmer S/C	NA	ER-NR
16	765 kV Anpara C-Unnao Line	NA	ER-NR
17	765 kV Gwalior - Orai S/C	NA	ER-NR
18	765 kV Aligarh - Orai S/C	WR-NR	ER-NR
19	765 kV Satna-Orai Line	WR-NR	ER-NR
20	765 kV Satna-Gwalior Line	WR-NR	ER-NR
21	765 kV Satna-Bina S/C	NA	ER-NR
22	765 kV Aligarh-Greater Noida S/C	NA	ER-NR
23	765 kV Fatehabad-Greater Noida S/C	NA	ER-NR
24	765 kV Chhitorgarh - Banaskantha S/C	NA	ER-NR
25	765 kV Chhitorgarh - Ajmer S/C	NA	ER-NR
26	765 kV Bhadla - Bikaner S/C	NA	ER-NR
27	765 kV Bhadla II - Ajmer S/C	NA	ER-NR
28	765 kV Jabalpur - Orai S/C	NA	ER-NR
29	765 kV Agra - Aligarh S/C	NA	ER-NR
30	765 kV Gaya - Varanasi S/C	NA	ER-NR
31	765 kV Gaya - Balia S/C	NA	ER-NR
32	765 kV Jabalpur - Vindhyachal S/C	NA	ER-NR
33	400 kV Gaya-Chandwa-S/c	NA	ER-NR
34	400 kV Gaya-Chandwa-D/c	NA	ER-NR
35	400 kV Ranchi-Chandwa S/C	NA	ER-NR
36	400 kV Ranchi-Chandwa-D/c	NA	ER-NR

37	765 kV Vindhyachal - Varanasi D/C	WR-NR	ER-NR
38	765 kV Vindhyachal - Jabalpur D/C	WR-NR	ER-NR
39	765 kV Agra - Gwalior D/C	WR-NR	ER-NR
40	765 kV Agra - Fatehpur D/C	NA	ER-NR
41	765 kV Phagi - Gwalior D/C	WR-NR	ER-NR
42	765 kV Phagi-Bhiwani D/C	NA	ER-NR
43	765 kV Phagi-Ajmer D/C	NA	ER-NR
44	765 kV Aligarh - Orai-D/c	WR-NR	ER-NR
45	765 kV Chhitorgarh - Banaskantha D/C	NA	ER-NR
46	765 kV Chhitorgarh - Ajmer D/C	NA	ER-NR
47	765 kV Bhadla - Bikaner D/C	NA	ER-NR
48	765 kV Bhadla - Ajmer D/C	NA	ER-NR
49	one 765/400 kV, 1500 MVA ICT at Vindhyachal	NA	ER-NR
50	one 765/400 kV, 1500 MVA ICT at Satna	NA	ER-NR
51	one 765/400 kV, 1500 MVA ICT at Varanasi	NA	ER-NR
52	one 765/400 kV, 1500 MVA ICT at Agra	NA	ER-NR
53	one 765/400 kV, 1000 MVA ICT at Orai	NA	ER-NR
54	one 765/400 kV, 1500 MVA ICT at Phagi	NA	ER-NR

Annexure II

Regulation-21 of Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2023

21. Handling of electric supply lines and apparatus. – (1) Before any conductor or apparatus is handled, adequate precautions shall be taken, by earthing or other suitable means, to discharge electrically such conductor or apparatus, and any adjacent conductor or apparatus if there is danger therefrom, and to prevent any conductor or apparatus from being accidentally or inadvertently electrically charged when persons are working thereon shall be followed as per the relevant standards.

(2) Every person who is working on an electric supply line or apparatus or both shall be provided with, –

(a) personal protective equipment, tools and devices such as rubber gloves and safety footwear suitable for working voltage, safety belts for working at height, nonconductive ladder, earthing devices of appropriate class, helmet, line tester, hand lines, voltage detector and hand tools as per the relevant standards; and

(b) any other device for protecting him from mechanical and electrical injury due to arc flash and such personal protective equipment, tools and devices shall conform to the relevant standards and shall always be maintained in sound working condition.

(3) No person shall operate and undertake maintenance work on any part or whole of an electrical plant or electric supply line or apparatus and no person shall assist such person on such work, unless he is designated in that behalf and observes the safety precautions given in Part-I, Part-II, Part-III and Part-IV, as the case may be, of Schedule I.

(4) Every telecommunication line on supports carrying an overhead line of voltage exceeding 650 V but not exceeding 33 kV shall, for the purpose of working thereon, be deemed to be a line of voltage exceeding 650 V:

Provided that prior permission shall be taken from the concerned licensee before laying telecommunication lines on electric supports.

(5) For the safety of operating personnel, all non-current carrying metal parts of switchgear and control panels shall be properly earthed and insulating floors or mat conforming to the relevant standards, of appropriate voltage level shall be provided in front and rear of the panels where such personnel are required to carry out operation, maintenance or testing work.

(6) All panels shall be painted with the description of their identification at front and at the rear.

Schedule-1 of Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2023

Schedule I

Handling of electric supply lines and apparatus

[See sub-regulation (3) of regulation (21)]

Part-I

Precautions to be observed: -

(1) Hotline maintenance trained personnel only shall be designated to do work on line.

(2) Work permit shall be taken from the terminal substations at each end of the line.

(3) Work shall be performed with proper planning and prior understanding and clarity.

(4) Favourable climatic condition for hotline operations is sunny weather. If the weather forecasts rain or thunderstorms work will not begin.

(5) Organisation of work shall be discussed among the members and responsibility of each team member fixed.

(6) Before going to the work site, all equipment and tools shall be inspected and checked for correct operation.

(7) Auto re-closure shall be in `OFF' position for the line at both ends.

(8) The work procedure shall be discussed with the team member at the tower location and the responsibility of each member shall be properly defined.

(9) The land in close vicinity to the tower/poles shall be cleared to provide a site area for the required tools.

(10) All cleaned hot sticks, strain carrier and other assemblies shall be kept on the hotline tool rack to avoid ground contact.

(11) Helmet, safety shoes and safety belt shall compulsorily be used.

(12) All hot sticks and ladders shall be cleaned and checked for integrity by the hot sticks tester.

(13) All linemen in the hotline team shall be equipped with personal protective equipment during the work.

(14) No live-line team members on the tower and conductor shall wear any metallic chain, wristwatch or ring to avoid any circulating current.

(15) The team of linemen shall wear conductive socks, boots, helmets and hand gloves. The 'hot-end' lineman shall wear complete bare hand suit.

(16) Tarpaulin sheet should be laid on the work area.

(17) A light vehicle shall be kept nearby during entire work period.

Tools normally required for hot line maintenance operation: -

The following tools conforming to the relevant standards or equivalent specifications shall be used in on-line working:

(1) Wire tongs;

(2) Wire tongs saddle;

(3) Tie sticks;

(4) Strain link sticks;

(5) Roller link sticks;

(6) Suspension link sticks;

(7) Auxiliary arms;

(8) Strain carrier;

(9) Gin poles;

(10) Cum-a-along clamp;

(11) Safety equipment like conductor guards, X-arm guards, insulator covers, hand gloves and the like; and

(12) Hot sticks.

Safe Working Distance: -

The following safe working distances shall be observed for hot line maintenance operations:

Phase to Phase	Safe Clearance
kV	Metre
11	0.61
33	0.71
66	0.91
110	1.02
132	1.07
220	1.52
400	2.13

Declaration for Application of Hotline Maintenance

To,

Shift In-charge, NRLDC

All Safety norms specified in Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2023 of Hot line maintenance works, will be followed. All responsibility of safety measures to be followed lies with the executing agency.

Date of Application:

Date of Hotline Maintenance:

Signature and Stamp of Authorized person

Name:

Designation:

(not below the level of Deputy General Manager/

Executive Engineer/ Substation In-charge)

Name of Substation :_____ Region :_____

Date of Maintenance/Testing :_____

Duration of Hot line work :_____

Sl No:	Particular	Details
1.	Name of Element (Line/ICT/Reactor/Bay no.)/Bus on which Hot line work is to be done	
2.	Details of Work to be carried out.	
	2a)Method adopted for hot line work	Hot Stick/ Bare Hand
	2b) "Risks (Safety Risks/System Risk) Identified during the work"	• Work at Height (Fall hazard) • Exposure to electromagnetic induction • Electrocution • Excess Leakage current from Hot line tools
	2c) Mitigation Measures planned for above Risks.	(1) Hotline maintenance trained personnel only shall be designated to do work on line. (2) Work permit shall be taken from the terminal substations at each end of the line. (3) Work shall be performed with proper planning and prior understanding and clarity. (4) Favorable climatic condition for hotline operations is sunny weather. If the weather forecasts rain or thunderstorms work will not begin. (5) Work shall be carried out only if the leakage current is within limit i.e. 1 micro Amp per kV. (6) Organization of work shall be discussed among the members and responsibility of each team member fixed. The work procedure shall be discussed with the team member at the tower location and the responsibility of each member shall be properly defined. (7) Before going to the work site, all equipment and tools shall be inspected and checked for correct operation. (8) Auto re-closure shall be in `OFF" position for the line at both ends. (9) The land in close vicinity to the tower/poles shall be cleared to provide a site area for the required tools.

Name and Designation of Authorized Person

Signature and Stamp of Authorized Person

		(10) All cleaned hot sticks, strain carrier and other assemblies shall be kept on the hotline tool rack to avoid ground contact. (11) Helmet, safety shoes and safety belt shall compulsorily be used. (12) All hot sticks and ladders shall be cleaned and checked for integrity by the hot sticks tester. (13) All linemen in the hotline team shall be equipped with personal protective equipment during the work. (14) No live-line team members on the tower and conductor shall wear any metallic chain, wristwatch or ring to avoid any circulating current (15) The team of linemen shall wear conductive socks, boots, helmets and hand gloves. The `hot-end" lineman shall wear complete bare hand suit. (16) Tarpaulin sheet should be laid on the work area to keep the required tools and other material like conductive suit and other apparels. (17) A light vehicle shall be kept nearby during entire work period.
3.	Premises (Tick ✓ please)	○ **Work in Indenting Licensee Premises** ○ Work is in other utility Premises. ○ Work on Transmission Line
4.	Ensure the following before start of Hot line work (Tick ✓ please)	○ Minimum approach distance (MAD)/Safe Working Distance is maintained by the linesmen when they are exposed to energized parts. ○ The Hot line tools are tested by Hot stick tester and results are OK. ○ CHECKED PPE (Steel rope , Clamps, PP Rope , helmets , safety belts etc.) ○ SAFETY PEP talk before start of work by Maintenance I/C. ○ **Ensure presence of at least 2 executives from Transmission licensee and other utility if applicable.**

Name and Designation of Authorized Person

Signature and Stamp of Authorized Person

Format I: Request For Transmission Element Outage by indenting agency to NRPC

Format I: Request For Transmission Element Outage by Indenting agency to RPC												
Indenting Agency						For the month				Date		
S No	Request Type	OCC Number	Name of Requesting Agency	Element Name	Daily/ Continuous	Reason	From Date	From Time	To Date	To Time	Remarks	Tag
1	PLANNED/ Post OCC	OCC_XXX			C							Outage
2	PLANNED/ Post OCC	OCC_XXX			D							Outage
3	PLANNED/ Post OCC	OCC_XXX			C							Online
4	PLANNED/ Post OCC	OCC_XXX			D							Online
6	PLANNED/ Post OCC	OCC_XXX			C							AR in non-auto
7	PLANNED/ Post OCC	OCC_XXX			D							AR in non-auto
.												

Format II: List of Received Proposals for Transmission Element Outage from Different Agencies

Format II: List of Received Proposals for Transmission Element Outage from Different Agencies												
Name of RPC						For the month				Date		
S No	Request Type	OCC Number	Name of Requesting Agency	Element Name	Daily/ Continuous	Reason	From Date	From Time	To Date	To Time	Remarks	Tag
1	PLANNED /Post OCC	OCC_XXX			C							Outage
2	PLANNED /Post OCC	OCC_XXX			D							Outage
3	PLANNED /Post OCC	OCC_XXX			C							Online
4	PLANNED /Post OCC	OCC_XXX			D							Online
6	PLANNED /Post OCC	OCC_XXX			C							AR in non-auto
7	PLANNED /Post OCC	OCC_XXX			D							AR in non-auto
.												

Format III: List of OCC approved shutdowns of Transmission Elements

Format III: List of OCC approved shutdowns of Transmission Elements														
Name of RPC						For the month				Date				
Request Id	Request Type	OCC Number	Name of Requesting Agency	Element Name	Owner	Daily/ Continuous	Reason	From Date	From Time	To Date	To Time	RLDC/NLDC Remarks	OCC S/d Status	OCC Remarks
													Approved	
													Deferred	
													Deferred	

Format IV: Request for Transmission Element Outage by Indenting Agency to RLDC/SLDC

Request for emergency shutdown of elements to be submitted by requesting utility		
1	Element Name	
2	Reason	
3	Proposed Shutdown start Date and time	
4	Proposed Shutdown end Date and time	
5	Daily basis or continuous basis	
6	Proof of emergency (Attachment to be added along with outage proposal)	
7	Any other element/bay is under out in outage proposed stations	
8	Quantum of load or area affected during the outage	
9	Previous maintenance work carried out date	
10	Name and Designation of the officer responsible for site work	
11	Site contact number/responsible officer contact number	
12	Utility Remarks	
13	SLDC Remarks/Consent	

Format V: Monthly Shutdown Report for Transmission Elements by RLDCs

S No.	Name of Constituent	No. of outages planned in OCC	No. of planned outages in Post OCC	Total planned outages	Number of final outages approved	Number of actual outages availed	Availed vs Planned (%)	Availed Vs Approved (%)
		(a)	(b)	(c) = (a+b)	(d)	(e)	(f) = (e/c)	(g) = (e/d)
1	Constituen-1							
2	Constituen-2							
3								
4								
. . .								
	XXX Region							

Scope of work for
Centralized Database containing details of relay settings for grid elements connected to 220 kV and above

Scope of software shall be broadly as below for all elements in Northern Region connected to 220 kV and above voltage level:

A. **Protection Settings Database Management System.**
B. **Protection Setting Calculation and Study Tool.**
C. **Repository of DR/EL and analysis.**
D. **Application of protection settings by utilities and its approval by NRPC.**
E. **Reporting of performance indices by utilities.**
F. **Repository of protection audit reports.**

A. Protection Settings Database Management System

1. To create facility to store all types of relay settings of all power system elements (connected to 220 kV and above in Northern Region such as lines, cable, ICT, Reactor/Capacitor, generator, GT, STATCOM/SVC, FSC/TCSC, HVDC) in one system irrespective of the manufacturer and relay type and controlled access to users.
2. Complete modeling of elements with relevant system parameters **based on data received from utilities** for transmission lines, generators, transformers, reactors, substation layouts, and associated protective relays in the substations. The model should include CT, PT, Isolator, Breaker and other bay equipment's ratings along with rating of the BUS and the type of conductor used for the BUS. The modeling should be done as per bus-breaker philosophy instead of node-oriented model.
3. Creation of necessary relay templates of all make and model existing in grid. **Template for electro-mechanical relay shall also be required to be created. Users shall have option to provide settings of electro-mechanical relay.**
4. Option to users to upload relay setting files (downloaded from relay) directly.
5. To capture the life cycle of protection settings and template.
6. To create an interface with Protection Setting Calculation and Study Tool.

7. To provide Role based access control.
8. Building the entire Northern region network data for load flow and fault calculation, Protection database and substation SLD preparation.
9. Hardware setup and software package capable of meeting the above objectives. Associated servers for installation and Deployment of application and database software along with standard Operating System –With Main and Back up.
10. Work flow Management.
11. Availability of historical fault data for predicting nature of fault.
12. The tool should be capable of analyzing, storing, and handling all fault records (Disturbance record, Event Logger, COMTRADE files, etc.) for a minimum period of prescribed years; and the updated database to be used for fault analysis should be permanently available.
13. Reports:
    a. Feature to generate reports as per user requirement.
    b. User can generate report in standard format like .xls, .pdf.
14. History log: All user activities such as user operations, data management, template management, configuration management and workflow shall be logged to track the user activities.
15. Import and Export: There shall be an option to import template and data from any third party application in standard formats like .xml and .xls
16. Relay characteristics curve can be drawn from the setting data.
17. Provision to attach documents to relay template and relay data can be made available. Option to accept setting data as per the audit and verify/compare the field setting with protection database setting and generate error report.
18. Provision to store and retrieve audit reports.
    c. Provision to store and retrieve relay tripping incidence report.
    d. Facility to store and retrieve setting guidelines as per various committees.
    e. Automatic Reconciliation Tool should be available which will generate automatic reconciliation requests for relay settings in the database.
    f. Up-to-date application guides and user manuals of all relays is a part of the relay library.
19. A user-friendly interface with features such as
    a) Web based System.

b) Role based access control
c) Flexible customization of user roles, grants, actions from Master control panel
d) User Access Monitor
e) Relay Template Management
f) Create\Edit\Delete relay templates
g) Viewing relay template
h) Locking and Unlocking templates
i) Copy & Edit templates from the existing template
j) Import and Export templates
k) Relay Data management
l) Create\Edit\Delete relay data
m) Viewing relay data
n) Locking and Unlocking relay data
o) Copy & Edit relay data from the existing data
p) Import and Export relay data

20. Built with standard relays library data for different manufacturers, including but not restricted to the following protection features:

i. **Transmission Line & cable (including compensated):**
Distance, over current, earth fault, over voltage, Line Differential protection.

ii. **Power Transformer:**
Differential Protection, Under Impedance protection, Over fluxing Protection, Thermal Overload Protection, Low Impedance Restricted Earth Fault Protection, High Impedance Restricted Earth Fault Protection, back-up over current (Directional/ Non-Directional) and earth fault protection (Directional/ Non-Directional).

iii. **Shunt Reactors:**
Differential protection, Restricted Earth Fault, Back Up Protection (Impedance / overcurrent)

iv. **Generator:**
Differential Protection, Stator Earth Fault Protection (Both 95% and 100% protection), Inter – Turn Differential Protection, Backup impedance, Voltage Controlled O/C, Negative Sequence, Field Failure,

Reverse Power/Low forward Power, Pole Slipping, Overload, Over voltage, Under Frequency, Dead Machine, Rotor Earth Fault, Over Fluxing.

v. **Generator Transformer/ Unit Auxiliary Transformer:**

Differential Protection, Back up Earth Fault Protection, Back up over current, Restricted Earth Fault.

vi. **HVDC:**

- Converter Protection: Valve Short Circuit Protection, DC Differential Protection, DC Harmonic Protection, DC Under voltage Protection, DC Overvoltage Protection, AC Over voltage Protection, AC Under voltage Protection, AC Voltage Stress Protection of Converter, Group Differential Protection, Bridge Differential Protection, Overcurrent Protection, Sub-Synchronous Resonance Protection, AC Valve Winding Ground Fault Supervision,
- DC Filter Protection: Capacitor Differential Over current Protection, Capacitor Unbalance Supervision, Inverse Overcurrent Time Protection, DC Filter Differential Protection,
- DC Line Protection: Travelling Wave Front Protection, Under voltage Sensing Protection, Under voltage Operation Protection, DC Line Differential Protection, AC-DC Conductor Contact Protection.
- Electrode Line Protection: Electrode Bus Differential Protection, Electrode Current Balance Protection, Electrode Over Current Protection, Electrode line open circuit Over voltage Protection, Station Ground Overcurrent Protection, Open Conductor Electrode Line Protection
- DC Busbar Protection: HV Side DC Bus bar Differential Protection, Neutral Side DC Busbar Differential Protection, DC Differential Backup Protection, Valve Protection
- Converter Transformer Protection: differential protection, high impedance, restricted earth fault protection, ground earth fault overcurrent protection, thermal overload protection, over-fluxing protection, directional definite time / inverse-time overcurrent protection and directional earth fault overcurrent protection.

- AC Filter Sub-bank Protection (Shunt/Capacitor/Resistor): Differential, overcurrent, overload, unbalance supervision, Zero Sequence Overcurrent.

vii. STATCOM:

- Transformer Protection: Differential protection, REF protection, Directional Overcurrent protection, Ground Overcurrent, over flux protection, Transformer mechanical trips.
- STATCOM (MV) Bus protection: Bus Differential protection, Ground over current protection, used with neutral Grounding Transformer, Under/ Over Voltage protection, Over voltage (Open Delta) protection.
- STATCOM Branch Protection: Differential protection and/or O/C protection, Ground over current protection , Valve Overcurrent protection (in Controls), DC overvoltage protection (in Controls)
- MSR/TCR Branch Protection: Differential protection, Ground over current protection, Reactor branch unbalance protection, Thermal Overload protection.
- MSC/TSC Branch Protection: Differential protection, Ground over current protection, Capacitor Overvoltage (Using current signal) protection, Capacitor unbalance protection, over current protection.
- Harmonic Filter Protection: Ground over current protection, Capacitor Overload (Using current signal) protection, over current protection, Neutral Voltage shift.
- Auxiliary Transformer Protection: Over current, open delta voltage protection.

viii. SVC:

- Coupling Transformer (HV & MV) Protection: Differential protection, REF protection, Directional Overcurrent protection, Ground Overcurrent, over flux protection, Transformer mechanical trips.
- SVC Bus Bar protection: Bus Differential protection, Ground over current protection, used with neutral Grounding Transformer, Under/ Over Voltage protection, Over voltage (Open Delta) protection.

- TCR Protection: Differential protection, Ground over current protection, Reactor branch unbalance protection, Thermal Overload protection.
- TSC Protection: Differential protection, Ground over current protection, Capacitor Overvoltage (Using current signal) protection, Capacitor unbalance protection, over current protection.
- Harmonic Filter Protection: Differential protection, Ground over current protection, Capacitor Overvoltage (Using current signal) protection, Capacitor unbalance protection, over current protection, Neutral Voltage shift.
- Auxiliary Transformer Protection: Over current, open delta voltage protection.

ix. **FSC & TCSC:** Capacitor unbalance, Capacitor overload, Line current supervision, MOV overload, MOV short term energy protection, MOV high current protection, MOV high temperature protection, MOV failure protection, Flashover to platform protection, Spark Gap protection, Trigger circuit supervision, Sub-harmonic protection, Pole disagreement protection, Bypass switch failure protection,

x. **BUSBAR & LBB**: Differential protection, Beaker Failure Protection

21. Protection Settings Database Management System shall be suitable for integration with other portals, software of protection. It shall be able to integrate any third party application to share data between protection database management software and calculation engine/tool and vice versa.
22. Training of utilities.
23. AMC.

B. Protection Setting Calculation and Study Tool.

This module shall be capable of giving recommendation of Protection Setting for protections of elements as mentioned under point no. 20 of para A. Calculation Tool should be capable of performing the following:

1. Relay co-ordination for power system elements. Co-ordination check shall be conducted for relays of all make.
2. Primary/back-up relay pairs generation.
3. Fault calculation will be a part of relay co-ordination program.

4. Transparent Fault calculation results.
5. Simulation engines for protection co-ordination, power flow analysis, fault calculation, transient stability studies, electromagnetic transient analysis, and protection relay operation post-mortem analysis. There should be features to study low frequency oscillations, 3rd zone tripping, PSS tuning support and Voltage collapse prediction feature.
6. The protection calculation tool should be capable of interacting with the relay data in the database.
7. Tool for simulating the performance/ behavior of the protection system under all possible normal and abnormal operating conditions of the power system, including effect of changing one or more parameter setting of the relays.
8. Diagnostics Tool for verifying proper coordination among various protective relays.
9. Computation of critical clearing time.
10. Plotting Log-Log grid and graphs.
11. Option to check existing relay settings with respect to field or vice versa.
12. Computation of Out of Step Tripping Protection Settings.
13. Display of sequence operation of relays with respect to tripping time.
14. Switching status for all relays elements from the screen.
15. Association of relays to power system elements.
16. Disturbance analysis can be done on mapping of disturbances files with corresponding relay.
17. It shall have standard power system components and relay symbols.
18. Automatic computation of zone setting for distance protection.
19. Feature for viewing existing and newly computed relay settings.
20. Pre-loaded standard relay curves.
21. Directional and non-directional feature for relays.
22. Overload factor, unbalance factor and discrimination time (user defined/selectable) for each relay.
23. Inbuilt discrimination time calculator for grading of relays.
24. Facility to model the back-up protection settings of generating units / GTs.

C. Repository of DR/EL and analysis.

a) Platform for upload of DR/EL by utilities and access to all.

b) Tracking of non-compliance in uploading.

c) Tool for analysis of DR/EL.

d) Tool shall be integrated with outage portal of NRLDC so that it can capture details of outages of elements automatically from NRLDC portal so that users can upload DR, EL, FIR, tripping report, analysis report.

D. Application of protection settings by utilities and its approval by NRPC.

a) Platform for application of protection setting by utilities.

b) Hierarchical role for scrutiny and approval of setting by NRPC.

c) Intimation of approval of settings by NRPC.

d) Intimation of implementation of settings by utilities.

E. Reporting of performance indices by utilities.

a) Platform for reporting of performance indices by utilities.

b) Feature for scrutiny and intimation of errors to utilities by NRPC.

c) Recording of justification note for non-compliance.

F. Repository of protection audit reports.

a) Platform for reporting of internal and external audit report of all utilities.

b) Tracking non-compliance and next due date.

c) Web-based Checklist for protection audit should be made available for Constituents to self-auditing.

*****

License requiremet for Protection Calculation Tool of Northern region				
S. No.	**NRPC Member**	**Category**	**No. of License Key Required**	**Remarks**
1	NRPC	Secretariat	2	
2	PGCIL	Central Government owned Transmission Company	3	NR-1,2,3
3	NLDC	National Load Despatch Centre	1	
4	NRLDC	Northern Regional Load Despatch Centre	1	
5	NTPC	Central Generating Company	1	
6	BBMB		1	
7	THDC		1	
8	SJVN		1	
9	NHPC		1	
10	NPCIL		1	
11	Delhi SLDC	State Load Despatch Centre	1	
12	Haryana SLDC		1	
13	Rajasthan SLDC		1	
14	Uttar Pradesh SLDC		1	
15	Uttarakhand SLDC		1	
16	Punjab SLDC		1	
17	Himachal Pradesh SLDC		1	
18	DTL	State Transmission Utility	1	
19	HVPNL		1	
20	RRVPNL		1	
21	UPPTCL		1	
22	PTCUL		1	
23	PSTCL		1	
24	HPPTCL		1	
25	IPGCL	State Generating Company	1	
26	HPGCL		1	
27	RRVUNL		1	
28	UPRVUNL		1	
29	UJVNL		1	
30	HPPCL		1	
31	PSPCL	State Generating Company & State owned Distribution Company	1	
32	HPSEBL	Distribution company having Transmission connectivity ownership	1	
33	Prayagraj Power Generation Co. Ltd.	IPP having more than 1000 MW installed capacity	1	
34	Aravali Power Company Pvt. Ltd		1	
35	Apraava Energy Private Limited		1	
36	Talwandi Sabo Power Ltd.		1	
37	Nabha Power Limited		1	
38	Lanco Anpara Power Ltd		1	

		Installed capacity		
39	Rosa Power Supply Company Ltd		1	
40	Lalitpur Power Generation Company Ltd		1	
41	MEJA Urja Nigam Ltd.		1	
42	Adani Power Rajasthan Limited		1	
43	JSW Energy Ltd. (KWHEP)		1	
44	Greenko Group	Other IPP	1	
45	Sravanthi Energy Private Ltd		1	
46	NTPC Renewable Energy wing		1	
47	RENEW POWER		1	
48	Adani Power Ltd		1	
49	Avaada Energy		1	
50	Mahindra Solar		1	
51	ACME Heeragarh Powertech Pvt. Ltd.		1	
52	Tata Power Renewable Energy Ltd.		1	
53	Azure Power Pvt. Ltd.		1	
54	Thar Surya Pvt. Ltd.		1	
55	Ayana Renewable Power Pvt. LTd.		1	
56	CSP(J)PL, Hero Future Energies		1	
57	ABC Renewable Energy(RJ-01) Pvt. Ltd.		1	
58	Eden Renewable Cite Pvt. Ltd.		1	
59	UT of J&K	UT of Northern Region	1	
60	UT of Ladakh		1	
61	UT of Chandigarh		1	
62	ATIL	Other transmission licensee in NR	1	
63	INDIGRID		1	
64	POWERLINK		1	
65	ADHPL		1	
66	Sekura Energy Limited		1	

Tapping Tertiary of 765/400/33 kV ICT -2 for Reliable Auxiliary Power Supply to ±500kV HVDC Ballia Sub-Station & 765/400/132 KV Ballia HVAC Sub-station.

➢ ***Gist of Balia HVDC & HVDC substations :***

- *500kV Ballia – Bhiwadi HVDC Bi-pole with 2500MW power transfer capacity.*

- *765kV Elements*
  - ❖ *3 Nos of 765kV Circuits (Inter & Intra regional connectivity)*
  - ❖ *2 Nos. of 765/400kV ICTs*
  - ❖ *2 Nos. of 765kv Bus Reactors*

- *400kV Elements*
  - ❖ *10 Nos of 400kV Circuits (Inter & Intra regional connectivity)*
  - ❖ *1 Nos. of 400/132kV ICTs*
  - ❖ *4 Nos. of 400kv Bus Reactors*

- *132kV Elements*
  - ❖ *2 Nos of 132kV Transmission lines (UPPTCL feeders) connected with 200 MVA, 400/132/33kV ICT -1.*

➢ *Successful operation of HVDC auxiliary system such as Thyristor cooling water pump, Tap changer of Convertor transformer etc are wholly dependent on uninterrupted Auxiliary power supply.*

Connectivity of Auxiliary Sources at Ballia HVDC & HVAC Substations

Year 2007

- *400kV Ballia Substation commissioned*
- *Auxiliary source : Only one dedicated 33kV Feeder from UPPTCL S/s.*

Year 2010

- *+/- 500kV HVDC Ballia – Bhiwadi Bi-Pole commissioned*
- *Second Auxiliary sources from 200MVA ,400/132/33kV ICT -1 Tertiary*

Year 2012

- *765kV Ballia Substation was commissioned along with 02 Nos - 765/400/33kV ICTs.*

- ***Presently Auxiliary AC supply of Ballia HVDC & HVAC system are operated and maintained with support of 02 sources:***

  1. From Tertiary of 200MVA ,400/132kV ICT-1 at Balia

  2. 33kV Dedicated feeder from 132/33kV Simrli Jamalpur (UPPTCL) substation.

Constraints in Reliable dual source of Auxiliary supply at Ballia HVDC & HVAC :

1. Tertiary supply connected through 400/132kV ICT 1 at Ballia - Protective relay senses frequent faults in associated 132kV lines.

2. Frequent interruptions in 33kV dedicated UPPTCL feeder.

Operational issues due to Auxiliary supply at Ballia HVDC & HVAC

- *Both supplies are always on load condition to HVDC LVAC buses of Pole- 1 and Pole-2 and Bus Coupler under open condition. This provision is standard for HVDC Auxiliary supply to prevent dead bus condition during changeover in case of any one supply fails.*

- *There are frequent faults in 02 Nos 132 KV transmission lines connected with 400/132/33kV ICT at Ballia and it affects reliability of the ICT. Detail of line faults in 132kV UPPTCL Lines in last 3 months (Total 673 times relay detected line faults).*

- *Due to frequent breakdowns of 33KV UPPTCL feeder, the Auxiliary Power supply changeover occurs multiple times which is undesirable in view of frequent MV/LT CB operation, Valve Cooling Pump changeovers & UPS bypass operation etc.*

- ***Fault sensed by 400/132kV ICT at Ballia due to frequent line faults (Period : Aug 23 to Oct 23)***

Through Fault Data in 132kV Lines (UPPCL) at HVDC Ballia Terminal Station

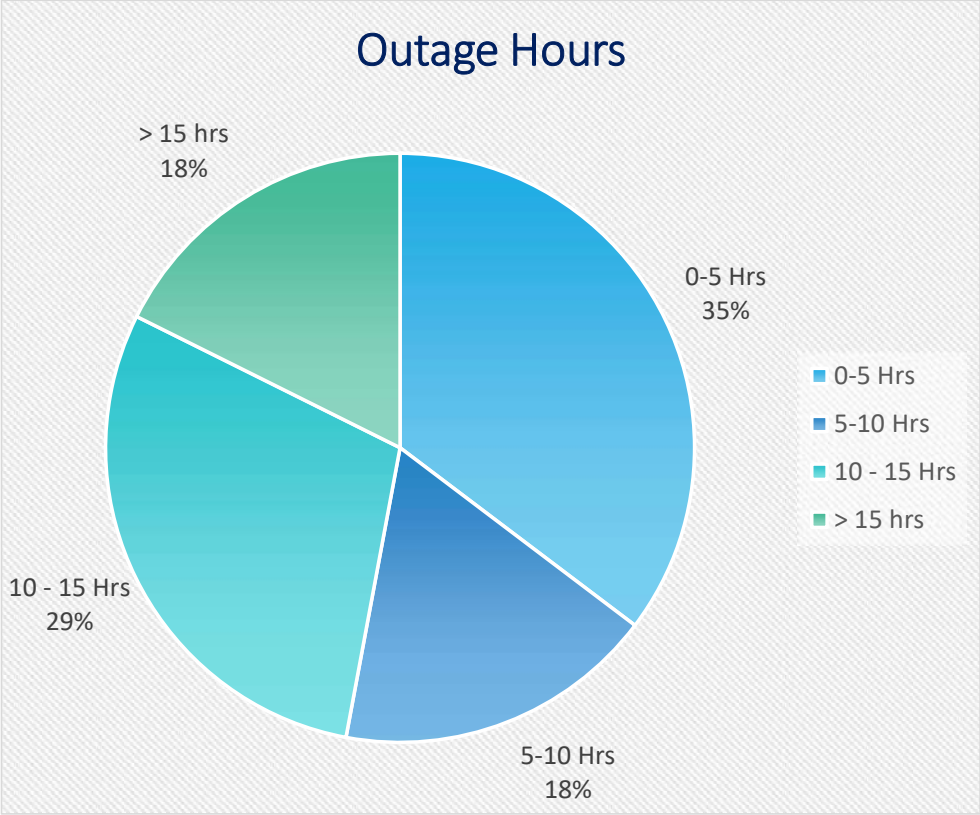
Sl. No.	Date	Time	Locat	Volta	Bay/D	Devic	Information Text	Value
1	01-8-2023	01:04:59	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
2	01-8-2023	01:15:22	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
3	01-8-2023	03:00:35	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
4	01-8-2023	21:41:56	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
5	01-8-2023	23:57:47	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
6	02-8-2023	03:12:48	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
7	02-8-2023	07:51:22	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
8	02-8-2023	10:24:49	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
9	02-8-2023	15:45:01	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
10	02-8-2023	17:49:34	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
11	02-8-2023	18:00:08	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
12	02-8-2023	18:48:25	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
13	03-8-2023	08:13:19	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
14	03-8-2023	12:50:21	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
15	03-8-2023	12:54:51	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
16	03-8-2023	13:09:45	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
17	03-8-2023	13:18:16	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
18	03-8-2023	13:25:13	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
19	04-8-2023	00:37:10	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
20	04-8-2023	11:53:14	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
21	04-8-2023	17:02:50	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
22	05-8-2023	06:59:18	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
23	05-8-2023	07:30:00	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
24	05-8-2023	07:30:00	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
25	05-8-2023	10:22:54	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
26	06-8-2023	06:27:10	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
27	06-8-2023	09:00:49	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
28	06-8-2023	12:46:29	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
29	06-8-2023	15:53:08	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
30	06-8-2023	17:42:35	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
31	06-8-2023	17:58:22	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
32	06-8-2023	18:26:03	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
33	06-8-2023	18:28:16	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
34	06-8-2023	18:28:16	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
35	06-8-2023	18:42:54	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
36	06-8-2023	18:46:24	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
37	06-8-2023	18:55:10	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
38	07-8-2023	06:44:03	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
39	07-8-2023	08:44:23	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
40	07-8-2023	12:15:06	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
41	07-8-2023	16:38:49	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
42	08-8-2023	19:18:44	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
43	08-8-2023	19:30:57	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
44	09-8-2023	00:33:50	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
45	09-8-2023	03:56:10	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
46	09-8-2023	04:01:33	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
47	09-8-2023	04:15:21	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
48	09-8-2023	07:04:48	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
49	09-8-2023	15:40:51	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
50	10-8-2023	06:44:39	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
51	10-8-2023	11:39:50	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
52	11-8-2023	09:01:29	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
53	11-8-2023	14:05:26	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
54	11-8-2023	14:05:26	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
55	11-8-2023	18:26:37	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
56	11-8-2023	21:15:19	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
57	11-8-2023	21:21:05	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
58	11-8-2023	21:26:16	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
59	11-8-2023	23:46:56	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
60	12-8-2023	04:31:26	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
61	12-8-2023	05:12:38	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
62	12-8-2023	05:24:09	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
63	12-8-2023	05:36:29	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
64	12-8-2023	11:51:30	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
65	12-8-2023	12:23:29	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
66	12-8-2023	13:59:49	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
67	12-8-2023	14:24:20	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
68	13-8-2023	06:40:49	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
69	13-8-2023	08:17:50	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
70	13-8-2023	12:11:20	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
71	13-8-2023	13:26:31	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
72	13-8-2023	14:00:45	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
73	14-8-2023	03:14:22	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
74	14-8-2023	05:06:28	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
75	14-8-2023	08:23:48	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
76	14-8-2023	13:17:07	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
77	15-8-2023	06:54:50	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
78	15-8-2023	07:38:49	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
79	15-8-2023	15:04:26	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
80	15-8-2023	17:17:08	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
81	16-8-2023	00:47:08	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
82	16-8-2023	05:53:52	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
83	16-8-2023	06:10:36	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
84	16-8-2023	06:56:52	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
85	16-8-2023	13:34:12	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
86	16-8-2023	18:44:56	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
87	16-8-2023	23:24:28	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
88	17-8-2023	07:01:51	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
89	17-8-2023	07:22:01	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
90	17-8-2023	08:47:22	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
91	17-8-2023	15:42:44	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
92	17-8-2023	15:48:30	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
93	17-8-2023	15:52:54	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
94	17-8-2023	18:19:40	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
95	17-8-2023	19:32:22	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
96	18-8-2023	04:15:47	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
97	18-8-2023	13:43:57	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
98	18-8-2023	14:20:11	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
99	18-8-2023	14:21:36	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
100	18-8-2023	14:56:31	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE

- ***Fault sensed by 400/132kV ICT at Ballia due to frequent line fault (Period : Aug 23 to Oct 23)***

Sl. No.	Date	Time	Locat	Volta	Bay/D	Devic	Information Text	Value
560	19-10-2023	16:55:21	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
561	20-10-2023	07:36:50	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
562	20-10-2023	07:36:50	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
563	20-10-2023	08:13:11	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
564	20-10-2023	08:13:11	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
565	21-10-2023	16:30:56	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
566	21-10-2023	16:30:56	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
567	22-10-2023	00:16:57	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
568	22-10-2023	00:16:57	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
569	22-10-2023	08:06:35	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
570	22-10-2023	08:06:35	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
571	23-10-2023	03:06:18	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
572	23-10-2023	03:06:18	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
573	24-10-2023	08:43:36	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
574	24-10-2023	08:43:36	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
575	24-10-2023	13:09:17	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
576	24-10-2023	13:09:17	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
577	24-10-2023	16:28:33	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
578	24-10-2023	16:28:33	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
579	01-10-2023	00:55:48	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
580	01-10-2023	00:55:48	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
581	01-10-2023	12:53:09	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
582	01-10-2023	12:53:09	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
583	01-10-2023	14:01:22	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
584	01-10-2023	14:01:22	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
585	02-10-2023	07:24:23	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
586	02-10-2023	07:24:23	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
587	02-10-2023	12:58:55	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
588	02-10-2023	12:58:55	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
589	03-10-2023	16:32:35	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
590	03-10-2023	16:32:35	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
591	04-10-2023	04:37:50	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
592	04-10-2023	04:37:50	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
593	04-10-2023	06:08:03	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
594	04-10-2023	06:08:03	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
595	04-10-2023	17:39:58	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
596	04-10-2023	17:39:58	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
597	05-10-2023	12:04:00	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
598	05-10-2023	12:04:00	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
599	05-10-2023	17:26:20	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
600	05-10-2023	17:26:20	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
601	06-10-2023	01:42:27	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
602	06-10-2023	01:42:27	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
603	06-10-2023	04:32:00	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
604	06-10-2023	04:32:00	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
605	06-10-2023	06:10:52	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
606	06-10-2023	06:10:52	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
607	06-10-2023	21:19:59	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
608	06-10-2023	21:19:59	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
609	06-10-2023	21:55:41	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
610	06-10-2023	21:55:41	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE

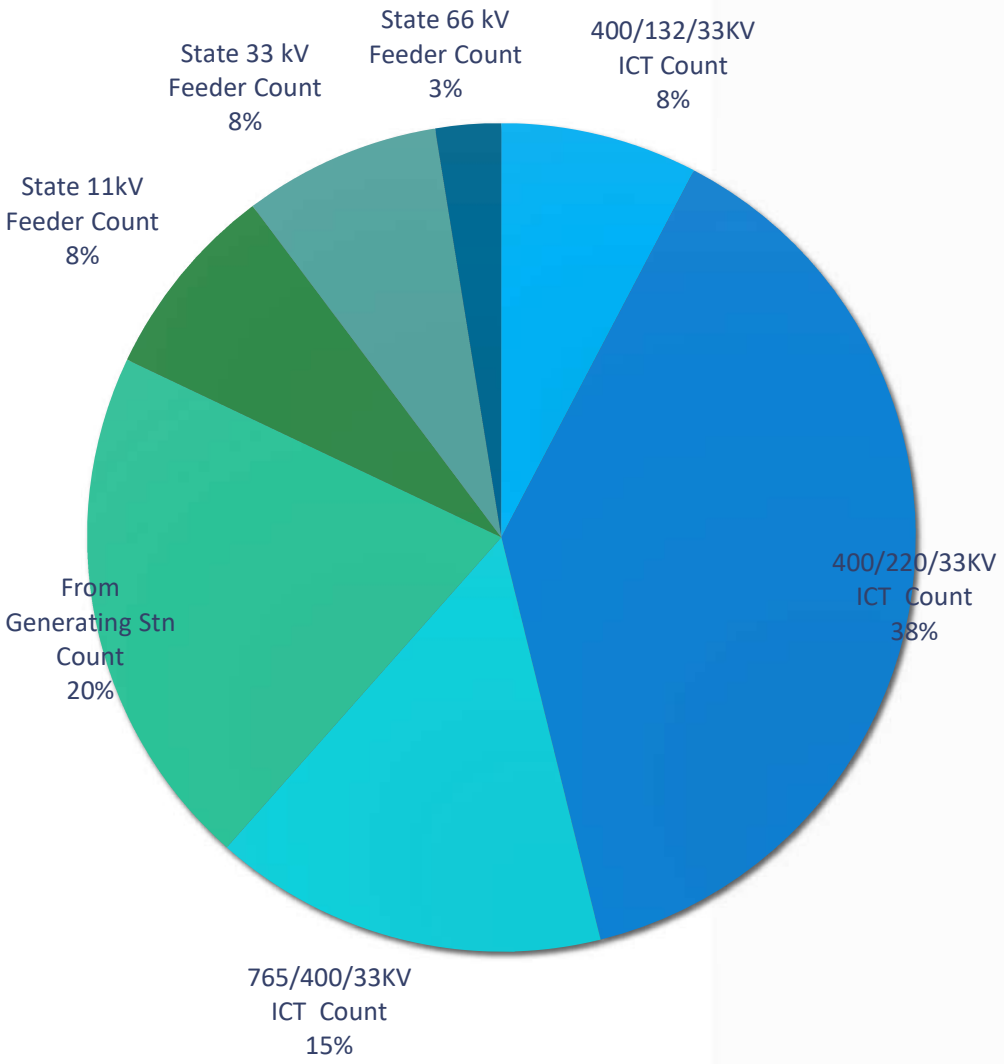
Sl. No.	Date	Time	Locat	Volta	Bay/D	Devic	Information Text	Value
611	07-10-2023	06:05:47	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
612	07-10-2023	06:05:47	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
613	07-10-2023	07:09:42	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
614	07-10-2023	07:09:42	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
615	07-10-2023	13:55:20	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
616	07-10-2023	13:55:20	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
617	07-10-2023	17:55:07	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
618	07-10-2023	17:55:07	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
619	08-10-2023	05:01:46	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
620	08-10-2023	05:01:46	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
621	08-10-2023	14:24:09	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
622	08-10-2023	14:24:09	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
623	08-10-2023	20:22:24	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
624	08-10-2023	20:22:24	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
625	09-10-2023	01:25:26	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
626	09-10-2023	01:25:26	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
627	09-10-2023	04:37:33	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
628	09-10-2023	04:37:33	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
629	09-10-2023	04:43:46	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
630	09-10-2023	04:43:46	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
631	09-10-2023	07:26:57	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
632	09-10-2023	07:26:57	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
633	09-10-2023	07:43:27	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
634	09-10-2023	07:43:27	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
635	09-10-2023	07:49:44	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
636	09-10-2023	07:49:44	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
637	09-10-2023	10:00:35	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
638	09-10-2023	10:00:35	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
639	09-10-2023	10:39:08	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
640	09-10-2023	10:39:08	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
641	09-10-2023	10:45:46	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
642	09-10-2023	10:45:46	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
643	09-10-2023	23:40:17	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
644	09-10-2023	23:40:17	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
645	10-10-2023	00:14:49	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
646	10-10-2023	00:14:49	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
647	10-10-2023	05:10:36	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
648	10-10-2023	05:10:36	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
649	10-10-2023	08:58:52	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
650	10-10-2023	08:58:52	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
651	27-10-2023	05:43:07	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
652	27-10-2023	05:43:07	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
653	27-10-2023	12:09:27	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
654	27-10-2023	12:09:27	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
655	28-10-2023	02:15:26	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
656	28-10-2023	02:15:26	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
657	28-10-2023	08:15:35	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
658	28-10-2023	08:15:35	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
659	28-10-2023	09:10:50	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
660	28-10-2023	09:10:50	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE
661	28-10-2023	09:16:24	KIOS	132	BAY 1	7SJ62	Total.Pickup	RAISE

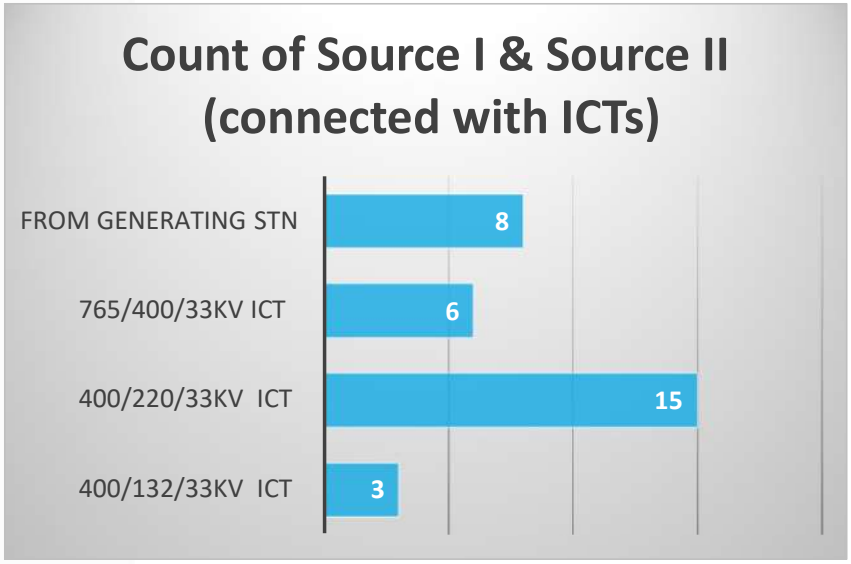
- ***Auxiliary Supply – 33kV UPPTCL feeder Interruption details***

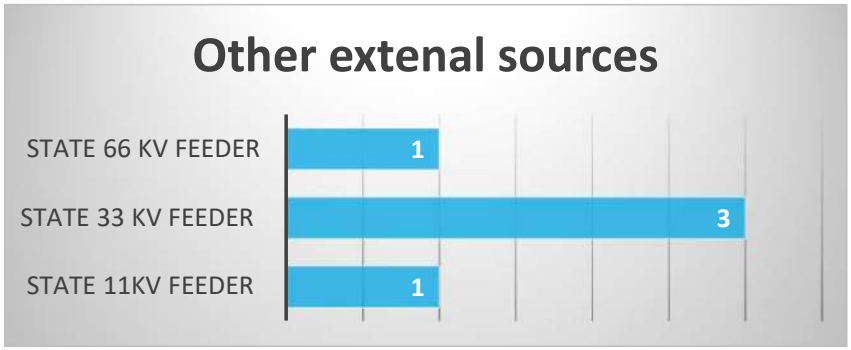


33KV UPPCL TRIPPING DETAILS			
Time of Tripping		Line taken into service	
DATE	TIME	DATE	TIME
01.05.2023	20:05	02.05.2023	10:44
07.05.2023	19:40	08.05.2023	12:09
20.05.2023	11:43	20.05.2023	17:59
06.06.2023	23:59	07.06.2023	09:32
10.06.2023	16:14	10.06.2023	17:45
19.06.2023	06:20	19.06.2023	09:37
15.07.2023	14:18	15.07.2023	14:43
07.08.2023	03:29	07.08.2023	15:58
09.08.2023	06:17	09.08.2023	10:10
13.08.2023	08:53	13.08.2023	10:30
17.08.2023	19:58	18.08.2023	13:19
22.08.2023	22:40	23.08.2023	11:58
30.08.2023	18:46	01.09.2023	16:42
03.09.2023	09:35	03.09.2023	16:25
08.09.2023	09:51	09.09.2023	16:15
09.09.2023	20:54	21.09.2023	10:33
26.09.2023	13:09	26.09.2023	15:32
16.10.2023	22:02	17.10.2023	10:39
16.11.2023	23:24	18.11.2023	13:10
19.11.2023	20:19	20.11.2023	16:57

POPULATION OF AUXILIARY SOURCES IN HVDC STATIONS







Availability of Reliable Dual source Auxiliary(HT Feeders) Connectivity in Various HVDC S/S

Substation / Region	Source I	Source II	Others
Champa (WR-1)	765/400/33KV ICT 1 Tertiary	765/400/33KV ICT 4 Tertiary	
Kurushektra(NR1-)	400/220/33KV ICT 1 Tertiary	400/220/33KV ICT 2 Tertiary	State 11kV Feeder for Construction purpose
Raigarh(WR-1)	765/400/33KV ICT 1 Tertiary	765/400/33KV ICT 2 Tertiary	State 11kV Feeder
Pugalur(SR-2)	400/220/33KV ICT 1 Tertiary	400/220/33KV ICT 2 Tertiary	State 11kV Feeder for Colony
Thrissur (SR-2)	400/220/33KV ICT 1 Tertiary	400/220/33KV ICT 2 Tertiary	
Bhadrawati (WR-2)	400/220/33KV ICT 1 Tertiary	400/220/33KV ICT 2 Tertiary	
Vizag (SR-1)	400/220/33KV ICT 1 Tertiary	400/220/33KV ICT 2 Tertiary	State 33 kV Feeder
Bhiwadi (NR-1)	400/220/33KV ICT 1 Tertiary	400/220/33KV ICT 2 Tertiary	State 33 kV Feeder for Colony
Agra HVDC(NR-3)	765/400/33KV ICT 1 Tertiary	400/220/33KV ICT 1 Tertiary	
Agra HVAC(NR-3)	765/400/33KV ICT 2 Tertiary		State 33 kV Feeder
BiswanathCharili(NER)	400/132/33KV ICT 1 Tertiary	400/132/33KV ICT 2 Tertiary	
Alipurduar(ER)	400/132/33KV ICT 1 Tertiary	400/132/33KV ICT 2 Tertiary	
Rihand (NR-3)	Rihand(NTPC) Stage 1	Rihand(NTPC) Stage 2	Rihand(NTPC) Stage 5
Dadri (NR-1)	Dadri(NTPC) Stage 1	Dadri(NTPC) Stage 2	
Talcher (ER)	Talcher Stage 2	Talcher Stage 3	Talcher Stage 4
Kolar (SR-2)	400/220/33KV ICT 1 Tertiary	400/220/33KV ICT 2 Tertiary	State 66 kV Feeder

Proposal for Reliable dual source of Auxiliary supply at Balia HVDC & HVAC

- *To ensure reliability of auxiliary system for Balia HVDC & HVAC substation and as mentioned above in other HVDC stations which has provision for reliable dual sources of auxiliary supply from tertiary of the two independent ICTs or dedicated feeders from generating plants/State feeder as per site feasibility.*
- *Separate connection from Tertiary supply of 765/400/33kV ICT-2 is necessitated for reliable sources to HVDC and HVAC Auxiliary Power Supply in view of Non reliability of existing source.*

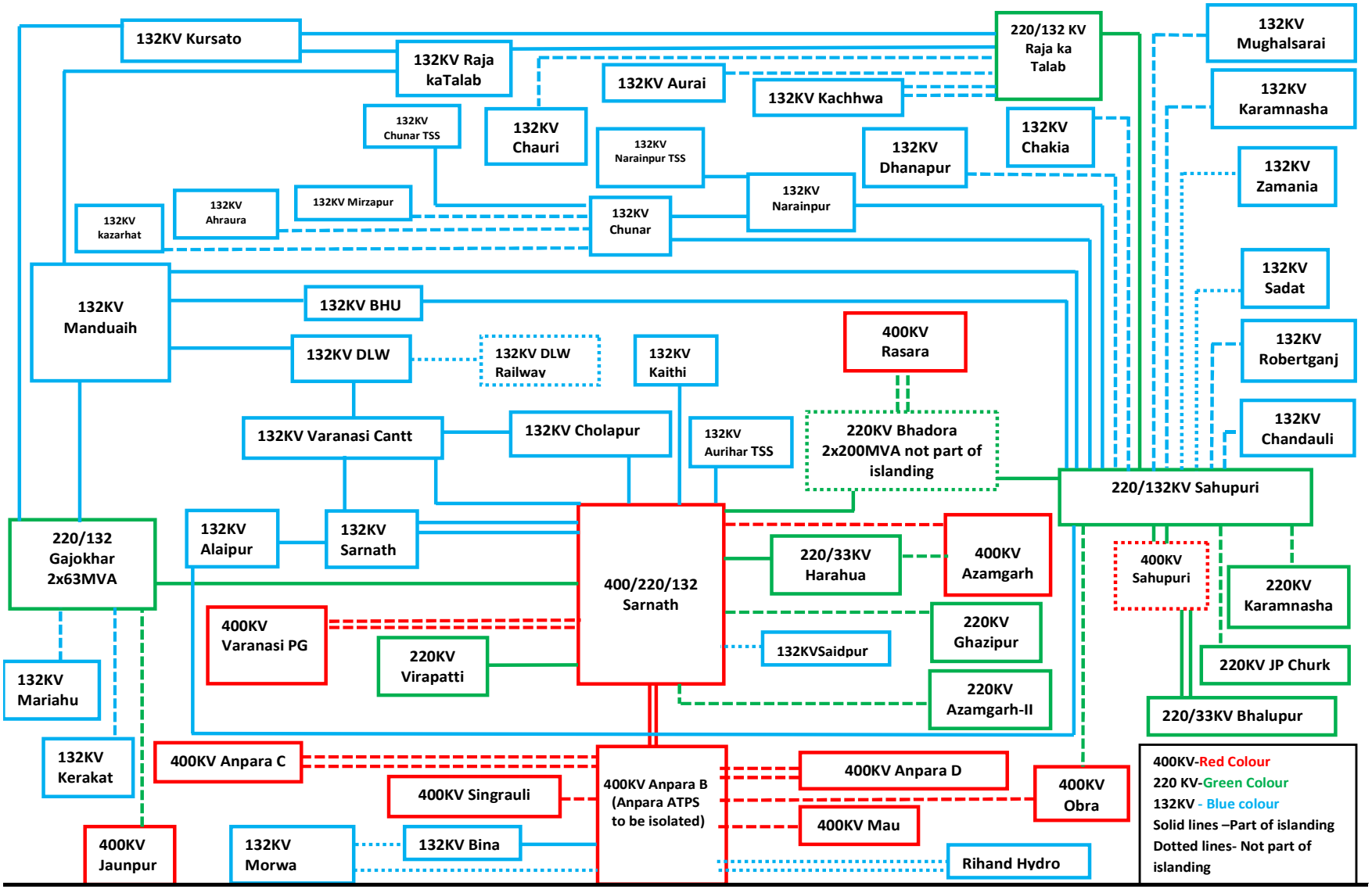
In view of above facts, POWEGRID proposes that –Alternate Source connectivity from tertiary of 765/400/33 kV ICT-2 in addition to the existing UPPTCL Supply(33kV feeder) & 200MVA 400/132kV ICT Tertiary for Reliable Auxiliary Supply to ±500kV HVDC Ballia Substation with approx. cost estimate of Rs 1.25 Cr may be considered under ADDCAP.

Varanasi Islanding Scheme(VIS)

Varanasi Islanding Scheme(VIS)

- Generation-Anpara BTPS(2X500 MW)
- Load – From Varanasi Region

Block Diagram of Varanasi islanding scheme

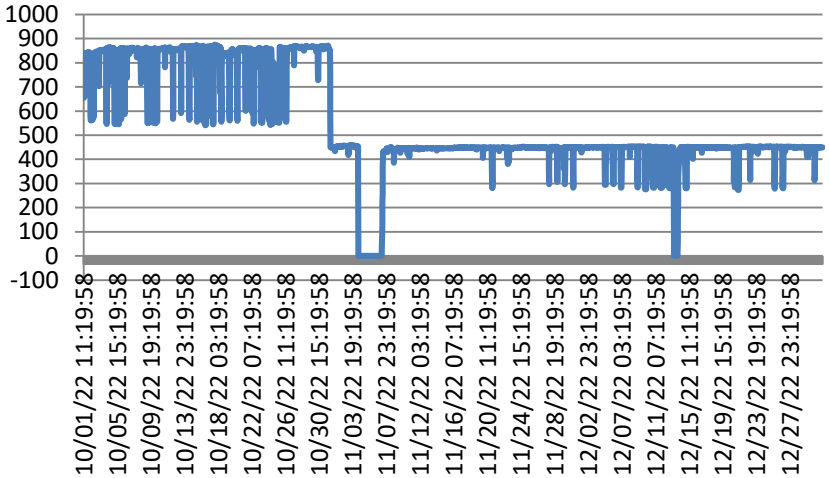


Load details of Varanasi Islanding Scheme

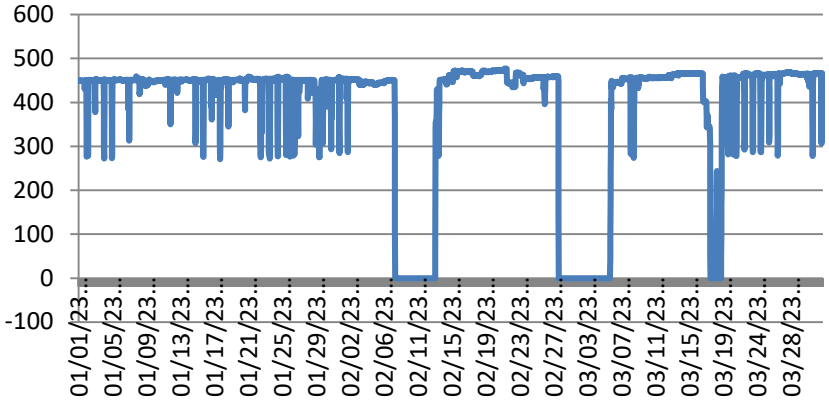
Summer Peak (2022-23) MW	Summer Off Peak (2022-23) MW	Summer Average (2022-23)	Winter Peak (2022-23) MW	Winter Off Peak (2022-23)MW	Winter Average (2022-23)
879	420	643	688	385	490

Generation Pattern of Anpara BTPS (2x500MW)

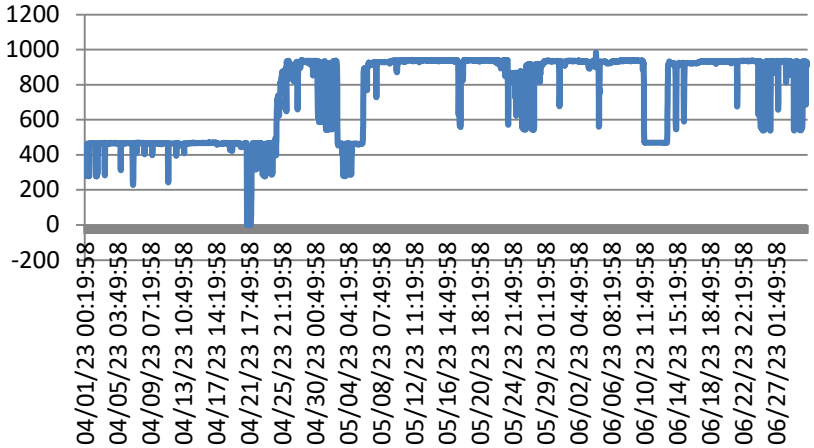
October-December-2022



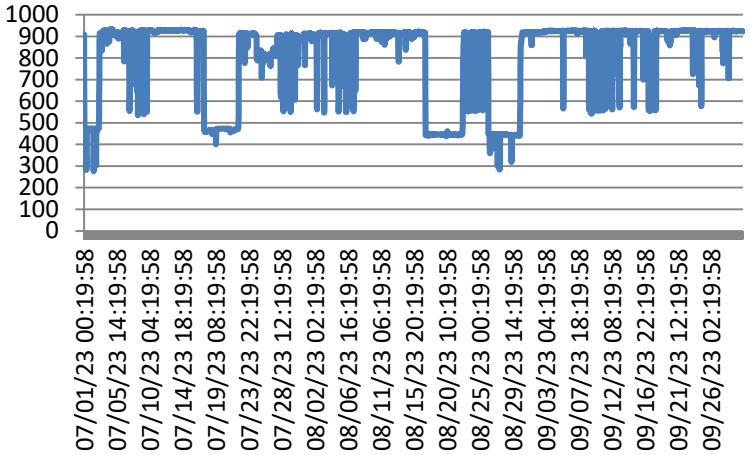
January-March -2023



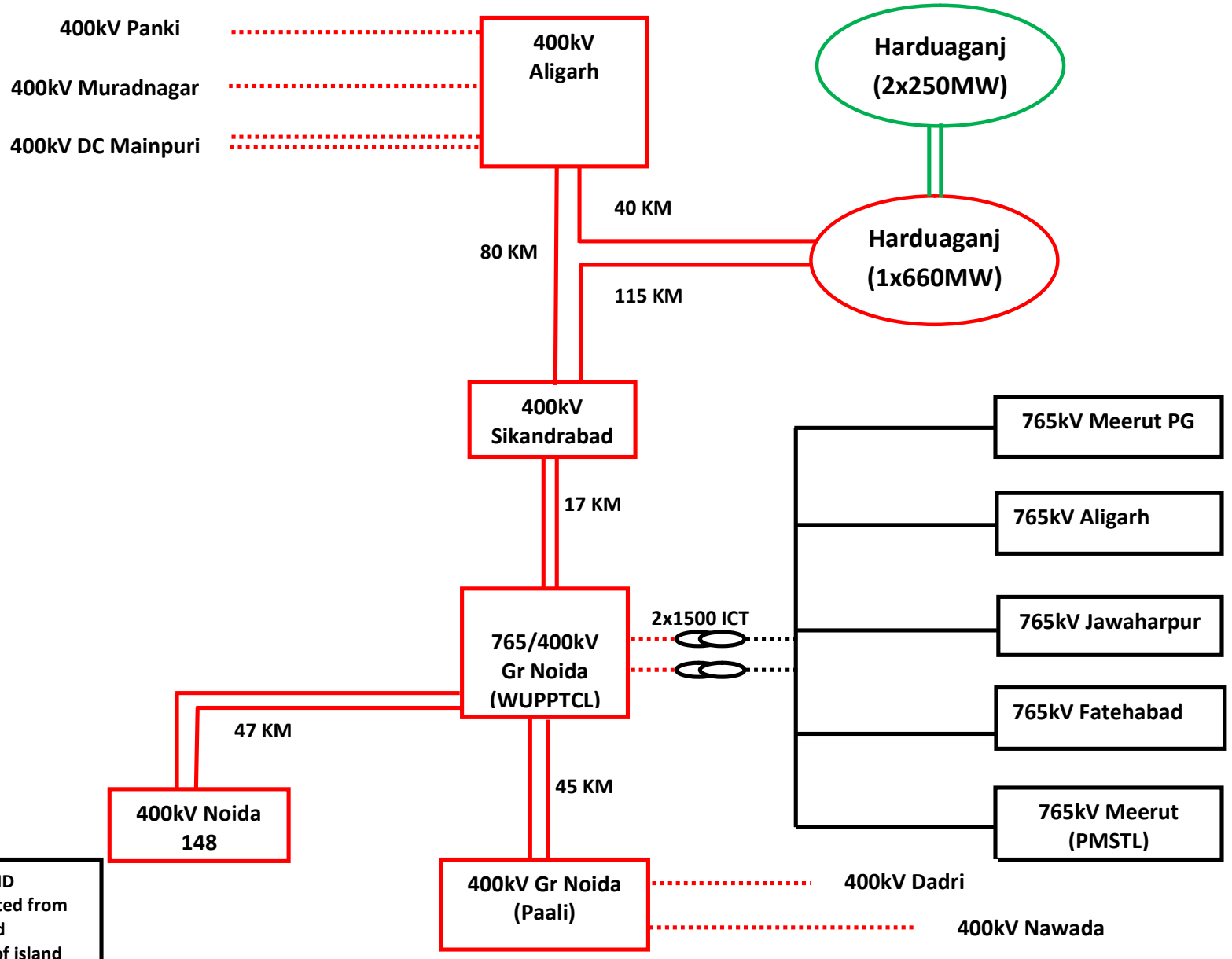
April-June-2023



July-September-2023



SLD of Proposed Noida Islanding Scheme



	RE Complex of Northern region at 10:36Hrs. on 31.07.2023						
3	**FRC calculation for total generation loss of 2526MW at Rajasthan RE generation complex of Northern Region at 13:53Hrs on 20.07.2023**	-10.78	11.22	-2.02	0.71	86.84	-18.44
4	**FRC calculation for total generation loss of 1410MW at Sikkim hydro Complex of Eastern Region at 02:28Hrs on 28.06.2023**	-4.09	34.72	-4.65	8.21	**Under Reserve shutdown**	73.21
5	**FRC calculation for total generation loss of 7120MW at Rajasthan at 11:51Hrs on 15.05.2023**	5.04	-2.96	-3.92	0	86.07	11.06
6	**FRC calculation for total generation loss of 1100MW at Rajasthan at 13:23Hrs on 01.05.2023**	-2.22	12.24	**Under Reserve shutdown**	**Under Reserve shutdown**	**Under Reserve shutdown**	20.20

Based on above data Primary Frequency Response Performance of plants shall be discussed. Generators which do not provide satisfactory response may provide action plan to ensure satisfactory Primary Frequency Response is provided.

Note: FRC value for more than 50% is considered as satisfactory response

5. **<u>Automatic Generation Control (AGC)</u>**

a) As per Regulation 30(11) of IEGC 2023 every state has to maintain Secondary Reserves for providing Secondary Response for controlling the grid frequency. The reserve requirement for FY 2023-24 calculated by NLDC for UPSLDC is as follows

Within ISGS	Within State	Total
118	104	222

b) As per Regulation 7 of Central Electricity Regulatory Commission (Ancillary Services) Regulations, 2022, a generating station connected to inter-State transmission system or intra-State transmission system shall be eligible to provide Secondary Reserve Ancillary Service provided they are AGC enabled.

c) **Requirements for AGC implementation**

I. Regulation on Ancillary Services by UPERC

II. AGC software and associated computer hardware at UPSLDC end

III. Reliable Communication path between plant and UPSLDC

IV. Hardware and Software at power plants to communicate with UPSLDC and distribution of signals to generating units

Readiness of Generators to implement AGC in UP Control Area may be deliberated

5. (A). Regarding AGC (Agenda by PPGCL Prayagraj Power Generation Company Limited.

Your kind attention is drawn to agenda point no. 13 of minutes of 210th OCC meeting, held on 18/09/2023. Based on discussion in the meeting, OCC forum directed PPGCL to approach UPSLDC to take-up matter with UPERC for taking further directives.

In this regard we would like to submit that vide PPGCL letter under ref. (1), PPGCL had requested UPSLDC to take necessary action so that Intra-state Generator can participate in similar Ancillary service to support grid stability as mandated through various notifications.

We would like to inform that as per Regulation (7) of the Ancillary Service Regulations 2022 according to which "Any generating station or an entity having storage resource or an entity capable of providing demand response, on standalone or aggregated basis, connected to inter-state transmission system or intra-state transmission system, shall be eligible to provide SRAS if it fulfils other criteria provided in the Regulation".

In 210th OCC meeting, the matter was deliberated and as per point no. (13) of the Minutes, PPGCL has been directed to approach UPSLDC to further take-up matter with UPERC for directives.

6. Implementation of ADMS

As per Indian Electricity Grid Code, 2023 point number 36(2):

"SLDC, in coordination with STU and Distribution Licensee (s), shall develop Automatic Demand Management scheme with emergency controls at SLDC".

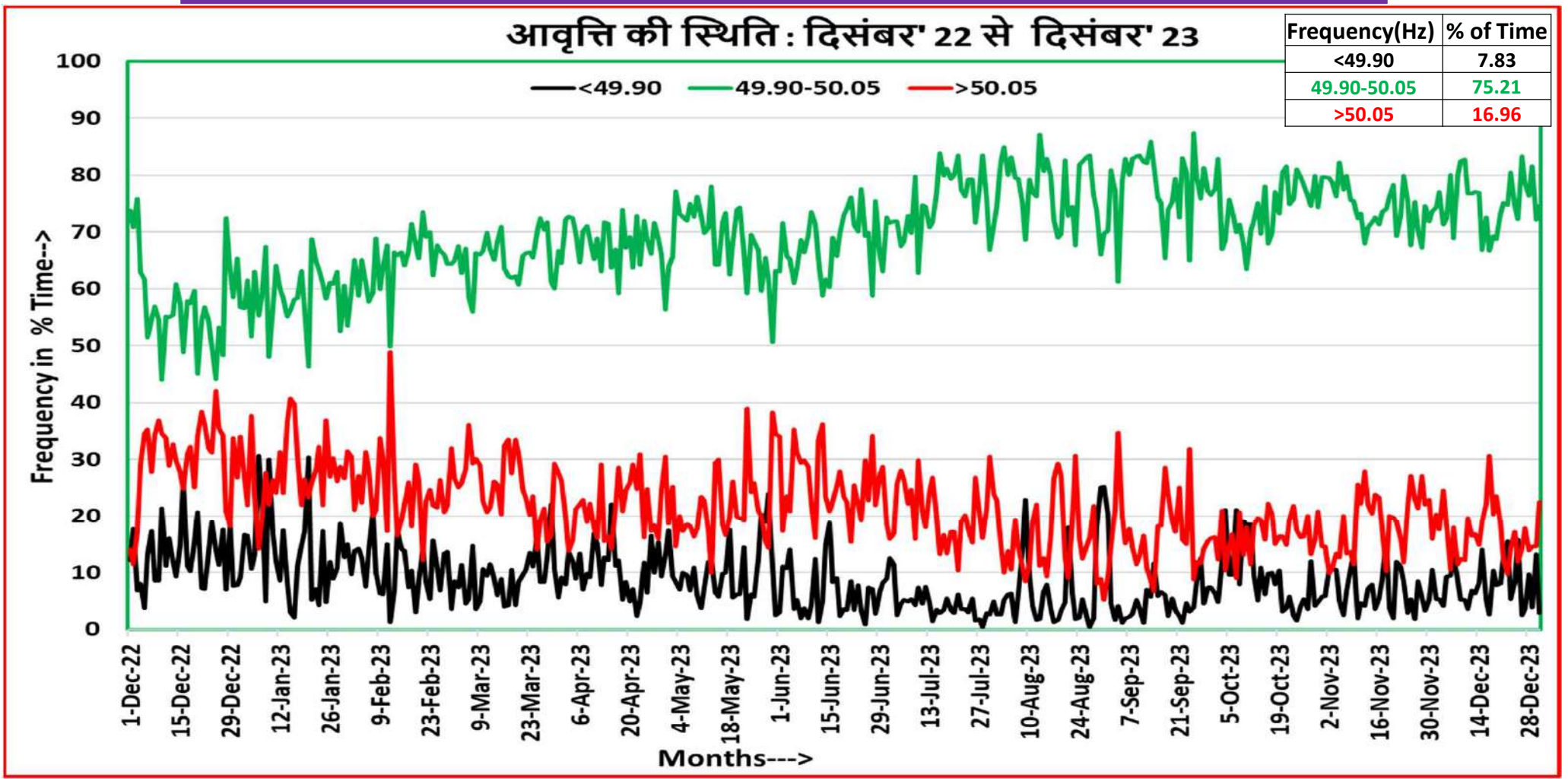
List of Participants of 215th OCC Meeting held in Varanasi, Uttar Pradesh

1. Sh. D. K. Meena, Superintending Engineer, NRPC
2. Sh. Reeturaj Pandey, Executive Engineer, NRPC
3. Sh. Omkishor, Executive Engineer, NRPC
4. Sh. Vipul Kumar, Assistant Executive Engineer, NRPC
5. Sh. Piyush Garg, Director (Operation), UPPTCL
6. Sh. Sushant Kumar Das, Director P&C, UPPTCL
7. Sh. A. K. Mishra, Director SLDC
8. Sh. Kavindra Singh, Advisor UPPTCL
9. Sh. Vineet Rastogi, Superintending Engineer, UPPTCL
10. Sh. Amit Kumar Singh, Superintending Engineer, Uttarakhand SLDC
11. Sh. Ashok Kumar, Sr. General Manager, NRLDC
12. Sh. Gaurav Malviya, Manager, NRLDC
13. Sh. S. K. Swain, Director Finance, UPPTCL
14. Sh. Amit Narain, Superintending Engineer, UPPTCL
15. Sh. Vijay Kumar, General Manager (O&M), NHPC
16. Sh. Manish Athaiya, Chief Engineer, Rajasthan SLDC
17. Sh. Mukul Bhargava, Superintending Engineer, Rajasthan SLDC
18. Sh. Avinash Kumar, Vice President-Operation, LPGCL Lalitpur
19. Sh. Manoj Taunk, Associate Vice President, Adani Power
20. Sh. Amandeep Singh, Power Controller, BBMB
21. Sh. S. K. Sinha, Additional General Manager (Tech), Delhi SLDC
22. Sh. Sandeep Kumar, Additional Superintending Engineer, PSPCL
23. Sh. Ganesh Mishra, Senior Manager (O&M), THDC
24. Sh. Er. Deepak Kumar, Chief Engineer (L-1), UPRVUNL
25. Sh. Hitesh Rastogi, Director General Manager (OS & Commercial), NTPC
26. Sh. Ashish Dabral, Senior Manager (O&M), THDC
27. Sh. Sanjay Mathur, Executive Engineer (P&P), RVPN
28. Sh. Er. A. P. Singh, Chief Engineer, PSTCL
29. Sh. Er. Pankaj Garg, Assistant Executive Engineer, PSTCL
30. Sh. Harish Sharma, Chief General Manager, SJVN
31. Sh. Vikas Marwah, HOP, SJVN
32. Sh. Rohit Kumar, Assistant Engineer, HPSLDC
33. Sh. S. K. Goyal, Senior Engineer (E&I), NPCIL
34. Sh. Munish Kumar Satija, Executive Engineer, Haryana SLDC
35. Sh. Hitesh Kumar, Deputy General Manager, DTL

36. Sh. Deepak Mehdiratta, Manager, DTL
37. Sh. Kashish Bhambani, GM, CTU
38. Sh. Mohsin Khan, Assistant Engineer, UP SLDC
39. Sh. Sanjay Bhargava, Head Com. & Regulatory, PPGCL
40. Sh. Kamal Joshi, Assistant Engineer, UP SLDC
41. Sh. A. K. Singh, Deputy General Manager, RTAMC, Powergrid
42. Sh. Satyendra Kumar, Superintending Engineer, UPPTCL
43. Sh. Sujeet Kumar Singh, Assistant General Manager, Lanco Anpara Power Ltd.
44. Sh. Anil Kumar, Assistant General Manager, MUNPL, MEJA
45. Sh. S. N. Tiwari, Sr. Manager, Lanco Anpara Power Ltd.
46. Sh. Hriday Prakash, Executive Engineer
47. Sh. Shatrughna Ram, Superintending Engineer, UPPTCL
48. Sh. Pankaj Saxena, Superintending Engineer, UPPTCL
49. Sh. Subyendu Singh, Chief Engineer, UPPTCL
50. Sh. Mithlesh, Superintending Engineer, UPPTCL
51. Sh. Praveen Raj, UPPTCL

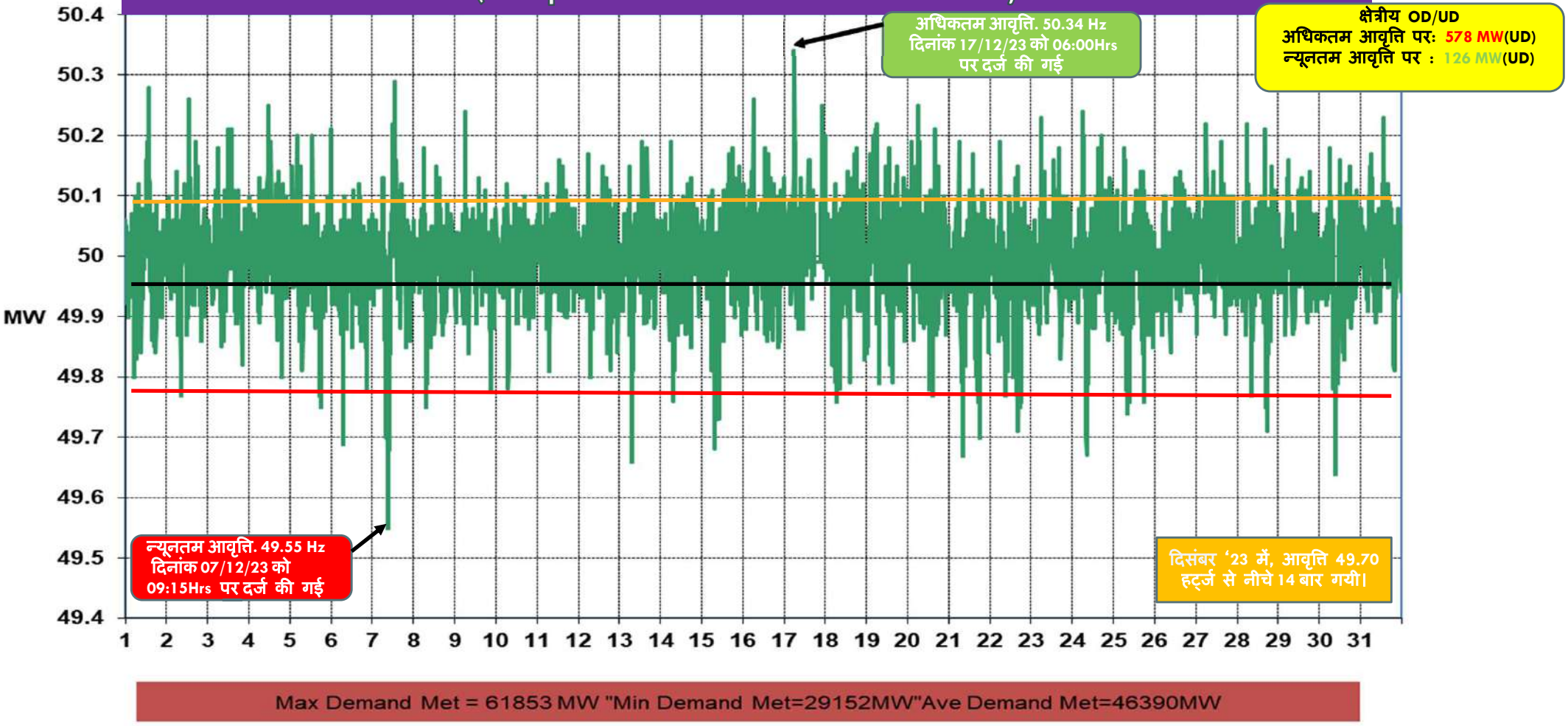
प्रचालन समन्वय उपसमिति की बैठक
दिसंबर- 2023

आवृत्ति की स्थिति: दिसंबर -2022 से 2023



दिसंबर -2023 के दौरान आवृत्ति की स्थिति

(As per 5 Minute SCADA data)



Max Demand Met = 61853 MW "Min Demand Met=29152MW"Ave Demand Met=46390MW

पिछले एक साल मे आवृत्ति की स्थिति

आवृत्ति बैंड	दिसंबर 2022	जनवरी 2023	फ़रवरी 2023	मार्च 2023	अप्रैल 2023	मई 2023	जून 2023	जुलाई 2023	अगस्त 2022	सितम्बर 2023	अक्टूबर2023	नवम्बर 2023	दिसंबर 2023
< 49.7 Hz(%)	1.11	1.25	0.32	0.16	0.24	0.24	0.22	0.09	0.47	0.11	0.53	0.10	0.17
<49.8 Hz(%)	3.96	3.60	1.95	1.26	1.68	1.48	0.86	0.66	1.63	0.57	1.99	0.96	1.40
<49.9 Hz(%)	12.78	13.30	10.75	9.03	10.54	9.83	8.42	4.60	7.11	5.21	8.87	6.83	7.83
49.90-50.05 Hz(%)	**57.39**	**58.70**	**64.68**	**63.84**	**67.90**	**68.48**	**67.83**	**74.96**	**77.25**	**77.86**	**74.42**	**74.36**	**75.21**
50.05-50.10 Hz(%)	11.99	15.26	14.59	17.86	12.54	13.25	15.59	15.64	13.28	13.32	13.53	13.74	10.47
>50.10 Hz(%)	17.84	12.34	8.49	7.99	6.46	8.44	8.15	4.79	2.35	3.61	3.18	5.06	6.49
>50.20 Hz(%)	4.07	1.83	1.49	1.28	0.88	0.77	1.09	0.80	0.23	0.32	0.14	0.66	0.53
औसत आवृत्ति	50.00	50.00	50.00	50.00	49.99	49.99	50.01	50.01	50.00	50.00	49.99	50.00	49.99

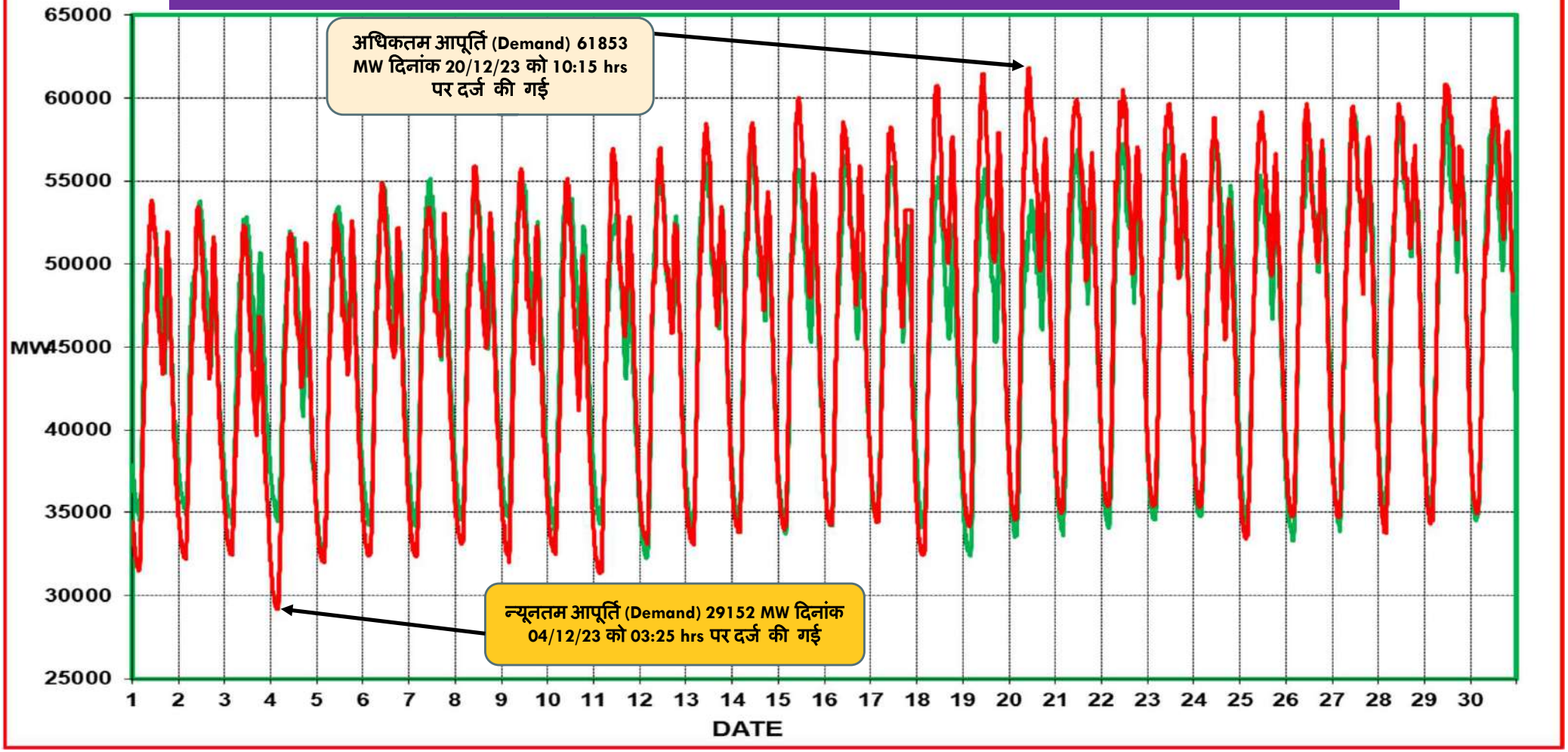
दिसंबर-2023 के दौरान अधिकतम मांग (Demand Met), अधिकतम ऊर्जा खपत (Energy consumption) और अब तक का कीर्तिमान (राज्यों द्वारा जमा आंकड़ों के अनुसार)

ग्रिड-इंडिया GRID-INDIA

राज्य	अधिकतम मांग (MW) (in Dec'23)	दिनांक / समय	रिकॉर्ड अधिकतम मांग (in MW) (upto Nov'23)	दिनांक / समय	अधिकतम ऊर्जा खपत (MU) (in Dec'23)	दिनांक	रिकॉर्ड अधिकतम ऊर्जा खपत (MU) (Upto Nov'23)	दिनांक
पंजाब	8041	09.12.23 at 10:00	15293	24.06.23 को 11:45 बजे	148.29	14.12.2023	344.1	24.06.2023
हरियाणा	8225	29.12.23 at 12:45	12768	28.06.22 को 11:56 बजे	152.81	20.12.2023	273.1	18.08.2023
राजस्थान	17376	26.12.23 at 11:00	17840	02.09.23 को 14:45 बजे	325.21	26.12.2023	371.6	04.09.2023
दिल्ली	4582	22.12.23 at 10:03	7695	29.06.22 को 15:10 बजे	80.03	29.12.2023	153.5	28.06.2022
उत्तर प्रदेश	19874	31.12.23 at 18:44	28284	24.07.23 को 21:43 बजे	346.46	30.12.2023	580	03.09.2023
उत्तराखंड	2224	19.12.23 at 08:00	2594	14.06.22 को 21:00 बजे	44.43	20.12.2023	56.2	17.06.2023
हिमाचल प्रदेश	2162	27.12.23 at 08:15	2071	06.01.23 को 09:45 बजे	38.37	29.12.2023	37.1	14.09.2023
जम्मू और कश्मीर (UT) तथा लद्दाख़ (UT)	2904	21.12.23 at 07:00	3044	02.02.23 को 20:00 बजे	63.46	31.12.2023	64.6	20.01.2023
चंडीगढ़	258	22.12.23 at 07:00	426	08.07.21 को 15:00 बजे	4.28	20.12.2023	8.4	08.07.2021
उत्तरी क्षेत्र #	61853	20.12.23 at 10:15	81048	04.09.23 को 14:50 बजे	1181.9	20.12.2023	1792.7	04.09.2023

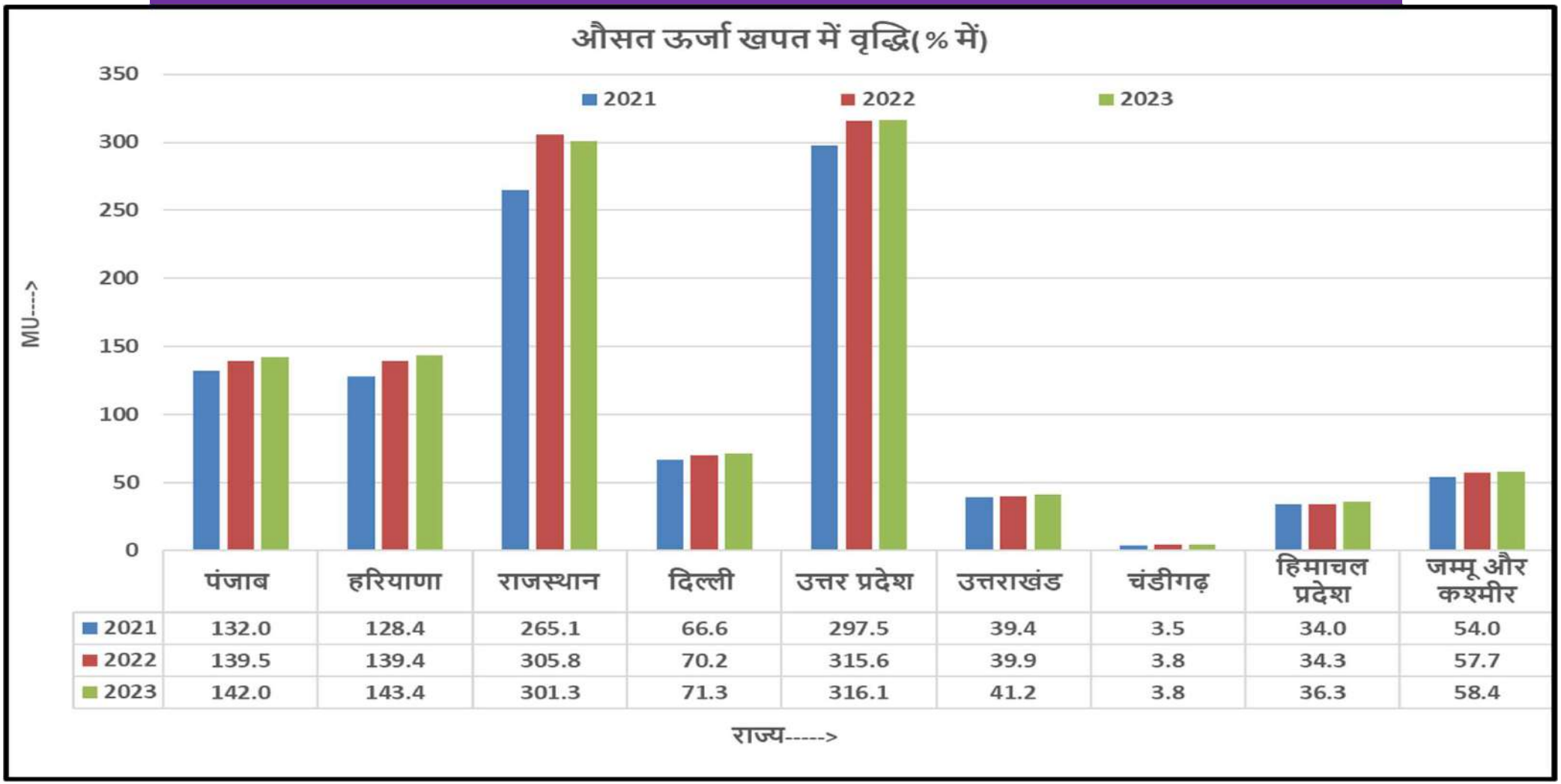
उत्तरी क्षेत्र अधिकतम मांग (Demand Met) as per SCADA Data

क्षेत्रीय विद्युत आपूर्ति (Demand) दिसंबर 2022 बनाम दिसंबर 2023 (As per 5 Minute SCADA data)



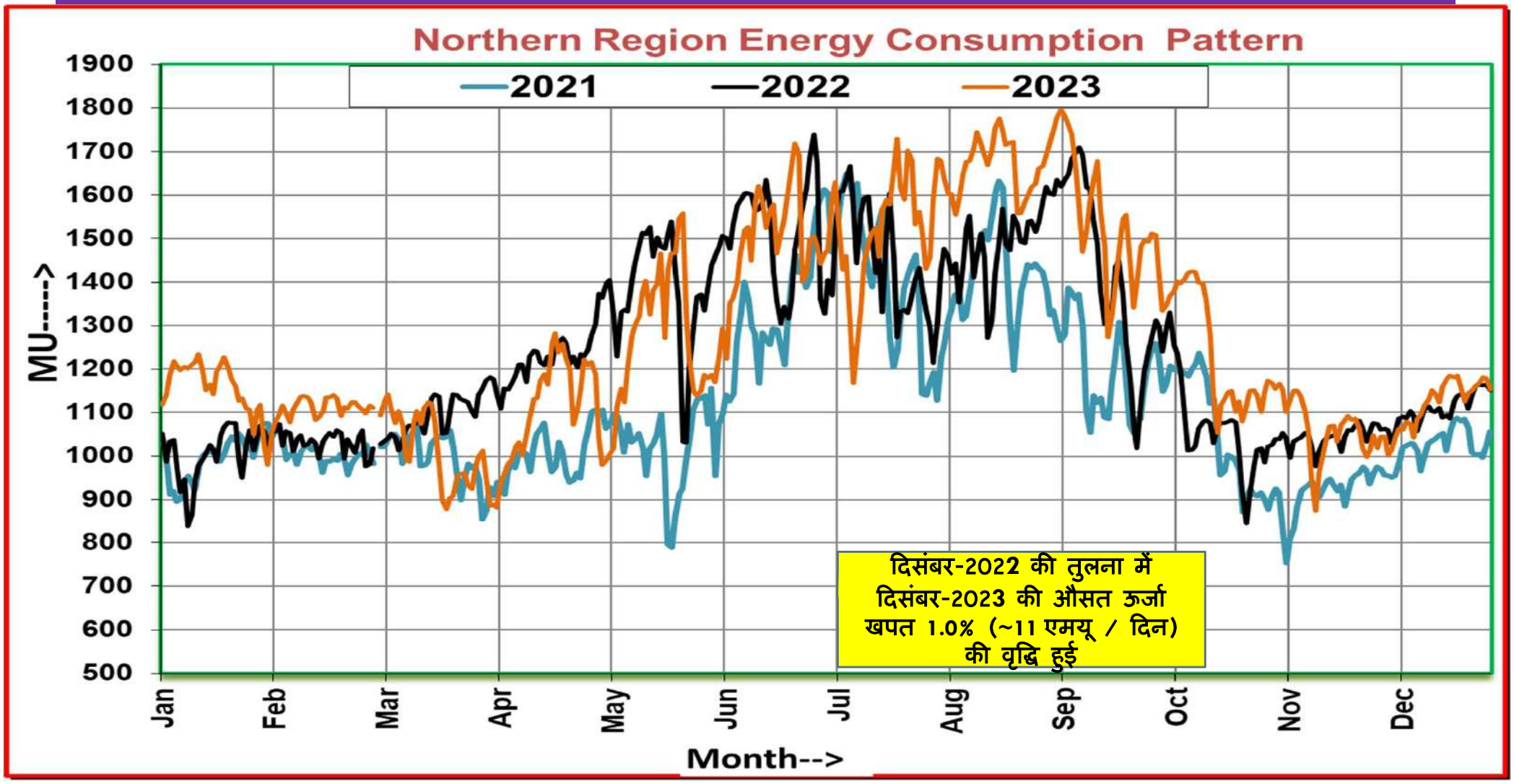
दिसंबर -2022 की तुलना में दिसंबर -2023 की औसत विद्युत आपूर्ति में 0.5% (~202 MW) वृद्धि हुई

उत्तरी क्षेत्र की औसत ऊर्जा खपत में वृद्धि(% में) दिसंवर-2023/ दिसंवर-2022 / दिसंवर-2021

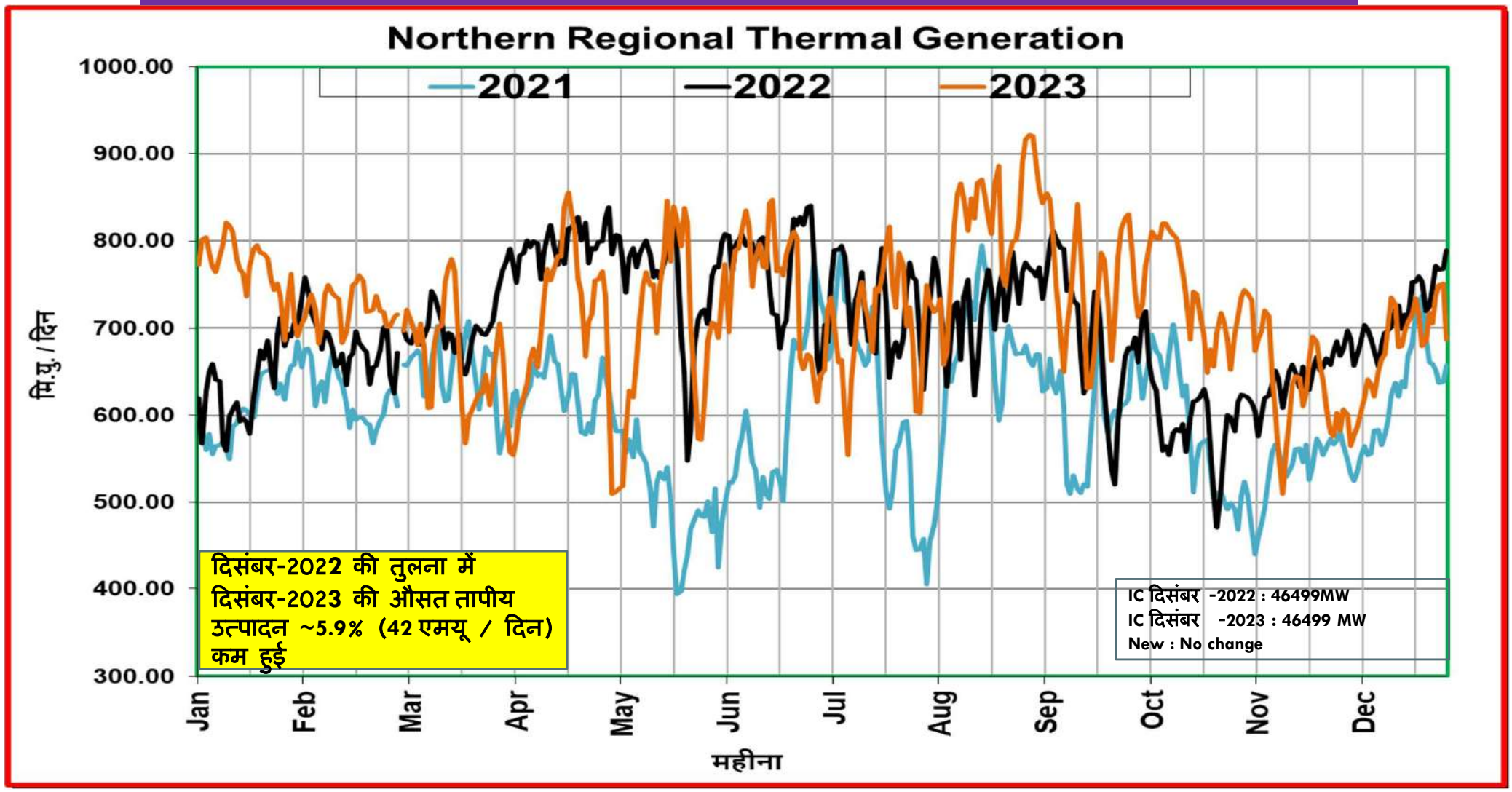


	पंजाब	हरियाणा	राजस्थान	दिल्ली	उत्तर प्रदेश	उत्तराखंड	चंडीगढ़	हिमाचल प्रदेश	जम्मू और कश्मीर
2021	132.0	128.4	265.1	66.6	297.5	39.4	3.5	34.0	54.0
2022	139.5	139.4	305.8	70.2	315.6	39.9	3.8	34.3	57.7
2023	142.0	143.4	301.3	71.3	316.1	41.2	3.8	36.3	58.4

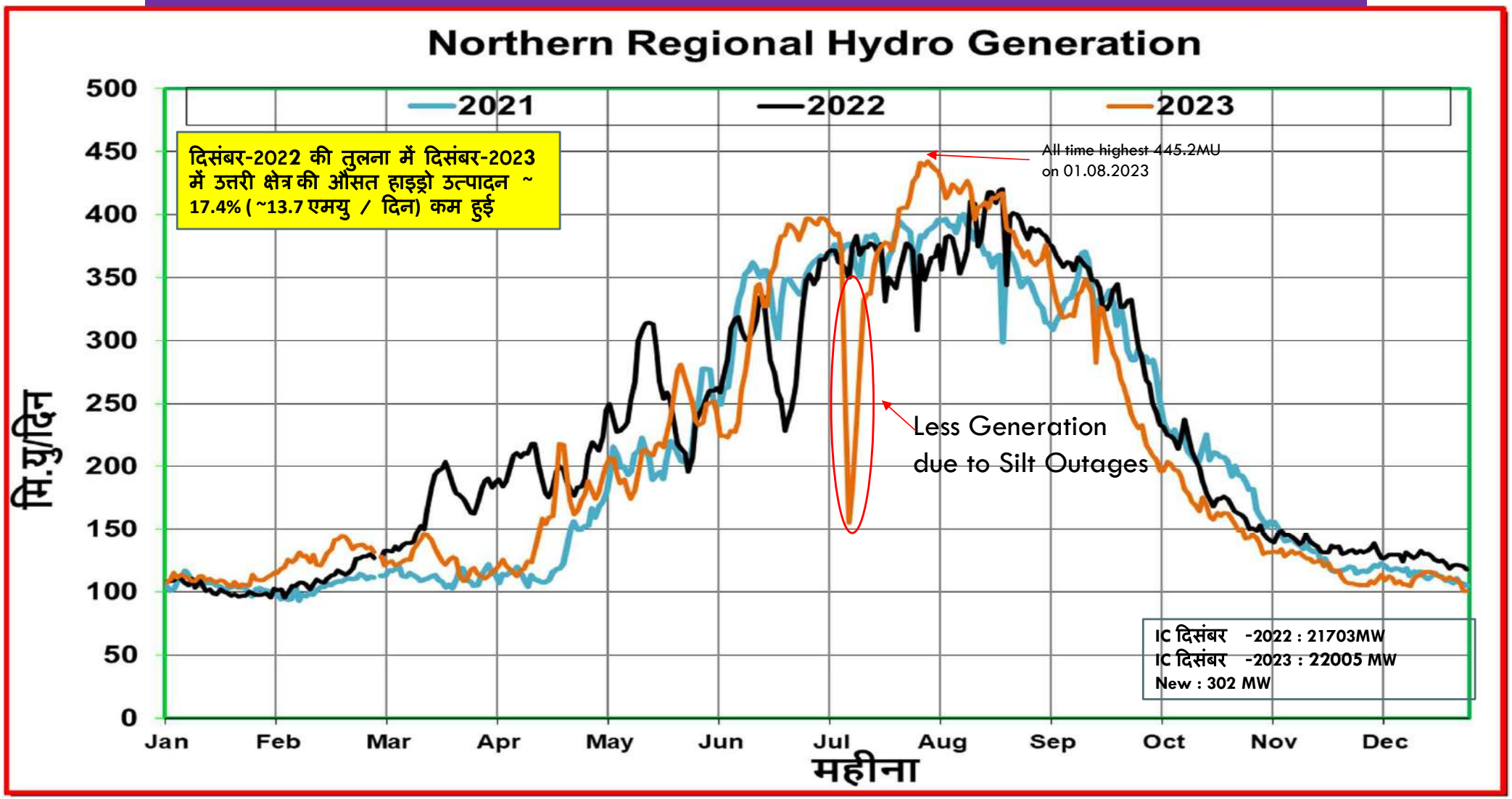
उत्तरी क्षेत्र की ऊर्जा खपत(MUs)



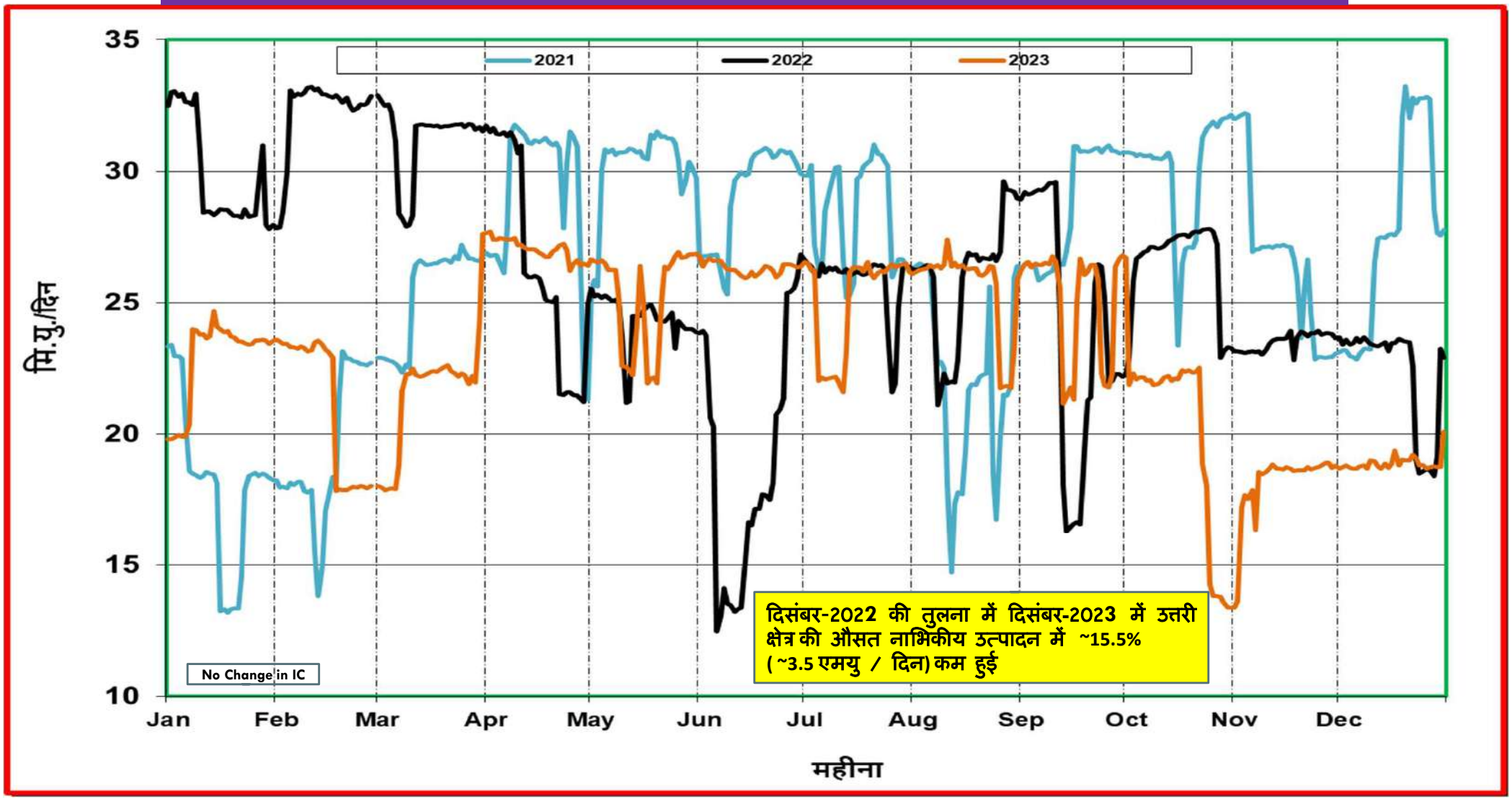
उत्तरी क्षेत्र की तापीय (Thermal) उत्पादन की स्थिति(Mus/Day)



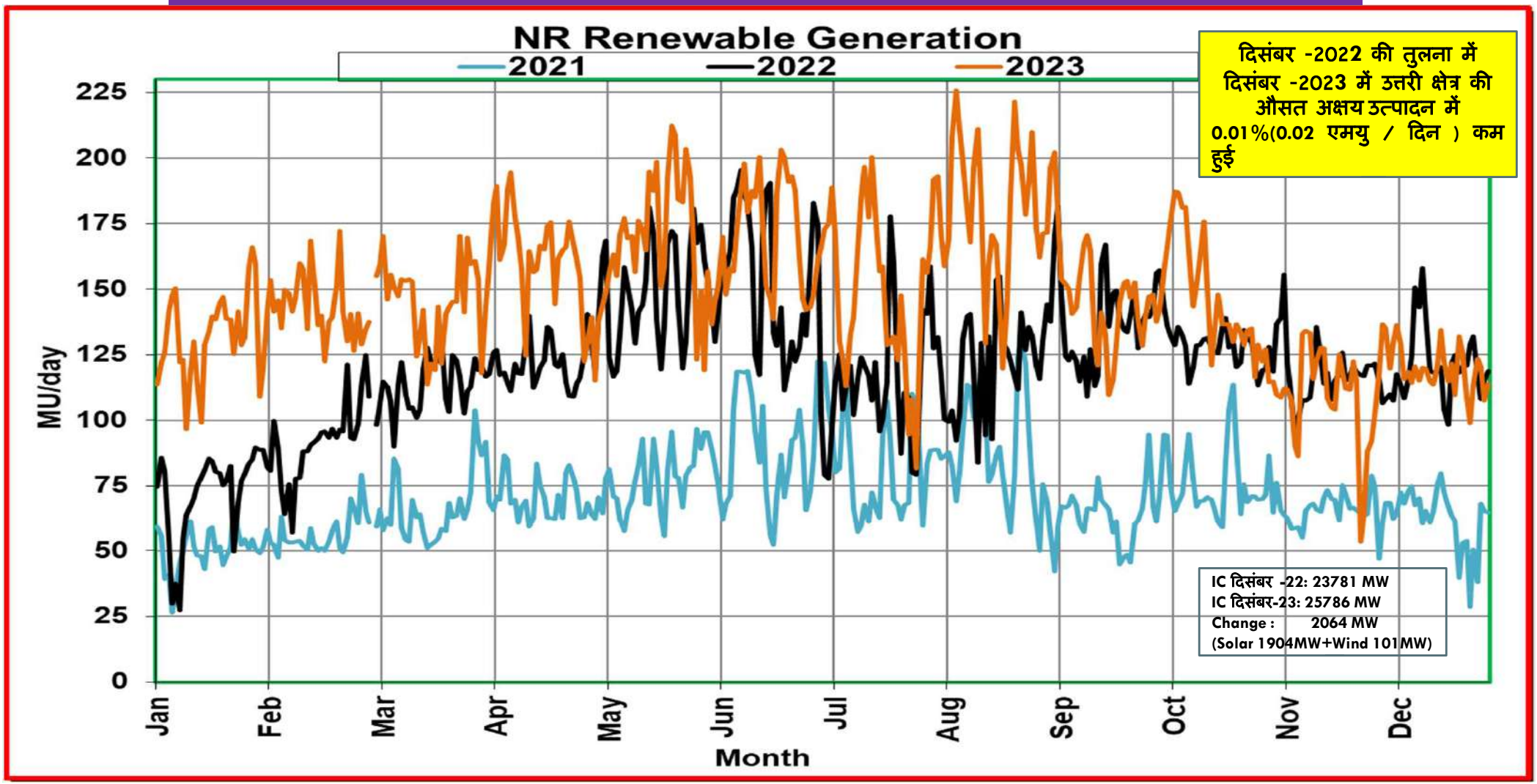
उत्तरी क्षेत्र की जलीय (हाइड्रो) उत्पादन की स्थिति(Mus/Day)



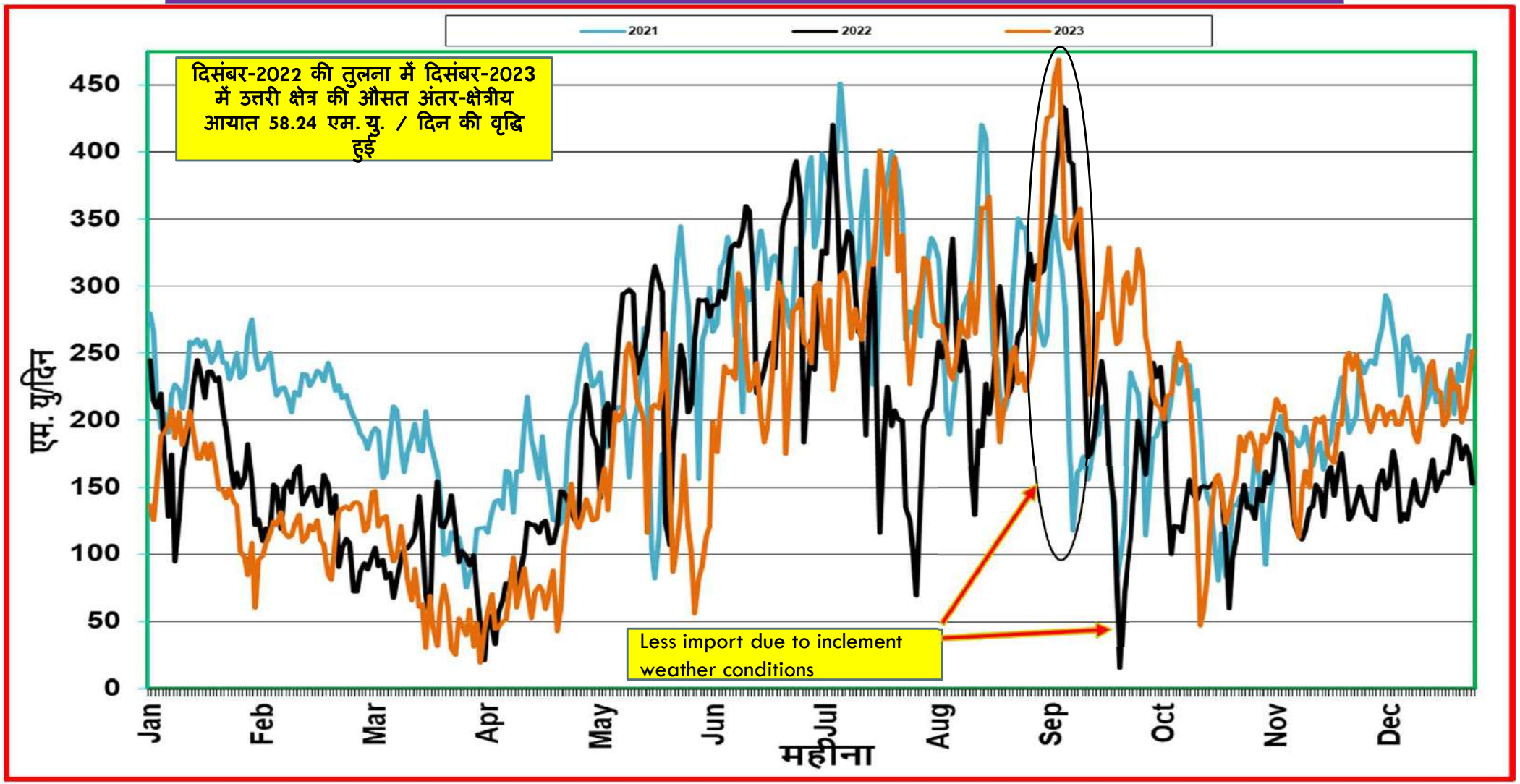
उत्तरी क्षेत्र की नाभिकीय उत्पादन की स्थिति (Mus/Day)



उत्तरी क्षेत्र की अक्षय (Renewable) उत्पादन की स्थिति (Mus/Day)



अंतर-क्षेत्रीय आयात(Mus/Day) की स्थिति



वास्तविक सारांश -
दिसंवर-2022 वनाम दिसंवर-2023

	दिसंबर-2022 (मि.यु. /दिन)	दिसंबर-2023 (मि.यु. /दिन)	दिसंबर माह में वृद्धि (मि.यु./दिन)
तापीय (Thermal) उत्पादन	714.27	672.40	-41.87
जलीय (Hydro) उत्पादन	126.46	109.10	-17.36
नाभिकीय (Nuclear) उत्पादन	22.35	18.88	-3.47
अंतर-क्षेत्रीय (Inter-Regional) कुल आयात	153.44	211.69	58.24
अक्षय (Renewable) उत्पादन	120.075	120.058	-0.02

RE Penetration

	Maximum Daily MU Penetration			
	Dec '2023		Record upto Nov '2023	
	Max % Penetration	Date	Max % Penetration	Date
Punjab	4.35	03-12-2023	12.28	01-04-2020
Rajasthan	15.77	02-12-2023	36.47	22-10-2021
UP	3.28	11-12-2023	4.72	22-03-2023
NR	13.48	03-12-2023	20.69	02-04-2023

Outage Summary For Dec 2023									
CONSTITUENTS	PLANNED (A)	FORCED OUTAGES (B=C+D)	EMERGENCY SHUTDOWNS (C)	TRIPPING (D)	% PLANNED SHUTDOWNS (A/(A+C))	% EMERGENCY SHUTDOWNS(C/(A+C)	% ESD SHUTDOWNS(C/B)	% TRIPPING (D/B)	TOTAL OUTAGES (A+B)
POWERGRID	461	190	128	62	78.3%	21.7%	67.4%	32.6%	651
UPPTCL	215	152	52	100	80.5%	19.5%	34.2%	65.8%	367
RRVPNL	78	147	72	75	52.0%	48.0%	49.0%	51.0%	225
PSTCL	111	32	11	21	91.0%	9.0%	34.4%	65.6%	143
HVPNL	39	28	19	9	67.2%	32.8%	67.9%	32.1%	67
BBMB	38	24	9	15	80.9%	19.1%	37.5%	62.5%	62
NTPC	25	7	4	3	86.2%	13.8%	57.1%	42.9%	32
DTL	9	20	8	12	52.9%	47.1%	40.0%	60.0%	29
ADHPL,ADHPL	26	0	0	0	100.0%	0.0%	NA	NA	26
AMP Energy Green Private L	4	14	4	10	50.0%	50.0%	28.6%	71.4%	18
PTCUL	5	9	2	7	71.4%	28.6%	22.2%	77.8%	14
SJVNL	14	0	0	0	100.0%	0.0%	NA	NA	14
GPTL	11	1	0	1	100.0%	0.0%	0.0%	100.0%	12
NRSS36	1	10	10	0	9.1%	90.9%	100.0%	0.0%	11
ATIL	6	2	2	0	75.0%	25.0%	100.0%	0.0%	8
AHEJ4L	5	2	1	1	83.3%	16.7%	50.0%	50.0%	7
PDD JK	6	1	1	0	85.7%	14.3%	100.0%	0.0%	7
THDC	0	7	5	2	0.0%	100.0%	71.4%	28.6%	7
AHEJOL	5	1	0	1	100.0%	0.0%	0.0%	100.0%	6
PATRAN	6	0	0	0	100.0%	0.0%	NA	NA	6
MAHINDRA	4	1	0	1	100.0%	0.0%	0.0%	100.0%	5
NHPC	2	3	1	2	66.7%	33.3%	33.3%	66.7%	5
PKATL	4	1	0	1	100.0%	0.0%	0.0%	100.0%	5
AHEJ3L	2	1	0	1	100.0%	0.0%	0.0%	100.0%	3
Chandigarh SEB	0	2	1	1	0.0%	100.0%	50.0%	50.0%	2
PKTSL	1	1	0	1	100.0%	0.0%	0.0%	100.0%	2
Renew Solar Urja (RSUPL)	0	2	1	1	0.0%	100.0%	50.0%	50.0%	2
Total	1078	658	331	327	76.5%	23.5%	50.3%	49.7%	1736

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))	
Sep-23	701	797	349	448	66.8%	33.2%	1498
Oct-23	966	707	331	376	74.5%	25.5%	1673
Nov-23	935	631	347	284	72.9%	27.1%	1566
Dec-23	**1078**	**658**	**331**	327	**76.5%**	**23.5%**	**1736**

New Elements First Time Charged During Dec 2023

S. No.	Type of transmission element	Total No
1	Transmission Lines	03
2	LINE REACTOR	02
3	ICTs/GTs/Transformers	06
4	SOLAR ICR/BLOCK	02
5	BUS REACTOR	01
6	BUS	04
Total New Elements charged		18

Transmission Lines

S.No	Name of element	Owner	Voltage Level (in kV)	Line Length	Conductor Type	Actual date of charging
1	220kV AXPPL_SL_FTHG3_PG-Fatehgarh_III(PG)-1	ALTRA XERGI POWER PVT LTD	220kV	4.522 KM	HTLS	17-Dec-2023
2	400kV Fatehgarh_III(PG)-Fatehgarh_II(PG)-1	PRTL	400kV	44.136 KM	Twin HTLS	20-Dec-2023
3	400kV Fatehgarh_III(PG)-Fatehgarh_II(PG)-2	PRTL	400kV	44.136 KM	Twin HTLS	20-Dec-2023

LINE REACTOR

S.No	Name of element	Owner	Voltage Level (in kV)	MVAR Capacity	Actual date of charging
1	80 MVAR Switchable Convertable LINE_REACTOR of 400kV SSCTPS - Babai Line - I at Suratgarh SCTPS(RVUN)	RRVUNL	400kV	80 MVAR	07-Dec-2023
2	80 MVAR Switchable Convertable LINE_REACTOR of 400kV SSCTPS - Babai Line - II at Suratgarh SCTPS(RVUN)	RRVUNL	400kV	80 MVAR	07-Dec-2023

ICTs/GTs/Transformers

S.No	Name of element	Owner	Voltage Level (HV/LV/Tertiary)	MVA Capacity	Actual date of charging
1	220/33kV, 150 MVA, 3-Phase, Atlanta Electricals, ICT - 1 at AEGPL_SL_BHD2_PG	AMP Energy Green Private Limited	220/33	150	01-Dec-2023
2	220/33kV, 150 MVA, 3-Phase, Atlanta Electricals, ICT - 2 at AEGPL_SL_BHD2_PG	AMP Energy Green Private Limited	220/33	150	01-Dec-2023
3	220/33kV, 200 MVA, 3-Phase, Toshiba, Power Transformer - 2 at AXPPL_SL_FTHG3_PG	ALTRA XERGI POWER PVT LTD	220/33	200	18-Dec-2023
4	220/33kV, 200 MVA, 3-Phase, Toshiba, Power Transformer - 1 at AXPPL_SL_FTHG3_PG	ALTRA XERGI POWER PVT LTD	220/33	200	18-Dec-2023
5	400/220/5 MVA, 500 MVA, 3-Phase, ABB, ICT - 1 at Bikaner_2 (PBTSL)	PBTSL	400/220	500	23-Dec-2023
6	765/400/33kV, 1000 MVA MVA, 3x1-Phase, ABB, ICT - 2 at Mainpuri(UP)	UPPTCL	765/400/33	1000	27-Dec-2023

SOLAR ICR/BLOCK

S.No	Plant Name	Capacity to be charged	Total Installed Capacity of Plant	Type of RE	Solar ICR/Block No	IDT MVA Rating	Inverter Type	Inverter Make	Inverter AC Rating	Agency/ Owner	Actual date of charging
1	AMP Energy Green Six Private Limited.	100 MW	100 MW	Solar	1 to 13	8.75	String Inverter	Sungrow	295 kW	AMP Energy Green Six Private Limited	07-Dec-2023
2	ALTRA XERGI POWER PVT LTD	259.6 MW	380MW	Solar	1 to 30	8.8	Central Inveter	Sungrow	4.4MW	ALTRA XERGI POWER PVT LTD	20-Dec-2023

BUS REACTOR

S.No	Name of element	Owner	Voltage LeveL	MVAR Capacity	Actual date of charging
1	400kV, 125 MVAr Bus Reactor 1 at Obra_C_TPS(UP)	UPRVUNL	400kV	125 MVAr	08-Dec-2023

BUS

S.No	Name of element	Owner	Voltage Level (in kV)	Bus Type	Actual date of charging
1	33kV Main Bus 33 kv Bus-1 at AEGPL_SL_BHD2_PG	AMP Energy Green Private Limited	33kV	Main Bus	01-Dec-2023
2	33kV Main Bus 33kv_BUS-2 at AEGPL_SL_BHD2_PG	AMP Energy Green Private Limited	33kV	Main Bus	01-Dec-2023
3	220kV Main Bus 1 at AXPPL_SL_FTHG3_PG	ALTRA XERGI POWER PVT LTD	220kV	Main Bus	18-Dec-2023
4	220kV Main Bus 2 at AXPPL_SL_FTHG3_PG	ALTRA XERGI POWER PVT LTD	220kV	Main Bus	18-Dec-2023


धन्यवाद