सत्यमेव जयते

भारत सरकार

Government of India

विद्युत मंत्रालय

Ministry of Power

उत्तर क्षेत्रीय विद्युत समिति

Northern Regional Power Committee

विषय: प्रचालन समन्वय उप-समिति की 217वीं बैठक की कार्यसूची।

Subject: Agenda of the 217th OCC meeting.

प्रचालन समन्वय उप-समिति की **217वीं** बैठक का आयोजन वीडियो कॉन्फ्रेंसिंग के माध्यम से दिनांक **15.03.2024** को **10:30** बजे से किया जायेगा । उक्त बैठक की कार्यसूची उत्तर क्षेत्रीय विद्युत् समिति की वेबसाइट http://164.100.60.165 पर उपलब्ध है ।

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

कृपया बैठक में उपस्थित होने की सुविधा प्रदान करें।

The **217th** meeting of the Operation Co-ordination sub-committee will be conducted through Video Conferencing on **15.03.2024** from **10:30 Hrs**. The agenda of this meeting has been uploaded on the NRPC web-site http://164.100.60.165.

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

Kindly make it convenient to attend the meeting.

(डी. के. मीना)
अधीक्षण अभियंता (प्रचालन)

List of addressee (via mail)			
OCC Members for FY 2023-24			
S. No.	**OCC Member**	**Category**	**E-mail**
1	CTUIL	Central Transmission Utility	kashish@powergrid.in
2	PGCIL	Central Government owned Transmission Company	ravindrangupta@powergrid.in
3	NLDC	National Load Despatch Centre	nomination awaited
4	NRLDC	Northern Regional Load Despatch Centre	alok.kumar@grid-india.in
5	NTPC	Central Generating Company	hrastogi@ntpc.co.in
6	BBMB		powerc@bbmb.nic.in
7	THDC		rrsemwal@thdc.co.in
8	SJVN		sjvn.cso@sjvn.nic.in
9	NHPC		vijayk@nhpc.nic.in
10	NPCIL		nomination awaited
11	Delhi SLDC	State Load Despatch Centre	nomination awaited
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	nomination awaited
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		nomination awaited
25	IPGCL	State Generating Company	nomination awaited
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		nomination awaited
31	PSPCL	State Generating Company & State owned Distribution Company	ce-ppr@pspcl.in
32	DHBVN	State owned Distribution Company (alphabetical rotaional basis/nominated by state govt.)	cecommercial@dhbvn.org.in
33	Jaipur Vidyut Vitran Nigam Ltd.		acempit@jvvnl.org
34	Madhyanchal Vidyut Vitaran Nigam Ltd.		commvvnl@gmail.com
35	UPCL		cgmupcl@yahoo.com
36	HPSEB		nomination awaited

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.		nomination awaited
41	Nabha Power Limited		Durvesh.Yadav@larsentoubro.com
42	Lanco Anpara Power Ltd		nomination awaited
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.		anilkumar02@ntpc.co.in
46	Adani Power Rajasthan Limited		manoj.taunk@adani.com
47	JSW Energy Ltd. (KWHEP)		roshan.zipta@jsw.in
48	RENEW POWER	IPP having less than 1000 MW installed capacity (alphabetical rotaional basis)	sumant@renew.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	BYPL	Private Distribution Company in region (alphabetical rotaional basis)	jitendra.nalwaya@relianceada.com
53	Bikaner Khetri Transmission Limited	Private transmission licensee (nominated by central govt.)	Abhishek.Kukreja@adani.com
54	Adani Enterprises	Electricity Trader (nominated by central govt.)	mayursinhd.gohil@adani.com
55	Ajmer Vidyut Vitran Nigam Ltd.	Special Invitee for FY 2023-24	ce.ruvnl@rajasthan.gov.in

Contents

खण्ड-क: उ.क्षे.वि.स. Part-A: NRPC

A.1. Confirmation of Minutes

216th OCC meeting was held on 14.02.2024. Minutes of the meeting were issued vide letter dt. 12.03.2024.

Decision required from Forum:

Forum may approve the minutes of 216th OCC meeting.

A.2. Review of Grid operations

A.2.1. Power Supply Position (Provisional) for February 2024

Anticipated Power Supply Position v/s Actual Power Supply Position (Provisional) of Northern Region during the month of February-2024 is as under:

State / UT	Req. / Avl.	Energy (MU)			Peak (MW)		
		Anticipated	Actual	% Variation	Anticipated	Actual	% Variation
CHANDIGARH	(Avl)	110	116	5.5%	300	301	0.3%
	(Req)	126	116	-7.9%	260	301	15.8%
DELHI	(Avl)	1950	2184	12.0%	5000	5406	8.1%
	(Req)	3047	2185	-28.3%	5000	5406	8.1%
HARYANA	(Avl)	4790	4253	-11.2%	11610	8868	-23.6%
	(Req)	4039	4272	5.8%	8900	8868	-0.4%
HIMACHAL PRADESH	(Avl)	1062	1032	-2.8%	2063	2133	3.4%
	(Req)	1063	1036	-2.5%	2115	2133	0.9%
J&K and LADAKH	(Avl)	1110	1672	50.7%	4130	3048	-26.2%
	(Req)	1810	1703	-5.9%	3090	3048	-1.4%
PUNJAB	(Avl)	5000	4517	-9.7%	10930	10307	-5.7%
	(Req)	4305	4517	4.9%	8500	10307	21.3%
RAJASTHAN	(Avl)	8030	9156	14.0%	18590	17867	-3.9%
	(Req)	8845	9159	3.6%	17000	17867	5.1%
UTTAR PRADESH	(Avl)	9570	9321	-2.6%	19000	20346	7.1%
	(Req)	9425	9389	-0.4%	19000	20346	7.1%
UTTARAKHAND	(Avl)	1177	1221	3.7%	2340	2523	7.8%
	(Req)	1204	1226	1.9%	2390	2523	5.6%
NORTHERN REGION	(Avl)	32799	33473	2.1%	77800	63800	-18.0%
	(Req)	33864	33603	-0.8%	62000	63800	2.9%

As per above, negative / significant variation (≥5%) in Actual Power Supply Position (Provisional) vis-à-vis Anticipated figures is observed for the month of February-2024 in terms of Energy Requirement for Chandigarh, Delhi, Haryana, HP, UTs of J&K and Ladakh, UP, and in terms of Peak Demand similar variation is noted for Chandigarh, Delhi, Haryana, UTs of J&K and Ladakh, Punjab, Rajasthan, UP, and Uttarakhand. These states/UTs are requested to submit reason for such variations so that the same can be deliberated in the meeting.

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

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

A.3.1 Maintenance Programme for Generating Units

The meeting on proposed maintenance programme for Generating Units for the month of April-2024 is scheduled on 14-March-2024 via Video Conferencing

A.3.2 Outage Programme for Transmission Elements

The meeting on proposed outage programme of Transmission elements for the month of April-2024 is scheduled on 14-March-2024 via Video conferencing.

A.4. Planning of Grid Operation

A.4.1. Anticipated Power Supply Position in Northern Region for April 2024

The Anticipated Power Supply Position in Northern Region for April 2024 is as under:

State / UT	Availability / Requirement	Revised Energy (MU)	Revised Peak (MW)	Date of revision
CHANDIGARH	Availability	160	360	No Revision submitted
	Requirement	133	288	
	Surplus / Shortfall	27	72	
	% Surplus / Shortfall	19.9%	25.2%	
DELHI	Availability	3970	7630	No Revision submitted
	Requirement	2734	6324	
	Surplus / Shortfall	1236	1306	
	% Surplus / Shortfall	45.2%	20.7%	
HARYANA	Availability	7100	11980	No Revision submitted
	Requirement	4910	10598	
	Surplus / Shortfall	2190	1382	

State / UT	Availability / Requirement	Revised Energy (MU)	Revised Peak (MW)	Date of revision
	% Surplus / Shortfall	44.6%	13.0%	
HIMACHAL PRADESH	Availability	1030	1902	11-Mar-24
	Requirement	1054	1875	
	Surplus / Shortfall	-24	27	
	% Surplus / Shortfall	-2.3%	1.4%	
J&K and LADAKH	Availability	1430	3290	No Revision submitted
	Requirement	1760	3169	
	Surplus / Shortfall	-330	121	
	% Surplus / Shortfall	-18.7%	3.8%	
PUNJAB	Availability	6910	11230	No Revision submitted
	Requirement	5150	8935	
	Surplus / Shortfall	1760	2295	
	% Surplus / Shortfall	34.2%	25.7%	
RAJASTHAN	Availability	9230	17180	No Revision submitted
	Requirement	8162	14994	
	Surplus / Shortfall	1068	2186	
	% Surplus / Shortfall	13.1%	14.6%	
UTTAR PRADESH	Availability	11700	25800	07-Mar-24
	Requirement	11400	25800	
	Surplus / Shortfall	300	0	
	% Surplus / Shortfall	2.6%	0.0%	
UTTARAKHAND	Availability	1263	2340	06-Mar-24
	Requirement	1290	2430	
	Surplus / Shortfall	-27	-90	
	% Surplus / Shortfall	-2.1%	-3.7%	
NORTHERN REGION	Availability	42793	75300	
	Requirement	36592	68500	
	Surplus / Shortfall	6200	6800	
	% Surplus / Shortfall	16.9%	9.9%	

SLDCs are requested to update the anticipated power supply position of their respective state / UT for the month of April-2024 and submit the measures proposed to be taken to bridge the gap between demand & availability, as well to dispose-off the surplus, if any, in the prescribed format.

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

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

All utilities are requested to update the status.

A.6. NR Islanding scheme

Latest status of Islanding Scheme of NR is attached as **Annexure-A.II.**

Members may kindly deliberate.

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

A.7.1. In 186th OCC meeting, it was agreed that coal stock position of generating stations in northern region may be reviewed in the OCC meetings on the monthly basis.

A.7.2. Accordingly, coal stock position of generating stations in northern region during current month (till 10th March 2024) is as follows:

Station	Capacity (MW)	PLF % (prev. months)	Normative Stock Reqd (Days)	Actual Stock (Days)
ANPARA C TPS	1200	0.83	17	12.1
ANPARA TPS	2630	0.73	25	12.3
BARKHERA TPS	90	0.19	26	49.5
DADRI (NCTPP)	1820	0.60	26	17.2
GH TPS (LEH.MOH.)	920	0.46	26	24.0
GOINDWAL SAHIB TPP	540	0.41	26	29.5
HARDUAGANJ TPS	1265	0.67	18	26.4
INDIRA GANDHI STPP	1500	0.58	26	24.2
KAWAI TPS	1320	0.81	26	9.1
KHAMBARKHERA TPS	90	0.15	26	41.2
KOTA TPS	1240	0.80	26	10.1
KUNDARKI TPS	90	0.28	26	21.1
LALITPUR TPS	1980	0.50	26	25.9
MAHATMA GANDHI TPS	1320	0.72	26	23.8
MAQSOODPUR TPS	90	0.18	26	54.8
MEJA STPP	1320	0.59	26	34.5
OBRA TPS	1094	0.50	26	15.6
PANIPAT TPS	710	0.59	26	26.0
PARICHHA TPS	1140	0.46	26	17.2
PRAYAGRAJ TPP	1980	0.50	26	28.5
RAJIV GANDHI TPS	1200	0.32	26	31.7
RAJPURA TPP	1400	0.64	26	27.0

Station	Capacity (MW)	PLF % (prev. months)	Normative Stock Reqd (Days)	Actual Stock (Days)
RIHAND STPS	3000	0.56	25	19.8
ROPAR TPS	840	0.48	26	12.8
ROSA TPP Ph-I	1200	0.61	26	14.4
SINGRAULI STPS	2000	0.84	17	27.5
SURATGARH TPS	1500	0.82	26	7.9
TALWANDI SABO TPP	1980	0.61	26	8.3
TANDA TPS	1760	0.86	18	17.8
UNCHAHAR TPS	1550	0.61	26	24.7
UTRAULA TPS	90	0.23	26	30.7
YAMUNA NAGAR TPS	600	0.82	26	22.2
CHHABRA-I PH-1 TPP	500	0.53	26	38.7
KALISINDH TPS	1200	0.49	26	5.6
SURATGARH STPS	1320	0.66	26	7.5
CHHABRA-I PH-2 TPP	500	0.39	26	4.3
CHHABRA-II TPP	1320	0.79	26	5.6

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

A.8.1. In the 68th meeting of NRPC issues arising due to non-availability of sufficient ERS were discussed and it was decided that ERS availability monitoring shall be taken as rolling/follow-up agenda in OCC meetings for regular monitoring of ERS under different utilities in Northern region.

A.8.2. Subsequently matter was deliberated in 211th OCC meeting wherein NRLDC representative briefed about the Requirement of ERS, recent experience in Northern Region, CEA Regulation on ERS, Govt. Guidelines and Present situation on ERS.

A.8.3. NRPC Sectt. vide letter dated 26.09.2023 requested all transmission utilities of NR to furnish the length of transmission line (ckt-kms) and number of ERS towers available with them at different voltage levels (e.g. 220 kV, 400 KV 765 KV and + -500 kV HVDC via email at **seo-nrpc@nic.in**.

A.8.4. In this regard, inputs received from utilities are attached as **Annexure-A.III.**

Transmission utilities of NR to update status.

A.9. Proposed SPS for 2X315 MVA, 400/220kV ICTs at 400kV GSS Babai (Agenda by RVPN)

A.9.1. RVPN vide letter dated 26.02.2024 has proposed a SPS for 2X315 MVA, 400/220kV ICTs at 400kV GSS Babai (details of the SPS is attached as **Annexure-A.IV**)

Members may kindly deliberate.

A.10. Early restoration of NAPP-Khurja 220kV Transmission line from Khurja end & review of NAPS islanding scheme (Agenda by NAPS)

A.10.1 NAPS vide letter dated 22.02.2024 (copy attached as **Annexure-A.V**) has intimated that NAPS-Khurja 220 KV transmission line is out of service from 15.02.2024 due to fire at Khurja substation. Further, it would take approx. 6 months time to normalize the system and connect back to the grid.

A.10.2 Moreover, this line is a part of NAPS islanding scheme. NAPS makes island with Debai, Khurja and Simbholi substation when both units of NAPS are in operating condition. Total island load is in the range of 150-280 MWe. At present both NAPS-1&2 are in operating condition.

A.10.3 In this regard, NAPS has requested for review of existing NAPS Islanding scheme in view of long outage of NAPS Khurja 220kV Transmission line and Khurja substation from grid.

Members may kindly deliberate.

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

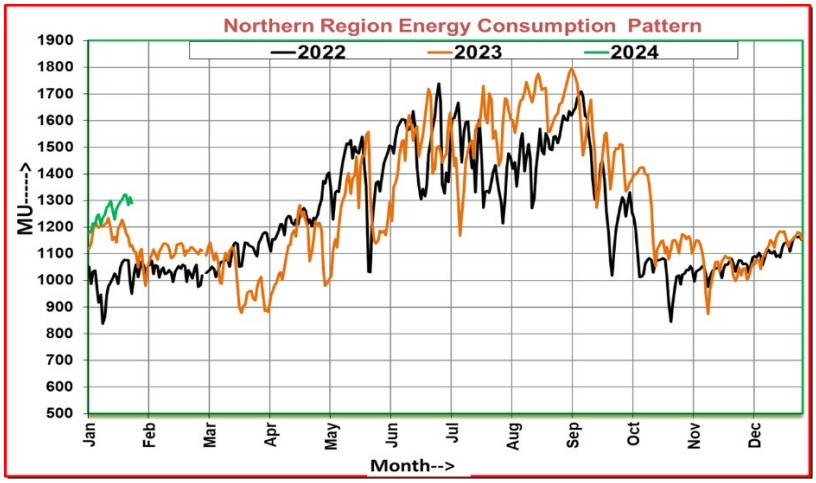
B.1. NR Grid Highlights for February 2024

Detailed presentation on grid highlights of Feb'2024 will be shared by NRLDC in OCC meeting.

B.2. Summer Preparedness 2024

With the increase in temperature, demand of Northern Region starts increasing from March onwards every year. Summer of Northern region are typically hot and demand is also high during this time, therefore advance actions help in better grid operation.

Due to extreme weather conditions, high demand is observed during summer/monsoon months in Northern region. Along with high demand, high loadings of lines and transformers and low voltages especially at distribution level are big challenge to safe and secure grid operation.



To overcome the commonly encountered challenges during summer months and ensuring smooth grid operation, following are few points which have been discussed on many occasions in previous OCC and TCC/ NRPC meetings and are required to be followed by all:

S. No.	Issues	Action plan	Action by
1	**Maintenance of reserves** During summer, in anticipation of increasing demand, adequate reserves shall be maintained. During summer, sudden outage of hydro units on silt or other major generation outage affects frequency/voltage, line loading, reliability and security of the corridor/control area/Generation complex etc. In events of sudden load crash, ISGS generators are being instructed to back down to 55% of their installed capacity. However, amongst states only UP state controlled generators are seen to be backing down upto 55%, which ensures that sufficient reserves are available to cater any variation in demand.	In such cases, apart from portfolio management based on proper forecast as discussed above, re-starting of units under reserve shutdown at state as well as Inter-state level through appropriate transactions is required. Moreover, display window showing reserve available in ISGS generators has been developed at NRLDC. SLDCs are also requested to arrange for such display window at their control centers so that system operators readily know quantum of reserve available and hence better real-time actions can be taken. Other states are also requested to take actions to ensure backing down of generators to 55% of their capacity in case of critical situations. This would ensure reserves in the system and also make us prepared for extreme situations.	NRLDC, SLDCs, Generators

2	**Furnishing of coal stock position** Advance information of coal stock of thermal plants ensures generating units availability and it is very important during high demand season.	It has been observed in past years that sudden information of outage of thermal units on coal unavailability poses challenges to meet high demand. It is therefore requested to update & share coal stock position of thermal plants at least a week in advance as agreed earlier in TCC/NRPC meeting.	Generators, SLDCs
3	**Portfolio Management, load staggering** As discussed in previous OCC meetings states such as UP, Rajasthan and Haryana connect/ disconnect large quantum of load at hourly boundaries resulting in frequency spikes and instantaneous over voltages. This has also resulted in tripping of lines on overvoltage in recent past. In view of high/increasing demand & transmission constraints (if any) in importing the power or in case of any contingency in the system, states are requested to maximize their internal generation to avoid low frequency/low voltage operation or other related issues.	Apart from LTA/MTOA/STOA/ Market arrangements based on forecast, other short term arrangements should also be planned for real time imbalances. For example, ensuring adequate margin while scheduling own thermal generation, units on bar, maintenance of reserves, technical minimum operation of thermal units in case of load crash, tie up with neighbor states or hydro rich states and utilization of real-time market etc. to bridge the load-generation gap in real time.	SLDCs
4	**Tower Strengthening and availability of ERS** There have been number of instances of tower collapse & damage in the past during thunder storms which resulted in constraints in power transmission for extended duration of time. Number of tower collapse incidents occurred during last summer also in May/Jun 2022 & 2023 in which many EHV lines including 765kV lines were out on tower collapse.	All utilities are requested to ensure availability of Emergency Restoration System (ERS) for early restoration of supply. Each utility shall work on plan for tower repairing work before April. Extra precautions need to be taken care for important lines which have history of tripping during thunderstorm/ windstorm. PTCUL, PKTCL, NRSS XXXVI, HPPTCL, HVPNL,	STUs and POWERGRID

	Number of 400kV lines were also out in Rajasthan control area leading to curtailment of RE in Western Rajasthan.	NRSS-XXXI are not having ERS as per information available. Further, RVPN and DTL also need to procure ERS for 400kV towers. ERS procurement may be expedited by licensees having deficit ERS than requirement as per the Govt. norms	
5	**Reactive power management** Over the years during summer months, it has been observed that voltage profile during summer has improved. However, it is always essential to remain alert and take all necessary precautions to avoid any issues arising due to low voltages during summer months.	To maintain the voltage profile of Grid within IEGC band during summer, following known actions are suggested: i. Switching ON Capacitor/Switching OFF reactor as per system requirement ii. Tap Optimization at 400/220kV by NRLDC and 220/132kV by respective state control area based on scatter plots of ICTs, offline studies, NRPC RE account etc. iii. Dynamic reactive support from Generator as per their capability curve. iv. SCADA Displays for better visualization during real-time	NRLDC, SLDCs
6	**Defense Mechanism** Several defense mechanism schemes have been recommended by various committees and advantages of such defense schemes have been discussed in many fora too. Majority of defense mechanism are to cover protection for under voltage, under frequency, rate of change of frequency, SPS for line/ICTs loading/generator complex evacuation etc. It is pertinent to mention here that SPS is only for operational	Till date it has been observed that performance of SPS is considerably low. Accurate operation of SPS is very essential and hence, mapping of SPS in SCADA is also being done. It is suggested that all state control area/Users shall ensure before start of summer that their protection and defense system are in working conditions and settings are as per the recommendations of NRPC.	Transmission utilities (STU/ISTS) and SLDCs

	defense and should not be considered as long term solution.	In addition, all states/user need to provide update for changes or modifications carried out if any.	
7	**Telemetry** It has been observed number of times, that telemetry of large nos of stations is affected during contingency, inclement weather, or in day to day switching operations etc.	All are requested to ensure the telemetry of all analog & digital points of all stations at respective control centers. Large number of telemetry issues are also encountered with newly commissioned elements. Analog as well as Digital data of from many Rajasthan Stations is not reliable. Matter had been taken up in 24th TEST meeting. Major issues of telemetry data at 400 KV Heerapura, Hindaun, Ratangarh ,Bhilwara and Phagi lines have been reported. At some places isolators are open.	SLDCs STUs

Due to unfavourable weather conditions during summer months, All India demand is on the higher side. On several days, it is observed that frequency is below the band for most of the time. In order to maintain the Grid security all SLDCs are requested to take proactive steps as follows:

- Ensure that ADMS is in service and expedite its implementation if not commissioned. Latest status for NR states is shown below:

DELHI	Scheme Implemented but operated in manual mode.
HARYANA	Scheme not implemented
HP	Scheme not implemented
PUNJAB	Scheme not implemented
RAJASTHAN	Under implementation. Likely completion schedule is 31.12.2023.
UP	Scheme implemented by NPCIL only
UTTARAKHAND	Scheme not implemented

- Ensure healthiness and availability of AUFLS and df/dt load shedding.
- Ensure revival of intra-state generators under economic shutdown/RSD
- Ensure portfolio balancing through STOA/RTM market segments
- Ensure no under injection by the generators from schedule
- In case of inadequate margins in intrastate generators measures for emergency load regulation measures may be taken in interest of grid security.

- Pursue generators to expedite revival of thermal units under forced outage wherever feasible.

In this case, the list of radial feeders become very important. Utilities have been requested number of times to update list of radial feeders which can be opened on the directions of NRLDC to regulate the demand. List of such radial feeders has been provided by respective utilities and is part of 'Operating Procedure of Northern Region'. Latest list of radial feeders is also attached as **Annexure-B.I**. Following are the attributes for such feeders:

- Feeders shall be radial in nature
- They should usually have substantial load flow so that reduction of drawal can be prominently noticed on opening of such lines.

The opening of feeders is generally an extreme step which shall be required in case of threat to grid security and non-adherence to RLDC instructions to manage overdrawl by SLDCs/ DISCOMs. In such a case, every utility needs to take actions to support RLDC by following their instructions including opening of feeders.

SLDCs are once again requested to verify that

- list of feeders are actually radial in nature and are likely to provide the expected relief
- such feeders are not part of any other scheme such as any SPS, UFR or df/dt actuated shedding

Telemetry is to be ensured for all such feeders for monitoring in real time by SLDC/ NRLDC. States are also advised to take remedial measures for minimizing sustained over drawal at low frequencies as per the IEGC.

Members may like to discuss.

B.3. Quantum of Reserve for SRAS & TRAS

The Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2023 (hereinafter called 'Grid Code') was published on 11.07.2023, in the Gazette of India Extraordinary (Part-III, Section-4, No. 488)

Regulation 30 (11)(k) of the Grid Code requires NLDC to prepare a detailed methodology for the assessment of secondary reserve capacity and submit the same for approval of the Commission. Further Regulation 30(11)(a) requires NLDC to assess tertiary reserve requirements for the regional control area and the State control area. In line with above regulations, Grid-India submitted detailed procedure to CERC after stakeholder consultation and same was approved by CERC vide their letter dated 28th Sep 2023. (https://posoco.in/wp-content/uploads/2023/10/Order_SRAS-TRAS-Approved.pdf).

NLDC vide their letter dated 25.01.2024 (**Annexure-B.II**) has highlighted SRAS & TRAS at regional level for reserves for year ahead basis.

Apart from this, number of other procedures and timelines have been provided for data submission in IEGC 2023 and various procedures prepared in line with IEGC 2023.

Accordingly, it is requested that all states once again go through the procedures, available @ https://posoco.in/en/nldc-procedures/ and ensure that all the data that is to be submitted as per these procedures is adhered and submitted timely. Executives at NRLDC/NLDC may always be consulted for any doubts/clarifications related to data submission or thereof.

Members may please discuss.

B.4. RE related Issues in Northern region

Presently more than 13000MW of renewable generation has been connected in the ISTS network in Western Rajasthan. As deliberated in previous NRPC meetings, number of issues have been observed with increasing RE integration in Western Rajasthan. On many occasions, multiple element tripping including outage of renewable generation has also taken place.

Following issues are being observed w.r.t. performance of RE plants:

a. As stipulated in Central Electricity Authority (Technical Standards for Connectivity to the Grid) (Amendment) Regulations, 2013, Part-II, clause B1, Sub-clause (1), (2), (3) & (4) about requirements with respect to Harmonics, Direct Current (DC) Injection and Flicker are as follows;

B1. Requirements with respect to Harmonics, Direct Current (DC) Injection and Flicker

(1) Harmonic current injections from a generating station shall not exceed the limits specified in Institute of Electrical and Electronics Engineers (IEEE) Standard 519.

(2) The Generating station shall not inject DC current greater than 0.5 % of the full rated output at the interconnection point.

(3) The generating station shall not introduce flicker beyond the limits specified in IEC 61000. Provided that the standards for flicker will come into effect from 1st April 2014.

(4) Measurement of harmonic content, DC injection and flicker shall be done at least once in a year in presence of the parties concerned and the indicative date for the same shall be mentioned in the connection agreement.

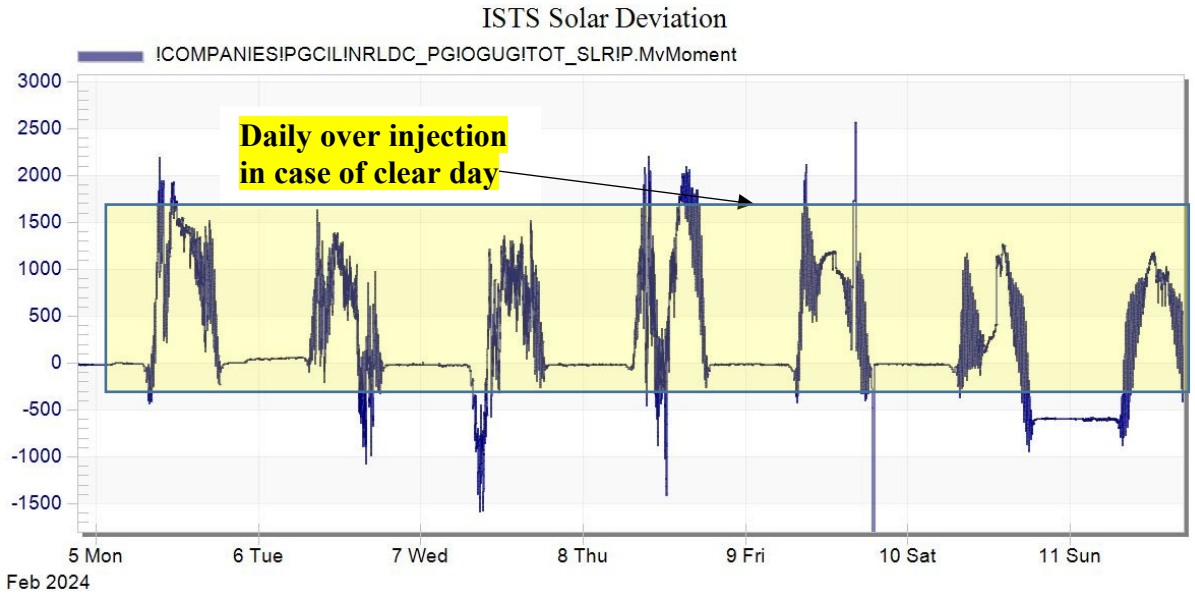
Provided that in addition to annual measurement, if distribution licensee or transmission licensee or the generating company, as the case may be, desires to measure harmonic content or DC-injection or flicker, it shall inform the other party in writing and the measurement shall be carried out within 5 working days.

It is requested to perform Power Quality measurement, Harmonic analysis test and Flicker test at Field as per CEA regulation as mentioned above and submit the Test report for Power Quality measurement, Harmonic analysis, DC injection and Flicker test showing the %THD and distortion due to nth Harmonic at Point of Interconnection for Voltage and Current, DC injection and Flicker at POI. Same was also requested vide NRLDC letter dated 04.03.2024 attached as **Annexure-B.III.**

b. Significant amount of Reactive MVAr is required for the collector system/IDTs/ICTs and dedicated line at the time of Peak Solar generation of a RE plant. This leads to MVAr absorption from Pooling station and subsequent low voltage issue in pooling station.

Now RE plants are installing either SVGs (Static VAr generators) or additional Inverters or STATCOMs to provide adequate dynamic reactive support to ensure Voltage stability. This has been ensured from the connectivity stage itself after WG 2022 report.

c. Common Challenges associated with RE integration are Variability, Balancing Reserves, System Inertia, Predictability, Observability, Net Load Ramp, Reactive power management and Protection coordination etc. On several days it is being observed that RE plants in NR are overinjecting during the day time. The aggregate overinjection from 12-13GW ISTS RE capacity is coming to be in range of 1000-1500MW.



All RE plants are requested to strictly generate as per their respective schedule.

d. Various events of RE generation loss occurred during events of fault in the complex, Non-compliance of LVRT/HVRT requirement at Interconnection point are still being observed. To avoid any generation loss, LVRT/HVRT compliance at POI need to be ensured by RE plant(s)

It has been observed that there have been several events in the last 2-3 months which have led to significant RE generation loss, although faults are getting cleared within stipulated time.

Some of these events are mentioned below:

S. No.	Generation Loss (MW)	Date & Time of Event	Frequency Dip (Hz)	Triggering incident
1	**~2510**	03.03.2024 14:01:03hrs	0.25	R-Y phase to phase fault on 400 KV Kankani-Jaisalmer (RS) Ckt-2
2	**~1225**	24.01.2024 12:16:51hrs	0.12	Y-B phase to phase fault on 400kV Bhadla-Bikaner (RS) ckt-1
3	**~2020**	15.01.2024 13:59:34hrs	0.15	R-B phase to phase fault on 400kV Bhadla-Bikaner (RS) ckt-1
4	**~1760**	15.01.2024 14:06:41hrs	0.21	R-Y phase to phase fault on 400kV Bhadla-Bikaner (RS) ckt-2
5	**~1360**	10.01.2024 12:19:43hrs	0.21	Y-B phase to phase fault on 400kV Bhadla-Bikaner (RS) ckt-2
6	**~1600**	17.12.2023 13:01:03hrs	0.15	Y-B phase to phase fault on 400kV Bhadla-Bikaner (RS) ckt-1
7	**~1600**	17.12.2023 13:14:25hrs	0.18	Y-B phase to phase fault on 400kV Bhadla-Bikaner (RS) ckt-2

RE generation dip in the range of 1500-2500MW were observed, Due to which significant drop in frequency occurred. As per analysis of PMU data of RE plants, some of the RE plants were found Non-compliant w.r.t CEA clause B2(3) and B2(7) (LVRT & HVRT requirement at Interconnection point).

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

1. NRLDC letter NRLDC\ RES\TS-108\ dated 22.01.2024
2. NRLDC letter NRLDC\ RES\TS-108\ dated 16.01.2024
3. NRLDC letter NRLDC\ RES\TS-108\656-668 dated 27.12.2023

NRLDC has also written to the RE plants on 1st March'24 that the model submitted during First time charging showed that plants are complying with LVRT/HVRT regulations of CE technical standards for connectivity to the Grid, however same is not being observed in real-time. Accordingly, suitable changes in model may also be provided so that actual behavior of RE plants is represented through simulation tests.

Following RE plants were observed to be non-compliant w.r.t. CEA clause B2(3) and B2(7) (LVRT & HVRT requirement at Interconnection point) in most of the grid-events involving RE generation loss for last several months:

Pooling Station	Plant Name	Capacity (MW)
Bhadla-I	Clean Solar Power (Jodhpur) Pvt. Ltd.	300
Bhadla-II	Avaada Sunrays Pvt. Ltd.	320
Bikaner	Renew Surya Ravi Private Limited Bikaner (RSRPL)	300
	Renew Solar Power Pvt Ltd, Bikaner (BIKNP)	250
Fatehgarh-II	ReNew Solar Energy Jharkhand Three Pvt. Ltd (RJ3PL)	300
	Adani Hybrid Energy Jaisalmer Two Limited (AHEJ2)	375
	Adani Solar Energy Jaisalmer one Limited: Wind	420
	ReNew Solar Urja Private Limited(RSUPL)	300

Above RE plants are specially requested to analyse the past grid events in detail and take corrective actions. Corrective Actions taken to improve performance during fault ride through condition may be subsequently shared with NRLDC/NRPC. Apart from this, for some of the other plants where PMU data was down, are requested to make sure that PMU healthiness is checked at site and it may be ensured in coordination with NRLDC SCADA team that PMUs are reporting to NRLDC control room.

e. Few events of High frequency voltage oscillation occurred in RE complex of Northern Regional grid during Aug'23-Feb'24. Issue have been addressed by PMU data analysis, taking identified plants in Fixed-Q mode, taking STATCOM at Fatehgarh-II(PG) in Fixed-Q (Manual mode), changing mode of operation of STATCOMs keeping minimal outage of line in the RE complex.

However, it is important that all RE plants record the data at inverter & PPC level for such events and share with NRLDC. It is being observed that even after repeated requests from NRLDC side, very little information is being received at NRLDC.

Further, in view of past experience of frequent outage of lines in RE complex during summer after thunderstorm, there may be requirement of RE curtailment due to inadequate evacuation paths. Accordingly, in such cases RE plants need to ensure that diligent manpower is made available at control center, so that in case of any instruction from NRLDC, such instructions are quickly acted upon.

Members may like to discuss.

B.5. Sharing of ATC/TTC assessment and basecase with NRLDC

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

CERC vide their order dated 29.09.2023 has granted approval of "'Detailed Procedure for Allocation of Transmission Corridor for Scheduling of General Network Access and Temporary General Network Access under Central Electricity Regulatory Commission (Connectivity and General Network Access to the inter-State Transmission System) Regulations, 2022".

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

Purpose	***Sl No***	***Action of Stakeholder***	***Responsibility***	***Submission to***	***Data/ Information Submission Time line***
1. Revision 0 TTC/ATC Declaration for Month 'M'	*1(a)*	*Submission of node wise Load and generation data along with envisaged scenarios for assessment of transfer capability*	*SLD*	*RLDC*	*10th Day of 'M-12' month*
		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*	*SLD*	*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*	*SLD*	*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*	*SLDC*	*RLDC*	*22nd Day of*

		with RLDC			*'M-1' month*

To encourage participation from SLDCs with regard to 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.5.1 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 March'25 i.e. Morning Peak, Solar Peak, Evening Peak & Off-Peak hours as given below

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

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

Basecase & ATC/TTC assessment was received from only Haryana, UP and J&K SLDC for M-12 scenarios.

It was discussed in last several OCC meetings & all states were requested to share basecase as well as ATC/TTC assessments for M-11 scenarios on monthly basis with NRLDC as per CERC approved procedure. Accordingly, it is requested to submit the basecase as well as ATC/TTC assessments.

Members may please discuss.

B.5.2 Sharing of Data and study results for interconnection studies

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

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

In line with above, utilities are requested to share the list of **elements/LGB data/interconnection study results** etc as per the approved procedure which are expected to be commissioned up to **September 2024, before 08.03.2024. Above was also requested vide mails dated 29.02.2024 by NRLDC. This needs to be practised as monthly exercise on regular basis.**

It 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.

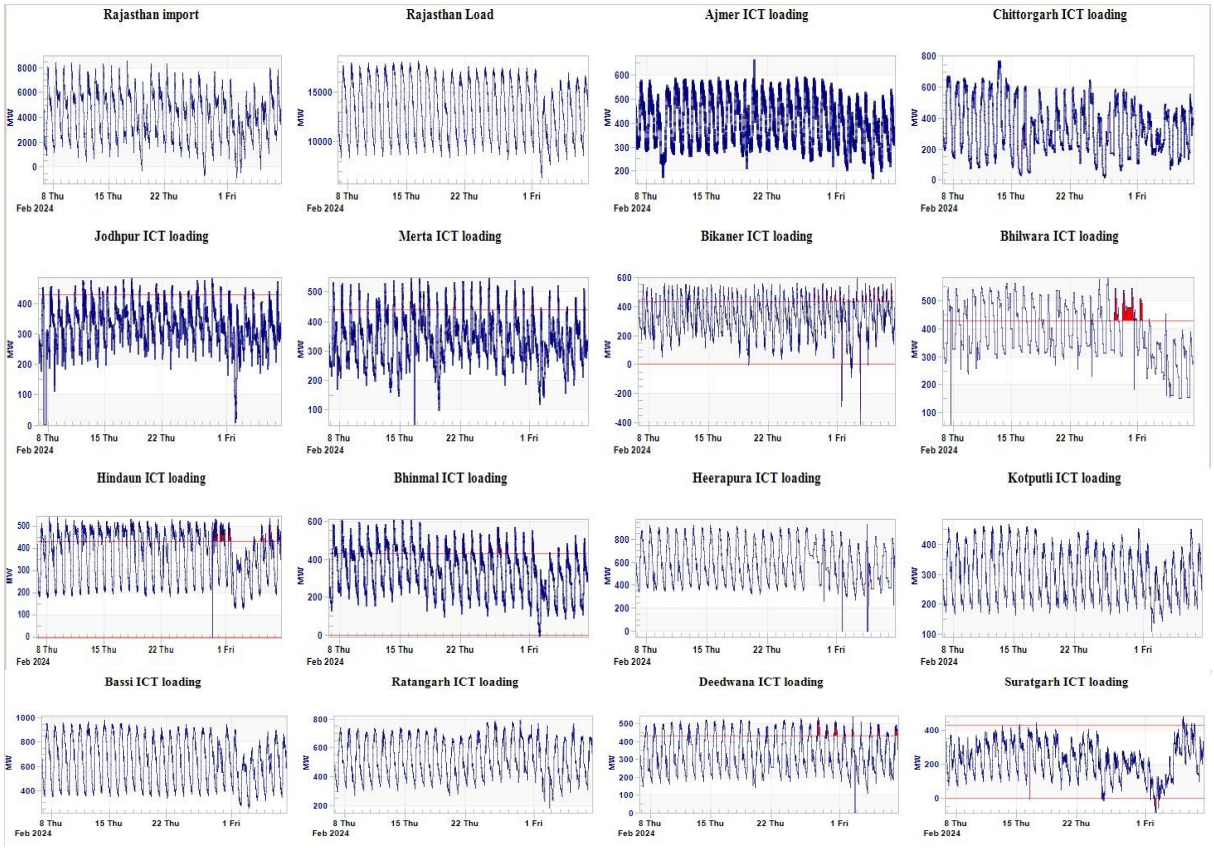
B.5.3 ATC/TTC of states for summer 2023-24 (M-1)

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

ATC/TTC assessment for summer 2024 is yet to be received from the states

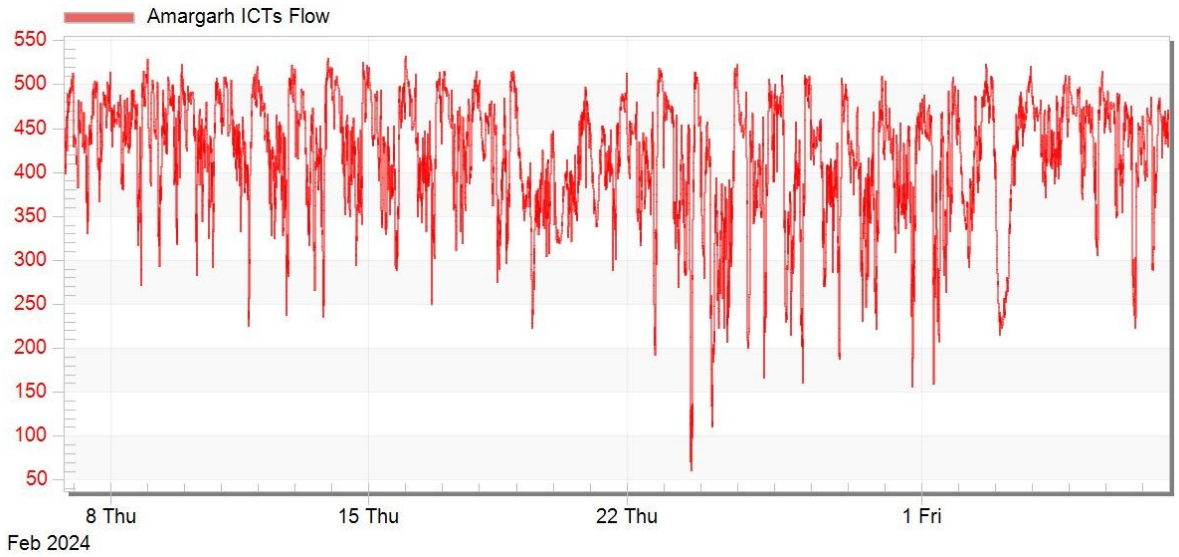
B.5.4 Constraints observed during last month

It is being observed that loading of 400/220kV ICTs at number of RVPN substations continue to be on the higher side. Some of the such stations are shown below along with loading of 400/220kV ICTs for last 30 days:



From the data available at NRLDC, it is being observed that the loading of almost all 400/220kV substations (intrastate as well as interstate) in Rajasthan is beyond their N-1 contingency limit during day-time. Such situation may always load loss in particular area of N-1 non-compliance apart from possibilities of major grid disturbance in Rajasthan control area.

Plot of loading of 400/220kV 2*315MVA ICTs at Amargarh which was not N-1 compliant for last 30 days is shown below:



As discussed in 216 OCC meeting, it is requested that,

- All SLDCs assess and share ATC/TTC assessment for Summer 2024 at the earliest.
- All states to share data and base case for M-6 & M-11 timelines as discussed in the agenda.
- SLDCs to take actions to ensure that loading of ICTs and lines under their jurisdiction are below their N-1 contingency limits.
- Maximize internal generation in case of drawl near to the transfer capability limits.
- Forum agreed that in case no assessments for eleven months in advance are shared by SLDC, the existing ATC/TTC assessment could be published on website and considered for the said month.

Members may please discuss.

B.6. Frequent forced outages of transmission elements in the month of February'24:

The following transmission elements were frequently under forced outages during the month of **February'24**:

S. NO.	Element Name	No. of forced outages	Utility/ SLDC
1	220 KV Alusteng-Drass (PG) Ckt-1	4	POWERGRID
2	220 KV Ganguwal-Jamalpur (BB) Ckt-1	4	Rajasthan/ RAPS
3	220 KV RAPS_A(NP)-Sakatpura(RS) (RS) Ckt-1	4	Rajasthan/ RAPS
4	220 KV RAPS_A(NP)-Sakatpura(RS) (RS) Ckt-2	4	Rajasthan/ RAPS
5	400 KV Agra-Unnao (UP) Ckt-1	4	UP
6	400 KV Bareilly-Unnao (UP) Ckt-2	4	UP
7	400 KV Unnao(UP)-Jehta_Hardoi Road (UP) (PG) Ckt-2	5	UP

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

It may be noted that frequent outages of such elements affect the reliability and security of the grid. Hence, utilities are requested to analyze the root cause of the tripping and share the remedial measures taken/being taken in this respect.

Members may like to discuss.

B.7. Multiple element tripping events in Northern region in the month of February '24:

A total of 20 grid events occurred in the month of Feb'24 of which **13** are of GD-1 category, **01** are of GI-1 Category and **06** are of GI-2 Category. The tripping report of all the events have been issued from NRLDC. A list of all these events is attached at **Annexure-B.VI.**

Maximum delayed clearance of fault observed in event of multiple elements tripping at 400/220kV Bhadla(RS) on 25th February, 2024 (As per PMU at Bikaner(PG), R-Y

phase to phase fault converted to 3-phase fault is observed with delayed fault clearance time of 880 msec.)

Delayed clearance of fault (more than 100ms for 400kV and 160ms for 220kV system) observed in total **06** events out of **20** grid events occurred in the month. In 05 (no.) of grid events, there was no fault in the grid.

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

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

DR/EL of the following grid events not received till date:

a) 220kV Jamalpur(BB) on 1st Feb'24
b) 220kV Kunihar(HP) on 2nd, 8th & 16th Feb'24
c) 220kV Jamalpur(BBMB) on 23rd Jan'24
d) 220kV Yamunanagar(HR) on 8th Feb'24
e) 400/220kV Bhadla(RS) on 25th Feb'24
f) 400/220kV Hinduan(RS) on 28th Feb'24 (partial data received)
g) 400/220kV Suratgarh(RS) on 28th Feb'24

Detail report of majority of the grid events not received yet.

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

Members may like to discuss.

B.8. Details of tripping of Inter-Regional lines from Northern Region for February' 24:

A total of 09 inter-regional lines tripping occurred in the month of February'24. The list is attached at **Annexure-B.VII.** 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.

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

Members may like to discuss.

B.9. Grid disturbance in 220kV Kunihar, Baddi complex during Feb'24:

Frequent event of multiple elements tripping have been reported in recent past (on 02nd Feb, 08th Feb and 16th Feb) in HP control area. Major affected substations were 220kV Kunihar, Baddi and Bhabha. Significant quantum of load in the range of 400-700MW affected during these grid events.

During Aug-Sept 2023 also, Grid events at Kunihar area were reported. Those events were discussed in 48th PSC meeting and PSC forum had recommended third party protection audit of Kunihar S/s. However, no update on the same have received and multiple events in recent past indicates that issues related to protection system and their coordination at these affected stations are still existing.

DR/EL and detail analysis of any of these events have not received from HP. Therefore, HP is requested to analyse the tripping events in detail and share following details w.r.t. all three grid events occurred in Feb'24:

- Disturbance recorder and event logger details of all the tripped elements.
- Sequence of tripping of elements.
- Details of protection operated along with their protection settings.
- Tripping analysis report along with corrective actions taken / planned to be taken.

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.

Kindly take necessary actions on priority and share the details at the earliest.

B.10. Status of submission of DR/EL and tripping report of utilities for the month of February'24.

The status of receipt of DR/EL and tripping report of utilities for the month of Febuary'24 is attached at **Annexure-B.VIII**. It is to be noted that as per the IEGC provision under clause 37.2 (c), tripping report along with DR/EL has to be furnished within 24 hrs of the occurrence of the event. However, it is evident from the submitted data that reporting status is not satisfactory and needs improvement. Also, it is observed that reporting status has improved however, reporting status from BBMB, Punjab, Delhi, HP, Rajasthan & J&K need further improvement.

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

Members may like to discuss.

B.11. Mock black start exercises in NR:

As per Indian Electricity Grid Code (IEGC) clause 34.3

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

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

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

Mock black start exercise conducted during 2023-24:

i) Tehri HEP: conducted on 07th Dec'23
ii) Dadri GPS: conducted on 15th Dec'23
iii) Anta GPS: conducted on 29th Feb'24
iv) Rihand & Obra HEP: 16th Feb'24

Mock black start exercise planned to be conducted during 2023-24:

i) Malana-II HEP: Mar'24 by HP
ii) Tanakpur HEP: Mar'24
iii) Koldam HEP: Mar'24

Members are requested to share the tentative schedule of mock black start exercise of generating stations in their respective control area. SLDCs shall submit the reports of black start exercise in their respective control area. SLDCs may also identify further generating stations/unit for black start exercise.

Members may like to discuss.

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 — Jan-2024
◎ HARYANA — Dec-2023
◎ HP — Oct-2023
◎ J&K and LADAKH — Not Available
◎ PUNJAB — Dec-2023
◎ RAJASTHAN — Jan-2024
◎ UP — Jan-2024
◎ UTTARAKHAND — Feb-2024
All States/UTs are requested to update status on monthly basis.</td></tr>
<tr><td>3</td><td>Healthiness of defence mechanism: Self-certification</td><td>Report of mock exercise for healthiness of UFRs carried out by utilities themselves on quarterly basis is to be submitted to NRPC Secretariat and NRLDC. All utilities were advised to certify specifically, in the report that “All the UFRs are checked and found functional”.</td><td>Data upto following months, received from various states / UTs:
◎ CHANDIGARH — Not Available
◎ DELHI — Dec-2023
◎ HARYANA — Dec-2023
◎ HP — Oct-2023
◎ J&K and LADAKH — Not Available
◎ PUNJAB — Dec-2023
◎ RAJASTHAN — Dec-2023
◎ UP — Dec-2023
◎ UTTARAKHAND — Dec-2023
◎ BBMB — Dec-2023
All States/UTs are requested to update status for healthiness of UFRs on monthly basis for islanding schemes and on quartely basis for the rest .</td></tr>
<tr><td></td><td></td><td>In compliance of NPC decision, NR states/constituents agreed to raise the AUFR settings by 0.2 Hz in 47th TCC/49th NRPC meetings.</td><td>Status:
◎ CHANDIGARH — Not Available
◎ DELHI — Increased
◎ HARYANA — Increased
◎ HP — Increased
◎ J&K and LADAKH — Increased
◎ PUNJAB — Increased
◎ RAJASTHAN — Increased
◎ UP — Increased
◎ UTTARAKHAND — Increased
◎ BBMB — Increased</td></tr>
</table>

<table>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td>4</td><td>Status of FGD installation vis-à-vis installation plan at identified TPS</td><td>List of FGDs to be installed in NR was finalized in the 36th TCC (special) meeting dt. 14.09.2017. All SLDCs were regularly requested since 144th OCC meeting to take up with the concerned generators where FGD was required to be installed.
Further, progress of FGD installation work on monthly
basis is monitored in OCC
meetings.</td><td>Status of the information submission (month) from states / utilities is as under:
<table><tr><td>◎</td><td>HARYANA</td><td>Sep-2023</td></tr><tr><td>◎</td><td>PUNJAB</td><td>Feb-2024</td></tr><tr><td>◎</td><td>RAJASTHAN</td><td>Jul-2023</td></tr><tr><td>◎</td><td>UP</td><td>Jan-2024</td></tr><tr><td>◎</td><td>NTPC</td><td>Feb-2023</td></tr></table>FGD status details are enclosed as Annexure-A.I.II.
All States/utilities are requested to update status of FGD installation progress on monthly basis.</td></tr>
<tr><td>5</td><td>Submission of breakup of Energy Consumption by the states</td><td>All states/UTs are requested to submit the requisite data as per the billed data information in the format given as under:
<table><tr><td>Category→</td><td>Consumption by Domestic Loads</td><td>Consumption by Commercial Loads</td><td>Consumption by Agricultural Loads</td><td>Consumption by Industrial Loads</td><td>Traction supply load</td><td>Miscellaneous / Others</td></tr><tr><td><Month></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table></td><td>Status of the information submission (month) from states / utilities is as under:
<table><tr><td></td><td>State / UT</td><td>Upto</td></tr><tr><td>◎</td><td>CHANDIGARH</td><td>Not Submitted</td></tr><tr><td>◎</td><td>DELHI</td><td>Jan-24</td></tr><tr><td>◎</td><td>HARYANA</td><td>Dec-23</td></tr><tr><td>◎</td><td>HP</td><td>Jan-24</td></tr><tr><td>◎</td><td>J&K and LADAKH</td><td>Not Submitted</td></tr><tr><td>◎</td><td>PUNJAB</td><td>Dec-23</td></tr><tr><td>◎</td><td>RAJASTHAN</td><td>Dec-23</td></tr><tr><td>◎</td><td>UP</td><td>Dec-23</td></tr><tr><td>◎</td><td>UTTARAKHAND</td><td>Oct-23</td></tr></table>J&K and Ladakh and Chandigarh are requested to submit the requisite data w.e.f. April 2018 as per the billed data information in the given format</td></tr>
<tr><td>6</td><td>Information about variable charges of all generating units in the Region</td><td>The variable charges detail for different generating units are available on the MERIT Order Portal.</td><td>All states/UTs are requested to submit daily data on MERIT Order Portal timely.</td></tr>
<tr><td>7</td><td>Status of Automatic Demand Management Sysytem in NR states/UT's</td><td>The status of ADMS implementation in NR, which is mandated in clause 5.4.2 (d) of IEGC by SLDC/SEB/DISCOMs is presented in the following table:</td><td>Status:
<table><tr><td>◎</td><td>DELHI</td><td>Scheme Implemented but operated in manual mode.</td></tr><tr><td>◎</td><td>HARYANA</td><td>Scheme not implemented</td></tr><tr><td>◎</td><td>HP</td><td>Scheme not implemented</td></tr><tr><td>◎</td><td>PUNJAB</td><td>Scheme not implemented</td></tr><tr><td>◎</td><td>RAJASTHAN</td><td>Under implementation. Likely completion schedule is 31.03.2024</td></tr><tr><td>◎</td><td>UP</td><td>Scheme implemented by NPCIL only</td></tr><tr><td>◎</td><td>UTTARAKHAND</td><td>Scheme not implemented</td></tr></table></td></tr>
</table>

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

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

Annexure-A-I.I

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

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

Sl. No.	Substation	Downstream network bays	Status of bays	Planned 220 kV system and Implementation status	Revised Target	Remarks
9	Bhiwani 400/220kV S/s	Commissioned: 6 Total: 6	Utilized: 2 Unutilized: 4	• 220 kV Bhiwani (PG) - Isherwal (HVPNL) D/c line.	Apr'24	Issue related to ROW as intimated in 215th OCC by HVPNL.
				• 220 kV Bhiwani (PG) - Dadhibana (HVPNL) D/c line.	Apr'24	Issue related to ROW as intimated in 192nd OCC by HVPNL.
10	Jind 400/220kV S/s	Commissioned: 4 Approved:4 Total: 8	Utilized: 4 Unutilized: 0	• LILO of both circuits of 220 kV Jind HVPNL to PTPS D/C line at 400 kV substation PGCIL Khatkar (Jind) with 0.5 sq inch ACSR conductor	May'24	Tender is under process Updated in 205th OCC by HVPNL.
11	400/220kV Tughlakabad GIS	Commissioned: 6 Under Implementation: 4 Total: 10	Utilized: 6 Unutilized: 0 Under Implementation:4	• RK Puram – Tughlakabad (UG Cable) 220kV D/c line – March 2023.	Commissioned	Updated in 216th OCC by DTL
				• Masjid Mor – Tughlakabad 220kV D/c line.	Commissioned	Updated in 216th OCC by DTL
12	400/220kV Kala Amb GIS (TBCB)	Commissioned: 6 Total: 6	Utilized: 2 Unutilized: 2 Under Implementation:2	• HPPTCL has planned one no. of 220kV D/c line from Kala Amb 400/220kV S/s to 220/132kV Kala Amb S/s	Jan'24	Updated in 214th OCC by HPPTCL
				• HPPTCL has planned one no. of 220kV D/c line from Kala Amb 400/220kV S/s to 220/132kV Giri S/s	-	HPPTCL to update the status.
				• Network to be planned for 2 bays	-	HPPTCL to update the status.
13	400/220kV Kadarpur Sub-station	Commissioned: 8 Total: 8	Utilized: 0 Unutilized: 8	• LILO of both circuits of 220 KV Pali - Sector 56 D/C line at Kadarpur along with augmentation of existing conductor from 220 KV Sector-56 to LILO point with 0.4 sq inch AL-59 conductor.	Mar'24	Forest approval is pending for 220 KV Pali - Sector 56 D/C line. Updated in 215th OCC by HVPNL
				• LILO of both circuits of 220KV Sector 65 - Pali D/C line at Kadarpur along with augmentation of balance 0.4 sq. inch ACSR conductor of 220 kV Kadarpur - Sector 65 D/C line with 0.4sq inch AL-59 conductor	Mar'24	Updated in 205th OCC by HVPNL
14	400/220kV Sohna Road Sub-station	Commissioned: 8 Total: 8	Utilized: 4 Unutilized: 4	• LILO of both circuits of 220kV D/c Sohna-Rangla Rajpur at Roj Ka Meo line at 400kV Sohna Road	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	31.03.2024	Updated in 205th OCC by HVPNL
				• LILO of both ckt of 220kV D/c Ranga Rajpur – Palwal line	Commissioned	Commisioned date: 31.12.2021. Updated in 198th OCC by HVPNL
				• 220kV D/C for Sector78, Faridabad	31.03.2024	Issue related to ROW and Pending crossing approval from Northern Railways and DFCCIL. as intimated in 205th OCC by HVPNL.
				• Prithla - Sector 89 Faridabad 220kV D/c line	31.03.2024	Updated in 205th OCC by HVPNL

Sl. No.	Substation	Downstream network bays	Status of bays	Planned 220 kV system and Implementation status	Revised Target	Remarks
16	400/220kV Sonepat Sub-station	Commissioned: 6 Under Implementation:2 Total: 8	Utilized: 2 Unutilized: 4 Under Implementation:2	• LILO of both circuits of 220kV Samalkha - Mohana line at Sonepat	Mar'24	Updated in 216th OCC by HVPNL. **Status:** Work was held up due to ROW at T.L. No. 7,8,11,12 & 13 by the farmers of Jajji villagers during July'23 and now the matter has been resolve and work under progress from 01.08.2023. The erection work of T.no. 1 is pending due to non availability of shut down at 220KV Mohana-Smk line and 220KV Jajji-Mohana line. • PLCC protection coupler and Forest approval is also pending.
				• Sonepat - HSIISC Rai 220kV D/c line	Mar'24	Updated in 212th OCC by HVPNL. **Status:** Due to non-performance of work of 220KV GIS Rai S/Stn, the Contract has been terminated & blacklisted by O/o XEN/WB O/o CE/PD&C, HVPNL, Panchkula vide Ch-100/HDP-2418/REC-254/Xen(WB) Dated 24.02.2023. Now pending work will be caried out by HVPNL/ Departmentely. Now, the matter is under approval from competent authority of Nigam.,
				• Sonepat - Kharkhoda Pocket A 220kV D/c line	31.07.2024	Updated in 212th OCC by HVPNL. **Status:** Work order has been issued to M/s R.S Infra on dated 09.08.2023 by O/o CE/PD&C, Panchkula for construction of line. The Survey work has been completed.
17	400/220kV Neemrana Sub-station	Commissioned: 6 Total: 6	Utilized: 4 Unutilized: 2	• LILO of Bhiwadi - Neemrana 220kV S/c line at Neemrana (PG)	-	Work is under progres. Stub Setting: 02/2017. Permission for forest, Highway & pipeline crossing is awaited from concerned department as updated in 215th OCC by RVPNL.
18	400/220kV Kotputli Sub-station	Commissioned: 6 Total: 6	Utilized: 4 Unutilized: 2	• Kotputli - Pathreda 220kV D/c line	-	Date of bid opening has been extended up to 28.02.2024 as updated in 216th OCC by RVPNL.
19	400/220kV Jallandhar Sub-station	Commissioned: 10 Total: 10	Utilized: 8 Unutilized: 2	• Network to be planned for 2 bays	May'24	LILO of 220 kV BBMB Jalandhar - Butari line at 400 kV PGCIL Jalandhar being planned. Work expected to be completed by May 2024. Updated in 198th OCC by PSTCL.
20	400/220kV Roorkee Sub-station	Commissioned: 6 Total: 6	Utilized: 4 Unutilized: 2	• Roorkee (PG)-Pirankaliyar 220kV D/c line	Commissioned	Roorkee (PG)-Pirankaliyar 220kV D/c line commissioned in 2020 as intimated by PTCUL in 197th OCC
21	400/220kV Lucknow Sub-station	Commissioned: 8 Total: 8	Utilized: 4 Unutilized: 4	• Network to be planned for 2 bays	Commissioned	• Lucknow -Kanduni, 220 kV D/C line work energized on 05.10.2023. Updated in 212th OCC by UPPTCL. _____ • No planning for 2 no. of bays upated by UPPTCL in 196th OCC. The same has been communicated to Powergrid.
22	400/220kV Gorakhpur Sub-station	Commissioned: 6 Total: 6	Utilized: 4 Unutilized: 2	• Network to be planned for 2 bays	Commissioned	• Gorakhpur(PG)- Maharajganj, 220 kV D/C line energized on 27.09.2023 updated by UPPTCL in 212th OCC

Sl. No.	Substation	Downstream network bays	Status of bays	Planned 220 kV system and Implementation status	Revised Target	Remarks
23	400/220kV Fatehpur Sub-station	Commissioned: 8 Under Implementation:2 Total: 10	Utilized: 6 Unutilized: 2 Under Implementation:2	• Network to be planned for 2 bays	-	• UPPTCL intimated that 02 no. of bays under finalization stage. In 201st OCC, UPPTCL intimated that it is finalized that Khaga s/s will be connected (tentative time 1.5 years). _____ • No planning for 2 no. of bays updated by UPPTCL in 196th OCC. The same has been communicated to Powergrid.
24	400/220kV Abdullapur Sub-station	Commissioned: 10 Under Implementation:2 Total: 12	Utilized: 10 Unutilized: 0 Under Implementation:2	• Abdullapur – Rajokheri 220kV D/c line	Mar'24	SCDA System & PLCC work pending at 220 KV S/stn. Rajokheri Updated in 215th OCC by HVPNL
25	400/220kV Pachkula Sub-station	Commissioned: 8 Under tender:2 Total: 10 Out of these 10 nos. 220kV Line Bays, 2 bays would be used by the lines being constructed by POWERGRID (Chandigarh-2) and balance 8 nos. bays would be used by HVPNL	Utilized: 2 Unutilized: 4 Under Implementation:2	• Panchkula – Pinjore 220kV D/c line	Feb'24	Updated in 211th OCC by HVPNL
				• Panchkula – Sector-32 220kV D/c line	Feb'24	Updated in 211th OCC by HVPNL
				• Panchkula – Raiwali 220kV D/c line	Commissioned	Updated in 194th OCC by HVPNL
				• Panchkula – Sadhaura 220kV D/c line: Sep'23	Jul'24	Updated in 205th OCC by HVPNL
26	400/220kV Amritsar S/s	Commissioned:7 Approved in 50th NRPC- 1 no. Total: 8	Utilized: 6 Under Implementation:2	• Amritsar – Patti 220kV S/c line	Mar'24	Work is completed, agreement is expected to be signed by March 2024. Updated in 216th 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)	Mar'24	Work is completed, agreement is expected to be signed by March 2024. Updated in 216th 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 205th OCC by HVPNL. **Status:** Under Tendering process
				• Bahadurgarh - METL 220kV D/c line (Deposit work of M/s METL)	Mar'25	Updated in 216th OCC by HVPNL. **Status:** Tendering under progress.
				• Bahadurgarh - Kharkhoda Pocket B 220kV D/c line	Jul'24	Updated in 212th OCC by HVPNL. **Status:** Work order has been issued to M/s R.S Infra on dated 09.08.2023 by O/o CE/PD&C, Panchkula for construction of line. The Survey work has been completed.
29	400/220kV Jaipur (South) S/s	Commissioned: 4 Total: 4	Utilized:2 Unutilized: 2	• LILO of 220 kV S/C Dausa – Sawai Madhopur line at 400 kV GSS Jaipur South (PG)	06.10.2025	Work order has been issued on 06.10.2023, work under progress as updated by RVPNL in 215th OCC
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

Sl. No.	Substation	Downstream network bays	Status of bays	Planned 220 kV system and Implementation status	Revised Target	Remarks
31	400/220kV, Kankroli	Commissioned: 6 Total: 6	Utilized: 4 Unutilized: 2	• 220 kV D/C Kankroli(PG) - Nathdwara line	Mar'24	Price bid opened on 29.01.2024 as updated bu RVPN in 216th OCC.
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	Mar'24	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 Mar'24 as Updated in 216th OCC by PSTCL.
36	400/220kV, Chamba (Chamera Pool)	Commissioned: 3 Under tender:1 Total: 4	Utilized:3 Unutilized: 0 Under tender:1	• Stringing of 2nd ckt of Chamera Pool – Karian 220kV D/c line	-	Stringing of 2nd Circuit of Chamera Pool-Karian Tansmission line has been completed & terminal bay at 400/220 kV chamera pooling substation (PGCIL) is ready for commissioning. Case for Initial Charging is in process at NRLDC.Updated in 214th OCC by HPPTCL
37	400/220kV, Mainpuri	Commissioned: 6 Under Implementation:2 Total: 8	Utilized: 6 Unutilized: 0 Under Implementation:2	• Network to be planned for 2 bays	-	• 02 no. of bays under finalization stage updated by UPPTCL in 196th OCC. Mainpuri S/s planned. Land is not finalized, therefore timeline not available as intimated by UPPTCL in 201st OCC.
38	400/220kV, Patiala	Commissioned: 8 Total: 8	Utilized: 6 Unutilized: 2	• Network to be planned for 2 bays	May'24	2 Nos. bays for 400 kV PGCIL Patiala - 220 kV Bhadson (D/C) line being planned. Work expected to be completed by May 2024. Updated in 198th OCC by PSTCL.

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 (18.07.2023)
ANPARA TPS
HARDUAGANJ TPS
OBRA TPS
PARICHHA TPS

PSPCL (18.07.2023)
GGSSTP, Ropar
GH TPS (LEH.MOH.)
RRVUNL (09.07.2023)
CHHABRA SCPP
CHHABRA TPP
KALISINDH TPS
KOTA TPS
SURATGARH SCTPS
SURATGARH TPS

Updated status of FGD related data submission

Lalitpur Power Gen. Co. Ltd. (17.10.2022)
Lalitpur TPS
Lanco Anpara Power Ltd. (18.06.2022)
ANPARA-C TPS

HGPCL (14.09.2022)
PANIPAT TPS
RAJIV GANDHI TPS
YAMUNA NAGAR TPS

Adani Power Ltd. (18.02.2022)
KAWAI TPS

Rosa Power Supply Company (18.06.2022)
Rosa TPP Phase-I
Prayagraj Power Generation Company Ltd. (17.10.2022)
Prayagraj TPP
APCPL (25.02.2022)
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#1 (Target: 31-01-2022), 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: 31-12-2022), PANIPAT TPS U#7 (Target: 31-12-2022), PANIPAT TPS U#8 (Target: 31-12-2022), RAJIV GANDHI TPS U#1 (Target: 31-12-2024), RAJIV GANDHI TPS U#2 (Target: 31-12-2024), YAMUNA NAGAR TPS U#1 (Target: 31-12-2024), YAMUNA NAGAR TPS U#2 (Target: 31-12-2024)

NTPC	DADRI (NCTPP) U#1 (Target: 31-12-2020), DADRI (NCTPP) U#2 (Target: 31-10-2020), DADRI (NCTPP) U#3 (Target: 31-08-2020), DADRI (NCTPP) U#4 (Target: 30-06-2020), DADRI (NCTPP) U#5 (Target: 30-06-2022), DADRI (NCTPP) U#6 (Target: 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: 31-12-2023), ANPARA C TPS U#2 (Target: 31-12-2023)
Prayagraj Power Generation Company Ltd.	PRAYAGRAJ TPP U#1 (Target: 31-12-2024), PRAYAGRAJ TPP U#2 (Target: 31-12-2024), PRAYAGRAJ TPP U#3 (Target: 31-12-2024)
PSPCL	GH TPS (LEH.MOH.) U#1 (Target: 31-12-2026), 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: 31-08-2024), KOTA TPS U#6 (Target: 31-08-2024), KOTA TPS U#7 (Target: 31-08-2024), 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: 31-12-2023), ANPARA TPS U#2 (Target: 31-12-2023), ANPARA TPS U#3 (Target: 31-12-2023), ANPARA TPS U#4 (Target: 31-12-2023), ANPARA TPS U#5 (Target: 31-12-2023), ANPARA TPS U#6 (Target: 31-12-2023), ANPARA TPS U#7 (Target: 31-12-2023), HARDUAGANJ TPS U#8 (Target: 31-12-2024), HARDUAGANJ TPS U#9 (Target: 31-12-2024), OBRA TPS U#9 (Target: 31-12-2024), OBRA TPS U#10 (Target: 31-12-2024), OBRA TPS U#11 (Target: 31-12-2024), OBRA TPS U#12 (Target: 31-12-2024), OBRA TPS U#13 (Target: 31-12-2024), PARICHHA TPS U#3 (Target: 30-04-2022), PARICHHA TPS U#4 (Target: 31-12-2024), PARICHHA TPS U#5 (Target: 31-12-2024), PARICHHA TPS U#6 (Target: 31-12-2024)

MIS Report for Status of Islanding Schemes

Implemented Schemes

Sl. No.	Islanding Scheme	SLDC	Status	Submission of Self Certification of Healitheness	SOP	SCADA Display Page	Remarks
1	NAPS IS	UP	Implemented	Yes (08-10-2021)	Yes	Yes	-
2	RAPS IS	Rajasthan	Implemented	16-Aug-21	Yes	Yes	List of officials in-charge, format for generation, islanding scheme sld and relays in RAPP IS submitted by RVPN on 04.12.2021.

Under Implementation/ Newly Proposed/Under Discussion

Sl. No.	Islanding Scheme	SLDC	Status	Details of progress	DPR for PSDF funding (Require	Timelines Status - Proposed/Actual									
						Study		Design		Approval		Procurement		Commissioning	
						Proposed	Actual	Proposed	Actual	Proposed	Actual	Proposed	Actual	Proposed	Actual
1	Lucknow-Unchahar IS	UP	Under Implementation	Scheme has been approved in 59th NRPC meeting held on 31.10.2022. Installation of Ufrs is complete expect at NTPC Unchahar end .		-		-	-	-	-	-	-	-	-
2	Agra IS	UP	Under Implementation	Scheme has been approved in 71th NRPC meeting held on 29.01.2024.		-		-	-	-	-	-	-	-	-
3	Jodhpur-Barmer-Rajwest IS	Rajasthan	Under Implementation	Scheme has been approved in 60th NRPC meeting held on 30.11.2022.Preparation of DPR is under finalization. Timeline to be intimated by RVPN	-	-		-	-	-	-	-	-	-	-
4	Suratgarh IS	Rajasthan	Under Implementation	Scheme has been approved in 60th NRPC meeting held on 30.11.2022. Preparation of DPR is under finalization. Timeline to be intimated by RVPN	-	-		-	-	-	-	-	-	-	-
5	Patiala-Nabha Power Rajpura IS	Punjab	Under Implementation	Scheme has been approved in 60th NRPC meeting held on 30.11.2022. Punjab SLDC informed that their management has decided to go for PSDF funding for its implementation Implementation timeline: March,2025		-		-	-	-	-	-	-	-	-
6	Pathankot-RSD IS	Punjab	Implemented	Scheme has been approved in 60th NRPC meeting held on 30.11.2022. Scheme has been implemented in April 2023 as informed by Punjab in 206th OCC. Testing Reports submitted by Punjab.		-		-	-	-	-	-	-	-	-
7	Kullu-Manali-Mandi IS	HP	Under Implementation	Scheme has been approved in 60th NRPC meeting held on 30.11.2022. Timeline to be intimated by HPSLDC		-		-	-	-	-	-	-	-	-
8	Shimla-Solan IS	HP	Under Implementation	Scheme has been approved in 60th NRPC meeting held on 30.11.2022. Timeline to be intimated by HPSLDC											
9	Delhi IS	Delhi	Implemented	Revised Delhi islanding scheme has been implemented as informed by DTL in 48th TCC and 70th NRPC meeting.											

Status of availability of ERS towers in NR

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

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
14	JKPTCL			10			JKPTCL, Kashmir:10 procured (out of which 3 on loan to JKPTCL, Jammu)
15	HVPN						HVPN does not have ERS Set. Technical Specifications have been finalized
16	PSTCL	400 kV	1666.43	2	2		
		220 kV	7921.991				
17	UPPTCL 1- Meerut	132KV	27508.321	24 Nos(15 Running+9 Angle)		400 kV S/s Gr. Noida	ERS will be also be used in other voltage level lines.
		220KV	14973.453				
		400KV	6922.828				
	UPPTCL 2-Prayagraj	765KV	839.37	24 Towers		220 kv S/s phulpur	ERS will also be used in other voltage lines.
		400KV	1804.257				
		220KV	2578.932				
		132KV	4714.768				
18	POWERLINK						
19	POWERGRID HIMACHAL TRANSMISSION LTD						
20	Powergrid Ajmer Phagi Transmission Limited						
21	Powergrid Fatehgarh Transmission Limited						
22	POWERGRID KALA AMB TRANSMISSION LTD						
23	Powergrid Unchahar Transmission Ltd						
24	Powergrid Khetri Transmission Limited						
25	POWERGRID VARANASI TRANSMISSION SYSTEM LTD						
26	ADANI TRANSMISSION INDIA LIMITED		2090	1 Set (12 towers)	1 set (12 towers)	Sami (Gujarat)	Make-Lindsey ERS set available for 400KV & 500KV rating can be used for lower as well as higher voltage Towers. In case used for 765KV Line, No of towers can reduce due to increase in Tower Height & nos of conductors.
27	BIKANER KHETRI TRANSMISSION LIMITED		482				
28	FATEHGARH BHADLA TRANSMISSION LIMITED	500 kV HVDC 400 kV HVAC	291				
29	NRSS-XXXI(B) TRANSMISSION LTD	400 kV	577.74	Not Available	Not Available		In the advance stage of process of finalising arrangement for providing ERS on need basis with other transmission utility (M/s INDIGRID).
30	ARAVALI POWER COMPANY PVT LTD	765 kv HVAC					

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

RAJASTHAN RAJYA VIDYUT PRASARAN NIGAM LTD

[Corporate Identity Number CIN: U40109RJ2000SGC016485]
(AN ISO 9001:2015 CERTIFIED COMPANY)
Regd. Office: VidyutBhawan, Janpath ,Jyoti Nagar, Jaipur 302005

OFFICE OF THE SUPERINTENDING ENGINEER (Automation, N/M &SP)
Rom No.323, VidyutBhawan, Janpath ,Jyoti Nagar, Jaipur (Tel.No. 2740752 / Fax No. 2740794)
Email: se.pp@rvpn.co.in, website: www.http://emergy.rajasthan.gov.in/rvpnl

No. RVPN/ SE(AUTOMATION)/ XEN(PP&D)/ AE-2(P&P)/ D. 162 Jaipur Date 26/02/2024

The General Manager (NRLDC)
Grid Controller of India Limited,
18-A, Shaheed Jeet Singh Sansanwal Marg, Katwaria Sarai
New Delhi-110016.

Sub:- Proposed SPS for 2x315 MVA, 400/220 kV ICTs at 400 kV GSS Babai.

On the above captioned subject, please find attached the proposed SPS for 2x315 MVA, 400/220 kV ICTs at 400 kV GSS Babai with request to please include in the next meeting of OCC for discussion and necessary approval of the OCC forum. This SPS has been finalized after detailed deliberations with the officers of RVPN and Rajasthan SLDC in a meeting held on dated 09.02.2024.

Encl: As above

(S.C. Meena)
Chief Engineer (PP&D)

Copy to the following for information and necessary action please-

1. The Member Secretary (NRPC), 18-A, Shaheed Jeet Singh Marg, Katwaria Sarai, New Delhi-110016.
2. The Addl. Chief Engineer (LD/Communications/MPT&S), RVPN, Jaipur/Ajmer.
3. The Chief Engineer, Power System Planning & Appraisal-I Division, CEA, Sewa Bhawan, RK Puram-I, New Delhi-110066.
4. The Superintending Engineer (Automation/P&P/SO&LD/Protection Engineering/T&C), RVPN, Jaipur/Babai
5. The Superintending Engineer (Operation), NRPC, 18-A, Shaheed Jeet Singh Marg, Katwaria Sarai, New Delhi-110016.
6. The System Operator-2, NRLDC, 18-A, Shaheed Jeet Singh Marg, Katwaria Sarai, New Delhi-110016

Encl: As above

Chief Engineer (PP&D)

Signature Not Verified

RajKaj Ref 5767106

Digitally signed by Suresh Chand Meena
Designation : Chief Engineer
Date: 2024.02.24 16:13:04 IST
Reason: Approved

Proposed SPS for 2x315 MVA, 400/220 kV ICTs at 400 kV GSS Babai

1. Details of Installed ICTs and Transmission Lines

- There are 2x315MVA, 400/220 kV ICTs at 400 kV GSS Babai. Percentage impedance (%) for the ICT-I is 11.83% and for ICT-III is 11.78% at normal tap 9. Both ICTs are of same rating and make.
- 400 kV GSS Babai is connected to the 400 kV GSS Sikar (PGCIL), and 400 kV GSS Neemrana (PGCIL) through 400 kV S/C lines. This GSS is also connected to Bhiwani through 400 kV D/C line.
- 400 kV GSS Babai is connected to 220 kV GSS Reengus, 220 kV GSS Khetri and 220 kV GSS Niwana through 220 kV lines.
- Load sharing on both the ICTs is almost equal and each ICT is loaded near to 180 MVA.
- Power map of transmission system at 400 kV GSS Babai and nearby region is shown in Figure 1.

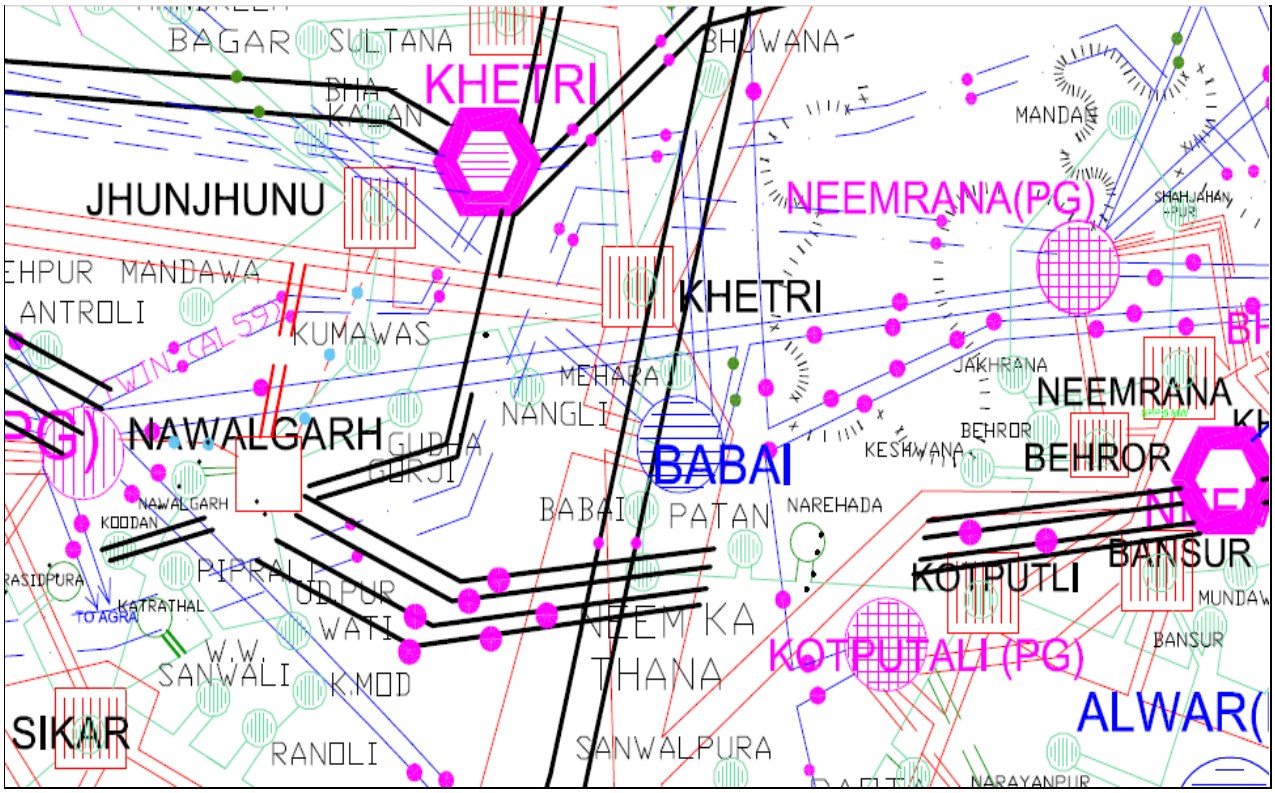


Fig. 1 Power map of Babai region

2. Load Details on ICTs and Transmission Lines Associated with 400 kV GSS Babai

- Peak Loads recorded on the Transformers and transmission lines associated with 400 kV GSS Babai, 220 kV GSS Niwana, 220 kV GSS Khetri and 132 kV GSS Babai are detailed in Table 1.

Table 1: Load Details on ICTs and Transmission Lines Associated with 400 kV GSS Babai

S. No.	Name of 220 kV line/ILTs	Peak Load (MVA)	Average Load (MVA)	SPS Group	Remark
1	315 MVA, 400/220 KV ICT-I	298	180		
2	315 MVA, 400/220 KV ICT-III	297	174.9		
3	400 kV S/C Babai-Neemrana line	466	-		
4	400 kV S/C Babai-Sikar line	599	-		
5	160 MVA, 220/132 KV Transformer at Babai	128	-		
6	220 kV Babai-Khetri line Ckt-I	232.13	148.01		Load on 220 kV GSS Khetri is high as 220 kV GSS Jhunjhunu and 220 kV GSS Chirawa are also fed from 220 kV GSS Khetri.
7	220 kV Babai-Khetri line Ckt-II	215.16	157.04		
8	220 kV Babai-DFCC Line Ckt-I	41	7.12		
9	220 kV Babai-DFCC Line Ckt-II	3.41	1.63		
10	220 kV S/C Babai-Niwana line	242	87.46	**SPS Group-1**	Load of Niwana will be reflected on the 400 kV GSS Heerapura where loading on ICTs is critical. The tripping of additional load at 220 kV GS Niwana is required. Load curtailment 87.46MW.
11	220 kV S/C Niwana-Heerapura line	207.66	161.45		
12	160 MVA, 220/132kV Transformer-I at Niwana	141.97	113.1		
13	160 MVA, 220/132kV Transformer-II at Niwana	141.97	113.16		
14	132 kV S/C Niwana-Govindgarh Line-I	75.91	60.01	**SPS Group-1**	132 kV GSS Govindgarh and 132 kV GSS Kaladera are fed from these lines in radial mode. Load curtailment of 117.79MW but relief at 400 kV GSS Babai is 87.46MW only.
15	132 kV S/C Niwana-Govindgarh Line-II	75.91	57.78	**SPS Group-1**	
16	132 kV S/C Niwana-Markhi Line	93.54	79.73		
17	20/25 MVA, 132/33 kV Transformer-I at Niwana	23.65	19.46		
18	20/25 MVA, 132/33 kV Transformer-II at Niwana	17.63	14.99		
19	220 kV S/C Babai-Reengus line	199	78.06		There is split bus arrangement on the 220 kV GSS Reengus. 220 kV S/C Reengus-Babai, 220 kV S/C Reengus-Renwal, 220 kV S/C Reengus-Chomu, and 220 kV S/C Reengus-Laxmangarh lines are connected on same bus. On tripping the 220 kV S/C Babai-Reengus lines, loading on the ICTs at 400 kV GSS Heerapura will increase and also loading on the interconnectors between 400 kV GSS Ratangarh and 220 kV GSS Ratangarh will be increased.
20	100 MVA, 220/132 kV Transformer-I at Khetri	80.51	72		
21	100 MVA, 220/132 kV Transformer-II at Khetri	80.51	72		
22	50 MVA, 220/33 kV Transformer-I at Khetri	14.44	14		
23	35 MVA, 220/33 kV Transformer-II	34.30	27		

	at Khetri				
24	35 MVA, 220/33 kV Transformer-III at Khetri	14.08	14		
25	132 kV S/C Khetri-Bhuwana Line	83.7	58	**SPS Group-1**	Load curtailment is 120MW.
26	132 kV S/C Khetri-Nangli Line	85.9	62	**SPS Group-1**	
27	132 kV S/C Khetri-Mehara Line	52.86	NR		Generally 132 kV GSS Mehara fed from Babai
28	20/25MVA, 132/33 kV Transformer-I at Babai	19.50	6.4		
29	20/25MVA, 132/33 kV Transformer-II at Babai	19.60	6.1		
30	132 kV S/C Babai-Mehada line	48.20	21.95 MW	**SPS Group-1**	Load curtailment is 60.75MW.
31	132 kV S/C Babai-Neem Ka Thana Line	90.20	38.80 MW	**SPS Group-1**	

- Incomer of 160MVA, 220/132 kV Transformer at Babai is connected to 132 kV Bus of 132 kV GSS Babai.
- Auxiliary supply of the 400 kV GSS Babai is taken from tertiary winding of 315MVA, 400/220 kV ICT-I at Babai and second source is taken from 132 kV GSS Babai.

3. Proposed SPS for ICTs at 400 kV GSS Babai

- Communication channel is available on the 220kV S/C Babai-Niwana line. Therefore, it is possible to trip the transformers and transmission lines at 220 kV GSS Niwana.
- Communication channel is available on the 220kV S/C Babai-Khetri Line-I&II. Therefore, it is possible to trip the transformers and transmission lines at 220 kV GSS Khetri.
- After detailed analysis of above loading conditions, grid interconnection issues, following lines are considered for tripping as soon as any one of the 2x315 MVA, 400/220 kV ICTs at Babai is tripped on fault/protection or overloading of the ICTs is observed:-

1. **SPS Group-1: Trip command is generated to trip the following lines and transformers when 100% loading of the 315 MVA, 400/220 kV ICT-1 or ICT-2 at Babai is reached due to tripping of any one of the ICT or overloading of the ICTs:-**
   - 220 kV S/C Babai-Niwana line at 400 kV GSS Babai
   - 132 kV S/C Niwana-Govindgarh Line-I at 220 kV GSS Niwana
   - 132 kV S/C Niwana-Govindgarh Line-II at 220 kV GSS Niwana
   - 132 kV S/C Babai-Neem Ka Thana Line at 132 kV GSS Babai
   - 132 kV S/C Babai-Mehara Line at 132 kV GSS Babai
   - 132 kV S/C Khetri-Bhuwana Line at 220 kV GSS Khetri

- 132 kV S/C Khetri-Nangli Line at 220 kV GSS Khetri
- 132 kV S/C Khetri-Mehara Line at 220 kV GSS Khetri

Implementation of SPS Logic-1:- This logic will be implemented by taking reference from overcurrent relays of the 400/220 kV ICTs at 400 kV GSS Babai. Trip command will be initiated if current exceed 100% loading of the ICTs which will be communicated to different locations to trip the elements identified and mentioned above.

- Tripping commands for transformers and transmission lines are to be taken from overload relay/over current back up relay on 400 kV and/or 220 kV side of 400/220 kV ICTs at Babai considering 100% loading with appropriate time delay to avoid tripping during the through faults. Further, time grading of the backup elements may also be correlated for time delay of overloading.
- Schematic diagram for tripping of 220/132 kV Transformers, 220 kV lines and 132 kV lines included in SPS for 2x315 MVA, 400/220 kV ICTs at 400 kV GSS Babai is shown below in Figure 2.

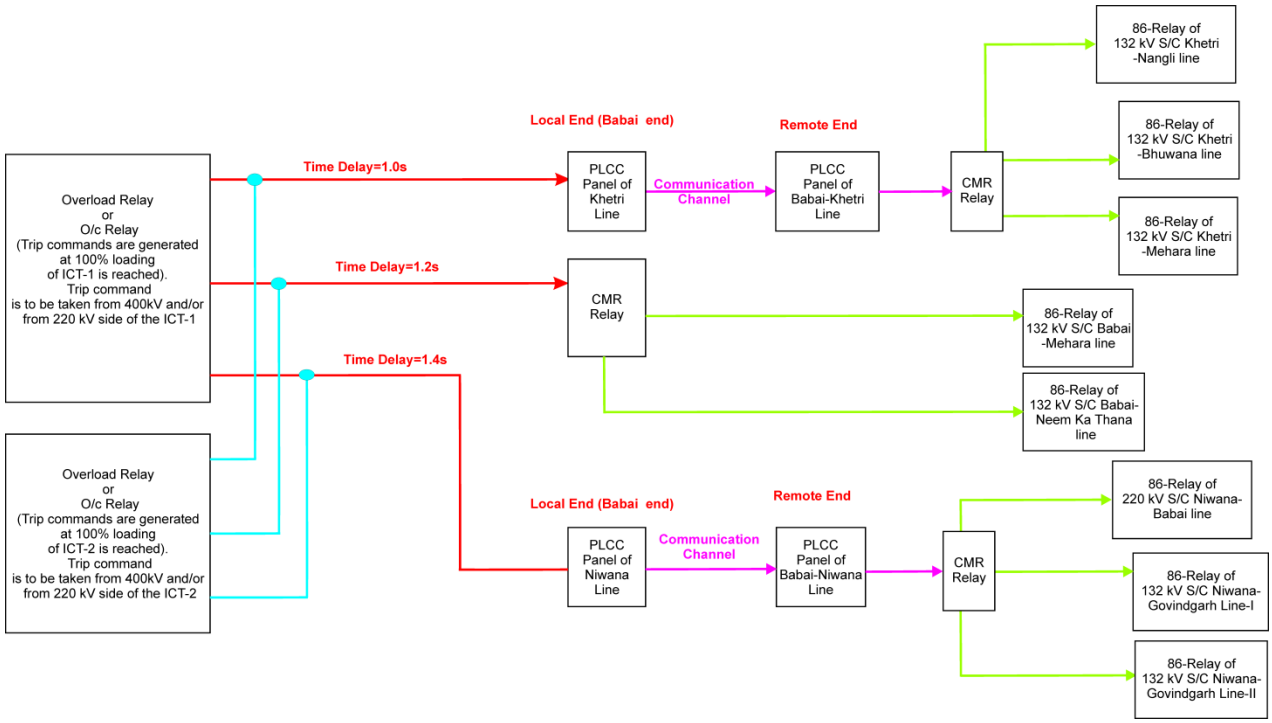


Fig. 2 Schematic diagram of proposed logics for SPS of 2x315 MVA, 400/220 kV ICTs at 400 kV GSS Babai

- 132 kV S/C Govindgarh-Chomu line will be normally kept charged on no load till the SPS is in operation at 400 kV GSS Babai. This line can only be used to cater load demand if it is really needed and will be decided by the LD control room.
- For load management, tripped transmission lines and transformers may be re-connected after curtailing the load to such a quantum to maintain loadings on the healthy 400/220 kV ICTs within permissible limits.

न्यूक्लियर पॉवर कॉरपोरेशन ऑफ इंडिया लिमिटेड
Nuclear Power Corporation of India Limited
(भारत सरकार का उद्यम A Govt. of India Enterprise)
नरौरा परमाणु विद्युत केंद्र Narora Atomic Power Station
डाक एनएपीएस टाउनशिप, नरौरा जिला बुलंदशहर (उ.प्र.)- 203389
PO : NAPS Township, Narora, Distt. Bulandshahr (UP)-203 389
फोन Phone 05734 - 222137, इंटरकॉम - 4556, फैक्स Fax: 05734 - 222112
ई-मेल E-Mail : sandeeptyagi@npcil.co.in

संख्या: एनएपीएस/ टीएसयू (ई एंड आई) /2024/एस/21 दिनांक :-22.02.2024
NO: NAPS/TSU (E&I)/2024/S/21 Dated:-22.02.2024

Ref.: NAPS/TSU (E&I)/2024/S/20 Dated:-17.02.2024

विषय: -खुर्जा छोर से एनएपीपी-खुर्जा 220 केवी ट्रांसमिशन लाइन की शीघ्र बहाली के लिए अनुरोध एंव एनएपीएस आइलैडिंग योजना की समीक्षा ।

Subject:-Request for early restoration of NAPP-Khurja 220kV Transmission line from Khurja end & review of NAPS islanding scheme.

NAPS-Khurja 220 KV transmission line is out of service from 15.02.2024 due to fire at Khurja substation.

After gathering information from SDO Khurja it has been informed that there was a fire at the cable gallery and most of cables got burnt / damaged at Khurja substation.

During telephonic discussion on 19.02.2024 with CE (T), Meerut, it is informed that it will take approx. 6 months time to normalize the system and connect back to the grid.

This line is a part of NAPS islanding scheme. NAPS makes island with Debai, Khurja and Simbholi substation when both units of NAPS are in operating condition. Total island load is in the range of 150-280 MWe. At present both NAPS-1&2 are in operating condition.

In view of the importance of this line for NAPS, CE (T) is kindly requested for early restoration of NAPS-Khurja line on priority basis.

SE(Operation), NRPC is kindly requested for listing of this agenda in next OCC meeting and review of existing NAPS Islanding scheme in view of long outage of NAPS Khurja 220kV Transmission line and Khurja substation from grid.

NAPS islanding scheme in enclosed.

संदीप कुमार त्यागी Sandeep Kumar Tyagi
एसटीई (ई&आई) , एनएपीएस STE(E&I), NAPS

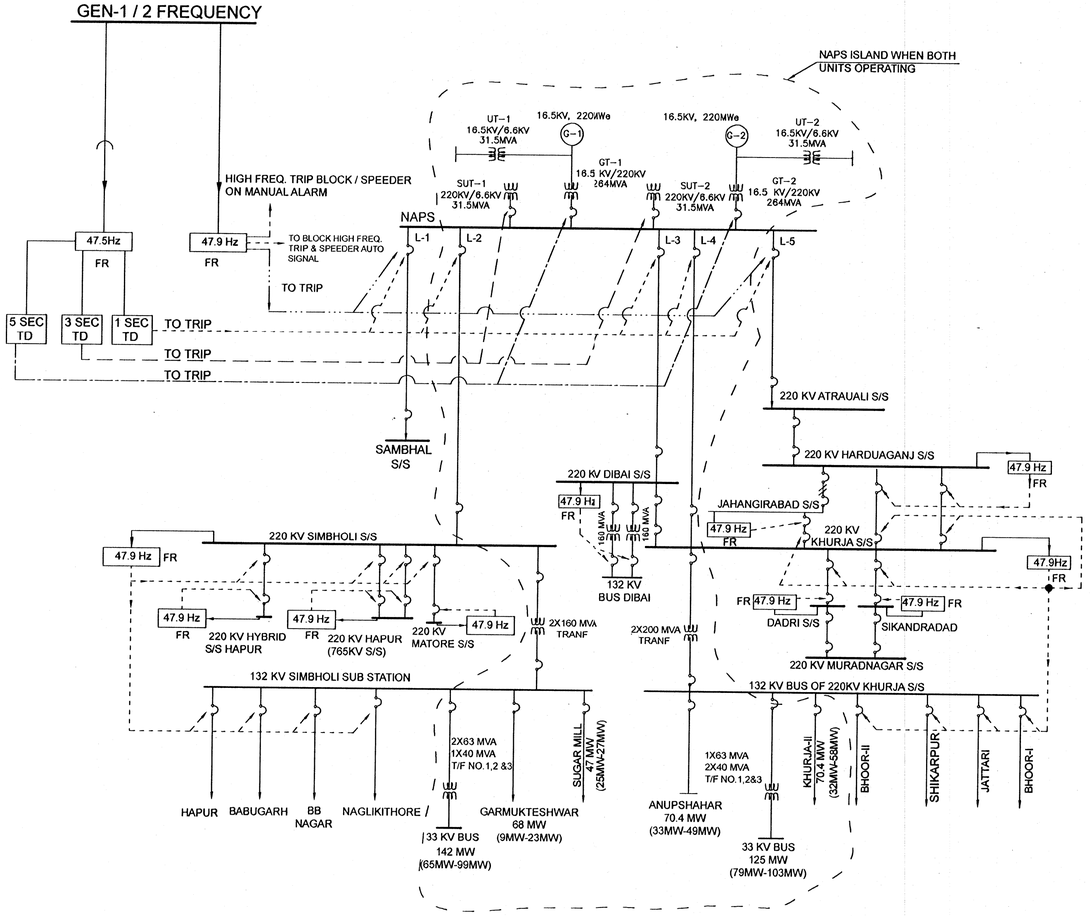
सेवा में To,

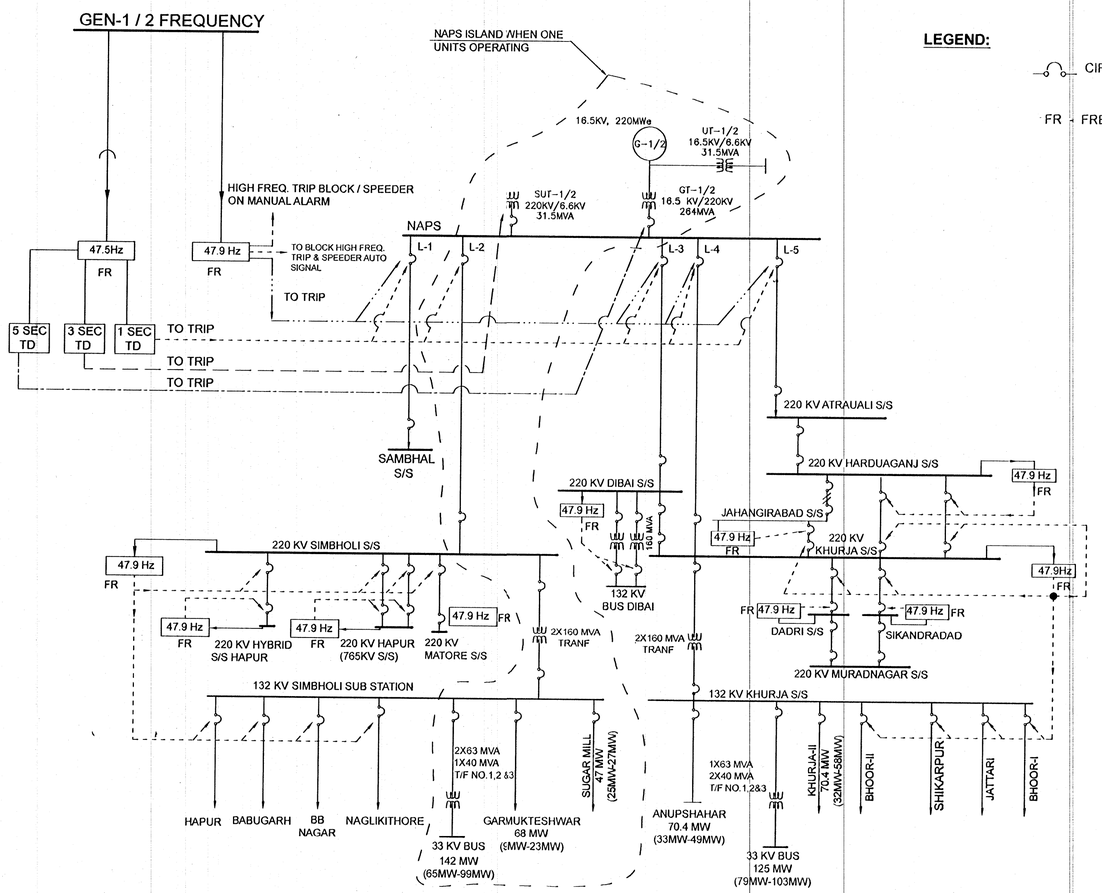
(i) मुख्या अभियन्ता ट्रान्समिशन मेरठ
CE Transmission, Meerut,
cetw@upptcl.org

(ii) एसई (औपरेशन) एनआरपीसी न्यू दिल्ली
SE (Operation), NRPC New Delhi
For including this agenda in OCC meeting

Distribution

UPPTCL / UPSLDC / NRPC	NAPS
Director, UPSLDC directorsldc@upsldc.org CE, UPSLDC cecs@upsldc.org SE, UPSLDC sesc@upsldc.org Executive Engineer, Greater Noida, U.P. Power Transmission Corporation Ltd eetncgtrnoida@gmail.com Member Secretary, NRPC ms-nrpc@nic.in GM, NRLDC NRLDC nrldcoutage@grid-india.in SE (Operation), NRPC seo-nrpc@nic.in	SD/ CS : for kind information please TSS/OS/MS SME(E) Sh. S.K.Goyal, SE (E&I) Smt. Arpita Chakravorty, SO/E





NOTE:
LOAD VARIATION SHOWN IN BRACKET i.e. (65MW-99MW). THIS IS INDICATING PEAK DEMAND OF WINTER AND SUMMER.

NAPS ISLAND SCHEME WHEN BOTH UNITS OPERATING

AT NAPS:

1) **48.0 Hz:** LOW FREQUENCY ALARM WILL APPEAR AT WINDOW ANN-407 ON PANEL NO.-6610-PL-2 IN MAIN CONTROL ROOM.
2) **47.9 Hz:**

THE TWO DESIGNATED 220 KV LINES I.E. NAPS-SAMBHAL & NAPS-ATRAULI LINES TRIP THROLGH UFR (SET AT 47.9 HZ) TO FORM "NAPS ISLAND" WITH ISLAND LOAD IN RANGE OF 150-280 MW. WITH 220 KV KHURJA, DIBAI & SIMBHOLI SUB-STATIONS INCLUSIVE OF NAPS STATION LOAD.

3) IF FREQUENCY DOES NOT IMPROVE AND REACHED AT 47.5 Hz.THEN

1. ALL FIVE LINES TRIP AFTER 1 SEC TIME DELAY.
2. SUT CBs TRIP AFTER 3 SEC. TIME DELAY & 6.6KV AUTO TRANSFER TAKE PLACE.
3. GT CBs TRIP AFTER 5 SEC TIME DELAY AND UNITS COME ON HOUSE LOAD.

SUB-STATION	TRIPPING ON UFR
SIMBHOLI	220 KV SIMBHOLI-MATORE, SIMBHOLI-HAPUR (765KV S/S) CKT.-I&II & SIMBHOLI-HAPUR HYBRID LINE TRIP THROUGH UFR (SET AT 47.9 Hz) FROM SIMBHOLI END TO ISOLATE "NAPS ISLAND" FROM REST OF THE GRID. SOME OF SELECTED 132 KV FEEDERS ALSO TRIP TO KEEP ISLAND LOAD WITHIN LIMIT.
DIBAI	LV BREAKER OF ICT-I & II (160MVA) TRIP THROUGH UFR (SET AT 47.9Hz).
KHURJA	220 KV KHURJA-HARDUAGANJ (DOUBLE CIRCUIT), KHURJA-DADRI, KHURJA-SIKANDRABAD AND KHURJA-JAHANGIRABAD LINES TRIP THROUGH UFR (SET AT 47.9 Hz) FROM KHURJA END TO ISOLATE "NAPS ISLAND" FROM REST OF GRID. SOME OF SELECTED 132 KV FEEDERS ALSO TRIP AT KHURJA S/S TO KEEP ISLAND LOAD WITHIN LIMIT.
MATORE	220 KV MATORE- SIMBHOLI LINE TRIP THROUGH UFR (SET AT 47.9Hz) FROM MATORE TO ISOLATE "NAPS ISLAND" FROM REST OF GRID AT 47.9 Hz
HAPUR 765KV	220 KV HAPUR- SIMBHOLI CIRCUIT 1 & 2TRIP THROUGH UFR (SET AT 47.9Hz) FROM HAPJR 765 KV SUB STATION TO ISOLATE "NAPS ISLAND" FROM REST OF GRID AT 47.9 Hz
HAPUR 220KV HYBRID	220 KV HAPUR- SIMBHOLI LINE TRIP THROUGH UFR (SET AT 47.9Hz) FROM HAPUR 220 KV HYBRID SUB-STATION TO ISOLATE "NAPS ISLAND" FROM REST OF GRID AT 47.9 Hz
HARDUAGANJ	220 KV HARDUAGANJ-KHURJA (D/C) LINE TRIP THROUGH UFR (SET AT 47.9Hz) FROM HARDUAGANJ END TO ISOLATE "NAPS ISLAND" FROM REST OF GRID.
DADRI	220 KV DADRI-KHURJA LINE TRIP THROUGH UFR (SET AT 47.9Hz) FROM DADRI END TO ISOLATE "NAPS ISLAND" FROM REST OF GRID.
SIKANDRABAD	220 KV SIKANDRABAD-KHURJA LINE TRIP THROUGH UFR (SET AT 47.9Hz) FROM SIKANDRABAD END TO ISOLATE "NAPS ISLAND" FROM REST OF GRID.
JAHANGIRABAD	220 KV JAHANGIRABAD-KHURJA LINE TRIP THROUGH UFR (SET AT 47.9Hz) FROM JAHANGIRABAD END TO ISOLATE "NAPS ISLAND" FROM REST OF GRID.

NAPS ISLAND SCHEME WHEN ONE UNIT OPERATING

NOTE: LOAD VARIATION SHOWN IN BRACKET i.e. (65MW-99MW). THIS IS INDICATING PEAK DEMAND OF WINTER AND SUMMER

AT NAPS:

1) **48.0 Hz:** LOW FREQUENCY ALARM WILL APPEAR AT WINDOW ANN-407 ON PANEL NO.-6610-PL-2 IN CONTROL ROOM.
2) **47.9 Hz:**

THE FOUR DESIGNATED 220 KV LINES i.e. NAPS-SAMBHAL, NAPS-ATRAULI, NAPS- KHURJA & NAPS - DIBAI LINES TRIP THROUGH UFR (SET AT 47.9 Hz) TO FORM "NAPS ISLAND" WITH ISLAND LOAD IN RANGE OF 70-90 MW OF 220 KV SIMBHOLI SUB-STATIONS.INCLUSIVE OF NAPS STATION LOAD

3) IF FREQUENCY DOES NOT IMPROVE AND REACHED AT 47.5 Hz.THEN

1. ALL FIVE LINES TRIP AFTER 1 SEC TIME DELAY.
2. SUT CB TRIP AFTER 3 SEC. TIME DELAY & 6.6KV AUTO TRANSFER TAKE PLACE.
3. GT CB TRIP AFTER 5 SEC TIME DELAY AND UNITS COME ON HOUSE LOAD.

REV No.	GRID No.	DESCRIPTION / REVISIONS	DATE	DR'N / APP'D
4	4	CHANGES DONE AS PER COMMUNICATION WITH UPSLDC	01.03.21	25/3/21
3	3	FCN / 65140 / S-6 INCORPORATED	09.10.18	
2	2	FCN / 65130 / S-14 INCORPORATED	19.05.16	
1	1	FCN/65140/S-5/RO & FCN/65100/ S-25/ROINCORPORATED	16.08.14	

रेखाचित्र जारी करने का उद्देश्य

न्यूक्लियर पॉवर कॉरपोरेशन ऑफ इंडिया लिमिटेड
(भारत सरकार का उपक्रम)
NUCLEAR POWER CORPORATION OF INDIA LTD.
(A GOVERNMENT OF INDIA ENTERPRISE)
NARORA ATOMIC POWER STATION
नरौरा परमाणु विद्युत केन्द्र
एन पी सी आई एल NPCIL

प्रचालन पत्रक शीट

NAPS ISLAND SCHEME

केन्द्र : एन ए पी एस-

आहरण कर्ता:	अशोक कुमार	दिनांक: 01.03.2021	अभिकल्पक: अभिकल्प जांच कर्ता:
आहरण जांच कर्ता	अर्पिता चक्रवर्ती	दिनांक: 01.03.2021	समीक्षा कर्ता: अनुमोदन कर्ता: तकनीकी सेवाएं अधीक्षक

रेखाचित्र सं/DRG NO.-0-51400-FS-1 संशोधन सं 4

Annexure-B.I

List of feeders for physical regulation in Supply

Uttar Pradesh

S No	Name of Feeder	Affected area	Approx Load relief (MW)	Remarks
1	220kV Meerut-Gajraula	Gajraula	100	Radial
2	220kV Baghpat(PG)-Baghpat D/C	Baghpat	60	Radial
3	220kV Allahabad(PG)-Jhusi	Jhusi	200	Radial
4	220kV Sohawal(PG)-Barabanki D/C	Barabanki	120	Not Radial
5	220kV Mainpuri(PG)-Neemkarori D/C	Farukkhabad	120	Radial
6	220kV Gorakhpur(PG)-Gola D/C	Gorakhpur	80	Radial
7	132kV Ballia(PG)-Bansdeeh	Ballia	15	Radial
8	132kV Ballia(PG)-Sikandarpur	Ballia	30	Radial

50 no.s 132kV feeders can also be opened from SLDC and testing was also carried out few days back at SLDC level

Punjab

S No	Name of Feeder	Affected area	Approx Load relief (MW)	Remarks
1	132kV Jamalpur-Ghulal D/C	Ghulal	91	High loading during paddy
2	66kV Jamalpur-Chandigarh Road	Chandigarh Road	37	To be preferred
3	66kV Jamalpur-Sherpur	Ludhiana	13	-
4	220/132kV Sangrur ICT 1,2, 3	Shamsabad	166	High loading during paddy
5	220kV Amritsar-Naraingarh D/C	Amritsar adjoining area	100	To be preferred
6	220kV Patiala-Nabha D/C	Nabha	190	To be opened after discussion with SLDC
7	220kV Jalandhar-Kanjli D/C	Kapurthala	64	To be preferred

120 no.s 66kV feeders may be tripped from SLDC control room to control over drawl (usually when freq below 49.8Hz)

Annex-VII

Rajasthan				
S. No.	Transmission line / Transformers to be opened	Power supply interruption	Approx load relief (MW)	Remark
1	220kV Anta-Lalsot	Lalsot	130	The load of 220 kV GSS Lalsot is normally fed from Anta radially. However If ring of 220kV Anta-Lalsot-Dausa is closed then SLDC will open 220 kV Dausa – Lalsot line immediately after physical regulation message received from NRLDC.
2	220 kV Bhinmal (PG) –Sayla Ckt-I & II	Sayla	40	However 220 kV GSS Saylais also fed from 220 kV GSS Jalore. SLDC will open 220 kV Sayla – Jalore line immediately after physical regulation message received from NRLDC.
3	220 kV Bassi(PG) - Bagru line	Bagru	80	However 220 kV GSS Bagruis also fed from 220 kV GSS Phulera. SLDC will open 220kV Bagru – Phulera line immediately after physical regulation message received from NRLDC.
4	220kV Bhiwadi(PG) -Khushkera 220kV Neemrana(PG)-Khushkera	Khushkhera & Kishangarh Bas	170	Limited alternate supply may be available. 220kV Alwar-K.G.Bas - Khushkhera linemay get overloaded.
5	220/132 kV, 160 MVA Transformer at 220kV GSS Behror	Behror	80	SLDC will open 220/132kV transformer of 220kV GSS Behror immediately after physical regulation message received from NRLDC.
J&K				
S No	Name of Feeder	Affected area	Approx Loadrelief (MW)	Remarks
1	220kV Kishenpur-Baran D/C	Baran	200	Radial feeder
2	220kV New Wampoh-Mirbazar	Mirbazar	200	Radial feeder
3	132kV Gladni-Kalakote S/C	Jammu	80	Priority 1
4	Kashmir Bemina	Kashmir	50	
5	132kV Barn-KalakoteD/C	Jammu	80	Priority 2
6	132kV Zainakote - Pattan D/C	Kashmir	70	
220kV Samba-Hiranagar may not be opened as it also supplies to Railways				

Annex-VII

Uttarakhand				
S No	Name of Feeder	Affected area	Approx Loadrelief (MW)	Remarks
1	132kV Pithoragarh(PG)-Pithoragarh	Pithoragarh	50	Radial feeder
2	220kV Sitarganj-Eldeco	Eldeco	40-60	Industrial load (only in caseof extreme situations)
No control available from SLDC control room for physical regulation. It was discussed that such feeders may be identified which are fed from two resources and will provide relief. Compiled list of such feeders after discussion at state level needs to be shared with NRLDC at the earliest. In case it is difficult to identify such feeders, contingency plan needsto be developed at SLDC level and shared with NRLDC.				
Himachal Pradesh				
S No	Name of Feeder	Affected area	Approx Loadrelief (MW)	Remarks
1	66kV Bhakra-Rakkar	Rakkar/ Una	10-18	Area being fed from 66kV Rakkar (Una)
2	66kV Pong-Sansarpur	Sansarpur	2-5	Radial feeder
3	132kV Dehar-Kangoo	Kunihar/Shimla	80-140	Priority 1. 400/220kV DeharICT may overload
4	220kV Dehar-Kangoo			
5	220kV Nallagarh-Upernangal D/C	Baddi/ Nallagarh	180-315	Industrial load (only in caseof extreme situations)
6	220kV Khodri-Majri D/C	Kala Amb/ Paonta Sahib/ Nahan	80-190	Limited supply may be available from Kunihar.Many essential loads, Oxygen plants, administrative buildings
7	132kV Kulhal-Giri			
8	66kV Parwanoo-Pinjore	Parwanoo	-	Generally kept open
9	33kV Ganguwal-Bilaspur	Bilaspur	6-8	-
Delhi				
S No	Name of Feeder	Affected area	Approx Loadrelief (MW)	Remarks
1	220kV Mundka-Peeragarhi D/C	Peeragarhi	100-150	Radial feeder
2	220kV BTPS-Okhla D/C	Okhla	200-350	Radial feeder
3	33kV Delhi ckts 1,2,3,4feeders from Rohtak road (BBMB)	Rohtak Road	20-30	Radial feeder
4	220kV MaharaniBagh-Lodhi Road D/C	Lodi Road	200-300	May not be opened as VIP area
5	220kV Maharanibagh-Masjid Moth D/C	Masjid Moth		Radial feeder

Annex-VII

Haryana				
S.No.	**Transmission element to be opened**	**Power supply Interruption in**	**Approx Relief (MW}**	**Remarks**
1	**Feeders in schedule A** Panipat: a) 33kV Panipat-Sewah b) 33kV Panipat-Untla c) 33kV Panipat-lsrana d) 33kV Panipat-Narayana e) 33kV Panipat-Sanoli road Kurukshetra: a) 33kV Kurukshetra-Mathana b) 33kV Kurukshetra-Ajrana c) 33kV Kurukshetra-Kirmich d) 33KV KuruKshetra-REC d) 11kV Kurukshetra-Bahadurpura e) 11kV Kurukshetra-Pipli -2 Dhulkote: a) 66kV Dhulkote-Barnala b) 66kV Dhulkote-Babyal c) 66kV Dhulkote-Sadopur d) Narela: a) 132kV Kundli line emanating from Narela BBMB	Panipat , Kurukshetra, Dhulkote, Kundli (Sonipat)	200 MW (Approx.)	Radial Lines or fed radially (These feeders were already Included In schedule A&B)
2	**Feeders in Schedule B** a) 220kV Sector-72 PG - Sector-33 ckt-1&2 b) 220kV Kaithal PG - Neemwala ckt-1&2	Kaithal, Gurugram,	180 MW (approx.)	Radial Lines (Additional one feeder included in Schedule-B now to achieve desired load relief

ग्रिड-इंडिया GRID-INDIA

ग्रिड कंट्रोलर ऑफ इंडिया लिमिटेड
(भारत सरकार का उद्यम)
GRID CONTROLLER OF INDIA LIMITED
(A Government of India Enterprise)
[formerly Power System Operation Corporation Limited (POSOCO)]
राष्ट्रीय भार प्रेषण केन्द्र / National Load Despatch Centre

आज़ादी का अमृत महोत्सव

कार्यालय : बी-9, प्रथम एवं द्वितीय तल, कुतुब इंस्टीट्यूशनल एरिया, कटवारिया सराय, नई दिल्ली - 110016
Office : 1st and 2nd Floor, B-9, Qutab Institutional Area, Katwaria Sarai, New Delhi -110016
CIN : U40105DL2009GOI188682, Website : www.grid-india.in, E-mail : gridindiacc@grid-india.in, Tel.: 011- 42785855

दिनांक : 07th March 2024

सेवा मे,

All SLDCs/RLDCs/RPCs

विषय: Publishing of Quantum of Reserves in line with Detailed Procedure For Estimation of the Requirement of Secondary Reserve Ancillary Service (SRAS) and Tertiary Reserve Ancillary Service (TRAS) at regional level

संदर्भ: 1. Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2023

2. Detailed Procedure for Assessment of Quantum of Secondary & Tertiary Reserve Capacity, along with Information Exchange and Timelines, as approved by CERC vide letter no. L-1/265/2022/CERC dated 28th Sep 2023

महोदय,

This has reference to the letter dated 25th Jan 2024, issued by NLDC for declaration of secondary & tertiary reserves necessary to be maintained in the financial year 2024-25. (Link: https://posoco.in/en/download/reference-contigency-and-reserves-requirement-of-sras-and-tras-for-2024-25/?wpdmdl=56116). Considering the different contingencies that have recently occurred specially in solar hours, the requirement of reserves during solar and non-solar hours have been reviewed.

The reference contingency for Solar hours & Non-Solar hours at All India level has been considered as 7000 MW & 4500 MW respectively considering the largest contingency which occurred in the Indian grid. Consequentially, the total secondary and tertiary reserve requirement for solar hours is estimated as 7000 MW and 12676 MW respectively for FY 2024-25. Also, the total secondary and tertiary reserve requirement for non-solar hours is estimated as 4500 MW and 10176 MW respectively for FY 2024-25. The details for each control area are enclosed as per Formats RAS3, and RAS4.

सधन्यवाद,

भवदीय

सुरजीत

(सुरजीत बनर्जी)
मुख्य महाप्रबंधक, रा.भा.प्रे.कें.

प्रतिलिपि : Secretary, CERC

GRID CONTROLLER OF INDIA LIMITED

(Formerly known as Power System Operation Corporation Limited)

Format – RAS3

Reference contingency of Non-Solar Hours for Indian Power System

Date of Issue: 07th March 2024	**Revision No.**	**1**
Applicable for Financial Year 2024-25		
Reference Contingency for generation loss (MW)	**4500**	
Reference Contingency for load loss (MW)	**4500**	

GRID CONTROLLER OF INDIA LIMITED

(Formerly known as Power System Operation Corporation Limited)

Format RAS4

Year-Ahead SRAS and TRAS Reserve requirement for Non-Solar hours Year 2024-25 (Scaled for reference contigency of 4500 MW)																
State/UT	Actual 99 Percentile Negative ACE (MW)	Actual 99 Percentile Positive ACE (MW)	Scaled 99 Percentile Negative ACE (MW) {a}	Scaled 99 Percentile Positive ACE (MW) {b}	Max. Demand met {c}	Internal Gen. at the time of max demand {d}	Drawl from ISTS {e=c-d}	State Internal Generation/ State Maximum Demand {f=d/c}	State drawl from ISTS/ State Maximum Demand {g=e/c}	Secondary Reserves in ISGS (h=a*g)	Secondary Reserves at Regional Level (sum of reserves in all states of the region as given in "h")	Secondary Reserves within state {i=a*f}	Tertiary Reserves in ISGS (j = h)	Tertiary Reserves within state (k = i)	Largest Unit Size of internal generation (l)	Total Tertiary Reserves within state {m=k + 0.5*l}
UT Chandigarh	49	55	19	21	428	0	428	0.00	1.00	19		0	19	0	0	0
Delhi	277	357	109	133	7433	1216	6217	0.16	0.84	91		18	91	18	216	126
Haryana	415	572	164	213	12881	2726	10155	0.21	0.79	129		35	129	35	660	365
Himachal Pradesh	209	142	82	53	2193	537	1657	0.24	0.76	62		20	62	20	100	70
UT of Jammu and Kashmir and UT of Ladakh*	425	402	168	150	3271	1564	1707	0.48	0.52	88	792	80	88	80	150	155
Punjab	438	516	173	192	15314	6384	8930	0.42	0.58	101		72	101	72	700	422
Rajasthan	653	955	258	356	17958	12332	5626	0.69	0.31	81		177	81	177	660	507
Uttar Pradesh	761	829	300	309	28224	12806	15418	0.45	0.55	164		136	164	136	660	466
Uttarakhand	217	259	86	97	2756	906	1850	0.33	0.67	57		28	57	28	76	66
NR state Sum	3444	4087	1358	1524												2177
Northern Region	3349	3549	1358	1524												
Chhattisgarh	301	399	121	142	5939	2654	3285	0.45	0.55	67		54	67	54	500	304
UT Daman and Diu & UT Dadra and Nagar Haveli	61	89	24	32	1352	0	1352	0.00	1.00	24		0	24	0	0	0
Gujarat	975	957	393	342	24360	14736	9624	0.60	0.40	155	532	238	155	238	800	638
Goa	82	53	33	19	705	0	705	0.00	1.00	33		0	33	0	0	0
Madhya Pradesh	695	773	280	276	17525	7259	10266	0.41	0.59	164		116	164	116	660	446
Maharashtra	799	743	322	265	29682	21555	8127	0.73	0.27	88		234	88	234	660	564
WR States Sum	2913	3013	1174	1076												1952
Western Region	2895	2505	1174	1076												
Andhra Pradesh	681	580	266	192	13400	8087	5313	0.60	0.40	105		160	105	160	800	560
Karnataka	729	779	285	258	16934	9849	7085	0.58	0.42	119		166	119	166	800	566
Kerala	216	122	84	40	5019	1676	3344	0.33	0.67	56	610	28	56	28	130	93
UT Puducherry	45	90	18	30	521	0	521	0.00	1.00	18		0	18	0	0	0
Tamil Nadu	754	1034	294	342	19556	7310	12246	0.37	0.63	184		110	184	110	600	410
Telangana	632	558	247	185	15467	7485	7982	0.48	0.52	127		119	127	119	800	519
SR State Sum	3058	3163	1193	1046												2149
Southern Region	2942	2437	1193	1046												
Bihar	317	432	121	144	7547	222	7325	0.03	0.97	118		4	118	4	250	129
DVC	338	247	129	82	4556	4968	-413	1.09	-0.09	0		129	0	129	600	429
Jharkhand	185	278	71	93	1989	409	1580	0.21	0.79	56		15	56	15	210	120
Orissa	311	408	119	136	7073	3260	3813	0.46	0.54	64	329	55	64	55	660	385
Sikkim	57	34	22	11	155	0	155	0.00	1.00	22		0	22	0	0	0
West Bengal	313	499	120	166	11771	4939	6831	0.42	0.58	69		50	69	50	500	300
ER state Sum	1521	1898	581	633												1362
Eastern Region	1432	1475	581	633												
Arunanchal Pradesh	45	50	20	25	223	0	223	0.00	1.00	20		0	20	0	0	0
Assam	196	166	89	83	2405	228	2178	0.09	0.91	81		8	81	8	50	33
Manipur	29	42	13	21	253	0	253	0.00	1.00	13		0	13	0	0	0
Meghalaya	53	49	24	25	407	14	393	0.04	0.96	23	172	1	23	1	51	26
Mizoram	12	35	6	17	157	0	157	0.00	1.00	6		0	6	0	30	15
Nagaland	15	34	7	17	176	0	176	0.00	1.00	7		0	7	0	8	4
Tripura	74	65	34	33	419	147	272	0.35	0.65	22		12	22	12	21	22
NER State Sum	424	441	193	221												101
North-Eastern Region	476	515	193	221												
All India (sum of regions)	11094	10481	4500	4500							2435	2065	2435	2065		7741
										Total Tertiary Reserves Requirement in India		10176				
	Note: * UT of Jammu and Kashmir and UT of Ladakh have been considered as single entity inline with data availability at NLDC.															

GRID CONTROLLER OF INDIA LIMITED

(Formerly known as Power System Operation Corporation Limited)

Format RAS4

	Year-Ahead Reserve Requirement of Non-Solar Hours (2024 - 2025)								
	Secondary Reserves			Tertiary Reserves			Total Reserves (Secondary + Tertiary)		
State/ Union Territory UT	Within in ISGS	Within state	Total	Within in ISGS	Within state	Total	Within in ISGS	Within state	Total
UT of Chandigarh	19	0	19	19	0	19	39	0	39
Delhi	91	18	109	91	126	217	183	144	327
Haryana	129	35	164	129	365	494	258	399	657
Himachal Pradesh	62	20	82	62	70	132	124	90	215
UT of Jammu and Kashmir and UT of Ladakh*	88	80	168	88	155	243	175	235	411
Punjab	101	72	173	101	422	523	201	494	696
Rajasthan	81	177	258	81	507	588	161	684	845
Uttar Pradesh	164	136	300	164	466	630	328	602	930
Uttarakhand	57	28	86	57	66	124	115	94	209
Chhattisgarh	67	54	121	67	304	371	134	358	493
UT Daman and Diu & UT Dadra and Nagar Haveli	24	0	24	24	0	24	49	0	49
Gujarat	155	238	393	155	638	793	311	876	1186
Goa	33	0	33	33	0	33	66	0	66
Madhya Pradesh	164	116	280	164	446	610	328	562	890
Maharashtra	88	234	322	88	564	652	176	798	974
Andhra Pradesh	105	160	266	105	560	666	211	721	932
Karnataka	119	166	285	119	566	685	238	731	969
Kerala	56	28	84	56	93	149	112	121	234
UT of Puducherry	18	0	18	18	0	18	35	0	35
Tamil Nadu	184	110	294	184	410	594	368	520	888
Telangana	127	119	247	127	519	647	255	639	893
Bihar	118	4	121	118	129	246	235	132	367
Damodar Valley Corporation	0	129	129	0	429	429	0	558	558
Jharkhand	56	15	71	56	120	176	113	134	247
Odisha	64	55	119	64	385	449	128	439	567
Sikkim	22	0	22	22	0	22	44	0	44
West Bengal	69	50	120	69	300	370	139	350	489
Arunanchal Pradesh	20	0	20	20	0	20	41	0	41
Assam	81	8	89	81	33	114	162	42	204
Manipur	13	0	13	13	0	13	26	0	26
Meghalaya	23	1	24	23	26	50	46	27	74
Mizoram	6	0	6	6	15	21	11	15	26
Nagaland	7	0	7	7	4	11	14	4	18
Tripura	22	12	34	22	22	44	44	34	78
Region-wise and All-India									
Northern Region	792	566	1358	792	2177	2969	1585	2743	4328
Western Region	532	642	1174	532	1952	2484	1065	2594	3659
Southern Region	610	584	1193	610	2149	2758	1220	2732	3952
Eastern Region	329	252	581	329	1362	1691	658	1614	2272
North-Eastern Region	172	21	193	172	101	273	344	122	466
All India	2435.40	2064.60	4500	2435.40	7740.60	10176	4870.81	9805.19	14676

Note:

* UT of Jammu and Kashmir and UT of Ladakh have been considered as single entity inline with data availability at NLDC.

GRID CONTROLLER OF INDIA LIMITED

(Formerly known as Power System Operation Corporation Limited)

Format – RAS3

Reference contingency of Solar Hours for Indian Power System

Date of Issue: 07th March 2024	**Revision No.**	**1**
Applicable for Financial Year 2024-25		
Reference Contingency for generation loss (MW)	**7000**	
Reference Contingency for load loss (MW)	**7000**	

GRID CONTROLLER OF INDIA LIMITED

(Formerly known as Power System Operation Corporation Limited)

Format RAS4

Year-Ahead SRAS and TRAS Reserve requirement for Solar Hours of Year 2024-25 (Scaled for reference contigency of 7000 MW)																
State/UT	Actual 99 Percentile Negative ACE (MW)	Actual 99 Percentile Positive ACE (MW)	Scaled 99 Percentile Negative ACE (MW) {a}	Scaled 99 Percentile Positive ACE (MW) {b}	Max. Demand met {c}	Internal Gen. at the time of max demand {d}	Drawl from ISTS {e=c-d}	State Internal Generation/ State Maximum Demand {f=d/c}	State drawl from ISTS/ State Maximum Demand {g=e/c}	Secondary Reserves in ISGS {h=a*g}	Secondary Reserves at Regional Level {sum of reserves in all states of the region as given in "h"}	Secondary Reserves within state {i=a*f}	Tertiary Reserves in ISGS {j = h}	Tertiary Reserves within state {k = i}	Largest Unit Size of internal generation (l)	Total Tertiary Reserves within state {m=k + 0.5*l}
UT Chandigarh	49	55	30	32	428	0	428	0.00	1.00	30		0	30	0	0	0
Delhi	277	357	170	207	7433	1216	6217	0.16	0.84	142		28	142	28	216	136
Haryana	415	572	255	332	12881	2726	10155	0.21	0.79	201		54	201	54	660	384
Himachal Pradesh	209	142	128	83	2193	537	1657	0.24	0.76	97		31	97	31	100	81
UT of Jammu and Kashmir and UT of Ladakh*	425	402	261	233	3271	1564	1707	0.48	0.52	136	1233	125	136	125	150	200
Punjab	438	516	269	299	15314	6384	8930	0.42	0.58	157		112	157	112	700	462
Rajasthan	653	955	401	554	17958	12332	5626	0.69	0.31	126		275	126	275	660	605
Uttar Pradesh	761	829	467	481	28224	12806	15418	0.45	0.55	255		212	255	212	660	542
Uttarakhand	217	259	133	150	2756	906	1850	0.33	0.67	89		44	89	44	76	82
NR state Sum	3444	4087	2113	2370												2492
Northern Region	3349	3549	2113	2370												
Chhattisgarh	301	399	189	222	5939	2654	3285	0.45	0.55	104		84	104	84	500	334
UT Daman and Diu & UT Dadra and Nagar Haveli	61	89	38	49	1352	0	1352	0.00	1.00	38		0	38	0	0	0
Gujarat	975	957	611	531	24360	14736	9624	0.60	0.40	242	828	370	242	370	800	770
Goa	82	53	51	29	705	0	705	0.00	1.00	51		0	51	0	0	0
Madhya Pradesh	695	773	436	429	17525	7259	10266	0.41	0.59	255		181	255	181	660	511
Maharashtra	799	743	501	413	29682	21555	8127	0.73	0.27	137		364	137	364	660	694
WR States Sum	2913	3013	1827	1673												2309
Western Region	2895	2505	1827	1673												
Andhra Pradesh	681	580	414	298	13400	8087	5313	0.60	0.40	164		250	164	250	800	650
Karnataka	729	779	443	401	16934	9849	7085	0.58	0.42	185		257	185	257	800	657
Kerala	216	122	131	63	5019	1676	3344	0.33	0.67	87	949	44	87	44	130	109
UT Puducherry	45	90	27	47	521	0	521	0.00	1.00	27		0	27	0	0	0
Tamil Nadu	754	1034	458	532	19556	7310	12246	0.37	0.63	287		171	287	171	600	471
Telangana	632	558	384	287	15467	7485	7982	0.48	0.52	198		186	198	186	800	586
SR State Sum	3058	3163	1856	1628												2473
Southern Region	2942	2437	1856	1628												
Bihar	317	432	188	224	7547	222	7325	0.03	0.97	183		6	183	6	250	131
DVC	338	247	201	128	4556	4968	-413	1.09	-0.09	0		201	0	201	600	501
Jharkhand	185	278	110	144	1989	409	1580	0.21	0.79	88	512	23	88	23	210	128
Orissa	311	408	185	212	7073	3260	3813	0.46	0.54	99		85	99	85	660	415
Sikkim	57	34	34	18	155	0	155	0.00	1.00	34		0	34	0	0	0
West Bengal	313	499	186	259	11771	4939	6831	0.42	0.58	108		78	108	78	500	328
ER state Sum	1521	1898	904	985												1502
Eastern Region	1432	1475	904	985												
Arunanchal Pradesh	45	50	32	39	223	0	223	0.00	1.00	32		0	32	0	0	0
Assam	196	166	139	129	2405	228	2178	0.09	0.91	126		13	126	13	50	38
Manipur	29	42	21	32	253	0	253	0.00	1.00	21		0	21	0	0	0
Meghalaya	53	49	37	39	407	14	393	0.04	0.96	36	267	1	36	1	51	27
Mizoram	12	35	9	27	157	0	157	0.00	1.00	9		0	9	0	30	15
Nagaland	15	34	11	27	176	0	176	0.00	1.00	11		0	11	0	8	4
Tripura	74	65	52	51	419	147	272	0.35	0.65	34		18	34	18	21	29
NER State Sum	424	441	300	344												113
North-Eastern Region	476	515	300	344												
All India (sum of regions)	11094	10481	7000	7000							3788	3212	3788	3212	11352	8888
										Total Tertiary Reserves Requirement in India	12676					
	Note: * UT of Jammu and Kashmir and UT of Ladakh have been considered as single entity inline with data availability at NLDC.															

GRID CONTROLLER OF INDIA LIMITED

(Formerly known as Power System Operation Corporation Limited)

Format RAS4

	Year-Ahead Reserve Requirement of Solar Hours (2024 - 2025)								
	Secondary Reserves			Tertiary Reserves			Total Reserves (Secondary + Tertiary)		
State/ Union Territory UT	Within in ISGS	Within state	Total	Within in ISGS	Within state	Total	Within in ISGS	Within state	Total
UT of Chandigarh	30	0	30	30	0	30	60	0	60
Delhi	142	28	170	142	136	278	284	164	448
Haryana	201	54	255	201	384	585	401	438	839
Himachal Pradesh	97	31	128	97	81	178	193	113	306
UT of Jammu and Kashmir and UT of Ladakh*	136	125	261	136	200	336	272	325	597
Punjab	157	112	269	157	462	619	313	574	887
Rajasthan	126	275	401	126	605	731	251	880	1131
Uttar Pradesh	255	212	467	255	542	797	510	754	1264
Uttarakhand	89	44	133	89	82	171	179	126	304
Chhattisgarh	104	84	189	104	334	439	209	419	627
UT Daman and Diu & UT Dadra and Nagar Haveli	38	0	38	38	0	38	76	0	76
Gujarat	242	370	611	242	770	1011	483	1140	1623
Goa	51	0	51	51	0	51	103	0	103
Madhya Pradesh	255	181	436	255	511	766	511	691	1202
Maharashtra	137	364	501	137	694	831	274	1058	1332
Andhra Pradesh	164	250	414	164	650	814	328	899	1227
Karnataka	185	257	443	185	657	843	370	915	1285
Kerala	87	44	131	87	109	196	175	153	327
UT of Puducherry	27	0	27	27	0	27	55	0	55
Tamil Nadu	287	171	458	287	471	758	573	642	1215
Telangana	198	186	384	198	586	784	396	771	1167
Bihar	183	6	188	183	131	313	366	136	502
Damodar Valley Corporation	0	201	201	0	501	501	0	701	701
Jharkhand	88	23	110	88	128	215	175	150	325
Odisha	99	85	185	99	415	515	199	500	699
Sikkim	34	0	34	34	0	34	68	0	68
West Bengal	108	78	186	108	328	436	216	406	622
Arunanchal Pradesh	32	0	32	32	0	32	64	0	64
Assam	126	13	139	126	38	164	251	51	303
Manipur	21	0	21	21	0	21	41	0	41
Meghalaya	36	1	37	36	27	63	72	28	100
Mizoram	9	0	9	9	15	24	17	15	32
Nagaland	11	0	11	11	4	15	21	4	25
Tripura	34	18	52	34	29	63	68	47	115
Region-wise and All-India									
Northern Region	1233	881	2113	1233	2492	3724	2465	3372	5837
Western Region	828	999	1827	828	2309	3137	1656	3307	4963
Southern Region	949	908	1856	949	2473	3421	1897	3380	5278
Eastern Region	512	392	904	512	1502	2014	1023	1894	2917
North-Eastern Region	267	33	300	267	113	380	535	146	681
All India	3788.40	3211.60	7000	3788.40	8887.60	12676	7576.81	12099.19	19676

Note:

* UT of Jammu and Kashmir and UT of Ladakh have been considered as single entity inline with data availability at NLDC.

National Load Despatch Centre
Import Capability of Punjab for April 2024

\

Issue Date: - Issue Time: 1600 Revision No. 0

Date	Time Period in IST (hrs)	Total Transfer Capability (TTC) (MW)	Reliability Margin (MW)	Available Transfer Capability (ATC) (MW)	Approved General Network Access (MW)	Margin Available for Temporary General Network Access(MW)	Changes in TTC w.r.t. Last Revision	Comments
1st April 2024 to 30th April 2024	00-24	9500	500	9000	5497	3503		https://www.punjabsldc.org/ATC_TTC.aspx
Limiting Constraints		N-1 contigency of 400/220KV ICTs at Rajpura, Ludhiana, Jalandhar Loading close to N-1 contingency limits of 400/220kV Patran, Malerkotla, Moga and Patiala ICTs 220 kV underlying network at Jalandhar, Ludhiana and Amritsar						

National Load Despatch Centre
Import Capability of Uttar Pradesh for April 2024

Issue Date: - Issue Time: 1600 Revision No. 0

Date	Time Period in IST (hrs)	Total Transfer Capability (TTC) (MW)	Reliability Margin (MW)	Available Transfer Capability (ATC) (MW)	Approved General Network Access (MW)	Margin Available for Temporary General Network Access(MW)	Changes in TTC w.r.t. Last Revision	Comments
1st April 2024 to 30th April 2024	00-24	16100	600	15500	9779	5721		https://www.upsldc.org/documents/20182/0/ttc_atc_24-11-16/4c79978e-35f2-4aef-8c0f-7f30d878dbde
Limiting Constraints		N-1 contingency of 400/220kV Azamgarh, Allahabad(PG), Gorakhpur (UP), Sarnath, Lucknow (PG) ICTs						

National Load Despatch Centre
Import Capability of Haryana for April 2024

Issue Date: - Issue Time: 1600 Revision No. 0

Date	Time Period in IST (hrs)	Total Transfer Capability (TTC) (MW)	Reliability Margin (MW)	Available Transfer Capability (ATC) (MW)	Approved General Network Access (MW)	Margin Available for Temporary General Network Access(MW)	Changes in TTC w.r.t. Last Revision	Comments
1st April 2024 to 30th April 2024	00-24	9100	250	8850	5418	3432		https://hvpn.org.in/#/atcttc
Limiting Constraints	N-1 contingency of 400/220kV ICTs at Deepalpur and Panipat(BBMB)							

National Load Despatch Centre
Import Capability of Rajasthan for April 2024

Issue Date: - Issue Time: 1600 Revision No. 0

Date	Time Period in IST (hrs)	Total Transfer Capability (TTC) (MW)	Reliability Margin (MW)	Available Transfer Capability (ATC) (MW)	Approved General Network Access (MW)	Margin Available for Temporary General Network Access(MW)	Changes in TTC w.r.t. Last Revision	Comments
1st April 2024 to 30th April 2024	00-24	7600	600	7000	5689	1311		https://sldc.rajasthan.gov.in/rrvpnl/scheduling/downloads
Limiting Constraints		N-1 contingency of 400/220kV Heerapura, Jodhpur, Bikaner, Ajmer, Merta, Hindaun and Bhinmal ICTs						

National Load Despatch Centre
Import Capability of Delhi for April 2024

Issue Date: - Issue Time: 1600 Revision No. 0

Date	Time Period in IST (hrs)	Total Transfer Capability (TTC) (MW)	Reliability Margin (MW)	Available Transfer Capability (ATC) (MW)	Approved General Network Access (MW)	Margin Available for Temporary General Network Access(MW)	Changes in TTC w.r.t. Last Revision	Comments
1st April 2024 to 30th April 2024	00-24	7300	300	7000	4810	2190		https://www.delhisldc.org/resources/atcttcreport.pdf
Limiting Constraints	N-1 contingency of 400/220kV Mundka, HarshVihar and Bawana (bus-split) ICTs.							

National Load Despatch Centre
Import Capability of HP for April 2024

Issue Date: - Issue Time: 1600 Revision No. 0

Date	Time Period in IST (hrs)	Total Transfer Capability (TTC) (MW)	Reliability Margin (MW)	Available Transfer Capability (ATC) (MW)	Approved General Network Access (MW)	Margin Available for Temporary General Network Access(MW)	Changes in TTC w.r.t. Last Revision	Comments
1st April 2024 to 30th April 2024	00-24	1680	100	1580	1130	450		https://hpsldc.com/mrm_category/ttc-atc-report/
Limiting Constraints		High loading of 220kV Hamirpur-Hamirpur D/C. Overloading of 2*200MVA Kunihar transformers						

National Load Despatch Centre
Import Capability of Uttarakhand for April 2024

Issue Date: - Issue Time: 1600 Revision No. 0

Date	Time Period in IST (hrs)	Total Transfer Capability (TTC) (MW)	Reliability Margin (MW)	Available Transfer Capability (ATC) (MW)	Approved General Network Access (MW)	Margin Available for Temporary General Network Access(MW)	Changes in TTC w.r.t. Last Revision	Comments
1st April 2024 to 30th April 2024	00-24	1700	100	1600	1402	198		https://uksldc.in/ttc-atc
Limiting Constraints		N-1 contingency of 400/220kV Kashipur ICTs. High loading of 220kV Roorkee-Roorkee and 220kV CBGanj-Pantnagar lines						

National Load Despatch Centre
Import Capability of J&K for April 2024

Issue Date: - Issue Time: 1600 Revision No. 0

Date	Time Period in IST (hrs)	Total Transfer Capability (TTC) (MW)	Reliability Margin (MW)	Available Transfer Capability (ATC) (MW)	Approved General Network Access (MW)	Margin Available for Temporary General Network Access(MW)	Changes in TTC w.r.t. Last Revision	Comments
1st April 2024 to 30th April 2024	00-24	2900	100	2800	1977	823		
Limiting Constraints		N-1 contigency of 400/220KV ICTs at Amargarh 220 kV underlying network at Amargarh, Wagoora						

National Load Despatch Centre
Import Capability of Chandigarh for April 2024

Issue Date: - Issue Time: 1600 Revision No. 0

Date	Time Period in IST (hrs)	Total Transfer Capability (TTC) (MW)	Reliability Margin (MW)	Available Transfer Capability (ATC) (MW)	Approved General Network Access (MW)	Margin Available for Temporary General Network Access(MW)	Changes in TTC w.r.t. Last Revision	Comments
1st April 2024 to 30th April 2024	00-24	400	20	380	342	38		
Limiting Constraints		N-1 contigency of 220kV Nallagarh-Kishengarh						

ग्रिड-इंडिया GRID-INDIA
ग्रिड कंट्रोलर ऑफ इंडिया लिमिटेड
भारत सरकार का उद्यम
GRID CONTROLLER OF INDIA LIMITED
(A Government of India Enterprise)
[formerly Power System Operation Corporation Limited (POSOCO)]
उत्तर क्षेत्रीय भार प्रेषण केन्द्र / Northern Regional Load Despatch Centre
कार्यालय : 18-ए, शहीद जीत सिंह सनसनवाल मार्ग, कटवारिया सराय, नई दिल्ली-110016
Office : 18-A, Shaheed Jeet Singh Sansanwal Marg, Katwaria Sarai, New Delhi-110016
CIN : U40105DL2009GOI188682, Website : www.nrldc.in, E-mail : nrldc@grid-india.in, Tel: 011 26519406, 26523869, Fax: 011 26852747

Ref No: NRLDC/SO-II/RE/ Date: 04.03.2024

To,
As per Distribution list,

Reference:

i. Letter on Power Quality & Harmonics (Ref. No. NRLDC/SO-II/RE/416-433) dated 13.04.2022.
ii. Letter on Power Quality & Harmonics (Ref. No. NRLDC/SO-II/RE/482-489) dated 08.08.2022.

Sub: Power Quality measurement and Harmonic distortion analysis for all RE generating stations in line with Central Electricity Authority (Technical Standards for Connectivity to the Grid) (Amendment) Regulations, 2013, Part-II, clause B1, Sub-clause (1), (2), (3) & (4)

महोदय,

As stipulated in Central Electricity Authority (Technical Standards for Connectivity to the Grid) (Amendment) Regulations, 2013, Part-II, clause B1, Sub-clause (1), (2), (3) & (4) about requirements with respect to Harmonics, Direct Current (DC) Injection and Flicker are as follows;

B1. Requirements with respect to Harmonics, Direct Current (DC) Injection and Flicker

(1) Harmonic current injections from a generating station shall not exceed the limits specified in Institute of Electrical and Electronics Engineers (IEEE) Standard 519.

(2) The Generating station shall not inject DC current greater than 0.5 % of the full rated output at the interconnection point.

(3) The generating station shall not introduce flicker beyond the limits specified in IEC 61000. Provided that the standards for flicker will come into effect from 1st April 2014.

(4) Measurement of harmonic content, DC injection and flicker shall be done ***at least once in a year*** *in presence of the parties concerned and the indicative date for the same shall be mentioned in the connection agreement.*

Provided that in addition to annual measurement, if distribution licensee or transmission licensee or the generating company, as the case may be, desires to measure harmonic content or DC-injection or flicker, it shall inform the other party in writing and the measurement shall be carried out within 5 working days.

Therefore, it is requested to perform Power Quality measurement, Harmonic analysis test and Flicker test at Field as per CEA regulation as mentioned above and submit the Test report for Power Quality measurement, Harmonic analysis, DC injection and Flicker test showing the %THD and distortion Individual Harmonic distortion at Point of Interconnection for Voltage and Current, DC injection and Flicker at POI.

List of RE plants commissioned full capacity before 1st March'2023 is enclosed as Annexure-I. These RE plants are requested to conduct the Power Quality measurement, Harmonic analysis, DC injection and Flicker test at earliest as already violated the compliance of aforementioned clause B1(4).

सादर,

अलोक कुमार
वरिष्ठ महाप्रबंधक (प्रणाली प्रचालन)
एन.आर.एल.डी.सी

1. Member Secretary, NRPC, 18-A SJSS Marg, Katwaria Sarai, New Delhi-110016.
2. COO, Central Transmission Utility of India Limited (CTUIL), Saudamini, plot no-2, Sector-29, Gurgaon, 122001.
3. Member Power System, Central Electricity Authority, Sewa Bhawan, R.K. Puram, New Delhi 110066
4. Chairman & Managing Director, Grid Controller of India Limited, B-9 (1st Floor), Qutab Institutional Area, Katwaria Sarai, New Delhi, 110016, Delhi
5. Executive Director (NLDC), Grid Controller of India Limited, B-9 (1st Floor), Qutab Institutional Area, Katwaria Sarai, New Delhi, 110016, Delhi
6. Executive Director (NRLDC), Grid Controller of India Limited, 18-A, Shaheed Jeet Singh Sansalwal Marg, Katwaria Sarai, New Delhi -110016
7. CGM (NRLDC), Grid Controller of India Limited, 18-A, Shaheed Jeet Singh Sansalwal Marg, Katwaria Sarai, New Delhi -110016

Annexure-I

S. No.	Name of the plant/ Developer	Capacity (MW)	Pooling station	Date on which full capacity was commissioned (Last capacity commissioned Date)
1	RENEW SOLAR POWER Pvt. Ltd. Bhadla	50	Bhadla(PG)	**05-05-2019**
2	AZURE POWER INDIA Pvt. Ltd., Bhadla	200	Bhadla(PG)	**05-05-2019**
3	SB ENERGY FOUR PRIVATE LIMTED, Bhadla	200	Bhadla(PG)	**17-05-2019**
4	Adani Renewable Energy (RJ) limited Rawara	200	Bhadla(PG)	**23-08-2019**
5	Azure Power Thirty Four Pvt. Ltd.	130	Bhadla(PG)	**09-09-2019**
6	RENEW SOLAR POWER Pvt. Ltd. Bikaner	250	Bikaner	**28-10-2019**
7	ACME Chittorgarh Solar Energy Pvt Ltd	250	Bhadla(PG)	**03-01-2020**
8	Clean Solar Power (Bhadla) Pvt. Ltd	300	Bhadla(PG)	**29-02-2020**
9	Adani Solar Enegry Four Private Limited	50	Bhadla(PG)	**19-04-2020**
10	Adani Solar Enegry Jodhpur Two Limited, Rawara	50	Bhadla(PG)	**13-09-2020**
11	Azure Power Forty Three Pvt. Ltd._RSS	300	Bikaner	**10-02-2021**
12	SB Energy Six Private Limited, Bhadla	300	Bhadla(PG)	**18-06-2021**
13	Eden Renewable Cite Private Limited	300	Fatehgarh-II(PG)	**14-08-2021**
14	Mahindra Renewable Private Limited	250	Bhadla(PG)	**20-08-2021**
15	Tata Power Renewable Energy Ltd. (TPREL)	300	Bhadla(PG)	**24-08-2021**
16	Renew Sun Waves Private Limited	300	Fatehgarh-II(PG)	**08-10-2021**
17	Renew Sun Bright (RSEJ4L)	300	Fatehgarh-II(PG)	**18-11-2021**
18	ReNew Solar Energy (Jharkhand Three) Pvt. Ltd.	300	Fatehgarh-II(PG)	**11-12-2021**
19	ReNew Solar Urja Pvt. Ltd.	300	Fatehgarh-II(PG)	**20-12-2021**
20	Azure Power Forty Three Pvt. Ltd._PSS	300	Bikaner	**01-01-2022**
21	Ayaana Renewable Power One Pvt. Ltd.	300	Bikaner	**02-01-2022**
22	Azure Power Forty One Pvt limited	300	Bhadla(PG)	**09-03-2022**
23	Avaada sunce energy Pvt limited	350	Bikaner	**08-04-2022**
24	Clean Solar Power (Jodhpur) Pvt. Ltd.	250	Bhadla(PG)	**23-04-2022**
25	Avaada Sustainable RJ Pvt. Ltd.	300	Bikaner	**12-05-2022**
26	Avaada RJHN_240MW	240	Bikaner	**12-05-2022**
27	ACME Heeragarh powertech Pvt. Ltd	300	Bhadla-II(PG)	**25-05-2022**
28	Adani Hybrid Energy Jaisalmer One Ltd._390MW	390	Fatehgarh-II(PG)	**27-05-2022**
29	ABC Renewable Pvt. Ltd	300	Bhadla-II(PG)	**05-06-2022**
30	Mega Surya Urja Pvt. Ltd. (MSUPL)	250	Bhadla-II(PG)	**25-06-2022**
31	Tata Power Green Energy Ltd. (TPGEL)	225	Bikaner	**02-08-2022**
32	Nedan Solar NTPC	296	Fatehgarh-I	**05-08-2022**
33	Adani Hybrid Energy Jaisalmer Two Ltd._300MW	300	Fatehgarh-II(PG)	**29-09-2022**
34	Adani Hybrid Energy Jaisalmer Three Ltd._300MW	300	Fatehgarh-II(PG)	**29-09-2022**
35	NTPC Kolayat_400kV	400	Bhadla-II(PG)	**30-09-2022**
36	Adani Hybrid Energy Jaisalmer Four Ltd.	700	Fatehgarh-I	**07-10-2022**
37	Adani Solar Energy Jaisalmer One Pvt. Ltd._450MW	450	Fatehgarh-II(PG)	**23-10-2022**

38	Thar Surya Pvt. Ltd.	300	Bikaner	**26-11-2022**
39	Avaada Sunrays Pvt. Ltd.	320	Bhadla-II(PG)	**14-12-2022**
40	NTPC Devikot Solar plant_240MW	240	Fatehgarh-II(PG)	**15-12-2022**

Sr No	Element Name	Outage Date	Outage Time	Reason
1	220 KV Alusteng-Drass (PG) Ckt-1	01-Feb-24	01:50	Over Voltage
		09-Feb-24	05:20	Phase to earth fault Y-N. As per PMU, Y-N fault occured, no auto-reclosing is observed.
		19-Feb-24	19:19	Phase to earth fault B-N. As per PMU, B-N fault occurred and delayed clearance of 240ms with no auto-reclosing observed.
		21-Feb-24	10:00	Phase to Phase Fault R-B. As per PMU, R-B fault is observed.
2	220 KV Ganguwal-Jamalpur (BB) Ckt-1	01-Feb-24	08:30	LBB operated. As per PMU, Y-N fault occured, no auto-reclosing is observed.
		02-Feb-24	18:06	Phase to Phase Fault R-Y. As per PMU, R-B fault is observed.
		03-Feb-24	17:29	Phase to Phase Fault Y-B. As per PMU, Y-B fault is observed.
		14-Feb-24	12:14	Phase to Phase Fault R-B. As per PMU, R-B fault is observed.
3	220 KV RAPS_A(NP)-Sakatpura(RS) (RS) Ckt-1	04-Feb-24	01:29	Phase to earth fault R-N.
		04-Feb-24	03:05	Phase to earth fault R-N
		08-Feb-24	06:07	Phase to earth fault R-N
		12-Feb-24	03:58	Phase to earth fault R-N
4	220 KV RAPS_A(NP)-Sakatpura(RS) (RS) Ckt-2	07-Feb-24	02:47	Phase to earth fault R-N
		08-Feb-24	04:59	Phase to earth fault R-N
		12-Feb-24	01:17	Phase to earth fault R-N
		23-Feb-24	05:08	Phase to earth fault R-N
5	400 KV Agra-Unnao (UP) Ckt-1	05-Feb-24	03:29	Phase to earth fault B-N. As per PMU, Y-N fault occured, no auto-reclosing is observed.
		11-Feb-24	05:18	Phase to earth fault Y-N
		20-Feb-24	21:47	LBB operated. As per PMU, R-B fault is observed.
		26-Feb-24	21:47	Phase to earth fault R-N. As per PMU, no fault is observed.
6	400 KV Bareilly-Unnao (UP) Ckt-2	13-Feb-24	12:03	Phase to earth fault B-N. As per PMU, B-N fault occured, no auto-reclosing is observed at CB Ganj end.
		20-Feb-24	21:47	LBB operated. As per PMU, R-N fault occured, no auto-reclosing is observed at both the end.
		23-Feb-24	01:13	PLCC maloperation. As per PMU, no fault is observed.
		23-Feb-24	11:11	PLCC maloperation. As per PMU, no fault is observed.
7	400 KV Unnao(UP)-Jehta_Hardoi Road (UP) (PG) Ckt-2	20-Feb-24	21:47	LBB operated. As per PMU, R-N fault occurred and delayed clearance of 280ms with no auto-reclosing observed.
		21-Feb-24	01:09	PLCC maloperation. As per PMU, no fault is observed.
		22-Feb-24	00:26	Relay maloperation. As per PMU, no fault is observed.
		23-Feb-24	12:10	Phase to earth fault B-N. As per PMU, no fault is observed.
		24-Feb-24	11:28	PLCC maloperation. As per PMU, no fault is observed.

Grid Event summary for February 2024

S.No.	Category of Grid Disturbance (GD-I to GD-V)	Name of Elements (Tripped/Manually opened)	Affected Area	Owner/ Agency	Outage		Revival		Duration (hh:mm)	Event (As reported)	Energy Unserved due to Generation loss (MU)	Energy Unserved due to Load loss (MU)	Loss of generation / loss of load during the Grid Disturbance		% Loss of generation / loss of load w.r.t Antecedent Generation/Load in the Regional Grid during the Grid Disturbance		Antecedent Generation/Load in the Regional Grid		Fault Clearance time (in ms)
					Date	Time	Date	Time					Generation Loss(MW)	Load Loss (MW)	% Generation Loss(MW)	% Load Loss (MW)	Antecedent Generation (MW)	Antecedent Load (MW)	
1	GI-2	1) 400 KV Uri_1(NH)-Amargarh (INDIGRID) (INDIGRID) Ckt-2	Jammu and Kashmir	NHPC, INDIGRID	1-Feb-24	01:20	1-Feb-24	06:07	04:47	i) As per SCADA SOE, PMU and information received from constituents the sequence of event is as follows: a. At 01:19:18.711hrs, CB of 80MVAR Bus reactor at 400kV Sambha(PG) opened. b. At 01:20:31.160 hrs, R-N phase to earth fault is observed as per PMU at Amatgarh(INDIGRID) (exact reason and location of fault yet to be shared). c. As per PMU, voltage increased to 1.1 p.u. and over-voltage trip command picked-up. However although voltage reduced to 1.075 p.u. after fault but over-voltage trip command didn't get reset (drop-off to pick-up ratio may be reviewed) and after 5 secs, at 01:20:36:160 hrs, 400 KV Uri_1(NH)-Amargarh (INDIGRID) (INDIGRID) Ckt-2 (as per PMU, voltage reached upto ~1.1 p.u. at the time of tripping) tripped on over-voltage. At the same time, active power generation of 60MW Unit-4 at Uri_2(NH) reduced from 63MW to 38MW. ii) As per PMU at Amargarh(INDIGRID), R-N phase to earth fault with fault clearing time of 120ms is observed at 01:20hrs. iii) As per SCADA, generation loss of approx. 25MW occurred at Uri_2(NH) at 01:20hrs.	0	0	25	0	0.089	0.000	28144	33714	120
2	GD-1	1) 400 KV Amargarh(INDIGRID)-Samba(PG) (INDIGRID) Ckt-1 2) 400 KV Amargarh(INDIGRID)-Samba(PG) (INDIGRID) Ckt-2 3) 400 KV Amargarh(INDIGRID)-Wagoora(PG) (INDIGRID) Ckt-1 4) 400 KV Amargarh(INDIGRID)-Wagoora(PG) (INDIGRID) Ckt-2 5) 220 KV Amargarh (INDIGRID)-Delina(PDD) (PDD JK) Ckt-1 6) 220 KV Amargarh (INDIGRID)-Delina(PDD) (PDD JK) Ckt-2 7) 220 KV Amargarh (INDIGRID)-Ziankote(JK) (PDD JK) Ckt-1 8) 220 KV Amargarh (INDIGRID)-Ziankote(JK) (PDD JK) Ckt-2 9) 400 KV Uri_1(NH)-Amargarh (INDIGRID) (INDIGRID) Ckt-1 10) 400 KV Uri_1(NH)-Uri_2(NH) (PG) Ckt 11) 400 KV Uri_2(NH)-Wagoora (PG) (PG) Ckt 12) 120MW Unit-1 at Uri_1(NH) 13) 60MW Unit-4 at Uri_2(NH) 14) 400kV Kishenpur(PG)-Chamera_2(NH) (PG) Ckt 15) 400 KV Dulhasti(NH)-Kishenpur(PG) (PG) Ckt-1 16) 220kV Bairasiul(NH)-Jassore(HP) Ckt 17) 220kV Drass(PG)-Alusteng Ckt	Jammu and Kashmir	NHPC, INDIGRID, PGCIL, PDD JK	1-Feb-24	01:50	1-Feb-24	02:56	01:06	i) As per SCADA SOE, PMU and information received from constituents the sequence of event is as follows: a. At 01:49:13 hrs, 400 KV Uri_2(NH)-Uri_1(NH) (PG) Ckt and 400 KV Uri_2(NH)-Wagoora (PG) (PG) Ckt also tripped on over-voltage. b. This led to tripping of 60MW Unit-4 at Uri_2(NH) (generating ~38MW and absorbing ~32MVAr) due to loss of evacuation path. Complete blackout occurred at 400kV Uri_2(NH). c. At 01:50:04 hrs, 400 KV Uri_1(NH)-Amargarh(INDIGRID) (INDIGRID) Ckt-1 (As per DR at Amargarh end, voltage reached upto ~1.13 p.u. and as per PMU voltage reached upto ~1.17 p.u.), also tripped on over-voltage. d. This led to tripping of 120MW Unit-1 at Uri_1(NH) (generating ~13MW and absorbing ~48MVAr) due to loss of evacuation path. Complete blackout occurred at 400kV Uri_1(NH). e. Due to tripping of 120MW Unit-1 at Uri_1(NH) and 60MW Unit-4 at Uri_2(NH) MVAr support lost and voltage further increased. f. After this all other 400kV lines from Amargarh(INDIGRID) tripped on over-voltage and supply to 220kV lines also lost which led to complete blackout at 400/220kV Amargarh(INDIGRID). g. During the same time, 400kV Kishenpur(PG)-Chamera_2(NH) (PG) Ckt and 400 KV Dulhasti(NH)-Kishenpur(PG) (PG) Ckt-1 also tripped on over-voltage. h. At the same time, 220kV Drass(PG)-Alusteng Ckt also tripped on over-voltage. Power was coming from Alusteng through 220kV Drass(PG)-Alusteng Ckt and it was going to Kargil through 220kV Drass(PG)-Kargil Ckt. Due to tripping of 220kV Drass(PG)-Alusteng Ckt, supply to 220kV Drass(PG)-Kargil Ckt lost and complete blackout occurred at 220/66kV Drass(PG). ii) As per SCADA SOE, 220kV Bairasiul(NH)-Jassore(HP) Ckt also tripped at the same time (exact reason yet to be shared). iii) As per SCADA, load loss of approx. 600MW is observed in Jammu and Kashmir control area. iv) As per SCADA, generation loss of approx. 38MW occurred at Uri_2(NH) and approx. 13MW occurred at Uri_1(NH) at 01:50hrs.	0	0.66	51	600	0.184	1.837	27750	32660	NA
3	GD-1	1)220KV Bus 1 at Jamalpur(BB) 2) 220 KV Jalandhar-Jamalpur (BB) Ckt-1 3) 220 KV Bhakra_R-Jamalpur (BB) Ckt-1 4) 220 KV Ganguwal-Jamalpur (BB) Ckt-1 5) 220/66kV 100 MVA ICT-1 at Jamalpur(BBMB) 6) 220/66kV 160 MVA ICT-3 at Jamalpur(BBMB) 7) 220/132kV 100 MVA ICT-1 at Jamalpur(BBMB)	Punjab	BBMB	1-Feb-24	08:30	1-Feb-24	11:21	02:51	i) As reported, at 08:30hrs, bus-bar protection of 220kV Bus 1 at Jamalpur(BB) operated (exact reason, nature and location of fault yet to be shared). ii) Due to bus bar protection operation, all the elements connected to 220kV Bus-1 at Jamalpur(BBMB) tripped and 220kV Bus-1 at Jamalpur(BBMB) became dead (Bus-wise arrangement of elements yet to be shared). iii) As reported, 220 kV Bhakra_R-Jamalpur (BB) Ckt-1 tripped on Y-N phase to earth fault with fault current of 2.031 kA and fault distance of 66.32km from Bhakra_R(BB); zone-1 distance protection operated at Bhakra_R(BB) end. iv) As per DR of main-1 relay of 220 KV Jalandhar(end)-Jamalpur (BB) Ckt-1, Y-N phase to earth fault with fault current of 2.511kA and fault clearing time of 53ms is observed. As per DR of main-2 relay of 220 KV Jalandhar(end)-Jamalpur (BB) Ckt-1, B-N phase to earth fault with fault current of 3.358kA and fault clearing time of 70ms is observed; zone-1 distance protection operated at Jalandhar end. (Phase sequence issue is observed in main-2 relay) v) As per PMU at Bhakra_R(BB), Y-N phase to earth fault is observed with fault clearing time of 120ms. vi) As per SCADA, load loss of approx. 30 MW is observed in Punjab control area.	0	0.086	0	30	0.000	0.060	44749	50280	120
4	GD-1	1) 220kV Baddi(HP)-Pinjore(HV) (HPPTCL) Ckt-1 2) 220kV Baddi(HP)-Pinjore(HV) (HPPTCL) Ckt-2 3) 220 kV Baddi-Kunihar(HP) Ckt-1 4) 220 kV Baddi-Kunihar(HP) Ckt-2 5) 220 kV Baddi-Upper Nangal(HP) Ckt 6) 220 kV Baddi-Madhala(HP) Ckt 7) 220 kV Baddi-Wardthman(HP) Ckt 8) 220 kV Madhala -Upper Nangal(HP) Ckt 9) 220 kV Bhabha-Kunihar(HP) ckt 10) 220 kV Jeori-Kunihar(HP) Ckt	Himachal Pradesh	HPPTCL, HVPNL	2-Feb-24	15:27	2-Feb-24	16:30	01:03	i) As reported, at 15:27 hrs, 2220kV Baddi(HP)-Pinjore(HV) (HPPTCL) Ckt-1 & 2 tripped on R-Y phase to phase fault; zone-1 disatnce protection operated at Pinjore end. (Exact reason, nature and location of fault yet to be shared) ii) Due to tripping of aforementioned lines, 220 kV Baddi-Kunihar(HP) Ckt-1 & 2, 220 kV Baddi-Upper Nangal(HP) Ckt, 220 kV Baddi-Madhala(HP) Ckt and 220 kV Baddi-Wardthman(HP) Ckt tripped due to over-loading and 220/66kV Baddi(HP) S/s became dead. iii) During the same time, 220 kV Madhala -Upper Nangal(HP) Ckt, 220 kV Bhabha-Kunihar(HP) ckt and 220 kV Jeori-Kunihar(HP) Ckt also tripped on over-loading. iv) Further, at 15:34 hrs, all 132kV lines from Kunihar(HP) tripped on over-loading and 220/132kV Kunihar(HP) S/s became dead. v) As per PMU, R-Y phase to phase fault is observed with delayed fault clearing time of 400ms. vi) As per SCADA, total change in demand of approx. 785MW in HP control area is observed.	0	0.824	0	785	0.000	1.616	44573	48586	400
5	GI-2	1) 400/220kV 500MVA ICT-2 at Rasra(UP) 2) 220/132kV 160MVA ICT-3 at Rasra(UP) 3) 220/132kV 160MVA ICT-4 at Rasra(UP) 4) 220kV Rasra-Rasra_220(UP) Ckt 5) 220kV Rasra-Bhadura(UP) Ckt-1 6) 220kV Rasra-Bhadura(UP) Ckt-2 7) 220kV Rasra-Ghazipur(UP) Ckt	Uttar Pradesh	UPPTCL	5-Feb-24	23:58	6-Feb-24	00:53	00:55	i) During antecedent condition, 400/220kV 500MVA ICT-2, 220/132kV 160MVA ICT-3 and 4 at Rasra(UP) was carrying approx. 180MW, 30MW and 30MW respectively. 400/220kV 500MVA ICT-1 at Rasra(UP) was not in service. ii) As reported, at 23:58 hrs, bus bar protection operated at both the 220kV buses of 400/220/132kV Rasra(UP) indicating flag "Low gas pressure zone-1". iii) Due to this, all 220kV ckts and 400/220kV ICT-2 and 220/132kV ICT-3 & 4 tripped and both the 220kV buses at Rasra(UP) became dead. iv) During inspection, low gas pressure was not found in GIS physically and the flag was reset. It seems that the relay mal-operated due to which this tripping occurred. v) As per PMU at Balia(PG), no fault is observed in the system. vi) As per SCADA, load loss of approx. 170MW is observed in UP control area.	0	0.156	0	170	0.000	0.447	30345	38002	NA
6	GD-1	1) 400 KV Bawana CCGTB(IPGCL)-Bhiwani(PG) (PG) Ckt 2) 400 KV Bawana CCGTB(IPGCL)-Bahadurgarh(PG) (PG) Ckt 3) 216 MW Bawana GPS - UNIT 2 (GT-2) 4) 216 MW Bawana GPS - UNIT 4 (GT-4) 5) 253.6 MW Bawana GPS - UNIT 5 (STG-1) 6) 253.6 MW Bawana GPS - UNIT 6 (STG-2) 7) 400/220kV 315MVA ICT-1 at Bawana(DV) 8) 400/220kV 315MVA ICT-4 at Bawana(DV) 9) 400/220kV 315MVA ICT-5 at Bawana(DV) 10) 400/220kV 315MVA ICT-6 at Bawana(DV) 11) 400 KV Bawana CCGTB(IPGCL) - Bus 1 12) 400 KV Bawana CCGTB(IPGCL) - Bus 2	Delhi	PGCIL, DTL, IPGCL	6-Feb-24	10:10	6-Feb-24	11:24	01:14	i) During antecedent condition, 400kV interconnectors 41952 and 42352 between 400kV Buses at Bawana(DTL) and 400kV Buses at Bawana CCGTB(IPGCL) were in off position. 400/220kV 315MVA ICT-1, 4, 5 & 6 were connected to Bawana CCGTB(IPGCL) and 315 MVA ICT-2 & 3 were connected to Bawana(DTL). 216 MW Bawana GPS - UNIT 2 (GT-2) & 4 (GT-4) and 253.6 MW Bawana GPS - UNIT 5 (STG-1) & 6 (STG-2) were generating approx. 145MW, 154MW, 88MW and 90MW respectively. 216 MW Bawana GPS - UNIT 1 (GT-1) & 3 (GT-3) were in back-charged condition for meeting the station auxiliary supply. ii) As reported, at around 10:10 hrs, heavy sparking and flash over were observed in 400 kV switchyard of CCGT Bawana. On inspection it was found that Y – phase drop down jumper of bay 413 (400 KV Bawana CCGTB(IPGCL)-Bahadurgarh(PG) (PG) Ckt) snapped from Jack Bus and fell on the support structure which led to fault in 400 KV Bawana CCGTB(IPGCL) - Bus 2. iii) Since, the Bus Bar Protection was out of service, both 400 KV Bawana CCGTB(IPGCL)-Bhiwani(PG) (PG) Ckt and 400 KV Bawana CCGTB(IPGCL)-Bahadurgarh(PG) (PG) Ckt sensed the fault in Z4 (reverse zone) and tripped after a time interval of 160ms from Bawana end. Although the fault was on Bus-2, yet both the line sensed the fault since tie CB was in closed position. iv) Similarly, all the Generators sensed the fault through back-up impedance protection but got blocked due to severe under – voltage condition. Finally, the generators tripped on dead machine protection (50 /27) due to loss of evacuation path. v) Due to tripping of all the lines and generators both the 400kV buses at Bawana CCGTB(IPGCL) became dead and complete blackout occurred at 400kV CCGT Bawana (IPGCL) S/s. viii) As per SCADA SOE, 400 KV Bawana (DV)-Shalimarbagh(DTL) Ckt-1 tripped during the same time (exact reason yet to be shared). vi) As reported by SLDC-Delhi, the load of 220kV Shalimar Bagh, SGTN, DSIDC Bawana and Rohini-I S/s got affected. vii) As per PMU, Y-N phase to ground fault with delayed fault clearing time of 280ms is observed. viii) As per SCADA, change in demand of approx. 650MW in Delhi control area and change in generation of approx. 470MW at CCGT Bawana are observed and , but as reported by SLDC Delhi, load loss of approx. 587MW and generation loss of approx. 477MW occurred. ix) Load of Shalimar Bagh and SGTN was normalized through 220kV Mundka-Peeragarhi-Wazipur Ckts and load of DSIDC Bawana was normalized through 220kV Mandola-Narela Ckt at 10:12 hrs. At 10:36 hrs, supply of 220kV Bawana-Rohini Ckt-2 restored at 220kV Rohini and load of bus-2 normalized and at 11:20hrs, supply of 220kV Bawana-Rohini Ckt-1 restored followed by normalization of 66kV loads at 11:24hrs.	0	0.724	477	587	0.957	0.989	49866	59355	280
7	GI-1	1) 220 KV Mandola(PG)-Narela(DV) (DTL) Ckt-1 2) 220 KV Mandola(PG)-Narela(DV) (DTL) Ckt-2 3) 220 KV DSIDC-Narela(DV) (DTL) Ckt-1 4) 220 KV DSIDC-Narela(DV) (DTL) Ckt-2 5) 220/66kV 100MVA ICT-1 at Narela(DTL) 6) 220/66kV 100MVA ICT-2 at Narela(DTL) 7) 220/66kV 100MVA ICT-3 at Narela(DTL) 8) 220kV Bus-1 at Narela(DTL)	Delhi	PGCIL, DTL	6-Feb-24	10:29	6-Feb-24	11:04	00:35	i) 220/66kV Narela(DTL) has double main bus scheme. ii) During antecedent condition, 220 kV Mandola(PG)-Narela(DV) (DTL) Ckt-1 & 2, 220 kV DSIDC-Narela(DV) (DTL) Ckt-1 & 2 and 220/66kV 100MVA ICT-1, 2 & 3 at Narela(DTL) were connected to 220kV Bus-1 at Narela(DTL) and 220 kV Panipat(BB)-Narela(DV) (DTL) Ckt-1, 2 & 3 and 220 kV Rohtak Road-Narela(DV) (DTL) Ckt-1 & 2 were connected to 220kV Bus-2 at Narela(DTL). 220kV Bus coupler was in off position. iii) As reported, at 10:29 Hrs, bus bar protection operated at 220kV Bus-1 at Narela(DTL) as PG clamp of B-phase conductor of Bus-1 got damaged creating bus fault on B-ph near ICT-2 bay. iv) Due to operation of bus-bar protection, all the elements connected to 220kV Bus-1 at Narela(DTL) tripped and Bus-1 became dead. v) As reported by SLDC-Delhi, the load of 220kV Narela S/s, Bhalswa, Bhalswa 2, Badli, IFC Narela, A-7 Narela, A.I.R. Kham Pur, DSIDC Narela-I got affected. vi) As per PMU, R-B phase to phase fault with fault clearing time of 120ms is observed. vii) As per SCADA, change in demand of approx. 270MW is observed in Delhi control area, but as reported by SLDC Delhi, load loss of approx. 126MW is observed which was normalized within 35 minutes. viii) As reported, at 11:04hrs, load was normalized on 220kV Bus-2 at Narela(DTL).	0	0.074	0	126	0.000	0.213	50745	59286	120
8	GD-1	1) 220 kV Bhabha-Kunihar(HP) ckt 2) 220 kV Jeori-Kunihar(HP) Ckt 3) 220 kV Baddi-Kunihar(HP) Ckt-1 4) 220 kV Baddi-Kunihar(HP) Ckt-2 5) 220 kV Baddi-Upper Nangal(HP) Ckt 6) 220 kV Baddi-Madhala(HP) Ckt 7) 220 kV Baddi-Wardthman(HP) Ckt	Himachal Pradesh	HPPTCL	8-Feb-24	10:41	8-Feb-24	10:59	00:18	i) During antecedent condition, as per SCADA, power was flowing towards Kunihar through 220 kV Bhabha-Kunihar(HP) ckt and 220 kV Baddi-Kunihar(HP) Ckt-1 & 2 carrying approx. 143MW, 115MW and 115MW. Approx. 31MW was going from Kunihar to Jeori through 220 kV Jeori-Kunihar(HP) Ckt and 220/132kV 80/100MVA ICT-1 & 2 at Kunihar(HP) were carrying approx. 170MW each. Bus coupler was in off position at 220kV Baddi(HP). ii) As reported, at 10:41 hrs, 220 kV Bhabha-Kunihar(HP) ckt tripped on B-N phase to earth fault. (Exact reason, nature and location of fault yet to be shared) iii) Due to tripping of this line, 220 kV Baddi-Kunihar(HP) Ckt-1 & 2 and 220 kV Jeori-Kunihar(HP) Ckt tripped due to over-loading and 220/66kV Kunihar(HP) S/s became dead. iv) During this time, 220 kV Baddi-Upper Nangal(HP) Ckt, 220 kV Baddi-Madhala(HP) Ckt and 220 kV Baddi-Wardthman(HP) Ckt also tripped due to over-loading and 220kV Bus-1 at Baddi(HP) became dead. v) As per SCADA SOE, 220/66kV 31.5MVA ICT-1 at Jeori(HP) tripped during the same time. (Exact reason yet to be shared) vi) As per PMU, B-N phase to earth fault is observed with fault clearing time of 80ms. vii) As per SCADA, change in demand of approx. 525MW in HP control area is observed.	0	0.158	0	525	0.000	0.901	49687	58261	80

S.No.	Category of Grid Disturbance (GD-I to GD-V)	Name of Elements (Tripped/Manually opened)	Affected Area	Owner/ Agency	Outage		Revival		Duration (hh:mm)	Event (As reported)	Energy Unserved due to Generation loss (MU)	Energy Unserved due to Load loss (MU)	Loss of generation / loss of load during the Grid Disturbance		% Loss of generation / loss of load w.r.t Antecedent Generation/Load in the Regional Grid during the Grid Disturbance		Antecedent Generation/Load in the Regional Grid		Fault Clearance time (in ms)
					Date	Time	Date	Time					Generation Loss(MW)	Load Loss (MW)	% Generation Loss(MW)	% Load Loss (MW)	Antecedent Generation (MW)	Antecedent Load (MW)	
9	GD-1	1) 220kV DCRTPP(HR)-Joria(HR) ckt -2 2) 220kV DCRTPP(HR)-Joria(HR) ckt -1 3) 220kV Karnal(HR)-Unispur(HR) ckt 4) 220kV Salempur(HR)-Bakana(HR) ckt-2 5) 220kV DCRTPP(HR)-Unispur(HR) ckt -1 6) 220kV DCRTPP(HR)-Unispur(HR) ckt -2 7) 220kV Salempur(HR)- Bakana(HR) ckt-1 8) 220kV DCRTPP(HR) – Bakana(HR) ckt -1 9) 220kV DCRTPP(HR) – Bakana(HR) ckt-2 10) 300 MW DCRTPPP (Yamuna Nagar) - UNIT 1 11) 300 MW DCRTPPP (Yamuna Nagar) - UNIT 2	Haryana	HVPNL	8-Feb-24	16:22	8-Feb-24	16:45	00:23	i) During antecedent condition, 220kV DCRTPP-Rampur Ckt-1 was under construction (LILO in place of DCRTPP-Abdullapur Ckt) and 220kV DCRTPP-Rampur Ckt-2 was under shutdown. 220kV DCRTPP(HR)-Joria(HR) ckt -1 & 2, 220kV DCRTPP(HR)-Bakana(HR) ckt -1 & 2 and 220kV DCRTPP(HR)-Unispur(HR) ckt -1 & 2 were carrying approx. 189MW, 183MW, 47MW, 56MW, 30MW and 31MW respectively. ii) As reported, at 16:12hrs, 220kV DCRTPP(HR)-Joria(HR) ckt -2 tripped due to snapping of R-ph jumper at tower location no. 8. Simultaneously, 220kV DCRTPP(HR)-Joria(HR) ckt -1 tripped on over-loading. iii) After this, load shifted to remaining four ckts. 220kV DCRTPP(HR)-Bakana(HR) ckt -1 & 2 and 220kV DCRTPP(HR)-Unispur(HR) ckt -1 & 2 were carrying approx. 192MW, 202MW, 74MW and 74MW respectively. Power was flowing from 220kV DCRTPP(HR) to Bakana(HR) (through 220kV DCRTPP(HR)-Bakana(HR) D/C) to Salempur(HR) (through 220kV Bakana(HR)-Salempur(HR) D/C) and 220kV DCRTPP(HR) to Unispur(HR) (through 220kV DCRTPP(HR)-Unispur(HR) D/C) to Karnal(HR) (through 220kV Unispur(HR)-Karnal(HR) S/C). iv) As further reported, at 16:22hrs, 220kV Karnal(HR)-Unispur(HR) ckt (carrying ~123MW) tripped on transient fault (exact nature and location of fault yet to be shared). v) After this, 220kV DCRTPP(HR)-Bakana(HR) ckt -1 & 2 and 220kV Bakana(HR)-Salempur(HR) ckt -1 & 2 were carrying approx. 253MW, 263MW, 239MW and 233MW respectively. vi) During the same time, 220kV Salempur(HR)-Bakana(HR) ckt-2 also tripped due to breaking of Y-ph conductor at tower location no. 83. vii) Due to this tripping, DCRTPP(HR)-Bakana(HR) ckt -1 & 2, 220kV Bakana(HR)-Salempur(HR) ckt -1 and 220kV DCRTPP(HR)-Unispur(HR) ckt -1 & 2 tripped on over-loading. Complete blackout occurred at 220KV Bakana(HR) and Unispur(HR) S/s. viii) Due to tripping of all the evacuating lines at DCRTPP, 300 MW DCRTPPP (Yamuna Nagar) - UNIT 1 & 2 also tripped and complete blackout occurred at 220KV DCRTPP(HR) S/s. ix) As per PMU at Abdullapur(PG), R-Y phase to phase fault is observed with fault clearing time of 80ms. x) As per SCADA, load loss of approx. 160 MW in Haryana control area and generation loss of approx. 547 MW at 220KV DCRTPP Yamunanagar(HR) are observed. xi) Supply at 220kV DCRTPP(HR) and Unispur(HR) was restored within 23 minutes and Supply at Bakana(HR) was restored within 30 minutes.	0	0.061	547	160	1.214	0.343	45045	46699	80
10	GD-1	1) 220 KV Adani RenewPark_SL_FGARH_FBTL (AREPRL)-AHEJ4L PSS 3 HB_FGRAH_FBTL (AHEJ4L) (AREPRL) Ckt	Rajasthan	AREPRL, AHEJ4L	14-Feb-24	09:49	14-Feb-24	18:23	08:34	i) Generation of 220kV AHEJ4L PSS-3 RE stations evacuates through 220 KV Adani RenewPark_SL_FGARH_FBTL (AREPRL) - AHEJ4L PSS 3 HB_FGRAH_ FBTL (AHEJ4L) (AREPRL) Ckt. During antecedent condition, AHE4L PSS 3 RE station was generating approx. 45MW as per SCADA. ii) As reported, at 09:49hrs, 220 KV Adani RenewPark_SL_FGARH_FBTL (AREPRL)-AHEJ4L PSS 3 HB_FGRAH_FBTL (AHEJ4L) (AREPRL) Ckt tripped on mal-operation of relay leading to Bay-204 CB trip (exact reason yet to be shared). iii) As per PMU at AHEJ4L Wind PSS-4, R-B phase to phase fault is observed with fault clearing time of 80ms. Voltage dropped to ~0.91 p.u. during the fault. iv) As per PMU, due to tripping of 220kV AHEJ4L PSS-3 line, RE (wind) generation (~45MW) of the RE station lost due to loss of evacuation path.	0	0	45	0	0.089	0.000	50457	62135	80
11	GD-1	1) 220 kV Bhabha-Kunihar(HP) ckt 2) 220 kV Jeori-Kunihar(HP) Ckt 3) 220 kV Baddi-Kunihar(HP) Ckt-1 4) 220 kV Baddi-Kunihar(HP) Ckt-2 5) 220 kV Baddi-Upper Nangal(HP) Ckt 6) 220 kV Baddi-Madhala(HP) Ckt 7) 220 kV Baddi-Wardthman(HP) Ckt 8) 220 kV Jeori-Bhaba(HP) Ckt	Himachal Pradesh	HPPTCL	16-Feb-24	11:30	16-Feb-24	11:36	00:06	i) During antecedent condition, as per SCADA, power was flowing towards Kunihar through 220kV Jeori-Kunihar(HP) Ckt, 220 kV Wangtoo-Bhabha-Kunihar(HP) ckt (T-connection) and 220 kV Baddi-Kunihar(HP) Ckt-1 & 2 carrying approx. 91MW, 99MW, 57MW and 58MW. 220/132kV 80/100MVA ICT-1 & 2 at Kunihar(HP) were carrying approx. 150MW each. Bus coupler was in off position at 220kV Baddi(HP). ii) As reported, at 11:30 hrs, 220kV Jeori-Kunihar(HP) Ckt tripped from Jeori end on R-N phase to earth fault with fault current of 1.537kA and fault distance of 39.7km from Jeori end. (Exact reason of fault yet to be shared). At the same time, 220kV Jeori-Bhaba(HP) Ckt also tripped on the same fault resulting into blackout at 220/66kV Jeori(HP) S/s. iii) On inspection it was found that a stone crusher office was laying internet cable near Bayal below tower no. 110 span, due to which 220kV Jeori-Kunihar(HP) Ckt came in induction zone of the line and the line tripped. It was also reported that a person got injured due to same and notice by concerened office was served to the defaulting party. iv) As further reported, bus coupler was in on position at that time at Bhaba(HP). Hence fault was sensed by 220 kV Wangtoo-Bhabha-Kunihar(HP) ckt (T-connection) and line tripped from Wangtoo end. v) Due to tripping of these two lines, 220 kV Baddi-Kunihar(HP) Ckt-1 & 2 tripped due to over-loading and 220/66kV Kunihar(HP) S/s became dead. vi) During this time, 220 kV Baddi-Upper Nangal(HP) Ckt, 220 kV Baddi-Madhala(HP) Ckt and 220 kV Baddi-Wardthman(HP) Ckt also tripped due to over-loading and 220kV Bus-1 at Baddi(HP) became dead. vii) As per SCADA SOE, 220/66kV 31.5MVA ICT-1 at Jeori(HP) and 220/11kV 3X13MVA ICT-2 at Mori(HP) tripped during the same time. (Exact reason yet to be shared) viii) As per PMU, R-N phase to earth fault is observed with delayed fault clearing time of 560ms. ix) As per SCADA, change in demand of approx. 510MW and change in generation of approx. 50MW in HP control area is observed. But as reported by, SLDC-HP, load loss of ~400MW (320MW at Kunihar feeding load of Solan and Shimla) and generation loss of ~40MW (20MW in Bhaba and 20MW in Giri) occurred in HP control area.	0	0.04	40	400	0.073	0.645	54781	62049	560
12	GD-1	1) 220 KV Alusteng-Drass (PG) Ckt	Jammu and Kashmir	PGCIL, JKPTCL	19-Feb-24	19:19	19-Feb-24	20:20	01:01	i) 220/66kV Drass(PG) have double main bus arrangement at 220kV side. ii) During antecedent condition, approx. 25MW power was coming from Alusteng to Drass and approx. 23MW power was going out from Drass to Kargil. iii) As reported, at 19:19 hrs, 220 KV Alusteng-Drass (PG) Ckt tripped on B-N phase to earth fault with distance of 96km from Drass end. iv) Due to this tripping supply to 220 KV Drass (PG)-Kargil Ckt was lost and blackout occurred at 220/66kV Drass(PG) S/s. v) As per PMU at Amargarh, B-N phase to earth fault is observed with fault clearing time of 280ms. vi) As per SCADA, change in demand of approx. 260MW is observed in J&K control area.	0	0.264	0	260	0.000	0.485	41035	53652	280
13	GD-1	1) 220 KV Bairasuil(NH)-Pong (BB)(PG) ckt 2) 220 KV Bairasuil(NH)-Jessore (HP)(PG) ckt	Himachal Pradesh	NHPC, BBMB, HPPTCL, PGCIL	20-Feb-24	17:32	20-Feb-24	19:41	02:09	i) During antecedent condition, no generation was there at Bairasiul(NH). ii) As reported, at 17:32hrs, 220 KV Bairasuil(NH)-Pong (BB)(PG) ckt tripped on 3-phase to earth fault (zone-2 distance protection operated at Pong(BB) end) with fault distance of 76.55km and fault current of Ir=~2.602kA, Iy=~3.122kA and Ib=~3.293kA from Pong(BB) end. iii) During the same time, 220 KV Bairasuil(NH)-Jessore (HP)(PG) ckt also tripped on 3-phase to earth fault (fault sensed in zone-2 at Jessore(HP) end) with fault distance of 54.22km and fault current of Ir=~4.513kA, Iy=~2.77kA and Ib=~2.56kA from Jessore(HP) end. iv) As per DR of 220 KV Bairasiul(NH) (end)-Jessore(HP) (PG) Ckt, Y-B-N double phase to earth fault is observed with fault current of Iy=~2.845kA and Ib=~3.093kA from Bairasiul(NH) end. Fault sensed in zone-1 at Bairasiul(NH) end. Fault clearing time was approx. 54ms. v) As per PMU at Jalandhar(PG), 3- phase to earth fault is observed with fault clearing time of 80ms. vi) As per SCADA, load loss of approx. 45MW is observed in HP control area.	0	0.097	0	45	0.000	0.091	45200	49340	80
14	GI-2	1) 400 KV Agra-Unnao (UP) Ckt 2) 400 KV Unnao-Lucknow (UP) Ckt 3) 400 KV Bareilly-Unnao (UP) Ckt-2 4) 400 KV Unnao(UP)-Jehta_Hardoi Road (UP) (PG) Ckt-2 5) 400/220 kV 315 MVA ICT 1 at Unnao(UP) 6) 765/400 kV 1000 MVA ICT 2 at Unnao(UP) 7) 765/400 kV 1000 MVA ICT 3 at Unnao(UP) 8) 400KV Bus 1 at Unnao(UP)	Uttar Pradesh	UPPTCL, PGCIL	20-Feb-24	21:47	20-Feb-24	22:51	01:04	i) 765/400/220kV Unnao(UP) has double main and transfer bus scheme at 400kV level. ii) During antecedent condition, 400 KV Agra-Unnao (UP) Ckt, 400 KV Unnao-Lucknow (UP) Ckt, 400 KV Bareilly-Unnao (UP) Ckt-2, 400 KV Unnao(UP)-Jehta_Hardoi Road (UP) (PG) Ckt-2, 400/220 kV 315 MVA ICT 1 at Unnao(UP), 765/400 kV 1000 MVA ICT 2 and 3 at Unnao(UP) were connected to 400KV Bus 1 at Unnao(UP) and rest of the elements were connected to 400KV Bus 2 at Unnao(UP). iii) As per SCADA, 400/220 kV 315 MVA ICT 1 at Unnao(UP), 765/400 kV 1000 MVA ICT 2 and 3 at Unnao(UP) were carrying approx. 151MW, 518MW and 535MW respectively. iv) As reported, at 21:47 hrs, LBB operated due to fault at Main CB of 400 KV Bareilly-Unnao (UP) Ckt-2. Hence all the elements connected to 400KV Bus 1 at Unnao(UP) tripped and 400KV Bus 1 at Unnao(UP) became dead. v) As per DR of 400 KV Bareilly-Unnao (UP) Ckt-2, R-N phase to earth fault is observed with fault current of 6.135kA from Unnao(UP) and 2.197kA from Bareilly(UP). Fault was sensed in zone-1 at Unnao(UP) end. Fault was cleared within 280ms from Unnao(UP) end and 130ms from Bareilly(UP) end. vi) As per PMU at Unnao(UP), R-N phase to earth fault is observed with fault clearing time of 280ms. vii) As per SCADA, no change in demand is observed in UP control area.	0	0	0	0	0.000	0.000	35580	44516	280
15	GD-1	1) 220 KV Alusteng-Drass (PG) Ckt	Jammu and Kashmir	PGCIL, JKPTCL	21-Feb-24	10:00	21-Feb-24	11:50	01:50	i) 220/66kV Drass(PG) have double main bus arrangement at 220kV side. ii) During antecedent condition, approx. 47MW power was coming from Alusteng to Drass and approx. 45MW power was going out from Drass to Kargil. iii) As reported, at 10:00 hrs, 220 KV Alusteng-Drass (PG) Ckt tripped on R-B phase to phase fault with fault current of 2kA and 2.2kA from Alusteng end in R and B phases respectively and fault distance of 61km from Alusteng end and 64.9km from Drass end. iv) Due to this tripping supply to 220 KV Drass (PG)-Kargil Ckt was lost and blackout occurred at 220/66kV Drass(PG) S/s. v) As per PMU at Amargarh, R-B phase to phase fault is observed with fault clearing time of 80ms. vi) As per SCADA, change in demand of approx. 115MW is observed in J&K control area.	0	0.211	0	115	0.000	0.205	49115	56164	80
16	GD-1	1) 220 KV Lalton Kalan(PS)-Dandhari Kalan(PS) (PSTCL) Ckt 2) 220 KV Ganguwal-Jamalpur (BB) Ckt-2 3) 220 KV Jamalpur(BB)-Sangrur(PS) (BB) Ckt-2 4) 220 KV Jamalpur(BB)-Dandhari Kalan(PS) (PSTCL) Ckt-1 5) 220 KV Jamalpur(BB)-Dandhari Kalan(PS) (PSTCL) Ckt-2 6) 220KV Bus 3 at Jamalpur(BB) 7) 126MW Unit-3 at Bhakra(BB)	Punjab	PSTCL, BBMB	24-Feb-24	10:31	24-Feb-24	12:03	01:32	i) During antecedent condition, 220 KV Ludhiana(PG)-Dandhari Kalan(PS) Ckt was not in service. 126MW Unit-3 at Bhakra(BBMB) was generating approx. 123MW. ii) As reported, at 10:31hrs, Y-phase jumper (exact location yet to be shared) of 220 KV Lalton Kalan(PS)-Dandhari Kalan(PS) (PSTCL) Ckt snapped. CB didn't open from Dhandhari Kalan end, due to which 220 KV Jamalpur(BB)-Dandhari Kalan(PS) (PSTCL) Ckt-1 & 2 tripped from Jamalpur(BB) end on back-up earth fault protection operation. iii) As 220 KV Ludhiana(PG)-Dandhari Kalan(PS) Ckt was not in service and 220 KV Lalton Kalan(PS)-Dandhari Kalan(PS) (PSTCL) Ckt, 220 KV Jamalpur(BB)-Dandhari Kalan(PS) (PSTCL) Ckt-1 & 2 already tripped, hence complete blackout occurred at 220/66 KV Dhandhari Kalan(PS) S/s. iv) During the same time, as per DR, bus bar protection (zone-2) operated at 220KV Bus 3 at Jamalpur(BB) (exact reason yet to be shared) and all other elements connected to Bus-3 tripped and Bus-3 became dead (Bus wise arrangement of elements yet to be shared). v) As per SCADA SOE, 126MW Unit-3 at Bhakra(BBMB) tripped during the same time (exact reason yet to be shared). vi) As per PMU at Jalandhar(PG), no fault is observed in the system. vii) As per SCADA, generation loss of approx. 123 MW is observed at Bhakra(BBMB). viii) As per SCADA, load loss of approx. 70 MW is observed in Punjab control area.	0	0.107	123	70	0.231	0.116	53134	60108	NA
17	GI-2	1) 400/220 kV 500 MVA ICT 1 at Bhadla(RS) 2) 400/220 kV 500 MVA ICT 2 at Bhadla(RS) 3) 400/220 kV 500 MVA ICT 3 at Bhadla(RS)	Rajasthan	RVPNL	25-Feb-24	12:55	25-Feb-24	14:08	01:13	i) During antecedent condition, MVA power flows of 400/220 kV 500 MVA ICT 1, 2 & 3 at Bhadla(RS) were 417MVA, 452MVA and 454MVA respectively as per SCADA. ii) As reported, at 12:55hrs, 400/220 kV 500 MVA ICT 1 at Bhadla(RS) tripped due to burning of isolator (exact reason, nature and location of fault yet to be shared) iii) Due to this tripping, 400/220 kV 500 MVA ICT 2 and 3 at Bhadla(RS) got overloaded and tripped due to over-current protection operation. iv) As per PMU at Bikaner(PG), R-Y phase to phase fault converted to 3-phase fault is observed with delayed fault clearance time of 880 ms. v) As per SCADA, change in demand of approx. 545MW is observed in Rajasthan control area. vi) As per SCADA, change in NR total solar generation of approx. 1890MW is observed.	0	0.663	1890	545	3.714	0.942	50888	57861	880

S.No.	Category of Grid Disturbance (GD-I to GD-V)	Name of Elements (Tripped/Manually opened)	Affected Area	Owner/ Agency	Outage		Revival		Duration (hh:mm)	Event (As reported)	Energy Unserved due to Generation loss (MU)	Energy Unserved due to Load loss (MU)	Loss of generation / loss of load during the Grid Disturbance		% Loss of generation / loss of load w.r.t Antecedent Generation/Load in the Regional Grid during the Grid Disturbance		Antecedent Generation/Load in the Regional Grid		Fault Clearance time (in ms)
					Date	Time	Date	Time					Generation Loss(MW)	Load Loss (MW)	% Generation Loss(MW)	% Load Loss (MW)	Antecedent Generation (MW)	Antecedent Load (MW)	
18	GD-1	1) 765 KV Anpara_D(UP) - Bus 1 2) 765 KV Anpara_D(UP) - Bus 2 3) 765/400 kV 1000 MVA ICT 1 at Anpara_D(UP) 4) 765 KV Obra_C_TPS-Anpara_D (UP) ckt 5) 765 KV Anpara_C(LAN)-Anpara_D(UP) (UP) Ckt-1 6) 500 MW Anpara-D TPS - UNIT 1 7) 500 MW Anpara-D TPS - UNIT 2 8) 400 KV Anpara-Anpara_D (UP) Ckt-1 9) 400 KV Anpara-Anpara_D (UP) Ckt-2	Uttar Pradesh	UPPTCL	27-Feb-24	13:57	27-Feb-24	14:11	00:14	i) During antecedent condition, 500MW Anpara-D TPS Unit-1&2 were generating approx. 285MW & 295MW respectively and evacuating from 765kV Anapara_D-Obra_C ckt carrying approx 582MW. ii) As reported, at 13:57hrs, R-N phase to earth fault occurred on 765kV Anapara_D-Obra_C ckt. Fault distance was ~8.5km from Obra_C end, Z-1 from Obra_C end and Z-2 from Anpara_D end. On this fault, 765kV Anapara_D-Obra_C ckt tripped from both ends however, delayed clearance occurred at Anpara_D end. iii) At the same time, 765 KV Anpara_C(LAN)-Anpara_D(UP) (UP) Ckt-1 tripped from Anpara_C end and 400 KV Anpara-Anpara_D (UP) Ckt-1&2 tripped from Anpara end on O/C E/F protection operation. Protection setting of O/C E/F protection in these lines need to be reviewed. iv) With the tripping of aforementioned lines, 500MW Unit-1&2 at Anpara_D TPS tripped due to loss of evacuation path. v) As per PMU at Anpara TPS, R-N phase to earth fault with delayed clearance of 480ms is observed. vi) As per SCADA, loss of generation of approx. 580MW is observed at Anpara_D TPS in UP control area.	0	0	580	0	1.199	0.000	48368	52560	480
19	GI-2	1) 220 KV Bassi(PG)-Dausa(RS) (PG) Ckt-1 2) 220 KV Bassi(PG)-Dausa(RS) (PG) Ckt-2 3) 220 KV Anta(NT)-Sakatpura(RS) (RS) Ckt-1 4) 400/220 kV 315 MVA ICT 1 at Hindaun(RS) 5) 400/220 kV 315 MVA ICT 2 at Hindaun(RS)	Rajasthan	RVPNL	28-Feb-24	06:58	28-Feb-24	07:38	00:40	i) During antecedent condition, 220 KV Bassi(PG)-Dausa(RS) (PG) Ckt-1 & 2 were carrying approx. 205MW towards Dausa and 400/220 kV 315 MVA ICT 1 & 2 at Hindaun(RS) were carrying approx. 257MW & 238MW respectively. ii) As reported, at 06:58hrs, 220 KV Bassi(PG)-Dausa(RS) (PG) Ckt-1 tripped due to snapping of B-ph dropper conductor at Dausa end. Due to tripping of 220 KV Bassi(PG)-Dausa(RS) (PG) Ckt-1, loading of 220kV Anta-Sakatpura ckt and 220 KV Bassi(PG)-Dausa(RS) (PG) Ckt-2 increased. Further, 220kV Anta-Sakatpura ckt and 220 KV Bassi(PG)-Dausa(RS) (PG) Ckt-2 also tripped from Sakatpura and Dausa end respectively due to overloading. Exacr details of protection operation yet to be received. iii) Due to tripping of aforementioned lines, load of Dausa now started drawing power from Hinduan leading to overloading of 400/220kV ICTs at Hinduan and ICT-1&2 at Hinduan tripped on over current protection operation. iv) As per PMU at Bassi(PG), no fault in system is observed. vi) As per SCADA, change in demand of approx. 680MW is observed in Rajasthan control area.	0	0.453	0	680	0.000	1.314	42410	51769	NA
20	GI-2	1) 400 KV Suratgarh SCTPS(RVUN)-Suratgarh(RS) (RS) Ckt-2 2) 400 KV Suratgarh(RVUN)-Ratangarh(RS) (RS) Ckt-1 3) 250 MW Suratgarh TPS - UNIT 4	Rajasthan	RVPNL, RVUNL	28-Feb-24	18:16	28-Feb-24	20:35	02:19	i) During antecedent condition, 250MW Suratgarh TPS Unit-3,4&5 were generating approx. 153MW, 203MW & 205MW respectively. 400/220kV ICT-2 was under shutdown and 250MW Unit-6 was not in service. ii) As reported, at 18:16hrs, Bus bar protection of 400kV Bus-2 at Suratgarh TPS operated. Event occurred during renocation work of protection system of ICT-2. During investigation, LBB cable of ICT-2 coming to bus bar panel was found earth.Due to operation of bus bar protection of 400kV Bus-2 at Surtagarh, 400 KV Suratgarh SCTPS(RVUN)-Suratgarh(RS) (RS) Ckt-2, 400 KV Suratgarh(RVUN)-Ratangarh(RS) (RS) Ckt-1 and 250 MW Suratgarh TPS - UNIT 4 tripped. All these elements were connected to 400kV Bus-2 at Suratgarh S/s. iii) As per PMU at Bikaner2(PG), no fault in system is observed. vi) As per SCADA, loss of generation of approx. 200MW is observed at Suratgarh TPS due to tripping of 250MW Suratgarh TPS Unit-4 in Rajasthan control area.	0	0	200	0	0.487	0.000	41038	50247	NA

S. No.	Name of Transmission Element Tripped	Owner/ Utility	Outage		Load Loss/ Gen. Loss	Brief Reason (As reported)	Category as per CEA Grid standards	# Fault Clearance Time (>100 ms for 400 kV and 160 ms for 220 kV)	*FIR Furnished (YES/NO)	DR/EL provided in 24 hrs (YES/NO)	Other Protection Issues and Non Compliance (inference from PMU, utility details)	Suggestive Remedial Measures	Remarks
			Date	Time									
1	765 KV Orai-Jabalpur (PG) Ckt-1	POWERGRID	2-Feb-24	08:10	Nil	Phase to earth fault R-N	NA	NA	YES (After 24 hrs)	YES (After 24 hrs)			As per PMU, R-N phase to earth fault with unsuccessful A/R operation is observed.
2	400 KV Gorakhpur(PG)-Motihari(BS) (PG) Ckt-2	POWERGRID	2-Feb-24	15:19	Nil	Phase to Phase Fault Y-B	NA	NA	YES (After 24 hrs)	YES (After 24 hrs)			As per PMU, Y-B phase to phase fault is observed.
3	400 KV Gorakhpur(PG)-Motihari(BS) (PG) Ckt-1	POWERGRID	2-Feb-24	15:19	Nil	Phase to Phase Fault R-Y	NA	NA	YES (After 24 hrs)	YES (After 24 hrs)			As per PMU, R-Y phase to phase fault is observed.
4	765 KV Orai-Jabalpur (PG) Ckt-1	POWERGRID	3-Feb-24	02:32	Nil	Phase to Ground Fault R-N	NA	NA	YES (After 24 hrs)	YES (After 24 hrs)			As per PMU, R-N phase to earth fault in reclaim time is observed.
5	765 KV Orai-Jabalpur (PG) Ckt-1	POWERGRID	4-Feb-24	22:17	Nil	Phase to earth fault R-N	NA	NA	YES (After 24 hrs)	YES (After 24 hrs)			As per PMU, R-N phase to earth fault with unsuccessful A/R operation is observed.
6	132 KV Rihand(UP)-Garwa(JS) (UP) Ckt-1	UPPTCL	9-Feb-24	10:18	Nil	Phase to Ground Fault R-N	NA	NA	YES (After 24 hrs)	YES (After 24 hrs)			As per DR, R-N phase to earth fault is observed, fault distance was ~57.7km (56%) from Rihand end.
7	132 KV Rihand(UP)-Nagar Untari(JS) (UP) Ckt-1	UPPTCL	9-Feb-24	10:18	Nil	Phase to Ground Fault R-N	NA	NA	YES (After 24 hrs)	YES (After 24 hrs)			As per DR, B-N phase to earth fault is observed, fault distance was ~59.2km (100%) from Rihand end.
8	400 KV Varanasi-Biharshariff (PG) Ckt-1	POWERGRID	13-Feb-24	22:49	Nil	Phase to earth fault Y-N	NA	NA	YES (After 24 hrs)	YES (After 24 hrs)			As per PMU, Y-N phase to earth fault with unsuccessful A/R operation is observed.
9	220 KV Auraiya(NT)-Malanpur(MP) (PG) Ckt-1	POWERGRID	16-Feb-24	00:07	Nil	Phase to earth fault R-N	NA	NA	NO	NO			

 # Fault Clearance time has been computed using PMU Data from nearest node available and/or DR provided by respective utilities (*Annexure-* ***II)***

****Yes, if written Preliminary report furnished by constituent(s)***

R-Y-B phase sequencing (Red, Yellow, Blue) is used in the list content.All information is as per Northern Region unless specified.

^^ tripping seems to be in order as per PMU data, reported information. However, further details may be awaited.

Reporting of Violation of Regulation for various issues for above tripping

1	Fault Clearance time(>100ms for 400kV and >160ms for 220kV)	1. CEA Grid Standard-3.e 2. CEA Transmission Planning Criteria
2	DR/EL Not provided in 24hrs	1. IEGC 37.2(c) 2. CEA Grid Standard 15.3
3	FIR Not Furnished	1. IEGC 37.2(b) 2. CEA Grid Standard 12.2 (Applicable for SLDC, ALDC only)
4	Protection System Mal/Non Operation	1. CEA Technical Standard of Electrical Plants and Electric Lines: 43.4.A 2. CEA (Technical Standards for connectivity to the Grid) Regulation, 2007: Schedule Part 1. (6.1, 6.2, 6.3)
5	A/R non operation	1. CEA Technical Standard of Electrical Plants and Electric Lines: 43.4.C 2. CEA Technical Planning Criteria

Status of submission of FIR/DR/EL/Tripping Report on NR Tripping Portal

Time Period: 1st February 2024 - 29th February 2024

S. No.	Utility	Total No. of tripping	First Information Report (Not Received)		Disturbance Recorder (Not Received)	Disturbance Recorder (NA) as informed by utility	Disturbance Recorder (Not Received)	Event Logger (Not Received)	Event Logger (NA) as informed by utility	Event Logger (Not Received)	Tripping Report (Not Received)	Tripping Report (NA) as informed by utility	Tripping Report (Not Received)	Remark
			Value	%	Value		%	Value		%	Value		%	
1	AD HYDRO	2	1	**50**	1	1	**100**	1	0	**50**	1	0	**50**	DR, EL & Tripping report need to be submitted
2	AHEJ2L	1	1	**100**	1	0	**100**	1	0	**100**	1	0	**100**	
3	ANTA-NT	3	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	Details received
4	APFOL	3	3	**100**	3	0	**100**	3	0	**100**	3	0	**100**	DR, EL & Tripping report need to be submitted
5	ASEJOL	1	1	**100**	1	0	**100**	1	0	**100**	1	0	**100**	
6	AURAIYA-NT	1	1	**100**	1	0	**100**	1	0	**100**	1	0	**100**	
7	BAIRASUIL-NH	4	0	**0**	0	1	**0**	0	1	**0**	0	0	**0**	Details received
8	BBMB	41	6	**15**	9	13	**32**	11	10	**35**	8	0	**20**	DR, EL & Tripping report need to be submitted
9	CHAMERA-III-NH	3	0	**0**	0	3	**0**	0	0	**0**	0	0	**0**	Details received
10	CPCC1	33	1	**3**	4	13	**20**	5	12	**24**	1	4	**3**	DR, EL & Tripping report need to be submitted
11	CPCC2	40	4	**10**	4	6	**12**	4	6	**12**	4	0	**10**	
12	CPCC3	32	3	**9**	2	6	**8**	2	5	**7**	3	0	**9**	
13	DADRI-NT	2	2	**100**	2	0	**100**	2	0	**100**	2	0	**100**	
14	DULHASTI-NH	2	0	**0**	0	1	**0**	0	0	**0**	0	0	**0**	Details received
15	KARCHAM	1	1	**100**	1	0	**100**	1	0	**100**	1	0	**100**	DR, EL & Tripping report need to be submitted
16	KOLDAM-NT	1	1	**100**	1	0	**100**	1	0	**100**	1	0	**100**	
17	MAHINDRA	1	1	**100**	1	0	**100**	1	0	**100**	1	0	**100**	
18	RAPPA	11	0	**0**	11	0	**100**	11	0	**100**	9	0	**82**	
19	RAPPB	2	2	**100**	0	0	**0**	2	0	**100**	2	0	**100**	
20	RENEW SURYA VIHAAN PRIVATE	1	1	**100**	1	0	**100**	1	0	**100**	1	0	**100**	
21	SINGRAULI-NT	1	0	**0**	0	1	**0**	0	0	**0**	1	0	**100**	
22	SLDC-DV	10	0	**0**	4	1	**44**	4	0	**40**	2	0	**20**	
23	SLDC-HP	8	0	**0**	5	0	**63**	5	0	**63**	0	0	**0**	DR, EL need to be submitted
24	SLDC-HR	19	5	**26**	5	6	**38**	5	6	**38**	6	1	**33**	DR, EL & Tripping report need to be submitted
25	SLDC-JK	21	3	**14**	21	0	**100**	21	0	**100**	18	0	**86**	
26	SLDC-PS	9	0	**0**	2	3	**33**	2	2	**29**	3	0	**33**	
27	SLDC-RS	57	29	**51**	14	4	**26**	16	4	**30**	19	1	**34**	
28	SLDC-UK	2	0	**0**	0	2	**0**	0	2	**0**	0	0	**0**	Details received
29	SLDC-UP	118	10	**8**	10	23	**11**	12	18	**12**	10	4	**9**	DR, EL & Tripping report need to be submitted

Status of submission of FIR/DR/EL/Tripping Report on NR Tripping Portal

Time Period: 1st February 2024 - 29th February 2024

S. No.	Utility	Total No. of tripping	First Information Report (Not Received)		Disturbance Recorder (Not Received)	Disturbance Recorder (NA) as informed by utility	Disturbance Recorder (Not Received)	Event Logger (Not Received)	Event Logger (NA) as informed by utility	Event Logger (Not Received)	Tripping Report (Not Received)	Tripping Report (NA) as informed by utility	Tripping Report (Not Received)	Remark
			Value	%	Value		%	Value		%	Value		%	
30	STERLITE	10	0	**0**	4	0	**40**	1	0	**10**	0	8	**0**	DR, EL need to be submitted
31	TANAKPUR-NH	1	0	**0**	0	1	**0**	0	0	**0**	0	0	**0**	Details received
32	TANDA-NT	1	1	**100**	1	0	**100**	1	0	**100**	1	0	**100**	DR, EL & Tripping report need to be submitted
33	UNCHAHAR-NT	2	2	**100**	2	0	**100**	2	0	**100**	2	0	**100**	
34	URI-II-NH	3	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	Details received
35	URI-I-NH	3	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	
Total in NR Region		**450**	**79**	**18**	**111**	**85**	**30**	**117**	**66**	**30**	**102**	**18**	**24**	

As per the IEGC provision under clause 37.2 (c), detailed tripping report along with DR & EL has to be furnished within 24 hrs of the occurrence of the event