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 226 वी बैठक का कार्यवृत |

Subject: Minutes of the 226th OCC meeting of NRPC.

उत्तर क्षेत्रीय विद्युत समिति की प्रचालन समन्वय उप-समिति की 226 वीं बैठक दिनांक 16.12.2024 को आयोजित की गयी थी। उक्त बैठक का कार्यवृत्त उत्तर क्षेत्रीय विद्युत समिति की वेबसाइट http://164.100.60.165 पर उपलब्ध है। यदि कार्यवृत पर कोई टिप्पणी हो तो कार्यवृत जारी करने के एक सप्ताह के अन्दर इस कार्यालय को भेजें |

The 226th meeting of the Operation Co-ordination Sub-Committee (OCC) of NRPC was held on 16.12.2024. 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 Dharmendra Kumar Meena
Date: 08-01-2025 10:07:52

(डी. के. मीना)
निदेशक (प्रचालन)

सेवा में,

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

18-ए, शहीद जीत सिंह मार्ग, कटवरिया सराय, नई दिल्ली दूरभाष:011-26513265 ई-मेल: seo-nrpc@nic.in वेबसाईट: www.nrpc.gov.in
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Contents

List of addressee (via mail)

OCC Members for FY 2024-25			
S. No.	**OCC Member**	**Category**	**E-mail**
1	NLDC	National Load Despatch Centre	nomination awaited (susha@grid-india.in)
2	NRLDC	Northern Regional Load Despatch Centre	somara.lakra@grid-india.in
3	CTUIL	Central Transmission Utility	kashish@powergrid.in
4	PGCIL	Central Government owned Transmission Company	rtamc.nr1@powergrid.in rtamcjammu@powergrid.in cpcc.nr3@powergrid.in
5	NTPC	Central Generating Company	hrastogi@ntpc.co.in
6	BBMB		powerc@bbmb.nic.in
7	THDC		ravindrasrana@thdc.co.in
8	SJVN		sjvn.cso@sjvn.nic.in
9	NHPC		surendramishra@nhpc.nic.in
10	NPCIL		df@npcil.co.in
11	Delhi SLDC	State Load Despatch Centre	gmsldc@delhisldc.org
12	Haryana SLDC		cesocomml@hvpn.org.in
13	Rajasthan SLDC		ce.ld@rvpn.co.in
14	Uttar Pradesh SLDC		cepso@upsldc.org
15	Uttarakhand SLDC		se_sldc@ptcul.org
16	Punjab SLDC		ce-sldc@pstcl.org
17	Himachal Pradesh SLDC		cehpsldc@gmail.com
18	DTL	State Transmission Utility	bl.gujar@dtl.gov.in
19	HVPNL		cetspkl@hvpn.org.in
20	RRVPNL		ce.ppm@rvpn.co.in
21	UPPTCL		smart.saxena@gmail.com
22	PTCUL		ce_oandmk@ptcul.org
23	PSTCL		ce-tl@pstcl.org
24	HPPTCL		gmprojects.tcl@hpmail.in
25	IPGCL	State Generating Company	ncsharma@ipgcl-ppcl.nic.in
26	HPGCL		seom2.rgtpp@hpgcl.org.in

27	RRVUNL		ce.ppmcit@rrvun.com
28	UPRVUNL		cgm.to@uprvunl.org
29	UJVNL		gm_engg_ujvn@yahoo.co.in
30	HPPCL		gm_generation@hppcl.in
31	PSPCL	State Generating Company & State owned Distribution Company	ce-ppr@pspcl.in
32	UHBVN	State owned Distribution Company (alphabetical rotaional basis/nominated by state govt.)	nomination awaited (md@uhbvn.org.in)
33	Jodhpur Vidyut Vitran Nigam Ltd.		addlcehqjdvvnl@gmail.com
34	Paschimanchal Vidyut Vitaran Nigam Ltd.		nomination awaited (md@pvvnl.org)
35	UPCL		cgmupcl@yahoo.com
36	HPSEB		cesysophpsebl@gmail.com
37	Prayagraj Power Generation Co. Ltd.	IPP having more than 1000 MW installed capacity	sanjay.bhargava@tatapower.com
38	Aravali Power Company Pvt. Ltd		amit.hooda01@gmail.com
39	Apraave Energy Ltd.,		rajneesh.setia@apraava.com
40	Talwandi Sabo Power Ltd.		ravinder.thakur@vedanta.co.in
41	Nabha Power Limited		Durvesh.Yadav@larsentoubro.com
42	MEIL Anpara Energy Limited		arun.tholia@meilanparapower.com
43	Rosa Power Supply Company Ltd		Suvendu.Dey@relianceada.com
44	Lalitpur Power Generation Company Ltd		avinashkumar.ltp@lpgcl.com
45	MEJA Urja Nigam Ltd.		rsjuneja@ntpc.co.in
46	Adani Power Rajasthan Limited		manoj.taunk@adani.com
47	JSW Energy Ltd. (KWHEP)		roshan.zipta@jsw.in

48	TATA POWER RENEWABLE	IPP having less than 1000 MW installed capacity (alphabetical rotational basis)	nomination awaited (dhmahabale@tatapower.com)
49	UT of J&K	From each of the Union Territories in the region, a representative nominated by the administration of the Union Territory concerned out of the entities engaged in generation/ transmission/ distribution of electricity in the Union Territory.	sojpdd@gmail.com
50	UT of Ladakh		cepdladakh@gmail.com
51	UT of Chandigarh		elop2-chd@nic.in
52	Noida Power Company limited	Private Distribution Company in region (alphabetical rotational basis)	nomination awaited (ssrivastava@noidapower.com)
53	Fatehgarh Bhadla Transmission Limited	Private transmission licensee (nominated by central govt.)	nomination awaited (nitesh.ranjan@adani.com)
54	NTPC Vidyut Vyapar Nigam Ltd.	Electricity Trader (nominated by central govt.)	nomination awaited (ceonvvn@ntpc.co.in)

उत्तर क्षेत्रीय विद्युत समिति की प्रचालन समन्वय उप-समिति की 226 वीं बैठक का कार्यवृत्त

The 226th OCC meeting of NRPC was held on 16.12.2024 through video conferencing. MS, NRPC welcomed all the participants connected through VC.

खण्ड-क:उ.क्षे.वि.स. PART-A:NRPC

A.1. Confirmation of Minutes

Minutes of the 225th OCC meeting was issued on 12.11.2024. OCC confirmed the minutes of the meeting.

A.2. Status of action taken on decisions of 225th OCC meeting of NRPC

A.2.1. MS, NRPC conveyed that the agenda has been taken to track the status of action taken as per decision of last meeting. Accordingly, issues may be resolved at the earliest.

A.2.2. Concerned utilities submitted the status of action taken.

Decision of OCC Forum:

Concerned utilities submitted the status of action taken and the same has been complied as ***Annexure- 0****.*

A.3. Review of Grid operations of November 2024

Anticipated vis-à-vis Actual Power Supply Position (Provisional) for November 2024

Reasons submitted by States for significant deviation of actual demand from anticipated figures during the month of November 2024 are as under:

- **Delhi**

  In month of Nov-2024, Delhi experienced above normal average temperature so the energy consumption was on higher side than expected.

- **Himachal Pradesh**

The Anticipation in Energy Requirement in respect of Himachal Pradesh for the month of November, 2024 came on the lower side due to dry weather conditions in the state.

- **Haryana**

Delayed onset of winter season led to increased consumption of agricultural demand to the tune of 22% for first fortnight of the month of Nov-24 whereas while anticipating the demand for Nov-24, CAGR of 4% was considered in view of the historic demand growth.

Punjab

Actual maximum demand is more as compared to anticipated maximum demand because of dry spell in the month of November 2024 in the state of Punjab.

Uttar Pradesh

Actual energy consumption was higher than anticipated due to unusual higher temperature, on some of the days during November-2024.

Uttarakhand

The reason for significant variation in energy requirement for month of Nov'24 against anticipated figures was due to delayed pre-winter and less decrease in temperature in this month as compared to historical data.

A.4. Maintenance Programme of Generating units and Transmission Lines

The maintenance programme of generating units and transmission lines for the month of January 2025 was deliberated in the meeting on 13.12.2024.

A.5. Anticipated Power Supply Position in Northern Region for January 2025

The updated anticipated Power Supply Position for January 2025 is as below:

State / UT	Availability / Requirement	Revised Energy (MU)	Revised Peak (MW)	Date of revision
CHANDIGARH	Availability	120	300	No Revision submitted
	Requirement	164	314	
	Surplus / Shortfall	-44	-14	
	% Surplus / Shortfall	-26.8%	-4.6%	
DELHI	Availability	3628	5900	

State / UT	Availability / Requirement	Revised Energy (MU)	Revised Peak (MW)	Date of revision
	Requirement	2800	5900	13-Dec-24
	Surplus / Shortfall	828	0	
	% Surplus / Shortfall	29.6%	0.0%	
HARYANA	Availability	6839	9192	13-Dec-24
	Requirement	5119	9170	
	Surplus / Shortfall	1720	22	
	% Surplus / Shortfall	33.6%	0.2%	
HIMACHAL PRADESH	Availability	1221	2150	10-Dec-24
	Requirement	1251	2268	
	Surplus / Shortfall	-29	-118	
	% Surplus / Shortfall	-2.4%	-5.2%	
J&K and LADAKH	Availability	1230	3130	No Revision submitted
	Requirement	2240	3455	
	Surplus / Shortfall	-1010	-325	
	% Surplus / Shortfall	-45.1%	-9.4%	
PUNJAB	Availability	6200	10840	13-Dec-24
	Requirement	5142	10401	
	Surplus / Shortfall	1058	439	
	% Surplus / Shortfall	20.6%	4.2%	
RAJASTHAN	Availability	8480	17790	12-Dec-24
	Requirement	10385	18400	
	Surplus / Shortfall	-1905	-610	
	% Surplus / Shortfall	-18.3%	-3.3%	
UTTAR PRADESH	Availability	12400	23800	10-Dec-24
	Requirement	12059	23800	
	Surplus / Shortfall	341	0	
	% Surplus / Shortfall	2.8%	0.0%	
UTTARAKHAN	Availability	1426	2550	05-Dec-24

State / UT	Availability / Requirement	Revised Energy (MU)	Revised Peak (MW)	Date of revision
D	Requirement	1442	2600	
	Surplus / Shortfall	-16	-50	
	% Surplus / Shortfall	-1.1%	-1.9%	
NORTHERN REGION	Availability	41544	70900	
	Requirement	40601	71500	
	Surplus / Shortfall	943	-600	
	% Surplus / Shortfall	2.3%	-0.8%	

A.6. Follow-up of issues from various OCC Meetings - Status update

A.6.1. The updated status of agenda items is enclosed at ***Annexure-A.I.***

A.6.2. In 226th 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.7. NR Islanding scheme

A.7.1. In the meeting (226th OCC), UPPTCL representative apprised that Unchahar-Lucknow Islanding scheme has been successfully implemented and same is visible at SCADA of UPSLDC also (except 03 Substation: Namely 132 kV S/s tripula,132 kV S/s bachhrawan and 132 kV S/s Hussainganj. The data of above 03 substation is not available at UPSLDC due to lack of OPGW. The work of laying OPGW cable is under progress and same shall be completed by end of December.

A.7.2. With regard to Agra islanding scheme, UPPTCL representative apprised forum that their management is of view that procurement of UFRs for the Lalitpur-Agra islanding scheme should be explored through PSDF funding. A proposal for the same has been prepared and submitted to the PSDF Secretariat.

A.7.3. RRVPNL representative stated that they have revised their DPR for Jodhpur-Barmer-Rajwest IS and, instead of using cloud storage, they will be opting for network-attached storage. As a result, there is a price variation, and they have obtained approval from their management and would submit their proposal for PSDF funding.

A.7.4. RRVPNL representative mentioned that DPR for implementation of Suratgarh islanding scheme would be submitted after finalization of DPR for Jodhpur-Barmer-Rajwest islanding scheme.

A.7.5. With regard to Patiala-Nabha Power Rajpura islanding scheme representative from Punjab SLDC informed that during a meeting with the PSDF Secretariat on 22nd October 2024, they had given a presentation on the DPR submitted to the PSDF Secretariat, and the minutes of the meeting are awaited.

A.7.6. HPSLDC representative apprised that proposed UFR scheme for Kullu- Manali islanding scheme has been recommended by the Appraisal Committee of the State PSDF for approval of Hon'ble HPERC. The islanding scheme would now be taken up in the Monitoring committee for State PSDF funding approval. Meeting of Monitoring committee is yet to be convened.

A.7.7. Further, with regard to Shimla-Solan Islanding scheme, a separate meeting was conducted by NRPC Sectt. with HPSLDC, HPSEBL and M/s GE on 18.09.2024) wherein HPSEBL informed that payment to M/s GE would be made within two months and subsequently work regarding the implementation in revised setting of Bhaba HEP would be completed by M/s GE within one month. In the meeting, HPSLDC also informed that they had sent a letter to all concerned generators (a copy of which is attached as **Annexure-A.II**) requesting them to lower the UFR settings of their generators to below 47.5 Hz.

A.8. Coal Supply Position of Thermal Plants in Northern Region

A.8.1. NRPC representative apprised forum about the coal stock position of generating stations in northern region during current month (till 10th December 2024).

A.8.2. Average coal stock position of generating stations in northern region, having critical stock, during first ten days of December 2024 is NIL.

A.9. Updating outage Details by Generating Station/utilities (Agenda by CEA)

A.9.1 NRPC representative apprised forum that to enhance the monitoring of approved Planned Maintenance schedules, CEA has asked that information regarding actual maintenance availed against approved planned maintenance is to be updated on priority by respective RPCs regularly on monthly basis.

A.9.2 In the 221st OCC meeting of NRPC, forum asked generating stations of NR to update the status of Planned Maintenance schedules versus actual maintenance availed for the previous month before every OCC meeting and it was decided that to enhance the monitoring of approved Planned Maintenance schedules the said agenda item shall be taken as rolling/follow-up agenda in OCC meetings.

A.9.3 In this regard, list of Planned Maintenance schedules versus actual maintenance availed for the year 2024-25 for the month of November-2024 attached as Annexure-A.IV of agenda was shared with the relevant generating stations of NR

and based on the inputs received from them the updated information is attached as **Annexure-A.III**.

A.10. Compliance of "Workforce adequacy guidelines for Load Despatch Centres (Agenda by NRPC Sectt.)

A.10.1. EE(O) NRPC apprised forum that NRPC Sectt. vide letter dated 02.12.2024 (copy attached as Annexure-A.IV of agenda) has circulated to all SLDC's of NR alongwith Joint Secretary, MoP's D.O. letter dated 25.11.2024 regarding "Workforce adequacy guidelines for Load Despatch Centres". These guidelines will serve as a benchmark for enhancing the Load Despatch Centres by ensuring that they are equipped with sufficient skilled human resources.

A.10.2. As per these guidelines, States are required to identify exiting staffing gaps within the SLDCs and to formulate a phased staffing plan to address these gaps in order to ensure smooth grid operations. These guidelines also mandate training and certification of all System Operators at SLDCs in line with the Government of India's standards.

A.10.3. In view of above, MS NRPC asked all SLDC's of NR to take necessary action for compliance/implement these guidelines which will play a significant role in enhancing the operation capacity of SLDCs.

Decision of OCC Forum:

Forum asked all SLDC's of NR to take necessary action for compliance/implement these guidelines which will play a significant role in enhancing the operation capacity of SLDCs.

A.11. Production Linked Incentive (PLI) Scheme for the goods and services related to Power Sector (Agenda by NRPC Sectt.)

A.11.1 EE(O), NRPC informed forum about Production Linked Incentive (PLI) Scheme for the goods and services related to Power Sector is being framed by ET&I Division CEA.

A.11.2 In this regard, ET&I Division CEA has sought following information

- Format (**Annexure-A.V of agenda**) for Demand projections for items / equipment to be taken up for Production Linked Incentive (PLI) for local manufacturing.
- Format (**Annexure-A.VI of agenda**) for the all the equipment/component used in the power sector (Minimum Local Content trajectory and Demand projections for Power Sector Equipment/ Components)
- Furnish details as per the format given in the excel sheet (**Annexure-A.VII of agenda**)

- (ii) Confirmation/suggestions/inputs on MLC trajectory proposed in the excel sheet (**Annexure-A.VIII of agenda**) (trajectory from existing MLC to 100%)
- Furnish list of additional items for inclusion in self-sufficiency in capacity and competitiveness as per the para 3 (a) of PPP-MII order of DPIIT dated 19th July, 2024 (**Annexure-A.IX of agenda**)

A.11.3 MS, NRPC asked concerned utilities to submit above mentioned requisite information to ce-rndcea@gov.in at the earliest.

A.12. Procurement of cold spare transformers and reactor for Northern Region (Agenda by POWERGRID NR-1)

A.12.1 EE(O), NRPC intimated that the subject cited matter was also deliberated in the 225th OCC meeting of NRPC wherein forum asked Powergrid to submit a consolidated, capacity-wise list of the total number of transformers required as spares on a regional basis. The list should include the current shortfall in ICTs, the number of ICTs allocated States/UT's of NR as regional spares, and the expected timeline for their return.

A.12.2 In view of the above directive, Powergrid representative informed that they have prepared a consolidated, capacity-wise list of the total number of transformers required as spares on a regional basis and details of the same are mentioned below:

Capacity wise details of transformers and reactors with spare requirement in Northern Region

Sl No	State/ UT	MVA Rating and Phase	Voltage	Total installed unit	Spare Required as per CERC report	RPC Approved Spares	Qty Proposed for procurement	Approx Cost (Rs. In Crore)	Availability of RPC Spare	Remarks
1	DELHI	3Ø-500MVA	400/220	10	1	1	0		Tughlakabad	
2	HARYANA	3Ø-500MVA	400/220	17	1	2	0		Manesar GIS & Panchkula (Given	

									to PSTCL)	
3	PUNJAB	3Ø-500MVA	400/220	12	1	1	0		Moga	
4	RAJASTHAN	3Ø-500MVA	400/220	32	2	1	0		Jaipur South	
5	UTTAR PRADESH	3Ø-500MVA	400/220	15	1	1	0		Lucknow	
6	UTTARAKHAND	3Ø-500MVA	400/220	1	1	0	1	26.81		Required at Roorkee
Total for Northern Region:				87	7	6	1	26.81		

Sl No	**State/ UT**	**MVA Rating and Phase**	**Voltage**	**Total installed unit**	**Spare Required as per CERC report**	**RPC Approved Spares**	**Qty Proposed for procurement**	**Approx Cost (Rs. In Crore)**	**Availability of RPC Spare**	**Remarks**
1	DELHI	3Ø-315MVA	400/220	3	1	0	1	20.24		Maharanibagh/ Bawana
2	HARYANA	3Ø-315MVA	400/220	22	2	1	0		Ballabgarh (GSI)	
3	HIMACHAL	3Ø-315MV	400/220	3	1	0	1	20.24		Required at

	PRADESH	A								Nallagarh
4	JAMMU & KASHMIR	3Ø-315MVA	400/220	3	1	0	1	20.24		Required at Samba
5	PUNJAB	3Ø-315MVA	400/220	10	1	2	0		1 under procurement in POWERGRID & Ludhiana - Given to DTL	
6	RAJASTHAN	3Ø-315MVA	400/220	18	1	1	0		Bhiwadi - Given to RVPNL	
7	UTTAR PRADESH	3Ø-315MVA	400/220	21	2	2	0		2 under procurment in POWERGRID	
8	UTTARAKHAND	3Ø-315MVA	400/220	4	1	0	1	20.24		Required at Dehradun
Total for Northern Region:				84	10	6	4	80.96		

Apart from the above, 03 nos. 400/220/33kV ICTs given to DTL on loan basis.

Sl No	State/ UT	MVA Rating and Phase	Voltage	Total installed unit	Spare Required as per CERC report	RPC Approved Spares	Qty Proposed for procurement	Approx Cost (Rs. In Crore)	Availability of RPC Spare	Remarks
1	UTTAR PRADESH	3Ø-200MVA	220/132	2	1	1	0		Raibareilly	
Total for Northern Region:				2	1	1	0	0		

Sl No	State/ UT	MVA Rating and Phase	Voltage	Total installed unit	Spare Required as per CERC report	RPC Approved Spares	Qty Proposed for procurement	Approx Cost (Rs. In Crore)	Availability of RPC Spare	Remarks
	CHANDIGARH	3Ø-160MVA	220/66	2	1	0	1	11.7		Required at Chandigarh
Total for Northern Region:				2	1	0	1	11.7		

Sl. No	State	Voltage	Capacit	Total instal	Spare requir	RPC Appro	Qty Prop	Approx	Availability	Remarks

.		Rating	y in MV AR	led Unit	ed as per CERC Committee report	ved Spares	osed for procurement	Cost (Rs. In Crore)	of RPC Spare	
1	Delhi	420 kV	125	3	1	0	1	13.00		
2	Haryana	420 kV	125	11	1	0	1	13.00		
3	HP	420 kV	125	1	1	0	1	13.00		
4	J&K	420 kV	125	2	1	0	1	13.00		
5	Punjab	420 kV	125	7	1	0	1	13.00		
6	Rajasthan	420 kV	125	12	1	0	1	13.00		
7	UP	420 kV	125	21	2	0	1	13.00		
8	Uttrakhand	420 kV	125	2	1	0	1	13.00		
Total for Northern Region:				59	9	0	8	104		

Sl. No.	State	Voltage Rating	Capacity in MV AR	Total installed Unit	Spare required as per CERC Committee report	RPC Approved Spares	Qty Proposed for procurement	Approx Cost (Rs. In Crore)	Availability of RPC Spare	Remarks
1	Haryana	420 kV	80	7	1	0	1	11.25		
2	HP	420 kV	80	4	1	0	1	11.2		

								5		
3	J&K	420 kV	80	2	1	0	1	11.25		
4	Punjab	420 kV	80	2	1	0	1	11.25		
5	Rajasthan	420 kV	80	7	1	0	1	11.25		
6	UP	420 kV	80	16	1	0	1	11.25		
7	Uttrakhand	420 kV	80	1	1	0	1	11.25		
Total for Northern Region:				39	7	0	7	78.75		

Sl. No.	**State**	**Voltage Rating**	**Capacity in MVAR**	**Total installed Unit**	**Spare required as per CERC Committee report**	**RPC Approved Spares**	**Qty Proposed for procurement**	**Approx Cost (Rs. In Crore)**	**Availability of RPC Spare**	**Remarks**
1	Haryana	420 kV	50	12	1	0	1	9.26		
2	HP	420 kV	50	4	1	0	0	0		
3	HP	420 kV	63	2	1	0	1	9.56		
4	J&K	420 kV	50	5	1	0	0	0		
5	J&K	420 kV	63	3	1	0	1	9.56		
6	Punjab	420 kV	50	8	1	0	0	0		
7	Punjab	420 kV	63	4	1	0	1	9.56		

8	Rajasthan	420 kV	50	22	2	0	0	0.00		
9	Rajasthan	420 kV	63	2	1	0	1	9.56		
10	UP	420 kV	50	36	2	0	0			
11	UP	420 kV	63	11	1	0	1	9.56		
12	Uttrakhand	420 kV	50	0	0	0	1	9.56		
Total for Northern Region:				109	13	0	7	66.62		

Sl. No.	**State**	**Voltage Rating**	**Capacity in MVAR**	**Total installed Unit**	**Spare required as per CERC Committee report**	**RPC Approved Spares**	**Qty Proposed for procurement**	**Approx Cost (Rs. In Crore)**	**Availability of RPC Spare**	**Remarks**
1	Haryana	220 kV	25	2	1	0	1	5.00		
2	J&K	220 kV	25	1	1	0	1	5.00		
3	LADAKH	220 kV	25	2	1	0	1	5.00		
4	Punjab	220 kV	25	3	1	0	1	5.00		
5	UP	220 kV	25	1	1	0	1	5.00		
6	Uttrakhand	220 kV	25	2	1	0	1	5.00		
Total for Northern Region:				11	6	0	6	30		

Special type of transformer

1	GIS Maharani Bagh	3Ø-500MVA	400/220	2	1	0	1	30		HV bushings: Oil to GIS IV Bushings: Oil to Oil
2	GIS Baghpat	3Ø-500MVA	400/220	2	1	0	1	30		

Special type of Reactors

1	GIS Manesar	420 kV	125	2	1	0	1	14.00		HV bushings: Oil to GIS
2	GIS Baghpat	420 kV	125	1	1	0	1	14.00		

A.12.3 Considering the shortages of Cold spare Transformers and lead time for procurement, OCC forum gave technical concurrence to the above proposal of Powergrid for procurement of Cold spare Transformers & Reactors on regional basis.

A.12.4 MS, NRPC asked Powergrid to bring this proposal in the upcoming 52nd TCC and 77th NRPC meeting of NRPC for approval of the NRPC Board.

Decision of OCC Forum:

Forum gave technical concurrence to the above proposal of Powergrid for procurement of Cold spare Transformers & Reactors on regional basis and asked Powergrid to bring this proposal in the upcoming 52nd TCC and 77th NRPC meeting of NRPC for approval of the NRPC Board.

A.13. Consent for complete 400 kV Bus-1 &2 shutdown at Mandola & Ballabgarh SS for replacement of damaged sections 400 kV jack buses (Agenda by POWERGRID NR-1)

A.13.1. Powergrid NR-1 intimated that in line with discussion in 224th & 225th OCC, DTL has provided consent for 400 kV Bus section-1 &2 shutdown on daily basis from 21st -28th Dec'24 for replacement of Jack bus.

A.13.2. Further, Powergrid has mentioned that matter for shutdown of 400 kV bus sections at Ballabgarh S/S has been taken up with HVPNL/Haryana SLDC & BBMB however consent for shutdown has not been provided for Ballabgarh S/S.

A.13.3. HVPNL requested Powergrid to take one bus shutdown at a time shutdown of 400 kV bus sections at Ballabgarh S/S, as complete shutdown of Buses at Ballabgarh S/S would affect power flow at 220kV level.

A.13.4. MS, NRPC asked Powergrid NR-1, HVPNL & BBMB to jointly visit the site and explore the possibility of one bus shutdown at a time at Ballabgarh S/S.

Decision of OCC Forum:

Forum asked Powergrid NR-1, HVPNL & BBMB to jointly visit the site and explore the possibility of one bus shutdown at a time at Ballabgarh S/S.

A.14. Replacement of 48 Volt battery bank at Kashipur (PTCUL) (Agenda by POWERGRID NR-3)

A.14.1. Powergrid NR-3 intimated that 48 Volt Battery Bank at Kashipur (PTCUL) end has deteriorated, due to this whenever LT supply fail at Kashipur end, PLCC system becomes non-functional.

A.14.2. Further, they mentioned that on date 27.06.24, due to failure of LT supply at Kashipur end PLCC system was not functional and due to the same 400 KV Bareilly-Kashipur-1 line tripped on single-phase fault as Auto-reclosure feature was blocked. Vide letter dated 27.06.24 and 23.08.2024 to executive engineer Kashipur (PTCUL), POWERGRID had requested PTCUL to change 48-volt battery bank at Kashipur end.

A.14.3. PTCUL representative informed that the 48-volt battery bank at Kashipur end has been replaced on 13.12.2024

A.15. PLCC issue in 220 KV Kanpur-Mainpuri (UP) line and 220 KV Kanpur-Sikandara (UP) Line (Agenda by POWERGRID NR-3)

A.15.1. Powergrid NR-3 mentioned that PLCC panel in 220 KV Kanpur-Mainpuri (UP) is out of service since long times and in 220 KV Kanpur-Sikandara(UP) PLCC Panel doesn't have provision for transfer of permissive code and direct trip code in case of line fault and bus fault.

A.15.2. Due to non-healthiness of PLCC Panel, Carrier aided distance protection of line will not be possible and will lead to mal tripping/operation of system in case of Z2 fault or bus fault at either end of line.

A.15.3. POWERGRID intimated that they have sent several communications to executive engineer Mainpuri (UP) and Sikandara (UP), wherein it had been communicated by POWERGRID to UPPTCL to restore the PLCC panel as soon as possible to avoid any maloperation.

A.15.4. MS, NRPC asked Powergrid to escalate the issue to the senior officials of UPPTCL and requested SE, UPPTCL to address the said matter promptly.

Decision of OCC Forum:

OCC forum asked Powergrid to escalate the issue to the senior officials of UPPTCL and SE, UPPTCL to address the said matter promptly.

A.16. No load Charging Code for 220 kV Fatehpur bays under NCR Consultancy (Agenda by POWERGRID NR-3)

A.16.1. Powergrid NR-3 mentioned that two nos. 220 kV bays were constructed by POWERGRID under North Central Railways (NCR) Consultancy at 765/400/220KV Fatehpur Substation.

A.16.2. All the work including pre-commissioning tests was completed in all respect and subsequently CEA approval for energisation has been received on date 28.03.2023.

A.16.3. NRLDC code of these bays were requested vide email dated 15.06.2023 for no load test charging. Charging code was not issued by NRLDC due to the requirement of Connection Agreement and GNA (General Network accesses) certificate.

A.16.4. North Central Railways (NCR) had applied for the same, but it was gathered from CTU that same was not granted due to non-availability of Grid Substation (GSS) & line, which are yet to be constructed by North Central Railways (NCR) at their end.

A.16.5. Powergrid stated that it has been learnt that it will take at least one more year in completion of GSS & connecting line by North Central Railways (NCR).

A.16.6. The physical completion of above bays has already been completed on 28.03.2023 and performance check of the bay equipment during warranty are pending due to pending charging of the same.

A.16.7. DGM, NRLDC stated that a new safety clearance would be necessary, as the previous clearance, which was issued over six months ago, has expired. Additionally, since the ownership of the line lies with the Railway, it is the Railway's responsibility to contact NRLDC for FTC clearance.

A.16.8. CGM, NRLDC highlighted that in June 2023 Powergrid on behalf on Railway approached NRLDC for FTC clearance, in July 2023 NRLDC returned the application asking for connectivity agreement which is to be obtained from CTU.

A.16.9. CTU representative informed that, at present, 130 MW GNA is allotted to Railways, which can be drawn from four ISTS points: Dadri, Auraiya, Allahabad, and Abdullapur. He further mentioned that, as per the recent APTEL order, Railways is to be given an additional 20 MW connectivity at Fatehpur. Since Fatehpur is not among the four ISTS points mentioned above, Railways need to approach the CTU for additional connectivity at Fatehpur. He also stated that, since Railways is a bulk consumer, they can be given a minimum of 50 MW connectivity at Fatehpur. Therefore, CTU has sought clarification from the CERC on the matter.

A.16.10. MS, NRPC asked Powergrid to inform Railways that they need to approach CTU for additional connectivity at Fatehpur and thereafter apply for FTC to NRLDC.

Decision of OCC Forum:

Forum asked Powergrid to inform Railways that they need to approach CTU for additional connectivity at Fatehpur and thereafter apply for FTC to NRLDC.

A.17. Review of existing combined islanding scheme of RAPP-A and RAPP-B (Agenda by RAPS)

A.17.1. RAPS has mentioned that in view of the event of 29th March 2024, RAPP-A survived on islanding but couldn’t survive for more than 20 minutes due to four long transmission lines (2 Debari and 2 Chittorgarh) remained connected to it. This possibly could have been the reason for higher 220kV bus voltage at RAPP-A end, even generator was operating on the leading MVAR.

A.17.2. NPCIL has stated that had RAPP-2 been connected to single Debari line (isolated from RAPP-B), it is presumed that RAPS-2 would have survived. This would have saved NPCIL one unit during the event and also supported grid during disturbance.

A.17.3. In view of the above, NPCIL has requested to review RAPP-A and RAPP-B islanding scheme, in terms of economic for NPCIL and grid support, which is better combined or separate islanding scheme for RAPP-A and RAPP-B.

A.17.4. MS, NRPC asked NPCIL to hold a separate meeting with RVPN to discuss the matter and subsequently present a detailed proposal to the OCC forum.

Decision of OCC Forum:

Forum asked NPCIL to hold a separate meeting with RVPN to discuss the matter and subsequently present a detailed proposal to the OCC forum.

A.18. Deployment of the OPGW Network in Powerlinks Transmission Limited (Agenda by Powerlinks Transmission Limited)

A.18.1. Powerlinks Transmission Limited mentioned that it carries out O&M of EHV transmission line(220kV and 400kV) having towers spread across 3 states from West Bengal to Uttar Pradesh. In existing transmission infrastructure, appx. 90% of the transmission line does not have OPGW.

A.18.2. Also, as per the advisory by Central Electricity Authority dated 22.05.24, Central and State Sector utilities must prioritize the implementation of the OPGW laying across its transmission network to ensure compliance with regulatory requirements.

A.18.3. Hence, to optimally utilize the existing transmission assets covering three states with a significant line length and adhere to the compliance with regulatory requirements, Powerlinks Transmission Limited propose to set up OPGW network in entire line length of Powerlinks Transmission Limited.

A.18.4. CGM, NRLDC stated that the said matter may be referred to appropriate forum i.e. TEST sub-committee for detailed scrutiny and deliberation on the Powerlinks Transmission Limited proposal to set up OPGW network in entire line length of Powerlinks Transmission Limited.

A.18.5. OCC forum referred the said matter to TEST sub-committee.

Decision of OCC Forum:

Forum referred the said matter to TEST sub-committee.

A.19. Long outage of 400KV Baglihar-2 main Bay (Bay No 413) at Kishenpur Substation due to Oil leakage in Y-Phase CT. (Agenda by Powergrid NR-2)

A.19.1. Powergrid NR-2 has intimated that 400KV Baglihar-2 main Bay (Bay No 413) at Kishenpur Substation is out of service due to Oil leakage in Y-Phase CT since 24.10.2024 and needs to be replaced on priority. Line connected to this bay is also out of service since September ‘2024 due to problem in GIS Bay at Baglihar end. Another element in the Dia is 400KV Samba-1 Line and any outage of Samba main Bay will result in outage of this line also.

A.19.2. Powergrid mentioned that they have written several communications to JKPDCL, but till now, no plan submitted by JKPDCL to replace the CT.

A.19.3. POWERGRID intimated that JKSPDC officials during their recent meeting at POWERGRID Jammu office has requested POWERGRID to provide CT for replacement in their bay and JKPTCL had agreed to sign a MOU to finalize the financial modalities regarding cost of CT.

A.19.4. POWERGRID intimated that as and when funds are received from JKPTCL, POWERGRID will arrange 01 number CT for M/S JKSPDC.

A.19.5. Members from JKSPDC were not present in the meeting.

A.19.6. OCC forum asked Powergrid to have a meeting with the officials of JKSPDC and expedite the signing of MOU covering the financial modalities regarding cost of CT.

Decision of OCC Forum:

Forum asked Powergrid to have a meeting with the officials of JKSPDC and expedite the signing of MOU covering the financial modalities regarding cost of CT.

A.20. Shutdown of 220KV Kishenpur Bern 1 &2 required to complete stringing of 2nd circuit of 400kV Dulhasti Kishenpur#2 (Agenda by Powergrid NR-2)

A.20.1. POWERGRID presented that S/D of 220KV Kishenpur Bern 1 & 2 is required to complete stringing of 2nd circuit of 400kV Dulhasti Kishenpur#2 and in case S/D is not allowed, charging of 400KV Kishenpur Kishtwar (2 nd circuit of Kishenpur Dulhasti #2) and 400KV Kishtwar Substation of Sterlite will be delayed.

A.20.2. The matter was deliberated in the OCC meeting and representative from JKPTCL agreed for S/D of 220KV Kishenpur Bern 1 &2 from 02.01.2024 to 16.02.2024 on daily basis from 10:00 Hrs to 16:00 Hrs.

A.21. Considering deemed availability of Outage of elements due to force majeure events beyond the control of the transmission licensee (Agenda by Powergrid NR-2)

A.21.1. Powergrid representative mentioned that cited agenda is regarding considering deemed availability of Outage of elements due to force majeure events beyond the control of the transmission licensee as per details:

- Tripping caused by lightening
- Tripping caused by loose flying objects during localised winds/storms
- Outage taken for removal of kite thread

- Outage due to Snow avalanche in snow bound areas

A.21.2. POWERGRID presented that from April ‘2024 onwards, there are 09 instances of tripping due to lightning, 07 instances of tripping due to kite thread, 02 number tripping due to snow avalanches and 07 number S/D were taken to remove kite thread.

A.21.3. For tripping due to lightning, POWERGRID presented GPS tagged photo for various tripping instances showing flashover marks on insulators, pitting marks on arcing horns, corona ring & conductor. POWERGRID presented that above flashover, and pitting marks are due to Back flashover during lightning. POWERGRID presented Back flashover Analysis from International Journal of Engineering Research and Applications (IJERA) ISSN: 2248-9622, Issue 1, January -February 2013, submitted by Department of Electrical & Electronics Engineering, VNR VJIET. Hyderabad - 90) 2 (Department of Electrical & Electronics Engineering, JNTU Hyderabad as under:

Quote

“Back flashover occurs when lightning stroke terminates on the overhead ground wire or tower. A stroke that so terminates forces currents to flow down the tower and out on the ground wires. Thus, voltages are built up across the line insulation. If these voltages equal or exceed the line critical flashover voltage (CFO), flashover occurs”.

A.21.4. POWERGRID further presented that as per the data published by IMD, different districts under J&K like Poonch, Rajouri, Reasi, Jammu, Udhampur and some of the Punjab area experience one of the highest light strikes per sq km/ day in India and all 9 tripping are lines passing through above area.

A.21.5. For tripping due to external object, POWERGRID presented Geo tagged photo for various tripping instances showing external objects like polythene, tarpaulin and other materials.

A.21.6. For S/D taken to remove kite thread, POWERGRID presented Geo tagged photos of kite thread found wrapped multiple times around the insulator string along the line. POWERGRID further intimated that in case kite thread not removed, it may cause outage of line during odd hours resulting in longer outage.

A.21.7. In case of snow avalanches, POWERGRID intimated that is not possible to provide geotagged photo or video however Newspaper cuttings, other media, IMD warning and relay fault data will be provided.

A.21.8. POWERGRID further presented that all above events are beyond the control of transmission licensee and hence outage due to above events may be covered under force majeure. POWERGRID further presented that as per tariff regulation 2024.

Quote

"Force Majeure' for the purpose of these regulations means the events or circumstances or combination of events or circumstances, including those stated below, which prevent the generating company or transmission licensee from completing or operating the project, and only if such events or circumstances are not within the control of the generating company or transmission licensee and could not have been avoided, had the generating company or transmission licensee taken reasonable care or complied with prudent utility practices:

Act of God including lightning, drought, fire and explosion, earthquake, volcanic eruption, landslide, flood, cyclone, typhoon, tornado, geological surprises, or exceptionally adverse weather conditions which are more than the statistical measures for the last hundred years.

A.21.9. Members from GRID India stated that it becomes difficult to verify outages due to insufficient supporting documents by transmission licensee.

A.21.10. EE(P) NRPC intimated that above outages can be verified provided transmission licensee provides all supporting documents such as Geo tagged photo showing signs of lightening, relay fault data, Relay DR and tower schedule.

A.21.11. MS NRPC advised all transmission licensee to submit all supporting documents for each tripping and based upon the relevant documents submitted by the utilities, Outages due to tripping caused by lightening, loose flying objects during localised winds/storms, Snow avalanche in snow bound areas would be examined and scrutinized by NRPC Sectt. on case-to-case basis after prudent checking.

A.22. Generator hunting at RAPS-5 &6 dated 08/12/2024 (Agenda by NPCIL)

A.22.1. The matter discussed under agenda item no. B.10. Please refer to item no. B.10.

A.23. Tripping of Rihand Stage-3 Units, during Monopole Ground Return Mode Operation of Rihand Dadri HVDC line. (Agenda by NTPC)

A.23.1. The matter discussed under agenda item no. B.2. Please refer to item no. B.2.

A.24. Additional Agenda 1: Implementation of AUFLS scheme in accordance with the report of Task Force on Automatic under Frequency Load Shedding (AUFLS) (Agenda by NRPC Sectt.)

A.24.1. EE(O), NRPC apprised forum that in line with the report of Task Force on Automatic under Frequency Load Shedding (AUFLS) and df/dt scheme (copy

enclosed as **Annexure-A.IV**), NPC Secretariat to communicate the Region wise relief quantum (based on Regional Peak Demand Met during the previous year) by 31st of May to RPCs for implementation in the next Financial Year (FY).

A.24.2. NPC Secretariat has communicated to RPC's that they have computed the quantum of load shedding in different stages of AUFLS based on the Peak Demand Met of the Region in the financial year (2023-24). The region wise Peak Demand Met considered by NPC Sectt. is as follows:

Region	**NR**	**SR**	**WR**	**ER**	**NER**
Peak Demand Met (MW)	80,548	68,094	72,556	29,299	3,603

A.24.3. The quantum of load shedding in different stages of AUFLS region-wise is as follows:

Sr. No.	***Stage***	***Frequency (Hz)***	***Demand Disconnection (%)***	**Quantum of Load shed in MW**					
AUFLS Set Points and Percentage Quantum of Relief				**NR**	**SR**	**WR**	**ER**	**NER**	**All India Load shed**
1	Stage 1	49.4 Hz	5.00%	3801.7	3213.9	3424.5	1382.8	173.5	11996.55
2	Stage 2	49.2 Hz	6.00%	4562.04	3856.7	4109.4	1659.4	208.3	14395.86
3	Stage 3	49.0 Hz	7.00%	5322.4	4499.5	4794.3	1935.9	243.03	16795.17
4	Stage 4	48.8 Hz	7.00%	5322.4	4499.5	4794.3	1935.9	243.03	16795.17
	Total (in MW)			**19008.5**	**16069.5**	**17122.4**	**6914.3**	**867.9**	**59982.7**

A.24.4. After the receipt of the allocated load shedding quantum of the Region from NPC, AUFLS relief quantum should be distributed among the State/UT in the region by the RPCs in consultation with the stakeholders.

A.24.5. NRPC Sectt. has computed each State/UT Stage-wise AUFLS quantum for NR based upon the task force report and quantum of load shedding in different stages of AUFLS region-wise finalized by NPC. The details of which are mentioned in the table below:-

State/UT	**Stage-1 49.4 Hz (5%)**	**Stage-2 49.2 Hz (6%)**	**Stage-3 49.0 Hz (7%)**	**Stage-4 48.8 Hz (7%)**	**Total**
	Stage-1 Relief	Stage-2 Relief	Stage-3 Relief	Stage-4 Relief	
Chandigarh	15.850	19.020	22.190	22.190	**79.248**

Delhi	299.338	359.205	419.073	419.073	**1496.690**
Haryana	526.332	631.599	736.865	736.865	**2631.661**
Himachal Pradesh	97.246	116.695	136.145	136.145	**486.231**
UT J&K & Ladhak	145.406	174.487	203.569	203.569	**727.031**
Punjab	601.638	721.966	842.293	842.293	**3008.190**
Rajasthan	811.056	973.268	1135.479	1135.479	**4055.282**
Uttar Pradesh	1191.769	1430.122	1668.476	1668.476	**5958.843**
Uttarakhand	113.069	135.682	158.296	158.296	**565.343**
Total	**3801.704**	**4562.045**	**5322.386**	**5322.386**	**19008.52**

A.24.6. Further, States/UT shall identify the load relief for each stage considering the Quantum of relief and their demand contribution considering the intra-day, seasonality etc. 10% additional relief would be finalised considering the demand growth of the year, planned and forced outages, UFR and breaker issues etc. SLDC would communicate feeder-wise, Stage-wise details etc. to RPC/RLDC.

GUIDELINES FOR IDENTIFICATION OF AUFLS FEEDERS

The following to be considered for identification of feeders:

i. AUFLS relays under Stage-1 & Stage-2 should be implemented preferably on downstream network at 11/22/33 kV level.

ii. AUFLS relays under Stage-3 & Satge-4 should be implemented on upstream network at EHV (66/110/132 kV) level so that load relief obtained is fast and reliable as it is a desperate measure for areas that have disintegrated.

iii. As far as possible the feeders/transformers are feeding radial loads shall be identified.

iv. Telemetry availability would be considered as important factor so that the feeders/transformer loading can be extended to SLDC/RLDC for mapping

v. Feeders catering to critical loads are to be avoided. VIP areas, Airport, Metro, Railways, Defence, Govt. Hospitals, Government Offices, continuous process industries etc. needs to be prioritized

vi. No mixed feeders with RE/Distributed generations should be identified. If identified the feeder should be never in injecting mode. Steps to segregate the feeder (load/RE/Distributed generation) would be taken.

vii. If Grid feeder is identified the other side breakers should be in normally open condition. If they are to be closed frequently then UFR with same set points to be provided at other ends.

viii. The feeders identified for AUFLS would be as far as possible not common for df/dt, scheduled power cuts, load shedding, SPS, ADMS etc. In case of difficulty to identify dedicated feeders the same is to be approved in OCC/PCSC. Adequate care is to be taken if round robin scheme is adopted for ADMS, SPS etc.

ix. The Islanding loads/feeders which are to be retained would not be enabled for AUFLS. However, loads in the Island can be identified for AUFLS but same has to be factored while designing the Island.

A.24.7. OCC forum in line with the report of task force on AUFLS and df/dt scheme asked States/UTs of NR to communicate feeder-wise, Stage-wise AUFLS quantum to NRPC/NRLDC before next OCC meeting.

Decision of OCC Forum:

Forum asked States/UTs of NR to communicate feeder-wise, Stage-wise AUFLS quantum to NRPC/NRLDC before next OCC meeting.

A.25. Additional Agenda 2: Discrepancy in the Regional Energy Account (REA) published by NRPC for SJVN Generating station viz Rampur HPS for August, 24, September, 2024 and October, 2024. (Agenda by SJVN)

A.25.1. SJVN representative mentioned that as per Regional Energy Account published by NRPC Sectt. on Monthly basis, SJVN has observed a discrepancy in the **Regional Energy Account** (REA) published by NRPC for SJVN generating station viz Rampur HPS for August, 24, September, 2024 and October, 2024.

PAF as issued by NRPC in Provisional REA for Rampur HPS			PAF as calculated based on Declared Capacity of Rampur HPS	Remarks
Dated	Month	PAF (%)	Actual PAF (%)	
04.11.24	Oct, 24	99.995	DC:407.90 MW, IC:407.90 MW, **Overall PAF= 100 %**	Discrepancy in PAF from 100 % to 99.995 %
03.10.24	Sept, 2024	105.665	DC a) DC From 01.09.24 to 17.09.24: 448.690 MW (412.02 X 0.99 X1.1), IC: 407.90 MW, PAF= 110 % b) DC From 18.09.24 to 30.09.24: 407.90 MW, IC: 407.90 MW, PAF= 99.995 % **Overall PAFM= 105.667 %**	Discrepancy in PAF from 105.667 % to 105.665 %
03.09.24	August, 24	110.016	DC a) DC From 01.08.24 to 04.08.24:449.50 MW, IC:407.90, PAF = 110.199 %	Discrepancy in PAF from 110.026 % to 110.016 %

			b) DC From 05.08.24 to 31.08.24: 448.690 MW, IC: 407.90, PAF= 110 % **Overall PAFM= 110.026 %**	

A.25.2. Aforesaid discrepancy arises due to the restriction on Declared Capacity by Rampur HPS on new **WBES**, which limits the value to two decimal places. Consequent to the same, there is a **commercial loss** to Rampur HPS in terms of reduction in PAF and Capacity Charges.

A.25.3. In this context, SJVN requested OCC forum impress upon the aforesaid matter to avoid financial implication to Rampur HPS and ensuring accurate representation of the plant's performance.

A.25.4. MS, NRPC asked SJVN to take up the matter with the energy scheduling team of NRLDC and NRLDC to address the grievance of SJVN.

Decision of OCC Forum:

Forum asked SJVN to take up the matter with the energy scheduling team of NRLDC and NRLDC to address the grievance of SJVN.

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

B.1 NR Grid Highlights for November 2024 and demand forecasting related

NRLDC representative presented the following grid highlights for month of Nov'2024:

S.No.	Constituents	Max Demand met (in MW)	Date & Time of Max Demand met	Max Consumption (in MUs)	Date of Max Consumption	Average Demand met (in Mus)
1	Chandigarh	221	05.11.24 at 18:00	4.0	06.11.24	3.6
2	Delhi	4259	08.11.24 at 18:03	82.8	08.11.24	74.8
3	Haryana	7848	11.11.24 at 18:30	156.0	12.11.24	144.8
4	H.P.	2107	29.11.24 at 08:15	37.7	29.11.24	33.9

5	J&K	2836	26.11.24 at 19:00	58.5	30.11.24	54.6
6	Punjab	8962	30.11.24 at 09:45	160.5	30.11.24	143.6
7	Rajasthan	17434	27.11.24 at 09:45	333.5	09.11.24	320.2
8	U.P	19929	05.11.24 at 18:29	392.7	09.11.24	349.5
9	Uttarakhand	2249	28.11.24 at 08:00	42.4	09.11.24	39.8
10	Northern Region	**61434**	29.11.24 at 10:43	**1247.9**	**09.11.24**	**1164.7**

***As per SCADA**

- In Nov'24, the Maximum energy consumption of Northern Region was **1248 MUs** on 09th Nov'24 and it was 7 % higher than Nov'23 (1165 MU 1st Nov'23)

- In Nov'24, the Average energy consumption per day of Northern Region was **1165 MUs** and it was 9.4 % higher than Nov'23 (1065 MUs/day)

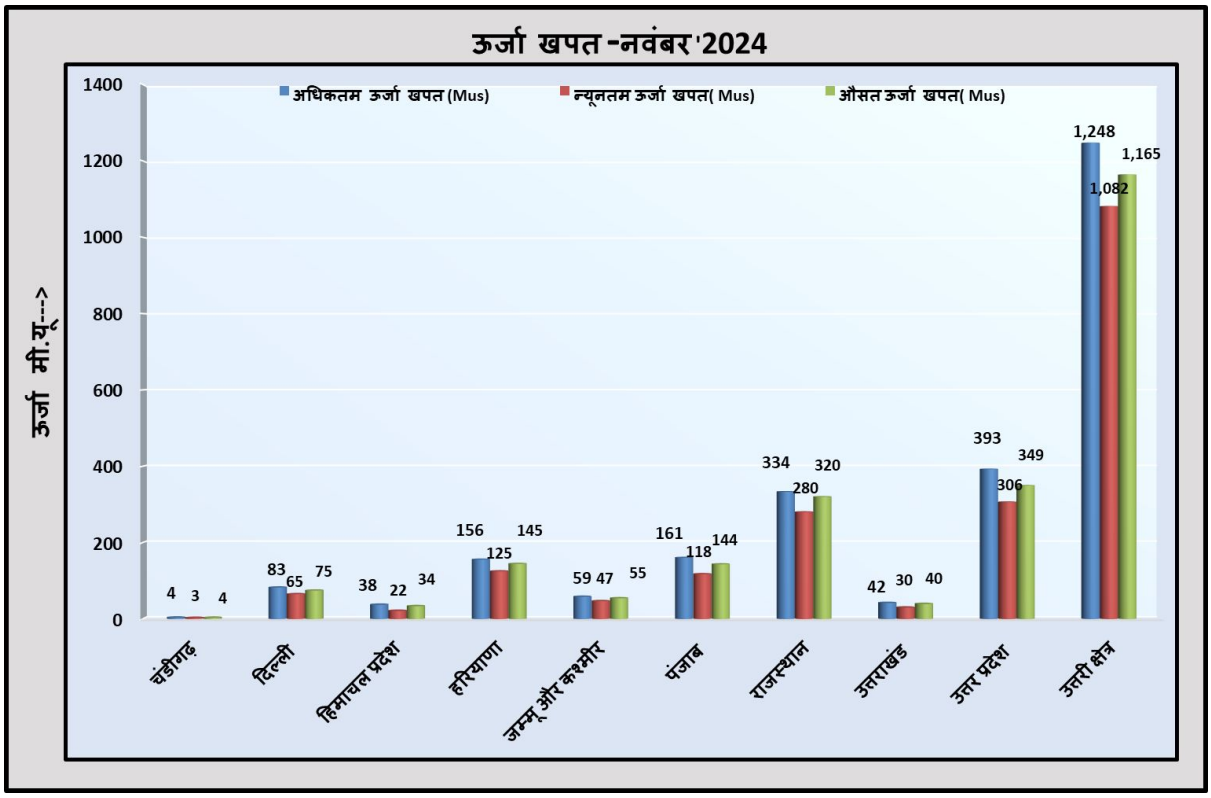
- In Nov'24, the Maximum Demand met of Northern Region was **61434 MW** on 29th Nov'24 @10:43 hours (*as per SCADA data)* as compared to 56849 MW on 8th Nov'23 @18:17hours.

Comparison of Average Energy Consumption (MUs/Day) of NR States for the Nov'23 vs Nov'24

क्षेत्र/राज्य	नवंबर- 2023	नवंबर- 2024	% अंतर
चंडीगढ़	3.4	3.6	7.1%
दिल्ली	70.5	74.8	6.1%
हिमाचल प्रदेश	32.3	33.9	5.2%

हरियाणा	131.7	144.8	9.9%
जम्मू और कश्मीर	52.3	54.6	4.5%
पंजाब	130.8	143.6	9.8%
राजस्थान	292.0	320.2	9.7%
उत्तराखंड	37.1	39.8	7.1%
उत्तर प्रदेश	314.8	349.5	11.0%
उत्तरी क्षेत्र	**1064.8**	**1164.7**	**9.4%**

Energy Consumptions

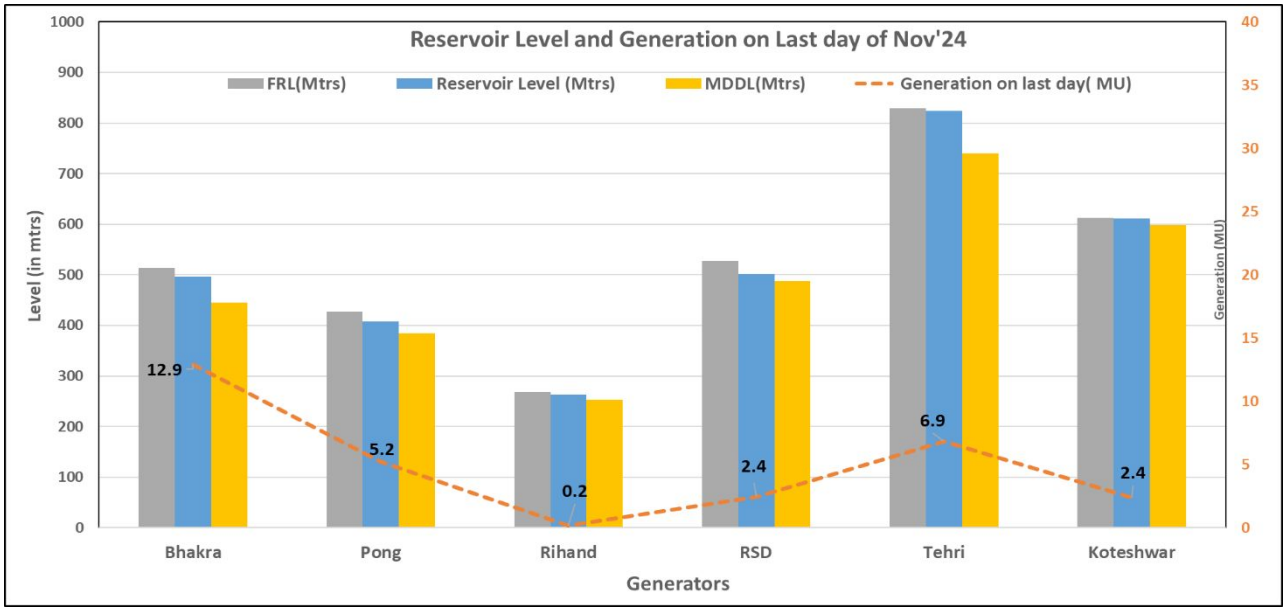


Frequency profile

Month	Avg. Freq. (Hz)	Max. Freq. (Hz)	Min. Freq. (Hz)	<49.90 (% time)	49.90 – 50.05 (% time)	>50.05 (% time)
Nov'24	49.995	50.317 (02.11.24 at 11:04:20 hrs)	49.553 (27.11.24 at 17:18:50 hrs)	5.2	80.8	14.0

Nov'23	50.00	50.39 27.11.23 at 00:02:00 hrs	49.55 25.11.23 at 14:17:10 hrs	6.83	74.36	18.81

Reservoir Level and Generation on Last Day of Month



Reservoir Level on last day of Nov (Low: -ve) (High: +ve)

Year	Bhakra	Pong	Rihand	RSD	Tehri	Koteshwar
2024	497	408	264	502	824	611
2023	502	418	259	513	818	610
Diff (in m)	-5	-10	5	-12	6	1

Detailed presentation on grid highlights of Nov'2024 as shared by NRLDC in OCC meeting is attached as **Annexure-B.I.**

B.2 Restriction on loadability of HVDC Rihand-Dadri under monopolar mode of operation

Rihand stage-III generating station (2x500 MW) is evacuated through Western Region via 400 kV Rihand stage-III- Vindhyachal PS D/C. Further, the station is disconnected from NR by keeping the bus coupler between Rihand-III and Rihand- I&II open. In order to relieve the loading of 765 kV Vindhyanchal – Varanasi D/C during peak NR import season and enhancement of NR Import TTC, the shifting of Rihand stage-III

generating station (2x500 MW) to NR by closing the bus coupler between Rihand-III and Rihand-I & II and disconnecting Rihand-III from WR by opening 400 kV Rihand stage-III - Vindhyachal PS D/C as an interim measure was proposed.

Subsequently, after detailed studies at NLDC/NRLDC/WRLDC and discussions, it was proposed in the meeting chaired by MS, NRPC on 24th July 2024 that shifting of Rihand-III to NR for enhancement of WR-NR transfer capability may be carried out and the above rearrangement of Rihand-III would be reversed to the original configuration (Rihand-III back to WR) in October 2024.

Accordingly, operation circulars were issued by NRLDC/NLDC for shifting of Rihand – III units for both operations. Rihand – III units were shifted to NR on 14th August 2024 and then again shifted back to WR on 4th November 2024.

After successful changeover of Rihand-III to WR, shutdown of Rihand-Dadri HVDC was facilitated in Northern region.

During this shutdown, there was also monopolar operation of HVDC pole via ground return.

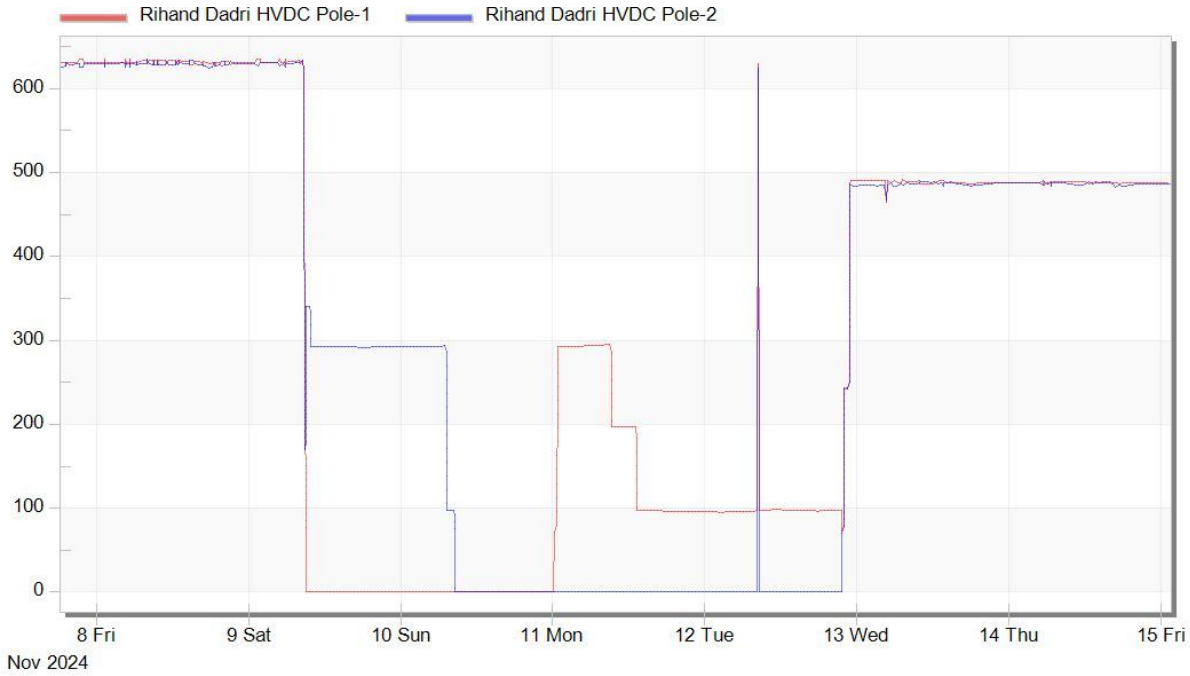
Under such operation, NTPC has reported vibrations in Rihand units and also that DC current is entering HV neutral of GTs. The DC current component in Rihand-III (Unit-5 and Unit-6) are much higher than Rihand Stage-I and Stage-II units.

Earlier, also such vibrations were observed when Rihand-Dadri was operated in monopolar mode with ground return.

To resolve this, committee was formed at NRPC level, and POWERGRID/CTUIL & NTPC were asked to take up further study and power order under monopolar mode of operation was restricted to 300MW. No vibrations were observed with power order of 300MW.

However, this time (in Nov'2024) even with 300MW and lower, power order on Rihand-Dadri pole under monopolar ground return mode of operation, vibrations were observed and Rihand-III units (Unit-5 (GT-5Y) & Unit-6 (GT-6R & 6B)) tripped on Buchholz operation on 11.11.2024 at 01:13 hrs / 01:16 hrs respectively.

Due to such vibrations, power order on Rihand-Dadri HVDC monopole had to be further reduced and it was lowered to 100MW, at which vibrations were minimal.



Extract of MoM of 45th TCC meeting (27th & 28th August 2020) & 48th NRPC Meeting (2nd September 2020) is quoted below:

"B.27.6 After deliberations, TCC recommended following:

B.27.6.1 It was decided that power flow during ground return mono polar operation may be restricted at 300 MW on automatic mode of operation rather than manual mode of operation as being followed currently to avoid damage due to excessive vibrations.

B.27.6.2 Further, it was noted that NTPC is no way responsible for excessive vibrations since flow of harmful DC current above the permissible limit in the neutral of the surrounding transformers is due to HVDC ground return mode of operation. Therefore, it was decided that CTU in consultation with NTPC will examine the issue in details and come out with a solution for discussions in OCC.

B.27.6.3 In continuation to decision in 2nd meeting of the committee constituted to look into the issue, it was decided that outage of one pole of Rihand-Dadri may be given only when both units of stage-Ill of Rihand or both units of stage-IV / stage-V of Vindhyachal are not simultaneously planned for outage so that neutral current is shared among GTs.

NRPC Deliberations

B.27.7 NRPC concurred with the deliberation of TCC and advised CTU and NTPC to jointly decide on the study to be conducted for resolving the issue of vibrations in GTs.

In 226 OCC meeting, NRLDC representative stated that:

- Such restriction on power order of HVDC Rihand-Dadri under monopolar mode of operation, reduce the flexibility and utility of Rihand-Dadri HVDC for power evacuation and grid management as it increases loading on parallel ckts and reduces the margin in transmission system.

- Issues of vibrations in Rihand-III units under monopolar mode of operation of Rihand-Dadri HVDC to be resolved at the earliest based on study by POWERGRID/CTUIL & NTPC as agreed in 45th TCC meeting (27th & 28th August 2020) & 48th NRPC Meeting (2nd September 2020). Status of decision of these meetings may be provided by POWERGRID/CTUIL/NTPC.
- NTPC may also confirm whether any vibrations were reported on 09.11.2024 when Rihand Dadri Pole-2 was under operation or such vibrations were only reported on 11.11.2024 when Rihand Dadri Pole-1 was under operation.

NTPC representative highlighted the following points:

- Minor vibrations were also reported on 09.11.2024 when Rihand Dadri Pole-2 was under operation, but that were not that significant. When RIhand Dadri Pole-1 was operated under monopolar operation, there were significant vibrations.
- Vibrations were also observed in RIhand Stage-I and RIhand Stage-II units on 11.11.2024
- On 17.10.2024, Unit-6 at Rihand had also tripped. During inspection it was found that acetylene gas was observed in the transformer.

Presentation as shared by NTPC in the meeting is attached as **Annexure-B.II.**

NTPC/POWERGRID/CTUIL informed that no studies have been undertaken at their end as per decision of 45th TCC meeting (27th & 28th August 2020) & 48th NRPC Meeting (2nd September 2020).

POWERGRID representative stated that:

- Measurements were taken at earth electrode station near Rihand station. However, no anomaly was observed.

CTUIL representative stated that no network change has taken place recently, so that reason could be identified. It was also requested that NTPC Rihand may also share data of any vibrations before Rihand Stage-III commissioning.

NRLDC representative stated that 400kV Singrauli-Anpara was opened to control fault level in Aug 2024 as per decision of 3 NRPCTP Meeting. That is the only network change since previous years operation.

OCC forum again discussed that why vibrations are prominent in Rihand-III units and not significant in Rihand Stage-I and Stage-II units, need to be investigated. Restriction on power order of HVDC Rihand-Dadri under monopolar mode of operation, reduce the flexibility and utility of Rihand-Dadri HVDC for power evacuation and grid management

MS NRPC suggested that committee may be formed under SE(O), NRPC with members from NTPC, POWERGRID, NRLDC, CTUIL, CEA to analyse the issue.

OCC agreed that committee may be formed under SE(O), NRPC with members from NTPC, POWERGRID, NRLDC, CTUIL to analyse the issue. Further, if required, inputs from academia/ OEM may also be sought by the committee. The committee shall submit its report and recommendation within 3 months. Till the

result from committee, power order on Rihand-Dadri under monopolar operation shall be restricted to 100MW based on grid conditions.

B.3 Periodic testing of generators and FACTS/HVDC Devices

In 213 OCC meeting held in Nov 2024, the requirements w.r.t. periodic testing of generators and FACTS/HVDC Devices were discussed when presentation was made by Solvina team in OCC forum.

Subsequently, in 219 OCC meeting and 73 NRPC meeting held in May 2024, the agenda was again discussed. During these meetings, it was discussed that:

Regulation 40 (1) of CERC (IEGC) Regulations, 2023 stipulate that there shall be periodic tests, as required under clause (3) of this Regulation, carried out on power system elements for ascertaining the correctness of mathematical models used for simulation studies as well as ensuring desired performance during an event in the system.

The tests shall be performed once every five (5) years or whenever major retrofitting is done. If any adverse performance is observed during any grid event, then the tests shall be carried out even earlier, if advised by SLDC or RLDC or NLDC or RPC, as the case may be.

Further, Regulation 40(1)(b) stipulate that “All equipment owners shall submit a testing plan for the next year to the concerned RPC by 31st October to ensure proper coordination during testing as per the schedule. In case of any change in the schedule, the owners shall inform the concerned RPC in advance.”

Extract of IEGC 2023 clause 40,

“40. PERIODIC TESTING

(1) There shall be periodic tests, as required under clause (3) of this Regulation, carried out on power system elements for ascertaining the correctness of mathematical models used for simulation studies as well as ensuring desired performance during an event in the system.

(2) General provisions

(a) The owner of the power system element shall be responsible for carrying out tests as specified in these regulations and for submitting reports to NLDC, RLDCs, CEA and CTU for all elements and to STUs and SLDCs for intra-State elements.

(b) ***All equipment owners shall submit a testing plan for the next year to the concerned RPC by 31st October to ensure proper coordination during testing as per the schedule****. In case of any change in the schedule, the owners shall inform the concerned RPC in advance.*

(c) The tests shall be performed once every five (5) years or whenever major retrofitting is done. If any adverse performance is observed during any grid event, then the tests shall be carried out even earlier, if so advised by SLDC or RLDC or NLDC or RPC, as the case may be.

(d) The owners of the power system elements shall implement the recommendations, if any, suggested in the test reports in consultation with NLDC, RLDC, CEA, RPC and CTU.

(3) Testing requirements

The following tests shall be carried out on the respective power system elements:

TABLE 9 : TESTS REQUIRED FOR POWER SYSTEM ELEMENTS

Power System Elements	Tests	Applicability
Synchronous Generator	(1) Real and Reactive Power Capability assessment. (2) Assessment of Reactive Power Control Capability as per CEA Technical Standards for Connectivity (3) Model Validation and verification test for the complete Generator and Excitation System model including PSS. (4) Model Validation and verification of Turbine/Governor and Load Control or Active Power/ Frequency Control Functions. (5) Testing of Governor performance and Automatic Generation Control.	Individual Unit of rating 100MW and above for Coal/lignite, 50MW and above gas turbine and 25 MW and above for Hydro.
Non synchronous Generator (Solar/Wind)	(1) Real and Reactive Power Capability for Generator (2) Power Plant Controller Function Test (3) Frequency Response Test (4) Active Power Set Point change test. (5) Reactive Power (Voltage / Power Factor / Q) Set Point change test	Applicable as per CEA Technical Standards for Connectivity.
HVDC/FACTS Devices	(1) Reactive Power Controller (RPC) Capability for HVDC/FACTS (2) Filter bank adequacy assessment based on present grid condition, in consultation with NLDC. (3) Validation of response by FACTS devices as per settings.	To all ISTS HVDC as well as Intra-State HVDC/FACTS, as applicable

In accordance with above, Generators and HVDC/FACT owners were required to furnish the Testing schedule for 2024-25 by 31st October 2023. As the time has

already passed, Generators and HVDC/FACT owners were supposed to furnish the Testing schedule for 2025-26 by 31st October 2024.

The procedure for testing is available at the NLDC website at https://posoco.in/wpcontent/uploads/2023/09/Final-Procedure-of-Periodic-Testing-for-Power-System-Elements-submitted-to-CERC.pdf. This may be used for testing.

Along with testing, the mathematical models (preferably PSSE models) based on the results of testing need to be provided, so that All India case can be built with the respective generic models.

As per the decision of 73 NRPC meeting, NRPC forum asked all Generators and HVDC/FACT owners to furnish the Testing schedule for 2024-25 and 2045-26 to NRPC/NRLDC at the earliest.

However, the same is still pending.

Matter was then once again discussed in 54th Protection Sub-Committee Meeting held on 25th November, 2024. During the meeting, utilities had requested that list of third party testing agencies may be provided by NRLDC/NRPC. It was discussed that as of now there is no such criteria for selection of third party for carrying out testing. However, the third party should be a certified agency.

NRLDC representative stated that as the testing plan is yet to be received from utilities, a google sheet has been prepared and it is requested that testing plan for 2024-25 and 2025-26 may be updated in the sheet provided at the earliest as per the requirement of IEGC 2023 and decision of 73 NRPC meeting. Google sheet link is:

https://docs.google.com/spreadsheets/d/18KTutJ66bK9LdOOhuHfzlmBeYH7_TgMs/edit?gid=849497112#gid=849497112

MS NRPC stated that testing has to be carried out as per IEGC 2023, and was also discussed in NRPC meeting earlier. As it has been mentioned in IEGC and also decision of NRPC forum, all generating units and HVDC/FACT devices owner were asked to provide testing schedule in the the google sheet attached.

OCC forum asked all generating units and HVDC/FACT devices owner to provide testing schedule in the google sheet attached. SLDCs were asked to take up the matter with respective state generating units. NRPC sect. shall also include this google sheet as part of follow up agenda of OCC meeting in Part-A.

B.4 Demand forecasting and resource adequacy related

Hon'ble CERC In the matter of Planning for safe, secure, and reliable integrated operation of the power system during critical periods arising on account of seasonal variations wherein the electricity demand increases rapidly by undertaking specific measures to mitigate the risks on the power system, under clause (h) of sub-section (1) of Section 79 of the Electricity Act, 2003 and the Regulation 31 of the Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2023 has issued suo-motto order 9/SM/2024 dated 07.10.2024.

Commission has issued the following directions to NLDC, RLDCs, and SLDCs in connection with the implementation of Regulations 31 and 33 of the Grid Code to address the anticipated surge in demand of electricity during October 2024 on account of seasonal variations:

a) All the State Load Despatch Centres and RLDCs shall furnish the details of operational planning undertaken by them in terms of Regulation 31(4) (a) of the Grid Code especially for October 2024. RLDC shall validate the adequacy of resources in terms of Regulation 31(4)(b) of the Grid Code.

b) All State Load Despatch Centres and Regional Load Despatch Centres shall prepare the worst-case scenario due to possible surge in demand during the period 1.10.2024 to 31.10.2024 in their respective control area and submit within seven days to the Commission with a copy to National Load Despatch Centre.

c) The State Load Despatch Centres or Regional Load Despatch Centres, as the case may be, should assess their demand-generation scenario in the upcoming months, ensure the optimum generation, avoid undesirable planned outages, and advise the generating company to offer their availability. The State Load Despatch Centre or Regional Load Despatch Centre shall ensure the optimum scheduling during the shortage period and surplus power to get despatched during the deficit period.

d) The Distribution Companies, in case of a shortage scenario, can procure the power from surplus or requisitioned capacity of other states so that optimum despatch can be ensured for safe and reliable power system operations. The State Load Despatch Centre shall monitor the generation-demand deficit of the respective distribution companies.

e) The generating companies operating their plant with capacity less than its installed capacity due to technical issues, i.e., capacity under partial outage or forced outage, are advised to fix the issues to ensure the maximum generation capacity on-bar.

f) The draw schedule of the respective control area needs to adhere to prevent the reduction of system frequency. The State Load Despatch Centre or Regional Load Despatch Centre, as the case may be, shall monitor the deviation of the key system parameters.

g) The State Load Despatch Centres or Regional Load Despatch Centres, as the case may be, shall issue the system alerts to their respective grid-connected entities for the possible deficit during the likely surge in demand

The Regional Load Despatch Centres and State Load Despatch Centres shall submit the report on the implementation of the above measures, a load-generation scenario in their respective control areas, and any other measures taken to address the deficit of power supply during the period 1.10.2024 to 31.10.2024.

NLDC, RLDCs, and SLDCs were directed to submit their responses to the measures contained in para 9 of this order by 16.10.2024.

As per the information available with NRLDC, only J&K, Punjab, Rajasthan, HP & Uttarakhand have submitted their formal reply to CERC as per latest information available with NRLDC.

Whereas other states have neither submitted their response to CERC nor NRLDC with regard to order 9/SM/2024 dated 07.10.2024.

In 225 OCC meeting, NRLDC representative mentioned that:

- *As per the information available with NRLDC, only HP & Uttarakhand have submitted their formal reply to CERC.*
- *Punjab and J&K have shared some information with NRLDC, but formal communication to CERC from their side is yet to be done.*
- *Whereas other states have neither submitted their response to CERC nor NRLDC with regard to order 9/SM/2024 dated 07.10.2024.*

Delhi SLDC representative had mentioned that reply is with their legal team and would be submitted shortly to Hon'ble Commission. Punjab SLDC mentioned that node wise data has been requested from PSPCL, after receipt of the same, official reply would be submitted to CERC. No other update could be received from SLDCs in the meeting.

In 226 OCC meeting,

UP and Haryana SLDC representative stated that they have only submitted data to NRLDC and no reply has been submitted to CERC.

Delhi SLDC representative stated that they have filed reply in first fortnight of Dec 2024.

With reference to the Clause 31(2) of Central Electricity Regulatory Commission-IEGC Regulations, 2023 and the Operating Procedure of NRLDC prepared in accordance with the same, each SLDC has to furnish the demand estimation for day ahead, week ahead, month ahead (with time block wise granularity) and demand estimation for year ahead (with hour granularity). The sub-clause 31(2) (h) of IEGC-2023 states the following timeline for the submission of demand estimate data to RLDC.

Type of Demand Estimation	**Timeline**
Daily	10:00 hours of previous day
Weekly	First working day of previous week
Monthly	Fifth day of previous month
Yearly	30th September of previous year

Status of Day Ahead Forecasting, week ahead, month-ahead and year-ahead submission status for November-2024 as per Clause 31(4) (a) & (b) of IEGC-2023 is shown below:

Region	State	Day ahead Data submission (Y/N)	Weeky Data submission (Y/N)	Monthly Data submission (Y/N)	Yearly Data submission (Y/N)
NR	Punjab	Y	Y	Y	N
	Haryana	Y	N	N	N
	Rajasthan	Y	N	N	N
	Delhi	Y	N	Y	Y
	UP	Y	Y	Y	Y
	Uttarakhand	Y	N	Y	N
	HP	Y	Y	Y	Y
	J&K	Y	N	N	N
	Chandigarh	Y	Y	N	N

In accordance with above, all SLDCs are requested to timely furnish the demand estimation data along with generation adequacy data as per the formats available at *https://drive.google.com/drive/folders/1KWY4G9gTBLV5wTJkhGEleRptKP-QbhjL?usp=drive_link* to NRLDC through mail (nrldcmis@grid-india.in) and FTP as per above timeline.

The relevant clauses from IEGC 2023 related to demand forecasting exercise and resource adequacy exercise as discussed in 225 OCC meeting are enclosed in Annexure-B.I of agenda

All SLDCs need to take actions at their end for timely submission of demand forecasting and resource adequacy data on day-ahead, week-ahead, month ahead and year ahead basis. It is also requested to share actions being taken at your end to ensure compliance of listed clauses of IEGC 2023 as Annexure-B.I of agenda.

In 226 OCC meeting, it was requested that SLDCs share actions being taken at their end to ensure compliance of above listed clauses of IEGC 2023. Further, report of self-audit carried out as per compliance of IEGC 2023 may also be submitted to NRLDC/ NRPC. All SLDCs agreed to take actions as discussed in the meeting.

NHPC representative stated that they have shared self-audit reports of their hydro stations with NRPC/NRLDC.

B.5 Status of insulator washing and replacement of porcelain insulators with polymer insulators

With low temperature across Northern region and with high humidity in the air, fog starts to appear across the Northern region. This problem is generally most severe from 15Dec- 15Feb period & more prominent in areas having high pollution. During this time, additional care needs to be taken by system operator as many multiple element

tripping events have been reported in the past especially in Punjab, Rajasthan, Haryana and Eastern UP. Such tripping are more severe if the lines are tripping from generation complex.

To furnish details of Progress on cleaning and replacement of porcelain insulator with polymer insulator. NRLDC has already requested vide emails dated 26.09.2024, 30.09.2024 & 07.11.2024, all transmission utilities to furnish the utility-wise latest status of the replacement of porcelain insulators with polymer insulators so that crucial lines for which such works are pending may be identified & prioritized. List is also attached as **Annexure-B.II** of agenda.

List of line that reported tripping on 4 or more instances last year during Dec-Jan months during fog-prone time of 21:00-10:00hrs along with their insulator status is shown below:

S. No.	Line Name	Tripping instances	Owner	Insulator status
1	220 KV RAPS_A(NP)-Sakatpura(RS) Ckt-2	12	RRVPNL	N/A
2	220 KV RAPS_B(NP)-Sakatpura(RS) Ckt-1	10	RRVPNL	N/A
3	220 KV RAPS_A(NP)-Sakatpura(RS) Ckt-1	9	RRVPNL	N/A
4	400 KV Agra-Unnao Ckt-1	8	UPPTCL	Partial polymer (25%)
5	220 KV Debari(RS)-RAPS_A(NP) Ckt-1	6	RRVPNL	N/A
6	220 KV Nara(UP)-Roorkee(UK) Ckt-1	5	UPPTCL	N/A
7	220 KV Ratangarh(RS)-Sikar(PG) Ckt-1	5	POWERGRID	N/A
8	220 KV Panipat(BB)-Chajpur(HV) Ckt-2	5	HVPNL	N/A
9	400 KV Muktsar-Makhu Ckt-2	5	PSTCL	Porcelain
10	400 KV Suratgarh(RVUN)-Ratangarh(RS) Ckt-1	4	RRVPNL	Porcelain
11	220 KV Shahjahanpur(PG)-Lakhimpur(Gola) Ckt-2	4	UPPTCL	N/A
12	220 KV Ratangarh(RS)-Sikar(PG) Ckt-2	4	POWERGRID	N/A
13	400 KV Shree Cement(SCL)-Kota(PG) Ckt-1	4	POWERGRID	Polymer
14	400 KV Muradnagar_2-Mathura Ckt-1	4	UPPTCL	N/A

During 225 OCC meeting, Punjab SLDC representative stated that due to smog, number of transmission lines had tripped in last one week. However, lines for which washing and cleaning was not done and had tripped recently, would be taken on priority.

NRLDC had also conducted a meeting with PSTCL representatives on 21.11.2024 to discuss preparedness measures taken by Punjab to minimize tripping of lines due to fog.

In 226 OCC meeting,

RVPN representative stated that they are undertaking washing/cleaning and installation of bird guards in lines emanating from 220kV RAPS.

NRLDC representative also stated that RAPS islanding was designed for average/peak load condition whereas in case of tripping of lines from RAPS in morning hours, load in island is lower and there is no significant reactive power absorption by RAPS units, therefore, survival of island in case it is formed at morning hours is comparatively lower.

Punjab SLDC representative stated that insulator for 400kV Muktsar-Makhu ckt 2 has been changed from porcelain insulators to polymer insulators.

All transmission utilities were once again requested to furnish the utility-wise latest status of the replacement of porcelain insulators with polymer insulators so that crucial lines for which such works are pending may be identified & prioritized.

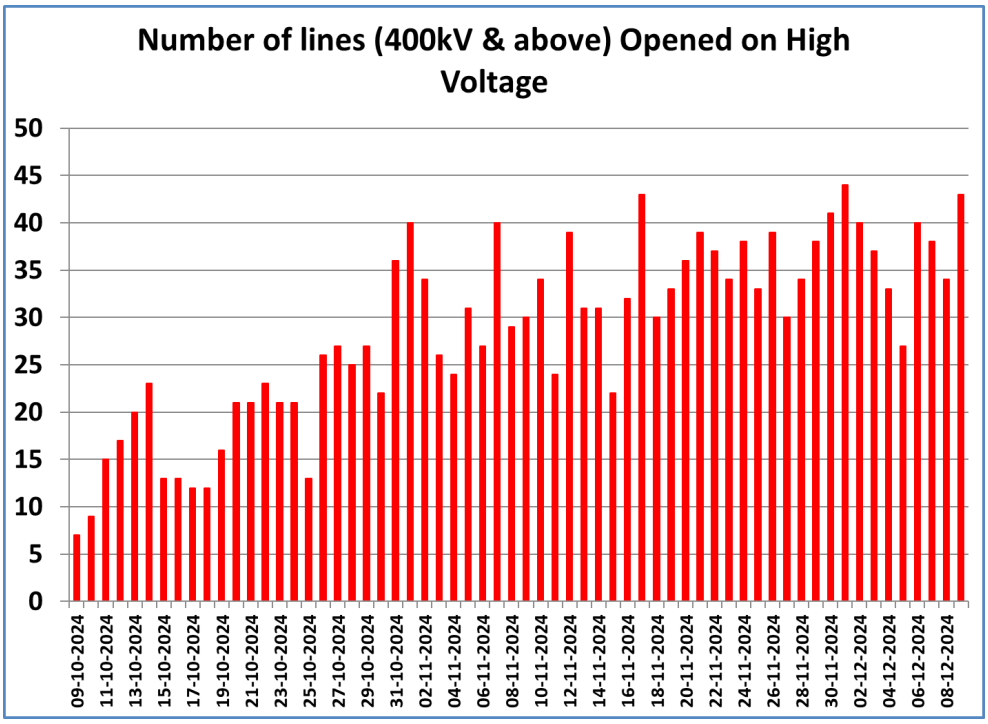
B.6 Grid operation challenges during winter 2024-25

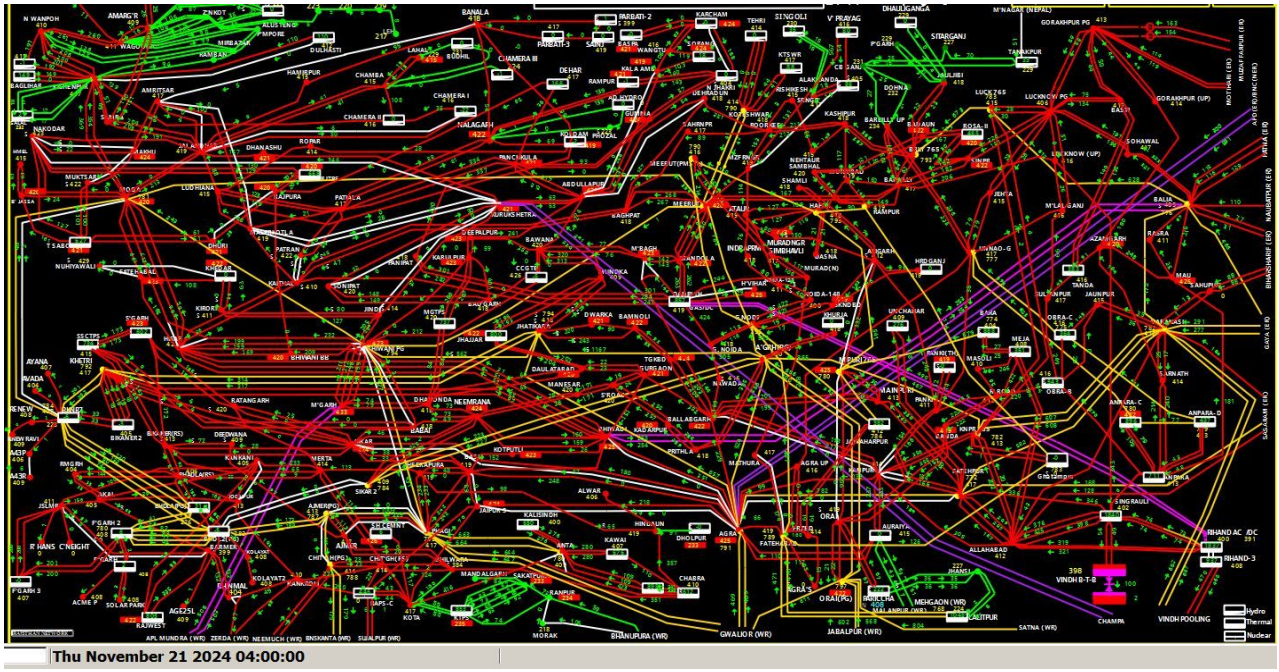
As it is well known that Northern region faces issues related to severe high voltages in the grid in winter months due to less demand as the transmission system remains lightly loaded. A number of measures are already being taken to control high voltages in the grid such as:

- Ensuring to switch off capacitors & switch on reactors.
- Ensuring healthiness of all commissioned reactors in the system
- Monitoring of reactive power through SCADA displays.
- Reactive power support (absorption) by generating stations as per the capability curve.
- Synchronous condenser operation especially of hydro units during night hours for dynamic voltage support.
- ICT Tap Optimization at 400kV & above is carried out by NRLDC.
- Utilisation of line reactors as bus reactor in case of opening of EHVAC transmission lines.
- Opening of EHV lines based on expected voltage reduction and also considering security & reliability of system

Switching of bus reactors, line reactors are done as frequently as twice in a day at same location. For instance, during peak hours, voltages being on lower side, reactors are switched off while during off peak hours, reactors are brought into relieve high voltages. Capacitors switching is done primarily at lower voltage levels. The dynamic reactive power resources like generators, SVC, STATCOM keep on changing the VAr value as per system requirement or system operator's instructions. Tap optimization is being done mainly on seasonal basis. Manual opening of high voltage line is also carried out as a last resort to alleviate alarming high voltages in the system.

Even after taking all measures it is being seen that large number of EHVAC transmission lines have to be opened to control high voltages in the grid. Number of transmission lines (400kV & above) opened to control high voltage in last 60 days as well as snapshot of high voltages in grid is shown below:





Such opening of transmission lines always increases risk of system insecurity as transmission system gets weak due to opening of transmission lines and also susceptibility of tripping of lines especially during foggy weather. As such there seems to be requirement for planning of additional reactive compensation in the grid to control high voltages at both interstate as well as intrastate level.

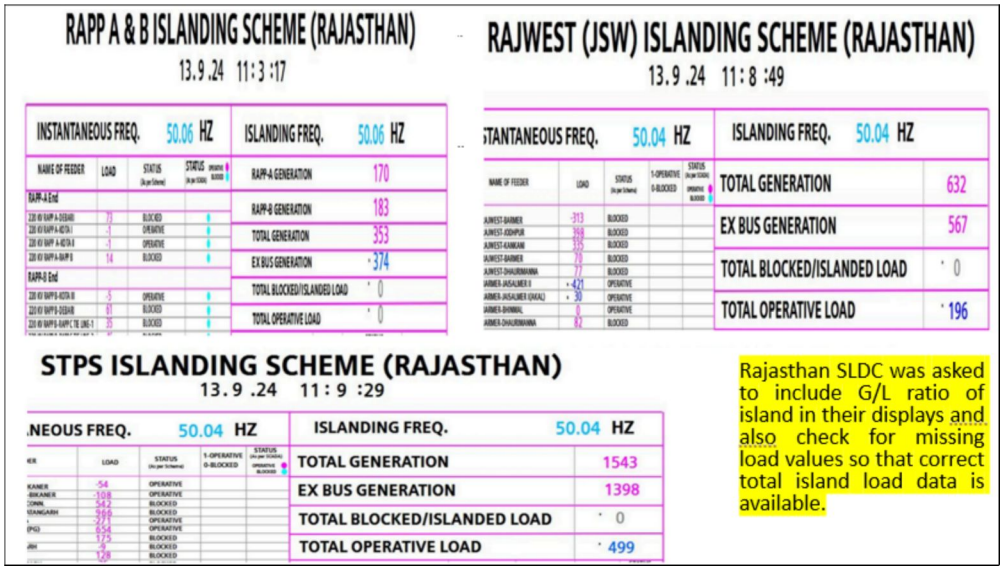
CTUIL representative stated that in NR, around 60-80% reactive compensation has been provided at ISTS level. Reactive compensation planning and implementation at intrastate level needs to be expedited to cater low/high voltage scenarios.

OCC asked all SLDCS to analyze reactive power change with ISTS grid and accordingly plan reactive power devices at intrastate level. This would also help to minimize opening/closing of EHVAC lines in winter months.

B.7 Mock testing of islanding scheme and simulation studies

Following four islanding schemes are operational in the Northern Region: NAPP Islanding Scheme (Uttar Pradesh), RAPP Islanding Scheme (Rajasthan), Bawana Islanding Scheme (Delhi), and Pathankot-RSD Islanding Scheme (Punjab). As per the SOP for mock islanding schemes approved in the recently concluded OCC 223, SLDCs are requested to prepare and share their plans for conducting mock testing of islanding schemes in their control areas.

None of the four utilities have yet created a SCADA network map for their island areas. However, Uttar Pradesh and Rajasthan have developed SCADA displays with partial island summaries, although telemetry issues still need resolution.



RAPP A & B ISLANDING SCHEME (RAJASTHAN)
13.9.24 11:3:17

INSTANTANEOUS FREQ.	50.06 HZ	ISLANDING FREQ.	50.06 HZ
		RAPP-A GENERATION	170
		RAPP-B GENERATION	183
		TOTAL GENERATION	353
		EX BUS GENERATION	374
		TOTAL BLOCKED/ISLANDED LOAD	0
		TOTAL OPERATIVE LOAD	0

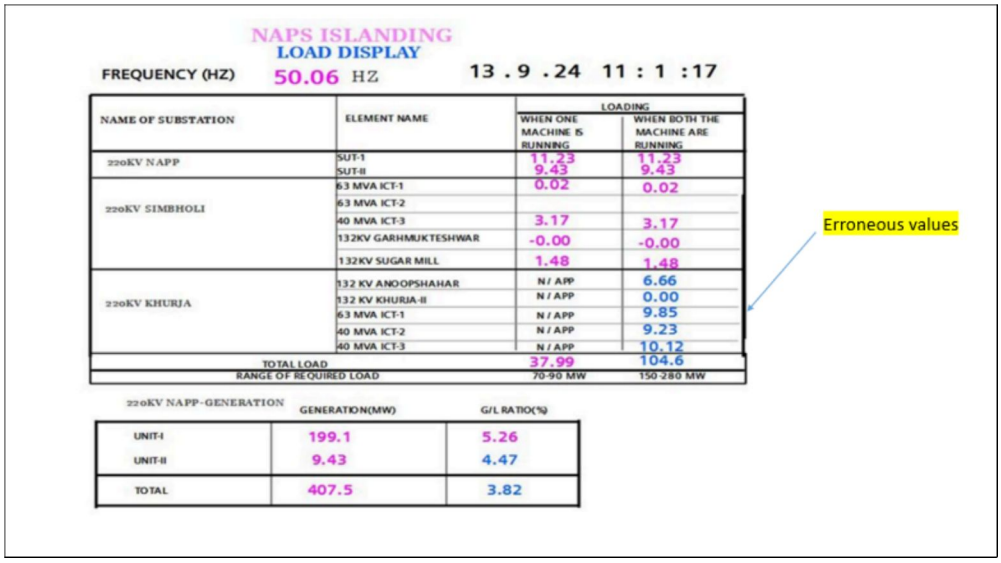
RAJWEST (JSW) ISLANDING SCHEME (RAJASTHAN)
13.9.24 11:8:49

STANTANEOUS FREQ.	50.04 HZ	ISLANDING FREQ.	50.04 HZ
		TOTAL GENERATION	632
		EX BUS GENERATION	567
		TOTAL BLOCKED/ISLANDED LOAD	0
		TOTAL OPERATIVE LOAD	196

STPS ISLANDING SCHEME (RAJASTHAN)
13.9.24 11:9:29

NEOUS FREQ.	50.04 HZ	ISLANDING FREQ.	50.04 HZ
		TOTAL GENERATION	1543
		EX BUS GENERATION	1398
		TOTAL BLOCKED/ISLANDED LOAD	0
		TOTAL OPERATIVE LOAD	499

Rajasthan SLDC was asked to include G/L ratio of island in their displays and also check for missing load values so that correct total island load data is available.



NAPS ISLANDING
LOAD DISPLAY
FREQUENCY (HZ) 50.06 HZ 13.9.24 11:1:17

NAME OF SUBSTATION	ELEMENT NAME	LOADING: WHEN ONE MACHINE IS RUNNING	LOADING: WHEN BOTH THE MACHINE ARE RUNNING
220KV NAPP	SUT-I	11.23	11.23
	SUT-II	9.43	9.43
220KV SIMBHOLI	63 MVA ICT-1	0.02	0.02
	63 MVA ICT-2		
	40 MVA ICT-3	3.17	3.17
	132KV GARHMUKTESHWAR	-0.00	-0.00
	132KV SUGAR MILL	1.48	1.48
220KV KHURJA	132 KV ANOOPSHAHAR	N/APP	6.66
	132 KV KHURJA-II	N/APP	0.00
	63 MVA ICT-1	N/APP	9.85
	40 MVA ICT-2	N/APP	9.23
	40 MVA ICT-3	N/APP	10.12
TOTAL LOAD		37.99	104.6
RANGE OF REQUIRED LOAD		70-90 MW	150-280 MW

Erroneous values

220KV NAPP-GENERATION

	GENERATION(MW)	G/L RATIO(%)
UNIT-I	199.1	5.26
UNIT-II	9.43	4.47
TOTAL	407.5	3.82

During 224 OCC meeting, NRLDC representative mentioned that only the NAPS Islanding Scheme of UP has incorporated the G/L ratio in its SCADA display

according to the shared format. UP representative added that due to a recent fire incident at Khurja S/S, the telemetry from the 220kV Khurja S/S is currently unavailable, and they promised to share an update on the restoration of telemetry from Khurja as soon as possible.

NRLDC representative also requested that all concerned utilities provide updated islanding base cases for different load-generation balance scenarios (Summer: Peak/Off-peak and Winter: Peak/Off-peak) along with dynamic data of the generators in the island for conducting dynamic simulation studies. He reiterated that the Islanding SCADA display should be made available at NRLDC as per the format shared in previous OCC meetings.

During 225 OCC meeting, UP, Rajasthan, Punjab and Delhi SLDC were requested to provide update.

UP SLDC representative informed that NAPS has been asked to carry out mock testing of ufr which are part of islanding scheme. After receiving testing report from NAPS, same shall be shared with OCC forum.

No other update could be received from other SLDCs.

OCC asked all SLDCs to proactively take actions as discussed in the meeting.

Further, NRLDC had also conducted an online meeting on 03.12.2024 with all relevant stakeholders from UP, Rajasthan, Delhi and Punjab regarding any issues being faced in carrying out mock testing exercise of islanding scheme.

Following updates were received in the meeting:

1. Uttar Pradesh (NAPS Islanding Scheme)
    - Field testing of relays has been completed; a detailed report will be shared by 15th December 2024.
    - PSSE basecase files will be submitted within one month.
    - NRLDC demonstrated modelling the island in PSSE using the Bawana Island example (Delhi SLDC).
2. Rajasthan (RAPS Islanding Scheme)
    - Regular UFR testing is ongoing and will extend to Islanding UFR relays.
    - A detailed report as per the SOP will be submitted by the first week of January 2025.
    - PSSE basecase files will be provided within one month.
3. Delhi (Bawana Islanding Scheme)
    - DTL will conduct field mock testing as per the SOP within one month and submit a detailed report accordingly.
    - PSSE basecase files will be shared within one month.
4. Punjab (RSD Islanding Scheme)
    - Field mock testing as per SOP will be conducted within one month, and a detailed report will follow.
    - PSSE basecase files will be submitted within one month.

UP, Rajasthan, Delhi and Punjab SLDCs were asked by OCC to submit information as discussed in meeting held on 03.12.2024.

B.8 Utilisation of FSC/TCSCs installed in Northern region

From the data available in NRLDC control room, it is seen that numbers of Fixed Series Capacitors and Thyristor Controlled Series capacitors in Northern region are under long outage. The purpose of installation of these devices was to enhance the power transfer capability of transmission lines and also reduce the voltage drop across the line.

As per present status available with NRLDC, following is status of outage of FSC/TCSC in Northern region:

S.No.	Name of Transmission Line	COMPENSATION	END	Outage Date	REASON	Remarks
1	400 kV Unnao-Bareilly(UP) - 1	45%	Unnao	25-Oct-2024	Forced Outage	Due to capacitor unbalanced
2	400 kV Unnao-Bareilly(UP) - 2	45%	Unnao	23-Apr-2024	System Requirement	Out of service to avoid overloading on line
3	400 kV Kanpur-Ballabhgarh 2	40%	Ballabhgarh	23-Sep-2022	Forced Outage	DC earth fault in main power supply.
4	400 kV Kanpur-Ballabhgarh 3	40%	Ballabhgarh	23-Sep-2022	Forced Outage	Forced shut down taken to attend DC earth fault in ckt-2.
5	400 kV Lucknow - Gorakhpur 1	30%	Lucknow (PG)	13-Sep-2024	Low Current	Out of service due to low current and can be taken any time whenever current limit permits.
6	400 kV Lucknow - Gorakhpur 2	30%	Lucknow (PG)	09-Sep-2024		
7	400 kV Lucknow - Basti-1	30%	Lucknow (PG)	26-Sep-2024		
8	400 kV Lucknow - Basti-2	30%	Lucknow (PG)	01-Oct-2024		

9	400 kV Fatehpur-Mainpuri 1	56%	Mainpuri	24-Oct-2021	Forced Outage	BHEL breaker hydraulic pressure could not be developed in B phase and (loss of N2 pressure) doesn't allow the FSC-1 taken into service. OEM support stopped
10	400 kV Fatehpur-Mainpuri 2	56%	Mainpuri	29-Jan-2022	Forced Outage	VME protection system was blocking the FSC back in service as reported by CPCC3. OEM support stopped.
11	400 kV Meerut-Bareilly 1	30%	Bareilly (PG)	31-Mar-2023	Low Current	Out of service due to low current and can be taken any time whenever current limit permits.
12	400 kV Meerut-Bareilly 2	30%	Bareilly (PG)	23-Mar-2023		
13	765 KV Koteswar-Meerut-1	50%	Meerut	08-Jun-2023	Forced Outage	B-Phase to ground fault occurred in the line fault. FSC1 failed
14	765 KV Koteswar-Meerut-2	50%	Meerut	18-Apr-2023	Forced Outage	Capacitor bank current disbalance protection acted
15	400 kV Sorang – Kalaamb	40%	Kalaamb	26-Sep-2022	Forced Outage	Unbalance Current in B-phase

To address these challenges of under-utilisation of TCSC/FSC, following are proposed for necessary action:

- Conduct a detailed technical evaluation of the out-of-service FSCs/TCSCs to determine the feasibility of their restoration.

- Explore the possibility of relocating and deploying FSCs/TCSCs on other critical high-power transmission corridors to enhance grid reliability and import capability.

POWERGRID NR-2 representative stated that FSC in 400 kV Sorang – Kalaamb line is available.

NRLDC representative asked all utilities to update the status of FSCs in NRLDC outage portal and also share update through excel file to nrldcso2@grid-india.in.

With regard to shifting of FSC to other lines, CTUIL representative stated that it is difficult to find line with similar line lengths and also substations with similar fault levels. Further, there would be huge cost of transportation of FSC and also difficulty in finding spare of old FSCs, as per previous discussion held with POWERGRID/OEM.

Further, Tehri PSP has also been synchronized with NR grid and also injecting power on few occasions. The issues related to model development of Tehri PSP in PSSe and PSCAD are already being discussed at CEA level.

It is to be noted that there is always possibility of sub-synchronous resonance in the grid when power of PSP will be evacuated through lines having Fixed Series Capacitors as Tehri PSP will generate current harmonics in the grid side which may interact with series compensated lines.

It is requested that THDC/CTUIL may share any kind of sub synchronous torsional interaction or sub synchronous control interaction studies that may have been carried out at their end.

Further, the requirement of FSC on 765kV Koteshwar-Meerut D/C line may be studied by CTUIL/CEA and accordingly decision may be taken whether FSCs shall be kept in service or not.

CTUIL representative stated that THDC would be developing PSCAD model as per decision of meeting held in CEA. SSTI study may be included by THDC in package of studies that would be carried out as part of tender awarded by THDC.

OCC asked that CTUIL and THDC may coordinate for carrying out SSTI studies for Tehri PSP. Further, CTUIL in coordination with CEA PSPA-I would assess whether there is requirement of FSC on 765kV Koteshwar-Meerut D/C line as the line has been upgraded to 765kV.

B.9 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 20 days (20 Nov 2024 – 09 Dec 2024) 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	-160 to 100	410
		2	490		-147 to 294	-150 to 100	410
2	Singrauli NTPC	1	200	UP	-60 to 120	-10 to 20	402
		2	200		-60 to 120	-20 to 20	400
		3	200		-60 to 120	-10 to 20	402
		4	200		-60 to 120	-30 to 10	400
		5	200		-60 to 120	-15 to 10	400
		6	500		-150 to 300	0 to 50	404
		7	500		-150 to 300	0 to 50	402
3	Rihand NTPC	1	500	UP	-150 to 300	-40 to 20	397
		2	500		-150 to 300	-60 to 0	395
		3	500		-150 to 300	-80 to 0	394
		4	500		-150 to 300	-80 to 0	394
4	Kalisindh RS	1	600	Rajasthan	-180 to 360	-100 to 150	-
		2	600		-180 to 360	-130 to 50	-
5	Anpara C UP	1	600	UP	-180 to 360	-150 to 0	770
		2	600		-180 to	-150 to 50	770

					360		
6	Talwandi Saboo PB	1	660	Punjab	-198 to 396	-200 to 50	412
		2	660		-198 to 396	-200 to 20	410
		3	660		-198 to 396	-	-
7	Kawai RS	1	660	Rajasthan	-198 to 396	-80 to 80	404
		2	660		-198 to 396	-90 to 50	404
8	IGSTPP Jhajjar	1	500	Haryana	-150 to 300	-120 to 120	415
		2	500		-150 to 300	-100 to 150	412
		3	500		-150 to 300	-110 to 120	418
9	Rajpura (NPL)	1	700	Punjab	-210 to 420	-200 to 50	405
		2	700		-210 to 420	-200 to 50	405
10	MGTPS	1	660	Haryana	-198 to 396	-150 to 100	410
		2	660		-198 to 396	-130 to 120	408
11	Bawana	1	216	Delhi-NCR	-65 to 130	-	-
		2	216		-65 to 130	-	-
		3	216		-65 to 130	-	-
		4	216		-65 to 130	-	-
		5	253		-65 to 130	-	-
		6	253		-65 to 130	-	-
12	Bara PPGCL	1	660	UP	-198 to 396	-100 to 80	770
		2	660		-198 to 396	-	-
		3	660		-198 to 396	-150 to 50	770
13	Lalitpur TPS	1	660	UP	-198 to 396	-90 to 50	760
		2	660		-198 to 396	-20 to 60	770
		3	660		-198 to 396	-100 to 50	760
14	Anpara D UP	1	500	UP	-150 to 300	-	-
		2	500		-150 to 300	-200 to -80	760
15	Chhabra	1	250	Rajasthan	-75 to 150	-20 to 40	410

	TPS	2	250		-75 to 150	-60 to 30	410
		3	250		-75 to 150	-20 to 30	410
		4	250		-75 to 150	-	-
		5	660		-198 to 396	-50 to 200	410
		6	660		-198 to 396	-60 to 200	410

All generating stations are requested to resolve any issues related to telemetry and make sure that MVAr absorption is as per grid requirement and capability curve of machine.

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.

Some of the generating units such IGSTPP Jhajjar, MGTPS Jhajjar, Bara need to explore possibility of further MVAR absorption. Further, intrastate generators in Rajasthan control area may be asked to support through adequate reactive power generation during day-time when Rajasthan grid experiences low voltage.

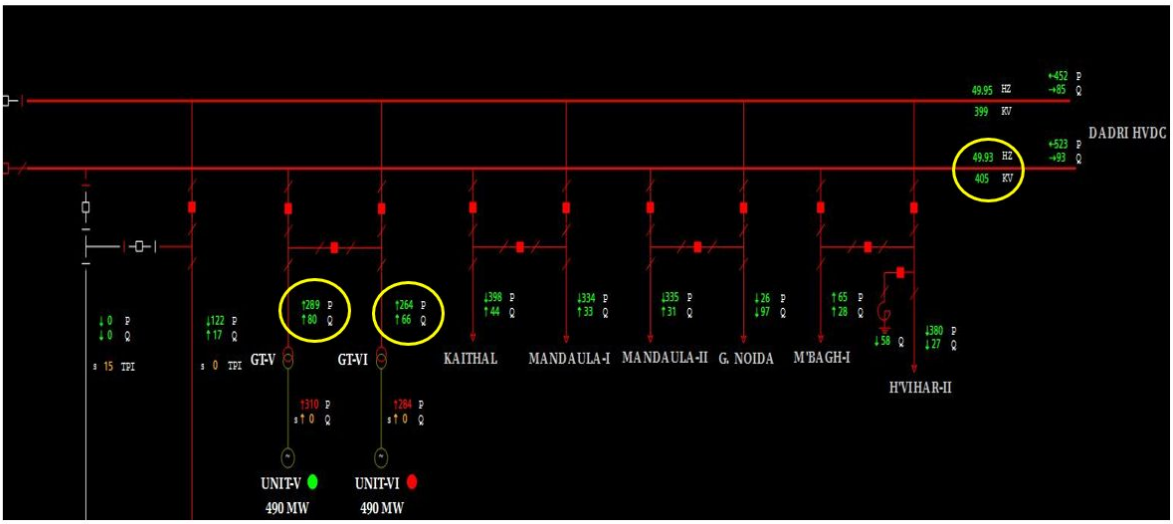
NRLDC representative presented following are few observations based on data of 20 Nov 2024 – 09 Dec 2024 analysed at NRLDC end:

- ***Some of the machines at NTPC Singrauli are generating MVAr whereas some are absorbing MVAr***
- ***IGSTPP Jhajjar and MGTPS performance needs improvement, unnecessary MVAR generation could be avoided. AVR setpoint to be reduced.***
- ***AVR setpoint may also be reduced for Dadri Stage-II, Talwandi Saboo stations. It was mentioned that Railwyas has also highlighted high voltage in their supply from 220kV Dadri gas and NRLDC would be communicating with Dadri Gas for tap change.***
- ***More reactive power support can be obtained from Chhabra 250MW generating units.***
- ***No internal generation in Delhi state control area is leading to high voltages in the Delhi network as no dynamic reactive compensation is available from thermal machines for MVAR generation from cables.***

SCADA snapshots as available at NRLDC end were also presented in the meeting:

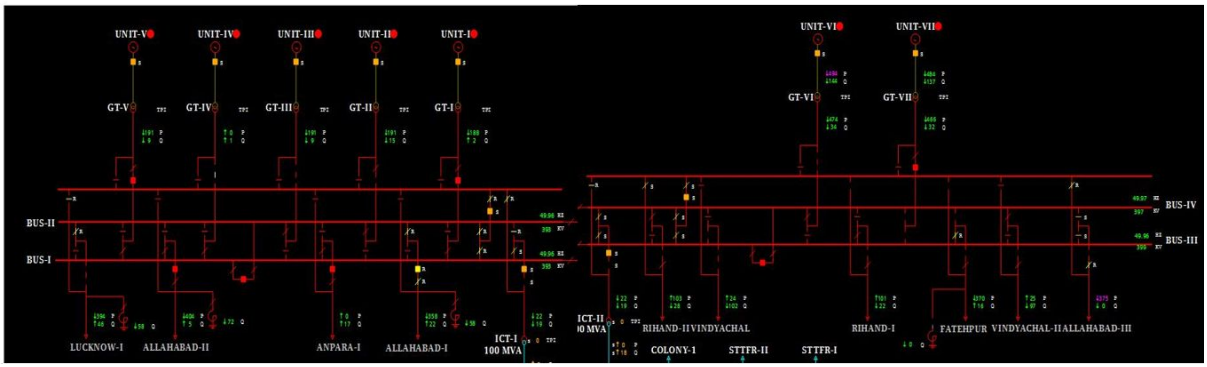
Snapshot of 16.12.2024 @10:30hrs.

Dadri Stage-II



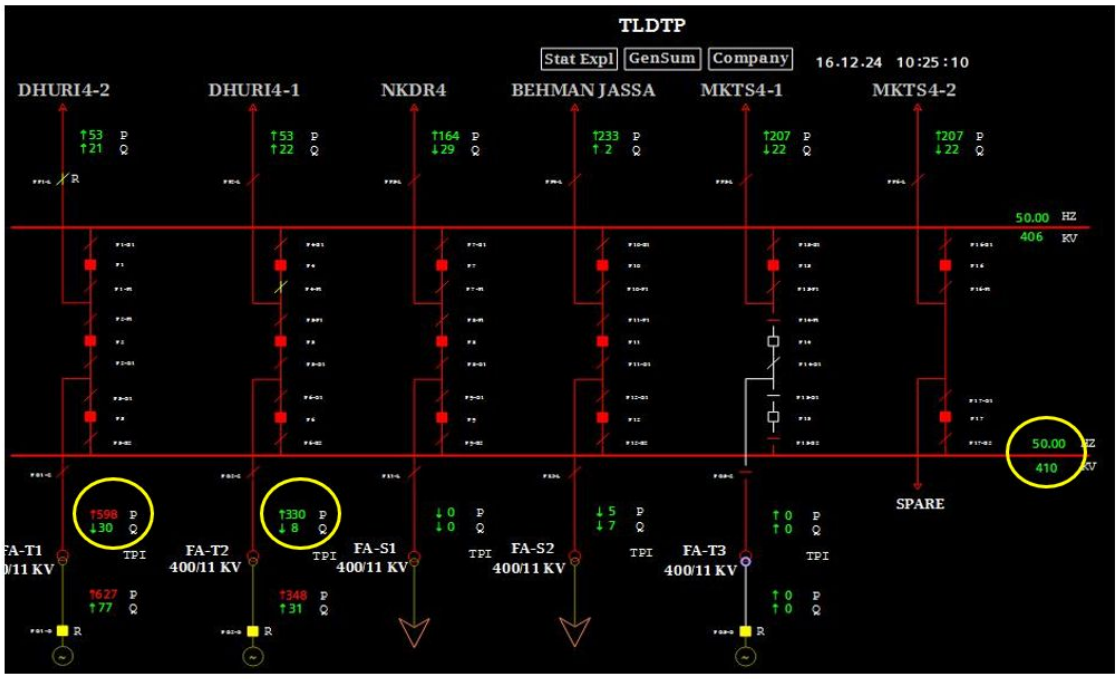
Singrauli: Different MVAr from each unit

Snapshot of 16.12.2024 @10:30hrs.



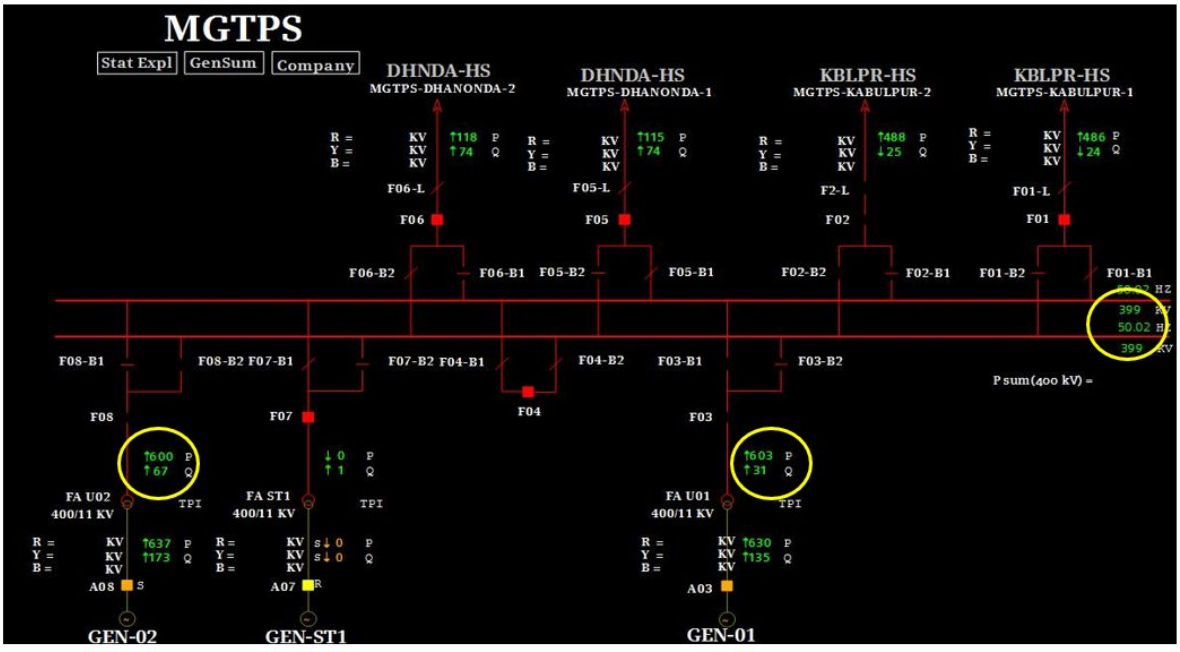
Talwandi Saboo

Snapshot of 16.12.2024 @10:30hrs.



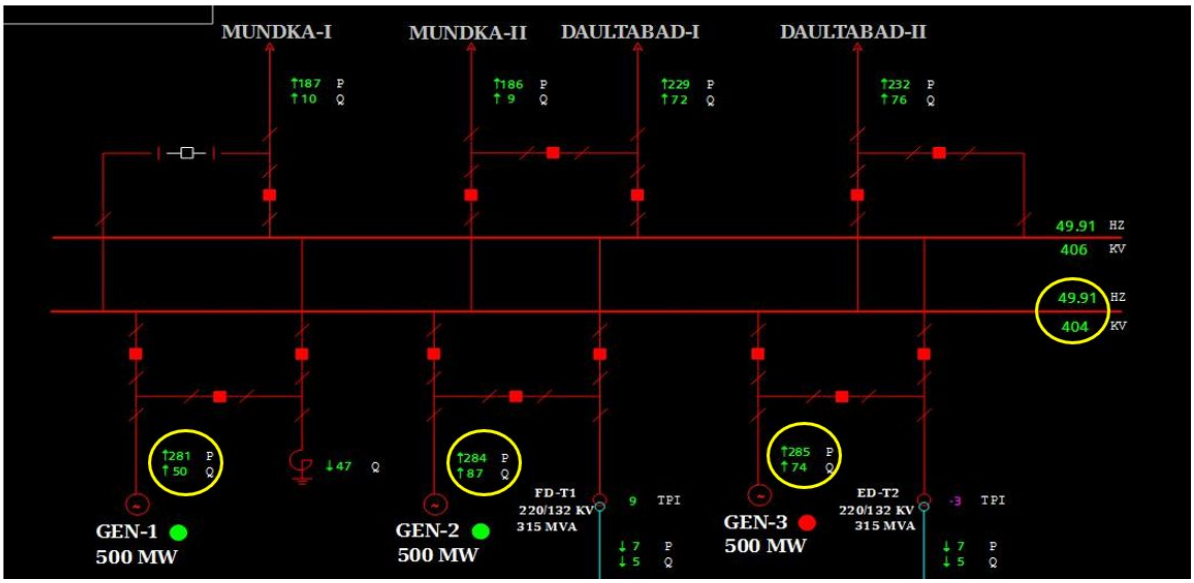
MGTPS

Snapshot of 16.12.2024 @10:30hrs.



IGSTPP Jhajjar

Snapshot of 16.12.2024 @10:30hrs.



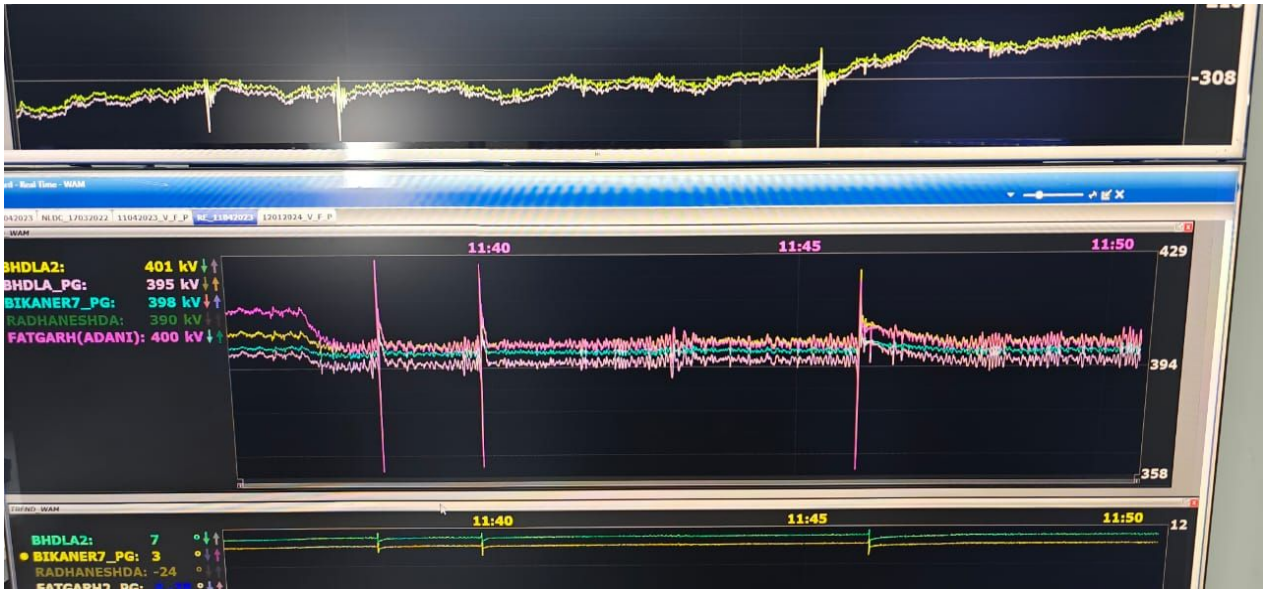
NTPC representative stated that they will check performance of Singrauli units, AVR is planned to be replaced for one unit.

OCC expressed concern on performance of IGSTPP Jhajjar, and asked to reduce AVR setpoint, change tap position, so that voltage profile in the grid is improved.

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. Generators may also set their Vsch (voltage set point) such that units are absorbing MVAR as per their capability and grid requirement with intimation to RLDC/SLDC.

B.10 Observance of sudden voltage dips in Western Rajasthan

Since the month of November, it is being observed that sudden voltage dips in Western Rajasthan are being observed on some of the days. During such voltage dips, the voltage at 400kV bus dips to below 360kV and rises beyond 420kV within few milliseconds. It is to be noted that no fault is being recorded for such events and there is also some generation loss that is taking place due to such voltage dips. The magnitude of these dips is higher in Fatehgarh and Bhadla area of Western Rajasthan. One such sample dip from 06.12.2024 is shown below:



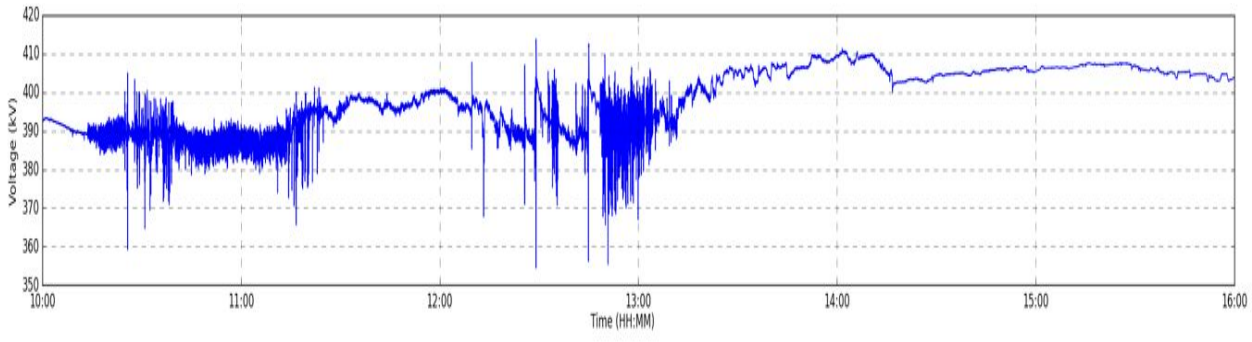
It is to be noted that these voltage fluctuations in the range of 690-820 KV (765kV level) are observed during these spikes. Root cause of these voltage spikes couldn't be ascertained yet. Monitoring is being done at NRLDC using PMU data however, availability of more better resolution data may help in better monitoring and analysis of these events.

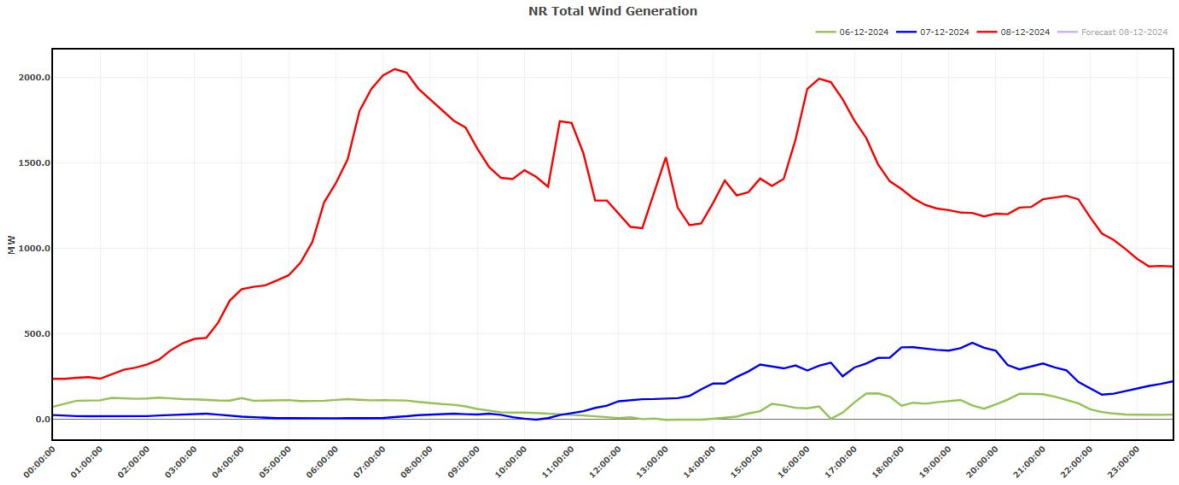
In view of above, it is requested to enable the triggering of Disturbance Recorder on START of Over Voltage (at OV stage-1/2 setting) and Under Voltage (0.9 p.u.) at 220kV & above voltage level in all the lines of RE plants and POWERGRID in RE complex wherever feasible.

Such voltage dips are also leading to some generation loss in Western Rajasthan and may also create other issues in the grid. Accordingly, it is discussed that the data with highest resolution is shared with NRLDC from POWERGRID and RE plants side for further analysis at NRLDC end.

Furthermore, severe voltage dips were observed on 08.12.2024, when there was high wind generation in Rajasthan state control area as shown below:

Voltage dips observed on 08.12.204 at Bhadla(PG) are shown below:





It is important to note that there was high wind generation on 08.12.2024, continuous voltage dips were observed in the grid and number of thermal generators in the Northern region complained of hunting.

NPCIL and Rajasthan SLDC representatives stated that continuous hunting is being observed on most of the days since last few months.

Rajasthan SLDC representative stated that the old wind turbines are drawing reactive power from the grid and degrading grid voltage profile during peak solar generation coinciding with wind generation. Moreover, during voltage spikes, the wind turbines are also switching from LVRT/HVRT mode and wind generation is also varying.

Some other thermal generators also stated that they had also reported hunting on 8th Dec 2024 during 10:30-12:30hrs.

OCC asked that in coordination with wind developers RVPN shall install suitable reactive compensation devices or restrict generation from wind plants which are drawing reactive power from the grid, incase wind generation is present during period of solar generation i.e. 10:00hrs to 14:00hrs so that grid voltages remain within IEGC band.

Further, it was discussed that maximum allowable loading in 765kV Bhadla-II(PG)-Ajmer(PG) D/C line is 2400MW each ckt. Angular separation is exceeding 30° under N-1 contingency of 765kV Bhadla-II(PG)-Ajmer(PG) D/C line if pre-contingency loading remains 2400MW each ckt. Sensitivity on one ckt under N-1 contingency of other ckt is ~36%

765kV Bhadla-II(PG)-Ajmer(PG) D/C line			
Basecase		N-1 contingency	
Loading (MW)	Angular seperation (°)	Loading (MW)	Angular seperation (°)
2371	20.47	3230	28.59

Therefore, there does not seem to be additional margin in the transmission system considering present network configuration. Accordingly, POWERGRID/ other

transmission licensees were once again requested to expedite commissioning of associated transmission system to avoid any bottling of RE evacuation.

POWERGRID representative stated that the transmission lines associated with Bhadla2 such as 765kV Bhadla2-Sikar2 D/C lines are expected to be charged shortly. Further, substations and lines associated with 765/400kV Narela would be commissioned by March 2025.

OCC forum discussed that upcoming transmission lines would resolve low short circuit ratio in Western Rajasthan and accordingly, situation is likely to improve in complex. Further, SLDC Rajasthan and NRLDC were also suggested to explore and identify the probable causes of these hunting. All generators that reported hunting were asked to share generator data including PSS output data. Availability of more better resolution data than PMU data may help in better monitoring and analysis of these events and accordingly same was requested from transmission licenses and generators.

B.11 Sharing of ATC/TTC assessment and basecase with NRLDC

All NR states except Chandigarh UT 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	***S 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*	*SLDC*	*RLDC*	*10th Day of 'M-12' month*
		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			
	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*	*SLDC*	*RLDC*	*8th Day of 'M- 1' month*
		Assessment of TTC/ATC of the intra- state system and sharing of updated network simulation models			
	3(b)	*Declaration of TTC/ATC of the intra- state system in consultation with RLDC*	*SLDC*	*RLDC*	*22nd Day of 'M-1' month*

To encourage participation from SLDCs regarding basecase preparation and ATC/TTC assessment, two workshops have been conducted from Grid-India/NRLDC side. One workshop was conducted 31.08.2023 before the finalization of the procedure and another on 10.01.2024 recently to involve further participation from SLDCs.

Although all SLDCs are now involved in preparation of basecase & ATC/TTC assessment, it is seen that the timelines as per CERC approved procedure are not being followed and number of times basecases are not received from SLDC side.

B.11.1 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 Oct'25 i.e. Afternoon Peak, Solar Peak, Evening Peak & Off-Peak hours as communicated from NRLDC side. It is requested that the basecases as well as ATC/TTC assessments may be shared with NRLDC as per CERC approved procedure. Further, the above exercise needs to be carried out regularly monthly.

It was discussed in last several OCC meetings & all states were requested to share basecase as well as ATC/TTC assessments for M-12 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*.*

B.11.2 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 within next six months. This needs to be practised as monthly exercise on regular basis.

The agenda was discussed in last several OCC meetings & all utilities were requested to share list of elements/LGB data/interconnection study results etc as per the approved procedure on monthly basis*.*

B.11.3 TTC/ATC of state control areas for Jan 2025 (M-1)

As discussed in previous OCC meetings, most of the NR states except Ladakh and Chandigarh U/Ts are sharing basecase and ATC/TTC assessment with NRLDC.

Based on simulation studies and discussions between SLDCs and NRLDC, ATC/TTC limits for NR states for the month of Jan'2025 are attached as **Annexure-B.III of agenda**.

OCC has advised all states to timely declare TTC/ATC for prospective months and revise the figures as per requirement.

The agenda was also discussed in last several OCC meetings wherein all states agreed to send the data as well as PSSE basecases on time for all three (M-1, M-6, M-11) scenarios.

Still, it is being observed that response from some SLDCs is not as per desired levels. Latest status for December 2024 as shown below was presented in the meeting:

July 2024 Mails

	ATC/TTC Declaration				Interconnection Studies	
	M-1 (August-24)		M-11 (July-25)		M-6 (Jan-25)	
	Data Values	Basecases	Data Values	Basecases	Data Values	Basecases
Chandigarh	No	No	No	No	No	No
Delhi	No	No	No	No	No	No
Haryana	No	No	No	No	No	No
Himachal	No	No	No	No	No	No
J & K	Yes	Yes	Yes	Yes	Yes	Yes
Ladakh	No	No	No	No	No	No
Punjab	No	No	No	No	No	No
Rajasthan	No	No	No	No	No	No
Uttar Pradesh	Yes	Yes	Yes	Yes	Yes	Yes
Uttarakhand	No	Shared only for 1 cardinal point	No	No	No	No

August 2024 Mails

	ATC/TTC Declaration				Interconnection Studies	
	M-1 (September-24)		M-11 (August-25)		M-6 (Feb-25)	
	Data Values	Basecases	Data Values	Basecases	Data Values	Basecases
Chandigarh	No	No	No	No	No	No
Delhi	No	No	Yes	Yes	No	No
Haryana	No	Shared only for 1 cardinal point	No	No	No	No
Himachal	No	No	No	No	No	No
J & K	Yes	Yes	Yes	Yes	Yes	Yes
Ladakh	No	No	No	No	No	No
Punjab	No	No	Yes	Yes	Yes	Yes
Rajasthan	No	No	No	No	No	No
Uttar Pradesh	Yes	Yes	Yes	Yes	Yes	Yes
Uttarakhand	No	No	No	No	No	No

September 2024 Mails

	ATC/TTC Declaration				Interconnection Studies	
	M-1 (October-24)		M-12 (September-25)		M-6 (Mar-25)	
	Data Values	Basecases	Data Values	Basecases	Data Values	Basecases
Chandigarh	No	No	No	No	No	No
Delhi	No	No	No	No	No	No
Haryana	No	No	No	No	No	Shared only for 1 cardinal point
Himachal	Shared only for 1 cardinal point	Shared only for 1 cardinal point	Shared only for 1 cardinal point	Shared only for 1 cardinal point	No	No
J & K	Yes	Yes	Yes	Yes	Yes	Yes
Ladakh	No	No	No	No	No	No
Punjab	No	No	Yes	Yes	Yes	Yes
Rajasthan	Yes	Yes	Yes	Yes	Yes	Yes
Uttar Pradesh	Yes	Yes	Yes	Yes	Yes	Yes
Uttarakhand	No	No	No	No	No	No

October 2024 Mails

	ATC/TTC Declaration				Interconnection Studies	
	M-1 (November-24)		M-12 (October-25)		M-6 (Apr-25)	
	Data Values	Basecases	Data Values	Basecases	Data Values	Basecases
Chandigarh	No	No	No	No	No	No
Delhi	No	No	No	No	No	No
Haryana	Yes	Yes	No	No	No	No
Himachal	Yes	No	Yes	No	No	No
J & K	Yes	Yes	Yes	Yes	Yes	Yes
Ladakh	No	No	No	No	No	No
Punjab	No	No	Yes	Yes	Yes	Yes
Rajasthan	Yes	Yes	Yes	Yes	Yes	Yes
Uttar Pradesh	Yes	Yes	Yes	Yes	Yes	Yes
Uttarakhand	Shared only TTC value and TTC case, no data regarding cardinal points		No	No	No	No

Submitted with one month delay

November 2024 Mails

	ATC/TTC Declaration				Interconnection Studies	
	M-1 (December-24)		M-12 (November-25)		M-6 (May-25)	
	Data Values	Basecases	Data Values	Basecases	Data Values	Basecases
Chandigarh	No	No	No	No	No	No
Delhi	No	No	Yes	Yes	No	No
Haryana	Yes	Yes	No	No	No	No
Himachal	Yes	Yes	Yes	Yes	No	No
J & K	Yes	Yes	Yes	Yes	Yes	Yes
Ladakh	No	No	No	No	No	No
Punjab	No	No	Yes	Yes	Yes	Yes
Rajasthan	Yes	Yes	Yes	Yes	Yes	Yes
Uttar Pradesh	Yes	Yes	Yes	Yes	Yes	Yes
Uttarakhand	Yes	Yes	No	No	No	No

December 2024 Mails

	ATC/TTC Declaration				Interconnection Studies	
	M-1 (January-25)		M-12 (December-25)		M-6 (June-25)	
	Data Values	Basecases	Data Values	Basecases	Data Values	Basecases
Chandigarh						
Delhi			Yes	Yes		
Haryana						
Himachal						
J & K	Yes	Yes	Yes	Yes	Yes	Yes
Ladakh						
Punjab						
Rajasthan	Yes	Yes	Yes	Yes	Yes	Yes
Uttar Pradesh	Yes	Yes	Yes	Yes	Yes	Yes
Uttarakhand	Yes	Yes				

In 226 OCC meeting,

- ***NRLDC representative stated that the agenda was also discussed in last several OCC meeting wherein all states agreed to send the data as well as PSSE basecases on time for all three (M-1, M-6, M-11) scenarios. CGM NRLDC asked states to get help from NRLDC in case of any difficulty and emphasized on the need for regularity in sharing the data.***
- ***NRLDC representative presented the status of basecase and data sharing by NR states for the last six months.***
- ***It was mentioned that UP, Punjab, Rajasthan and J&K are regularly sharing basecase as well ATC/TTC assessment with NRLDC. Haryana, Delhi, Uttarakhand and HP are sharing data, but on some occasions it is getting missed. It was requested that all SLDCs may timely share the same.***
- ***All SLDCs agreed to share basecase as well as ATC/TTC assessment as per CERC approved procedure.***

B.12 Corrective action for healthiness of 500kV Mundra-Mahindergarh SPS

On 17th May 2024 on outage of both pole (carrying total ~1500MW), SPS of 500kV HVDC Mundra-Mahindergarh inter regional link didn't operate. This issue was discussed during 51st PSC meeting and ADANI was requested to share the details w.r.t. SPS operation during the meeting.
Further, NRLDC in coordination with NLDC conducted an online discussion meeting with concerned stakeholders (SLDCs, ADANI, POWERGRID) on 12th August 2024, for further remedial actions required to make this SPS healthy.

Following actions were decided during the meeting:

i. POWERGRID, ADANI and concerned states were requested to identify the issue in communication links and take expeditious actions to make the all the communication link healthy. POWERGRID & ADANI shall review the healthiness of SPS system at different load centres and communication path between them in coordination with the SLDCs.
ii. States were requested to go through the details of load feeders mentioned in SPS document and share the changes / modifications as per present scenario and share the inputs w.r.t. unavailability in identified load feeders and load shedding. SLDCs shall share the revised updated feeder details (radial) along with expected average/peak load relief through respective feeders.
iii. SLDCs in coordination with their transmission and protection team shall share the status and healthiness of existing SPS system along with details of availability of communication path for incorporation of proposed revised/additional feeders.

Load end details have been received from UP, Haryana, Punjab Rajasthan & Delhi. Details are attached as Annexure-B.IV of agenda.

ADANI has submitted the status of healthiness of communication network and hardware system at different locations on the basis of preliminary inspection. As per details submitted, counter status was found OFF at Alwar, Ratangarh, Gobindgarh, Malerkotla, Bamnauli, Shamli and Dhanonda.

Details of nodal officer of different substation involved in SPS scheme has already been shared with ADANI team for coordination and further remedial actions.

During 53rd PSC meeting, ADANI was requested to coordinate with the respective states to rectify the issues in the SPS system and share the status of remedial action taken / planned to be taken. Desired remedial actions need to be expedited.
ADANI agreed for the same and stated that update would be given within 01 week. However, no detail received yet from ADANI.

During discussion in 54th PSC meeting also there was no further update received from ADANI team.

During 226th OCC meeting, NRLDC representative requested OCC forum to discuss the issue and propose action plan for necessary remedial action plans needed for making SPS scheme of HVDC Mundra-Mahindergarh healthy & operational.

ADANI was requested to apprise the forum about the present status of remedial actions.

ADANI representative stated that there are basically communication related issues at various location involved in this scheme. OEM / vendor has been assigned and instructed to inspect all the stations and list out the different issues. After compilation of all the issues comprehensive action plan would be shared. Further, issue related to coordination & communication with the state nodal officers was highlighted by ADANI representative. Support from states would be required for expeditious corrective actions.

NRLDC representative emphasized the importance of this SPS link and requested ADANI to take lead for corrective actions as this SPS scheme was commissioned by ADANI. Details of nodal officers will be provided however necessary coordination with state counterpart need to be done for identification and rectification of issues. States were also requested to ensure proper coordination from their end. Further, states were also requested to ensure incorporation of revised decided feeders during work at their stations.

States representative assured to provide all necessary coordination from their end.

OCC forum emphasized the importance of 500kV Mundra-Mahindergarh SPS and its healthiness is important to ensure secure & reliable operation of grid. ADANI was requested to coordinate with the respective states to rectify the issues in the SPS system and share action plan along with the status of remedial action taken / planned to be taken. Desired remedial actions need to be expedited.

B.13 Frequent elements tripping during November 2024:

OCC forum was of view that cited agenda to be deliberated in detail in the upcoming 55nd PSC meeting of NRPC.

B.14 Multiple element tripping events in Northern region in the month of November ’24:

A total of 10 grid events occurred in the month of **November'24** of which **01** are of GD-1 category, **04** are of GI-2 Category and **05** are of GI-1 Category. The tripping report of all the events have been issued from NRLDC. A list of all these events is attached at Annexure-B.VI of agenda.

Maximum delayed clearance of fault observed in event of multiple elements tripping at 400/220/132kV Merta (RS) on 11th November, 2024 (As per PMU at Merta(RS), R-Y-B phase to phase fault was observed with delayed fault clearance time of 720 msec is observed).

Delayed clearance of fault (more than 100ms for 400kV and 160ms for 220kV system) observed in total **03** events out of **10** grid events occurred in the month. In 02 (no.) of grid event, there was no fault in the grid.

NRLDC representative presented the reporting status of DR/EL & tripping reports w.r.t. grid events occurred in November 2024. It was highlighted that detailed report of majority of the tripping events have not received. Utilities were requested to start preparing the detailed report of the tripping events as per timeline mentioned in IEGC 2023 and share the report with NRLDC, NRPC and PSC forum. Remedial actions taken by constituents to avoid such multiple elements tripping may also be included in the detail report.

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.

OCC forum requested members to take necessary preventive measures to avoid such grid incidents / disturbances in future and report actions taken by respective utilities in OCC & PSC forum. Moreover, utilities may impress upon all concerned for providing the Preliminary Report, DR/EL & detailed report of the events to RLDC in line with the regulations.

B.15 Details of tripping of Inter-Regional lines from Northern Region for November' 24:

A total of 4 inter-regional lines tripping occurred in the month of November'24. 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 highlighted the frequent tripping of 220 KV Auraiya(NT)-Malanpur(MP) (MPSEB) Ckt and issue of non-operation of A/R in line. NTPC was requested to apprise the forum about the cause of frequent tripping and remedial action taken to avoid the trippings.

NTPC representative stated that as informed by the site there are no protection related issues at Auraiya end. Frequent faults is due to vegetation issue.

NRLDC representative stated that DR files submitted from Auraiya end shows A/R block after few msec of A/R start. Reason of the same need to be identified. NTPC was requested to further review the tripping incidents.
NLRDC representative requested all the members to please note and advise the concerned for taking corrective action to avoid such tripping as well as timely submission of the information.

OCC forum emphasized the importance of inter- regional links and requested NTPC to take up the issue with concerned site for expeditious resolution. All the concerned utilities were requested to take necessary corrective to minimise such tripping in future and to ensure proper operation of protection system.

B.16 Status of submission of DR/EL and tripping report of utilities for the month of November'24.

The status of receipt of DR/EL and tripping report of utilities for the month of November'24 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.

NRLDC representative stated that on the basis of status of November month it is evident that reporting status is not satisfactory and needs improvement.

Members may please note and advise the concerned for timely submission of the information. It is requested that DR/EL of all the tripping 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.

NRLDC representative requested RE stations, SLDC-Delhi, SLDC-HP, SLDC J&K, LSDC-RS & Punjab to improve the status of submission of DR/EL & tripping reports.

OCC forum emphasized the importance of DR/EL & tripping report data for analysis of the tripping. In addition, these data are also the base for the availability verification. The 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 with 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 tripping 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.

B.17 Frequency response performance for the reportable events of month of *November '24*:

In the month of November 2024, there was no reportable event during November 2024.

As per IEGC clause 30.10 (d)

'' The generating stations and units thereof shall have electronically controlled governing systems or frequency controllers in accordance with the CEA Technical Standards for Connectivity and are mandated to provide PRAS. The generating stations and units thereof with governors shall be under Free Governor Mode of Operation.''

As per IEGC clause 30.10 (g

''All the generating units shall have their governors or frequency controllers in operation all the time with droop settings of 3 to 6 % (for thermal generating units and WS Seller) or 0-10% (for hydro generating units) as specified in the CEA Technical Standards for Connectivity''

ISGS were requested to confirm whether FGMO as per IEGC 2023 has been implemented at their respective stations or not. Updated sheet on the basis of details receicved is as follows:

Sl. No.	Entity	Capacity(MW)	Governor Mode (FGMO as per IEGC 2023) Yes or No	Droop setting (%)	Remarks (if any)
1	Dadri-1 (TH)	4*200			
2	Dadri -2 (TH)	2*490			
3	Jhajjar (TH)	3*500			
4	Rihand-1 (TH)	2*500	Yes	5.0	Under

					Implementation
5	Rihand-2 (TH)	2*500	Yes	5.0	Under Implementation
6	Rihand-3 (TH)	2*500	Yes	5.0	Under Implementation
7	Shree Cement (TH)	(2 * 150)			
8	Singrauli (TH)	2*500+5*200			
9	Tanda-2 (TH)	2*660			
10	Unchahar stg-4 (TH)	1*500			
11	Unchahar (TH)	2*210			
12	Anta (G)	(1 * 153.2 + 3 * 88.71)			
13	Auraiya (G)	(2 * 109.3 + 4 * 111.19)			
14	Dadri (G)	(2 * 154.51 + 4 * 130.19)			
15	AD Hydro (H)	(2 * 96)	YES	4.0	-
16	Bairasiul (H)	(3 * 60)	Yes	4.0	
17	Bhakra (H)	(5 * 126 + 5 * 157)			
18	Budhil (H)	(2 * 35)			
19	Chamera-1 (H)	(3 * 180)	Yes	5.0	
20	Chamera-2 (H)	(3 * 100)	Yes	5.0	
21	Chamera-3 (H)	(3 * 77)	Yes	4.0	
22	Dehar (H)	(6 * 165)			
23	Dhauliganga (H)	(4 * 70)	Yes	5.0	
24	Dulhasti (H)	(3 * 130)	Yes	5.0	
25	Karcham (H)	(4 * 261.25)	Yes	5.0	
26	Kishenganga	(3 * 110)	Yes	4.0	
27	Koldam (H)	(4 * 200)	Yes	4.0	
28	Koteswar (H)	(4 * 100)	Yes	4.0	
29	Malana-2 (H)	(2 * 50)			
30	Nathpa Jhakri (H)	(6 * 250)	Yes	5.5	
31	Parbati-2 (H)	(4 * 200)			
32	Parbati-3 (H)	(4 * 130)	Yes	4.0	
33	Pong (H)	(6 * 66)			
34	Rampur (H)	(6 * 68.67)			
35	Sainj (H)	(2 * 50)			
36	Salal (H)	(6 * 115)	Yes	3.0	
37	Sewa-II (H)	(3 * 40)	Yes	4.0	
38	Singoli Bhatwari (H)	(3 * 33)			
39	Sorang (H)	(2 * 50)			

40	Tanakpur (H)	(1 * 31.42 + 2 * 31.4)	Yes	4.0	
41	Tehri (H)	(4 * 250)	Yes	4.0	
42	Uri-1 (H)	(4 * 120)	Yes	6.0	
43	Uri-2 (H)	(4 * 60)	Yes	5.0	

Constituents were requested to share the details at the earliest.

NRLDC representative requested concerned members to ensure implementation of FGMO as per IEGC 2023 at generating stations in their respective control area and share the present status.

NRLDC representaitve also higlighted unsatisfactory response of some of the generating stations during the grid events and requested to take necessary remedial actions to improve the governor response.

OCC forum requested members to share the governor details of their generating stations, ensure the complaince w.r.t. IEGC 2023 and take necessary actions for imporvemnt of governer response.

B.18 Mock trial run and testing of black start facilities at generating stations in Northern Region

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*".

Hydro and gas-based plants are capable of self-black-start. Conducting periodic mock black start exercises are extremely important to ensure the healthiness of black start facilities and also to build awareness as well as confidence among the system operators.

In view of above, regional entity generating stations shall conduct the dead bus charging of their units on rotation basis as per availability of schedule under intimation to the NRLDC. Testing of Diesel generator sets and other standalone auxiliary supply source to be used for black start shall also be done on a weekly basis. SLDC shall also ensure the same in their respective control area. This will ensure the healthiness

of blackstart facility at generating stations. Further, NRLDC shall coordinate with the ISGS and states to conduct the mock black start exercise of subsystems.

Therefore, regional entity generating stations and SLDCs were requested to share the annual schedule plan for conducting dead bus charging / mock black start exercise of generating stations / sub-systems during 2024-25 in the format attached as Annexure-B.IX of agenda. Constituents were also requested to share the test report of diesel generators / auxiliary supply on a quarterly basis. In this regard, communication has already been sent to constituents through NRLDC letter dated 24.04.2024.

NRLDC representative informed that details received from AD Hydro HEP, Tehri HEP, Karcham Wangtoo HEP, Koteshwar HEP, SJVN, NHPC, Budhil, Auraiya GPS, Singoli Bhatwari HEP, Koldam HEP, Dadri GPS, Delhi, Punjab and Uttarakhand.

Mock black start exercises conducted during 2024-25 till date is as follows:

a) GTPS (IPGCL) on 10.04.2024
b) Ranjit Sagar Dam(RSD) HEP on 07.05.2024
c) Kishenganga HEP on 09.11.2024
d) Tehri HEP on 13.11.2024
e) Koteshwar HEP on 27.11.2024
f) N.Jhakri & Rampur HEP on 08.12.2024
g) Chamera-I HEP on 12.12.2024
h) Dhauliganga HEP on 13.12.2024
i) Bairasiul HEP on 14.12.2024

NHPC representative informed that mock black start exercise (dead bus charging) at Salal HEP & Tanakpur HEP is scheduled in next week.

NRLDC representative requested ISGS and SLDCs to take following actions were:

- To share the tentative schedule of mock black start exercise of generating stations in their respective control area.
- SLDCs are requested to share the tentative schedule plan of mock black start exercise of generating stations in their respective control area.
- To conduct dead bus charging after self-starting the generating station if schedule with load is not available.
- To share the test report of mock black start exercise conducted along with weekly DG testing on monthly/quarterly basis.

NRLDC representative requested Rajasthan to coordinate with Ramgarh GPS for mock black start exercise. Ramgarh GPS is only gas/hydro generating station nearest to the RE pocket of Rajasthan. Therefore, healthiness of its black start facility is important. Rajasthan agreed to follow up with the Ramgarh GPS for mock black start exercise.

OCC forum requested all the concerned generating stations and states to conduct and share the schedule of mock black start of generating stations of their control area.

B.19 Mock testing of System Protection Schemes (SPS) in Northern Region

As per IEGC clause 16.2

''For the operational SPS, RLDC or NLDC, as the case may be, in consultation with the concerned RPC(s) shall perform regular load flow and dynamic studies and mock testing for reviewing SPS parameters & functions, at least once in a year. RLDC or NLDC shall share the report of such studies and mock testing including any short comings to respective RPC(s). The data for such studies shall be provided by CTU to the concerned RPC, RLDC and NLDC.''

As per IEGC clause 16.3

''The users and SLDCs shall report about the operation of SPS immediately and detailed report shall be submitted within three days of operation to the concerned RPC and RLDC in the format specified by the respective RPCs.''

There are 53 numbers of System Protection Scheme (SPS) approved in Northern Region out of which 05 number of SPS are under implementation stage. These SPS are implemented at major generation complexes, important evacuating transmission lines and ICTs which are N-1 non-complaint. Details of SPS in Northern Region is available on NRLDC website at link https://nrldc.in/download/nr-sps-2024/?wpdmdl=13255&lang=en .

SPS is designed to detect abnormal system conditions and take predetermined, corrective action to preserve system integrity and provide acceptable system performance. Therefore, correct operation of SPS as per designed logic is important to serve its purpose. To ensure this, mock testing of SPS needs to be conducted at a regular period. Clause 16.2 of IEGC 2023 also mandates the mock testing of SPS for reviewing SPS parameters & functions, at least once a year.

In view of the above, concerned constituents / utility were requested to share the tentative schedule plan for conducting mock testing of SPS in their respective control area during 2024-25 in format attached as Annexure-B.X of agenda. In this regard, communication has already been sent to constituents through NRLDC letter dated 01.05.2024. Update in this regard received only from UP and Uttarakhand.

Details only received from Uttarakhand, Rajasthan & UP.

NRLDC representative informed that UP & Rajasthan has conducted ~70-80% of SPS schemes in their control area. POWERGRID, Punjab and other members are also requested to plan and conduct the SPS testing in their control area.

NRLDC representative asked UP to share the present status of SPS of 400kV Gr. Noida, Unnao & Sultanpur. In status report submitted by UP, it was mentioned that SPS at these stations are unhealthy. Necessary remedial actions may be taken to ensure the healthiness of SPS system.

UP representative informed that updated status yet to be received, they will follow up and share the updated status.

OCC forum requested members to conduct the mock testing of SPS in their respective control area, share the tentative schedule of mock testing of SPS and also share the report of the same.

B.20 Availability and Standardization of recording instrument (Disturbance recorder and Station Event Logger) and status of work regarding undertaking submitted during First Time Charging of elements:

OCC forum was of view that cited agenda to be deliberated in detail in the upcoming 55nd PSC meeting of NRPC.

B.21 Revision of document for Reactive Power Management of Northern Region:

NRLDC representative informed the forum that NRLDC has been issuing 'Reactive Power document of Northern Region' on annual basis. Reactive Power Management document for Northern region was last revised on 31st Dec 2023 & updated document link is as below:

https://nrldc.in/download/nr_reactivepowermanagement_2024/?wpdmdl=13136&lang=en

The document is password protected, and password was already informed to all the NR constituents through letter dated 10th Dec 2024.

*In view of new addition/modification of transmission & generation element in NR grid since Dec'23, the document is being reviewed for update. NRLDC requested all the c****onstituents to provide feedback, suggestions and updated information of their respective control area by 16th Dec 2024.***

OCC forum requested all the members to share their inputs, updated details for compilation of Reactive Power management Document of Norther Region at the earliest.

Status of action taken on decision of 225th OCC meeting of NRPC

S.N.	Agenda	Decision of 225th OCC meeting of NRPC	Status of action taken
1	A.12. Procurement of cold spare transformers and reactor for Northern Region (Agenda by POWERGRID NR-1)	Forum asked Powergrid to submit a consolidated, capacity-wise list of the total number of transformers required as spares on a regional basis. The list should include the current shortfall in ICTs, the number of ICTs allocated States/UT's of NR as regional spares, and the expected timeline for their return.	Powergrid has submitted an agenda in this regard.

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 — Nov-2024
◎ HARYANA — Oct-2024
◎ HP — Sep-2024
◎ J&K and LADAKH — Not Available
◎ PUNJAB — Nov-2024
◎ RAJASTHAN — Sep-2024
◎ UP — Oct-2024
◎ UTTARAKHAND — Nov-2024
All States/UTs are requested to update status on monthly basis.</td></tr>
<tr><td rowspan="2">3</td><td rowspan="2">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-2024
◎ HARYANA — Sep-2024
◎ HP — Oct-2024
◎ J&K and LADAKH — Not Available
◎ PUNJAB — Sep-2024
◎ RAJASTHAN — Sep-2024
◎ UP — Nov-2024
◎ UTTARAKHAND — Sep-2024
◎ BBMB — Jun-2024
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>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</td></tr>
</table>

<table>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td>◎</td><td>UTTARAKHAND</td><td>Increased</td></tr>
<tr><td>◎</td><td>BBMB</td><td>Increased</td></tr>
</table>
</td></tr>
<tr><td>4</td><td>Status of Automatic Demand Management System 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>
The status of ADMS implementation in NR is enclosed in Annexure-A.I.II.
<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.</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>
<tr><td>5</td><td>Status of availability of ERS towers in NR</td><td>As per the decesion of 68th NRPC and 211th OCC meeting, ERS availability monitoring is being taken as rolling/follow-up agenda in OCC meetings for regular monitoring of ERS under different utilities in Northern region.</td><td>As per the information received from different utilities in Northern region, updated status of availability of ERS towers in Northern Region attached as Annexure-A.I.III.</td></tr>
<tr><td>6</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>Oct-24</td></tr>
<tr><td>◎</td><td>HARYANA</td><td>Oct-24</td></tr>
<tr><td>◎</td><td>HP</td><td>Sep-24</td></tr>
<tr><td>◎</td><td>J&K and LADAKH</td><td>JPDCL- Mar'24
KPDCL- Not Submitted</td></tr>
<tr><td>◎</td><td>PUNJAB</td><td>Sep-24</td></tr>
<tr><td>◎</td><td>RAJASTHAN</td><td>Sep-24</td></tr>
<tr><td>◎</td><td>UP</td><td>Sep-24</td></tr>
<tr><td>◎</td><td>UTTARAKHAND</td><td>Aug-24</td></tr>
</table>
Chandigarh is 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>7</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</td><td>
Status of the information submission (month) from states / utilities is as under:
<table>
<tr><td>◎</td><td>HARYANA</td><td>Jun-2024</td></tr>
<tr><td>◎</td><td>PUNJAB</td><td>Jun-2024</td></tr>
<tr><td>◎</td><td>RAJASTHAN</td><td>Nov-2024</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.IV.
</td></tr>
</table>

		basis is monitored in OCC meetings.	All States/utilities are requested to update status of FGD installation progress on monthly basis.
8	Information about variable charges of all generating units in the Region	The variable charges detail for different generating units are available on the MERIT Order Portal.	All states/UTs are requested to submit daily data on MERIT Order Portal timely.

9	Reactive compensation at 220 kV/ 400 kV level at 8 substations			
	State / Utility	Substation	Reactor	Status
i	DTL	Peeragarhi	1x50 MVAr at 220 kV	1x50 MVAr Reactor at Peeragarhi has been commissioned on dated 18.09.2023
ii	DTL	Harsh Vihar	2x50 MVAr at 220 kV	2x50 MVAR Reactor at Harsh Vihar has been commissioned on dated 31th March 2023.
iii	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.
iv	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.
v	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.
vi	DTL	Electric Lane	1x50 MVAr at 220 kV	Under Re-tendering due to Single Bid
vii	PTCUL	Kashipur	1x125 MVAR at 400 kV	Tender for Procurement of 125 MVAR Reactor has been floated on 04.11.2024 and tender opening date is 30.12.2024.
viii	RAJASTHAN	Jodhpur	1x125 MVAr	1X 125 MVAR reactor at Jodhpur has been commissioned on dated 09.12.2024

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'25	02 No. of bays shall be utilized for LILO-II of 220kV Jatwal-Bishnah Transmission Line, the work of which is delayed due to persisting RoW issues. expected date of completion is Mar 2025 subject to availability of funds and resolving of RoW issues), Updated in 220th 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	Mar'25	Under construction.Updated in 222nd 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	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
9	Bhiwani 400/220kV S/s	Commissioned: 6 Total: 6	Utilized: 2 Unutilized: 4	• 220 kV D/C line Bhiwani (PG) – Bhiwani (HVPNL) line	Commissioned	Updated in 202nd OCC by HVPNL
				• 220 kV Bhiwani (PG) - Isherwal (HVPNL) D/c line.	Dec'24	Issue related to ROW as intimated in 218th OCC by HVPNL. **Status:** Work was stalled since 29.07.2021 due to ROW issues and farmers agitation and further restarted on 9.10.2023 with the help of district administration. Now, work was again stalled since30.11.2023 due to severe ROW issues. Expected to be completed by 31.12.2024. Foundation 209/212. Erection 193/212. Stinging 37.8/50.3 km
				• 220 kV Bhiwani (PG) - Dadhibana (HVPNL) D/c line.	Oct'25	Line work awarded to M/s R S Infra Projects Pvt. Ltd. Noida, Uttar Pardesh on dated 09.03.2024. Work of route plan and route alignment has been started by the firm as intimated in 218th 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	Dec'24	Work in progress. Updated in 220th OCC by HVPNL.
11	400/220kV Tughlakabad GIS	Commissioned: 6 Under Implementation: 4	Utilized: 6 Unutilized: 0	• RK Puram – Tughlakabad (UG Cable) 220kV D/c line – March 2023.	Commissioned	Updated in 216th OCC by DTL
				• Masjid Mor – Tughlakabad 220kV D/c line.	Commissioned	Updated in 216th OCC by DTL

Sl. No.	Substation	Downstream network bays	Status of bays	Planned 220 kV system and Implementation status	Revised Target	Remarks
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	Commissioned	Energization date: 31.05.2024 updated by HPPTCL in 220th OCC
				• HPPTCL has planned one no. of 220kV D/c line from Kala Amb 400/220kV S/s to 220/132kV Giri S/s	-	Tendering process is yet to be started.Updated in 219th OCC by HPPTCL
				• 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	• D/C line Kadarpur - Sec-56 Gurugram.	Not awarded yet	Initial proposal of LILO of 220kV Pali-Sector 56 Line and Pali-Sector 52 line was descoped due to forest issue. Proposal to evacuate power from 220kV D/C Pali-Sector 56 line to Sector 56 and 52 with bunching of lines is under consideration. Updated in 218th OCC by HVPNL
				• S/C line Kadarpur - Sec-52 Gurugram	Not awarded yet	Initial proposal of LILO of 220kV Pali-Sector 56 Line and Pali-Sector 52 line was descoped due to forest issue. Proposl to evacuate power from 220kV D/C Pali-Sector 56 line to Sector 56 and 52 with bunching of lines is under consideration. Updated in 218th OCC by HVPNL
				• S/C line Kadarpur - Pali	Not awarded yet	Initial proposal of LILO of 220kV Pali-Sector 56 Line and Pali-Sector 52 line was descoped due to forest issue. Proposl to evacuate power from 220kV D/C Pali-Sector 56 line to Sector 56 and 52 with bunching of lines is under consideration. Updated in 218th 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	Dec'24	Updated in 216th 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	Mar'25	Contract awarded on 08.08.23 to M/s Skipper with completion in March 25.Updated in 218th OCC by HVPNL
				• LILO of both ckt of 220kV D/c Ranga Rajpur – Palwal line	Commissioned	Energization date: 31.12.2021. Updated in 198th OCC by HVPNL
				• 220kV D/C for Sector78, Faridabad	31.01.2025	Issue related to ROW and Pending crossing approval from Northern Railways and DFCCIL. as intimated in 223rd OCC by HVPNL.
				• Prithla - Sector 89 Faridabad 220kV D/c line	Jul'25	Work awarded to M/s Man Structurals Pvt Ltd. JV M/s Aquarian Enterprises on 09.01.2024. Contractual date: 06.05.2025 and Tentative date of completion :06.05.2025 Route has been approved and further work is in progress.Updated in 218th OCC by HVPNL
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	31.12.2024	Updated in 224th OCC by HVPNL. **Status:** The stringing work between TL No. 19 & 20, TL No. 22 & 23 and TL No. 22 & 24 is pending for want of necessary consent from the forest department. The case has already been uploaded on Parivesh portal and is currently pending at the O/o AIGF, Forest Dept. Panchkula.
				• Sonepat - HSIISC Rai 220kV D/c line	Commissioned	Energization date: 31.05.2024 updated by HVPNL in 220th OCC
				• Sonepat - Kharkhoda Pocket A 220kV D/c line	08.03.2025	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. Both bays are under construction and erection of electrical equipment is under progress. Tetative date of completion of both bays at PGCIL end is end of July 2024.
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: 14/2017. Permission for Highway is awaited from concerned department as updated in 218th 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 30.04.2024 as updated in 218th OCC by RVPNL.
19	400/220kV Jallandhar Sub-station	Commissioned: 10 Total: 10	Utilized: 8 Unutilized: 2	• Network to be planned for 2 bays	Nov'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. 6 months more are needed due to ROW issues as updated by PSTCL in 220th OCC

Sl. No.	Substation	Downstream network bays	Status of bays	Planned 220 kV system and Implementation status	Revised Target	Remarks
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
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	Commissioned	Ckt-1 commissioned at 16:13hrs on dated 06.08.24 & Ckt-2 commissioned at 20:10 hrs on dated 05.08.24. Updated in 223rd OCC by HVPNL
25	400/220kV Pachkula Sub-station	Commissioned: 8 Under tender:2 Total: 10 Out of these 10 nos. 220kV	Utilized: 2 Unutilized: 4 Under Implementation:2	• Panchkula – Pinjore 220kV D/c line	Commissioned	Updated in 218th OCC by HVPNL
				• Panchkula – Sector-32 220kV D/c line	Commissioned	Energization date: 24.05.2024 updated by HVPNL in 220th OCC
				• Panchkula – Raiwali 220kV D/c line	Commissioned	Updated in 194th OCC by HVPNL
				• Panchkula – Sadhaura 220kV D/c line: Sep'23	Mar'25	Updated in 222nd 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	31.08.2024	Issue in connectivity agreement with CTU. CTU asked PSTCL to approach CEA and thereafter CEA may plan a meeting with PSTCL and CTU to resolve the issue. Updated in 225th 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)	31.08.2024	Issue in connectivity agreement with CTU. CTU asked PSTCL to approach CEA and thereafter CEA may plan a meeting with PSTCL and CTU to resolve the issue. Updated in 225th 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	Mar'25	Updated in 220th OCC by HVPNL. **Status:** NIT has been floated vide NIT No. EPC-D-96 dated 15.10.23 to be opened on 22.12.23. • Now, the tender has been dropped and likely to be refloated by 31.07.2024.
				• Bahadurgarh - METL 220kV D/c line (Deposit work of M/s METL)	Mar'25	Updated in 220th OCC by HVPNL. **Status:** • Revised BOQ forwarded from Design wing to contract wing. • Tender has floated vide NIT No. EPC-D-100 dated 04.01.2024 with tender opening date of 26.02.2024. • Tender has been opened on 26.03.24 and 03 nos. bids has been received. The work is likely to be awarded by the 31.07.2024.
				• Bahadurgarh - Kharkhoda Pocket B 220kV D/c line	08.03.2025	Updated in 220th OCC by HVPNL. **Status:** Contract awarded on 09.08.23 to M/s R S Infra Noida. Work has been started.
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
30	400/220kV Sohawal S/s	Commissioned: 8 Total: 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
				• 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	-	Standard bid document has been finalized on 13.08.2024 and bid is under preparation as updated by RVPN in 222nd OCC.

Sl. No.	Substation	Downstream network bays	Status of bays	Planned 220 kV system and Implementation status	Revised Target	Remarks
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	Commissioned	Direct circuit from 220 kV Lalton Kalan to Dhandari Kalan to be diverted to 400 kV PGCIL Ludhiana. Work completed , final agrrement is expected to be signed by May'24. Updated in 218th 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	Commissioned	Stringing of 2nd Circuit of Chamera Pool-Karian Tansmission line has been completed & terminal bay at 400/220 kV chamera pooling substation (PGCIL) is commissioned on 20.01.2024. Updated in 217th 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'25	2 Nos. bays for 400 kV PGCIL Patiala - 220 kV Bhadson (D/C) line being planned. Tender is yet to be awarded. Timeline one year communicated by PSTCL in 220th OCC meeting

Status of ADMS implementation in NR:

Sl. No.	State / UT	Status	Remarks
1	DELHI	Scheme Implemented but operated in manual mode.	A committee has been constituted under the chairmanship of GM, SLDC Delhi to formulate the logic for implementation of ADMS. Delhi SLDC informed that two meetings have been held by the committee and based on the delibration in those meetings, SoP has been formed by the committee. Delhi SLDC has shared the logic for implementation of ADMS with NRLDC for their observation and upon examination of same NRLDC has submitted its views/comments to Delhi SLDC. In 222nd OCC meeting Delhi SLDC intimated that they would be shortly having a meeting with its Discoms and NRLDC views would be delibrated in the said meeting. Delhi SLDC intimated that they have shared revised SoP with NRPC and NRLDC after incorporating the views of NRLDC In 225th OCC meeting NRPC representative apprised forum that revised Standard Operating Procedure (SOP) of Automatic Demand ManagementScheme (ADMS) by the DISCOMs in NCT of Delhi has been approved in 51st TCC and 76th NRPC meeting. In 52nd TCC and 77th NRPC DTL intimated that tentative timeline for implemenation is 28th February 2025.
2	HARYANA	Scheme not implemented	Haryana SLDC intimated that as per Joint Roadmap of implementation of ADMS in Haryana supplied to NRPC vide memo dated 17.10.2023 (Annexure-II), the implementation plan was proposed to be carried out in two parts, as mentioned below: PART-I: Control with Transmission Utility PART-II: Control with Distribution Utility It is pertinent to mention that as part of upcoming SCADA-EMS system i.e. upgradation of SCADA-EMS system, a feature in the name of LSS (Load Shedding Software)/ ADMS is part of the Technical Specification of project to be delivered. Therefore, the functionalities of ADMS application will be covered under 'Part-I: Control with Transmission Utility' will already be covered using the RTUs available at select substations along with the ADMS software being delivered by M/s GE under SCADA upgradation project. Hence, there is no need to acquire a separate ADMS application & associated hardware for data centre for implementation of PART-I. Further for Part -II a committee has been constituted for further finalization of the ADMS module with control with Discoms is under discussions for preparation of DPR.
3	HP	Scheme not implemented	HP SLDC imentioned that HPSEB had intimated that initially 142 Nos. of feeders were identified for operation under ADMS functionality but most of these feeders were from same sub-station. Therefore, now they have increased the no. of sub-station and identified the non-critical feeders. Load relief to be given through these feeders is under finalization. The revised feeder list to be shared by HPSEBL with the SLDC within one month.
4	PUNJAB	Scheme not implemented	i. A committee comprising of following officers of PSPCL & PSTCL has been constituted to finalize the logic regarding implementation of Automatic Demand Management System in Punjab Control Area. A meeting in this regard was held on dated 26-02-2024 at PSLDC Complex, Patiala. The committee deliberated various loading scenarios and proposed the following logic for the management of demand: 1. If the frequency sustains below 49.90 Hz for duration of 3 minutes, the Automatic Demand Management System will initiate a 50% reduction in the Over Drawl. 2. In case the frequency falls further below 49.85 Hz, the Over Drawl will be reduced to zero. 3. The software at the SLDC end for ADMS shall be available with ULDC phase –III SCADA system which is under implementation. ii. In 222nd OCC, MS NRPC asked Punjab to co-ordiante with Powergrid for integration of their propsoed logic with the ULDC phase-III SCADA system for timely implementation.

5	RAJASTHAN	Under implementation	In 226th OCC meeting, RVPN informed that 201 nos. of circuit breakers have been mapped to ADMS, all 201 circuit breakers tested upto yard individually. Total 650CBs are to be mapped in phased manner.
6	UP	Scheme implemented by NPCIL only	i. A meeting regarding ADMS was held on 15.01.2023 with the UPPCL under the chairmanship of MD UPPTCL ii. A committee formed for identification of load at 33 kV level under the chairmanship of Director (Distribution), UPPCL. iii. Another committee under the chairmanship of Director UPSLDC shall identify the technical and operational requirement for ADMS implementation iv. The software at the SLDC end for ADMS shall be available with ULDC phase –III SCADA system which is under implementation and likely to be commissioned by March 2025. v. In order to operate identified 33 kV feeders under ADMS scheme, integration of 132 kV substations with SCADA system is under implementation in the Reliable Communication Scheme and expected date of completion of the scheme is October 2024. vi. MS, NRPC apprised forum that a letter has been written to Director, SLDC for co-odinatng with Director (Distribution), UPPCL for expediting the finalization of feeder list at 33kV for ADMS implementation.
7	UTTARAKHAND	Scheme not implemented	i. UPCL has prepared a system architecture in which all the non-monitored sub-stions have been selected and 11kV feeders have been considered for ADMS operation. For the scheme, discom has also done group-wise selection of feeders and quantum of MW relief to be given for automatic demand response at 11kV level has also been decided. UPCL has awarded the tender for implementation of the aforementioned scheme to M/s Metergy Pvt.Ltd. ii. As per the status report submitted by M/s Metergy Pvt.Ltd, the survey work of 30 nos. incomer sites have been completed and order has been placed by UPCL for hardware equipments. iii. Uttarakhand SLDC informed that feeder list at 11kV level has been finalized and logic of ADMS implementation is under finalization. iv. Uttarakhand has intimated that It is bring to your notice that installation MFT(Multi Function Transducers) at various interstate points at PTCUL Substations under ADRS Project of UPCL is in progress.

Annexure-A.I.III.

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		Tender has been scraped due to single tender.
		220kV	1045.135	NIL	1		
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						JKPTCL, Jammu: being procured JKPTCL, Kashmir:10 tower procured (out of which 3 on loan to JKPTCL, Jammu)

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. The agenda has been sent to Hon'ble Energy Minister for approval. Thereafter, the purchase proposal shall be placed before HPPC meeting for negotation and decision
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)

FGD Status

Updated status of FGD related data submission

NTPC (27.02.2023)
MEJA Stage-I
RIHAND STPS
SINGRAULI STPS
TANDA Stage-I
TANDA Stage-II
UNCHAHAR TPS
UPRVUNL (10.01.2024)
ANPARA TPS
HARDUAGANJ TPS
OBRA TPS
PARICHHA TPS

PSPCL (18.06.2024)
GGSSTP, Ropar
GH TPS (LEH.MOH.)
RRVUNL (20.11.2024)
CHHABRA SCPP
CHHABRA TPP
KALISINDH TPS
KOTA TPS
SURATGARH SCTPS
SURATGARH TPS

Updated status of FGD related data submission

Lalitpur Power Gen. Co. Ltd. (10.01.2024)
Lalitpur TPS
Lanco Anpara Power Ltd. (01.01.2024)
ANPARA-C TPS

HGPCL (22.11.2024)
PANIPAT TPS
RAJIV GANDHI TPS
YAMUNA NAGAR TPS

Adani Power Ltd. (18.02.2022)
KAWAI TPS

Rosa Power Supply Company (01.01.2024)
Rosa TPP Phase-I
Prayagraj Power Generation Company Ltd. (05.01.2024)
Prayagraj TPP
APCPL (01.05.2024)
INDIRA GANDHI STPP

Pending submissions

GVK Power Ltd.
GOINDWAL SAHIB

NTPC
DADRI (NCTPP)
Talwandi Sabo Power Ltd.
TALWANDI SABO TPP
L&T Power Development Ltd.
Nabha TPP (Rajpura TPP)

Target Dates for FGD Commissioning (Utility-wise)

Adani Power Ltd.	KAWAI TPS U#1 (Target: 31-12-2024), KAWAI TPS U#2 (Target: 31-12-2024)
APCPL	INDIRA GANDHI STPP U#2 (Target: 30-09-2023), INDIRA GANDHI STPP U#3 (Target: 30-06-2023)
GVK Power Ltd.	GOINDWAL SAHIB U#1 (Target: 30-04-2020), GOINDWAL SAHIB U#2 (Target: 29-02-2020)
HGPCL	PANIPAT TPS U#6 (Target: 31-12-2025), PANIPAT TPS U#7 (Target: 31-12-2025), PANIPAT TPS U#8 (Target: 31-12-2025), RAJIV GANDHI TPS U#1 (Target: 31-08-2027), RAJIV GANDHI TPS U#2 (Target: 31-08-2027), YAMUNA NAGAR TPS U#1 (Target: 31-08-2027), YAMUNA NAGAR TPS U#2 (Target: 31-08-2027)

NTPC	DADRI (NCTPP) U#1 (Target: 31-12-2020), DADRI (NCTPP) U#2 (Target: 31-10-2020), DADRI (NCTPP) U#3 (Target: 31-08-2020), DADRI (NCTPP) U#4 (Target: 30-06-2020), DADRI (NCTPP) U#5 (Target: 30-06-2022), DADRI (NCTPP) U#6 (Target: 31-03-2023), RIHAND STPS U#1 (Target: 31-10-2025), RIHAND STPS U#2 (Target: 30-06-2026), RIHAND STPS U#3 (Target: 31-12-2024), RIHAND STPS U#4 (Target: 31-03-2025), RIHAND STPS U#5 (Target: 30-06-2025), RIHAND STPS U#6 (Target: 31-10-2025), SINGRAULI STPS U#1 (Target: 31-12-2024), SINGRAULI STPS U#2 (Target: 31-12-2024), SINGRAULI STPS U#3 (Target: 31-12-2024), SINGRAULI STPS U#4 (Target: 31-12-2024), SINGRAULI STPS U#5 (Target: 31-03-2025), SINGRAULI STPS U#6 (Target: 31-06-2024), SINGRAULI STPS U#7 (Target: 31-03-2024), UNCHAHAR TPS U#1 (Target: 31-12-2023), UNCHAHAR TPS U#2 (Target: 31-12-2023), UNCHAHAR TPS U#3 (Target: 30-09-2023), UNCHAHAR TPS U#4 (Target: 30-09-2023), UNCHAHAR TPS U#5 (Target: 30-09-2023), UNCHAHAR TPS U#6 (Target: 31-08-2022), MEJA Stage-I U#1 (Target: 31-10-2023), MEJA Stage-I U#2 (Target: 30-06-2023), TANDA Stage-I U#3 (Target:), TANDA Stage-I U#4 (Target:), TANDA Stage-II U#3 (Target: 31-03-2023), TANDA Stage-II U#4 (Target: 30-09-2023)

L&T Power Development Ltd (Nabha)	Nabha TPP (Rajpura TPP) U#1 (Target: 30-04-2021), Nabha TPP (Rajpura TPP) U#2 (Target: 28-02-2021)
Lalitpur Power Gen. Company Ltd.	LALITPUR TPS U#1 (Target: 31-12-2026), LALITPUR TPS U#2 (Target: 30-09-2026), LALITPUR TPS U#3 (Target: 30-06-2026)
Lanco Anpara Power Ltd.	ANPARA C TPS U#1 (Target: 31-12-2025), ANPARA C TPS U#2 (Target: 31-12-2025)
Prayagraj Power Generation Company Ltd.	PRAYAGRAJ TPP U#1 (Target: 31-12-2026), PRAYAGRAJ TPP U#2 (Target: 31-12-2026), PRAYAGRAJ TPP U#3 (Target: 31-12-2026)
PSPCL	GH TPS (LEH.MOH.) U#1 (Target: 31-12-2026), GH TPS (LEH.MOH.) U#2 (Target: 31-12-2026), GH TPS (LEH.MOH.) U#3 (Target: 31-12-2026), GH TPS (LEH.MOH.) U#4 (Target: 31-12-2026), GGSSTP, Ropar U#3 (Target: 31-12-2026), GGSSTP, Ropar U#4 (Target: 31-12-2026), GGSSTP, Ropar U#5 (Target: 31-12-2026), GGSSTP, Ropar U#6 (Target: 30-12-2026)

Rosa Power Supply Company	ROSA TPP Ph-I U#1 (Target: 31-12-2026), ROSA TPP Ph-I U#2 (Target: 31-12-2026), ROSA TPP Ph-I U#3 (Target: 31-12-2026), ROSA TPP Ph-I U#4 (Target: 31-12-2026)
RRVUNL	KOTA TPS U#5 (Target: 30-11-2025), KOTA TPS U#6 (Target: 30-11-2025), KOTA TPS U#7 (Target: 30-11-2025), SURATGARH TPS U#1 (Target: 31-12-2026), SURATGARH TPS U#2 (Target: 31-12-2026), SURATGARH TPS U#3 (Target: 31-12-2026), SURATGARH TPS U#4 (Target: 31-12-2026), SURATGARH TPS U#5 (Target: 31-12-2026), SURATGARH TPS U#6 (Target: 31-12-2026), SURATGARH SCTPS U#7 (Target: 28-02-2025), SURATGARH SCTPS U#8 (Target: 28-02-2025), CHHABRA TPP U#1 (Target: 31-12-2026), CHHABRA TPP U#2 (Target: 31-12-2026), CHHABRA TPP U#3 (Target: 31-12-2026), CHHABRA TPP U#4 (Target: 31-12-2026), CHHABRA SCPP U#5 (Target: 28-02-2025), CHHABRA SCPP U#6 (Target: 28-02-2025), KALISINDH TPS U#1 (Target: 28-02-2025), KALISINDH TPS U#2 (Target: 28-02-2025)
Talwandi Sabo Power Ltd.	TALWANDI SABO TPP U#1 (Target: 28-02-2021), TALWANDI SABO TPP U#2 (Target: 31-12-2020), TALWANDI SABO TPP U#3 (Target: 31-10-2020)
UPRVUNL	ANPARA TPS U#1 (Target: 31-12-2025), ANPARA TPS U#2 (Target: 31-12-2025), ANPARA TPS U#3 (Target: 31-12-2025), ANPARA TPS U#4 (Target: 31-12-2025), ANPARA TPS U#5 (Target: 31-12-2025), ANPARA TPS U#6 (Target: 31-12-2025), ANPARA TPS U#7 (Target: 31-12-2025), HARDUAGANJ TPS U#8 (Target: 31-12-2026), HARDUAGANJ TPS U#9 (Target: 31-12-2026), OBRA TPS U#9 (Target: 31-12-2026), OBRA TPS U#10 (Target: 31-12-2026), OBRA TPS U#11 (Target: 31-12-2026), OBRA TPS U#12 (Target: 31-12-2026), OBRA TPS U#13 (Target: 31-12-2026), PARICHHA TPS U#3 (Target: 31-12-2026), PARICHHA TPS U#4 (Target: 31-12-2026), PARICHHA TPS U#5 (Target: 31-12-2026), PARICHHA TPS U#6 (Target: 31-12-2026)

Annexure-A.II

HIMACHAL PRADESH STATE LOAD DESPATCH CENTRE

(an Apex body)

GOVERNMENT OF HIMACHAL PRADESH

No. HPSLDC/SLDC-75 (Vol.-III)/2024-25- 7004-13 **Dated:** 29-10-2024

To

As per List;

Subject: **Request to decrease the Under-Frequency Relay (UFR) settings of generators.**

Reference: **MoM held on 11.01.2023 to discuss implementation of islanding scheme in Himachal Pradesh (Attached as Annexure – I)**

Sirs,

This has reference to the minutes of meeting (MoM) mentioned under reference, vide which the representative of your project has agreed that the under-frequency relay settings (UFR) of your generator can be decreased to 47.5 Hz.

In regard to the above, it is requested to decrease the UFR settings of your generators to 47.5 Hz and compliance of the same be intimated to this office at the earliest.

In addition to the above, it is intimated that if the UFR settings of your generators are below 47.5 Hz, then there is no need to increase it to 47.5 Hz, however, the intimation of the same be informed to this office immediately.

This is for your kind information and necessary action please.

Yours sincerely,

DA: As Above

Superintending Engineer,
O/o Managing Director,
HPSLDC, GoHP, Totu, Shimla-11.

Copy to:

1. The General Manager (SO – I), Northern Regional Load Despatch Centre, 18-A, Shaheed Jeet Singh Sansanwal Marg, Katwaria Sarai, New Delhi-110016 for kind information please. Email: nrldcso2@posoco.in.
2. The Superintending Engineer (Operation), Northern Regional Power Committee, 18-A, Shaheed Jeet Marg, New Delhi – 110016 for kind information please. Email id: seo-nrpc@nic.in

Superintending Engineer,
O/o Managing Director,
HPSLDC, GoHP, Totu, Shimla-11.

SLDC Complex, Totu, Shimla-171011
Phone: 0177-2838666, Telefax: 0177-2837649 GST No. 02AAAAH7757E1ZX
Email: sehpsldc@gmail.com, cehpsldc@gmail.com, mdhpsldc@gmail.com, Web: www.hpsldc.com

LIST

1. M/s Sandhya Hydro Power Project (Balargha-3x3 MW SHEP), Reg. Office-H. No. 24, Behind HPSEB Bhuntar Substation, Bhuntar, Kullu (HP)-175125. Email: kumar.abhinav@continuumenergy.in
2. M/s Nanti Hydro Power Pvt. Ltd. (Uper Nanti – 2x6.5 MW HEP), Gymba House, New Shimla – 9. Email: nanti.nhppl@gmail.com
3. M/s Malana Power Company Ltd. (2x43 MW HEP), MDR 30, Village Chauki, P.O. Jari Distt. Kullu – 175105. Email: malanageneration@injbhilwara.com
4. M/s Kurmi Energy Pvt. Ltd., V.P.O Phancha, Tehsil Rampur BSR, Distt. Shimla (HP) – 172101. Email: avtarsingh13021983@gmail.com
5. M/s Puri Oil Mills Ltd. Chaski 2 MW SHEP, V.P.O. Barshani, Distt. Kullu (HP) – 175105. Email: ajmer@purioilmills.com
6. M/s Toss Mini Hydel Power Project, Vill. Toss P.O. Barsheni Distt. Kullu (HP). Email: tossmhep@gmail.com
7. M/s Jirah Hydro Electric Project (4 MW SHEP), Village Tosh, P.O. Barshaini, Tehsil Bhunter, Distt. Kullu (H.P.) Email: binny195@gmail.com
8. M/s Kundan Green Energy Private Limited, Village Suru, PO Kut, Tehsil Rampur Bushahr, District Shimla (H.P). Email: kut@kundangreenenergy.com

											Approved Planned Outage-1			Actual Planned Outage-1		
Capacity (MW) 30-11-2023	Name of Station	UNIT_NM	STN_TYPE_ID	SECTOR	REGION_NM	ST_NM	SH_NM	IPP	FUEL_NM	Capacity (MW) 31-03-2025	Start Date	End Date	Reason	Start Date	End Date	Reason for any deviation
250	PRAGATI CCGT-III	1	T	STATE SECTOR	Northern	Delhi	PPCL	FALSE	NATURAL GAS	250	1-Nov-24	17-Nov-24	Mark VI upgradation			Outage not availed. As informed by utility required spares awaited
250	PRAGATI CCGT-III	3	T	STATE SECTOR	Northern	Delhi	PPCL	FALSE	NATURAL GAS	250	1-Nov-24	20-Nov-24	Hot Gas path inspection			Outage not availed. As informed by utility required spares awaited
250	PRAGATI CCGT-III	4	T	STATE SECTOR	Northern	Delhi	PPCL	FALSE	NATURAL GAS	250	2-Oct-24	1-Nov-24	Boiler Inspection			Outage not availed. As informed by utility pre-requiste action underway
660	KAWAI TPS	2	T	IPP SECTOR	Northern	Rajasthan	APL	FALSE	COAL	660	1-Nov-24	25-Nov-24	AOH	2-Oct-24	27-Oct-24	
250	HARDUAGANJ TPS	8	T	STATE SECTOR	Northern	Uttar Pradesh	UPRVUNL	FALSE	COAL	250	15-Oct-24	28-Nov-24	COH			Outage not availed by utility during the said duration
500	RIHAND STPS	2	T	CENTRAL SECTOR	Northern	Uttar Pradesh	NTPC Ltd.	FALSE	COAL-P	500	1-Oct-24	14-Nov-24	COH	1-Sep-24	9-Sep-24	Undertaken as per outage approved in 222nd OCC meeting.
210	UNCHAHAR TPS	4	T	CENTRAL SECTOR	Northern	Uttar Pradesh	NTPC Ltd.	FALSE	COAL	210	1-Oct-24	4-Nov-24	AOH	10-Nov-24	14-Dec-24	Unit under overhauling, as per 224th OCC meeting approved outage.
490	DADRI (NCTPP)	6	T	CENTRAL SECTOR	Northern	Uttar Pradesh	NTPC Ltd.	FALSE	COAL	490	7-Oct-24	20-Nov-24	Boiler Overhauling	30-Sep-24	13-Nov-24	Undertaken as per outage approved in 222nd OCC.
135	JALIPA KAPURDI TPP	2	T	IPP SECTOR	Northern	Rajasthan	JSWBL	FALSE	LIGNITE	135	13-Nov-24	20-Nov-24	Boiler Inspection	13-Nov-24	17-Nov-24	
111.19	AURAIYA CCPP	3	T	CENTRAL SECTOR	Northern	Uttar Pradesh	NTPC Ltd.	FALSE	NATURAL GAS	111.19	19-Nov-24	19-Nov-24	Boiler License Renewal	19-Dec-24	22-Dec-24	

Annexure-A.IV

भारत सरकार केंद्रीय विद्युत प्राधिकरण दक्षिण क्षेत्रीय विद्युत समिति 29, रेसकोर्स क्रास रोड बेंगलूर- 560 009	सत्यमेव जयते	Government of India Central Electricity Authority **Southern Regional Power Committee** 29, Race Course Cross Road Bengaluru-560 009
Email:mssrpc-ka@nic.in	Web site: www.srpc.kar.nic.in	Phone: 080-22282516
सं/No. SRPC/SE(O)/TF-AUFLS_dfdt/2023-24/ 4495-45		दिनांक/ Date **29th September 2023**

सेवा में / To

Member Secretary
National Power Committee (NPC)
Central Electricity Authority
New Dlehi-110 066

विषय/ Subject:Report of the "Task Force on Implementation AUFLS & df/dt Scheme" -reg.

Ref: NPC letter No. CEA/GO-15-14/1/2021-NPC Division/280-295 dated 25th August 2023

महोदय/महोदया/ Sir/ Madam,

Enclosed, please find the final Report of the "**Task Force** on Implementation of Automatic Under Frequency Load Shedding (AUFLS) and df/dt scheme".

Submitted for kind needful please.

भवदीय /Yours faithfully,

29/09/2023

(के पी मधु / K P Madhu)
अधीक्षक अभियंता/सदस्य सांयोजक
Superintending Engineer/Member Convener

Copy to:

1. Smt. Rishika Sharan, Chief Engineer & Member Secretary, NPC, New Delhi
2. Shri Chandra Prakash, Chief Engineer GM, CEA, New Delhi
3. Shri P.D.Lone, Superintending Engineer, WRPC, WRPC, Mumbai
4. Shri Shyam Kejriwal, Superintending Engineer, ERPC, Kolkata
5. Shri Santosh Kumar, Superintending Engineer, NRPC, New Delhi
6. Shri S M Aimol, Superintending Engineer NERPC, Shillong.
7. Shri Satyendra Kumar Dotan, Director, NPC, CEA, New Delhi
8. Shri Vivek Pandey, General Manager, NLDC, New Delhi

Copy for kind information to:

1. SA to Chairperson, CEA, New Delhi.
2. SA to Member GO&D, CEA, New Delhi.
3. Chairman & Managing Director, GRID-INDIA, New Delhi.
4. Member Secretary, NRPC, New Delhi.
5. Member Secretary, ERPC, Kolkata.
6. Member Secretary, WRPC, Mumbai.
7. Member Secretary, NERPC, Shillong.

Report
on
Implementation of AUFLS and df/dt Scheme

Task Force Constituted by National Power Committee, CEA
Under Chairmanship of Member Secretary, SRPC

Report No. NPC/CEA/TF-AUFLS-001 September 2023

REPORT

OF

TASK FORCE

ON

IMPLEMENTATION OF

AUFLS AND df/dt SCHEME

EXECUTIVE SUMMARY

REPORT OF THE TASK FORCE ON

IMPLEMENTATION OF AUFLS AND df/dt SCHEME

EXECUTIVE SUMMARY

National Power Committee (NPC), vide letter No. CEA/GO-15-14/1/2021-NPC Division/250 dated 18th August 2023 and vide letter No. CEA/GO-15-14/1/2021-NPC Division/280-295 dated 25th August 2023 constituted a Task Force on Implementation of Automatic Under Frequency Load Shedding (AUFLS) and df/dt scheme with the following Terms of Reference:

i. Review the recommendations of the Report as per directions by the 13th NPC Meeting within two months.

ii. Prioritization of the loads under the AUFLS and df/dt scheme.

iii. To oversee the implementation of the report on Automatic Under Frequency Load Shedding (AUFLS) and df/dt scheme.

iv. Any other suggestions/recommendations on related matters.

The Task Force comprised of the following Members:

1	Member Secretary, SRPC	Shri Asit Singh	**Chairperson**
2	Chief Engineer NPC,CEA	Smt Rishika Sharan	Member
3	Chief Engineer GM,CEA	Shri Chandra Prakash	Member
4	Superintending Engineer, WRPC	Shri P D Lone	Member
5	Superintending Engineer, ERPC	Shri Shyam Kejriwal	Member
6	Superintending Engineer, NRPC	Shri Santhosh Kumar*	Member
7	Superintending Engineer, NERPC	Shri S M Aimol	Member
8	Director, NPC,CEA	Shri Satyendra Kumar Dotan	Member
9	General Manager, NLDC	Shri Vivek Panday	Member
10	Superintending Engineer, SRPC	Shri K P Madhu	**Member Convener**

* NRPC replaced Shri Anzum Parwej.

The Task Force reviewed report of the Sub-Committee to review the AUFLS and df/dt scheme in line with the decisions of NPC in its 13th Meeting and relevant Regulations in Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2023 and identified the following:

- Total 25% relief will be planned in 4 stages-49.4 Hz, 49.2 Hz, 49.0 Hz & 48.8 Hz.
- Pumping load will be tripped before first stage (> 49.50 Hz). Battery energy system in charging mode will go in discharging mode (> 49.50 Hz), no storage will be in storage/charging mode at frequency < 49.50 Hz.
- All distribution licensees, STUs and bulk consumers shall provide automatic under frequency relays (UFR) and df/dt relays for load shedding in their respective systems to arrest frequency decline that could result in grid failure as per the plan given by the RPCs from time to time. The default UFR settings shall be as follows:

Sr. No.	***Stage of UFR Operation***	***Frequency (Hz)***
1	***Stage-1***	*49.40*
2	***Stage-2***	*49.20*
3	***Stage-3***	*49.00*
4	***Stage-4***	*48.80*
Note 1: All states (or STUs) shall plan UFR settings and df/dt load shedding schemes depending on their local load generation balance in coordination with and approval of the concerned RPC. *Note 2: Pumped storage hydro plants operating in pumping mode or ESS operating in charging mode shall be automatically disconnected before the first stage of UFR*		

- The following shall be factored in while designing and implementing the UFR and df/dt relay schemes:

  (a) The under-frequency and df/dt load shedding relays are always functional.

  (b) Demand disconnection shall not be set with any time delay in addition to the operating time of the relays and circuit breakers.

  (c) There shall be a uniform spatial spread of feeders selected for UFR and df/dt disconnection.

  (d) SLDC shall ensure that telemetered data of feeders (MW power flow in real time and circuit breaker status) on which UFR and df/dt relays are installed is available at its control centre. SLDC shall monitor the combined load in MW of these feeders at all times. SLDC shall share the above data with the respective RLDC in real time and submit a monthly exception report to the respective RPC. RLDC shall inform SLDCs as well as the concerned RPC on a quarterly basis, durations during the quarter when the combined load in MW of these feeders was below the level considered while designing the UFR scheme by the RPC. SLDC shall take corrective measures within a reasonable period and inform the respective RLDC and RPC, failing which suitable action may be initiated by the respective RPC.

(e) RPC shall undertake a monthly review of the UFR and df/dt scheme and also carry out random inspection of the under-frequency relays. RPC shall publish such a monthly review along with an exception report on its website.

(f) SLDC shall report the actual operation of UFR and df/dt schemes and load relief to the concerned RLDCs and RPCs and publish the monthly report on its website.

Through detailed deliberations, the Task Force finalized the methodology for identification quantum of relief at each stages of AUFLS, distribution among Regions by NPC, distribution of relief quantum among State/UT in Regions by respective RPCs for implementation in the Region, guidelines for identification of feeders, Mapping of feeders, Reporting by SLDCs/RLDCs, Testing/inspection of UFRs, setting of UFR for Pumps & Energy Storage Systems (ESS).The observations and recommendations are elaborated in the Task Force Report,

Salient observations & conclusion by the Task Force are summarized below:

- **AUFLS Set Points and Quantum of Relief**

  Total 25% relief would be planned in four stages: Stage-1 at 49.4 Hz, Stage-2 at 49.2 Hz, Stage-3 at 49.0 Hz & Stage-4 at 48.8 Hz. The 25% total relief distribution in four stages would be in such a way that 5% in Stage-1, 6% in Stage-2 and 7% each in Stage 3 & 4.

- **Identification of AUFLS Quantum by NPC and RPCs**

  NPC Division to communicate the Region wise relief quantum (based on Regional Peak Demand Met during the previous year) by **31st of May** to RPCs for implementation in the next Financial Year (FY). Distribution of relief among State/UT to be carried out based on Regional relief and demand contribution in the average of Peak demand met ratio and demand met (consumption) ratio of State/UT in the previous FY.

- **Quantum Identification for AUFLS by States/UT and monthly vetting**

  Each SLDC shall carry out month-wise Stage-wise analysis and furnish to RPC/RLDC in the following manner:

  AUFLS Stage -1:

  Actual Relief for the month = Average actual load (for the month) of all the feeders identified in the stage**.** For this Feeders are to be mapped at SLDC. The mapping would be extended to RLDC. If feeders are not mapped then values are to be collected from field. (Any outage would not be excluded).

  Desired Relief for the month = (Recommended AUFLS quantum in the stage x Average demand for the month of State/UT)/Demand Contribution of the State/UT

  The same exercise would be repeated for each Stage.

As a general guideline Actual Relief for the month should be 10% more than the Desired Relief for the month considering the Relay/breaker issues and a resilient safety net.

The data would be vetted by RLDC and discussed in OCC Meetings of RPC.

- **Analysis of AUFLS Event**

AUFLS Stage-1:

Actual Relief during incident = (Actual relief (during incident) of all the feeders identified in the stage)

Desired Relief during incident= (Recommended AUFLS quantum in the stage x demand of State/UT at time of incident)/Demand Contribution of the State.

The same exercise would be repeated for each Stage.

The data would be vetted by RLDC and discussed in OCC Meetings of RPC.

- **Guidelines for identification of AUFLS feeders**

AUFLS relays under Stage-1 & Stage-2 should be implemented preferably on downstream network at 11/22/33 kV level and AUFLS relays under Stage-3 & Satge-4 should be implemented on upstream network at EHV (66/110/132 kV) level so that load relief obtained is fast and reliable.

- **Mapping of AUFLS feeders**

SLDCs in coordination with STU/Discoms, map the feeders for loading, breaker status etc. and create display for monitoring of all the stages. The SLDC would extend the mutually agreed displays to RLDC. SLDCs also develop the SCADA Displays Discom-wise/Sub SLDC wise as applicable as well as feeder wise for all the stages.

Mapping verification between SLDC and Discom/STU to be carried out at least once in three (3) months and between RLDC and SLDCs at least once in six (6) months.

SLDCs shall download the data and store it for two years. The Data should be made available to RPCs/RLDCs/CEA/CERC for further studies or analysis.

- **Settings of UFR for Pumping load/Energy Storage Systems**

All Energy Storage Systems would change from charging mode to discharging mode at 49.50 Hz. If it is not possible then they would be tripped at 49.50 Hz. If ESS is injecting active power at 49.50 Hz not to be tripped.

Pumping load will be tripped before AUFLS first stage. Irrigation Pumps would be tripped at 49.50 Hz

All the relays procured in future to have a sampling period ranging from three (03) cycles to five (05) Cycles. No additional time delay to be incorporated in the relay other than the inherent measuring time.

- **Testing/Inspection of UFR**

SLDCs shall in consultation with the Utilities responsible for testing should chalk out a plan of relays testing schedule before 1st of December and submit the same to RPC/RLDC. The periodicity of testing of relays shall be twice in a year at 110 / 132 kV level and above Substations and once in a year at 66 kV level and below Substations.

RPC would carry UFR inspection randomly on sample basis by the RPC Secretariat or through RLDC.

- **df/dt Scheme**

The df/dt load shedding is specific to regions and therefore, the quantum of load shedding required to be wired up under the df/dt scheme may be discussed at regional levels in the RPCs. The RPCs in consultation with the stakeholders can decide the set points and quantum of Load shedding required under df/dt scheme.

Various aspects as brought out above have been deliberated by the Task Force and action by the agencies have been finalized. However, SLDCs and concerned utilities to ensure proper setting of relays considering sluggishness to achieve the desired load relief at all the stages of AUFLS and df/dt.

REPORT

OF

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ON

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REPORT OF THE TASK FORCE ON

IMPLEMENTATION OF AUFLS AND df/dt SCHEME

1.0 INTRODUCTION

National Power Committee (NPC) in its 13th Meeting held on 05.07.2023 had accepted the report of the Sub-Committee (constituted as per the decision in 10th meeting of NPC) to review the AUFLS and df/dt scheme with the following observations:

a) The first stage will be set at 49.4 Hz.

b) Total 25% relief will be planned in 4 stages-49.4 Hz, 49.2 Hz, 49.0 Hz & 48.8 Hz.

c) Pumping load will be tripped before first stage (> 49.4 Hz). Battery energy system in charging mode will go in discharging mode (> 49.4 Hz), no storage will be in storage/charging mode at frequency < 49.4 Hz.

d) A Task Force under chairmanship of MS, SRPC with Members from Grid India, RPCs/NPC may be formed. The task force will also oversee the implementation of the report.

Keeping this in view, MS NPC, vide letters dated 18.08.2023 & 25.08.2023 constituted Task Force on Implementation of Automatic Under Frequency Load Shedding (AUFLS) and df/dt scheme with the following Terms of Reference:

i. Review the recommendations of the Report as per directions by the 13th NPC Meeting within two months.

ii. Prioritization of the loads under the AUFLS and df/dt scheme.

iii. To oversee the implementation of the report on Automatic Under Frequency Load Shedding (AUFLS) and df/dt scheme.

iv. Any other suggestions/recommendations on related matters.

A copy of the letters is at **Annexure-I**.

The Task Force committee was constituted with the following Members:

1.	**Shri Asit Singh,** Member Secretary, SRPC ……**Chairperson**	2.	Smt. Rishika Sharan, Chief Engineer NPC,CEA ……. Member
3.	Shri Chandra Prakash, Chief Engineer GM,CEA …… Member	4.	Shri P D Lone Superintending Engineer, WRPC …… Member
5.	Shri Shyam Kejriwal Superintending Engineer, ERPC ..…….. Member	6.	Shri Santhosh Kumar* Superintending Engineer,NRPC …….. Member
7.	Shri S M Aimol Superintending Engineer, NERPC …….. Member	8.	Shri Satyendra Kumar Dotan Director, NPC,CEA …….. Member
9.	Shri Vivek Pandey General Manager, NLDC …….. Member	10.	**Shri K P Madhu** Superintending Engineer, SRPC ……. **Member Convener**

* NRPC replaced Shri Anzum Parwej.

The Task Force had its Meeting on 11.09.2023 through Video Conferencing (VC) and deliberated various aspects in the implementation of AUFLS & df/dt scheme. During the deliberations, it was observed that the frequency setting adopted by all the Regions for the four stages of AUFLS are uniform and same as mandated in CERC (IEGC) Regulations, 2023. It emerged that the load relief to obtained shall be reviewed yearly based on the actual peak met during the previous Financial Year and implemented in the next Financial Year. Mapping of identified feeders at SLDC/RLDC needed to be ensured by the utilities and monitoring of the feeders at real time by control rooms.

2.0 PROVISIONS IN CERC REGULATIONS

Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2023 effective from 01st October 2023 provides the following in respect of AUFLS and df/dt:

Regulation No.29: ***SYSTEM SECURITY***

……..

(12) All distribution licensees, STUs and bulk consumers shall provide automatic under frequency relays (UFR) and df/dt relays for load shedding in their respective systems to arrest frequency decline that could result in grid failure as per the plan given by the RPCs from time to time. The default UFR settings shall be as specified in Table-2 below:

Sr. No.	*Stage of UFR Operation*	*Frequency (Hz)*
1	*Stage-1*	*49.4*
2	*Stage-2*	*49.2*
3	*Stage-3*	*49.0*
4	*Stage-4*	*48.8*
Note 1: All states (or STUs) shall plan UFR settings and df/dt load shedding schemes depending on their local load generation balance in coordination with and approval of the concerned RPC. *Note 2: Pumped storage hydro plants operating in pumping mode or ESS operating in charging mode shall be automatically disconnected before the first stage of UFR.*		

(13) The following shall be factored in while designing and implementing the UFR and df/dt relay schemes:

(a) The under-frequency and df/dt load shedding relays are always functional.

(b) Demand disconnection shall not be set with any time delay in addition to the operating time of the relays and circuit breakers.

(c) There shall be a uniform spatial spread of feeders selected for UFR and df/dt disconnection.

(d) SLDC shall ensure that telemetered data of feeders (MW power flow in real time and circuit breaker status) on which UFR and df/dt relays are installed is available at its control centre. SLDC shall monitor the combined load in MW of these feeders at all times. SLDC shall share the above data with the respective RLDC in real time and submit a monthly exception report to the respective RPC. RLDC shall inform SLDCs as well as the concerned RPC on a quarterly basis, durations during the quarter when the combined load in MW of these feeders was below the level considered while designing the UFR scheme by the RPC. SLDC shall take corrective measures within a reasonable period and inform the respective RLDC and RPC, failing which suitable action may be initiated by the respective RPC.

(e) RPC shall undertake a monthly review of the UFR and df/dt scheme and also carry out random inspection of the under-frequency relays. RPC shall publish such a monthly review along with an exception report on its website.

(f) SLDC shall report the actual operation of UFR and df/dt schemes and load relief to the concerned RLDCs and RPCs and publish the monthly report on its website.

3.0 AUFLS SET POINTS AND QUANTUM OF RELIEF

The AUFLS setting with %age of quantum of load shedding concluded in the Report is given below (Table 10.1 in the Report):

Sr. No.	*Stage*	*Frequency*	*Demand Disconnection*	*Total Quantum of LS*
Stage-I Defense plan- Load Shedding				
1	I-A	49.2 Hz	3.50%	
2	I-B	49.0 Hz	3.50%	
3	I-C	48.8 Hz	4.00%	
4	I-D	48.7 Hz	4.50%	
5	I-E	48.6 Hz	4.50%	**20%**
Stage-II Desperate plan- Load Shedding				
6	II-F	48.4 Hz	6.00%	
7	II-G	48.2 Hz	6.00%	
8	II-H	48.0 Hz	6.00%	**18%**
Grand Total (Stage-I + II)				**36%**

In the 13th Meeting of NPC, it had been observed that the first stage will be set at 49.4 Hz and total 25% relief will be planned in four stages-49.4 Hz, 49.2 Hz, 49.0 Hz & 48.8 Hz. The AUFLS settings to be adopted for total relief of 25% of previous year peak demand met for implementation in the subsequent year.

The percentage relief from Stage-1 may be kept as 5 % since it is better to check the falling frequency and get sufficient quantum of relief at initial level itself and there may not arise the occasion for further reduction of frequency leading to more load shedding at other stages. In the Report of Expert Committee on IEGC also equal quantum of Load Relief was proposed for all stages. Keeping lower quantum of relief at higher level may lead to activation of lower stages since in most of the real time conditions the desired relief may not be achieved.

The Task Force recommended the following AUFLS Set Points and Percentage Quantum of Relief for implementation:

Table 1: AUFLS Set Points and Percentage Quantum of Relief

Sl No	Stage	UFR set points in Hz	Quantum of Relief
1	**Stage-1**	**49.4**	**5%**
2	**Stage-2**	**49.2**	**6%**
3	**Stage-3**	**49.0**	**7%**
4	**Stage-4**	**48.8**	**7%**
		Total	**25%**

4.0 IDENTIFICATION OF AUFLS QUANTUM BY NPC AND RPCs

NPC Division to communicate the Region wise relief quantum (based on Regional Peak Demand Met during the previous year) by **30th of June** to RPCs.

If the peak demand is lower than the previous year peak demand, the same settings should be continued (settings remain unchanged).

4.1. Methodology for AUFLS Quantum (MW) Distribution among Regions:

Let All India Peak Demand in Previous Year in MW= **AP**

Sum of Regional Peak in MW = (RP_{NR}+ RP_{WR} + RP_{SR} + RP_{ER} +RP_{NER})**= RP**

Table 2: Methodology for AUFLS Quantum (MW) Distribution among Regions

Region	Regional Peak Demand (MW)	Stage-1 49.4 Hz (5%)	Stage-2 49.2 Hz (6%)	Stage-3 49.0 Hz (7%)	Stage-4 48.8 Hz (7%)	Total (MW)
	(1)	(2)	(3)	(4)	(5)	(6)
Northern Region	RP_{NR}	0.05* RP_{NR}*AP/RP	0.06* RP_{NR}*AP/RP	0.07* RP_{NR}*AP/RP	0.07* RP_{NR}*AP/RP	Sum Clmn. (2) to (5)
Western Region	RP_{WR}	0.05* RP_{WR}*AP/RP	0.06* RP_{WR}*AP/RP	0.07* RP_{WR}*AP/RP	0.07* RP_{WR}*AP/RP	Sum Clmn. (2) to (5)
Southern Region	RP_{SR}	0.05* RP_{SR}*AP/RP	0.06* RP_{SR}*AP/RP	0.07* RP_{SR}*AP/RP	0.07* RP_{SR}*AP/RP	Sum Clmn. (2) to (5)
Eastern Region	RP_{ER}	0.05* RP_{ER}*AP/RP	0.06* RP_{ER}*AP/RP	0.07* RP_{ER}*AP/RP	0.07* RP_{ER}*AP/RP	Sum Clmn. (2) to (5)
North Eastern Region	RP_{NER}	0.05* RP_{NER}*AP/RP	0.06* RP_{NER}*AP/RP	0.07* RP_{NER}*AP/RP	0.07* RP_{NER}*AP/RP	Sum Clmn. (2) to (5)
All India	AP	Sum above	Sum above	Sum above	Sum above	25% OF AP

Sample calculation for AUFLS Quantum (MW) for 2023-24 is given below:

All India Peak Demand in 2022-23: 2,07,231 MW

Table 2A: Computation of AUFLS Quantum (MW) Distribution among Regions

Region	Regional Peak Demand (MW)	Stage-1 49.4 Hz (5%)	Stage-2 49.2 Hz (6%)	Stage-3 49.0 Hz (7%)	Stage-4 48.8 Hz (7%)	Total (MW)
	(1)	(2)	(3)	(4)	(5)	(6)
Northern Region	76,561	3270	3924	4577	4577	**16,348**

Western Region	71,677	3061	3673	4285	4285	**15,305**
Southern Region	64,337	2748	3297	3847	3847	**13,738**
Eastern Region	27,218	1162	1395	1627	1627	**5,812**
North Eastern Region	3,603	154	185	215	215	**769**
All India	**2,07,231**	**10394**	**12473**	**14552**	**14552**	**51,972**

4.2. Three options were considered by the Task Force for distribution of relief among State/UT. The Task Force recommended that Distribution of relief among State/UT to be carried out based on Regional relief and demand contribution in the average of Peak demand met ratio and demand met (consumption) ratio of State/UT in the previous FY.

4.3. After the receipt of the allocated load shedding quantum of the Region from NPC, AUFLS relief quantum should be distributed among the State/UT in the region by the RPCs by **July /August** in consultation with the stakeholders (in OCC Meeting).

Sample calculation for Northern Region is given below:

Table 3: State/UT contribution ratio for AUFLS Relief Quantum

State/UT	Actual Consumption in MU for 2022-23	Consumption Ratio	Actual Demand Met in 2022-23	Demand Met Ratio	State/ UT Contribution
	(1)	(2)=(1)/(A)	(3)	(4)=(3)/(B)	(5)=[(2)+(4)]/2
Chandigarh	1788	0.004	407	0.005	**0.004**
Delhi	35143	0.077	7695	0.089	**0.083**
Haryana	60945	0.133	12768	0.147	**0.140**
Himachal Pradesh	12542	0.027	2071	0.024	**0.026**
UT J&K & Ladhak	19322	0.042	2967	0.034	**0.038**
Punjab	69220	0.151	14311	0.165	**0.158**
Rajasthan	100057	0.219	17206	0.199	**0.209**
Uttar Pradesh	143050	0.313	26589	0.307	**0.310**
Uttarakhand	15386	0.034	2599	0.030	**0.032**
Total	457453 **(A)**	1.000	**86613 (B)**	**1.000**	1.000

4.4. Each State/UT relief quantum would be computed by RPC by distributing the NPC communicated Regional relief quantum based on ratio at 4.2. This quantum would become the base for monthly analysis of visible relief and also the analysis during any event.

Sample calculation of Demand Distribution for Northern Region:

Table 4: State/UT Demand Distribution in MW

State/UT	State/ UT Contribution	Load Relief in MW
	(a)=Column (5) of Table 3	(b)=a* B in Column (3) of Table 3
Chandigarh	0.004	330
Delhi	0.083	6342
Haryana	0.140	10743
Himachal Pradesh	0.026	1965
UT J&K & Ladhak	0.038	2928
Punjab	0.158	12118
Rajasthan	0.209	15978
Uttar Pradesh	0.310	23722
Uttarakhand	0.032	2436
Total	1.000	76561 **(C)**

4.5. Each State/UT Stage-wise AUFLS quantum would be computed by RPC. This Stage-wise recommended AUFLS quantum shall become the base for monthly analysis of visible relief and also the analysis during any tripping.

Sample calculation for NR is as follows:

Table 5: State/UT Stage-wise AUFLS in MW

State/UT	State/ UT Contribution	Stage-1 49.4 Hz (5%)	Stage-2 49.2 Hz (6%)	Stage-3 49.0 Hz (7%)	Stage-4 48.8 Hz (7%)	Total
	(c)=Column (5) of Table 3	NR in Column (2) of Table 2A* (c)	NR in Column (3) of Table 2A* (c	NR in Column (4) of Table 2A* (c	NR in Column (5) of Table 2A* (c	
Chandigarh	0.004	14	17	20	20	70

Delhi	0.083	271	325	379	379	1354
Haryana	0.140	459	551	642	642	2294
Himachal Pradesh	0.026	84	101	117	117	420
UT J&K & Ladhak	0.038	125	150	175	175	625
Punjab	0.158	517	621	724	724	2587
Rajasthan	0.209	682	819	955	955	3412
Uttar Pradesh	0.310	1013	1216	1418	1418	5065
Uttarakhand	0.032	104	125	146	146	520
Total	1.000	3270	3924	4577	4577	16348

5.0 QUANTUM IDENTIFICATION FOR AUFLS BY STATES/UT AND MONTHLY VETTING

5.1. States/UT shall identify the load relief for each stage considering the Quantum of relief and their demand contribution considering the intra-day, seasonality etc. 10% additional relief would be finalised considering the demand growth of the year, planned and forced outages, UFR and breaker issues etc. SLDC would communicate feeder-wise, Stage-wise details etc. to RPC/RLDC.

5.2. Each SLDC shall carry out month-wise Stage-wise analysis and furnish to OCC in the following manner:

AUFLS Stage -1:

Actual Relief for the month = Average actual load (for the month) of all the feeders identified in the stage**.** For this Feeders are to be mapped at SLDC. The mapping would be extended to RLDC. If feeders are not mapped then values are to be collected from field. (Any outage would not be excluded).

Desired Relief for the month = (Recommended AUFLS quantum in the stage x Average demand for the month of State/UT)/Demand Contribution of the State/UT

Similar exercise for each Stage.

The data would be vetted by RLDC and discussed in OCC Meetings of RPC.

5.3. Self-checking scheme: If Actual Relief for the month is **less the Desired Relief** for the month, **SLDC** would carry out feeder –wise analysis and in consultation with Discoms/STU take **corrective action** (like identifying new feeder, additional feeder, modifying the declared relief of feeders, verifying the mapped figures etc.). The same

would be implemented by SLDC/STU/Discoms before next OCC by submitting a compliance Report.

5.4. A**s a general guideline Actual Relief for the month should be 10% more than the Desired Relief for the month considering the Relay/breaker issues and a resilient safety net.**

Table 6: AUFLS – Monthly Report - …….(Month)

State/UT:……..

	Stage-1 49.4 Hz	Stage-2 49.2 Hz	Stage-3 49.0 Hz	Stage-4 48.8 Hz	**STATE TOTAL**
Recommended (A)					
Implemented (B)					
SCADA monitored (C)					
Actual flow on SCADA monitored (D)					
Balance implemented (E) = (B) – (C)					
Actual flow on balance implemented (F)					
Desired relief (G)= (B)x Average State Demand for the month/(State Demand Contribution)					
Actual relief (H) = (D+F)					
Deficit (-)/Surplus (+) H-G					

6.0 ANALYSIS OF AUFLS EVENTS

6.1. The following methodology to be adopted for AUFLS analysis during event:

AUFLS Stage-1:

Actual Relief during incident = (Actual relief (during incident) of all the feeders identified in the stage)

Desired Relief during incident= (Recommended AUFLS quantum in the stage x demand of State/UT at time of incident)/Demand Contribution of the State.

Similar exercise for each Stage.

The data would be vetted by RLDC and discussed in OCC Meetings of RPC.

6.2. If Actual Relief during incident is less the Desired Relief during incident, SLDC would carry out feeder –wise analysis and in consultation with Discoms/STU take corrective action. Necessary directions will be issued to Discoms/STU by SLDC. The same would be implemented by SLDC/STU/Discoms before next OCC by submitting a compliance Report.

6.3. The relief realization to be analyzed based on the demand at the time of incident. The data needed to be vetted by RLDC and discussed in OCC Meetings of RPC. Reason for non-tripping of the relays during the incident needed to be mentioned. If Actual Relief during incident is less than the Desired Relief during incident, SLDC would carry out feeder –wise analysis and in consultation with Discoms/STU take corrective action. Necessary directions shall be issued to Discoms/STU by SLDC. The same would be implemented by SLDC/STU/Discoms before next OCC by submitting a compliance Report.

6.4. SLDCs shall issue directions to state utilities to carry out self-testing of the relays and where ever tripping is not observed (due to discrepancy in measured frequency), such relays are recommended to retune to set the points accordingly at 49.41 Hz. or 49.42 Hz. etc. The implementation of the same is being monitored in OCC.

Table 7: AUFLS – Tripping Report at ….. hrs on ……..

State/UT:……..

Description	Stage-1 49.4 Hz	Stage-2 49.2 Hz	Stage-3 49.0 Hz	Stage-4 48.8 Hz	STATE TOTAL
Recommended (A)					
Implemented (B)					
SCADA monitored (C)					
Actual flow on SCADA monitored (D)					
Balance implemented (E) = (B) – (C)					
Actual flow on balance implemented (F)					
Desired relief (G)= (B)x State Demand at the time of tripping/(State Demand Contribution)					
Actual relief (H) = (D+F)					
Deficit (-)/Surplus (+) H-G					

Further feeder wise and Stage-wise details will also be furnished as per the Table given below:

Table 8: AUFLS – Feeder-wise Tripping Report at ….. hrs on ……..

AUTOMATIC UNDER FREQUENCY LOAD SHEDDING STAGE-1 (49.4)						
Sl No	Sub Station	Feeder Description	Average load per year (In MW)	Tripped (Y/N)	Reason if not tripped	Actual flow in MW
1						
2						
3						
4						
TOTAL MW RELIEF						

7.0 GUIDELINES FOR IDENTIFICATION OF AUFLS FEEDERS

The following to be considered for identification of feeders:

i. AUFLS relays under Stage-1 & Stage-2 should be implemented preferably on downstream network at 11/22/33 kV level.

ii. AUFLS relays under Stage-3 & Satge-4 should be implemented on upstream network at EHV (66/110/132 kV) level so that load relief obtained is fast and reliable as it is a desperate measure for areas that have disintegrated.

iii. As far as possible the feeders/transformers are feeding radial loads shall be identified.

iv. Telemetry availability would be considered as important factor so that the feeders/transformer loading can be extended to SLDC/RLDC for mapping

v. Feeders catering to critical loads are to be avoided. VIP areas, Airport, Metro, Railways, Defence, Govt Hospitals, Government Offices, continuous process industries etc. needs to be prioritized

vi. No mixed feeders with RE/Distributed generations should be identified. If identified the feeder should be never in injecting mode. Steps to segregate the feeder (load/RE/Distributed generation) would be taken.

vii. If Grid feeder is identified the other side breakers should be in normally open condition. If they are to be closed frequently then UFR with same set points to be provided at other ends.

viii. The feeders identified for AUFLS would be as far as possible not common for df/dt, scheduled power cuts, load shedding, SPS, ADMS etc. In case of difficulty to

identify dedicated feeders the same is to be approved in OCC/PCSC. Adequate care is to be taken if round robin scheme is adopted for ADMS, SPS etc.

ix. The Islanding loads/feeders which are to be retained would not be enabled for AUFLS. However loads in the Island can be identified for AUFLS but same has to be factored while designing the Island.

Chairperson, Task Force observed that the sampling rate is configured by the OEM and cannot be changed by S/S officials. There are relays with 3 cycle sampling rate and also with 6-10 cycle sampling rate. The only way to achieve the tripping at desired frequency is to set the relay set points based on the behaviour of each relay. 3-5 cycle sampling time is advisable since if response time is below 3 cycles, during some transients also unwanted tripping may happen.

NERPC mentioned that in their system most of the 33 kV feeders are radially loaded and 132 kV feeders are grid connected and difficult to get desired relief in tripping of 132 kV grid connected feeder since if relay trip at one S/s the load may be fed from other end. Requested that NER may be given some relaxation such that the feeders at 33 kV also may be identified at lower stages.

It was clarified that these are General Guidelines in which some changes may be carried according to specific constraints. However, if Grid feeder is identified the other side breakers should be in normally open condition. If they are to be closed frequently then UFR with same set points to be provided at other end also.

8.0 MAPPING OF AUFLS FEEDERS

SLDC in coordination with STU/Discoms map the feeders for loading, breaker status etc. and create display for monitoring. The SLDC would extend the mutually agreed display to RLDC. Display to be implemented at SLDC which would be extended to RLDC.

Table 9: AUFLS Monitoring in MW

Description	Stage-1 49.4 Hz	Stage-2 49.2 Hz	Stage-3 49.0 Hz	Stage-4 48.8 Hz	TOTAL (all the Stages)
Recommended (A)					
Implemented (B)					
Unmapped quantum (C)					
SCADA monitored (D)					
Actual flow (E)					
Desired relief (F)= (D)x State Demand/(State Demand Contribution)					
Deficit (-)/Surplus (+) E-F					

SLDC would further develop the SCADA Displays Discom-wise/Sub SLDC wise as applicable as given below:

Table 10: AUFLS Monitoring in MW STAGE-1 (49.4)

Description	DISCOM / SUB SLDC -1	DISCOM / SUB SLDC -2	DISCOM / SUB SLDC -3	.....	STATE TOTAL
Recommended (A)					
Implemented (B)					
Unmapped quantum (C)					
SCADA monitored (D)					
Actual flow (E)					
Desired relief (F)= (D)x Discom Demand/(Discom Demand Contribution)					
Deficit (-)/Surplus (+) E-F					

Similar display for all stages.

SLDC would further develop the SCADA Displays feeder wise as given below:

Table 11: Feeder wise AUFLS monitoring in MW

AUTOMATIC UNDER FREQUENCY LOAD SHEDDING STAGE-1 (49.4)											
Sl.No	Discom/ SUB-LDC	Voltage level	Substation / Feeder Name (A-B)	Average load (MW)	Relay function enabled (Y/N)	SCADA Visibility (Y/N)	Radial feeder (Y/N)	RE injection feeder (Y/N)	CB Status Both ends	Actual flow in MW(A)	Actual flow in MW (B)
1											
2											
3											
TOTAL (MW)											

Similar display for all Stages.

SLDCs would download the data and store it for two years. SLDCs would collect feeder loading details of unmapped feeders.

Concrete action plan with definitive timelines would be made by SLDC/STU/Discom to achieve 100% mapping. This would be followed up in OCC.

Mapping verification between SLDC and Discom/STU would carried out at least once in three (3) months. Mapping verification between RLDC and SLDC would be carried at least once in six (6) months.

Any change in feeder would be informed to RPC & RLDC and mapping would be ensured.

SE(P) WRPC informed that 85-90% of AUFLS relays installed in WR are at the voltage level of 11kV/22kV/33kV and also these relays are installed in many switching distribution level remotely located substations of the States. The implementation of the AUFLS display on SCADA system was deliberate in various forum of WRPC. However the States have expressed inability to implement the display in SCADA due to communication issues in remotely located S/Ss. However, efforts are still being made to improve the visibility of these feeders in SCADA.

9.0 SETTINGS OF UFR/PUMP LOADS/ESS

All Energy Storage Systems would change from charging mode to discharging mode at 49.45 Hz. If it is not possible then they would be tripped at 49.45 Hz. If ESS is injecting active power at 49.45 Hz not to be tripped.

Pumping load will be tripped before AUFLS first stage. Irrigation Pumps would be tripped at 49.45 Hz.

Load disconnection shall not be set with any time delay in addition to the operating time of the relays and circuit breakers.

During Testing if delay is observed (> 75 msec) in Relay Pick up and sending the command to breaker then set points to be enhanced to 49.41 Hz, 49.21 Hz, 49.01 Hz and 48.81 Hz as applicable or any higher value to ensure tripping 49.40 Hz, 49.20 Hz, 49.00 Hz and 48.80 Hz

All the relays to be procured in future to have a sampling period ranging from three cycles to five Cycles. No additional time delay to be incorporated in the relay other than the inherent measuring time.

With reference to the discussions regarding the trip setting of storage device operating in charging/pumping mode it is requested to consider the following inputs from NLDC.

(A) CEA Technical Standards of connectivity to the grid Regulations (2019 amendment), Connectivity standards mandate the wind generating stations, generating stations using inverters, wind - solar photo voltaic hybrid systems and energy storage systems as under

Quote

" The generating unit shall be capable of operating in the frequency range 47.5 to 52 Hz and be able to deliver rated output in the frequency range of 49.5 Hz to 50.5 Hz"

Unquote

In future several storage systems (BESS, PSP) are expected to be commissioned. Few hybrid RE stations with BESS/PSP are also envisaged. Considering the possible derating of inverter based resources at frequency below 49.5 Hz, it is desirable to take measures to arrest the frequency decline below 49.5 Hz. It is therefore desirable that the storage device operating in charging/pumping mode are tripped in a graded manner before the frequency dips below 49.5 Hz.

(B) Grid India vide its letter dated 2nd Jul 2018 had suggested to raise the UFR stage-I setting to 49.6 Hz and consider 49.8 Hz for initiating the tripping of pump storage/BESS operating in charging pumping mode. Thus keeping a margin of 0.2 Hz between tripping of storage and AUFLS stage-I.

(C) The Expert Group on IEGC considered 49.50 Hz as the nadir frequency for working out the AUFLS setting. Relevant extracts are quote below:

Under Frequency Relay (UFR) Settings: (a) Considering the All India electricity grid operating as a synchronous grid and being one of the largest grids in the world, the defence plans now need to be looked at from a national level rather than regional level. The same needs to be mandated in the IEGC itself rather than any discussion at the RPC level. As indicated in the section on primary response, for the reference contingency of 4500 MW generating station outage, the frequency would dip to 49.50 Hz and quickly recover to 49.70 Hz. So, the chances of the frequency falling below 49.50 Hz in an integrated large power system like India would be rare. The frequency would fall below this value only in case of part separation of systems leading to a generation deficit in one system

(D) The IEGC-2023 has mandated UFR stage-I as 49.4 Hz

It is suggested that the tripping of storage system (in charging pumping mode) may be initiated in a graded manner from 49.6 Hz onwards and to be complete by 49.5 Hz.

In view of NLDC observations the following is recommended:

All Energy Storage Systems would change from charging mode to discharging mode at 49.50 Hz. If it is not possible then they would be tripped at 49.50 Hz. If ESS is injecting active power at 49.50 Hz not to be tripped.

Pumping load will be tripped before AUFLS first stage. Irrigation Pumps would be tripped at 49.50 Hz.

10.0 TESTING/INSPECTION OF UFR

Testing Procedure SLDC for UFR by Discoms/STU:

i. Wherever relays are installed at 110 / 132 kV level and above S/s: The periodicity of testing shall be Twice in a year.

ii. Wherever relays are installed at 66 kV level and below S/s: The periodicity of testing shall be once in a year.

iii. SLDCs shall in consultation with the Utilities responsible for testing should chalk out a plan of relays testing schedule before 1st of December and submit the same to RPC/RLDC.

iv. Test shall be carried out by the State testing teams and report of the test carried out should be submitted to SLDC. SLDC shall submit a compiled progressive report of the same to RPC/RLDC every month. The format for testing of AUFLS relays is at **Annexure-II.**

v. SLDC should monitor the periodicity of test and ensure that the relays are tested as per the schedule. Deviation if any shall be intimated to RPC/RLDC with proper justification.

vi. If possible, relays through test up to breakers may be carried out. If this is not possible the continuity of trip circuit of UFR up to the trip coil of breaker should be checked during the testing.

vii. SLDC's shall ensure that at least 10% of the total relay testing be witnessed/carried out by other Circle Testing Engineer/RLDC/RPC.

Inspection of UFR Relays by RPC:

RPC would carry UFR inspection randomly on sample basis by the **RPC Secretariat or through RLDC.** The Sample Inspection Report is at **Annexure-III.**

Based on Inspection Report necessary directions would be issued by RPC which would be complied within six months.

11.0 df/dt SCHEME

In the Report it is mentioned that enabling frequency should be set at 49.9 Hz. i.e., the relay should always be enabled when the system frequency is below 49.9Hz. The following given in the Report:

Stage	'X' in MW = Largest generating station or peak import in the region whichever is higher			
	Enabling Frequency 'Hz'	df/dt setting 'Hz/sec'		Quantum of Load Shedding 'MW'
		RE rich	RE low	
Stage-1	49.9	0.10	0.05	30% of 'X'
Stage-2	49.9	0.15	0.10	40% of 'X'
Stage-3	49.9	0.20	0.25	50% of 'X'
The quantum is for a region as whole, and the RPCs shall decide how to further distribute the quantum amongst the States.				

The df/dt load shedding is specific to regions and therefore, the quantum of load shedding required to be wired up under the df/dt scheme be discussed at regional levels in the RPCs.

The RPCs in consultation with the stakeholders can decide on the quantum of Load shedding required to be wired up in Stage-1, 2 & 3 of the df/dt schemes.

In the Report, df/dt suggested for largest generating station/peak import in the region. Further the set point is suggested at 49.9 Hz which is lower most operating range of IEGC. The set point should be away from the operating range. **df/dt may be for credible contingency of each Region.**

The Task Force observed that df/dt load shedding is specific to regions and therefore, the quantum of load shedding required to be wired up under the df/dt scheme may be discussed at regional levels in the RPCs. The RPCs in consultation with the stakeholders can decide on the quantum of Load shedding required to be wired up in Stage-1, 2 & 3 of the df/dt schemes.

General Observations:

CE (GM), CEA opined that a comprehensive study needed to be carried out at National Leve l on the implementation of df/dt relays in the States. A common umbrella is needed at National Level (integrated grid) even though the issue is region specific.

NLDC suggested that it is very important that there should be a common methodology for df/dt relays at National Level. The settings/quantum may be Region Specific based on the LGB of each region taking care of most credible contingencies. He observed that in Rajasthan, there is concentrated RE and in case of trippings, the rate of fall of frequency may be high where as in WR where distributed RE generation are there the rate of fall in frequency may be less for the same quantum of trippings of generation. However it is pertinent to note that the same relay operation methodology (time duration for the operation of relay) should be identified for tripping of relays also.

MS SRPC informed that df/dt relays are implemented only in three regions (WR, NR and SR). Further studies needed to be carried out on the settings/quantum of df/dt relays and its implementation. In SR there are seven Islanding schemes in place, many SPSs, and other protection schemes and it is very difficult to get feeders for further protection schemes.

WRPC observed that the set points may be close to operating frequency.

MS SRPC informed that on other hand there was some recommendation that all protection settings should be away from operating range and accordingly df/dt settings in SR was kept at 49.5 Hz **& (0.2Hz/sec fall of frequency) and 49.3 Hz& & (0.3Hz/sec fall of frequency).** He opined that at present the concentration may be on implementation of AUFR relays. Subsequently df/dt relay issues may be discussed at NPC level and

accordingly decision may be taken. At present df/dt relay implementation may be discussed and finalised at Regional Level.

GM, NLDC informed that it is appreciable to note that the recommendations are in line with New IEGC. He added that the df/dt relays are also equally important and need to take up seriously. It is not compulsory that all the regions need to have same set points since the contingencies will be different w.r.t different states. Monitoring certainly will help in getting confidence on safety net. Unfortunately most of the feeders are at lower voltage levels. For SLDCs it will be a challenge to acquire 100 % visibility but effort to be put to achieve the same. In Islanding visibility takes a significant role.

Acknowledgement

The Task Force is thankful to SRPC Secretariat for their assistance and support in preparation of the Report.

1. Superintending Engineer (O)
   SRPC
   - Convener of the Task Force

2. Chief Engineer (NPC)
   CEA

3. Chief Engineer (GM)
   CEA

4. Superintending Engineer
   WRPC

5. Superintending Engineer
   ERPC

6. Superintending Engineer
   NRPC

7. Superintending Engineer
   NERPC

8. Director (NPC)
   CEA

9. General Manager
   NLDC

10. Member Secretary
    SRPC
    - Chairperson Task Force

ANNEXURE-I

Copy of letters dated 18th & 25th August 2023 from NPC

सत्यमेव जयते

भारत सरकार/Government of India
विद्युत मंत्रालय/ Ministry of Power
केन्द्रीय विद्युत प्राधिकरण/Central Electricity Authority
राष्ट्रीय विद्युत समिति प्रभाग/NPC Division
1st Floor, Wing-5, West Block-II, R.K. Puram, New Delhi-66

No. CEA-GO-15-14/1/2021-NPC Division/250 Date: 18 .08.2023

To,

(As per distribution list)

विषय:- आटोमेटिक अंडर फ्रीक्वेंसी लोड शेडिंग (एयूएफएलएस) और डीएफ/डीटी योजना पर टास्क फोर्स के गठन के संबंध में।

Subject: - Constitution of task force on Automatic Under Frequency Load Shedding (AUFLS) and df/dt scheme-reg.

It was decided in the 13th NPC meeting held on 05.07.2023 at Kolkata that a task force under chairmanship of MS, SRPC with Members from GRID-INDIA, RPCs/NPC may be formed.

Accordingly, the Constitution of the task force is as follows:-

1	Member Secretary, SRPC	Chairperson
2	Chief Engineer NPC,CEA	Member
3	Chief Engineer GM,CEA	Member
4	Representative from WRPC	Member
5	Representative from NRPC	Member
6	Representative from, ERPC	Member
7	Representative from NERPC	Member
8	Representative from NPC, CEA	Member
9	Representative from GRID-INDIA	Member
10	K.P Madhu, SE, SRPC	Member Convener

Taskforce may opt other members from any organization, if required.

2. Terms of Reference of the Taskforce is as follows:-
   i. Review of the recommendations of the report as per directions by the 13th NPC meeting within 2 months.
   ii. Prioritization of the loads under AUFLS and df/dt scheme.
   iii. To oversee the implementation of the report on Automatic Under Frequency Load Shedding (AUFLS) and df/dt scheme.
   iv. Any other suggestions/recommendations on related matters.

3. In this regard, it is requested that RPCs and GRID-INDIA may send their nominations (of the Rank not below SE from RPCs and GM from GRID-INDIA) to cenpccea@gmail.com by 22.08.2023.

This letter is issued with the approval of the competent authority.

भवदीय/Yours faithfully

18/8/2023

(ऋषिका शरण/Rishika Sharan)
मुख्य अभियन्ता एवं सदस्य सचिव,रा.वि.स /
Chief Engineer & Member Secretary, NPC

Distribution list:

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2. Member secretary, SRPC
3. Member secretary, ERPC
4. Member secretary, WRPC
5. Member secretary, NRPC
6. Member secretary, NERPC
7. Chief Engineer GM,CEA

Copy for kind information to:

1. SA to Chairprson,CEA
2. SA to Member GO&D, CEA

******

सत्यमेव जयते

भारत सरकार/Government of India
विद्युत मंत्रालय/ Ministry of Power
केन्द्रीय विद्युत प्राधिकरण/Central Electricity Authority
राष्ट्रीय विद्युत समिति प्रभाग/NPC Division
1st Floor, Wing-5, West Block-II, R.K. Puram, New Delhi-66

No. CEA-GO-15-14/1/2021-NPC Division/280-295 Date: 25.08.2023

To,

(As per distribution list)

विषयः- आटोमेटिक अंडर फ्रीक्वेंसी लोड शेडिंग (एयूएफएलएस) और डीएफ/डीटी योजना पर टास्क फोर्स के गठन के संबंध में।

Subject: - Constitution of task force on Automatic Under Frequency Load Shedding (AUFLS) and df/dt scheme-reg.

It was decided in the 13th NPC meeting held on 05.07.2023 at Kolkata that a task force under chairmanship of MS, SRPC with Members from GRID-INDIA, RPCs/NPC may be formed.

In this regards, NPC division vide letter No- CEA-GO-15-14/1/2021-NPC Division/250 dated 18.08.2023 requested RPCs and GRID-INDIA to send nomination for task force on Automatic Under Frequency Load Shedding (AUFLS) and df/dt scheme.

Accordingly, based on the nomination received from RPCs and GRID-INDIA the Constitution of the task force is as follows:-

1	Member Secretary, SRPC	Shri Asit Singh	**Chairperson**
2	Chief Engineer NPC,CEA	Smt. Rishika Sharan	Member
3	Chief Engineer GM,CEA	Shri Chandra Prakash	Member
4	Superintending Engineer,WRPC	Shri P.D.Lone	Member
5	Superintending Engineer,ERPC	Shri Shyam Kejriwal	Member
6	Superintending Engineer, NRPC	Shri Anzum Parwej	Member
7	Superintending Engineer NERPC	Shri S M Aimol	Member
8	Director,NPC,CEA	Shri Satyendra Kumar Dotan	Member
9	General Manager, NLDC	Shri Vivek Panday	Member
10	Superintending Engineer, SRPC	Shri K.P Madhu	**Member Convener**

2. Terms of Reference of the Taskforce is as follows:-

i. Review of the recommendations of the report as per directions by the 13th NPC meeting within 2 months.

ii. Prioritization of the loads under AUFLS and df/dt scheme.

iii. To oversee the implementation of the report on Automatic Under Frequency Load Shedding (AUFLS) and df/dt scheme.

iv. Any other suggestions/recommendations on related matters.

Task force can co-opt any member, if required.

भवदीय/Yours faithfully

ऋषिका 21(20)
25/8/23

(ऋषिका शरण/Rishika Sharan)
मुख्य अभियन्ता एवं सदस्य सचिव,रा.वि.स /
Chief Engineer & Member Secretary, NPC

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4. Shri N.S. Mondal, Member Secretary, ERPC,14,Golf Club Road, ERPC Building, Tollygunje,Kolkata-700033. [Email: mserpc-power@nic.in]
5. Shri K B Jagtap, Member Secretary, NERPC, NERPC Complex, Dong Parmaw, Lapalang, Shillong-793006. [Email: ms-nerpc@gov.in]
6. Shri V.K.Singh, Member Secretary, NRPC, 18-A, Shaheed Jeet Singh Marg, Katwaria Sarai, New Delhi-110066.[Email: ms-nrpc@nic.in]
7. Shri Deepak Kumar., Member Secretary, WRPC, Plot No- F-3, MIDC Area, Marol, Opp. SEEPZ, Central Road, Andheri (East), Mumbai-400093.[email: ms-wrpc@nic.in]

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ANNEXURE-II

Format for testing of AUFLS Relays

Annexure - II

REGION:

Inspection of AUFLS Relays at Site: **Date & Time:**

Details of Relay: **System frequency:**

Make of Relay	Serial no.	Stage	Date of Inspection

State/Name of Power Utilities:

Name of Sub-station:

Sr. No.	Name of feeder	Normal load relief envisaged in MW	UFR setting 49.2/49.0/ 48.8/48.7/ 48.6/48.4/ 48.2/48.0 Hz	Actual load at the time of inspection	Whether the feeder included in any other load shedding (such as SPS, Islanding, manual /ADMS etc)	Frequency Testing equipment used		Relay pick up frequency, Hz	Pick up time, sec	Relay drop off frequency, Hz	Relay drop off time, sec	Relay through trip test carried out Breaker Tripped or not	If Realy trip test is not carried out then continuity of Trip circuit upto Breaker trip coil checked
						Make	Sr. No.						

Name, Designation & Signature of the Site Engineer present at that time of inspection

Name & designation & sign of 3rd party inspecting officer

Note: 1. The functional testing has to be carried out by readjusting the relay setting to the present grid frequency.

2. Details of UFR operational & load relief obtained may be furnished in separate annexures.

ANNEXURE-III

Sample RPC Inspection Report Format

Annexure-III

UFR and df/dt Relay Inspection Report

Name of Substation:

Owned by (Licensee):

Date of Inspection/Testing by RPC:

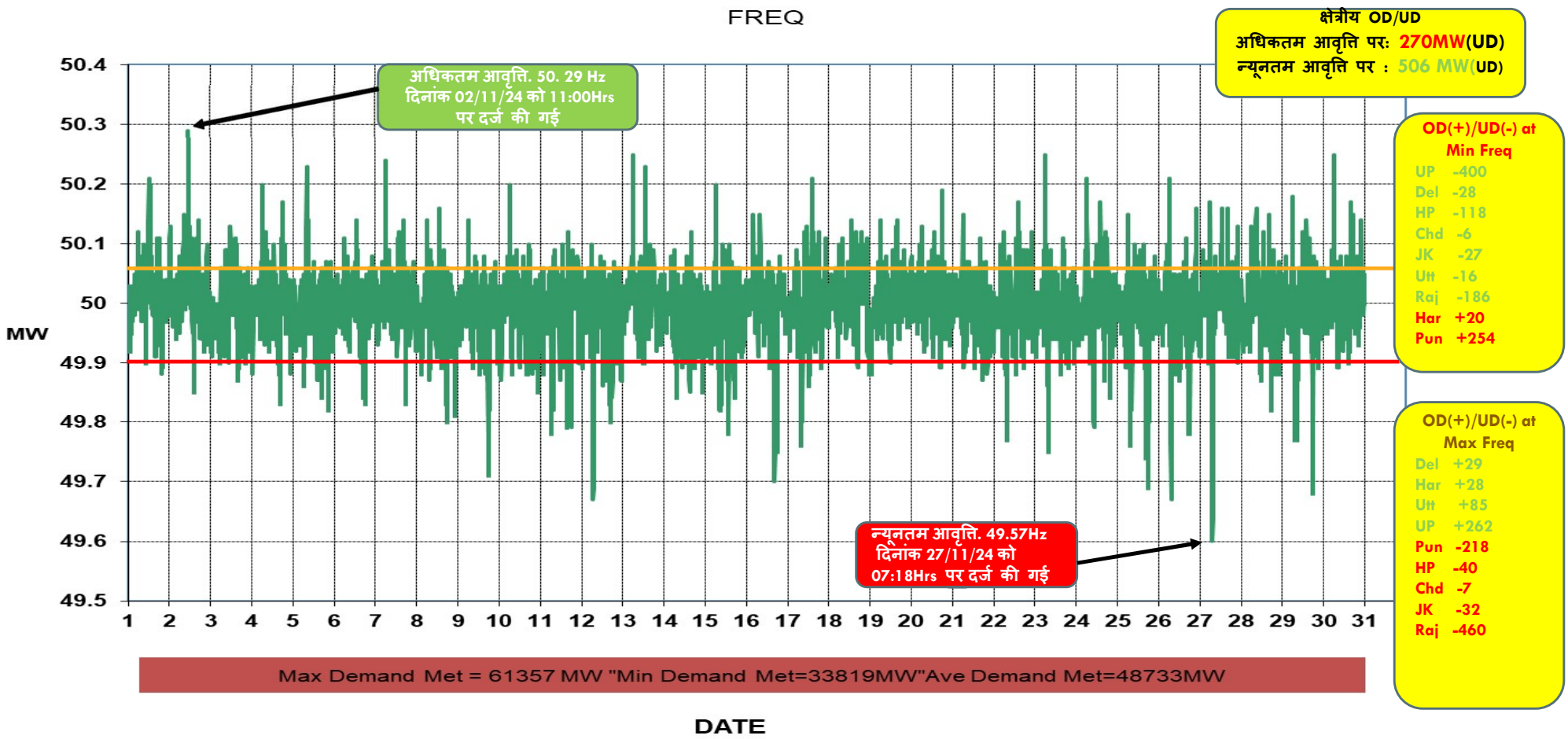
Sl. No.	Name of the feeder/PTR	Setting Details of UFR & df/dt Relay	Expected Load Relief (declared) MW)	Maximum load (MW) *	Average load (MW)*	Status of SCADA Mapping	Type of Feeder (Radial/Ring)	Observations (Including make of Relay)	Action to be taken

*** Load during previous six months**

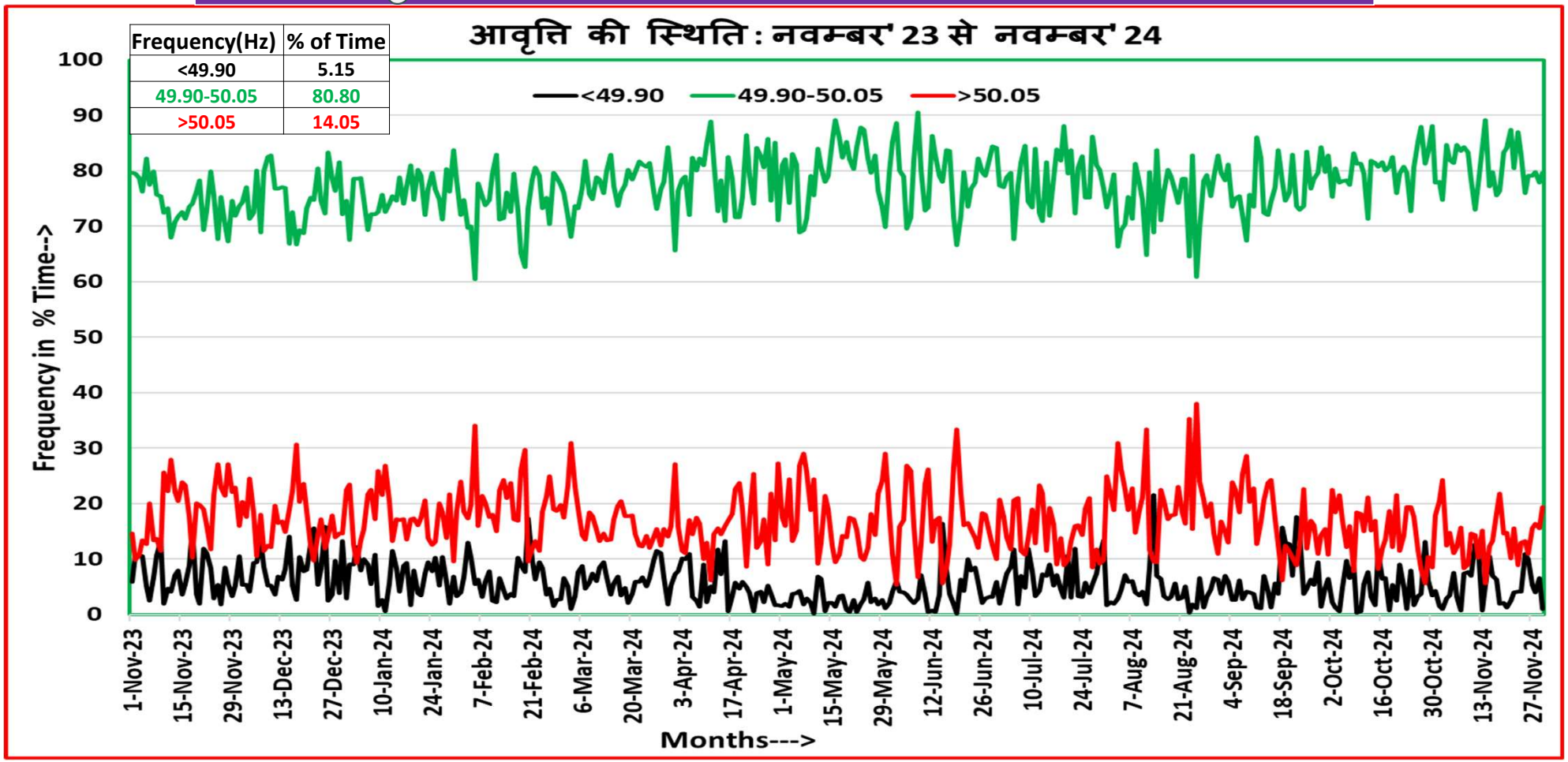
Annexure-B.I

प्रचालन समन्वय उपसमिति की बैठक
नवम्बर- 2024

नवम्बर-2024 के दौरान आवृत्ति की स्थिति
(As per 5 Minute SCADA data)



आवृत्ति की स्थिति: नवम्बर -2023 से 2024



पिछले एक साल मे आवृत्ति की स्थिति

आवृत्ति बैंड	नवम्बर 2023	दिसंबर 2023	जनवरी 2024	फ़रवरी 2024	मार्च 2024	अप्रैल 2024	मई 2024	जून 2024	जुलाई 2024	अगस्त 2024	सितम्बर 2024	अक्टूबर 2024	नवम्बर 2024
< 49.7 Hz(%)	0.10	0.17	0.12	0.095	0.065	0.030	0.000	0.02	0.054	0.176	0.18	0.14	0.10
<49.8 Hz(%)	0.96	1.40	0.92	0.797	0.479	0.432	0.059	0.31	0.621	0.631	0.89	0.60	0.66
<49.9 Hz(%)	6.83	7.83	6.80	6.239	6.022	5.254	2.490	4.50	6.406	4.660	6.09	4.86	5.15
49.90-50.05 Hz(%)	*74.36*	*75.21*	*75.83*	*74.06*	*77.51*	*78.56*	*80.045*	*79.177*	*78.424*	*75.012*	*77.130*	*80.27*	*80.80*
50.05-50.10 Hz(%)	13.74	10.47	11.91	14.118	12.262	11.178	13.839	13.34	12.122	13.334	10.36	12.18	10.90
>50.10 Hz(%)	5.06	6.49	5.47	5.581	4.204	5.010	3.627	2.99	3.047	6.992	6.42	2.49	3.15
>50.20 Hz(%)	0.66	0.53	0.41	0.565	0.657	0.539	0.285	0.12	0.280	1.725	1.03	0.20	0.21
औसत आवृत्ति	50.00	49.99	49.99	50.00	50.00	50.00	50.00	50.002	49.997	50.008	50.000	49.998	49.995

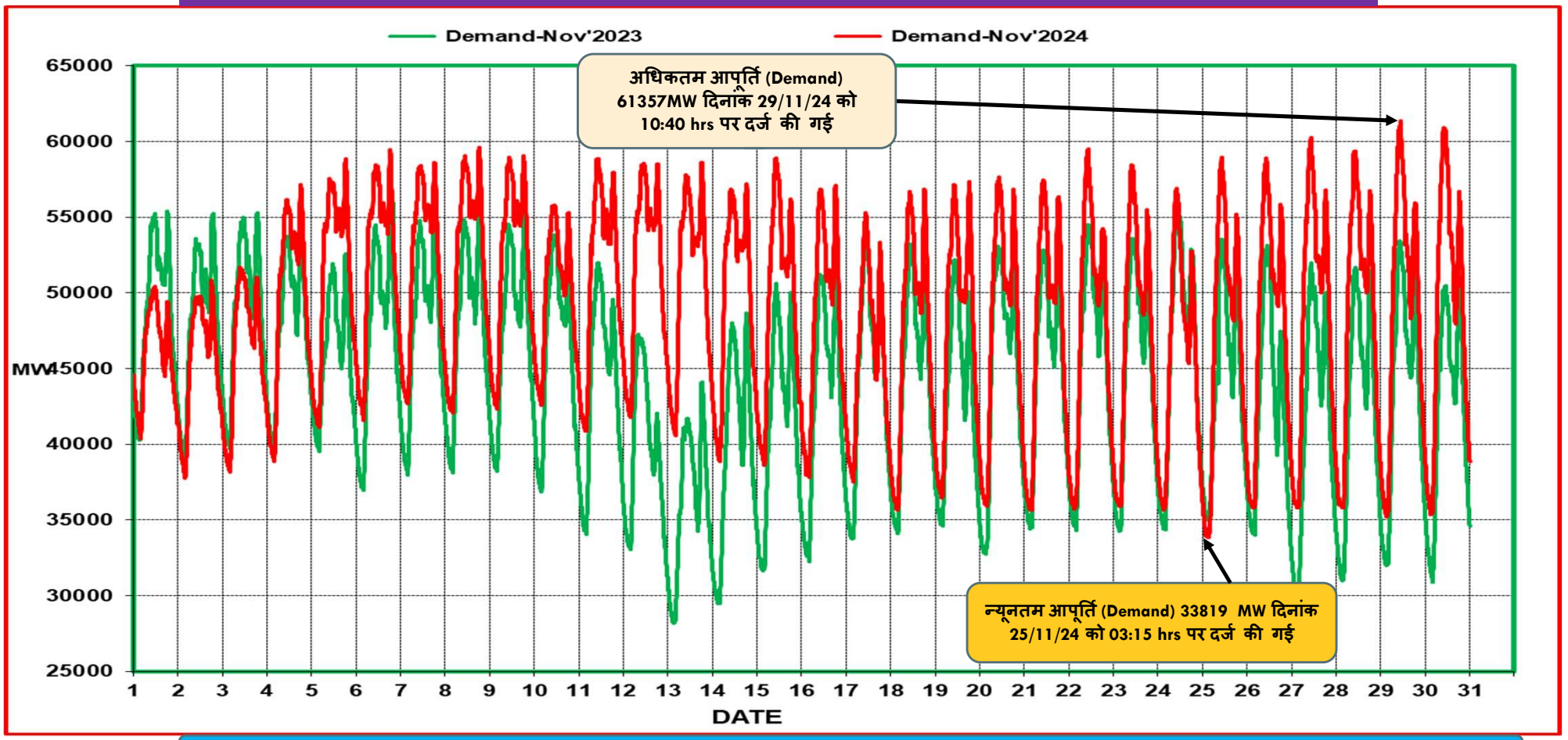
नवम्बर-2024 के दौरान अधिकतम मांग (Demand Met), अधिकतम ऊर्जा खपत (Energy consumption) और अब तक का कीर्तिमान (राज्यों द्वारा जमा आंकड़ों के अनुसार)

ग्रिड-इंडिया GRID-INDIA

राज्य	अधिकतम मांग (MW) (in Nov'24)	दिनांक / समय	रिकॉर्ड अधिकतम मांग (in MW) (upto Oct'24)	दिनांक / समय	अधिकतम ऊर्जा खपत (MU) (in Nov'24)	दिनांक	रिकॉर्ड अधिकतम ऊर्जा खपत (MU) (Upto Oct'24)	दिनांक
पंजाब	8962	30.11.24 at 09:45	16089	29.06.24 at 12:45	160.5	30.11.24	366.8	21.07.2024
हरियाणा	7848	11.11.24 at 18:30	14662	31.07.24 at 14:30	156.0	12.11.24	293.4	30.07.2024
राजस्थान	17434	27.11.24 at 09:45	17949	20.01.24 at 11:00	333.5	09.11.24	379.1	30.05.2024
दिल्ली	4259	08.11.24 at 18:03	8656	19.06.24 at 15:06	82.8	08.11.24	177.7	18.06.2024
उत्तर प्रदेश	19929	05.11.24 at 18:29	30618	13.06.24 at 22:00	392.7	09.11.24	658.7	17.06.2024
उत्तराखंड	2249	28.11.24 at 08:00	2863	14.06.24 at 22:00	42.4	09.11.24	62.1	14.06.2024
हिमाचल प्रदेश	2107	29.11.24 at 08:15	2235	20.01.24 at 07:00	37.7	29.11.24	40.5	30.07.2024
जम्मू और कश्मीर (UT) तथा लद्दाख़ (UT)	2836	26.11.24 at 19:00	3107	12.01.24 at 20:00	58.5	30.11.24	66.8	26.01.2024
चंडीगढ़	221	05.11.24 at 18:00	482	18.06.24 at 15:28	4.0	06.11.24	9.1	18.06.2024
उत्तरी क्षेत्र #	61434	29.11.24 at 10:43	91234	19.06.24 at 14:37	1247.9	09.11.24	1990.4	18.06.2024

उत्तरी क्षेत्र अधिकतम मांग (Demand Met) as per 1 min SCADA Data

क्षेत्रीय विद्युत आपूर्ति (Demand) नवम्बर 2023 बनाम नवम्बर 2024 (As per 5 Minute SCADA data)

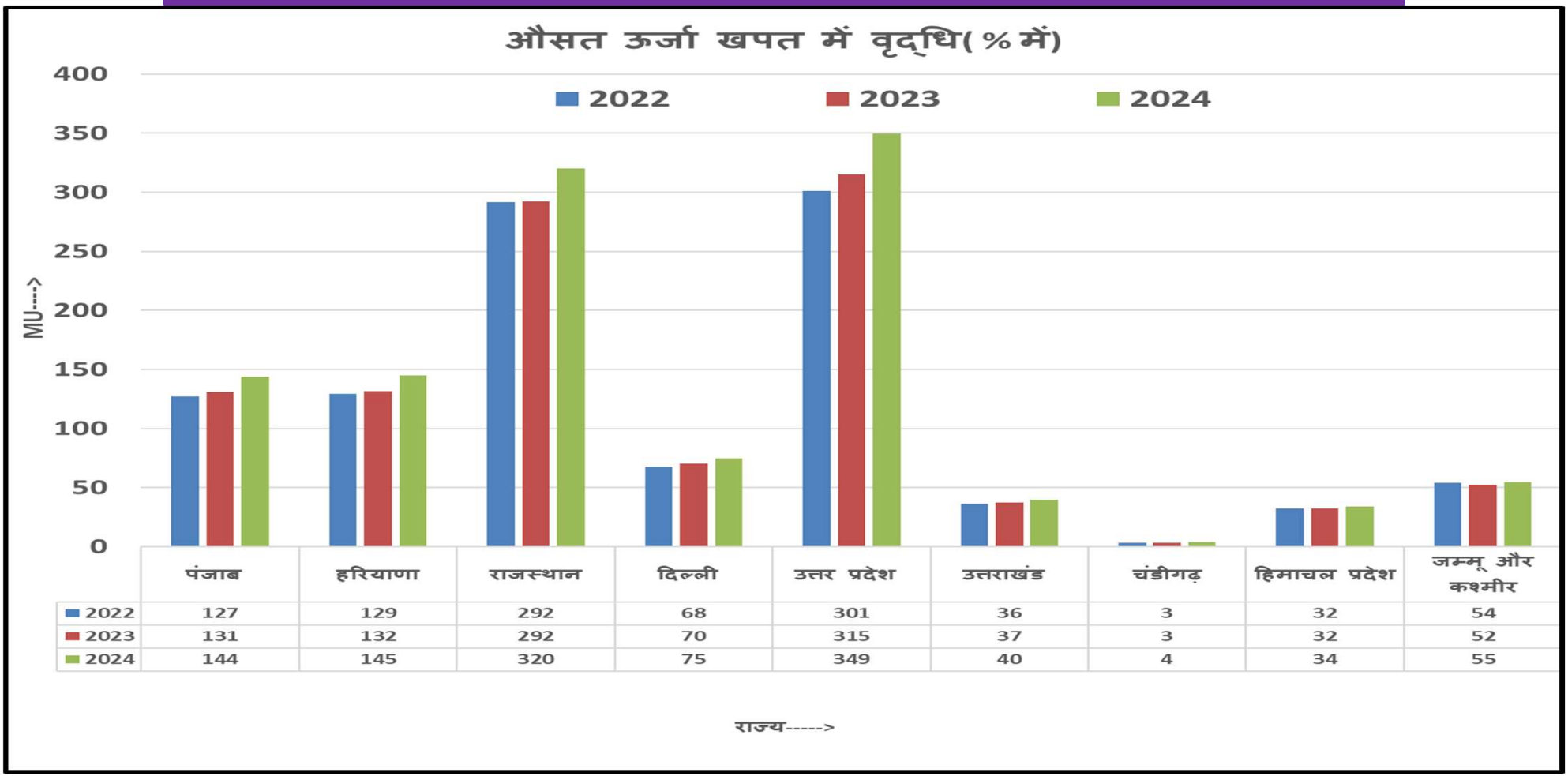


नवम्बर -2023 की तुलना में नवम्बर -2024 की औसत विद्युत आपूर्ति में 9.7% (~4290MW) वृद्धि हुई

उत्तरी क्षेत्र की औसत ऊर्जा खपत में वृद्धि(% में) नवम्बर -2024/ नवम्बर -2023 / नवम्बर -2022

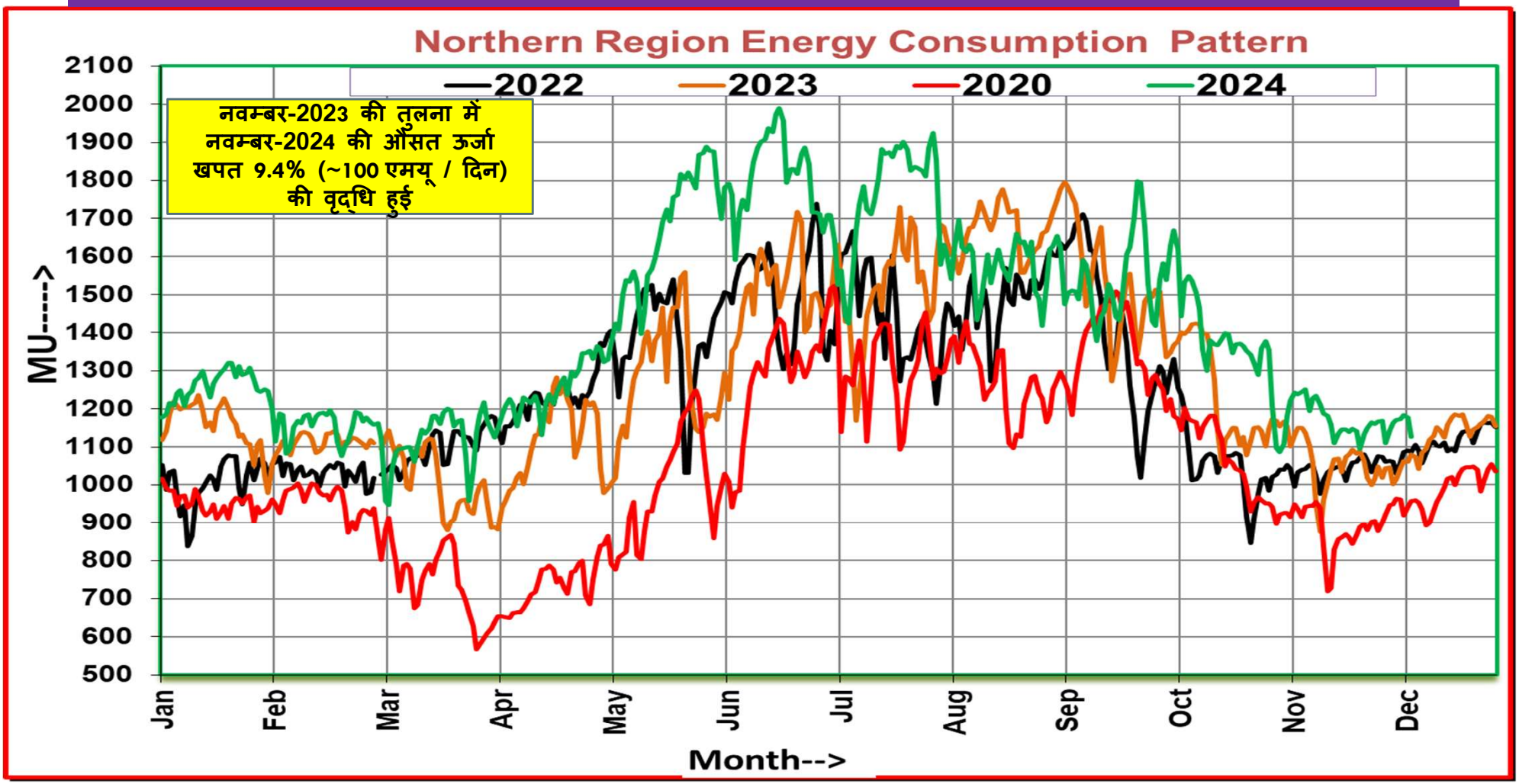
राज्य	नवम्बर -2022	नवम्बर -2023	नवम्बर -2024	% वृद्धि (नवम्बर -2023 vs नवम्बर -2022)	% वृद्धि (नवम्बर -2024 vs नवम्बर -2023)
पंजाब	127	131	144	3.0%	9.8%
हरियाणा	129	132	145	2.1%	9.9%
राजस्थान	292	292	320	0.1%	9.7%
दिल्ली	68	70	75	4.2%	6.1%
उत्तर प्रदेश	301	315	349	4.6%	11.0%
उत्तराखंड	36	37	40	2.6%	7.1%
चंडीगढ़	3	3	4	2.2%	7.1%
हिमाचल प्रदेश	32	32	34	0.0%	5.2%
जम्मू और कश्मीर (UT) तथा लद्दाख़ (UT)	54	52	55	-3.7%	4.5%
उत्तरी क्षेत्र	1042	1069	1169	2.5%	9.4%

उत्तरी क्षेत्र की औसत ऊर्जा खपत में वृद्धि(% में) नवम्बर-2024/ नवम्बर-2023 / नवम्बर-2022

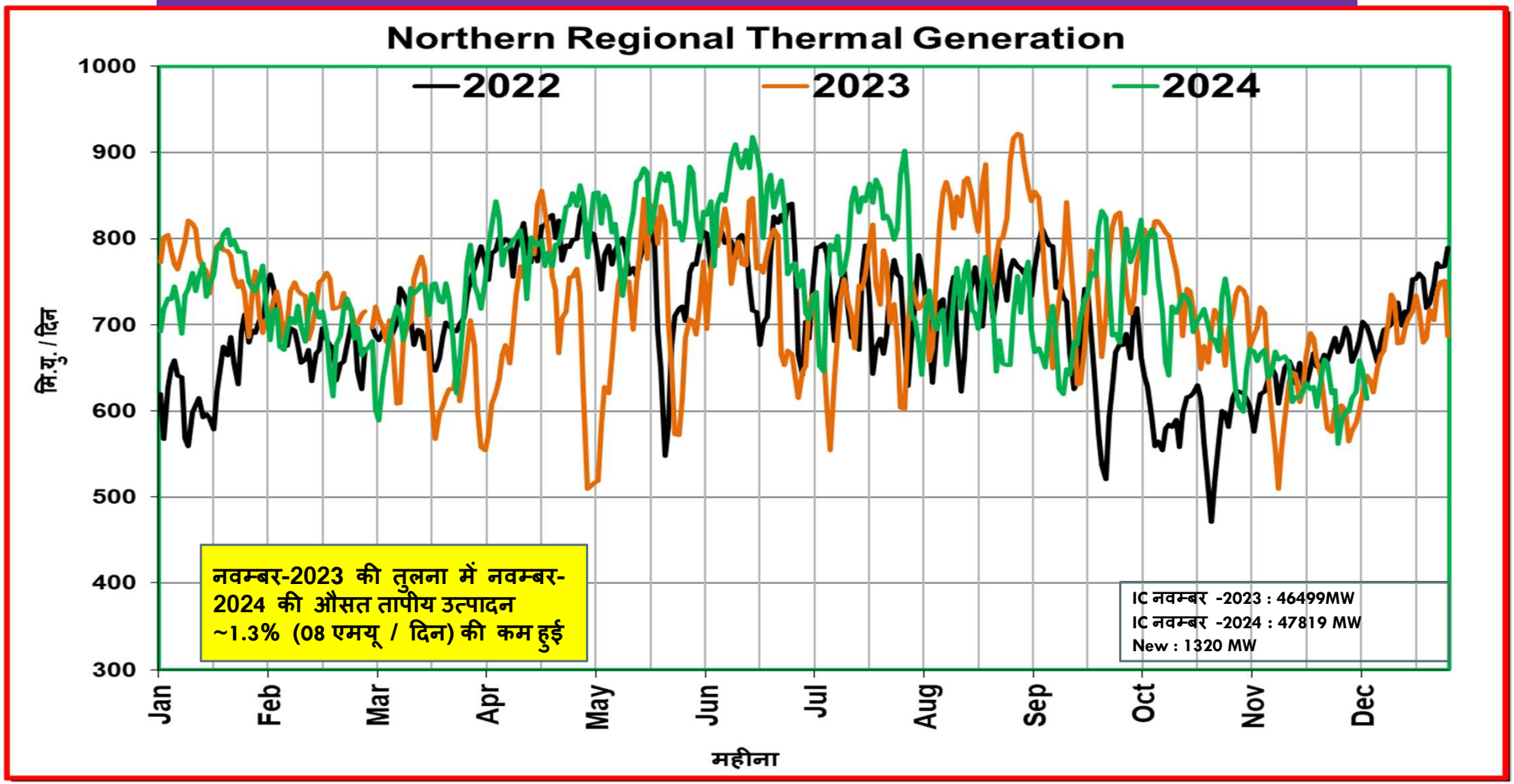


	पंजाब	हरियाणा	राजस्थान	दिल्ली	उत्तर प्रदेश	उत्तराखंड	चंडीगढ़	हिमाचल प्रदेश	जम्मू और कश्मीर
2022	127	129	292	68	301	36	3	32	54
2023	131	132	292	70	315	37	3	32	52
2024	144	145	320	75	349	40	4	34	55

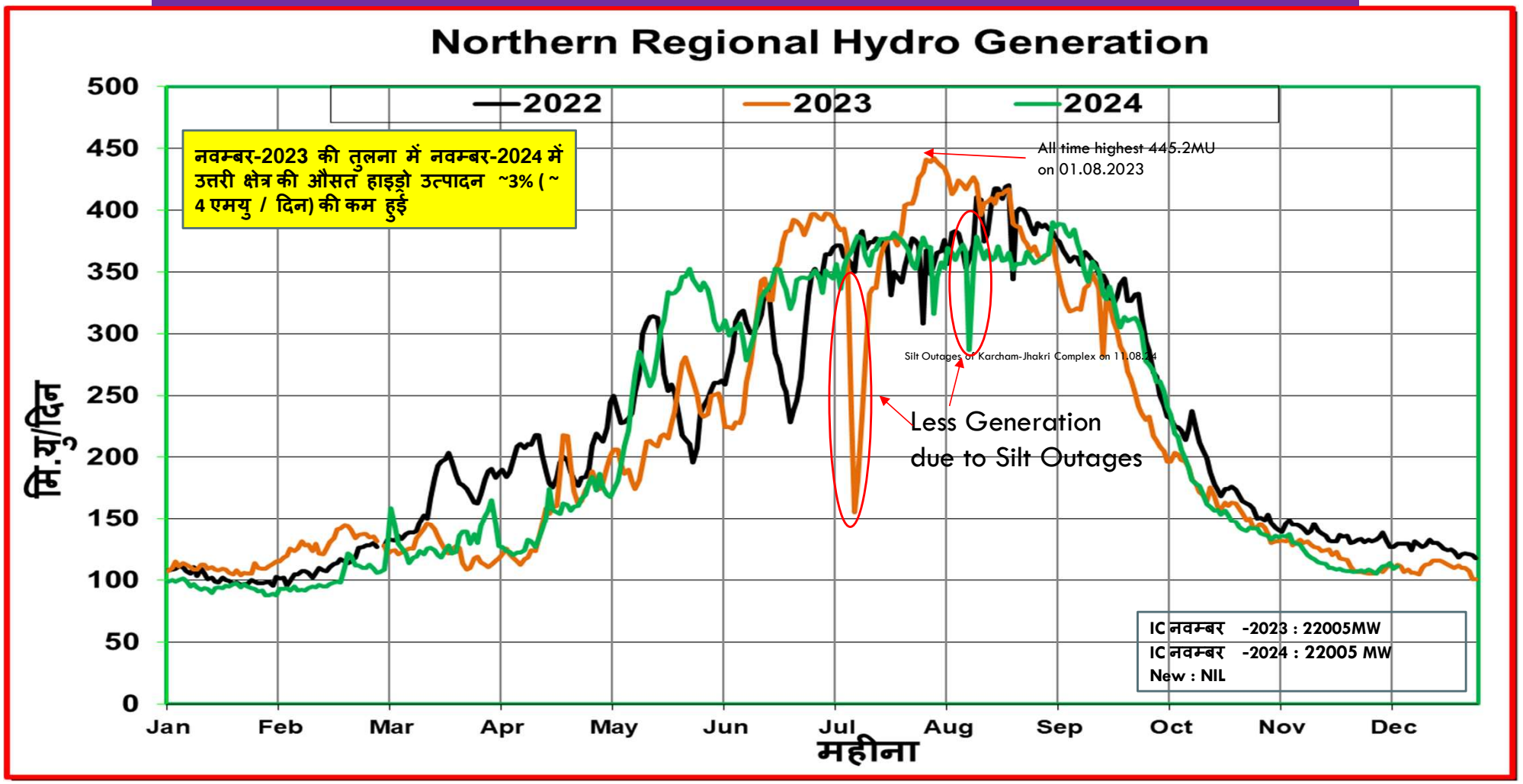
उत्तरी क्षेत्र की ऊर्जा खपत(MUs)



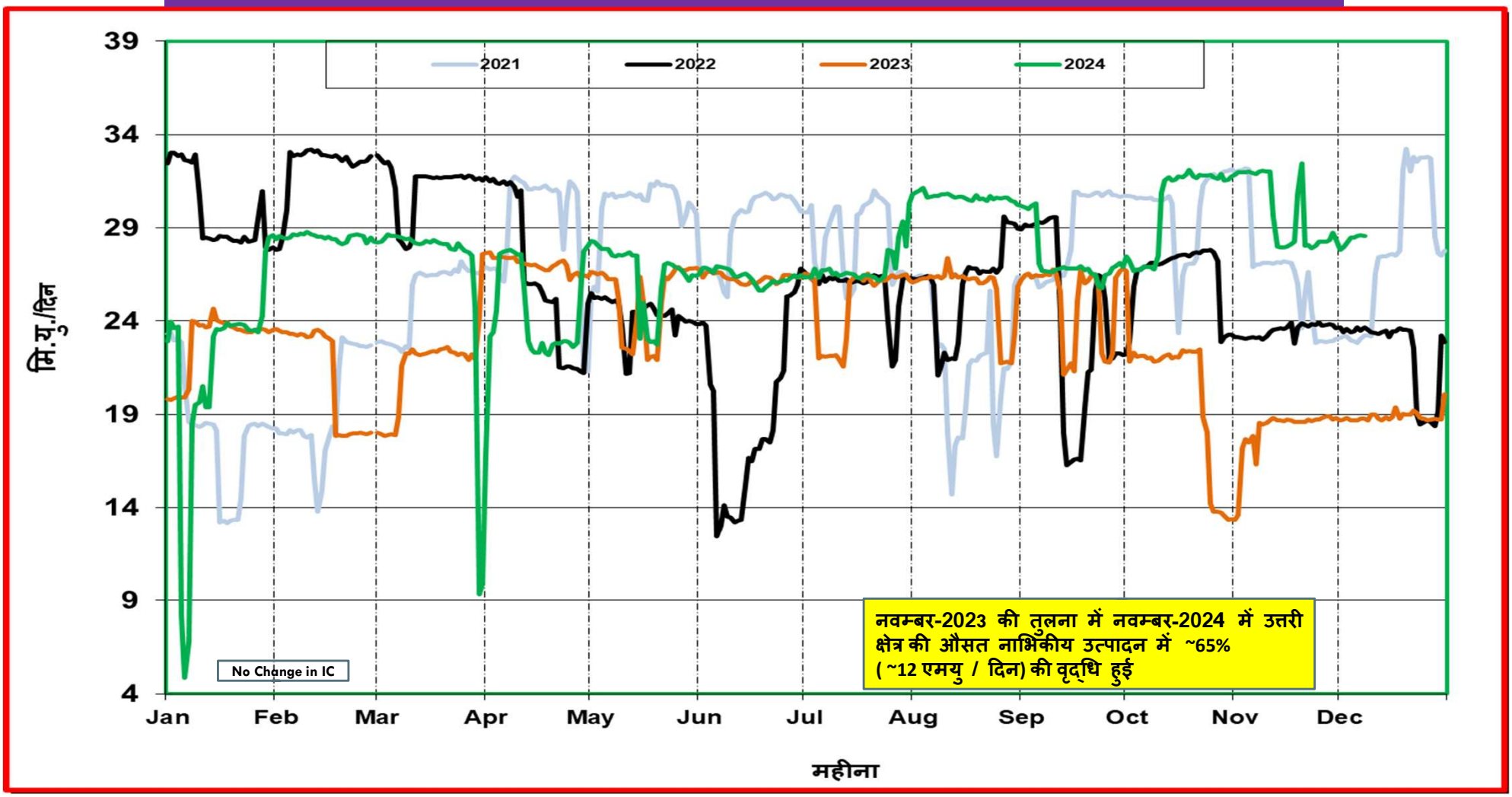
उत्तरी क्षेत्र की तापीय (Thermal) उत्पादन की स्थिति(MUs/Day)



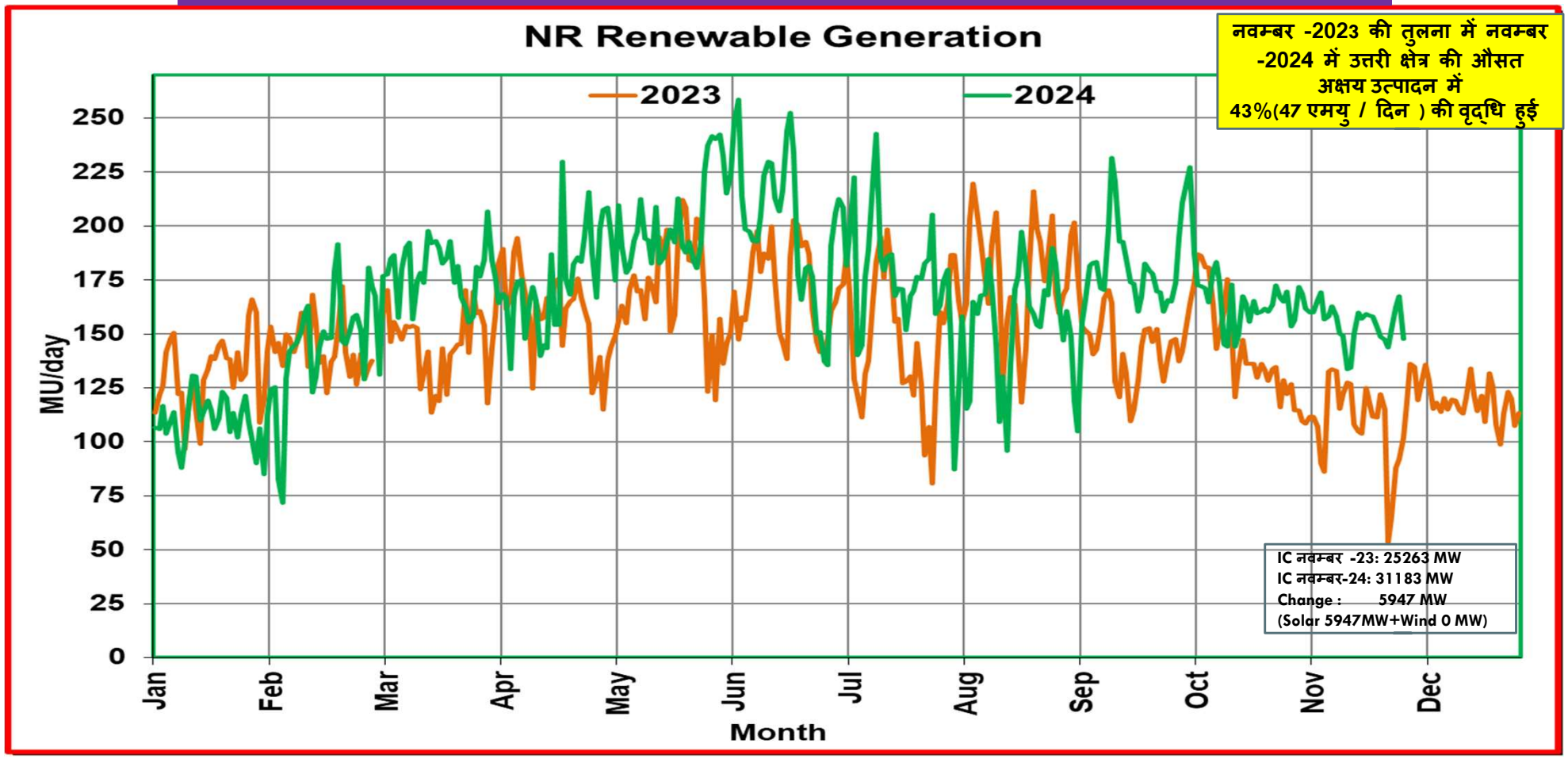
उत्तरी क्षेत्र की जलीय (हाइड्रो) उत्पादन की स्थिति(MUs/Day)



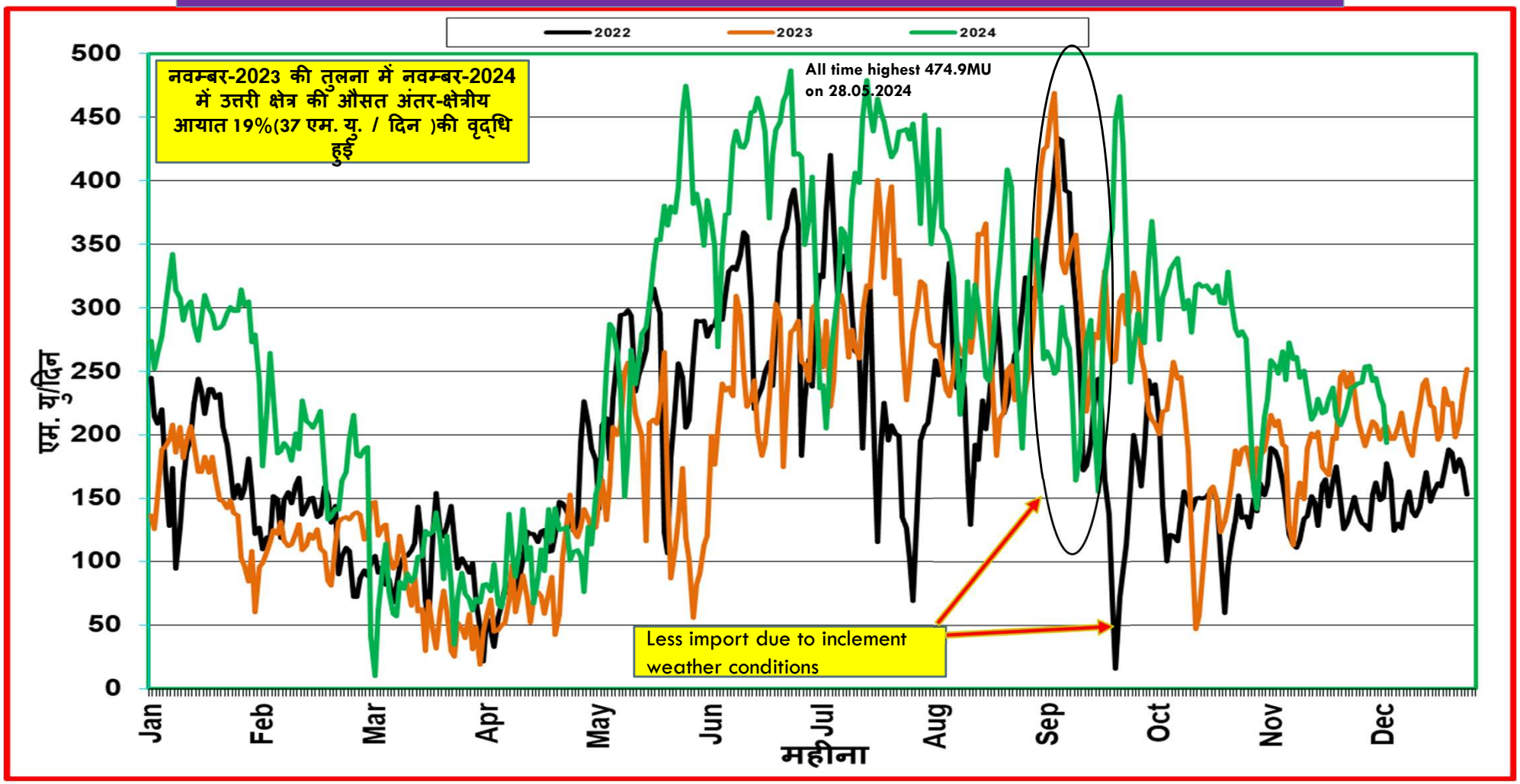
उत्तरी क्षेत्र की नाभिकीय उत्पादन की स्थिति (MUs/Day)



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



अंतर-क्षेत्रीय आयात(MUs/Day) की स्थिति



वास्तविक सारांश - नवम्बर-2023 बनाम नवम्बर-2024

	नवम्बर-2023 (मि.यु. /दिन)	नवम्बर-2024 (मि.यु. /दिन)	नवम्बर माह में वृद्धि (मि.यु./दिन)
तापीय (Thermal) उत्पादन	645.2	637.1	-8.06
जलीय (Hydro) उत्पादन	123.76	119.63	-4.13
नाभिकीय (Nuclear) उत्पादन	18.11	29.84	11.73
अंतर-क्षेत्रीय (Inter-Regional) कुल आयात	191.33	228.21	36.88
अक्षय (Renewable) उत्पादन	108.8	156.0	47.2

RE Penetration

	Maximum Daily MU Penetration			
	Nov '2024		Record upto Oct '2024	
	Max % Penetration	Date	Max % Penetration	Date
Punjab	4.56	01-11-2024	12.28	01-04-2020
Rajasthan	12.56	02-11-2024	36.47	22-10-2021
UP	3.76	02-11-2024	5.50	05-03-2024
NR	15.81	02-11-2024	20.69	02-04-2023

DEMAND FORECAST STATUS OF SLDC

- With reference to the Clause 31(2) of Central Electricity Regulatory Commission-IEGC Regulations, 2023 and the Operating Procedure of NRLDC prepared in accordance with the same, each SLDC has to furnish the demand estimation for day ahead, week ahead, month ahead (with time block wise granularity) and demand estimation for year ahead (with hour granularity). The sub-clause 31(2) (h) of IEGC-2023 states the following timeline for the submission of demand estimate data to RLDC.

Type of Demand Estimation	Timeline
Daily	10:00 hours of previous day
Weekly	First working day of previous week
Monthly	Fifth day of previous month
Yearly	30th September of previous year

- The following is the status regarding forecast data submission.

Region	State	Day ahead Data submission (Y/N)	Weeky Data submission (Y/N)	Monthly Data submission (Y/N)	Yearly Data submission (Y/N)
NR	Punjab	Y	Y	Y	N
	Haryana	Y	N	N	N
	Rajasthan	Y	N	N	N
	Delhi	Y	N	Y	Y
	UP	Y	Y	Y	Y
	Uttarakhand	Y	N	Y	N
	HP	Y	Y	Y	Y
	J&K	Y	N	N	N
	Chandigarh	Y	Y	N	N

***Submitted for FY-24-25. Data is awaited for FY 25-26.**

- In accordance with above, all SLDCs are requested to furnish the demand estimation data as per the formats to NRLDC through mail **(nrldcmis@grid-india.in)** and SFTP as per above timeline.

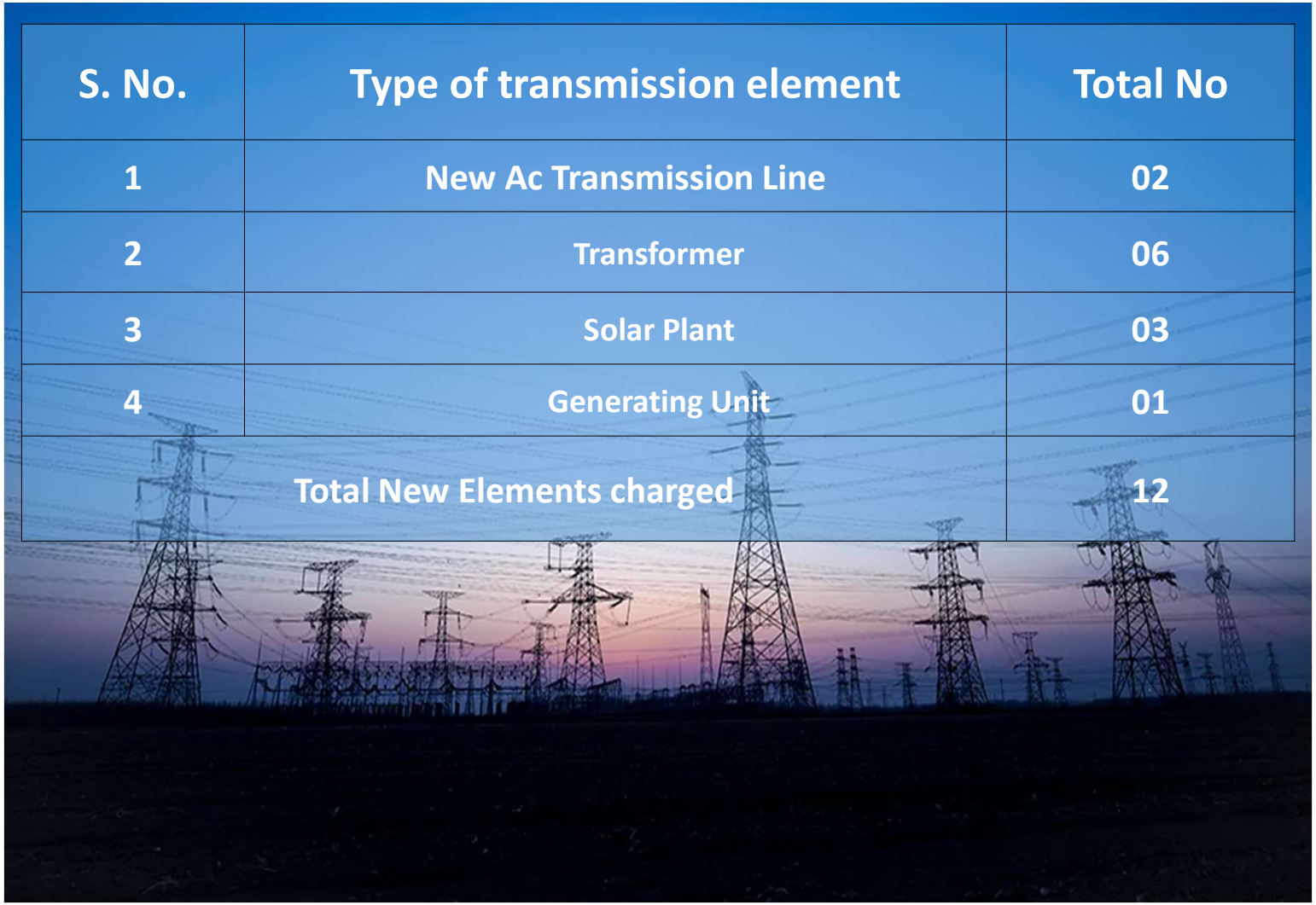
Outage Summary For November 2024									
CONSTITUENTS	PLANNED (A)	FORCED OUTAGES (B=C+D)	EMERGENCY SHUTDOWNS (C)	TRIPPING (D)	% PLANNED SHUTDOWNS (A/(A+C))	% EMERGENCY SHUTDOWNS(C/(A+C)	% ESD SHUTDOWNS(C/B)	% TRIPPING (D/B)	TOTAL OUTAGES (A+B)
POWERGRID	445	212	147	65	75.2%	24.8%	69.3%	30.7%	657
UPPTCL	215	178	71	107	75.2%	24.8%	39.9%	60.1%	393
RRVPNL	93	143	84	59	52.5%	47.5%	58.7%	41.3%	236
PSTCL	104	63	15	48	87.4%	12.6%	23.8%	76.2%	167
HVPNL	74	57	25	32	74.7%	25.3%	43.9%	56.1%	131
BBMB	71	50	19	31	78.9%	21.1%	38.0%	62.0%	121
DTL	31	30	15	15	67.4%	32.6%	50.0%	50.0%	61
NRSS36	3	26	26	0	10.3%	89.7%	100.0%	0.0%	29
ADHPL	24	0	0	0	100.0%	0.0%	NA	NA	24
NTPC	15	9	2	7	88.2%	11.8%	22.2%	77.8%	24
PTCUL	12	12	1	11	92.3%	7.7%	8.3%	91.7%	24
HPPTCL	3	15	7	8	30.0%	70.0%	46.7%	53.3%	18
PDD JK	4	5	1	4	80.0%	20.0%	20.0%	80.0%	9
AMP Energy Green Private L	5	3	1	2	83.3%	16.7%	33.3%	66.7%	8
AREPRL	7	0	0	0	100.0%	0.0%	NA	NA	7
RAILWAYS	4	2	0	2	100.0%	0.0%	0.0%	100.0%	6
AHEJ4L	0	4	2	2	0.0%	100.0%	50.0%	50.0%	4
Saurya Urja	1	3	3	0	25.0%	75.0%	100.0%	0.0%	4
Tata Power	2	2	2	0	50.0%	50.0%	100.0%	0.0%	4
NHPC	1	2	2	0	33.3%	66.7%	100.0%	0.0%	3
THDC	2	1	1	0	66.7%	33.3%	100.0%	0.0%	3
ESUCRL	1	1	1	0	50.0%	50.0%	100.0%	0.0%	2
Total	1117	818	425	393	72.4%	27.6%	52.0%	48.0%	1935

OUTAGE SUMMARY OF LAST THREE MONTHS

MONTH	PLANNED	FORCED OUTAGES	EMERGENCY SHUTDOWNS	TRIPPING	% PLANNED as of TOTAL S/D	% EMERGENCY SHUTDOWNS	TOTAL OUTAGES (A+B)
	(A)	(B=C+D)	(C)	(D)	(A/(A+C))	(C/(A+C))	
Aug-24	548	844	382	462	58.9%	41.1%	1392
Sep-24	758	911	415	496	64.6%	35.4%	1669
Oct-24	985	815	434	381	69.4%	30.6%	1800
Nov-24	**1117**	**818**	**425**	**393**	**72.4%**	**27.6%**	**1935**

New Elements First Time Charged During Nov 2024

S. No.	Type of transmission element	Total No
1	New Ac Transmission Line	02
2	Transformer	06
3	Solar Plant	03
4	Generating Unit	01
Total New Elements charged		12



New AC Transmission line

S.No	Name of element	Owner	Voltage Level (in kV)	Circuit No	Line Length	Conductor Type	Actual date of charging
1	220kV AGE24L(Bhimsar)SL_Ftg2_PG-Fatehgarh_II(PG)-1	AGE24L	220kV	1	12 Km	AL59 Zebra	27-Nov-2024
2	220kV AGE24L(Bhimsar)SL_Ftg2_PG-Fatehgarh_II(PG)-2	AGE24L	220kV	2	12 Km	AL59 Zebra	27-Nov-2024

Transformer

S.No	Name of element	Owner	Voltage Level (HV/LV/Tertiary)	MVA Capacity	Transformer Details	OLD MVA Capacity	Actual date of charging
1	400/220/33kV, 500 MVA, 3-Phase, KANOHAR, ICT - 3 at Nakodar(PSG)	PSTCL	400/220/33kV	500	New	NA	07-Nov-2024
2	400/220/33kV, 500 MVA MVA, 3-Phase, T & R, ICT - 5 at Bikaner_2 (PBTSL)	PBTSL	400/220/33kV	500	New	NA	23-Nov-2024
3	220/33kV, 250 MVA, 3-Phase, TBEA, Power Transformer - 1 at AGE24L(Bhimsar)SL_Ftg2_PG	AGE24L	220/33 kV	250	New	NA	28-Nov-2024
4	220/33kV, 250 MVA, 3-Phase, TBEA, Power Transformer - 2 at AGE24L(Bhimsar)SL_Ftg2_PG	AGE24L	220/33 kV	250	New	NA	28-Nov-2024
5	33/0.433kV, 0.630 MVA, 3-Phase, KALPA ELECTRICAL PVT LTD, Auxiliary Transformer - 2 at AGE24L(Bhimsar)SL_Ftg2_PG	AGE24L	33/0.433 kV	0.63	New	NA	28-Nov-2024
6	420/15.75kV, 306 MVA, 3-Phase, M/s GE, GT - 6 at Tehri(THDC)	Tehri PSP	420/15.75 kV	306	New	NA	30-Nov-2024

Solar plant

S.No	Plant Name	Pooling Sub-station	Total Capacity charged (MW)	Total Installed Capacity of Plant (MW)	Type of RE	Total No. of Solar ICR/Block Charged	Agency/ Owner	Actual date of charging
1	ACME Raisar Solar Energy Private Limited	Fatehgarh Pooling	79.33MW	272MW	Solar	7	ACME_Raisar_SEPL	19-Nov-24
2	ACME Dhaulpur Powertech Private Limited	Fatehgarh Pooling	79.33 MW	272MW	Solar	7	ACME_Dhaulpur_PPL	24-Nov-24
3	Adani Green Energy Twenty-Four Limited	Fatehgarh-II	238 MW	500 MW	Solar	20	AGE24L	30-Nov-2024

Generating Unit

S.No	Name of element	Owner	Voltage LeveL	Installed Capacity (MW)	MVA Capacity	Auxiliary Consumption	Actual date of charging
1	250 MW, 15.75 KV Make M/s GE Unit No 5 at 4x250 MW Tehri PSP(Stage 1)	Tehri PSP	15.75 kV	4x250	278	1.20%	19-Nov-24


धन्यवाद

RIHAND


NTPC R&R Colony, Darlipali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GT high Vibration issues


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Tripping of Rihand Stage-3 Units, during Monopole Ground Return Mode Operation of Rihand Dadri HVDC line

Background

Rihand-Dadri HVDC +- 500 KV 1500 MW bi-pole lines are sometimes operated in monopole ground return mode and during this operation, abnormally high DC current components in neutral of EHV transformers, emanating from the PGCIL HVDC grounding system causes high vibrations and abnormal sound in Station & Generating transformers of stage-3 units.

Background

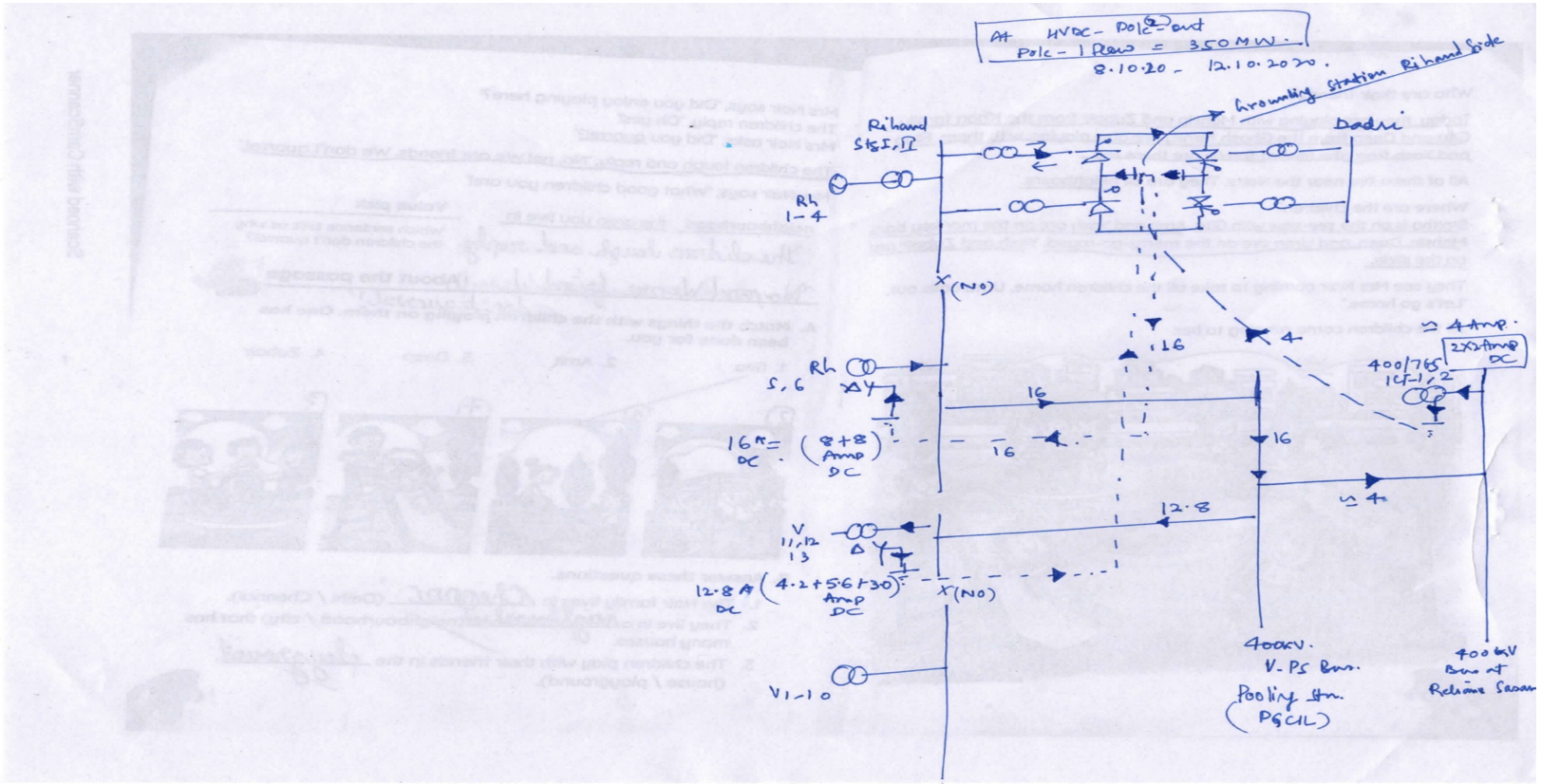
- The problem of abnormal noise & excessive vibrations in GTs of Rihand Stage-III and Vindhyachal Stage-IV during monopole operation of HVDC Rihand – Dadri link was earlier discussed, and it was decided in 45th TCC meeting (27th & 28th August 2020) and 48th NRPC Meeting (2nd September 2020) to limit HVDC line loading to 300MW during monopole ground return operation.

- This practice of reduced HVDC power flow (300 MW) operation was being followed since then.

Past record of DC Current data during monopole operation of HVDC

Sr No.	Unit	Date	DC Current Unit-5/6
1	5 & 6	24.09.2018	19.3/19.2 Amp
2	5 & 6	22.11.2018	16.2/18.2 Amp
3	5 & 6	24.11.2018	17.3/16.4 Amp
4	5 & 6	28.11.2018	18.2/17.5 Amp
5	5 & 6	29.11.2018	17.6/17.3 Amp
6	5 & 6	01.12.2018	16.9/17.2 Amp
7	5 & 6	15.06.2019	16.2/16.5 Amp
8	5 & 6	11.11.2019	11.1/19.0 Amp
9	5 & 6	12.10.2020	8.0/8.0 Amp at 300MW only

DC current flow path



Recent development

- During such monopole ground return operation, Stage-3 units of 2 X 500 MW (Unit-05 & 06) tripped on 11.11.2024.
- Rihand Unit # 5 tripped on Buchholz relay protection in GT-5Y at 01:13:27 hrs and taken back into service at 00:40 hrs on 12.11.2024
- Rihand Unit # 6 tripped in GT-6R & 6B transformers at 01:16:40 hrs and taken back into service at 23:23 hrs on 11.11.2024.
- Prior to this event, on 10.11.2024 at 23:45Hr, Rihand-Dadri HVDC pole-1 was charged in monopole ground return mode of operation after doing necessary annual maintenance,. Both units of Rihand Stage #3 (Unit# 5 & 6) got tripped within one and half hours of charging HVDC Pole-1 in ground return mode (with Pole-2 in shutdown condition).

Recent development

- HVDC pole-1 was taken under shutdown on 09.11.2024 at 09:55hrs however, pole-2 was in service in monopole ground return mode. Subsequently, Pole-2 was also taken under shutdown at 09:00 hrs on 10.11.2024.
- After stage-03 units tripping, high vibrations and abnormal sound in GTs/STs of all the stages-1/2/3 were also observed. Thus, the vibration & abnormal sound, which was earlier limited to the stage-03 units now observed in was stage-1 7 2 units also.
- On measurement, DC currents in EHV transformer neutral were found significantly high at 300 MW HVDC power flow, so on our request to NRLDC power flow was reduced to 200 MW and finally to 100 MW as mentioned in following table to minimize the DC current and vibration.

Neutral Currents at 300 MW, 200 MW & 100 MW HVDC power flow on dated 11.11.2024

Sr No.	Date	Unit	DC Current at 300MW HVDC flow	DC current at 200MW HVDC flow	DC current at 100MW HVDC flow
1	11.11.2024	GT-1 (400/20 kV)	16.1 Amp	9.5 Amp	0.2 Amp
2	11.11.2024	GT-2(400/20 kV)	16.3 Amp	9.6 Amp	1.6 Amp
3	11.11.2024	GT-3(400/21 kV)	15.1 Amp	8.3 Amp	0.5 Amp
4	11.11.2024	GT-4(400/21 kV)	15.0 Amp	10.0 Amp	0.6 Amp
5	11.11.2024	ST-5 (400/11/11 kV)	37.1 Amp	24.0 Amp	0.6 Amp
6	11.11.2024	ST-6 (400/11/11 kV)	37.5 Amp	24.6 Amp	0.5 Amp

Neutral Current at 100 MW HVDC flow on dated 12.11.2024 after synchronizing Unit-05 & 06

Sr No.	Date	Unit	DC component at 100MW HVDC flow
1	12.11.2024	GT-1 (400/20 kV)	0.4 Amp
2	12.11.2024	GT-2(400/20 kV)	0.6 Amp
3	12.11.2024	GT-3(400/21 kV)	0.9 Amp
4	12.11.2024	GT-4(400/21 kV)	0.5 Amp
5	12.11.2024	GT-5(400/21 kV)	1.5 Amp
6	12.11.2024	GT-6(400/21 kV)	1.8 Amp
7	12.11.2024	ST-5 (400/11/11 kV)	0.4 Amp
8	12.11.2024	ST-6 (400/11/11 kV)	0.6 Amp

Neutral Current measured with bi-pole operation on 13.11.2024

Sr No.	Date	Unit	DC current
1	13.11.2024	GT-1 (400/20 kV)	0.0 Amp
2	13.11.2024	GT-2(400/20 kV)	0.0 Amp
3	13.11.2024	GT-3(400/21 kV)	1.0 Amp
4	13.11.2024	GT-4(400/21 kV)	0.7 Amp
5	13.11.2024	GT-5(400/21 kV)	1.1 Amp
6	13.11.2024	GT-6(400/21 kV)	0.4 Amp

Unit-06 tripping Dated 17.10.2024

- On 17.10.2024, Unit-06 taken out of service at 23:29 hrs due to High hydrocarbon gases in GT-6R as reported in DGA
- High quantity of Hydrocarbon gases were found in DGA report
- GT-6R was replaced with spare GT and unit-06 was out of service from 17.10.2024 to 23.10.2024
- On 17.10.2024 also, Rihand Dadri HVDC pole-1 monopole operation was done in day hours around 10:00 hrs to 16:00 hrs

Immediate action

- Site has taken up the issue with CGM NR 3, PGCIL & with GRID-INDIA to ensure:

1. Restricted power flow in monopole ground return mode operation
2. Monopole operation with metallic return, till this issue is resolved.
3. Monopole operation with ground return mode may be temporarily blocked.

Action Plan

1. Establish root cause for high DC current flow in transformer neutral, during monopole operation
2. Establish a safe operation procedure of HVDC system in different modes, especially with load-limiting features during monopole operation-auto HVDC load flow control
3. Any other solution to control / mitigate the issue

Migratory Birds at NTPC Dadri

Thank You

NTPC Ramagundam

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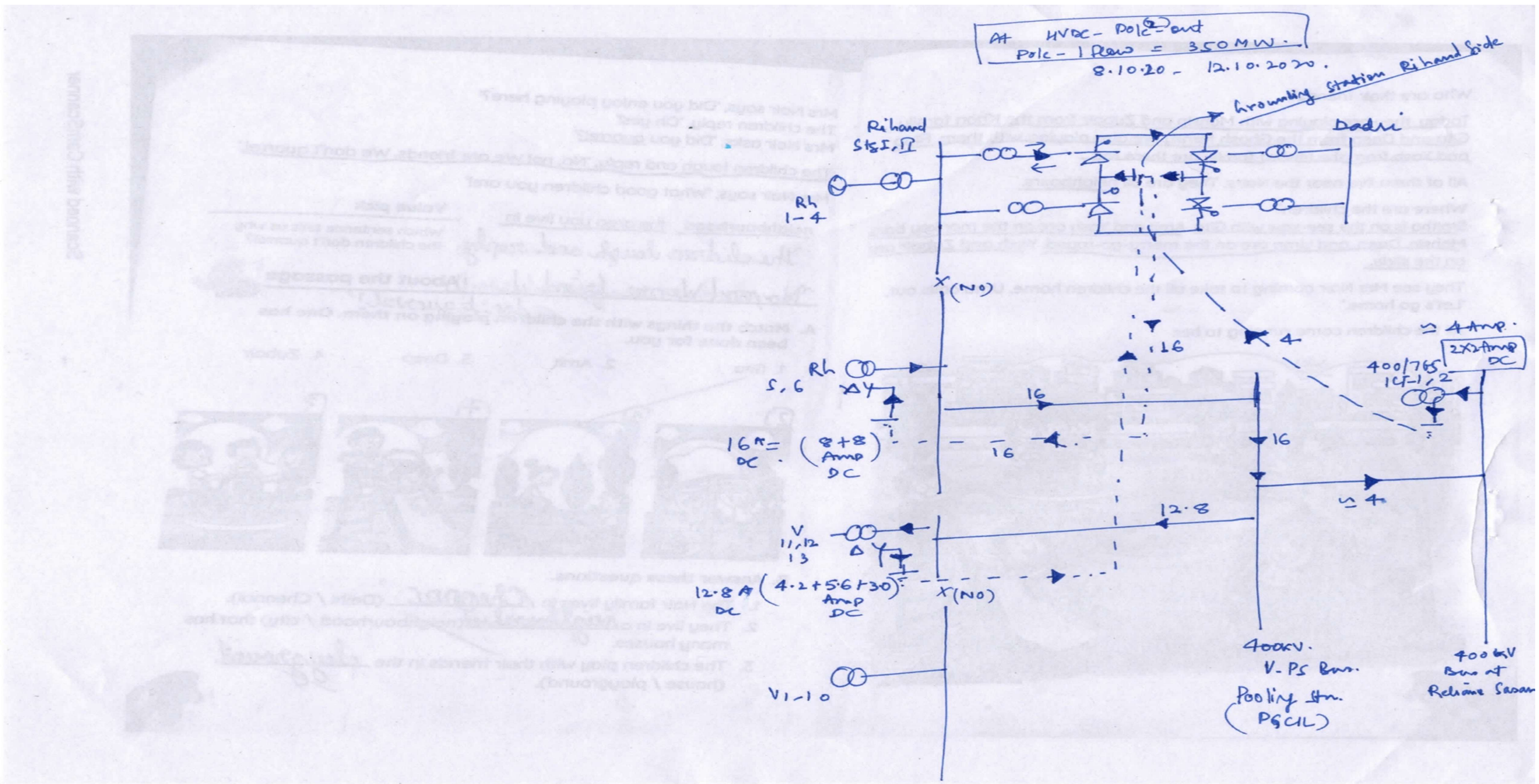
10/17/2024 12:39:46.000 PM
Bus Voltage
395.5
126.6
NET EXPORT
NORTHERN GRID
2,594
WESTERN GRID
902
INST. FREQ
49.955
SGRL- 1
SGRL- 2
HVDC- 1
HVDC- 2
ALD-1
ALD-2
VIN POLN STN-1
VIN POLN STN-2
584.8
590.3
152.8
152.7
556.9
556.7
404.8
497.6
Unit Load
1 444.7
2 498.0
3 428.4
4 460.0
Station Trf.
1 11.0
2 14.0
3 6.5
4 3.6
IBT
1 19.0
2 0.1
132kV BC
0.00
Misc. Trf.
1.3
OH
2.0
400kV Bus Coupler
1 364.8
2 246.3
Instanteneous Export
Stage-1 862
Stage-2 1,732
Stage-3 902



At HVDC- Pole 2 out
Pole-1 Rev = 350 MW.
8.10.20 - 12.10.2020.
Grounding Station Rihand Side
Rihand Stg I, II
Dadri
Rh 1-4
X (NO)
16
4
≃ 4 Amp.
2x2 Amp DC
400/765 ICT-1, 2
Rh 5, 6
16 A = (8+8 Amp DC)
16
12.8
≃ 4
V 11, 12 13
12.8 A = (4.2+5.6+3.0) Amp DC
X (NO)
400 kV. V-PS Bus.
400 kV Bus at Reliance Sasan
Pooling Stn. (PGCIL)
V1-10

HVDC Pole outages in 2024

Sr No	Date	Remarks
1	01.02.2024	HVDC pole-1 out & pole-2 i/s with ground return
2	04.06.2024	HVDC pole-1 out & pole-2 i/s with metallic return
3	09.11.2024	HVDC pole-1 out & pole-2 i/s with ground return
4	10.11.2024	HVDC pole-1 & 2 out
5	10.11.2024	HVDC pole-2 out & pole-1 i/s with ground return
6	12.11.2024	HVDC pole-2 also taken i/s