सत्यमेव जयते

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

सं: उ.क्षे.वि.स./प्रचालन/106/01/2022/4550-4591 दिनांक: 16.06.2022

विषय: प्रचालन समन्वय उप-समिति की196वीं बैठक की कार्यसूची।
Subject: Agenda of 196th OCC meeting.

प्रचालन समन्वय उप-समिति की 196वीं बैठक का आयोजन वीडियो कॉन्फ्रेंसिंग के माध्यम से दिनांक 22.06.2022 को 10:30 बजे से किया जायेगा I उक्त बैठक की कार्यसूची उत्तर क्षेत्रीय विद्युत् समिति की वेबसाइट http://164.100.60.165 पर उपलब्ध है I

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

कृपया बैठक में उपस्थित होने की सुविधा प्रदान करें।

196th meeting of the Operation Co-ordination sub-committee will be conducted through Video Conferencing on **22.06.2022** 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.

16/06/2022.

(सौमित्र मजूमदार)
अधीक्षण अभियंता (प्रचालन)

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

खण्ड-क: उ.क्षे.वि.स. Part-A: NRPC

1. Confirmation of Minutes

The minutes of the 195th OCC meeting were issued vide letter of even number dated 10.06.2022.

Sub-committee may deliberate and kindly confirm the Minutes.

2. Review of Grid operations

2.1 Power Supply Position (Provisional) for May 2022

Anticipated Power Supply Position v/s Actual Power Supply Position (Provisional) of Northern Region during the month of May-2022 is as under:

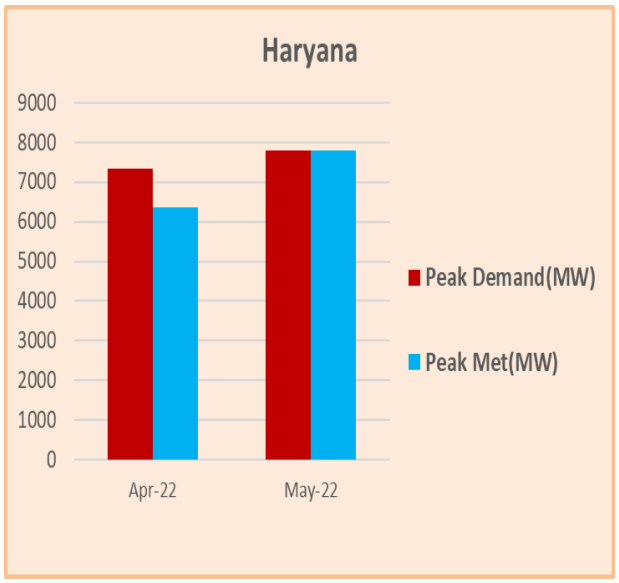
State / UT	Req. / Avl.	Energy (MU)			Peak (MW)		
		Anticipated	Actual	% Variation	Anticipated	Actual	% Variation
CHANDIGARH	(Avl)	150	183	22.2%	410	367	-10.5%
	(Req)	120	183	52.8%	360	367	1.9%
DELHI	(Avl)	4549	3774	-17.0%	6900	7070	2.5%
	(Req)	3550	3775	6.3%	6900	7070	2.5%
HARYANA	(Avl)	5560	5619	1.1%	11560	10052	-13.0%
	(Req)	5620	5670	0.9%	9870	10054	1.9%
HIMACHAL PRADESH	(Avl)	923	996	8.0%	1580	1644	4.1%
	(Req)	931	1014	8.9%	1570	1644	4.7%
J&K and LADAKH	(Avl)	1870	1546	-17.3%	3520	2825	-19.7%
	(Req)	1780	1578	-11.4%	2880	2825	-1.9%
PUNJAB	(Avl)	5950	6294	5.8%	11970	10886	-9.1%
	(Req)	5359	6313	17.8%	9424	10886	15.5%
RAJASTHAN	(Avl)	9280	8942	-3.6%	18790	15898	-15.4%
	(Req)	8150	9049	11.0%	13500	15949	18.1%
UTTAR PRADESH	(Avl)	13330	14458	8.5%	24000	25436	6.0%
	(Req)	12989	14560	12.1%	24000	25436	6.0%
UTTARAKHAND	(Avl)	1062	1384	30.2%	2180	2354	8.0%
	(Req)	1085	1393	28.4%	2250	2354	4.6%
NORTHERN REGION	(Avl)	42674	43195	1.2%	77400	68400	-11.6%
	(Req)	39584	43534	10.0%	65300	68400	4.7%

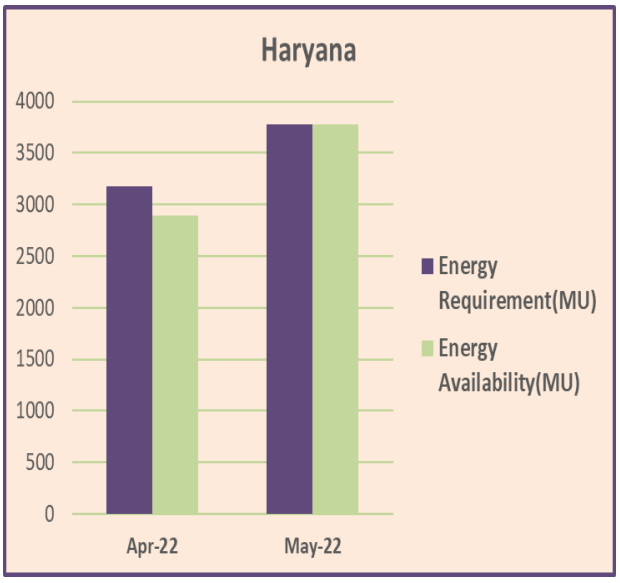
As per above, negative / significant variation (≥5%) in Actual Power Supply Position (Provisional) vis-à-vis Anticipated figures is observed for the month of May-2022 in terms of Energy Requirement for all states / UTs except Haryana and in terms of Peak Demand similar variation is noted for UTs of J&K and Ladakh, Punjab, Rajasthan and UP. These states/UTs are requested to submit reason for such variations so that the same can be deliberated in the meeting.

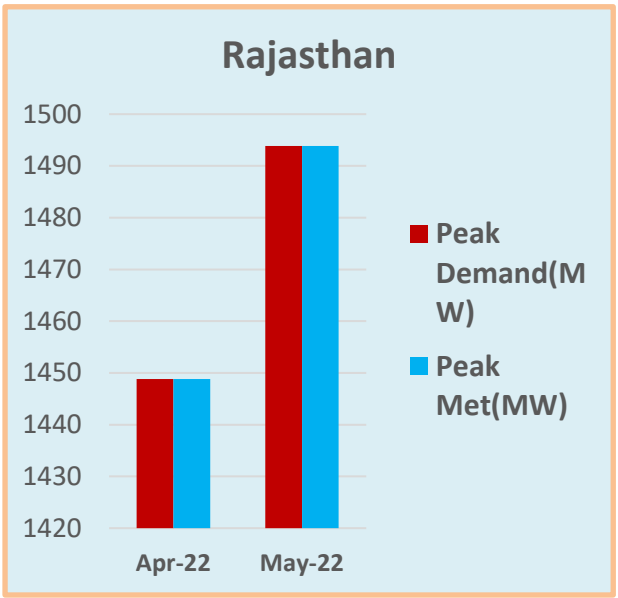
All SLDCs are requested to furnish provisional and revised power supply position in prescribed formats on NRPC website portal by 2nd and 15th day of the month respectively for the compliance of Central Electricity Authority (Furnishing of Statistics, Returns and Information) Regulations, 2007.

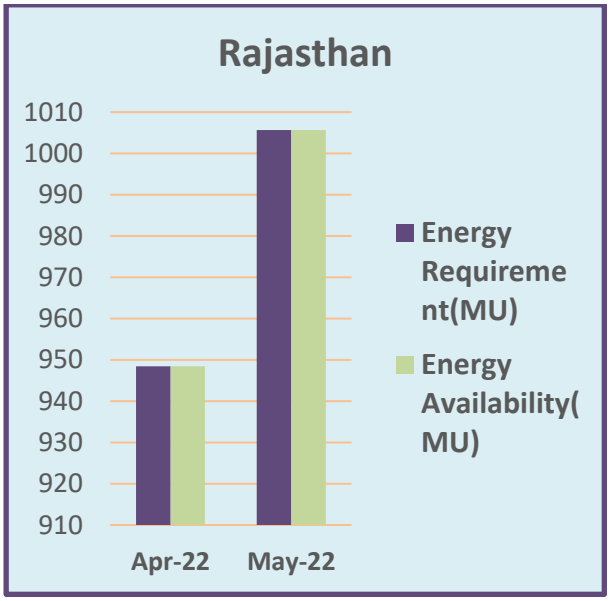
2.2 Power Supply Position of NCR

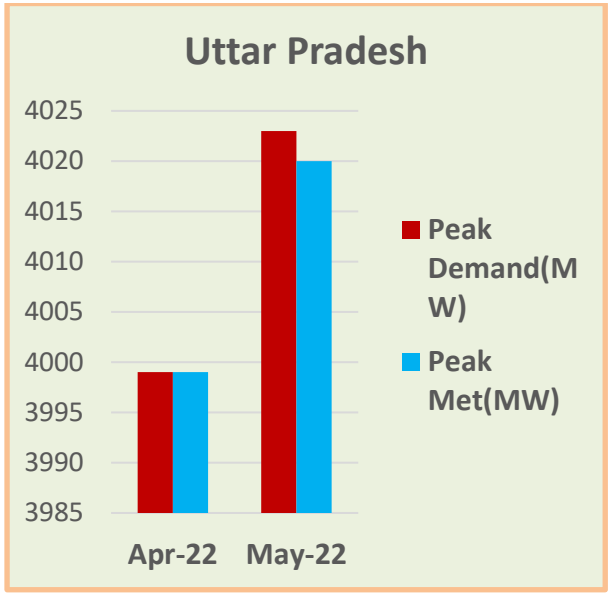
NCR Planning Board (NCRPB) is closely monitoring the power supply position of National Capital Region. Monthly power supply position for NCR till the month of May-2022 is available on NRPC website (http://164.100.60.165). Power supply position during the current financial year is shown as under:

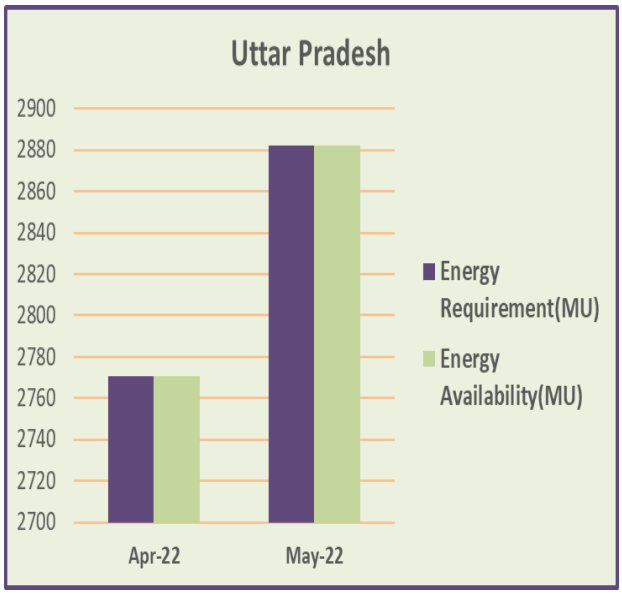


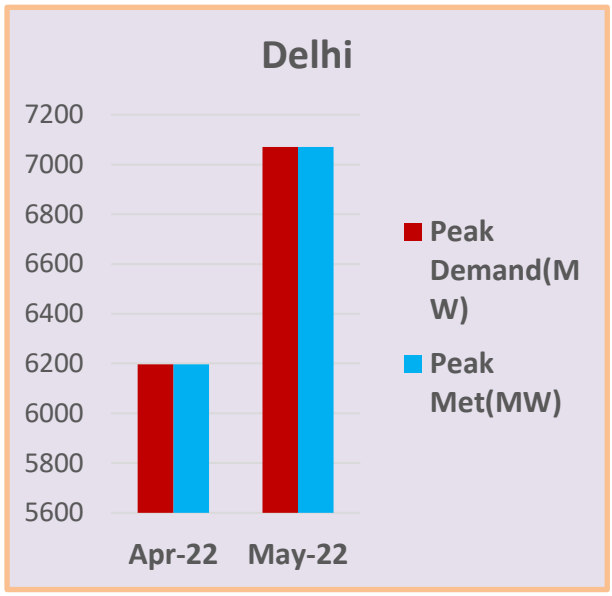


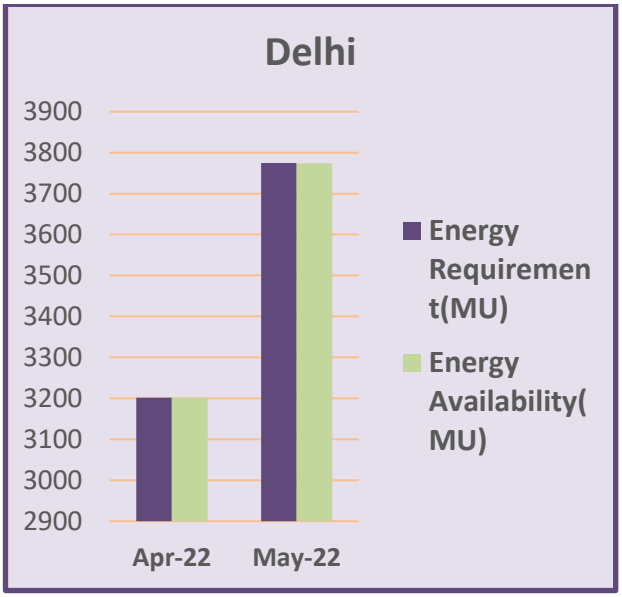












3. Maintenance Programme of Generating Units and Transmission Lines

3.1. Maintenance Programme for Generating Units

The meeting on proposed maintenance programme for Generating Units for the month of July-2022 is scheduled on 21-June-2022 via Video Conferencing.

3.2. Outage Programme for Transmission Elements

The meeting on proposed outage programme of Transmission elements for the month of July-2022 is scheduled on 21-June-2022 via Video conferencing.

4. Planning of Grid Operation

4.1. Anticipated Power Supply Position in Northern Region for July 2022

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

State / UT	Availability / Requirement	Revised Energy (MU)	Revised Peak (MW)	Date of revision
CHANDIGARH	Availability	200	430	No Revision

State / UT	Availability / Requirement	Revised Energy (MU)	Revised Peak (MW)	Date of revision
	Requirement	200	440	submitted
	Surplus / Shortfall	0	-10	
	% Surplus / Shortfall	0.0%	-2.3%	
DELHI	Availability	2810	6240	No Revision submitted
	Requirement	4000	8200	
	Surplus / Shortfall	-1190	-1960	
	% Surplus / Shortfall	-29.8%	-23.9%	
HARYANA	Availability	5770	11700	No Revision submitted
	Requirement	6660	12700	
	Surplus / Shortfall	-890	-1000	
	% Surplus / Shortfall	-13.4%	-7.9%	
HIMACHAL PRADESH	Availability	1104	1700	8-June-22
	Requirement	1109	1727	
	Surplus / Shortfall	-5	-27	
	% Surplus / Shortfall	-0.5%	-1.6%	
J&K and LADAKH	Availability	2150	3550	No Revision submitted
	Requirement	1690	2610	
	Surplus / Shortfall	460	940	
	% Surplus / Shortfall	27.2%	36.0%	
PUNJAB	Availability	6550	12160	No Revision submitted
	Requirement	8590	15320	
	Surplus / Shortfall	-2040	-3160	
	% Surplus / Shortfall	-23.7%	-20.6%	
RAJASTHAN	Availability	9250	18050	No Revision submitted
	Requirement	8630	14790	
	Surplus / Shortfall	620	3260	
	% Surplus / Shortfall	7.2%	22.0%	
UTTAR PRADESH	Availability	15810	26000	15-June-22
	Requirement	15500	26000	
	Surplus / Shortfall	310	0	
	% Surplus / Shortfall	2.0%	0.0%	
UTTARAKHAND	Availability	1333	2316	4-June-22
	Requirement	1380	2350	
	Surplus / Shortfall	-47	-34	
	% Surplus / Shortfall	-3.4%	-1.4%	

State / UT	Availability / Requirement	Revised Energy (MU)	Revised Peak (MW)	Date of revision
NORTHERN REGION	Availability	44977	74000	
	Requirement	47758	75800	
	Surplus / Shortfall	-2782	-1800	
	% Surplus / Shortfall	-5.8%	-2.4%	

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

5. Submission of breakup of Energy Consumption by the states

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

State / UT	From	To
DELHI	Apr-2018	Mar-2022
HARYANA	Apr-2018	Mar-2022
HIMACHAL PRADESH	Apr-2018	Apr-2022
PUNJAB	Apr-2018	Jan-2022
RAJASTHAN	Apr-2018	Mar-2022
UTTAR PRADESH	Apr-2018	Apr-2022
UTTARAKHAND	Apr-2018	Dec-2021

All the remaining UTs viz., 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 format given as under:

Category→	Consumption by Domestic Loads	Consumption by Commercial Loads	Consumption by Agricultural Loads	Consumption by Industrial Loads	Traction supply load	Miscellaneous / Others
<Month>						

6. Automatic Demand Management System

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

State/ Utility	Status
Punjab	**Scheme not implemented.** At SLDC level, remote tripping of 100 feeders at 66 kV is possible. At 11 kV feeder level, ADMS is to be implemented by Distribution Company.

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

6.2 As decided in the 175th OCC meeting, the nominations for matter specific meeting have been received from HVPN, UHBVN/DHBVN, PSPCL, RVPN (SLDC & Automation), UPPTCL, KESCO (DISCOM-UP), NPCL (DISCOM-UP).

6.3 Meetings on ADMS implementation road map have been held with the officers of Haryana, Himachal Pradesh, Punjab and UP on 05.02.2021, 19.02.2021, 05.03.2021, and 14.07.2021 respectively. In these meetings, issues and apprehensions on ADMS were discussed along with vital aspects like addressing the commercial issues, basic architecture for scheme and funding possibilities for the scheme.

6.4 As per request of states for DPR of any state that has got PSDF support for ADMS, website link of PSDF Sectt. has been shared with Haryana, Himachal Pradesh, Punjab and Uttar Pradesh for accessing DPR. SLDCs were also requested to

expedite the submission of pending nominations.

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

6.6 MS, NRPC stated that non-implementation of ADMS by states is indistinguishably non-adherence to directions of CERC.

6.7 NRPC representative added that initial deadline for ADMS implementation was 1st January 2011 as per para 5.4.2 (d) of IEGC. Later, CERC has taken suo-motu cognizance of non-implementation of ADMS by states and given 31.06.2016 as deadline vide its order dtd. 31.12.2015 in petition no. 5/SM/2014. Implementation deadline given by the statutory and regulatory body need to complied by concerned SLDC / SEB / distribution licensee as per regulation no. 5.4.2 (a) & (b) of IEGC. Moreover, hand holding process for project proposal preparation in respect of four NR states has already been done by NRPC

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

6.9 In 187th OCC meeting, NRLDC representative quoted the texts of CERC order dtd. 31.12.2015 in petition no. 5/SM/2014. He apprised the status of ADMS implementation till 2015. Further, he requested the states to update the status so that NRLDC may file petition in CERC on the basis of compiled status.

6.10 In the 188th OCC, NRLDC informed that it has not received comments from states in this matter. Accordingly, all SLDC/DISCOMs are requested to furnish the latest status of ADMS implementation in their respective control areas latest by 31st October 2021 to NRLDC. Status as received till 31.10.2021 would be reported to CERC by NRLDC.

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

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

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

***Members may kindly note*.**

7. 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.

8. NR Islanding scheme

8.1 Based on the decisions taken in the meeting taken by Hon'ble Minister of State (IC) for Power and New & Renewable Energy on 28.12.2020, Islanding Schemes for NR have been continuously reviewed/discussed in various forums.

8.2 In 187th OCC, it was decided that respective states would submit MIS report before every OCC meeting so that same may be discussed. It was also highlighted that MoP has agreed for PSDF funding for implementation of islanding schemes and states were requested to prepare and submit DPR for the same. Further, a sample DPR on implementation of Islanding scheme for PSDF funding has been already circulated vide email dated 07.10.2021 and requested to expedite the preparation of DPR.

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

8.4 A meeting was also taken by Honorable Cabinet Minister (Power, New & Renewable Energy) on 07.10.2021 wherein emphasis was given on PSDF funding for Islanding schemes and DPR submission for the same. MoM has been issued and copy of the same was enclosed as Annexure-A.II of 189th OCC agenda.

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

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

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

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

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

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

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

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

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

8.14 In 190th OCC, UPSLDC representative informed that CPRI has asked for some additional details and technical commercial offer would be provided to them by CPRI by 15th Jan 22.

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

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

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

8.18 In 191st OCC, HPSLDC representative informed that they need further two weeks to submit the outcome of transient study of all islands.

8.19 Uttarakhand representative informed that major hydro stations e.g. Chibro, Khodri etc at Dehradun Region in Yamuna valley are non-must run and peaking stations. Therefore, it is technically not feasible to implement Dehradun as an islanding scheme. However, nominations of nodal officers from various utilities (PTCUL, UJVN Ltd & UPCL) are being sought for the formation of internal committee for accessing the possibility of Dehradun as Islanding scheme and the report shall be submitted to NRPC Secretariat subsequently.

8.20 NRPC representative asked Uttarakhand to expedite the submission regarding the status on feasibility of the proposed Islanding scheme.

8.21 MS, NRPC stated that all constituents that have given their information about the planning of islanding scheme shall take up the work on top priority and submit the progress in time bound manner by submitting the updated MIS format every month.

8.22 NRLDC representative informed that Rajasthan SLDC is modelling data on PSSE software and it is expected to be completed within one week. Thereafter, NRLDC will submit its comments on the same. Rajasthan representative consented for the same.

8.23 UP and Punjab were asked to update the status of their study being done by CPRI. Both informed that there is no progress since last OCC and they are waiting for response from CPRI.

8.24 A meeting was convened by HPSLDC with officials of NRPC Sectt., NRLDC, HPSEBL, & HPPTCL on 11.02.2022 for apprising the status on implementation of Islanding scheme and MoM of the same is awaited. In the meeting, it was observed that system study work has been pending due to pre-occupation of the concerned

resource. Therefore, it was decided that HPSLDC shall write letters to MDs of HPSEBL & HPPTCL for expediting the implementation and NRPC Sectt may be kept in copy so that the matter may be apprised to MoP in next review meeting. Further, it was decided to review the status in another meeting in the first week of March 22.

8.25 HPSLDC convened a meeting with the officials of NRPC Sectt., NRLDC, HPSEBL & HPPTCL on 04.03.2022 and presented the results of static and dynamic study of the islanding scheme in the HP control area.

8.26 A meeting was convened by UPSLDC with officials of NRPC Sectt., NRLDC & UPPTCL on 07.03.2022 to review progress of implementation of Unchahar and Agra Islanding schemes and MoM of the same is awaited.

8.27 Latest status of Islanding Scheme of NR is attached as **Annexure-A.II.** RRVPNL has reviewed the RAPS islanding scheme and the proposed scheme is included in Agenda no. 10. Delhi SLDC is requested to provide update on the review of Delhi Islanding Scheme.

Members may kindly deliberate.

9. Coal Supply Position of Thermal Plants in Northern Region

9.1. 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.

9.2. Accordingly, coal stock position of generating stations in northern region during current month (till 10th June 2022) is as follows:

Station	Capacity (MW)	PLF % (prev. months)	Normative Stock Reqd (Days)	Actual Stock (Days)
ANPARA C TPS	1200	85.96	17	0.6
ANPARA TPS	2630	89.93	17	3.7
BARKHERA TPS	90	48.78	26	1.9
DADRI (NCTPP)	1820	85.45	26	8.2
GH TPS (LEH.MOH.)	920	63.61	26	16.2
GOINDWAL SAHIB TPP	540	32.99	26	3.1
HARDUAGANJ TPS	1265	62.38	26	1.0
INDIRA GANDHI STPP	1500	87.92	26	15.8
KAWAI TPS	1320	90.42	26	4.1
KHAMBARKHERA TPS	90	39.89	26	2.4
KOTA TPS	1240	80.39	26	5.7
KUNDARKI TPS	90	54.09	26	1.5
LALITPUR TPS	1980	79.91	26	1.0
MAHATMA GANDHI TPS	1320	69.02	26	2.4
MAQSOODPUR TPS	90	50.47	26	1.8
MEJA STPP	1320	44.70	26	5.5
OBRA TPS	1094	58.92	26	5.1

Station	Capacity (MW)	PLF % (prev. months)	Normative Stock Reqd (Days)	Actual Stock (Days)
PANIPAT TPS	710	87.32	26	6.2
PARICHHA TPS	1140	54.98	26	1.5
PRAYAGRAJ TPP	1980	76.69	26	9.1
RAJIV GANDHI TPS	1200	40.48	26	8.9
RAJPURA TPP	1400	95.32	26	22.8
RIHAND STPS	3000	92.57	17	28.8
ROPAR TPS	840	56.47	26	15.2
ROSA TPP Ph-I	1200	71.96	26	2.3
SINGRAULI STPS	2000	86.11	17	20.2
SURATGARH TPS	1500	67.95	26	10.8
TALWANDI SABO TPP	1980	60.35	26	5.8
TANDA TPS	1760	84.86	26	3.4
UNCHAHAR TPS	1550	80.48	26	6.5
UTRAULA TPS	90	46.37	26	0.7
YAMUNA NAGAR TPS	600	89.03	26	3.9
CHHABRA-I PH-1 TPP	500	84.20	26	0.6
KALISINDH TPS	1200	40.67	26	13.3
SURATGARH STPS	1320	0.00	26	5.5
CHHABRA-I PH-2 TPP	500	43.98	26	10.2
CHHABRA-II TPP	1320	74.62	26	2.7

10. Revised Islanding Schemes for the Rajasthan Atomic Power Station (RAPS-A & B) (Agenda by RRVPNL)

10.1. RRVPNL vide letter dated 06.06.2022 (Copy of the letter is attached as **Annexure-A.III**.) have submitted the revised islanding scheme for the Rajasthan Atomic Power Station (RAPS-A & B).

Members may kindly deliberate.

11. Review of planned outages proposed from 1st September'22 to 15th October'22

11.1. POSOCO vide letter dated 08.06.2022 (copy enclosed as **Annexure-A.IV**.) has communicated the need to review the planned outages proposed from 1st September'22 to 15th October'22 to ensure bare minimum planned outage of thermal units in aforesaid months so that all India electricity demand in the upcoming months could be met without nay constraint.

Members may kindly deliberate.

12. Reducing load on 400kV Tikrikalan-Bawana and 400kV Tikrikalan-Jhatikara Lines at 400kV S/Stn Tikrikalan (Erstwhile Mundka) (Agenda by DTL)

12.1. DTL vide email dated 15.06.2022 has communicated that the peak load on 400kV

lines associated with 400kV Tikrikalan is very high almost on daily basis. The loading data of 400kV Tikrikalan-Bawana and 400kV Tikrikalan-Jhatikara Lines for past 6 months is enclosed as **Annexure-A.V** for reference.

12.2. DTL mentioned that 400kV Tikrikalan to Bawana line is crossing 500MW on each circuit almost on daily basis. Furthermore, the load on this line some-times crosses 700 to 800 MW also. Any tripping of one circuit in such high load conditions may result in loading of nearly 1500 MW on single circuit. Similarly, load on Tikrikalan to Jhatikara line is also crossing 500 MW on each circuit almost on daily basis and peak load on many days cross 600 to 700 MW.

12.3. Currently the power from Jhatikara and Jhajjar substations is being routed to Depalpur, Abdullapur, Bhiwani, Bahadurgarh, Maharani Bagh and Bawana substations through Tikrikalan substation. As such a large area of load is being fed through Tikrikalan S/Stn and other 400kV Circuits in this region are remaining underutilized. Further, this uneven loading puts undue pressure on the lines and bay equipments at 400kV S/Stn Tikrikalan

12.4. Such high load conditions have made the maintenance of these circuits very difficult. Further, the shutdown of one circuit of the line invariably results in developing of hot point in the other circuit of the line due to high load conditions. This has resulted in very small windows for line and bay maintenance.

12.5. DTL has requested OCC forum to review the optimal loading of 400kV lines in the region so that high loading of Tikrikalan to Jhatikara and Tikrikalan to Bawana lines may be addressed and reliability of 400kV Ring around NCT of Delhi may be improved.

Members may kindly deliberate.

13. Shutdown of 800kV HVDC Champa-Kurukshetra and 500kV HVDC Rihand-Dadri transmission lines in July 2022 (Agenda by UPRVUNL)

13.1. UPRVUNL vide letter dt. 16.06.2022 (attached as ***Annexure A.VI***) has informed that construction of 2X660 MW Jawaharpur Thermal Power Project is under progress and in this regard shutdown of 800kV HVDC Champa-Kurukshetra and 500kV HVDC Rihand-Dadri transmission lines in July 2022 is requested.

Members may kindly deliberate.

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

14. NR Grid Highlights for May 2022

Maximum energy consumption of Northern Region was 1539.80 Mus on 20th May'22 and it was 35.04 % higher than May' 2021 (1140.26Mus 29th May'21)

Average energy consumption per day of Northern Region was 1381.11 Mus and it was 34.77% higher than May'21 (1024.79 Mus per day)

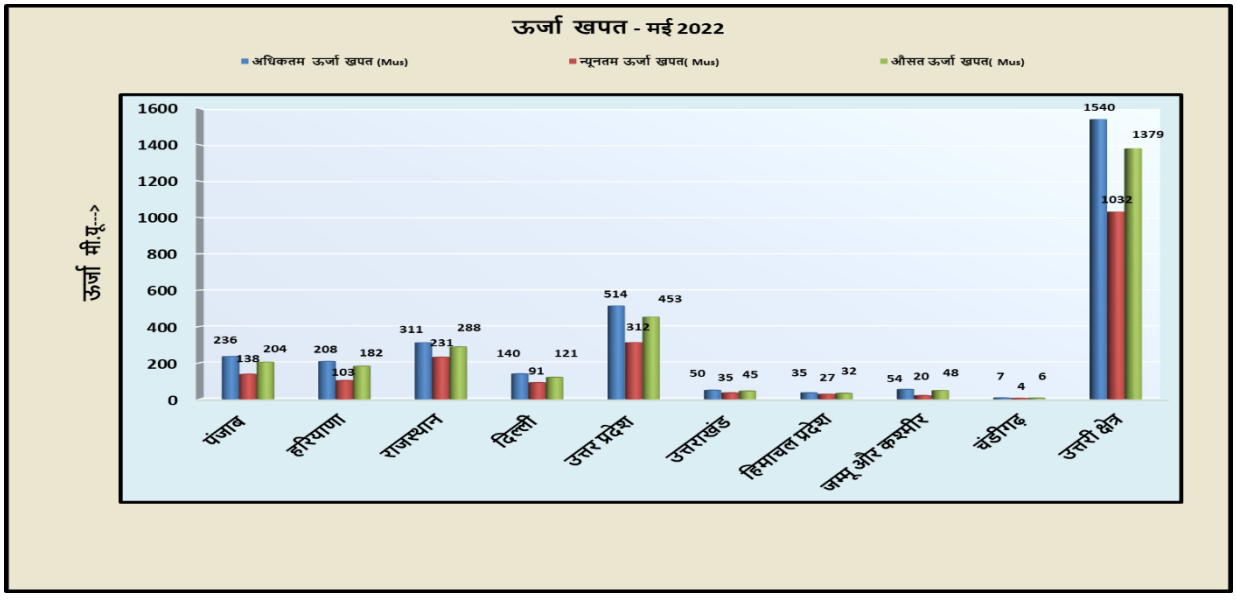
Maximum Demand met of Northern Region was 68398 MW on 13thMay'22 @23:00 hours (*based on data submitted by Constituents)* as compared to 52885 MW on 26th May'21 @23:00 hours.

Northern Region all time high value recorded in May'22:

State (Maximum Demand Met)	**All Time High Record**		**Previous Record (upto Apr-22)**	
	Value (MW)	**Achieved on**	**Value (MW)**	**Achieved on**
राजस्थान	**15797**	**19.05.22 at 13:00**	**15749**	**01.03.22 को 08:30 बजे**
उत्तर प्रदेश	**25046**	**15.05.22 at 22:00**	**24795**	**16.07.21 को 23:00 बजे**

State (Max Energy Consumption)	All Time High Record		Previous Record (upto Apr-22)	
राजस्थान	Value (MU)	Achieved on	Value (MU)	Achieved on
	311.080	20.05.22	310.79	19.08.21
उत्तराखंड	50.370	31.05.22	49.68	10.07.21

Energy Consumption



Frequency Data Comparison

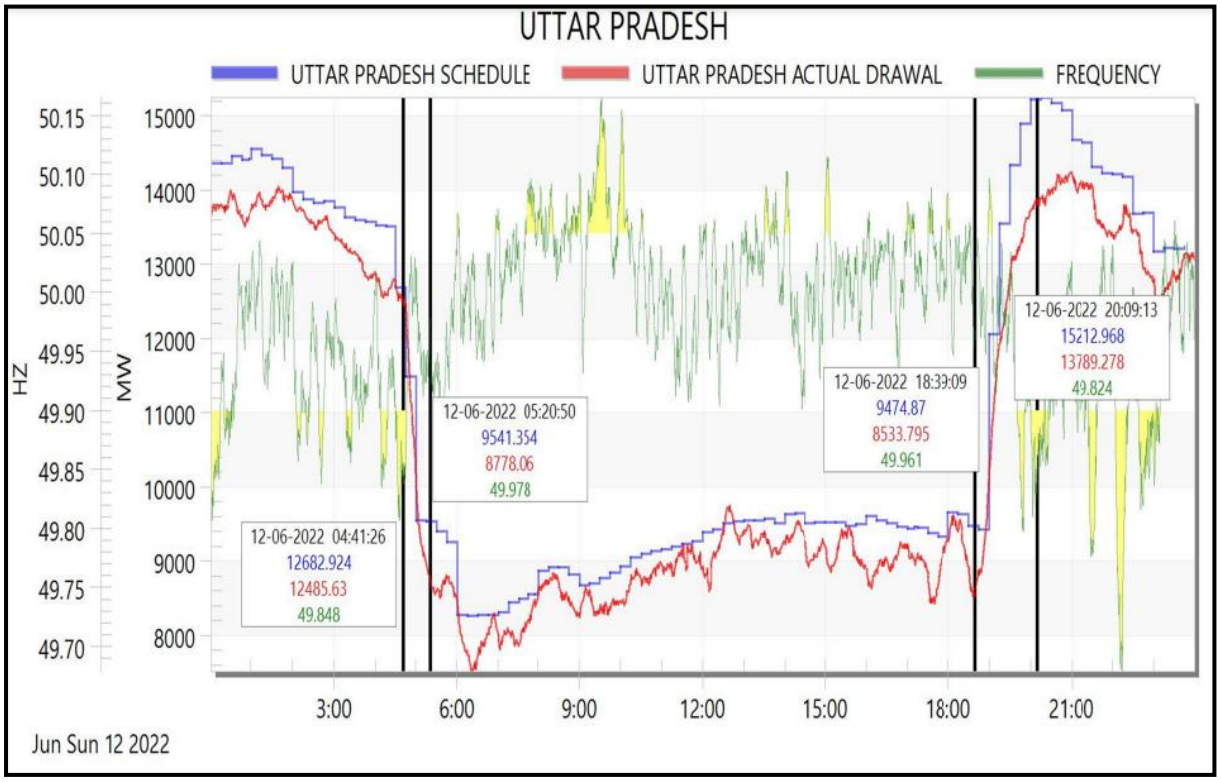
Month	Avg. Freq. (Hz)	Max. Freq. (Hz)	Min. Freq. (Hz)	<49.90 (% time)	49.90 – 50.05 (% time)	>50.05 (% time)
May'22	50.00	50.35	49.50	9.8	72.2	17.9
May'21	50.00	50.28	49.63	6.6	74.5	18.9

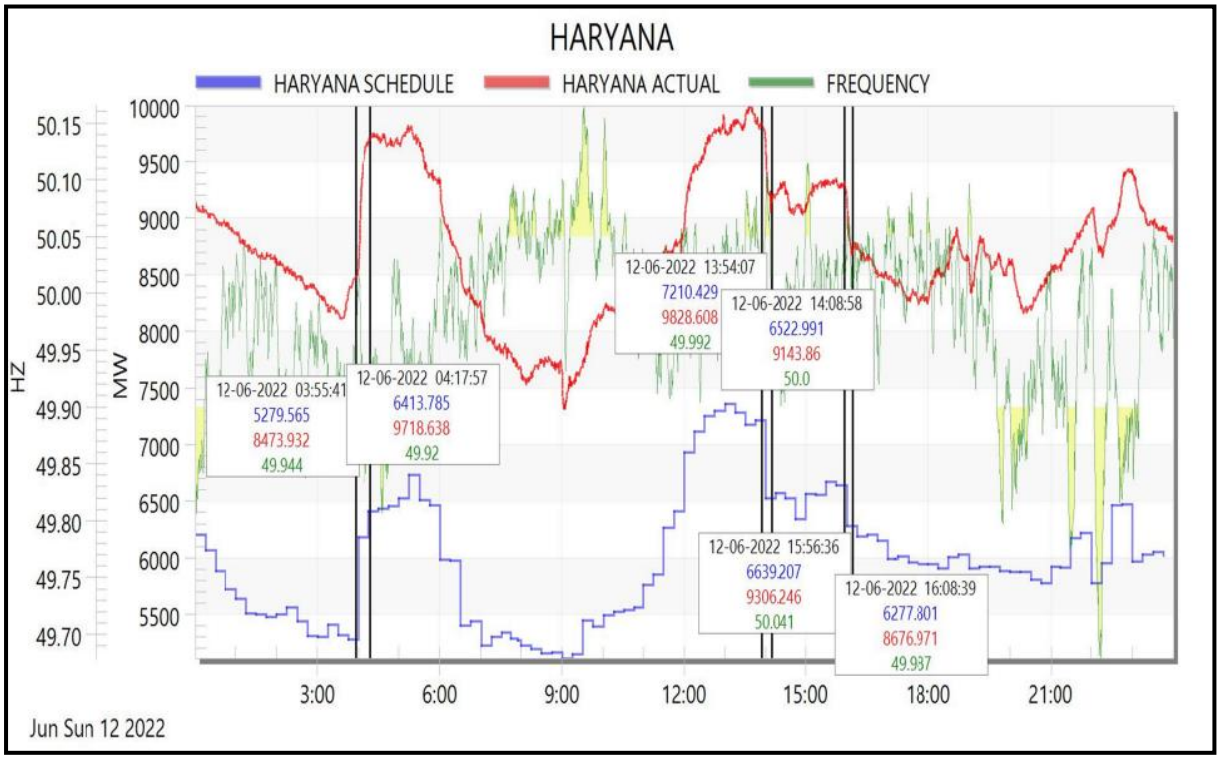
In May'22, frequency remained within IEGC band for only 72.2% of the time. All utilities are requested to follow all the measures described in subsequent agenda points.

All the concerned are requested to strictly take actions and avoid over drawal from Grid for safe & secure operation of the Grid. Therefore, the following is requested:

1. Managing the demand portfolio and making prearrangements for procurement of power and ensuring portfolio balancing through STOA/RTM market segments
2. More units shall be kept on bar in order to meet the increased demand safely as well as maintaining reserves
3. Keeping sufficient coal stock and maintaining adequate reserves.
4. Restricting deviations from schedule and ensuring no under injection by the generators from schedule.
5. Advance action is required for bringing the units on bar to avoid situation such as encountered in April 2022.
6. Ensure that ADMS is in service and expedite its implementation if not commissioned.
7. Ensure healthiness and availability of AUFLS and df/dt load shedding.
8. In case of inadequate margins in intrastate generators measures for emergency load regulation measures may be taken in interest of grid security.
9. Pursue generators to expedite revival of thermal units under forced outage wherever feasible.

It is being observed that some of the states such as Haryana and UP are changing drawl by large quantum for the past few days as shown below.





As per IEGC 5.2(j),

No User / SEB shall cause a sudden variation in its load by more than one hundred (100 MW) without prior intimation to and consent of the RLDC.

The above issues have been communicated to the respective SLDCs vide NRLDC letters dated 14.06.2022 attached as **Annexure-B.I.**

A meeting was organized by NRLDC on 06.05.2022 with participation from all SLDCs to review the list of feeders for physical regulation after most of the states had not submitted their feedback. Following is the updated status as per discussions held in the meeting.

In 195 OCC meeting, Uttarakhand representatives stated that they shall share updated list of radial feeders before next OCC meeting.

Haryana representative stated that the list of radial feeders has been sent for approval to management and would be shared after approval. These feeders are 220kV Kaithal-Neemwala D/C and 220kV Sec 72 Gurgaon- Sec 33 D/C. These would be in addition to Schedule A & B feeders already identified.

NRLDC representative urged Haryana and Uttarakhand representatives to share the updated list at the earliest. NRLDC representative also stated that since some of the feeders are being opened manually by UP and Punjab and it would be better if the same is automated.

SLDC Haryana and Uttarakhand to provide update. Other SLDC requested to explore possibility of automatic feeder opening in case of low frequency and over drawl.

Members may like to discuss.

15. TTC/ATC of state control areas for summer 2022

From last several OCC meetings, it has been discussed that most of the NR states except J&K, Ladakh and Chandigarh U/Ts are sharing base-case 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.

SLDCs are requested to go through the tentative ATC/TTC limits for July 2022 (**Annexure-B.II**) and provide comments. If no comments are received, these limits will be assumed confirmed and uploaded on NLDC website. SLDCs are also requested to upload these limits in their respective websites. States are also requested to regularly provide update regarding the upcoming transmission elements which would improve import capability of respective state control area.

Loading of 400/220kV ICTs observed above or close to N-1 contingency limits is also attached as **Annexure-B.III**.

Punjab

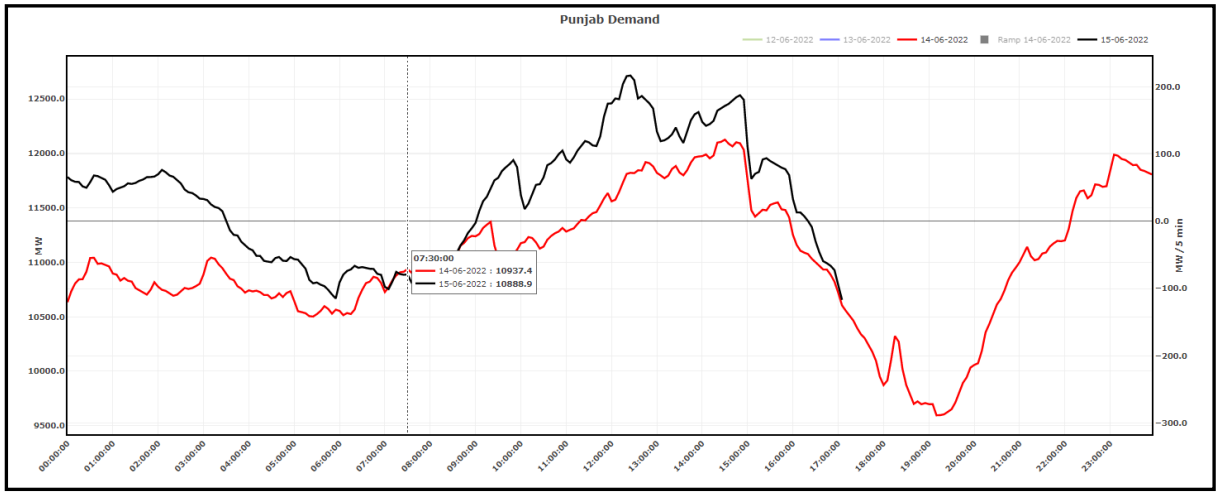
In 195 OCC meeting, NRLDC representative stated that in the month of May 2022, when import by Punjab state control area was more than 6500MW, severe N-1 non-compliance was observed at 400/220kV Rajpura ICTs whereas loading was close to N-1 contingency limit at 400/220kV Nakodar ICTs. Punjab has implemented SPS at both these locations, but it is necessary to complete the pending transmission elements to ensure N-1 compliance at these stations.

N-1 contingency of 500 MVA ICT at Ludhiana, Patran, Malerkotla, Moga, Patiala and N-1 contingency of 315 MVA ICT at Nakodar and Nallagarh will critically load other ICTs and thus, these contingencies are the limiting constraints for import capability of Punjab. Punjab SLDC should ensure loading of these 400/220kV ICTs below contingency N-1 limits.

Increased generation at 220 kV level (Ropar, Lehramohabbat, Goindwal) will help in meeting the high demand, expected at the time of paddy season as well as improvement in reliability due to increased voltage support. Thus, full generation at 220kV generating stations such as Goindwal, Ropar and Lehramohabbat is recommended to maintain this ATC/TTC limit for Punjab.

Although simulation studies suggest no major low voltage issues, Punjab SLDC needs to monitor continuously the voltage profile, load power factor and availability of shunt compensation.

It was also informed that works for reconductoring of 220kV Jalandhar-Kartarpur would be completed before 10th June 2022. However, it seems that the work is still to be completed. Load in Punjab state has started increasing as visible from the plot shown below:



With import close to 7000MW, sever n-1 non-compliance was observed at 400/220kV Nakodar ICTs while the loading of 400/220kV Ludhiana ICTs was just below the N-1 contingency limits.

Punjab SLDC was asked to take up the matter for selling power in Real Time Market in case of load crash events on priority. Punjab SLDC to provide update.

UP

UP SLDC vide mail dated 16.05.2022 has shared their revised assessments as follows:

Intra-State Generation(w/o Solar and Co-Gen)	TTC	RM	ATC
11000	15100	600	14500
12000	14500	600	13900
13000	14000	600	13400

In 195 OCC meeting, NRLDC representative stated that comments from NRLDC side have been mailed on 20.05.2022.

UP representative stated that 765kV AnparaD- Unnao line would be revived shortly and thereafter this issue would not be faced afterwards. Moreover, it was discussed that if required 220kV lines from Obra may be opened if loading of 400kV Anpara-Obra is higher than safe limit if they are not able to ensure sufficient generation at Obra TPS.

In the month of May-June 2022, when import of UP was in the range of 13000MW, loadings close to N-1 limit (slightly beyond even) were observed at 400/220kV Sarnath, Obra, Gorakhpur, Nehtaur and Allahabad(PG) ICTs. UP SLDC is requested to restrict loadings of these ICTs below their N-1 contingency limit.

UP representative to update on

- SPS implementation at Obra and Nehtaur.
- Mock testing of SPS already installed
- Revival of 765kV AnparaD - Unnao

Rajasthan

In 194 OCC meeting, NRLDC representative stated following were comments from NRLDC side on the proposal:

- Ajmer: Proposed SPS seems to be in order in general as per NRLDC.
- Merta: 220/132kV Merta ICTs not shown in diagram.
- Chittorgarh: Other 220kV line may also need to be added as sought relief may not be provided.

Rajasthan representative agreed to look into the comments from NRLDC side. Rajasthan was given in-principal approval for implementation of SPS at 400/220kV Ajmer, Merta and Chittorgarh, expedite implementation of SPS, and share revised ATC/TTC assessment of Rajasthan state control area.

In 195 OCC meeting, it was discussed that in the month of April-May 2022, severe N-1 non-compliance was observed at 400/220kV Ajmer, Chittorgarh, Merta, Bhinmal and Bikaner ICTs. Rajasthan SLDC representative was asked to provide the plan to ensure loadings at these 400/220kV ICTs below their N-1 contingency limits. Rajasthan SLDC was also asked to expedite implementation of SPS as agreed in last OCC meeting.

Recently, also N-1 non-compliance was observed at 400/220kV Merta, Ajmer, Chittorgarh and Bikaner ICTs.

Rajasthan SLDC representative is requested to provide the plan to ensure loadings at these 400/220kV ICTs below their N-1 contingency limits and also status of implementation of SPS as agreed in last OCC meetings.

Delhi

ATC is not being uploaded in website, only violation of ATC is being shown.

In 195 OCC meeting, DTL was asked to share ATC/TTC assessment and base-case with NRLDC/ NRPC at the earliest. Delhi SLDC representative informed that the ATC/TTC assessment was done and same is sent for approval by management. It was informed that constraints observed are 400/220kV Harsh Vihar and Mandola ICTs at ATC/TTC of 6800/7100MW. After approval, ATC/TTC figures would also be uploaded on Delhi SLDC website.

Delhi SLDC vide email dated 27.05.2022 has shared their ATC/TTC assessments with NRLDC. NRLDC vide email dated 14.06.2022 has shared their observations (also mentioned below):

- Severe N-1 non-compliance at 400/220kV Bamnauli ICTs, after shifting of one ICT to Mundka
- Loading of 400/220kV Mundka ICTs not matching with real-time (less than 400MW in basecase whereas more than 600MW in real-time)
- Bus split at Jhatikara to be incorporated.
- Please also check n-1 compliances of 765kV Jhatikara-Dwarka (high loading of Jhatikara-Bamnauli) and 765/400kV ICTs at Jhatikara (two ICTs on one 400kV bus)
- 220kV bus voltages at some of the buses are getting low
- Some 220kV lines ae highly loaded in base-case itself

Loading of 400/220kV Mundka and Harshvihar ICTs was close to N-1 contingency limits during last few weeks.

Delhi SLDC is requested to provide update.

Haryana

In 195 OCC meeting, Haryana SLDC representative stated that they have implemented SPS at 400/220kV Deepalpur. For Kurukshetra, they shall take up the matter for implementing SPS with POWERGRID. During shutdown of Samalkha-Chhajpur line due to highway crossing works, additional loading had to be kept on 220kV Sonepat-Mohana, therefore higher loading was observed.

For N-1 compliance of 400/220kV Panipat ICTs, drawl of Delhi also needs to be restricted as both Haryana and Delhi are drawing power from Panipat substation. Delhi SLDC representative stated that the line is connected since previous years and the line flow is normal.

It was discussed that Haryana and Delhi may mutually discuss and resolve the issue of loading of 400/220kV Panipat ICTs and in case same is not resolved it could be discussed in separate meeting or next OCC meeting after agenda by Haryana/ Delhi.

N-1 non-compliance was observed at 400/220kV Deepalpur and Panipat (BBMB) ICTs

Haryana SLDC to provide update.

HP and Uttarakhand have shared their ATC/TTC assessment for summer 2022. For Uttarakhand, N-1 compliance was observed at 400/220kV Kashipur ICTs along with high loading of 220kV CBGanj-Pantnagar.

J&K

Not assessing its ATC. J&K representatives had intimated during 47th TCC and 49th NRPC meeting that they would be sharing ATC/TTC assessment with NRLDC from October 2021, however the same is still awaited. J&K and Ladakh U/Ts are once again requested to advise the concerned officers to evaluate their ATC/TTC limits in coordination with NRLDC and share latest assessment with NRLDC and NRPC after procurement of PSSe software.

As discussed in last several OCC meetings, all SLDCs need to furnish ATC/TTC details of their control area at respective SLDC websites. Now, it is being observed that most of the SLDCs except J&K and Delhi are uploading ATC/TTC limits on their websites.

SLDC	Link for ATC on website
UP	https://www.upsldc.org/documents/20182/0/ttc_atc_24-11-16/4c79978e-35f2-4aef-8c0f-7f30d878dbde
Punjab	https://www.punjabsldc.org/downloads/ATC-TTC0321.pdf
Haryana	https://hvpn.org.in/#/atcttc
Delhi	**NA**
Rajasthan	https://sldc.rajasthan.gov.in/rrvpnl/scheduling/downloads
HP	https://hpsldc.com/mrm_category/ttc-atc-report/
Uttarakhand	http://uksldc.in/transfer-capability

J&K and Ladakh U/T	**NA**

Since demand of most of the NR states has started increasing sharply, it is requested that the revised ATC/TTC limits for summer2022 along with anticipated generation scenario may be shared with NRLDC at the earliest***.***

It is again requested that SLDCs may ensure that loading of ICTs and lines are below their N-1 contingency limits. While requisitioning power from various sources, states should take care to limit their scheduled drawl as well as actual drawl in real time within the Available Transfer Capability (ATC) limits assessed by SLDC and NRLDC.

Members may like to discuss.

16. Grid operation related issues

(i) Long outage of transmission elements/ generating units

Reasons and revival date for elements under long outage are being discussed regularly in OCC meetings. Any update on the status of these elements from last OCC meeting may be shared with the forum (**Annexure-B.IV**).

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

Revival of following critical transmission elements needs to be expedited:

- 400/220 kV 315 MVA ICT 2 at Mundka(DV)
- 400/220 kV 240 MVA ICT 3 at Moradabad(UP)
- 765 KV ANPARA_D-UNNAO (UP) CKT-1
- 400 KV Kadarpur (GPTL) - Bus 1
- 220 KV Sohawal(PG)-Gonda(UP) (UP) Ckt-1
- 220 KV Sohawal(PG)-Bahraich(UP) (UP) Ckt-1
- 400/220 kV 315 MVA ICT 1 at Muradnagar_1(UP)
- 400/220 kV 315 MVA ICT 1 at bhilwara(rs)
- 400/220 kV 500 MVA ICT 2 at Noida Sec 148(UP)
- 220 KV Kishenpur(PG)-Mir Bazar(PDD) (PDD) Ckt-1
- 400KV Bus 1 at Vishnuprayag(JP)

Members may please discuss.

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

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

Utilities are also requested to make sure that list of 220kV and underlying intra-state lines and ICTs is readily available with them, so that the same can be shared with NRLDC/NRPC as and when required. This data is to be shared with NRLDC/NRPC for timely updation of Powermaps, PSSebasecase, Protection analysis etc.

In line with the above decisions, all utilities are requested to share the information about transmission elements/ generating units which are expected to be first time charged in the next 45 days.

Members may like to discuss.

(ii) Calculation of Drawal points based on SLDC end data

Haryana and Uttarakhand SLDCs are requested to provide update on the agenda point.

Members may please discuss.

(iii) Update of Important grid element and Operating Procedure document in line with IEGC:

Based on the inputs received from utilities and discussions held in 194th and 195th OCC meetings, in line with section 5.2. (c) of IEGC, list of important grid elements in Northern region has been updated and uploaded on NRLDC website @https://nrldc.in/download/important-grid-element-of-northern-region-may-2022/?wpdmdl=10389.

Operating Procedure document would also be updated by NRLDC in mid-July 2022. Latest available document is available @ https://nrldc.in/download/operation-procedure-of-northern-region-2021-22/?wpdmdl=9306.

Utilities may provide update/ their inputs at the earliest.

(iv) Installation of Bird Divertor on Power Lines as directed by Hon' ble Supreme Court of India

Hon' ble SC has directed that " *In all cases where the overhead powerlines exist as on today in the priority and the potential GIB area the respondents shall takes steps forthwith to install divertors pending consideration of the conversion of overhead cables into underground power lines. In all such cases where it is found feasible to convert the overhead cables into underground power lines the same shall be undertaken and completed within a period of one year and till such time the divertors shall be hung from the existing powerlines."*

CEA has released the technical specifications of Bird flight divertor in January 2021 which is available on https://cea.nic.in/wpeontent/uploads/pse td/202110 I/Technical Specifications for Bird Flight Diverter.pdf. CTU has furnished the list of powerlines falling under potential habitats of GIB as a part of submission in CERC order no. l 36/TL/2021. NLDC letter regarding the issue is attached as **Annexure-B.V**.

In this regard, it is requested to furnish the status report on compliance of order of Hon' ble SC regarding installing bird divertors on the EHV lines which are already commissioned. Compliance of the above order shall be ensured for the transmission systems under commissioning before seeking approval for first-time charging.

(v) Delay in charging and revival of 765kV Bikaner-Khetri D/C

765 kV Bikaner-Khetri-Circuit 1 is under forced outage since 1850 hours of 23rd May 2022 on account of collapse of top cross arm of tower. The Outage of 765 kV Bikaner Khetri ckt-2 is being facilitated on daily basis since 26th May 2022 for restoration of 765 kV Bikaner-Khetri-Circuit 1. It may be noted that the 765 kV Bikaner-Khetri-double circuit lines are important for evacuation of wind/solar based generation from RE complexes in Rajasthan/Gujarat. The prolonged outage of Circuit-1 had caused alarming conditions in the system during high RE generation.

Further, Shutdown of 765 kV Bikaner – Khetri ckt-2 was planned from 1600 hrs of 09.06.2022 to 0700 hrs of 10.06.2022 for restoration work of ckt -1. However, it was observed that line charging was delayed for 4 hours and 23 minutes. Line could only be restored at 11:23 Hours. Due to which, heavy voltage oscillations were seen in Bikaner – Bhadla complex **(Annexure-B.VI).** The outage of 765 kV Bikaner-Khetri-D/C during high solar hours has caused the overloading of 400 kV Bikaner(PG)-Bikaner(RS) line and high voltage fluctuations.

As per Clause No. 5(1)(b) of Central Electricity Regulatory Commission (Standards of performance of interstate transmission licensees) Regulations 2012 which mentions *Restoration Times: Restoration time for different types of failures of transmission line and inter connecting transformers and reactors shall not exceed the following time limit:*

Sr.No.	Type of Failure	Restoration Time (Days)
1	Tower after collapse by Emergency Restoration System	12

It may be noted that around 19 days have passed since tripping of line on account of collapse of top cross arm of tower.

Bikaner-Khetri Transmission Limited is requested to share the root cause of the failure and expedite restoration of the 765 kV Bikaner-Khetri-I circuit. Also provide reasons for delay in charging of 765kV Bikaner-Khetri ckt2 on 10.06.2022.

Members may like to discuss.

(vi) Review of planned outages from 1 Sep 2022 to 15 Oct 2022

A meeting regarding coal supply issues to power supply issues to power plants was chaired by Secretary (P) on 03.06.2022. In the meeting it was agreed that planned

outage from 1 Sep 2022 to 15 Oct 2022 should be minimum possible so as to have adequate capacity available to meet expected demand.

NLDC letter NLDC/SO/2022-23/38 dated 08.06.2022 is attached as **Annexure-B.VII.**

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

(vii) Observation of low voltage & oscillations in the grid

Recently, on 27.05.2022, oscillations were observed dominantly in RE evacuation substations of Rajasthan in Northern region during high solar and high wind generation in Northern region. Moreover, low voltages have also been continuously observed in the grid during high solar and wind generation. The plots for oscillations observed in the grid are shown in next slide. In an integrated power system, such oscillations may propagate to affect or even trip other elements in the power system viz. line, generating unit etc.

Voltage fluctuation including low voltage along with tripping/dip in RE generation was first observed on 15th Jan'22 and same was deliberated in 192nd and 193rd NRPC OCC meetings held on 18th Feb'22 and 22nd March'22. Apart from voltage fluctuation and voltage oscillations all other RE related issues were also deliberated in 195th NRPC-OCC meetings.

On 10th June at 10:05hrs Oscillations in voltage started with a Jerk of around 15kV was observed, later sustained with amplitude of 3-4kV at 220kV level up to 10:13Hrs. After that amplitude of oscillation strengthened to 25-40kV/35-40kV at 220kV/400kV level. Oscillations mainly capture up to 10:55Hrs.

Largest amplitude of oscillations was observed at 220kV Fatehgarh2_PG connected RE plants in comparison of 220kV Bhadla,220kV Bhadla2 and220kV Bikaner i.e. around 25kV~40kV.

During the period of oscillations, the grid voltage near the RE generation was lower side.

Plots for voltage fluctuations including severe low voltages are attached as Annexure-B.VI.

All RE plants are requested to share the event logger details for all events of Voltage fluctuations.

Issues of voltage fluctuation and undesirable response from RE plants creating threat on Grid operation, same need to be analyzed in detailed and need to be rectified from its root cause for secure and reliable operation of Grid. To analyze any such kind of events a dedicated protection & reliability coordinator from each RE plants may be nominated for smooth sharing of data/tripping details and its detailed analysis.

Plots of oscillations on 27.05.2022 and 10.06.2022 are attached as Annexure-B.VI. Moreover, during the event there was huge MVAR drawl by RVPN stations such as Akal, Jodhpur, Kankani, Ramgarh and Barmer.

Rajasthan and Solar IPPS are requested to provide analysis done at their end.

(viii) PFR testing in Northern region

BBMB was not able to place PO to perform PFR testing of machines even after numerous discussions in OCC meetings and written communication from NRLDC. For these remaining units, Solvina has been provided with contract from following machines:

S.No.	Name of Utility	No. of units of utility	Station	Generating Unit No.	Capacity(MW)	Fuel Type
1	NTPC	1	Dadri stg-2	2	490	Coal
2	NTPC	2	Tanda Stage-II	1	660	Coal
3	NTPC		Tanda Stage-II	2	660	Coal
4	NTPC	1	Koldam	1	200	Hydro
5	SJVNL	3	Nathpa Jhakri	3	250	Hydro
6	SJVNL	2	Rampur	2	68.67	Hydro
7	SJVNL		Rampur	3	68.67	Hydro
8	NHPC	3	Dulhasti	1	128.44	Hydro
9	NHPC		Dulhasti	2	128.44	Hydro
10	NHPC		Dulhasti	3	128.44	Hydro
11	NHPC	3	Chamera Stage-II	1	98.8	Hydro
12	NHPC		Chamera Stage-II	2	98.8	Hydro
13	NHPC		Chamera Stage-II	3	98.8	Hydro

Members may kindly note.

17. Frequent forced outages of transmission elements in the month of May'22

The following transmission elements were frequently under forced outages during the month of **May'22**:

S. NO.	**Element Name**	**No. of forced outages**	**Utility/SLDC**
1	765 KV Orai-Jabalpur (PG) Ckt-1	4	POWERGRID
2	800 KV HVDC Kurukshetra(PG) Pole-1	4	POWERGRID
3	400 KV Aligarh-Muradnagar_1 (UP) Ckt-1	4	UP
4	400 KV NewWanpoh(PG)-Baglihar(JK) (JKSPDCL) Ckt-1	4	POWERGRID/JKSPDCL
5	400 KV Shree Cement(SCL)-Kota(PG) (PG) Ckt-1	4	POWERGRID
6	400 KV Talwandi Saboo(PSG)-Muktsar(PS) (PS) Ckt-2	4	PUNJAB
7	400 KV Anpara_B(UPUN)-Mau(UP) (UP) Ckt-1	3	UP

8	400 KV Bawana CCGTB(DTL)-Bhiwani(PG) (PG) Ckt-1	3	POWERGRID
9	400 KV Noida Sec 148-Noida Sec 123 (UP) Ckt-1	3	UP
10	400 KV Bawana-Mundka (DV) Ckt-2	3	DELHI
11	400 KV Chamera_2(NH)-Kishenpur(PG) (PG) Ckt-1	3	POWERGRID/NHPC
12	400 KV CLP Jhajjar(CLP)-Kabulpur(HV) (HVPNL) Ckt-1	3	HARYANA
13	400 KV Dadri(NT)-Panipat(BB) (PG) Ckt-1	3	POWERGRID/BBMB
14	400 KV Gr.Noida_2(UPC)-Noida Sec 148 (UP) Ckt-1	3	UP
15	400 KV Gurgaon(PG)-Daulatabad(HV) (HV) Ckt-2	3	HARYANA
16	400 KV Muzaffarnagar-Ataur (UP) Ckt-1	3	UP
17	220 KV Duni(RS)-Kota(PG) (RS) Ckt-1	4	RAJSTHAN
18	220 KV Badarpur(NT)-Alwar MIA(RS) (RS) Ckt-1	8	RAJSTHAN
19	220 KV Debari(RS)-RAPS_A(NP) (RS) Ckt-1	4	RAJSTHAN

The complete details are attached at **Annexure-B.VIII**. 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 trippings and share the remedial measures taken/being taken in this respect.

Members may like to discuss.

18. Multiple element tripping events in Northern region in the month of May'22

A total of **40** grid events occurred in the month of May'22 of which **19** are of GD-1 category. The preliminary report of all the events have been issued from NRLDC. A list of all these events is attached at **Annexure-B.IX.**

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

Maximum Fault Duration observed is 15secs 780ms in the event of multiple element tripping at 400/220kV Panki (UP) on 20-May-22 at 00:37hrs.)

Delayed clearance of fault (more than 100ms for 400kV and 160ms for 220kV system) observed in total **8** events out of **40** grid events occurred in the month. In 12 number of events, fault signature couldn't be captured from PMU data.

Members may take necessary preventive measures to avoid such grid incidents / disturbances in future and report actions taken by respective utilities in OCC & PSC

forum. Moreover, utilities may impress upon all concerned for providing the Preliminary Report, DR/EL & Detailed Report of the events to RLDC in line with the regulations.

Members may like to discuss.

19. Details of tripping of Inter-Regional lines from Northern Region for May'22

A total of 26 inter-regional lines tripping occurred in the month of May'22. The list is attached at **Annexure-B.X.** The status of receipt of preliminary reports, DR/EL within 24hrs of the event and fault clearing time as per PMU data has also been mentioned in the table. The non-receipt of DR/EL & preliminary report within 24hrs of the event from SLDCs / ISTS licensees / ISGSs is in violation of regulation 5.2(r) of IEGC and regulation 15(3) of CEA Grid Standards. As per regulations, all the utilities shall furnish the DR/EL, flag details & preliminary report to RLDC/RPC within 24hrs of the event. They shall also furnish the detailed investigation report within 7 days of the event if fault clearance time is higher than that mandated by CEA (Grid Standard) Regulations.

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

20. Status of submission of DR/EL and tripping report of utilities for the month of May'22

The status of receipt of DR/EL and tripping report of utilities for the month of May'2022 is attached at **Annexure-B.XI**. It is to be noted that as per the IEGC provision under clause 5.2 (r), detailed tripping report along with DR & EL has to be furnished within 24 hrs of the occurrence of the event. However, it is evident from the submitted data that reporting status is not satisfactory and needs improvement. Also, it is observed that reporting status has been improved from POWERGRID, CPCC2, Delhi, Haryana and Uttar Pradesh in May'2022 compared to the previous month.

Members may please note and advise the concerned for timely submission of the information. It is requested that DR/EL of all the trippings shall be **uploaded on Web Based Tripping Monitoring System "http://103.7.128.184/Account/Login.aspx"** within 24 hours of the events as per IEGC clause 5.2.r and clause 15.3 of CEA grid standard. Apart from prints of DR outputs, the corresponding COMTRADE files may please also be submitted in tripping portal / through email.

21. Frequency response characteristic:

Three FRC based event occurred in the month of **May-2022**. Description of the event is as given below:
Table:

S. No.	Event Date	Time (In hrs.)	Event Description	Starting Frequency (in Hz)	End Frequency (in Hz)	*Δf*

1	02-May-22	11:06hrs	As reported at 11:06 Hrs, 400/220 kV 500 MVA ICT 1 & ICT 2 at Adani Renew Park_SL_FGARH_FBTL (AREPRL) tripped on thermal over loading protection operation. With the tripping of both the ICTs which were carrying approx. 890MW total, sudden over voltage occurred. On this over voltage, multiple 765kV lines at Fatehgarh2 & Bhadla2 and few 220kv lines to RE stations tripped. As per SCADA, total drop in solar generation of around 1920MW is observed and same figure has been considered in FRC.	49.97	49.85	-0.12
2	03-May-22	03:16hrs	At 03:16 Hrs on Dated 03rd-May-2022, As reported at 03:16 hrs, 400 KV simhadri, 400kv gazuwaka, 400kv kalapakka, 400kv hinduja, 220kV VSS, 220kV gannavaram, 220kV pendurthy, 220kV sarada, 220kV Atchutapuram, 220kV abhjeet, 220kV mrs vizag got dead, consequently Generation loss of around 2660 MW and Load loss of around 1200 MW occurred in the event. In this Event effective generation loss of around 1440 MW has been considered for FRC Calculation.	50.025	50.00	-0.025
3	15-May-22	20:11hrs	As reported at 20:11 Hrs, 400 KV Nathpa Jhakri(SJ)-Rampur	49.99	49.94	-0.05

			HEP(SJ) (PG) Ckt-2 tripped on Y-N fault. Further after approx. 1min, 400kV Nathpa Jhakri(SJ)-Panchkula(PG) (PG) Ckt-1 also tripped on R-B phase to phase fault. With the tripping of both these lines Case-2 of SPS of Nathpa Jhakri, Rampur, Karcham HEP generation complex operated which led to tripping of 250 MW Karcham Wangtoo HPS - UNIT 2 & UNIT 4, 68.67MW Rampur HPS UNIT 4 & UNIT 5 and 250 MW Nathpa-Jhakri HPS - UNIT 3 & UNIT 5. As per SCADA, total hydron generation loss of approx. 1250MW is observed. Same has been considered for FRC calculation.			
4	20-May-22	12:31hrs	At 12:31 Hrs on Dated 20th-May-2022, 765kV Bhadla-Bikaner(PG) ckt-1 tripped on B-N phase to earth fault. At the same time, drop in solar generation of approx. 3014MW (Fatehgarh2 1578MW, Bhadla PG 1136 MW, Bhadla2 30 MW, Bikaner 270 MW) observed as per SCADA. After approx. 5 sec, 765kV Bhadla2-Fatehgarh2 ckt-1 tripped on over voltage. Further after approx. 5 sec, 765kV fatehgarh2-Bhadla ckt-1 also tripped on over voltage. Hence,	50.03	49.91	-0.12

			generation loss of 3014MW has been taken for FRC calculation.			
5	23-May-22	01:09hrs	At 01:09 Hrs on Dated 23rd-May-2022, At 01:09 hrs while test charging of 765 kV Bhuj-Banaskatha line 1, 765 kV Bhuj Banaskatha line 2 also tripped due to over voltage. Due to extended planned outage of 400kV CGPL Bhuj DC lines and tripping of both circuits of 765 kV Bhuj-Banaskantha lines, Bhuj substation got isolated from the grid which resulted loss of evacuation path for Bhuj RE generators leading to loss of around 1673 MW RE generation. Same has been considered for FRC Calculation.	50.03	50.00	-0.03

Status of Data received till date:

Status of Field Data received of FRC of Grid event occurred at Fatehgarh2 at 11:06 Hrs on 02.05.2022			
Data Received from		**Data Not Received from**	
AD Hydro HEP	NJHPC	Uttarakhand	Rihand NTPC
HP	NTPC Singrauli	Punjab	APCPL Jhajjar
NHPC	Rajasthan	Delhi	Koteshwar
	Rosa Reliance	Haryana	Rampur HEP
		UP	Dadri NTPC
			Unchhahar TPS
			Others

Status of Field Data received of FRC of Grid event occurred at Kalpakka (Southern region) at 03:16 Hrs on 03.05.2022			
Data Received from		Data Not Received from	
AD Hydro HEP	NJHPC	Uttarakhand	Rihand NTPC
HP	NTPC Singrauli	Punjab	APCPL Jhajjar
NHPC	Rajasthan	Delhi	Rampur HEP
BBMB	Rosa Reliance	Haryana	Dadri NTPC
Koteshwar		UP	Unchhahar TPS
			Others

Status of Field Data received of FRC of Grid event occurred at Nathpa Jhakri at 20:12 Hrs on 15.05.2022			
Data Received from		Data Not Received from	
AD Hydro HEP	NTPC Singrauli	Uttarakhand	Rihand NTPC
NHPC	Rajasthan	Punjab	APCPL Jhajjar
BBMB	Koldam HEP	Delhi	Dadri NTPC
Koteshwar	Tehri HEP	Haryana	Unchhahar TPS
		UP	Others
		HP	

Status of Field Data received of FRC of Grid event occurred at Fatehgarh2 at 12:31 Hrs on 20.05.2022			
Data Received from		Data Not Received from	
Kawai	Rosa Reliance	Uttarakhand	Rihand NTPC
NHPC	Unchhahar TPS	Punjab	APCPL Jhajjar
		Delhi	Rampur HEP
		Haryana	Dadri NTPC
		UP	Karcham
		HP	Tehri
		BBMB	NJHPC
		Rajasthan	Others

Status of Field Data received of FRC of Grid event occurred at Bhuj at 01:09 Hrs on 23.05.2022			
Data Received from		Data Not Received from	
Kawai	Rosa Reliance	Uttarakhand	Rihand NTPC
NHPC		Punjab	APCPL Jhajjar
		Delhi	Rampur HEP
		Haryana	Dadri NTPC
		UP	Karcham
		HP	Tehri
		BBMB	NJHPC
		Rajasthan	Others

PFR as per NRLDC SCADA data and generators field data:

Primary Frequency Response by Generators during Grid Event at Fatehgarh2 at 11:06 Hrs on 02.05.2022

Sr. No	Generating stations	FRC as per NRLDC SCADA data (in %)	FRC as per generator data (in %)	Response category/Remark
1	AD Hydro Unit-2	23%	37.3%	Unsatisfactory PFR Response
2	Chamera III	311%	327%	Satisfactory PFR Response
3	Dhauliganga	Suspected SCADA data	3%	
4	Nathpa Jhakri Unit-5	99%	94.84%	Satisfactory PFR Response
5	Nathpa Jhakri Unit-6		92.62%	
6	Singrauli Unit-6	16%	6.48%	Unsatisfactory PFR Response
7	Singrauli Unit-7		39.57%	
8	Kalisindh TPS Unit-1	12%	17%	Unsatisfactory PFR Response
9	KTPS Unit-4	1%	64.5%	Unsatisfactory PFR Response
10	KTPS Unit-5		21.2%	Unsatisfactory PFR Response
11	CTPP Unit-1	20%	13%	Unsatisfactory PFR Response
12	CTPP Unit-2		25.6%	Unsatisfactory PFR Response
13	CTPP Unit-3		99.9%	Satisfactory PFR Response
14	Rosa TPS Unit-1	16%	14%	Unsatisfactory PFR Response
15	Rosa TPS Unit-2		6.31%	
16	Rosa TPS Unit-3		14%	
17	Rosa TPS Unit-4		3.16%	

Primary Frequency Response by Generators during Grid Event at Kalpakka(Southern region) at 03:16 Hrs on 03.05.2022

Sr. No	Generating stations	FRC as per NRLDC SCADA data (in %)	FRC as per generator data (in %)	Response category/Remark
1	AD Hydro	485%	518%	Satisfactory PFR Response
2	Chamera III	46.45%	35%	Unsatisfactory PFR Response
3	Koteshwar Unit-4	100%	83.3%	Satisfactory PFR Response
4	Sewa-II	Suspected SCADA data	91.2%	Satisfactory PFR Response
5	Nathpa Jhakri Unit-1	-49%	-21%	Unsatisfactory PFR Response
6	Nathpa Jhakri Unit-2		119%	Satisfactory PFR Response
7	Singrauli Unit-6	28%	93.6%	Satisfactory PFR Response
8	Singrauli Unit-7		106.7%	
9	Kalisindh TPS Unit-1	49%	34.6%	Unsatisfactory PFR Response
10	SSCTPS Unit-8	9%	46.1%	Unsatisfactory PFR Response
11	Rosa TPS Unit-1,2,3 &4	22%	0%	Unsatisfactory PFR Response
12	CTPP Unit-1	20%	30%	Unsatisfactory PFR Response
13	CTPP Unit-2		39%	
14	CTPP Unit-3		13%	

In line with the decisions taken during various OCC meetings, the time and date of the FRC events were e-mailed to respective utilities***. Constituents may submit the FRC of their control areas for the above event and reason of poor response, if observed.***

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

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

In last 15 OCC meetings, this point was discussed and Utilities were requested to submit the present status of PSS tuning/re-tuning and Step Response Test of their respective generators as per the below mentioned format.

S. No.	Name of the Generating Station	Date of last PSS tuning / re-tuning performed (in DD/MM/YYYY format)	Date of last Step Response Test performed (in DD/MM/YYYY format)	Report submitted to NRLDC (Yes/ No)	Remarks (if any)

The status of test performed till date is attached at **Annexure-B.XII.**

It may be noted that Tehri HEP conducted PSS tuning/ Step response test of their units and submitted report. In UP Control area, Step response test of Rosa Unit#1 & Unit#4 done on 5th Oct, 2021, test of Lalitpur Unit#2 on 30th March 2021, unit#1 on 23rd February, 2022 & Unit#3 on 15th January 2022. Step response test of Bara Unit#2 done on 1st February, 2022, Anpara A unit#1 & Unit#2 done on 27th September, 2021, Harduaganj Unit#7 & Unit#9 done on 16th July, 2021.

In Rajasthan control area, PSS tuning/ retuning and step response of Unit #1, 2,3,4,6 & 7 of KTPS, Kota carried out during the period 02.03.22 to 04.03.22 and Unit #2 & 4 of STPS, Suratgarh was conducted on 06.06.22.

Schedule has been received from Rajasthan and UP Control area. However, no further updates have been received from other utilities till date.

It is to be noted that as per regulation 5.2(k) of IEGC, Power System Stabilizers (PSS) in AVRs of generating units (wherever provided), shall be got properly tuned by the respective generating unit owner as per a plan prepared for the purpose by the CTU/RPC from time to time.

In 195th OCC meeting, Members were requested to update about their future plan for PSS tuning as there is no significant progress despite including this agenda in every OCC meeting and a separate meeting may be call for detail discussion on this matter.

Members may please 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 — May-2022
◎ HARYANA — Aug-2021
◎ HP — Jan-2022
◎ J&K and LADAKH — Not Available
◎ PUNJAB — Aug-2021
◎ RAJASTHAN — Mar-2022
◎ UP — Mar-2022
◎ UTTARAKHAND — May-2022
All States/UTs are requested to update status on monthly basis.</td></tr>
<tr><td rowspan="2">3</td><td rowspan="2">Healthiness of defence mechanism: Self-certification</td><td>Report of mock exercise for healthiness of UFRs carried out by utilities themselves on quarterly basis is to be submitted to NRPC Secretariat and NRLDC. All utilities were advised to certify specifically, in the report that “All the UFRs are checked and found functional”.</td><td>Data upto following months, received from various states / UTs:
◎ CHANDIGARH — Not Available
◎ DELHI — Mar-2022
◎ HARYANA — Mar-2022
◎ HP — Apr-2022
◎ J&K and LADAKH — Not Available
◎ PUNJAB — Mar-2022
◎ RAJASTHAN — Mar-2022
◎ UP — Dec-2021
◎ UTTARAKHAND — Mar-2022
◎ BBMB — Mar-2022
All States/UTs are requested to update status for healthiness of UFRs on monthly basis for islanding schemes and on quartely basis for the rest .</td></tr>
<tr><td>In compliance of NPC decision, NR states/constituents agreed to raise the AUFR settings by 0.2 Hz in 47th TCC/49th NRPC meetings.</td><td>Status:
◎ CHANDIGARH — Not Available
◎ DELHI — Increased
◎ HARYANA — Increased
◎ HP — Increased
◎ J&K and LADAKH — Not increased
◎ PUNJAB — Increased
◎ RAJASTHAN — Increased
◎ UP — Partially increased</td></tr>
</table>

			◎	UTTARAKHAND	Increased
			◎	BBMB	Not increased
			Rajasthan, Delhi, HP and Uttarakhand were requested to submit the updated self certification report indicating increase of 0.2 Hz in AUFR settings, within one week. All states/UTs were requested to update status for increasing settings of UFRs.		
4	Status of FGD installation vis-à-vis installation plan at identified TPS	List of FGDs to be installed in NR was finalized in the 36th TCC (special) meeting dt. 14.09.2017. All SLDCs were regularly requested since 144th OCC meeting to take up with the concerned generators where FGD was required to be installed. Further, progress of FGD installation work on monthly basis is monitored in OCC meetings.	Status of the information submission (month) from states / utilities is as under:		
			◎	HARYANA	Mar-2022
			◎	PUNJAB	Apr-2022
			◎	RAJASTHAN	Jun-2022
			◎	UP	Mar-2022
			◎	NTPC	Feb-2022
			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.		
5	Information about variable charges of all generating units in the Region	The variable charges detail for different generating units are available on the MERIT Order Portal.	All states/UTs are requested to submit daily data on MERIT Order Portal timely.		

6	Reactive compensation at 220 kV/ 400 kV level at 15 substations			
	State / Utility	Substation	Reactor	Status
i	POWERGRID	Kurukshetra	500 MVAr TCR	Anticipated commissioning: July 2022 (90% supplies received from GE and rest is expected by Feb'22)
ii	DTL	Peeragarhi	1x50 MVAr at 220 kV	PO awarded to M/s Kanohar Electricals Ltd. Drawings approved and under stage inspection (delay due to pending supply of reactor bushings). GIS Bay is already available.
iii	DTL	Harsh Vihar	2x50 MVAr at 220 kV	PO awarded to M/s Kanohar Electricals Ltd. Drawings approved and under stage inspection (delay due to pending supply of rector bushings). GIS Bay is already available.
iv	DTL	Mundka	1x125 MVAr at 400 kV & 1x25 MVAr at 220 kV	Bay work awarded to M/s. Ethos. Bay work is expected to be completed by Dec.21. Reactor part tender is dropped and at present same is under revision.
v	DTL	Bamnauli	2x25 MVAr at 220 kV	Bay work awarded to M/s. Ethos. Bay work is expected to be completed by Dec.21. Reactor part tender is dropped and at present same is under revision.
vi	DTL	Indraprastha	2x25 MVAr at 220 kV	Bay work awarded to M/s. Ethos. Bay work is expected to be completed by Dec.21. Reactor part tender is dropped and at present same is under revision.
vii	DTL	Electric Lane	1x50 MVAr at 220 kV	Under Re-tendering due to Single Bid
viii	PUNJAB	Dhuri	1x125 MVAr at 400 kV & 1x25 MVAr at 220 kV	400kV Reactors - LOA issued on dated. 17.08.2021 and date of completion of project is 18 months from the date of LOA. 220kV Reactors - LOA issued on dated 19.07.2021 and date of completion of project is 18 months from the date of LOA.
ix	PUNJAB	Nakodar	1x25 MVAr at 220 kV	220kV Reactors - LOA issued on dated 19.07.2021 and date of completion of project is 18 months from the date of LOA.
x	PTCUL	Kashipur	1x125 MVAR at 400 kV	Tender has been invited in first week of Jan'22.

xi	RAJASTHAN	Akal	1x25 MVAr	LOA placed on dt. 4.1.2021. Agreement signed on dt. 8.02.2021. 2nd instalment has been received on dt. 30.07.2021. The erection work of 3 Reactors is under progress and shall be commissioned by 30.06.2022.
xii	RAJASTHAN	Bikaner	1x25 MVAr	LOA placed on dt. 4.1.2021. Agreement signed on dt. 8.02.2021. 2nd instalment has been received on dt. 30.07.2021. The erection work of 3 Reactors is under progress and shall be commissioned by 30.06.2022.
xiii	RAJASTHAN	Suratgarh	1x25 MVAr	LOA placed on dt. 4.1.2021. Agreement signed on dt. 8.02.2021. 2nd instalment has been received on dt. 30.07.2021. The erection work of 3 Reactors is under progress and shall be commissioned by 30.06.2022.
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.
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.

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.	-	PDD, J&K to update the status.
2	400/220kV, 2x315 MVA New Wanpoh	Commissioned: 6 Total: 6	Utilized: 2 Unutilized: 4	• 220 kV New Wanpoh - Alusteng D/c Line	-	PDD, J&K to update the status.
				• 220 kV New Wanpoh - Mattan D/c Line	-	PDD, J&K to update the status.
3	400/220kV, 2x315 MVA Amargarh	Commissioned: 6 Total: 6	Utilized: 6 Unutilized: 2	• 220kV D/C line from 400/220kV Kunzar - 220/33kV Sheeri	-	PDD, J&K to update the status.
4	400/220kV, 2x500 MVA Kurukshetra (GIS)	Commissioned: 8 Total: 8	Utilized: 6 Unutilized: 2	• 220kV Bhadson (Kurukshetra) – Ramana Ramani D/c line	-	HVPNL to update the status.
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: 3 Unutilized: 3 (2 bays to be utilized shortly) Approved/Under Implementation:1	• 220 kV D/C Shahajahanpur (PG) - Gola line	-	UPPTCL to update the status.
				• LILO of Sitapur – Shahjahanpur 220 kV SC line at Shahjahanpur (PG) – under commissioning	21.02.2022	Updated in 192nd OCC by UPPTCL.
7	Hamirpur 400/220 kV Sub-station	Commissioned: 8 Total: 8	Utilized: 4 Unutilized: 4 (2 bays to be utilized shortly)	• 220 kV Hamirpur-Dehan D/c line	Mar'22	Updated in 192nd 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: 4 Unutilized: 4	• LILO of 220 kV Sikar (220 kV GSS)-Dhod S/c line at Sikar (PG)	Commissioned	LILO of 220 kV S/C Sikar-Dhod line at 400 kV GSS PGCIL, Sikar has been charged on dt. 31.03.2022
				• Network to be planned for 2 bays.	-	Against the 3rd ICT at 400 kV GSS Sikar, only 2 bays were constructed and same has been utilized by RVPN by constructing LILO of 220 kV S/C Sikar – Dhod line as updated by RVPNL in 195th OCC
9	Bhiwani 400/220kV S/s	Commissioned: 6 Total: 6	Utilized: 0 Unutilized: 6	• 220 kV D/C line Bhiwani (PG) – Bhiwani (HVPNL) line	-	Issue related to ROW as intimated in 192nd OCC.HVPNL to update the status.
				• 220 kV Bhiwani (PG) - Isherwal (HVPNL) D/c line.	-	Issue related to ROW as intimated in 192nd OCC.HVPNL to update the status.
				• 220 kV Bhiwani (PG) - Dadhibana (HVPNL) D/c line.	-	Issue related to ROW as intimated in 192nd OCC.HVPNL to update the status.
10	Jind 400/220kV S/s	Commissioned: 4 Approved:4 Total: 8	Utilized: 4 Unutilized: 0 Approved:4	• 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	-	HVPNL to update the status.
11	400/220kV Tughlakabad GIS	Commissioned: 6 Under Implementation: 4 Total: 10	Utilized: 6 Unutilized: 0 Under Implementation:4	• RK Puram – Tughlakabad (UG Cable) 220kV D/c line – March 2023.	-	DTL to update the status.
				• Masjid Mor – Tughlakabad 220kV D/c line.	-	DTL to update the status.
12	400/220kV Kala Amb GIS (TBCB)	Commissioned: 6 Total: 6	Utilized: 0 Unutilized: 6	• 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'23	Updated in 192nd OCC by HPPTCL
				• Network to be planned for 4 bays	-	HPPTCL to update the status.
13	400/220kV Kadarpur	Commissioned: 8	Utilized: 0	• 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.	-	HVPNL to update the status.

Sl. No.	Substation	Downstream network bays	Status of bays	Planned 220 kV system and Implementation status	Revised Target	Remarks
13	Sub-station	Total: 8	Unutilized: 8	• 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	-	HVPNL to update the status.
14	400/220kV Sohna Road Sub-station	Commissioned: 8 Total: 8	Utilized: 0 Unutilized: 8	• LILO of both circuits of 220kV D/c Sector-69 - Roj Ka Meo line at 400kV Sohna Road	-	HVPNL to update the status.
				• LILO of both circuits of 220kV D/c Badshahpur-Sec77 line at 400kV Sohna Road	-	HVPNL to update the status.
15	400/220kV Prithla Sub-station	Commissioned: 8 Total: 8	Utilized: 0 Unutilized: 8	• LILO of both ckt of 220kV D/c Ranga Rajpur – Palwal line	-	HVPNL to update the status.
				• 220kV D/C for Sector78, Faridabad	-	HVPNL to update the status.
16	400/220kV Sonepat Sub-station	Commissioned: 6 Under Implementation:2 Total: 8	Utilized: 2 Unutilized: 2 Under Implementation:2	• LILO of both circuits of 220kV Samalkha - Mohana line at Sonepat		HVPNL to update the status.
				• Sonepat - HSIISC Rai 220kV D/c line	Jul'22	Updated in 192nd OCC
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)	Oct'22	In Tendering stage as updated in 192nd OCC by RVPNL.
18	400/220kV Kotputli Sub-station	Commissioned: 6 Total: 6	Utilized: 4 Unutilized: 2	• Kotputli - Pathreda 220kV D/c line	-	Bid documents under approval as updated in 195th OCC by RVPNL.
19	400/220kV Jallandhar Sub-station	Commissioned: 10 Total: 10	Utilized: 8 Unutilized: 2	• Network to be planned for 2 bays	-	PSTCL to update the status.
20	400/220kV Roorkee Sub-station	Commissioned: 6 Total: 6	Utilized: 4 Unutilized: 2	• Roorkee (PG)-Pirankaliyar 220kV D/c line	-	PTCUL to update the status.
21	400/220kV Lucknow Sub-station	Commissioned: 8 Total: 8	Utilized: 4 Unutilized: 4	• Network to be planned for 4 bays	-	UPPTCL to update the status.
22	400/220kV Gorakhpur Sub-station	Commissioned: 6 Total: 6	Utilized: 4 Unutilized: 2	• Network to be planned for 2 bays	-	UPPTCL to update the status.
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 4 bays	-	UPPTCL to update the status.
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	May'22	Updated in 194th 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	31.12.2022	Updated in 194th OCC by HVPNL
				• Panchkula – Sector-32 220kV D/c line	31.12.2022	Updated in 194th OCC by HVPNL
				• Panchkula – Raiwali 220kV D/c line	Commissioned	Updated in 194th OCC by HVPNL
				• Panchkula – Sadhaura 220kV D/c line: Sep'23	Sept'23	Updated in 194th OCC by HVPNL
		Commissioned:7	Utilized: 6	• Amritsar – Patti 220kV S/c line	-	PSTCL to update the status.

Sl. No.	Substation	Downstream network bays	Status of bays	Planned 220 kV system and Implementation status	Revised Target	Remarks
26	400/220kV Amritsar S/s	Approved in 50th NRPC- 1 no. Total: 8	Unutilized: 1 Approved in 50th NRPC- 1 no.	• 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)	-	PSTCL to update the status.
27	400/220kV Bagpat S/s	Commissioned: 8 Total: 8	Utilized:6 Unutilized: 2	·• Bagpat - Modipuram 220kV D/c line	-	UPPTCL to update the status.
28	400/220kV Bahardurgarh S/s	Commissioned: 4 Total: 4	Utilized:2 Unutilized: 2	• Network to be planned for 2 bays.		HVPNL to update the status.
29	400/220kV Jaipur (South) S/s	Commissioned: 4 Total: 4	Utilized:2 Unutilized: 2	• Network to be planned for 2 bays.	-	LILO case of 220 kV Dausa – Sawai Madhopur line at 400 kV GSS Jaipur South (PG) is under WTD approval as updated by RVPNL in 195th OCC
30	400/220kV Sohawal S/s	Commissioned: 8 Total: 8	Utilized: 2 Unutilized: 6	• Sohawal - Barabanki 220kV D/c line	-	UPPTCL to update the status.
				• Sohawal - New Tanda 220kV D/c line	-	UPPTCL to update the status.
				• Network to be planned for 2 bays	-	UPPTCL to update the status.
31	400/220kV, Kankroli	Commissioned: 6 Total: 6	Utilized: 4 Unutilized: 2	• Network to be planned for 2 bays	-	RVPNL to update the status
32	400/220kV, Manesar	Commissioned: 8 Total: 8	Utilized: 4 Unutilized: 4	• Network to be planned for 4 bays	-	HVPNL to update the status
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	-	UPPTCL to update the status
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	-	PSTCL to update the status
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	-	HPPTCL to update the status
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	-	UPPTCL to update the status
38	400/220kV, Patiala	Commissioned: 8 Total: 8	Utilized: 6 Unutilized: 2	• Network to be planned for 2 bays	-	PSTCL to update the status

2. Establishment of new 400/220kV substations in Northern Region:

Sl. No.	Name of Substation	MVA Capacity	Expected Schedule		Downstream connectivity by States
1	400/220kV Dwarka-I GIS (8 nos. of 220kV bays)	4x 500	Mar'22		DTL to update the status
2	220/66kV Chandigarh GIS (8 nos. of 66kV bays)	2x 160	Apr'22		Chandigarh to update the status.
3	400/220kV Jauljivi GIS Out of these 8 nos. 220kV Line Bays, 4 nos. (Pithoragath-2, & Dhauliganga-2) would be used by the lines being constructed by POWERGRID and balance 4 nos. bays would be used by the lines being constructed by PTCUL.	2x315	Feb'22		• 220kV Almora-Jauljibi line • 220kV Brammah-Jauljibi line PTCUL to update the status of lines.

FGD Status

Updated status of FGD related data submission

NTPC (25.02.2022)
MEJA Stage-I
RIHAND STPS
SINGRAULI STPS
TANDA Stage-I
TANDA Stage-II
UNCHAHAR TPS
UPRVUNL (21.05.2022)
ANPARA TPS
HARDUAGANJ TPS
OBRA TPS
PARICHHA TPS

PSPCL (23.05.2022)
GGSSTP, Ropar
GH TPS (LEH.MOH.)
RRVUNL (10.06.2022)
CHHABRA SCPP
CHHABRA TPP
KALISINDH TPS
KOTA TPS
SURATGARH SCTPS
SURATGARH TPS

Updated status of FGD related data submission

Lalitpur Power Gen. Co. Ltd. (15.02.2022)
Lalitpur TPS
Lanco Anpara Power Ltd. (15.02.2022)
ANPARA-C TPS

HGPCL (21.03.2022)
PANIPAT TPS
RAJIV GANDHI TPS
YAMUNA NAGAR TPS

Adani Power Ltd. (18.02.2022)
KAWAI TPS

Rosa Power Supply Company (15.02.2022)
Rosa TPP Phase-I
Prayagraj Power Generation Company Ltd. (15.02.2022)
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: 30-09-2022), INDIRA GANDHI STPP U#2 (Target: 30-09-2022), INDIRA GANDHI STPP U#3 (Target: 30-09-2022)
GVK Power Ltd.	GOINDWAL SAHIB U#1 (Target: 30-04-2020), GOINDWAL SAHIB U#2 (Target: 29-02-2020)
HGPCL	PANIPAT TPS U#6 (Target: 30-04-2021), PANIPAT TPS U#7 (Target: 28-02-2021), PANIPAT TPS U#8 (Target: 31-12-2020), RAJIV GANDHI TPS U#1 (Target: 30-04-2022), RAJIV GANDHI TPS U#2 (Target: 28-02-2022), YAMUNA NAGAR TPS U#1 (Target: 31-12-2021), YAMUNA NAGAR TPS U#2 (Target: 31-10-2021)

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

L&T Power Development Ltd (Nabha)	Nabha TPP (Rajpura TPP) U#1 (Target: 30-04-2021), Nabha TPP (Rajpura TPP) U#2 (Target: 28-02-2021)
Lalitpur Power Gen. Company Ltd.	LALITPUR TPS U#1 (Target: 31-12-2024), LALITPUR TPS U#2 (Target: 30-09-2024), LALITPUR TPS U#3 (Target: 30-06-2024)
Lanco Anpara Power Ltd.	ANPARA C TPS U#1 (Target: 31-12-2023), ANPARA C TPS U#2 (Target: 31-12-2023)
Prayagraj Power Generation Company Ltd.	PRAYAGRAJ TPP U#1 (Target: 31-10-2024), PRAYAGRAJ TPP U#2 (Target: 31-10-2024), PRAYAGRAJ TPP U#3 (Target: 31-12-2024)
PSPCL	GH TPS (LEH.MOH.) U#1 (Target: 31-12-2024), GH TPS (LEH.MOH.) U#2 (Target: 31-12-2024), GH TPS (LEH.MOH.) U#3 (Target: 31-12-2024), GH TPS (LEH.MOH.) U#4 (Target: 31-12-2024), GGSSTP, Ropar U#3 (Target: 31-03-2022), GGSSTP, Ropar U#4 (Target: 31-05-2022), GGSSTP, Ropar U#5 (Target: 31-07-2022), GGSSTP, Ropar U#6 (Target: 30-09-2022)

Rosa Power Supply Company	ROSA TPP Ph-I U#1 (Target: 31-12-2024), ROSA TPP Ph-I U#2 (Target: 31-12-2024), ROSA TPP Ph-I U#3 (Target: 31-12-2024), ROSA TPP Ph-I U#4 (Target: 31-12-2024)
RRVUNL	KOTA TPS U#5 (Target: 31-08-2024), KOTA TPS U#6 (Target: 31-08-2024), KOTA TPS U#7 (Target: 31-08-2024), SURATGARH TPS U#1 (Target: 31-12-2024), SURATGARH TPS U#2 (Target: 31-12-2024), SURATGARH TPS U#3 (Target: 31-12-2024), SURATGARH TPS U#4 (Target: 31-12-2024), SURATGARH TPS U#5 (Target: 31-12-2024), SURATGARH TPS U#6 (Target: 31-12-2024), SURATGARH SCTPS U#7 (Target: 31-12-2024), SURATGARH SCTPS U#8 (Target: 31-12-2024), CHHABRA TPP U#1 (Target: 31-12-2024), CHHABRA TPP U#2 (Target: 31-12-2024), CHHABRA TPP U#3 (Target: 31-12-2024), CHHABRA TPP U#4 (Target: 31-12-2024), CHHABRA SCPP U#5 (Target: 31-12-2024), CHHABRA SCPP U#6 (Target: 31-12-2024), KALISINDH TPS U#1 (Target: 31-12-2024), KALISINDH TPS U#2 (Target: 31-12-2024)
Talwandi Sabo Power Ltd.	TALWANDI SABO TPP U#1 (Target: 28-02-2021), TALWANDI SABO TPP U#2 (Target: 31-12-2020), TALWANDI SABO TPP U#3 (Target: 31-10-2020)
UPRVUNL	ANPARA TPS U#1 (Target: 31-12-2023), 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)

Annexure-A.II

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	Delhi IS	Delhi	Implemented	Yes (Sept - 2021)	No	Yes	-
2	NAPS IS	UP	Implemented	Yes (08-10-2021)	Yes	Yes	-
3	RAPS IS	Rajasthan	Implemented	16-Aug-21	Yes	Yes	RRVPNL has proposed a revised scheme for RAPS-A&B.

Under Implementation/ Newly Proposed/Under Discussion

Sl. No.	Islanding Scheme	SLDC	Status	Details of progress	DPR for PSDF funding (Required / Not Required)	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	UP has got offer from CPRI for study. The estimated time of study is 5 months from date of acceptance.		-		-	-	-	-	-	-	-	-
2	Agra IS	UP	Newly Proposed	UP has got offer from CPRI for study. The estimated time of study is 5 months from date of acceptance.		-		-	-	-	-	-	-	-	-
3	Jodhpur-Barmer-Rajwest IS	Rajasthan	Newly Proposed	Scheme was approved in 195th OCC meeting held on 24.05.2022. Implementation is pending at state end.	RVPN will propose to avail PSDF funding	-	Scheme was approved in 195th OCC meeting held on 24.05.2022.	-	-	-	-	-	-	-	-
4	Patiala-Nabha Power Rajpura IS	Punjab	Newly Proposed	Punjab has sent the offer to CPRI for study of Islanding Schemes. CPRI has asked for PSSE file for dynamic study which is being coordinated with NRLDC. Timeline: 6 months for implementation after CPRI study.		-		-	-	-	-	-	-	-	-
5	Pathankot-RSD IS	Punjab	Newly Proposed	Punjab has sent the offer to CPRI for study of Islanding Schemes. CPRI has asked for PSSE file for dynamic study which is being coordinated with NRLDC. Timeline: 6 months for implementation after CPRI study.		-		-	-	-	-	-	-	-	-
6	Talwandi Sabo IS	Punjab	Newly Proposed	Punjab has sent the offer to CPRI for study of Islanding Schemes. CPRI has asked for PSSE file for dynamic study which is being coordinated with NRLDC. Timeline: 6 months for implementation after CPRI study.		-		-	-	-	-	-	-	-	-
7	Dehradun IS	Uttarakhand	Newly Proposed	Matter is pending at Uttarakhand SLDC for finalization/rejection of scheme.		-	-	-	-	-	-	-	-	-	-
8	Jammu-Salal IS	J &K	Under Discussion	-		-	-	-	-	-	-	-	-	-	-
9	Suratgarh IS	Rajasthan	Under Discussion	Scheme was approved in 195th OCC meeting held on 24.05.2022. Implementation is pending at state end.	RVPN will propose to avail PSDF funding	-	Scheme was approved in 195th OCC meeting held on 24.05.2022.	-	-	-	-	-	-	-	-
10	Chamba-Chamera IS	HP	Under Discussion	Transient study is being done at HP end.		-	-	-	-	-	-	-	-	-	-
11	Kangra-Chamba-Bairasuil IS	HP	Under Discussion	Transient study is being done at HP end.		-	-	-	-	-	-	-	-	-	-
12	Kullu-Dehar IS	HP	Under Discussion	HP has proposed Kullu-Manali-Mandi islanding scheme with Larji and Malana HEP and Shimla-Solan Islanding with Bhabha and other IPPs at Kotla. Fresh transient study with dynamic data is pending at HP end.		-	-	-	-	-	-	-	-	-	-
13	Butari-Jamsher-Verpal IS	Punjab	Under Discussion	-		-	-	-	-	-	-	-	-	-	-
14	Kargil-Ladakh IS	Ladakh	Under Discussion	-		-	-	-	-	-	-	-	-	-	-

Annexure-A.III

RAJASTHAN RAJYA VIDYUT PRASARAN NIGAM LIMITED.

[Corporate Identity Number (CIN):U40109RJ2000SGC016485]

(Regd. Office: Vidyut Bhawan, Jan Path, Jyoti Nagar, Jaipur - 302 005)

OFFICE OF THE SUPERINTENDING ENGINEER (PROJECT & PLANNING)

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RVPN An ISO 9001:2000 Certified Company

No. RVPN/SE(P&P)/XEN-2(P&P)/AE-2/ F. /D 4191 Jaipur, Dt. 6/6/21

Member Secretary
Northern Regional Power Committee,
18-A, Shaheed Jeet Singh Marg, Katwaria Sarai,
New Delhi-110016

Sub: Revised Islanding Schemes for the Rajasthan Atomic Power Station (RAPS-A & B) units.

Ref: Email of NRPC dated 29.07.2021 addressed to the SE(SO&LD), RVPN, Jaipur and communicated to this office vide letter no. 623 dated 10.08.2021.

Dear Sir,

In reference to the above captioned subject and email dated 29.07.2021, kindly find enclosed herewith the revised Islanding Schemes for the Rajasthan Atomic Power Station (RAPS-A & B) units for consideration and approval.

Encl: as above

Your's faithfully,

(K. K. Meena)
Additional Chief Engineer (PP&D)

Copy to the following for information and necessary action please:-

1. The General Manager, NRLDC, 18-A, Shaheed Jeet Singh Marg, Katwaria Sarai, New Delhi-110016.
2. The Chief Engineer (LD/MPT&S), RVPN, Heerapura/Jaipur.
3. The Plant Head, Rajasthan Atomic Power Station (RAPS-A & B), Rawatbhata, Chittorgarh, Rajasthan.
4. The Superintending Engineer (Communication-Corporate Office/Automation) , RVPN, Heerapura/Jaipur.
5. The Superintenting Engineer (Opration), Northern Regional Power Committee, 18-A, Shaheed Jeet Singh Marg, Katwaria Sarai, New Delhi-110016.

Encl: as above

Additional Chief Engineer (PP&D)

REVISED ISLANDING SCHEME FOR RAPS-A&B

A. **Objective:** The Existing Islanding Scheme for RAPS-A&B was planned in 2013 but due to change in configuration of transmission lines and loads of the GSS, it is proposed to review and also revise the Islanding scheme for RAPS-A&B power plants.

B. **Generation Details**

a. **RAPS-A**

- The total generation of Unit-II is around 200 MW.
- Auxiliary load plus load of Heavy Water Plant is 30 MW.
- Net generation of unit-II is 170 MW.

b. **RAPS-B**

- The generation of Unit-III and Unit-IV is each around 220 MW. The total generation is around 440 MW if both units are running.
- Auxiliary load is 20 MW per unit, i.e. total 40 MW for both units of RAPS-B. Auxiliary consumption of 40 MW of the RAPS-C units is also fed from the RAPS-B units. Hence, total auxiliary consumption of RAPS-B & C is 80 MW.
- Net generation is 400 MW if both units of RAPS-B unit are running. Auxiliary load of RAPS-C (40 MW) is considered as load for RAPS-B units.

c. **Auxiliary Load of RAPS-B, C & D**

- Total auxiliary load includes the auxiliary load of both the units of RAPS-B + auxiliary load of the units of RAPS-C & RAPP-D (in future).
- Total auxiliary load will consists of 40 MW (RAPS-B both units) + 40 MW (RAPS-C) + 140 MW (RAPP-D in near future by 2025). This auxiliary consumption does not include auxiliary consumption of RAPS-A (40 MW).
- RAPP-D auxiliary consumption is higher because its each generating unit capacity is 700 MW.
- Total auxiliary consumption of RAPS-B & C for current scenario is 80 MW.
- Total auxiliary consumption of RAPS-A, B & C and heavy water plant for current scenario is 110 MW
- Total auxiliary consumption of RAPS-B, C & D for the scenario of 2025 will be 220 MW. Further, total auxiliary consumption of RAPS-A, B, C & D for the scenario of 2025 will be 250 MW.

C. **Transmission System at RAPP-A&B**

- 220 kV S/C RAPS-A - RAPS-B Line (3.00 km)
- 220 kV S/C RAPS-A - 220 kV GSS Debari line (192.70 km)

- 220 kV S/C RAPS-A - 220 kV GSS Kota (Sakatpura) Ckt-I (42.50 km)
- 220 kV S/C RAPS-A - 220 kV GSS Kota (Sakatpura) Ckt-II (42.50 km)
- 220 kV S/C RAPS-B - 220 kV GSS Debari line (198.00 km)
- 220 kV S/C RAPS-B - 220 kV GSS Chittorgargh line Ckt-I (95.00 km)
- 220 kV S/C RAPS-B - 220 kV GSS Chittorgargh line Ckt-II (95.00 km)
- 220 kV S/C RAPS-B - 220 kV GSS Kota (Sakatpura) Line (41.00 km)
- 220 kV S/C RAPS-B – RAPP-C Tie Line-I (2.00 km)
- 220 kV S/C RAPS-B – RAPP-C Tie Line-II (1.80 km)
- 220 kV S/C RAPS-C – Anta (80 km)
- 220 kV Switchyard for RAPS-C generators and RAPS-D generators is common.

D. Load Details

The identified load for island of RAPS-A&B is 508.94 MW which is placed at **Annexure-A.** Additional **40 MW load** on 220 kV bus of RAPS-C&D is also considered to represent the auxiliary load of RAPS-C. Additional load of **229.35 MW** is also identified which can be considered for lean load period. There are heavy seasonal variations of load in the region. Similarly, day and night load variations are also high in the region. Hence, islanding scheme is planned considering some of the transmission lines with both operative/blocked modes so that SLDC, Rajasthan can monitor and decide upon mode of the lines so as to match the load with generation in the island. Further, additional lines with blocked/operative status are also identified which helps to manage the load-generation during the lean load period.

E. Proposed Islanding Scheme

1. Islanding shall take place at 48.0 Hz without time delay.
2. Islanding is designed for the current scenario for load of 508.94 MW (including system losses) and additional 40MW auxiliary load of RAPS-C when all three units of RAPS-A&B are running. Further, if generation is low then load generation balance may be maintained by changing the blocked/operative status of the identified transmission lines depending on the available generation.
3. All the transmission lines with operative status may be operated at 48.0 Hz instantaneous to form Island.
4. Tie lines between RAPS-A & RAPS-B and RAPS-B & RAPS-C will kept blocked during island formation.
5. If load in the network of island is very low then one or more units may be taken on house load at (47.5 Hz + 10 Sec.) and 47.1 Hz inst.
6. If load in the network of island is very high and frequency is going further down then at RAPS-B unit-3 & unit-4 will come to house load at 47.5Hz + 5sec or 47.2 Hz instantaneous.

Similarly, at RAPS-A, unit-2 will come to house load at 47.5 Hz+10 sec or 47.1 Hz instantaneous.

7. Blocked and operative status of all transmission lines of 220 kV and 132 kV voltage levels considered for the islanding are placed at **Annexure-B.** During the condition of light loads, the load-generation balance is to be maintained by changing the blocked/operative status of the additional lines which have also been identified to include additional GSS in the island.
8. A single line diagram of 400 kV network, 220 kV & 132 kV network is at **Annexure-C.**

F. Results of Load Flow Study

A load flow study is carried out considering the blocked and operative status of line included in **Annexure-B** as per SLD diagram indicated in **Annexure-C** for a total load of **508.94 MW** and considering **40 MW load** on 220 kV bus RAPS-C to represent the auxiliary load of RAPS-C. Including auxiliary load of RAPS-C, total load is **548.94 MW.** Power flow plot of the network included in the island is placed at **Exhibit-1.** The results of load flow study indicate the following load-generation balance:-

Generation	=	574.0786 MW
Load	=	546.84085 MW
Losses	=	27.2378 MW

It is observed that loading on all the lines and transformers included in the island of RAPS-A&B is normal and overloading is not observed.

G. Conclusion

Proposed islanding scheme is designed after detailed discussion with the field officers and officers from the MPT&S, Communications, Automations, LD and representative of RAPS-A&B plant. Based on the feedback/inputs of Officers and results of load flow studies, it is concluded that:

- Results of load flow study indicate that load generation balance can be maintained in the network considered for the island of RAPS-A & B.
- All the transmission lines included in the island will be equipped with under frequency relays (UFRs) and additional transmission lines are considered for the island to manage the load generation balance for different load scenario considering the large seasonal variations of load in the region.
- Proposed islanding scheme can be practically implemented on the transmission network of RVPN for the current scenario for load of **508.94 MW** (including system losses) when all three units of RAPS-A&B are running. However, continuous monitoring of load-generation balance is required and action to change status of

UFRs from blocked to operative and vice-versa will be needed for load-generation balance during the event of change in generation and load.

- Islanding scheme is designed considering total auxiliary load of 110 MW which consists of 20 MW (Unit-II of RAPS-A) + 10 MW (Heavy water plant) + 40 MW (RAPS-B both units) + 40 MW (RAPS-C).
- Islanding scheme needs to be reviewed after commissioning of RAPP-D with auxiliary load of 140 MW (RAPP-D is expected to be commissioned in near future by 2025).

Annexure-A

Load on GSS considered in Islanding Scheme for RAPP-A&B			
S. No.	Name of GSS	Maximum Load (MW)	Average Load (MW)
A	Gourp-A for 370 MW		
A.1	Load at 220 kV GSS Debari		
1	220 KV GSS Debari	26	16
2	132 KV GSS Mavli	26.28	12
3	132 KV GSS Sanwad	21.85	13
4	132 KV GSS Dariba	24.43	15
5	132 KV Hindustan Zinc Limited (Industry)	41	24.7
6	132 KV GSS Bhatewar	39.31	24.1
7	132 KV GSS Bhinder	23.09	14.37
8	132 KV GSS Jhojhpura	19.52	12.1
9	132 KV GSS UCW (Industry)	11	6.57
	Total (A.1)	**232.48**	**137.84**
A.2	Load at 220 kV GSS Chittorgarh		
10	220 KV GSS Chittorgarh	52	32
11	132 kV GSS Ajoliya Khera	38.35	24.41
12	132 kV GSS Rashmi	34.78	21.31
13	132 KV GSS Bassi	33.63	21.87
14	132 KV GSS Senthi	37.96	14
	Total (A.2)	**196.72**	**113.59**
A.3	Load at 220 kV GSS Sawa		
15	220 kV GSS Sawa	27	17
16	132 kV ACW at Sawa	16	10
17	132 kV NUVOCO at Sawa	21.5	13
18	132 kV GSS Kapasan	43.44	27.29
19	132 kV GSS Bhopal Sagar	14.88	9.09
20	132 kV GSS Bhadesar	37.19	23.32
	Total (A.3)	**160.01**	**99.7**
	Total (A)	**589.210**	**351.13**
B	Group-B		
B.1	Load at 220 kV GSS Nimbahera		
21	220 kV GSS Nimbahera	52.704	31.52
22	132 kV GSS Rasoolpura	15.55	10.22
23	132 kV WCL at Rasoolpura	45.52	28
24	132 kV JKCW at Rasoolpura	29.52	18.2
25	132 kV GSS Kanera	13.75	7.42
26	132 kV JKCW at Nimbahera	25.588	16.078
27	132 kV GSS Bijapur	15.55	10.52
28	132 kV GSS Mangalwad	39.73	24.25
29	132 kV GSS Dhoriya Choraha	19.29	11.6
	Total (B.1)	**313.982**	**157.808**
	Total (B)	**313.982**	**157.808**
	Total load (A+B)	**936.612**	**508.94**
C	Auxiliary load of RAPS-C	40.00	40.00
	Total load (A+B+C)	**976.61**	**548.94**
D	**Additional Load**		
30	132 kV GSS Barisadari	56.78	45.82
31	220 kV GSS Hamirgarh	85.02	71.74
32	132 kV line of RSWM Industries at 132 kV GSS Hamirgarh	6.65	6.41
33	132 kV GSS RIICO Growth Centre	22.78	14.37
34	132 kV line of Nitin Industries at 132 kV GSS Hamirgarh	22.49	16.58
35	132 kV GSS Chhotisadari	40.8	33.43
36	Gogunda TSS (connected to 132 kV GSS Senthi)	16	16
37	Mavli TSS (connected to 132 kV GSS Mavli	25	25
	Total C	275.52	229.35
	Total load (A+B+C)	**1252.13**	**778.29**

Annexure-B

	Transmission Lines and Status of Under Frequency Relays for RAPP-A&B Island	
S. No.	Name of Line	Status
A.	**Transmision Lines at RAPP-A**	
1	220 kV S/C RAPS-A-Kota (Sakatpura)Line Ckt-I	Operative
2	220 kV S/C RAPS-A-Kota (Sakatpura)Line Ckt-II	Operative
3	132 kV S/C RAPS-A to RAPS-B Line	Blocked
4	220 kV S/C Debari-RAPS-A Line	Blocked
B.	**Transmision Lines at RAPP-B**	
5	220 kV S/C RAPS-B-Kota (Sakatpura)Line Ckt-III	Operative
6	220 kV S/C RAPS-B-RAPS-C Tie line Ckt-I	Blocked
7	220 kV S/C RAPS-B-RAPS-C Tie line Ckt-II	Blocked
8	220 kV S/C RAPS-C-Anta line	Operative
9	220 kV S/C Chittorgarh (220 kV GSS)-RAPS-B line Ckt-I	Blocked
10	220 kV S/C Chittorgarh (220 kV GSS)-RAPS-B line Ckt-II	Blocked
11	220 kV S/C Debari-RAPS-B Line	Blocked
C.	**Transmision Lines at 220 kV GSS Debari**	
12	220 kV S/C Debari-Chittorgarh (400 kV GSS) Line	Operative
13	132 kV S/C Debari-Mavli Ckt-I Line	Blocked
14	132 kV S/C Debari-Nathdwara line with T-off at Mavli	Operative
15	132 kV S/C Debari-Bhatewar Line	Blocked
16	132 kV S/C Debari-Madri Line	Operative
17	132 kV S/C Debari-Amberi Line	Operative
18	132 kV S/C Debari-UCW Line	Blocked
19	132 kV S/C Debari-HZL Line	Blocked
20	132 kV S/C Mavli-Sanwad Line	Blocked
21	132 kV S/C Mavli-Dariba Line	Blocked
22	132 kV S/C Mavli-TSS Line	Operative
23	132 kV S/C Bhatewar-Bhinder Line	Blocked
24	132 kV S/C Bhinder-Jhoojhpura Line	Blocked
D.	**Transmision Lines at 220 kV GSS Chittorgrah**	
25	220 kV S/C Chittorgarh (220 kV GSS)-Hamirgarh line	Operative
26	220 kV S/C Chittorgarh (220 kV GSS)-Sawa line	Blocked
27	220 kV S/C Chittorgarh (440 kV GSS)-Chittorgarh (220 kV GSS) line	Operative
28	132 kV S/C Chittorgarh-Ajoliya Khera Line	Blocked
29	132 kV S/C Ajoliya Khera-Bassi Line	Blocked
30	132 kV S/C Ajoliya Khera-Rashmi Line	Blocked
31	132 kV S/C Rashmi-Hamirgarh (Soniyana) Line	Operative
32	132 kV S/C Chittorgarh-Senthi Line	Blocked
33	132 kV S/C Senthi-Gosunda TSS Line	Operative
34	132 kV S/C Senthi-Rasoolpura Line	Blocked
35	132 kV S/C Chittorgarh-Sawa Line	Blocked
E.	**Transmision Lines at 220 kV GSS Sawa**	
36	220 kV D/C Sawa-Chittorgarh (400 kV GSS) Line	Operative
37	220 kV S/C Sawa-Nimbahera Line	Blocked
38	132 kV S/C Sawa-BhadesarLine	Blocked

39	132 kV S/C Sawa-Kapasan Line	Blocked
40	132 kV S/C Kapasan-Bhopal Sagar Line	Blocked
41	132 kV S/C Sawa-ACW Line	Blocked
42	132 kV S/C Sawa-NUVOCO Line	Blocked
F.	**Transmision Lines at 220 kV GSS Nimbahera**	
43	220 kV S/C Nimbahera-Pratapgarh Line	Operative
44	220 kV S/C Nimbahera-Chittorgarh (400 kV GSS) Line	Operative
45	132 kV S/C Nimbahera-Bhadesar Line	Blocked
46	132 kV S/C Nimbahera-Rasoolpura Line	Blocked
47	132 kV S/C Rasoolpura-WCL Line	Blocked
48	132 kV S/C Rasoolpura-JKCW Line	Blocked
49	132 kV S/C Nimbahera-Kaneri Line	Blocked
50	132 kV S/C Nimbahera-JKCW Line	Blocked
51	132 kV S/C Nimbahera-Bijapur Line	Blocked
52	132 kV S/C Nimbahera-Chhotisadari Line	Operative
53	132 kV S/C Nimbahera-Dhoriya Chouraha Line	Blocked
54	132 kV S/C Dhoriya Chouraha-Mangalwad Line	Blocked/Operative
55	132 kV S/C Mangalwad-Bhinder Line	Blocked
Additional Lines to Install Under Frequency Relays		
56	220 kV S/C Hamirgarh-Bhilwara line	Blocked/Operative
57	132 kV S/C Hamirgarh-RIICO Bhilwara line	Blocked/Operative
58	132 kV S/C Hamirgarh (220 kV GSS)-RIICO Growth Centre line	Blocked/Operative
59	132 kV S/C Chhotisadari- Badisadari line	Blocked/Operative
60	132 kV S/C Chhotisadari-Pratapgarh line	Blocked/Operative
61	132 Kv S/C RIICO Growth (Hamirgarh)-Nitin Industries Line	Blocked/Operative
62	132 Kv S/C Hamirgarh(220 kV GSS)-RSWM Line	Blocked/Operative
Note:	At 220 kV GSS Debari, 220 kV Bus is split with 220 kV 2xS/C lines from RAPS-A&B alongwith 470 MVA, 220/132 kV transformer on one bus and rest of 220 kV lines on another bus. Therefore, 220 kV GSS Aspur, Madri and Amberi and 400 kV GSS Chittorgarh is not included in the island. If buses M1 and M2 at 220 kV GSS Debari are integrated then UFR relays are also required on following lines	
63	220 kV S/C Debari-Aspur Line	Operative
64	220 kV S/C Debari-Madri Line	Operative
65	220 kV S/C Debari-Amberi Line	Operative
Note:	Units of atomic power plant are critical generation units, hence it is required that all lines in the island with blocked status may also be equipped with UFR relay. This will help to shorten the boundary of the island during light load conditions.	

Annexure-A

Load on GSS considered in Islanding Scheme for RAPP-A&B

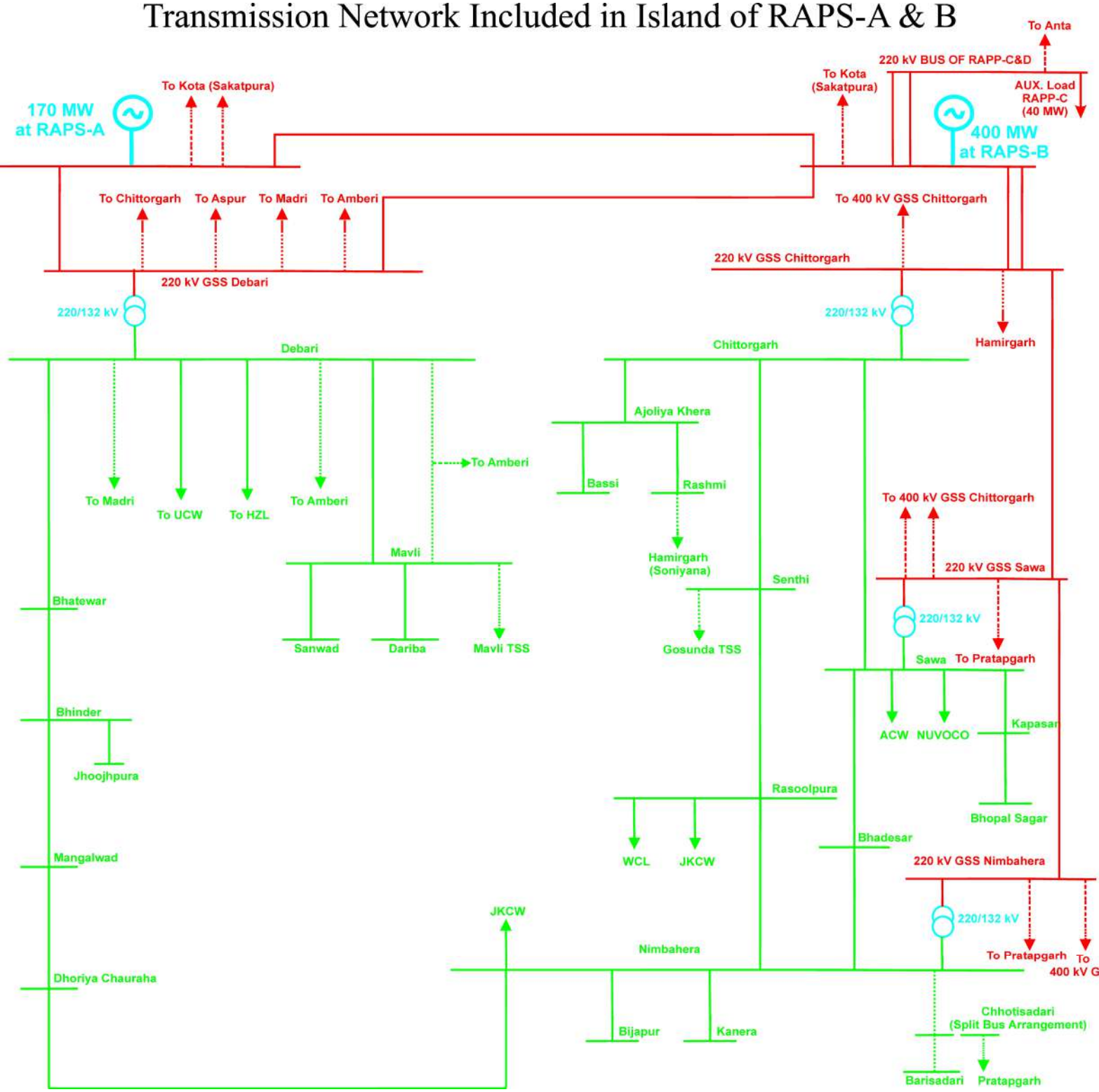
S. No.	Name of GSS	Maximum Load (MW)	Average Load (MW)
A	**Gourp-A for 370 MW**		
A.1	**Load at 220 kV GSS Debari**		
1	220 KV GSS Debari	26	16
2	132 KV GSS Mavli	26.28	12
3	132 KV GSS Sanwad	21.85	13
4	132 KV GSS Dariba	24.43	15
5	132 KV Hindustan Zinc Limited (Industry)	41	24.7
6	132 KV GSS Bhatewar	39.31	24.1
7	132 KV GSS Bhinder	23.09	14.37
8	132 KV GSS Jhojhpura	19.52	12.1
9	132 KV GSS UCW (Industry)	11	6.57
	Total (A.1)	**232.48**	**137.84**
A.2	**Load at 220 kV GSS Chittorgarh**		
10	220 KV GSS Chittorgarh	52	32
11	132 kV GSS Ajoliya Khera	38.35	24.41
12	132 kV GSS Rashmi	34.78	21.31
13	132 KV GSS Bassi	33.63	21.87
14	132 KV GSS Senthi	37.96	14
	Total (A.2)	**196.72**	**113.59**
A.3	**Load at 220 kV GSS Sawa**		
15	220 kV GSS Sawa	27	17
16	132 kV ACW at Sawa	16	10
17	132 kV NUVOCO at Sawa	21.5	13
18	132 kV GSS Kapasan	43.44	27.29
19	132 kV GSS Bhopal Sagar	14.88	9.09
20	132 kV GSS Bhadesar	37.19	23.32
	Total (A.3)	**160.01**	**99.7**
	Total (A)	**589.210**	**351.13**
B	Group-B		
B.1	**Load at 220 kV GSS Nimbahera**		
21	220 kV GSS Nimbahera	52.704	31.52
22	132 kV GSS Rasoolpura	15.55	10.22
23	132 kV WCL at Rasoolpura	45.52	28
24	132 kV JKCW at Rasoolpura	29.52	18.2
25	132 kV GSS Kanera	13.75	7.42
26	132 kV JKCW at Nimbahera	25.588	16.078
27	132 kV GSS Bijapur	15.55	10.52
28	132 kV GSS Mangalwad	39.73	24.25
29	132 kV GSS Dhoriya Choraha	19.29	11.6
	Total (B.1)	**313.982**	**157.808**
	Total (B)	**313.982**	**157.808**
	Total load (A+B)	**936.612**	**508.94**
C	Auxiliary load of RAPS-C	40.00	40.00
	Total load (A+B+C)	**976.61**	**548.94**
D	**Additional Load**		
30	132 kV GSS Barisadari	56.78	45.82
31	220 kV GSS Hamirgarh	85.02	71.74
32	132 kV line of RSWM Industries at 132 kV GSS Hamirgarh	6.65	6.41
33	132 kV GSS RIICO Growth Centre	22.78	14.37
34	132 kV line of Nitin Industries at 132 kV GSS Hamirgarh	22.49	16.58
35	132 kV GSS Chhotisadari	40.8	33.43
36	Gogunda TSS (connected to 132 kV GSS Senthi)	16	16
37	Mavli TSS (connected to 132 kV GSS Mavli	25	25
	Total C	**275.52**	**229.35**
	Total load (A+B+C)	**1252.13**	**778.29**

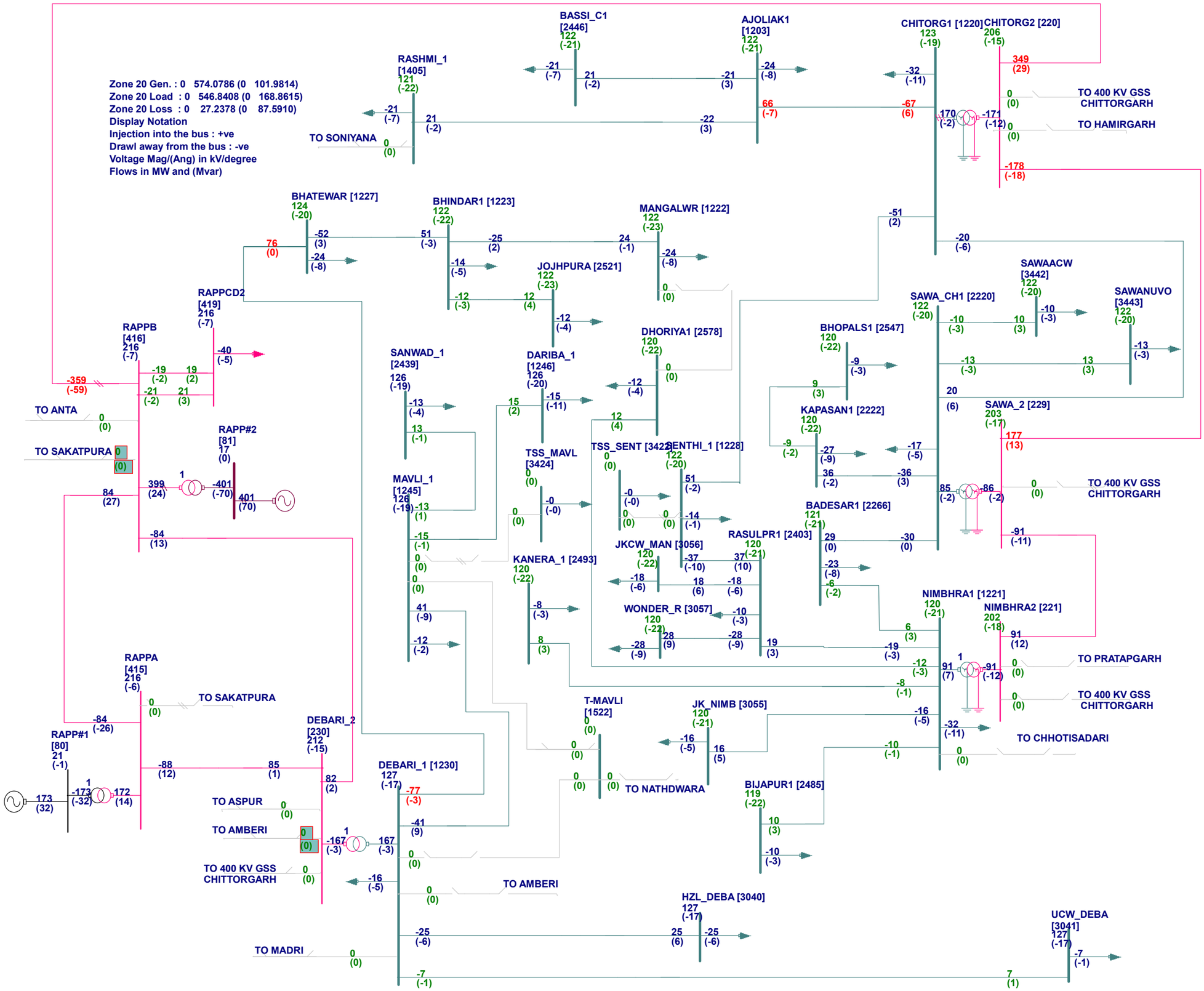
Annexure-B

	Transmission Lines and Status of Under Frequency Relays for RAPP-A&B Island	
S. No.	Name of Line	Status
A.	**Transmision Lines at RAPP-A**	
1	220 kV S/C RAPS-A-Kota (Sakatpura)Line Ckt-I	Operative
2	220 kV S/C RAPS-A-Kota (Sakatpura)Line Ckt-II	Operative
3	132 kV S/C RAPS-A to RAPS-B Line	Blocked
4	220 kV S/C Debari-RAPS-A Line	Blocked
B.	**Transmision Lines at RAPP-B**	
5	220 kV S/C RAPS-B-Kota (Sakatpura)Line Ckt-III	Operative
6	220 kV S/C RAPS-B-RAPS-C Tie line Ckt-I	Blocked
7	220 kV S/C RAPS-B-RAPS-C Tie line Ckt-II	Blocked
8	220 kV S/C RAPS-C-Anta line	Operative
9	220 kV S/C Chittorgarh (220 kV GSS)-RAPS-B line Ckt-I	Blocked
10	220 kV S/C Chittorgarh (220 kV GSS)-RAPS-B line Ckt-II	Blocked
11	220 kV S/C Debari-RAPS-B Line	Blocked
C.	**Transmision Lines at 220 kV GSS Debari**	
12	220 kV S/C Debari-Chittorgarh (400 kV GSS) Line	Operative
13	132 kV S/C Debari-Mavli Ckt-I Line	Blocked
14	132 kV S/C Debari-Nathdwara line with T-off at Mavli	Operative
15	132 kV S/C Debari-Bhatewar Line	Blocked
16	132 kV S/C Debari-Madri Line	Operative
17	132 kV S/C Debari-Amberi Line	Operative
18	132 kV S/C Debari-UCW Line	Blocked
19	132 kV S/C Debari-HZL Line	Blocked
20	132 kV S/C Mavli-Sanwad Line	Blocked
21	132 kV S/C Mavli-Dariba Line	Blocked
22	132 kV S/C Mavli-TSS Line	Operative
23	132 kV S/C Bhatewar-Bhinder Line	Blocked
24	132 kV S/C Bhinder-Jhoojhpura Line	Blocked
D.	**Transmision Lines at 220 kV GSS Chittorgrah**	
25	220 kV S/C Chittorgarh (220 kV GSS)-Hamirgarh line	Operative
26	220 kV S/C Chittorgarh (220 kV GSS)-Sawa line	Blocked
27	220 kV S/C Chittorgarh (440 kV GSS)-Chittorgarh (220 kV GSS) line	Operative
28	132 kV S/C Chittorgarh-Ajoliya Khera Line	Blocked
29	132 kV S/C Ajoliya Khera-Bassi Line	Blocked
30	132 kV S/C Ajoliya Khera-Rashmi Line	Blocked
31	132 kV S/C Rashmi-Hamirgarh (Soniyana) Line	Operative
32	132 kV S/C Chittorgarh-Senthi Line	Blocked
33	132 kV S/C Senthi-Gosunda TSS Line	Operative
34	132 kV S/C Senthi-Rasoolpura Line	Blocked
35	132 kV S/C Chittorgarh-Sawa Line	Blocked
E.	**Transmision Lines at 220 kV GSS Sawa**	
36	220 kV D/C Sawa-Chittorgarh (400 kV GSS) Line	Operative
37	220 kV S/C Sawa-Nimbahera Line	Blocked
38	132 kV S/C Sawa-BhadesarLine	Blocked

39	132 kV S/C Sawa-Kapasan Line	Blocked
40	132 kV S/C Kapasan-Bhopal Sagar Line	Blocked
41	132 kV S/C Sawa-ACW Line	Blocked
42	132 kV S/C Sawa-NUVOCO Line	Blocked
F.	**Transmision Lines at 220 kV GSS Nimbahera**	
43	220 kV S/C Nimbahera-Pratapgarh Line	Operative
44	220 kV S/C Nimbahera-Chittorgarh (400 kV GSS) Line	Operative
45	132 kV S/C Nimbahera-Bhadesar Line	Blocked
46	132 kV S/C Nimbahera-Rasoolpura Line	Blocked
47	132 kV S/C Rasoolpura-WCL Line	Blocked
48	132 kV S/C Rasoolpura-JKCW Line	Blocked
49	132 kV S/C Nimbahera-Kaneri Line	Blocked
50	132 kV S/C Nimbahera-JKCW Line	Blocked
51	132 kV S/C Nimbahera-Bijapur Line	Blocked
52	132 kV S/C Nimbahera-Chhotisadari Line	Operative
53	132 kV S/C Nimbahera-Dhoriya Chouraha Line	Blocked
54	132 kV S/C Dhoriya Chouraha-Mangalwad Line	Blocked/Operative
55	132 kV S/C Mangalwad-Bhinder Line	Blocked
Additional Lines to Install Under Frequency Relays		
56	220 kV S/C Hamirgarh-Bhilwara line	Blocked/Operative
57	132 kV S/C Hamirgarh-RIICO Bhilwara line	Blocked/Operative
58	132 kV S/C Hamirgarh (220 kV GSS)-RIICO Growth Centre line	Blocked/Operative
59	132 kV S/C Chhotisadari- Badisadari line	Blocked/Operative
60	132 kV S/C Chhotisadari-Pratapgarh line	Blocked/Operative
61	132 Kv S/C RIICO Growth (Hamirgarh)-Nitin Industries Line	Blocked/Operative
62	132 Kv S/C Hamirgarh(220 kV GSS)-RSWM Line	Blocked/Operative
Note:	At 220 kV GSS Debari, 220 kV Bus is split with 220 kV 2xS/C lines from RAPS-A&B alongwith 470 MVA, 220/132 kV transformer on one bus and rest of 220 kV lines on another bus. Therefore, 220 kV GSS Aspur, Madri and Amberi and 400 kV GSS Chittorgarh is not included in the island. If buses M1 and M2 at 220 kV GSS Debari are integrated then UFR relays are also required on following lines	
63	220 kV S/C Debari-Aspur Line	Operative
64	220 kV S/C Debari-Madri Line	Operative
65	220 kV S/C Debari-Amberi Line	Operative
Note:	Units of atomic power plant are critical generation units, hence it is required that all lines in the island with blocked status may also be equipped with UFR relay. This will help to shorten the boundary of the island during light load conditions.	

Transmission Network Included in Island of RAPS-A & B




Zone 20 Gen. : 0 574.0786 (0 101.9814)
Zone 20 Load : 0 546.8408 (0 168.8615)
Zone 20 Loss : 0 27.2378 (0 87.5910)
Display Notation
Injection into the bus : +ve
Drawl away from the bus : -ve
Voltage Mag/(Ang) in kV/degree
Flows in MW and (Mvar)
BASSI_C1 [2446] 122 (-21)
AJOLIAK1 [1203] 122 (-21)
RASHMI_1 [1405] 121 (-22)
TO SONIYANA
CHITORG1 [1220] 123 (-19)
CHITORG2 [220] 206 (-15)
TO 400 KV GSS CHITTORGARH
TO HAMIRGARH
BHATEWAR [1227] 124 (-20)
BHINDAR1 [1223] 122 (-22)
MANGALWR [1222] 122 (-23)
JOJHPURA [2521] 122 (-23)
RAPPCD2 [419] 216 (-7)
RAPPB [416] 216 (-7)
SAWAACW [3442] 122 (-20)
SAWANUVO [3443] 122 (-20)
SAWA_CH1 [2220] 122 (-20)
BHOPALS1 [2547] 120 (-22)
DHORIYA1 [2578] 120 (-22)
SANWAD_1 [2439] 126 (-19)
DARIBA_1 [1246] 126 (-20)
KAPASAN1 [2222] 120 (-22)
SAWA_2 [229] 203 (-17)
TO ANTA
TO SAKATPURA
RAPP#2 [81] 17 (0)
TSS_MAVL [3424]
TSS_SENT [3422]
SENTHI_1 [1228] 122 (-20)
MAVLI_1 [1245] 126 (-19)
BADESAR1 [2266] 121 (-21)
RASULPR1 [2403] 120 (-21)
JKCW_MAN [3056] 120 (-22)
KANERA_1 [2493] 120 (-22)
WONDER_R [3057] 120 (-22)
NIMBHRA1 [1221] 120 (-21)
NIMBHRA2 [221] 202 (-18)
TO PRATAPGARH
TO 400 KV GSS CHITTORGARH
TO CHHOTISADARI
RAPPA [415] 216 (-6)
TO SAKATPURA
RAPP#1 [80] 21 (-1)
DEBARI_2 [230] 212 (-15)
DEBARI_1 [1230] 127 (-17)
T-MAVLI [1522]
JK_NIMB [3055] 120 (-21)
TO NATHDWARA
BIJAPUR1 [2485] 119 (-22)
TO ASPUR
TO AMBERI
TO 400 KV GSS CHITTORGARH
TO AMBERI
TO MADRI
HZL_DEBA [3040] 127 (-17)
UCW_DEBA [3041] 127 (-17)

Annexure-A.IV

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

केन्द्रीय कार्यालय : 61, आई एफ सी आई टावर, 8 एवं 9वीं मंजिल, नेहरु प्लेस, नई दिल्ली -110019
Corporate Office : 61, IFCI Tower, 8 & 9th Floor, Nehru Place, New Delhi - 110019
CIN : U40105DL2009GOI188682, Website : www.posoco.in, E-mail : posococc@posoco.in, Tel.: 011- 40234672

Ref: NLDC/SO/2022-23/ 38 **Date: 08/06/2022.**

To,

Member secretary,
ERPC/NERPC/NRPC/SRPC/WRPC

Subject: Review of planned outages from 1st September 22 to 15th October 22

Madam/Sir,

A meeting regarding coal supply issues to the power plants was chaired by Secretary(P) on 03.06.22(Minutes of the Meeting is attached as Annexe). The planned outages of thermal capacity in the month of Sep & Oct,22 was discussed. As per CEA LGBR 2022-23, it was appraised that all India thermal capacity outage would be of the order of 15000MW in the month of September 22 and 7500MW in October 22. It was opined that hydro and wind generation would come down drastically in these months, hence 15000MW planned outage of thermal capacity could not be affordable in these months.

In view of the above, it was decided that efforts should be made to reduce the all India planned outage in the month of Sept and Oct 22 and should be kept as minimum as possible. Following has been directed during the meeting:

Quote
As discussed in the meeting, planned outage from 01st September to 15th October 22 should be minimum possible so as to have adequate capacity available to meet he expected demand.
Unquote

Accordingly, all planned outages of thermal units during the month of September 22 to 15th October 22 may please be discussed among all stakeholders and ensure the bare minimum planned outage of thermal units in aforesaid months so that all India electricity demand in the upcoming months could be met without any constraint.

Yours sincerely,

(Debasis De)

CC:

1) Member (GO&D), CEA
2) Joint secretary (OM, R&R), MOP
3) ED, SRLDC/ERLDC/NERLDC/WRLDC.
4) CGM(I/C), NRLDC

पंजीकृत कार्यालय : प्रथम तल, बी-9, कुतुब इंस्टीट्यूशनल एरिया, कटवारिया सराय, नई दिल्ली - 110016
Registered Office : First Floor, B-9, Qutab Institutional Area, Katwaria Sarai, New Delhi -110016

Annexe

F. No. FU-33/2021-FSC
Government of India
Ministry of Power
****

Shram Shakti Bhawan, Rafi Marg,
New Delhi, the 06.06.2022

OFFICE MEMORANDUM

Sub: Minutes of the Daily Review Meeting on Coal Supply issues held on 03.06.2022 at 02:15 pm under the Chairmanship of Secretary

The undersigned is directed to forward herewith the Minutes of the Daily Review Meeting on Coal Supply issues held under the Chairmanship of Secretary on 03.06.2022 at 02:15 pm at Conference room, Shram Shakti Bhawan, New Delhi for information and necessary action.

Encl: as above

06/06/2022

(D. K. Sharma)
Joint Director

To,

1. Chairman, CEA
2. Chief Engineer TPP&D, CEA
3. Member (Planning), CEA
4. FM Division CEA
5. CMD, NTPC
6. CMD, PFC
7. CMD, POSOCO

Minutes of the daily review meeting held under the Chairmanship of Secretary on 03.06.2022 at 2.15 PM to review coal and power supply.

List of Participants is at Annexure.

The decisions taken during the meeting were as under:

1. During discussion NPTC informed that they are getting less rakes, defective rakes leading to delay in unloading of coal. Secretary (P) directed CMD, NTPC to write a letter to Chairman, Railway Board on the matter. **(Action: NTPC)**
2. CEA was directed to include RCR lifting by NTPC in RCR materialisation. **(Action: CEA)**
3. RCR lifting of KPCL and Haryana has not yet started and in case of Tamil Nadu and AP the lifting is insufficient. DO letter be issued to Secretary (Coal) for de-allocation of RCR coal to KPCL and Haryana (HPGCL). A separate DO letter to be issued to Tamil Nadu and AP for improving lifting of RCR. The de-allocated coal may be re-allocated to those willing GENCOs having higher RCR materialization. **(Action: Thermal Divn.)**
4. The coal stock at some of the NTPC stations are getting exhausted and need additional allocation of coal. DO letter from JS (Thermal) be issued to JS (Coal) for necessary action as NTPC are performing well on blending and generate a third of the country's power. **(Action: Thermal Divn.)**
5. Letter to be sent to Ministry of Coal and CIL with projected generation and consequent coal requirement for 2023-24. **(Action: CEA)**
6. As discussed in the meeting, planned outage from 1st September to 15th October 2022 should be minimum possible so as to have adequate capacity available to meet expected demand. **(Action: POSOCO.**

****

Annexure

List of Participants

Ministry of Power

1. Shri Alok Kumar, Secretary (In Chair)
2. Shri Vivek Kumar Dewangan, Additional Secretary
3. Shri Piyush Singh, Joint Secretary (Thermal)
4. Shri Ghanshyam Prasad, Joint Secretary (R&R and OM)
5. Shri Sanjeev Kumar Kassi, Chief Engineer (Thermal)
6. Shri G. Muthuraja, Director
7. Shri D.K. Sharma, Joint Director
8. Shri Sarat Chandra Dubba, Asst. Section Officer

CEA

1. Shri B. K. Arya, Chairman
2. Shri A. Balan, Member (Planning)
3. Shri M. P. Singh, CE (TPP&D)
4. Shri Mohd. Afzal, CE (FM)
5. Shri Naresh Kumar, Director
6. Shri Nitin Prakash, Director
7. Shri Ajay Telgaonkar

NTPC

1. Shri Gurdeep Singh, CMD
2. Shri Ramesh Babu, Director (Operations)
3. Shri P. K. Sinha, ED
4. Ms. Priya Kumar
5. Shri V. Santosh Kumar

POSOCO

1. Shri S.R.Narsimhan, CMD
2. Shri Ashok Kumar, GM

Planned Thermal Unit Outage in NR from 1st Sept'22 to 15th Oct'22 as per CEA LGBR 22-23										
Station	**Unit**	**Station Type**	**Region**	**State**	**Utility**	**Capacity (MW)**	**Outage from**	**Outage To**	**Duration (days)**	**Remarks**
CSCTPP CHHABRA	5	THERMAL	NR	RAJASTHAN	RVUNL	660	15-Aug-22	10-Sep-22	27	Annual Boiler Overhaul
UNCHAHAR-II TPS	4	THERMAL	NR	UTTAR PRADESH	NTPC	210	16-Aug-22	19-Sep-22	35	Annual OH
TANDA TPS	4	THERMAL	NR	UTTAR PRADESH	NTPC	110	20-Aug-22	28-Sep-22	40	Capital OH
KOTA TPS (KSTPS)	4	THERMAL	NR	RAJASTHAN	RVUNL	210	01-Sep-22	15-Sep-22	15	Annual Boiler Overhaul
SINGRAULI STPS	5	THERMAL	NR	UTTAR PRADESH	NTPC	200	9-Sep-22	8-Oct-22	30	Annual OH
KAWAI TPS (ADANI POWER)	2	THERMAL	NR	RAJASTHAN	ADANI POWER	660	11-Sep-22	9-Oct-22	29	COH
KOTA TPS (KSTPS)	6	THERMAL	NR	RAJASTHAN	RVUNL	195	05-Oct-22	19-Oct-22	15	Annual Boiler Overhaul
CSCTPP CHHABRA	6	THERMAL	NR	RAJASTHAN	RVUNL	660	10-Oct-22	05-Nov-22	27	Annual Boiler Overhaul
GHTPS (LEHRA MOHBBAT)	2	THERMAL	NR	PUNJAB	PSPCL	210	10-Oct-22	15-Nov-22	37	Capital O/H (HPT/IPT/LPT/Gen.)

High Load on 400kV Circuits at Tikrikalan

	Nov-21				
S.No.	**Load**	**Jhatikara Ckt 1**	**Jhatikara Ckt 2**	**Bawana Ckt 1**	**Bawana Ckt 2**
1	> 500MW	19 days	19 days	23 days	24 days
2	>600MW	8 days	8 days	15 days	24 days
3	Max Load	730 MW	874 MW	1034 MW	876 MW
	Dec-21				
S.No.	**Load**	**Jhatikara Ckt 1**	**Jhatikara Ckt 2**	**Bawana Ckt 1**	**Bawana Ckt 2**
1	> 500MW	22 days	22 days	31 days	31 days
2	>600MW	8 days	8 days	21 days	21 days
3	Max Load	688 MW	688 MW	903 MW	745 MW
	Jan-22				
S.No.	**Load**	**Jhatikara Ckt 1**	**Jhatikara Ckt 2**	**Bawana Ckt 1**	**Bawana Ckt 2**
1	> 500MW	16 days	15 days	29 days	29 days
2	>600MW	4 days	3 days	14 days	14 days
3	Max Load	835 MW	891 MW	745 MW	745 MW
	Feb-22				
S.No.	**Load**	**Jhatikara Ckt 1**	**Jhatikara Ckt 2**	**Bawana Ckt 1**	**Bawana Ckt 2**
1	> 500MW	12 days	12 days	15 days	14 days
2	>600MW	0 days	0 days	3 days	1 days
3	Max Load	576 MW	576 MW	922 MW	994 MW
	Mar-22				
S.No.	**Load**	**Jhatikara Ckt 1**	**Jhatikara Ckt 2**	**Bawana Ckt 1**	**Bawana Ckt 2**
1	> 500MW	24 days	24 days	27 days	27 days
2	>600MW	14 days	14 days	22 days	22 days
3	Max Load	731 MW	731 MW	829 MW	829 MW
	Apr-22				
S.No.	**Load**	**Jhatikara Ckt 1**	**Jhatikara Ckt 2**	**Bawana Ckt 1**	**Bawana Ckt 2**
1	> 500MW	10 days	10 days	21 days	21 days
2	>600MW	0 days	0 days	11 days	11 days
3	Max Load	579 MW	579 MW	674 MW	674 MW
	May-22				
S.No.	**Load**	**Jhatikara Ckt 1**	**Jhatikara Ckt 2**	**Bawana Ckt 1**	**Bawana Ckt 2**
1	> 500MW	25 days	25 days	24 days	24 days
2	>600MW	9 days	9 days	11 days	11 days
3	Max Load	824 MW	824 MW	773 MW	674 MW
	June-22 upto 14.06.2022				
S.No.	**Load**	**Jhatikara Ckt 1**	**Jhatikara Ckt 2**	**Bawana Ckt 1**	**Bawana Ckt 2**
1	> 500MW	9 days	9 days	11 days	10 days
2	>600MW	6 days	6 days	6 days	5 days
3	Max Load	733 MW	733 MW	848 MW	884 MW

Annexure-A.VI

P Guruprasad
I.A.S.
Managing Director

U.P. Rajya Vidyut Utpadan Nigam Ltd.
(U.P. Govt. Undertaking)
8th Floor, Shakti Bhawan Extension,
Ashok Marg, Lucknow - 226001

CIN No. U40101UP1980SGC005065

No. 530 **/PPMM/SE-V/Jawaharpur** **Dated** 16 **.06.2022**

Shri Naresh Bhandari
Member Secretary
Northern Regional Power Committee,
18-A,Shaheed Jeet Singh Marg,Katwaria Sarai
New Delhi

Sub : Shut down of 800 KV HVDC Champa-Kurukshetra and 500 KV HVDC Rihand-Dadri transmission lines in July 2022

In reference to the subject matter, it is to inform that construction of 2x660 MW Jawaharpur thermal Power Project is under progress and in this regard following points may be noted:-

1) Construction of Rail network of Jawaharpur thermal Power Project is under progress from Etah to Malawan by M/s RITES
2) 800 KV HVDC Champa-Kurukshetra and 500 KV HVDC Rihand-Dadri transmission lines of M/s PGCIL are crossing the above mentioned under construction Rail network. Shifting and raising work of subject transmission lines is being done by M/s PGCIL.
3) The construction work of above mentioned rail network is getting hampered due to the delay in shifting and raising work of above mentioned transmission lines.The tower construction and stringing work of both the lines is already completed and only tagging work at both ends of the lines is pending. For timely completion of this pending work, shutdown of both the lines is urgently required.
4) M/s PGCIL has informed that they have applied for the shutdown of subject transmission lines in 193rd, 194th and 195th meeting of operations coordination committee (OCC) of NRPC for April 2022,May 2022,June 2022 respectively but shutdown request has been rejected by OCC with the remark to apply for the shutdown during lean period/ after NR peak demand season i.e. in Oct /Nov 2022.
5) M/s PGCIL has also informed that they have again applied for the shutdown of subject lines in the proposed meeting of OCC on 20.06.2022 for the month of July, 2022 (06 days shutdown for 800 KV HVDC Champa-Kurukshetra transmission line w.e.f. 01.07.2022 to 06.07.2022 and 05 days shutdown for 500 KV HVDC Rihand-Dadri transmission line w.e.f. 08.07.2022 to 12.07.2022).
6) The completion of construction work of Rail Network is important at least before two months of the synchronization of Unit-1 of 2x660 MW Jawaharpur thermal Power Project which is targeted in Dec, 2022.
7) Two month is required for M/s RITES to complete the rail line earth work after shifting of transmission line.

In view of the above and urgency of work, it is requested to kindly arrange to facilitate the earliest shutdown to M/s PGCIL for 800 KV HVDC Champa-Kurukshetra and 500 KV HVDC Rihand-Dadri transmission lines in the next proposed meeting of OCC on 20.06.2022.

(P Guruprasad)
Managing Director

CC:- Shri S.K.Gupta, Sr.G.M.(Eng. & consultancy), PGCIL, Lucknow

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

उत्तरी 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: U40105L2009GOI188682, Website: www.nrldc.org, www.nrldc.in, Tel.: 01126519406, 26523869, Fax: 011-26852747

संदर्भ सं॰ : उ0क्षे0भा0प्रे0कें0/प्र0सं0/151/ 150-154 दिनांक : 14 जून, 2022

सेवा मे,

मुख्य अभियंता,
राज्य भार प्रेषण केंद्र
हरियाणा विद्युत् प्रसारण निगम लिमिटेड
शक्ति भवन, सेक्टर-6, पंचकूला, हरियाणा-134109

विषय : **Large variations in drawal pattern by Haryana control area.**

Earlier Ref. : NRLDC letter no. NRLDC/SO/151 dtd. 22/03/2022
NRLDC letter no. NRLDC/SO/151/243 dtd. 23/03/2022
NRLDC letter no. NRLDC/SO/151 dtd. 30/03/2022
NRLDC letter no. NRLDC/SO/151 dtd. 07/04/2022

महोदय,

It has been observed that Haryana control area has been changing its drawal by large quantum (in the range of 500-1000MW) during hourly boundaries at 04:00Hrs, 09:00Hrs, 14:00Hrs, 16:00Hrs and 19:00Hrs. The trends (5 minutes' average) of Schedule vs Drawl vs Frequency for the period 06.06.2022 to 13.06.2022 are attached at Annexure-I. From the Annexure, it may be seen that Haryana's deviation from the schedule has crossed about 500 MW around 09:00Hrs on 11.06.2022 and 19:00Hrs on 13.06.2022. These large deviations from schedule leads to low/high frequency excursions at the hourly boundaries.

Please note that as per IEGC clause 5.2(j), "No User/SEB shall cause a sudden variation in its load by more than one hundred (100 MW) without prior intimation to and consent of the RLDC.

The matter has been taken up with Haryana multiple times in the form of operational messages and deviation messages from NRLDC control room. The large deviations causing low/high frequency excursions occurring almost on daily basis are detrimental to the Grid reliability.

In view of the increasing peak demand and lack of adequate ramping-up reserves during morning and evening peak hours, it is requested to kindly ensure following measures to restrict deviations from schedule to mitigate low/high frequency excursions:

1. Meticulous load forecasting and operational planning may be carried out on daily/weekly/monthly basis.
2. Restrict the load variation to the tune of limits specified in IEGC through staggering of load connection/disconnection.
3. Maintain drawal from the Grid as per schedule by proper ramping of on-bar own generation in consonance with the demand variation, to mitigate over-drawal/load shedding.
4. The units under reserve shutdown (in state control area) may be brought on-bar to maintain adequate spinning reserves.
5. Considering the ramping real time portfolio management through purchase/sale of power in STOA (Bilateral contingency and Real time market) and requisition of available URS in ISGS may be ensured.

Your cooperation is highly solicited for maintaining Grid parameters within permissible limits.

सादर धन्यवाद

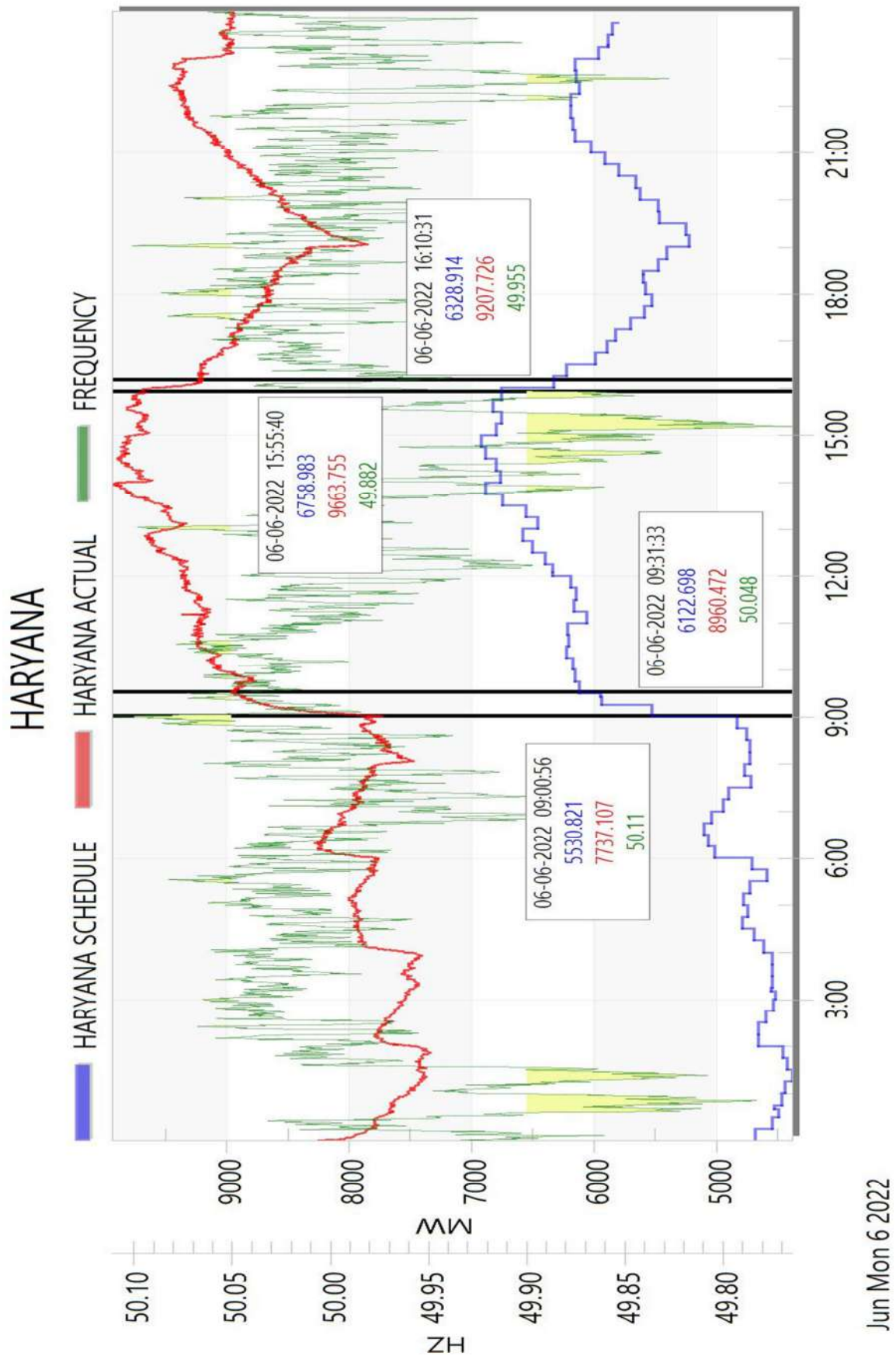
सोमारा

सोमारा लाकरा
व0 महाप्रबंधक (प्रणाली संचालन)
उत्तरी क्षेत्र भार प्रेषण केंद्र, नई दिल्ली

विनम्र सूचनार्थ :

1. सदस्य सचिव, उत्तरी क्षेत्र विद्युत् समिति
2. निदेशक(टेक्निकल), हरियाणा विद्युत् प्रसारण निगम लिमिटेड
3. कार्यपालक निदेशक, राष्ट्रीय भार प्रेषण केंद्र
4. मुख्य महाप्रबंधक (प्रभारी), उत्तरी क्षेत्र भार प्रेषण केंद्र

Annexure-I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HARYANA SCHEDULE
HARYANA ACTUAL
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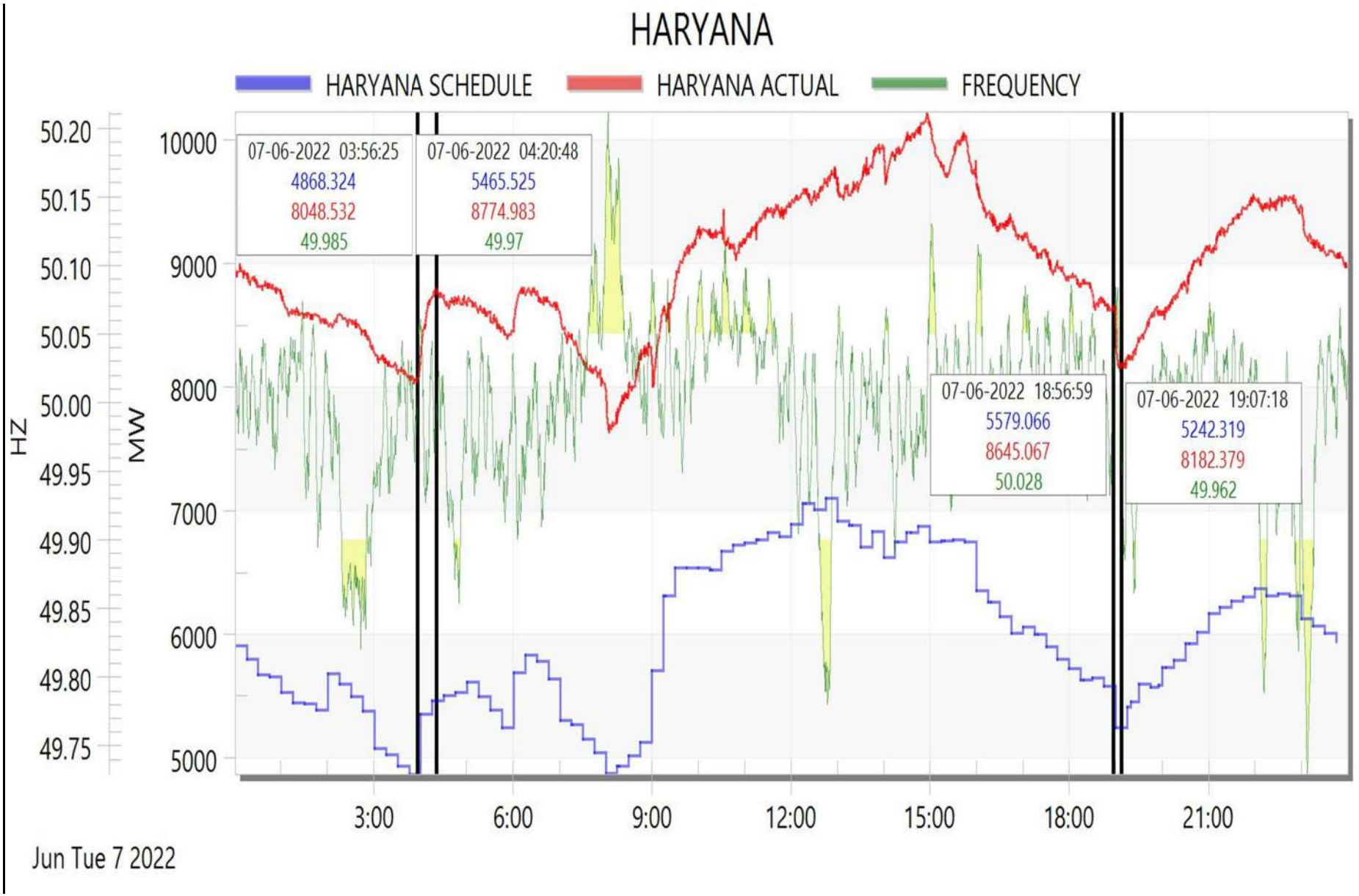
Jun Mon 6 2022


HARYANA
HARYANA SCHEDULE
HARYANA ACTUAL
FREQUENCY
HZ
MW
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50.15
50.10
50.05
50.00
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49.90
49.85
49.80
49.75
10000
9000
8000
7000
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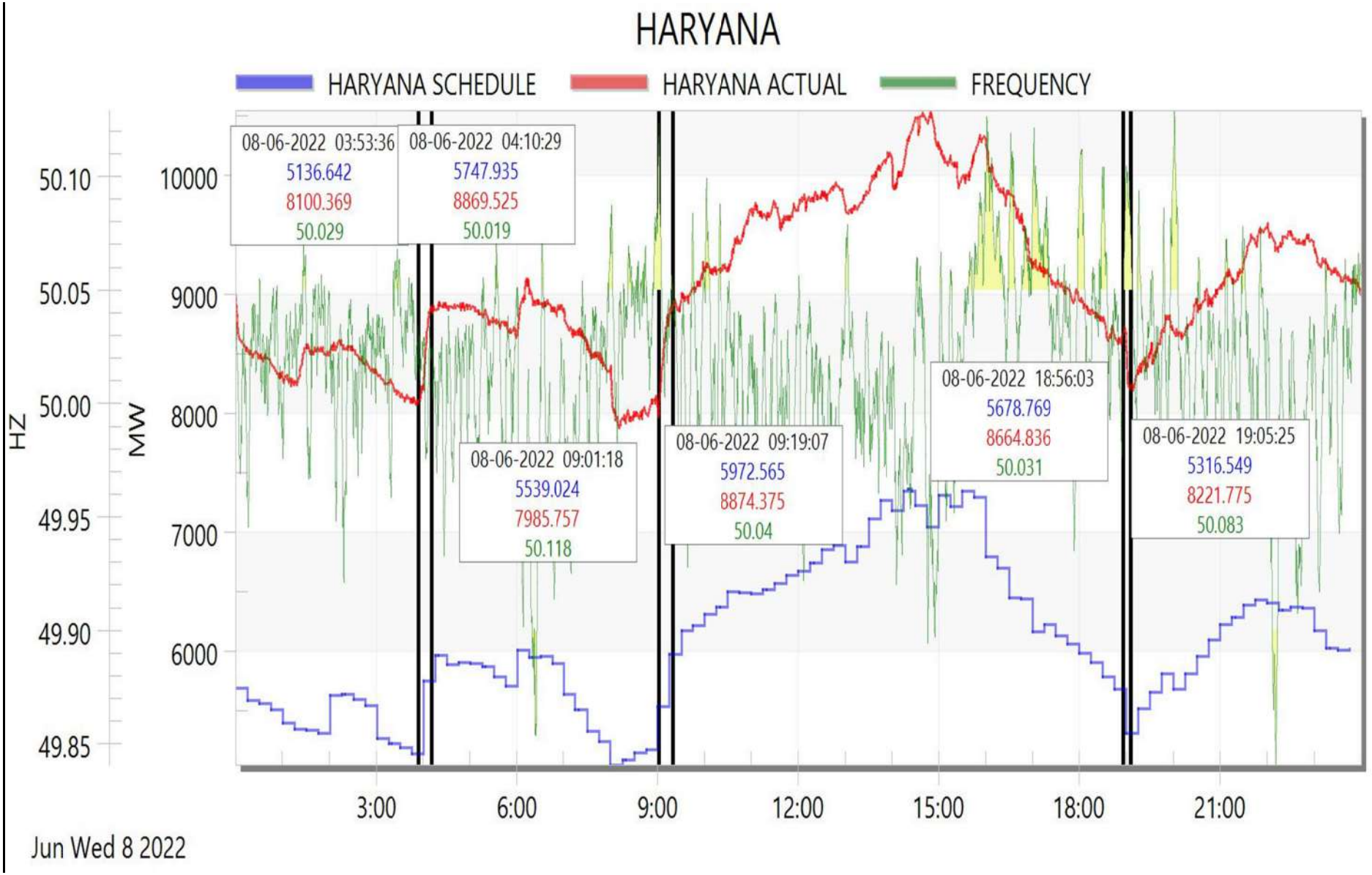
Jun Tue 7 2022


HARYANA
HARYANA SCHEDULE
HARYANA ACTUAL
FREQUENCY
HZ
MW
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50.05
50.00
49.95
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49.85
10000
9000
8000
7000
6000
3:00
6:00
9:00
12:00
15:00
18:00
21:00
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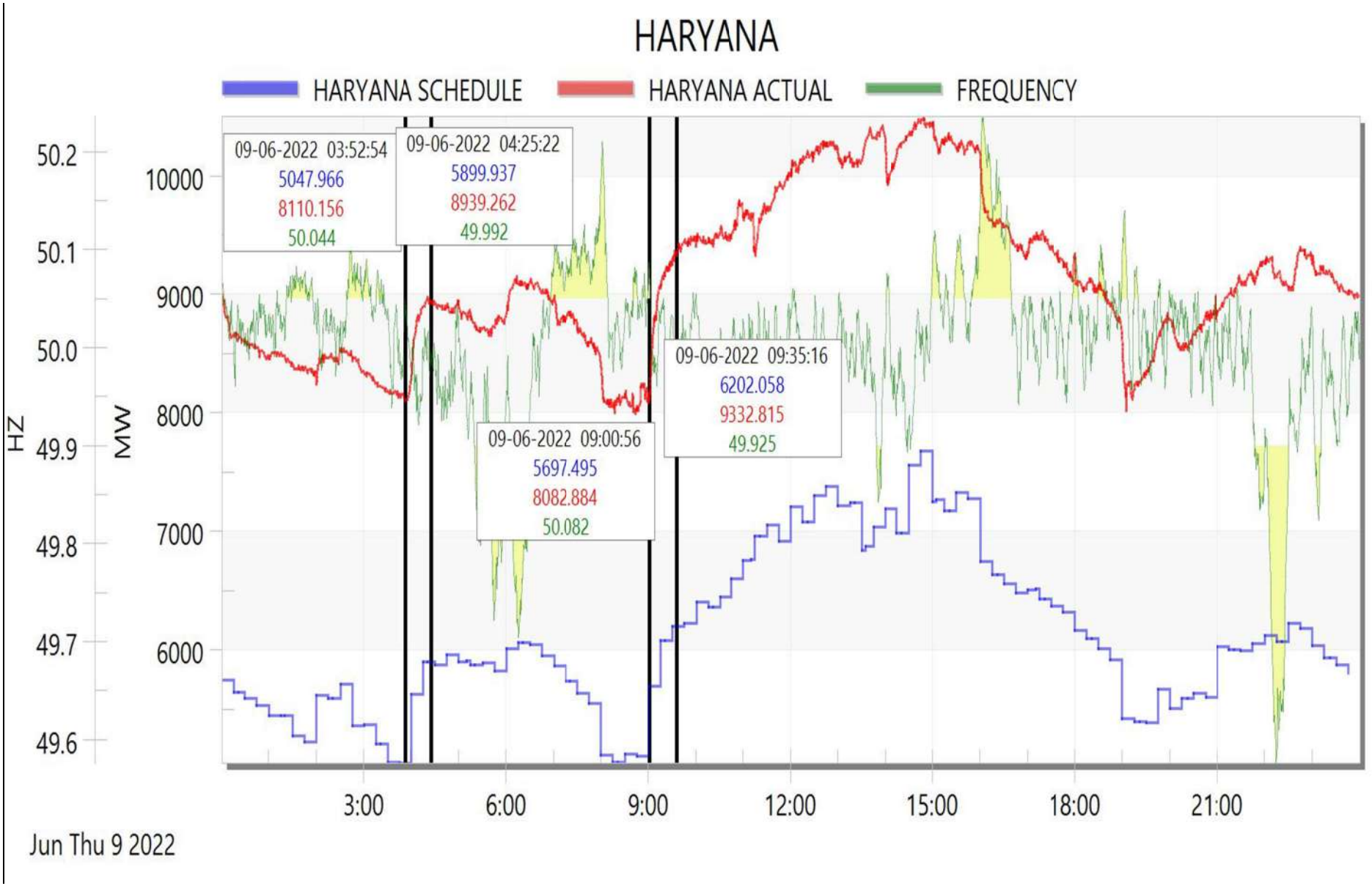
Jun Wed 8 2022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HARYANA SCHEDULE
HARYANA ACTUAL
FREQUENCY
HZ
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50.1
50.0
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49.6
10000
9000
8000
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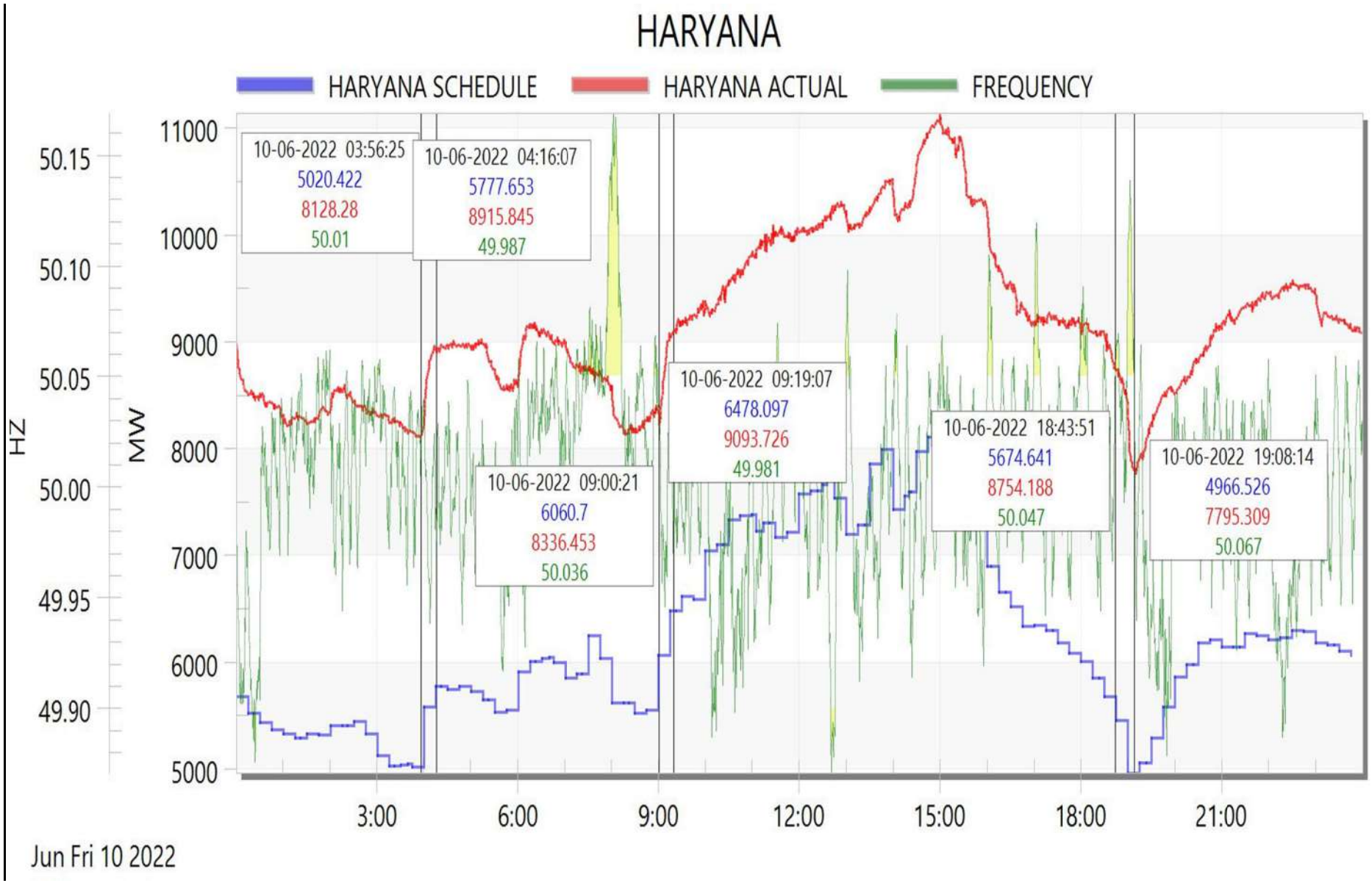
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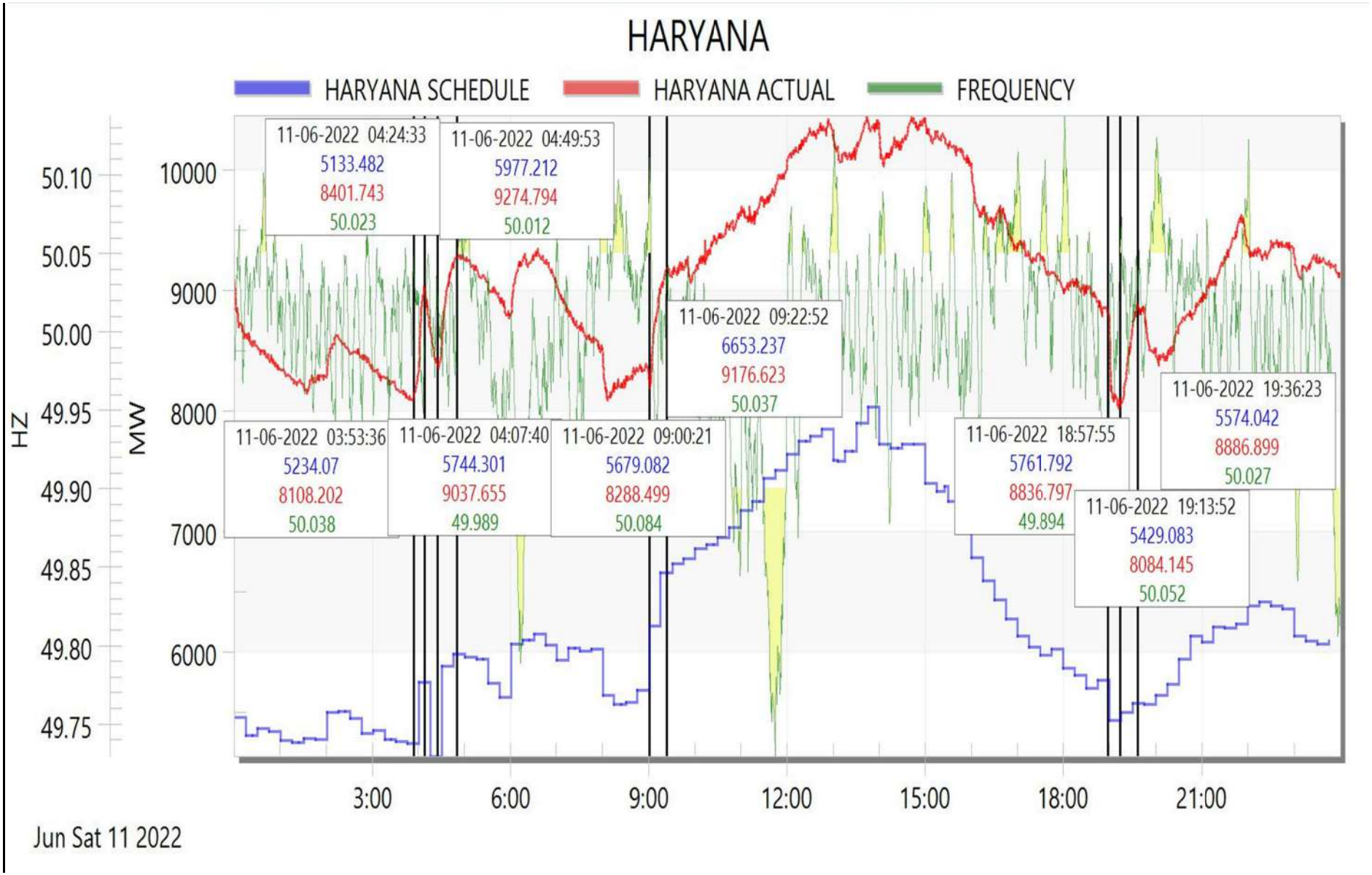
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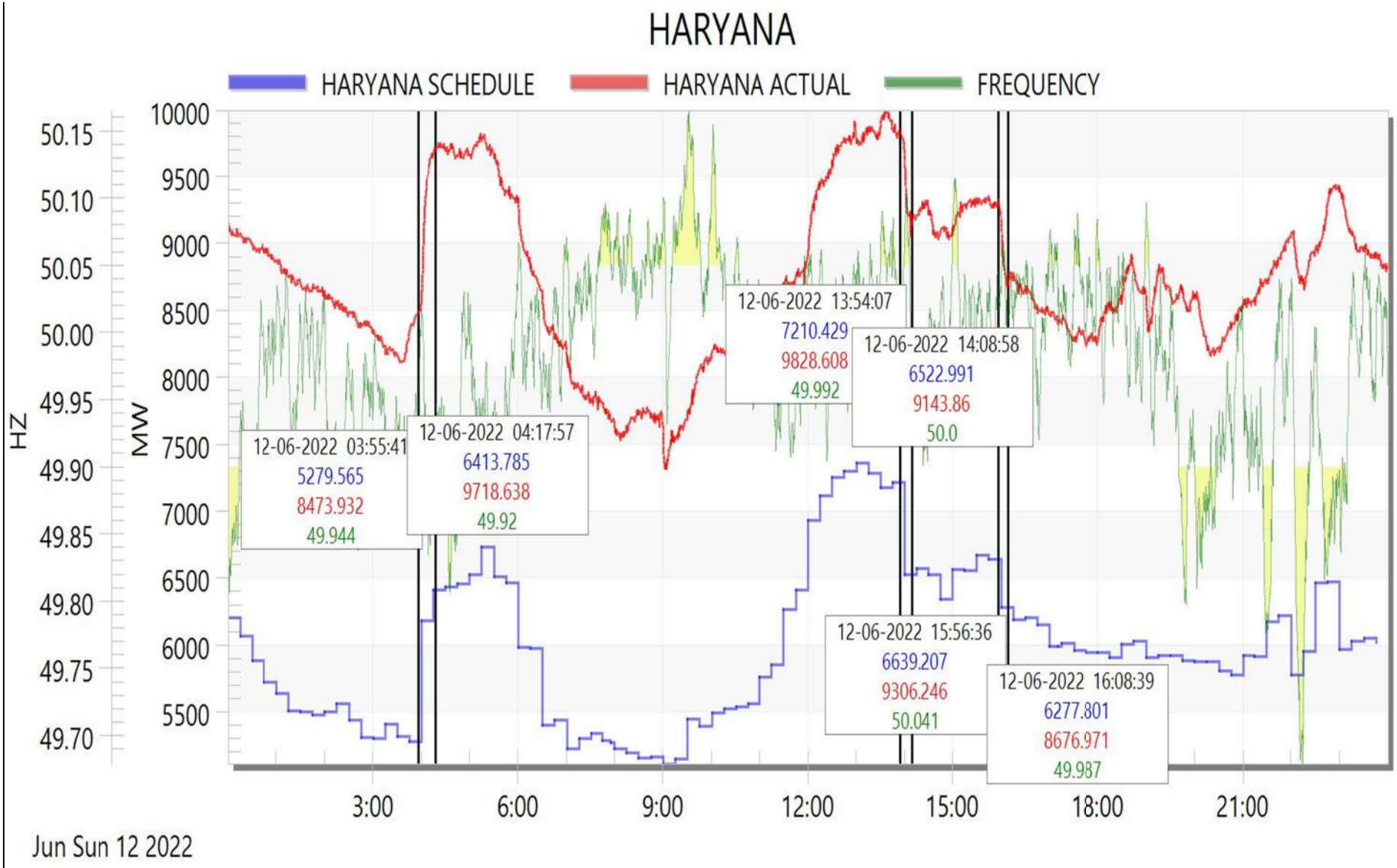
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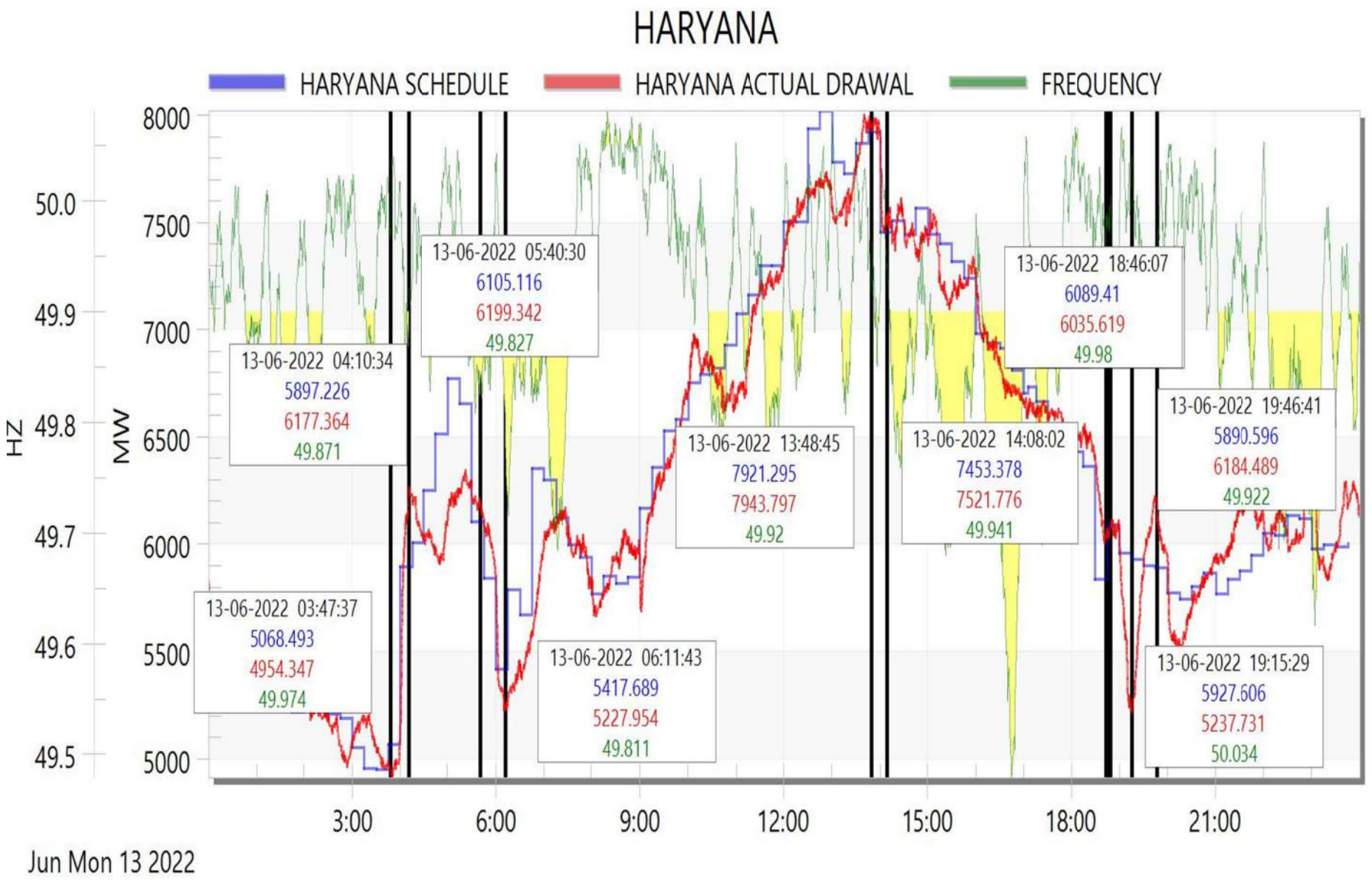
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पावर सिस्टम ऑपरेशन कॉर्पोरेशन लिमिटेड
(भारत सरकार का उद्यम)
POWER SYSTEM OPERATION CORPORATION LIMITED
(A Govt. of India Enterprise)

उत्तरी 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: U40105L2009GOI188682, Website: www.nrldc.org, www.nrldc.in, Tel.: 01126519406, 26523869, Fax: 011-26852747

संदर्भ सं॰ : उ0क्षे0भा0प्रे0कें0/प्र0सं0/151/ 151 दिनांक : 14 जून, 2022

सेवा मे,

मुख्य अभियंता,
राज्य भार प्रेषण केंद्र
उत्तर प्रदेश पावर ट्रांसमिशन कारपोरेशन लिमिटेड
फेज-II, विभूति खंड, लखनऊ, उत्तर प्रदेश-226010

विषय : **Large variations in drawal pattern by U.P. control area.**

Earlier Ref. : NRLDC letter no. NRLDC/SO/151/313 dtd. 28/03/2022
NRLDC letter no. NRLDC/SO/151/357 dtd. 06/04/2022
NRLDC letter no. NRLDC/SO/151/141 dtd. 02/06/2022

महोदय,

It has been observed that U.P. control area has been changing its drawal by large quantum (in the range of 1000-2500MW) during hourly boundaries at 05:00Hrs & 19:00Hrs. The trends (5 minutes' average) of Schedule vs Drawl vs Frequency for the period 06.06.2022 to 13.06.2022 are attached at Annexure-I. From the Annexure, it may be seen that U.P.'s deviation from the schedule has crossed about 2000 MW around 19:00Hrs on 13.06.2022. These large deviations from schedule leads to low/high frequency excursions at the hourly boundaries.

Please note that as per IEGC clause 5.2(j), "No User/SEB shall cause a sudden variation in its load by more than one hundred (100 MW) without prior intimation to and consent of the RLDC.

The matter has been taken up with U.P. multiple times in the form of operational messages and deviation messages from NRLDC control room. The large deviations causing low/high frequency excursions occurring almost on daily basis are detrimental to the Grid reliability.

In view of the increasing peak demand and lack of adequate ramping-up reserves during morning and evening peak hours, it is requested to kindly ensure following measures to restrict deviations from schedule to mitigate low/high frequency excursions:

1. Meticulous load forecasting and operational planning may be carried out on daily/weekly/monthly basis.
2. Restrict the load variation to the tune of limits specified in IEGC through staggering of load connection/disconnection.
3. Maintain drawal from the Grid as per schedule by proper ramping of on-bar own generation in consonance with the demand variation, to mitigate over-drawal/load shedding.
4. The units under reserve shutdown (in state control area) may be brought on-bar to maintain adequate spinning reserves.
5. Considering the ramping real time portfolio management through purchase/sale of power in STOA (Bilateral contingency and Real time market) and requisition of available URS in ISGS may be ensured.

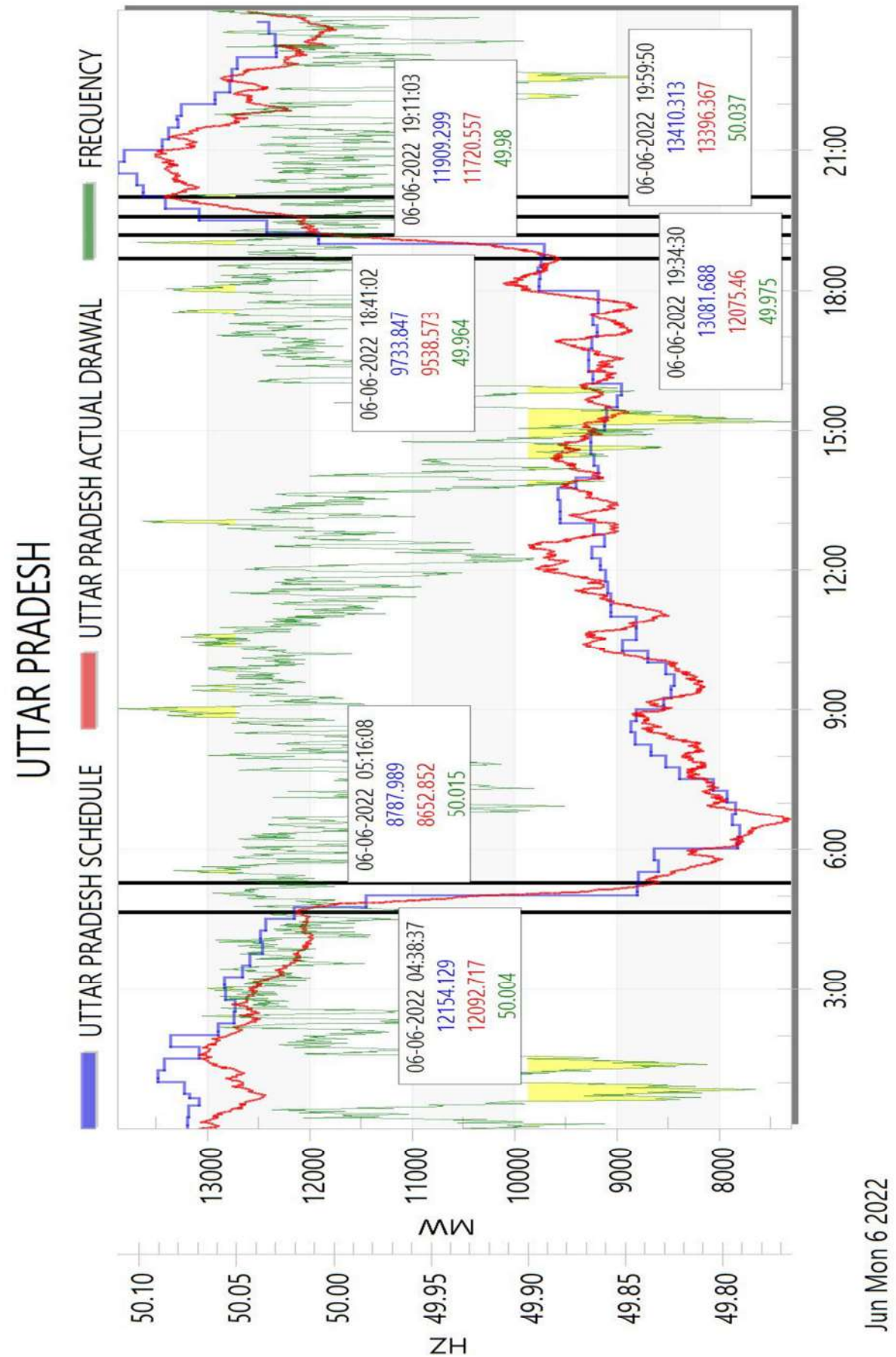
Your cooperation is highly solicited for maintaining Grid parameters within permissible limits.

सादर धन्यवाद

सोमारा लाकरा
व0 महाप्रबंधक (प्रणाली संचालन)
उत्तरी क्षेत्र भार प्रेषण केंद्र, नई दिल्ली

विनम्र सूचनार्थ :

1. सदस्य सचिव, उत्तरी क्षेत्र विद्युत् समिति
2. निदेशक, राज्य भार प्रेषण केंद्र, उत्तर प्रदेश
3. कार्यपालक निदेशक, राष्ट्रीय भार प्रेषण केंद्र
4. मुख्य महाप्रबंधक (प्रभारी), उत्तरी क्षेत्र भार प्रेषण केंद्र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MW
HZ
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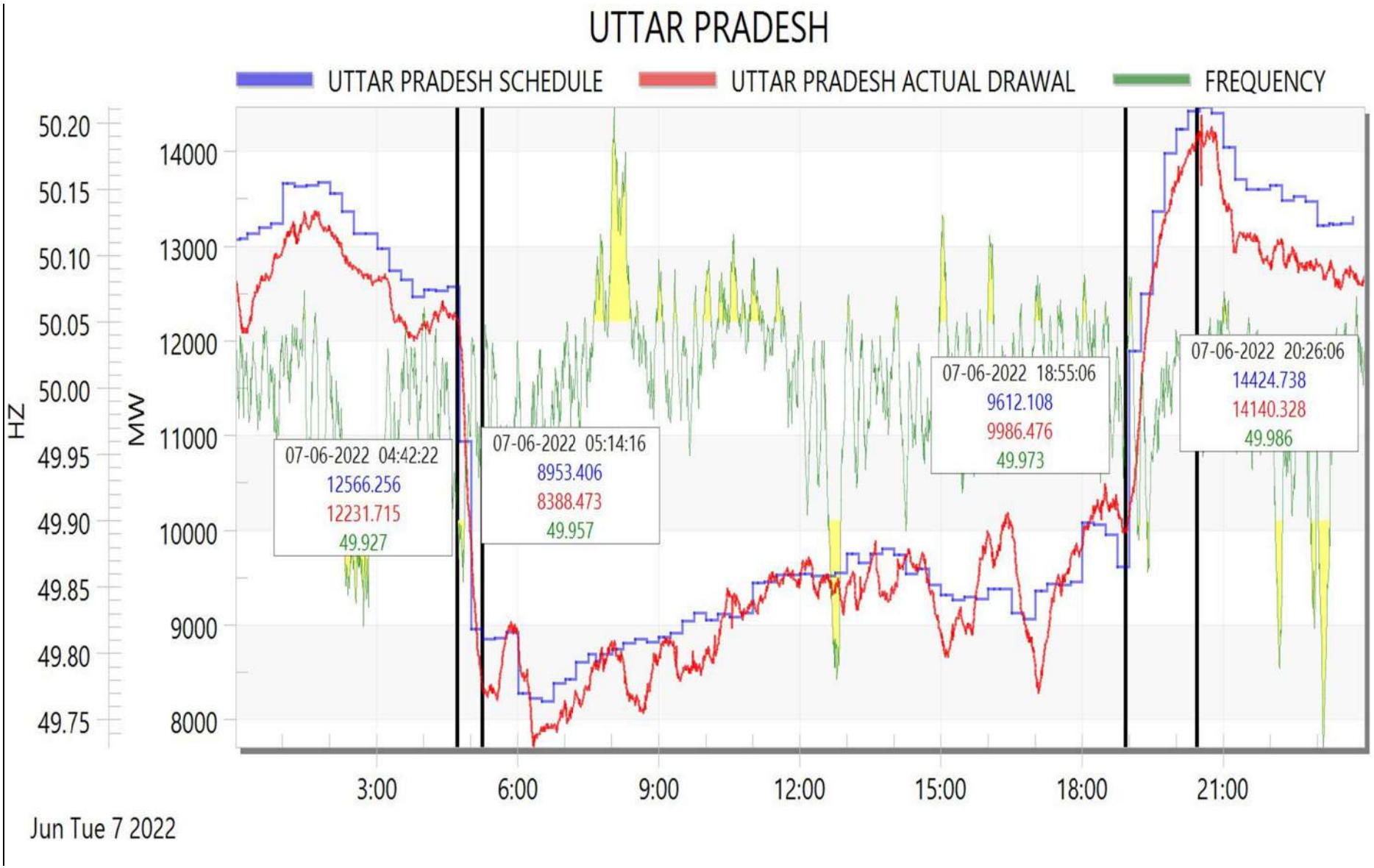
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UTTAR PRADESH ACTUAL DRAWAL
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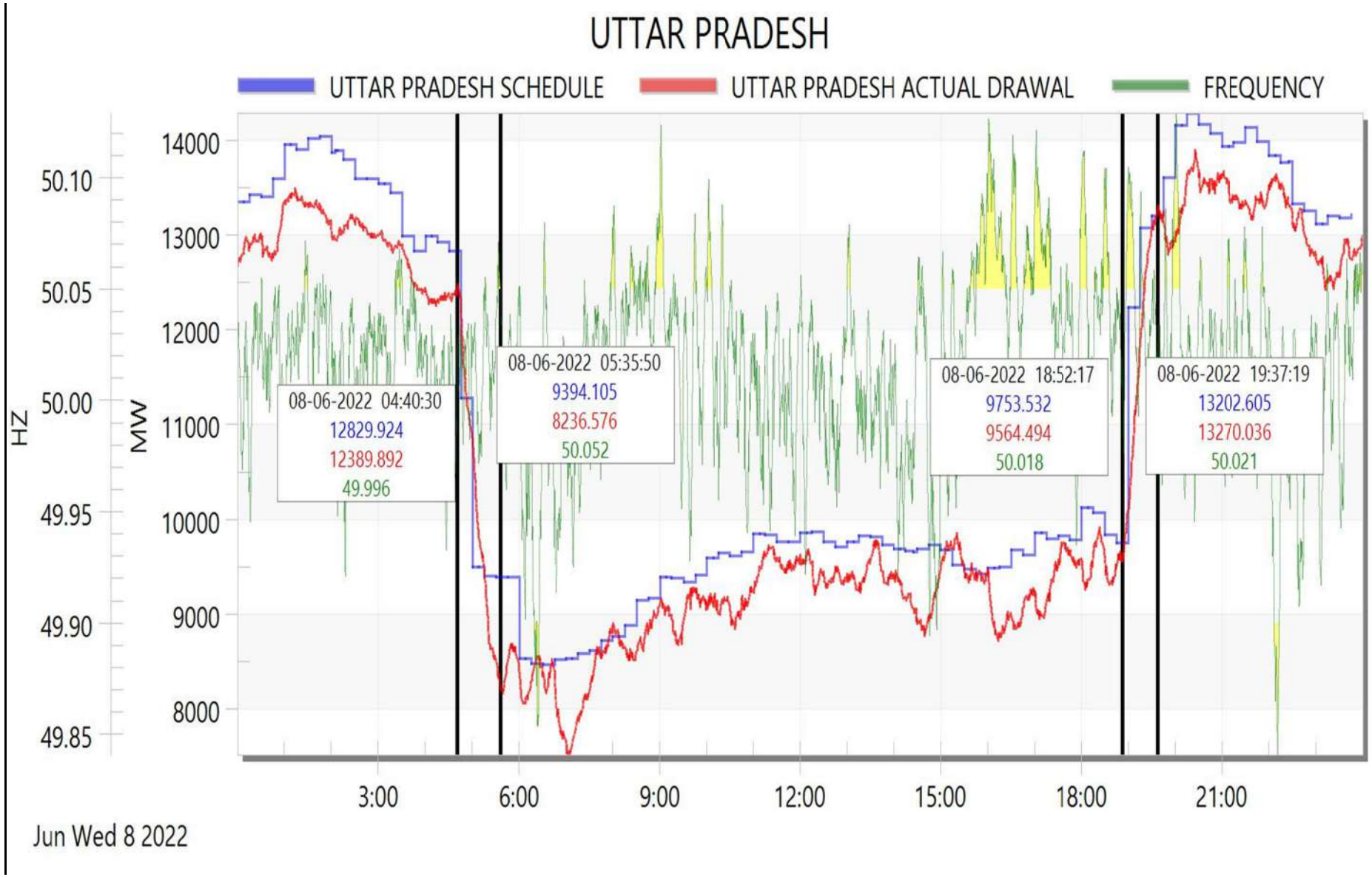
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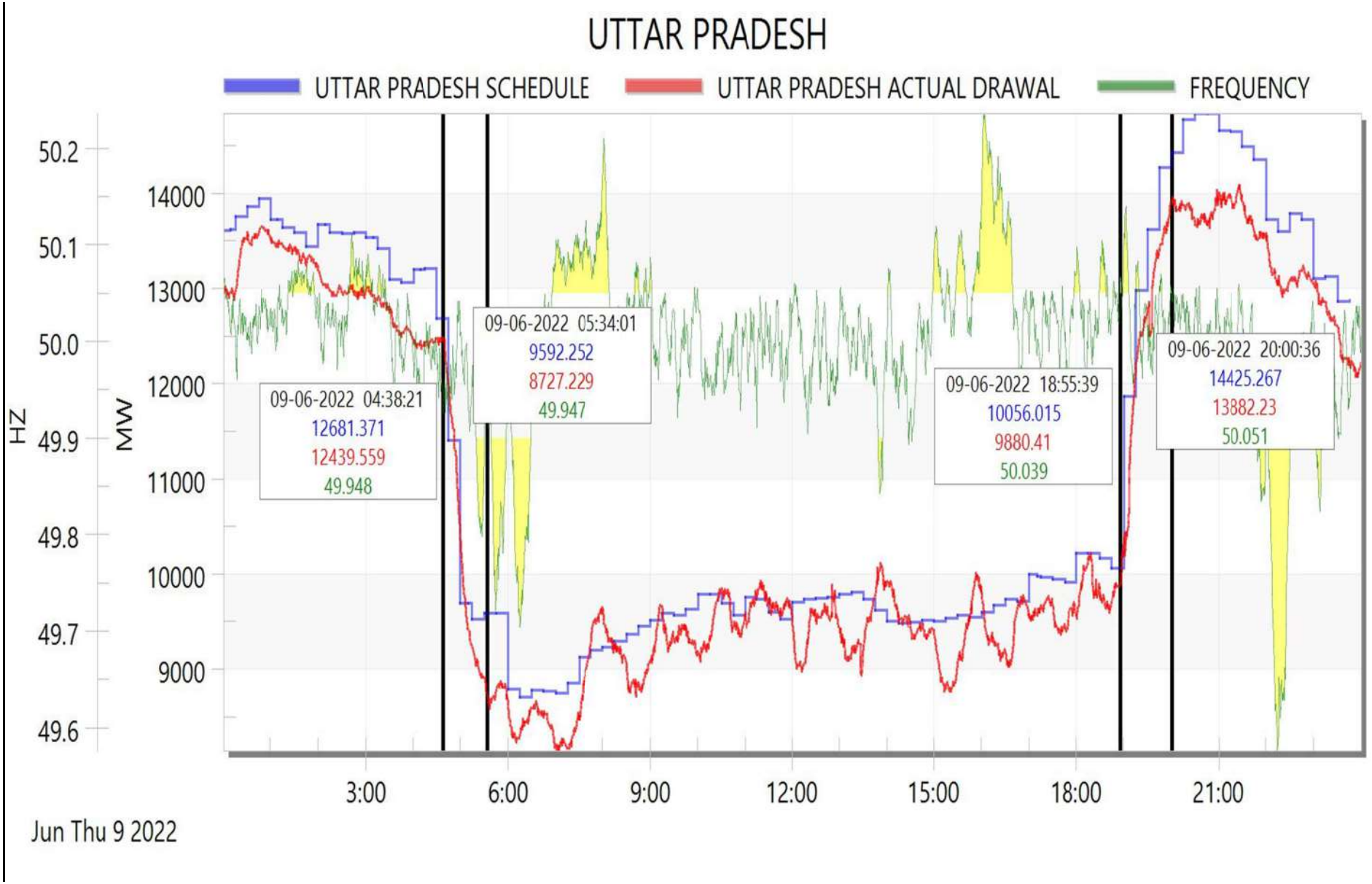
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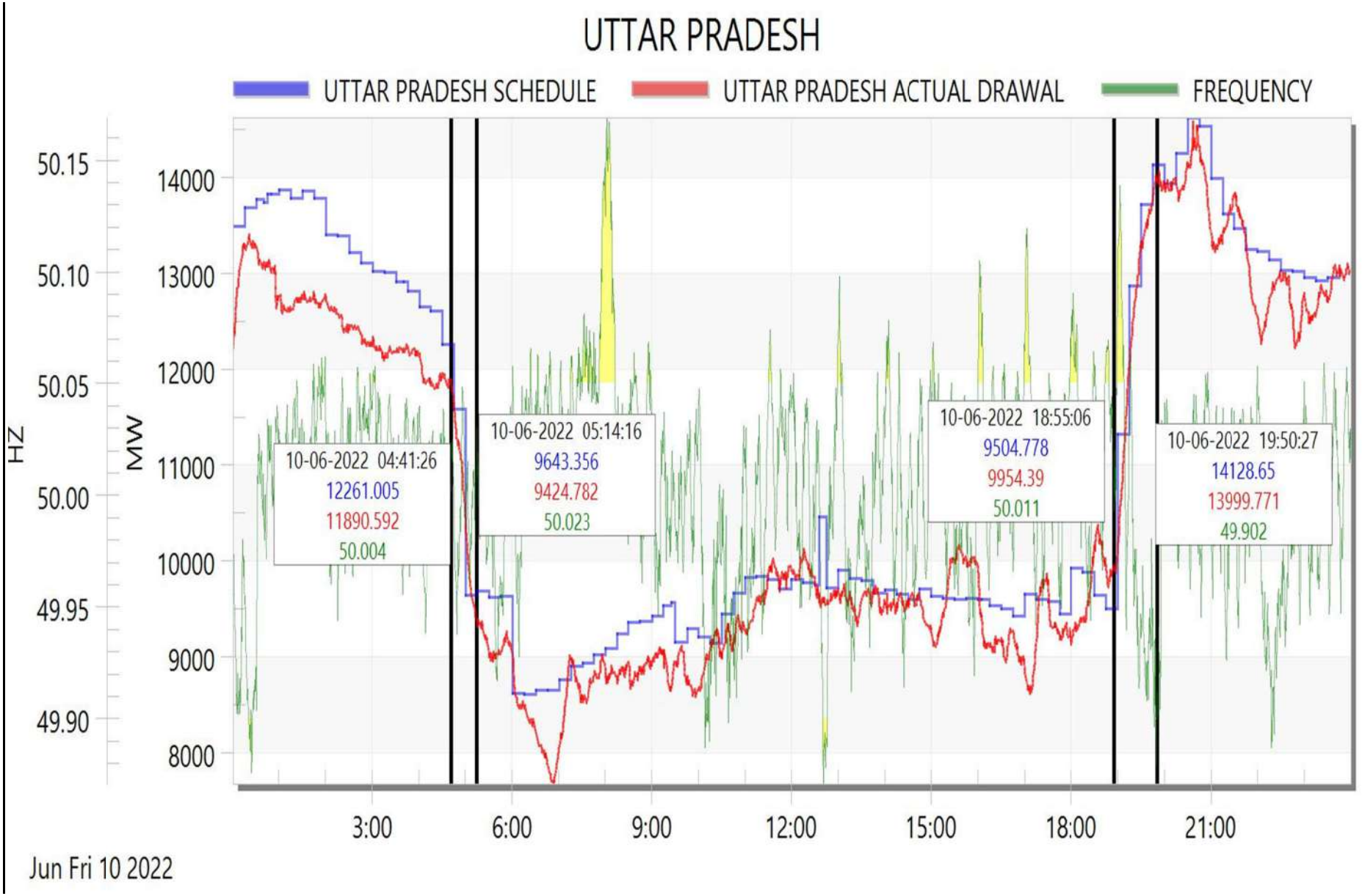
Jun Thu 9 2022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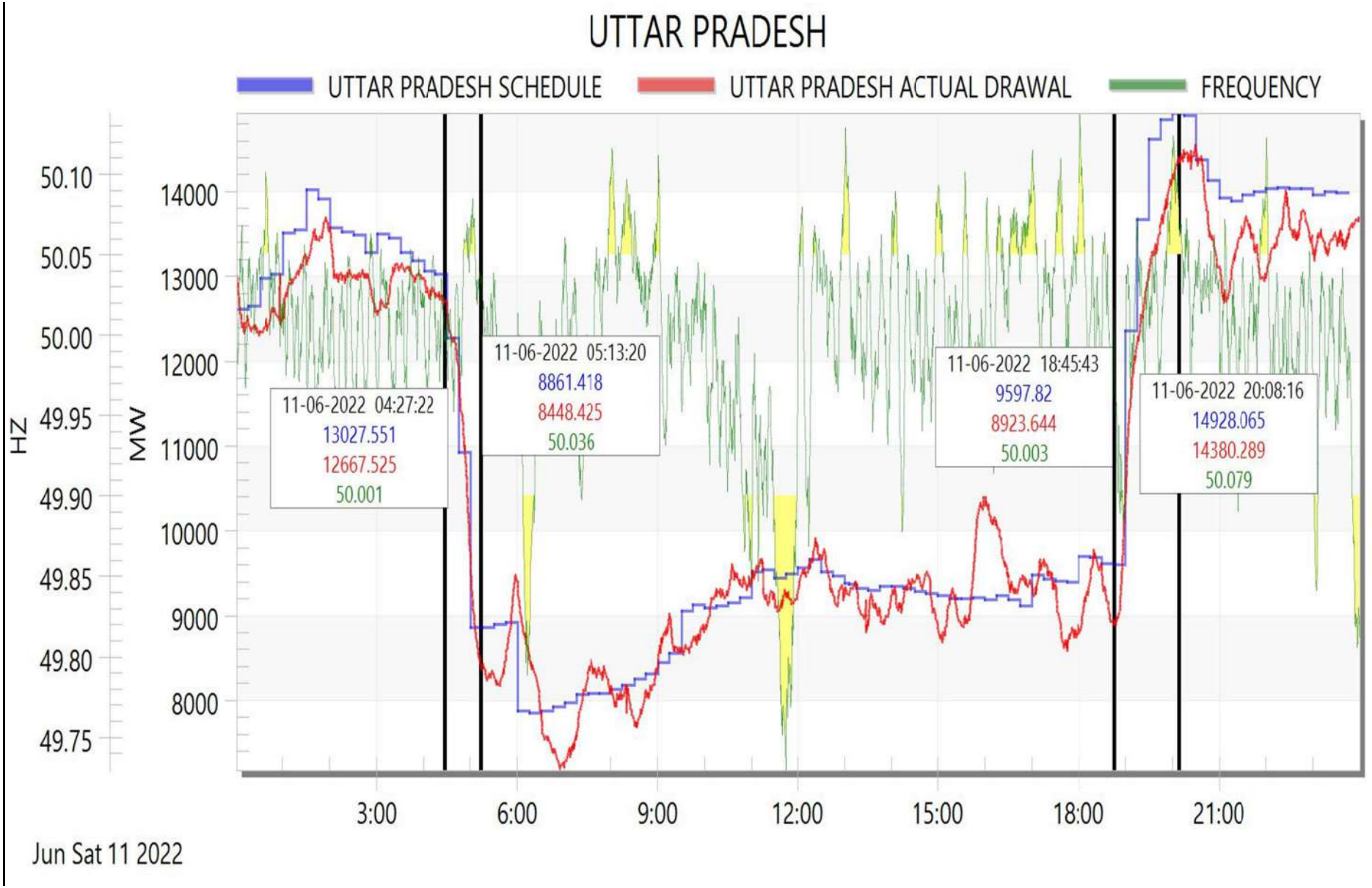
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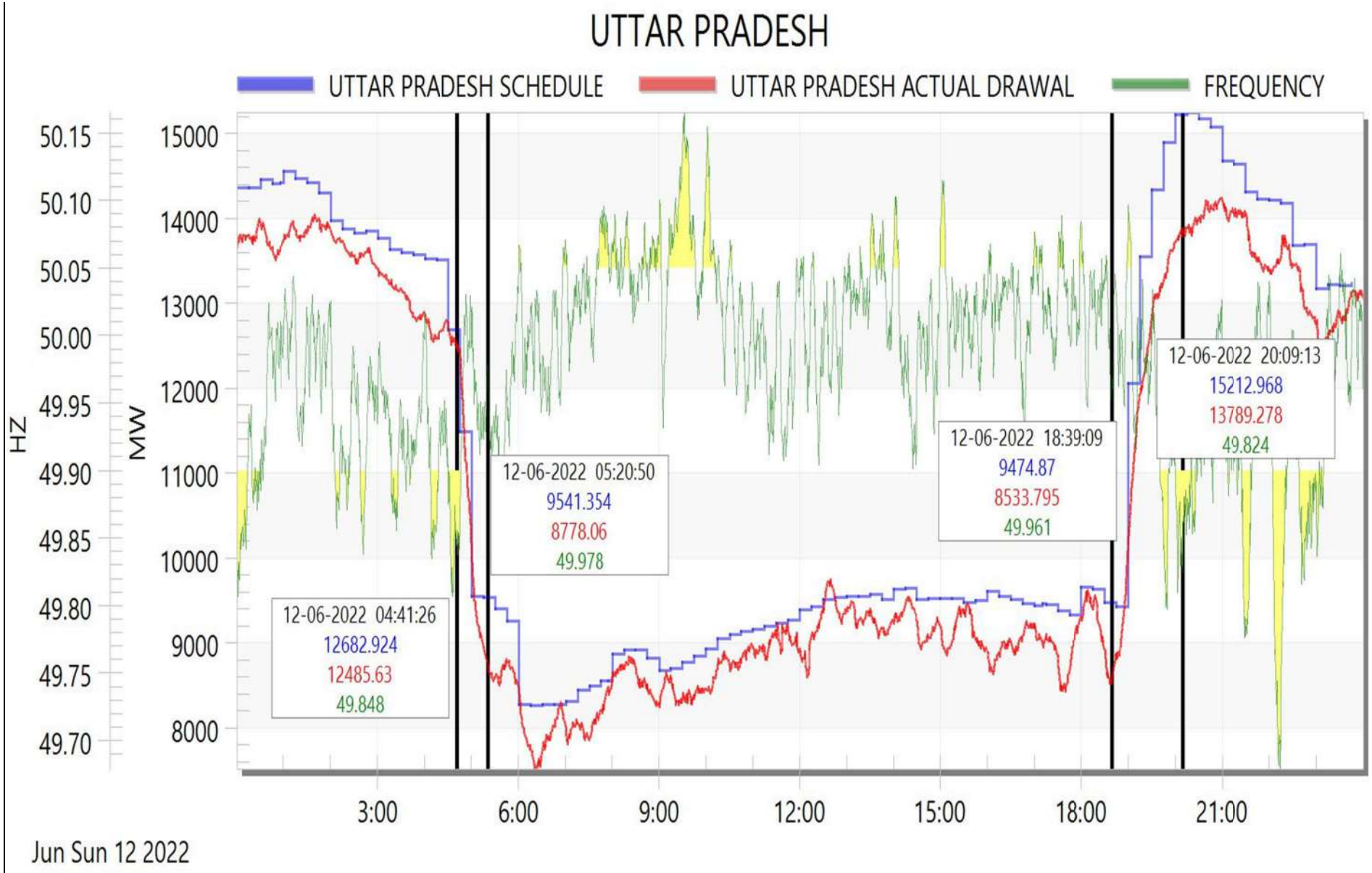
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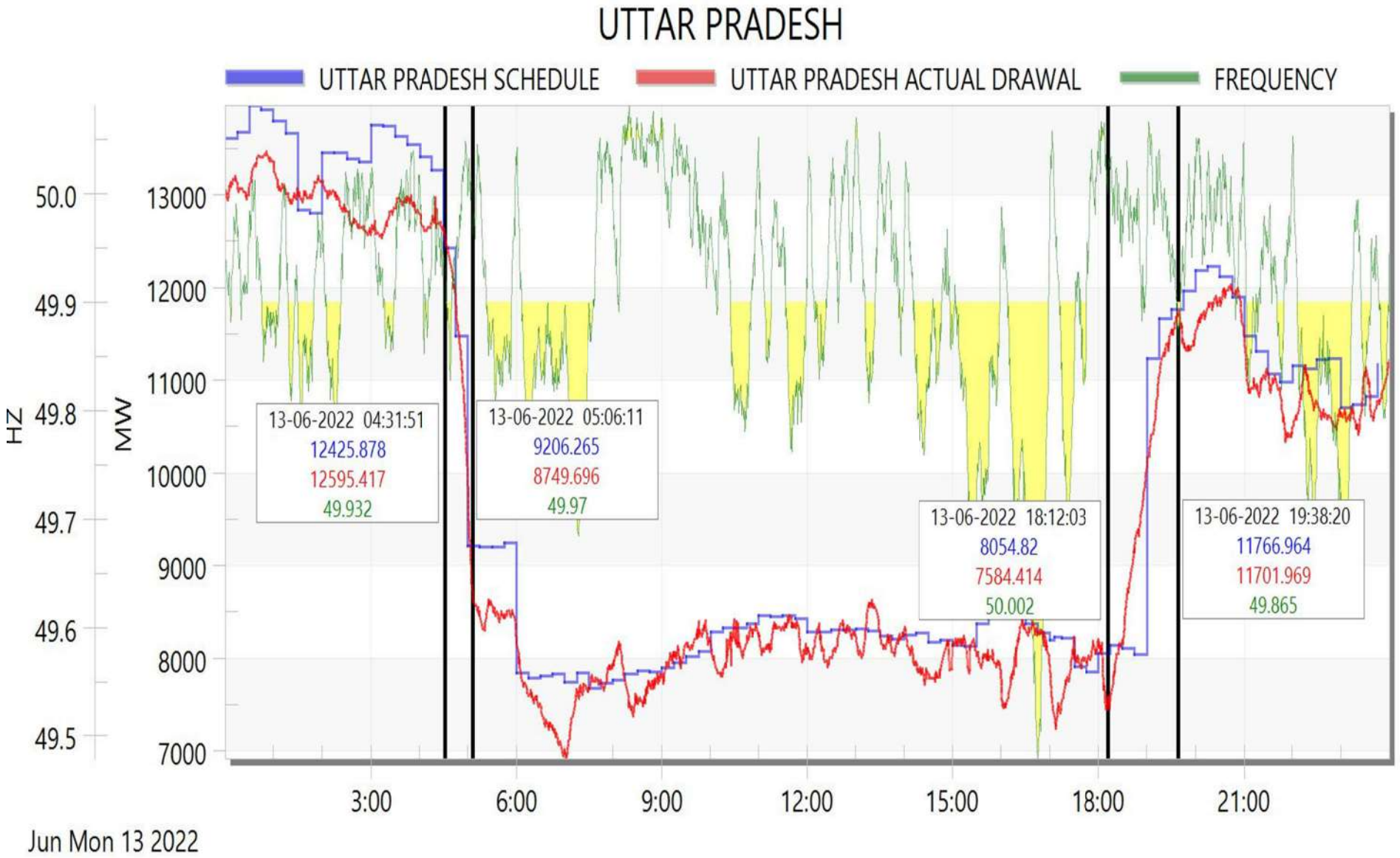
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Jun Mon 13 2022

National Load Despatch Centre

Import Capability of Uttar Pradesh for July 2022

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)	Long Term Access (LTA)/ Medium Term Open Access (MTOA) (MW)	Margin Available for Short Term Open Access (STOA) (MW)	Changes in TTC w.r.t. Last Revision	Comments
1st July 2022 to 31st July 2022	00-24	15100	600	14500	8420	6080		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, Obra, Mau, Sohawal (PG), Gorakhpur (UP), Sarnath, Lucknow (PG) ICTs							

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

National Load Despatch Centre
Import Capability of Rajasthan for July 2022

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)	Long Term Access (LTA)/ Medium Term Open Access (MTOA) (MW)	Margin Available for Short Term Open Access (STOA) (MW)	Changes in TTC w.r.t. Last Revision	Comments
1st July 2022 to 31st July 2022	00-24	6200	300	5900	3400	2500		https://sldc.rajasthan.gov.in/rrvpnl/scheduling/downloads
Limiting Constraints		N-1 contingency of 400/220kV Chittorgarh, Jodhpur, Bikaner, Ajmer, Merta and Bhinmal ICTs						

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

National Load Despatch Centre

Import Capability of Haryana for July 2022

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)	Long Term Access (LTA)/ Medium Term Open Access (MTOA) (MW)	Margin Available for Short Term Open Access (STOA) (MW)	Changes in TTC w.r.t. Last Revision	Comments
1st July 2022 to 31st July 2022	00-24	9100	600	8500	3000	5500		https://hvpn.org.in/#/atcttc
Limiting Constraints		N-1 contingency of 400/220kV ICTs at Deepalpur, Panipat(BBMB) and Kurukshetra(PG)						

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

National Load Despatch Centre
Import Capability of Delhi for July 2022

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)	Long Term Access (LTA)/ Medium Term Open Access (MTOA) (MW)	Margin Available for Short Term Open Access (STOA) (MW)	Changes in TTC w.r.t. Last Revision	Comments
1st July 2022 to 31st July 2022	00-24	7100	300	6800	4150	2650		
Limiting Constraints		N-1 contingency of 400/220kV Mundka, HarshVihar and Mandola ICTs.						

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

National Load Despatch Centre
Import Capability of HP for July 2022

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)	Long Term Access (LTA)/ Medium Term Open Access (MTOA) (MW)	Margin Available for Short Term Open Access (STOA) (MW)	Changes in TTC w.r.t. Last Revision	Comments
1st July 2022 to 31st July 2022	00-24	1400	100	1300	1400	-100		https://hpsldc.com/mrm_category/ttc-atc-report/
Limiting Constraints		N-1 contingency of 400/220kV Nallagarh ICTs. High loading of 220kV Nallagarh-Upernangal D/C and 220kV Hamirpur-Hamirpur D/C						

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

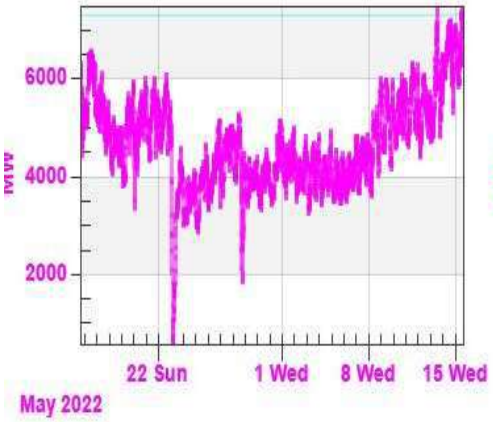
National Load Despatch Centre
Import Capability of Uttarakhand for July 2022

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)	Long Term Access (LTA)/ Medium Term Open Access (MTOA) (MW)	Margin Available for Short Term Open Access (STOA) (MW)	Changes in TTC w.r.t. Last Revision	Comments
1st July 2022 to 31st July 2022	00-24	1600	100	1500	1020	480		http://uksldc.in/transfer-capability
Limiting Constraints		N-1 contingency of 400/220kV Kashipur ICTs. High loading of 220kV Roorkee-Roorkee and 220kV CBGanj-Pantnagar lines						

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

Punjab Import



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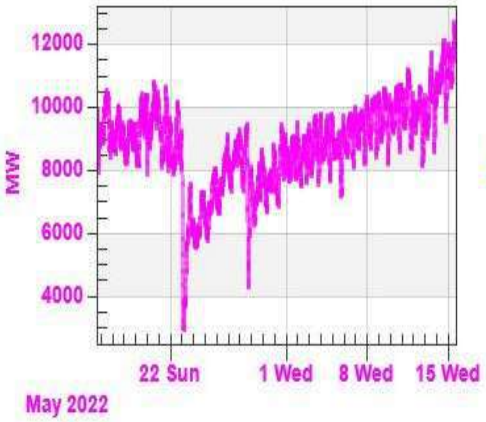

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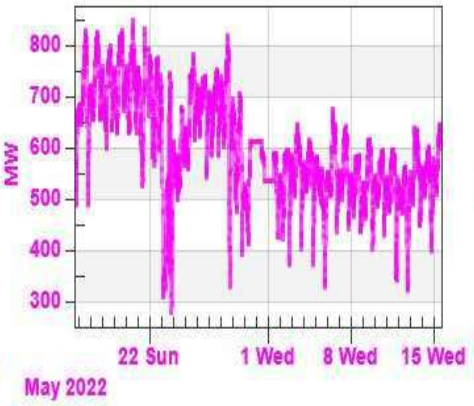

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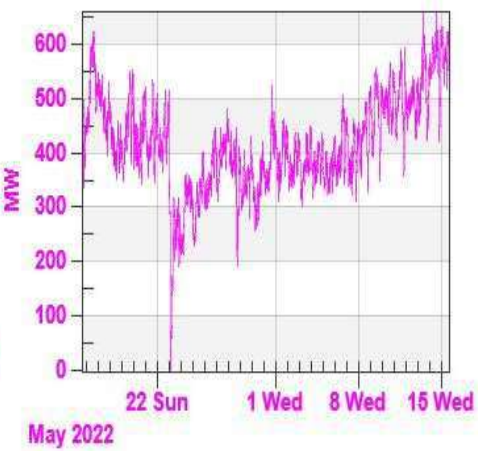

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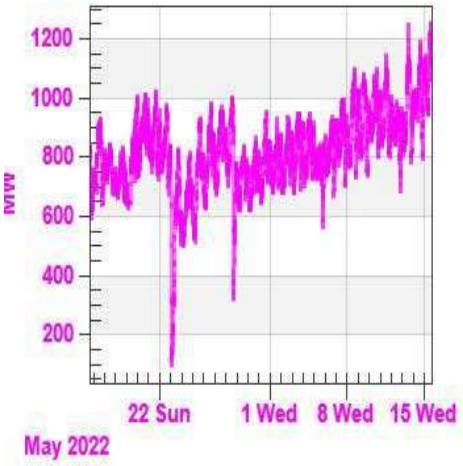

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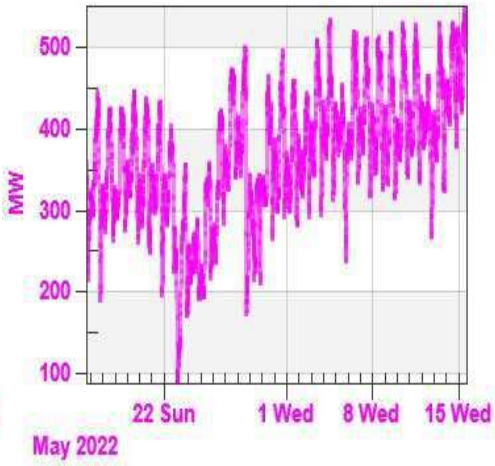

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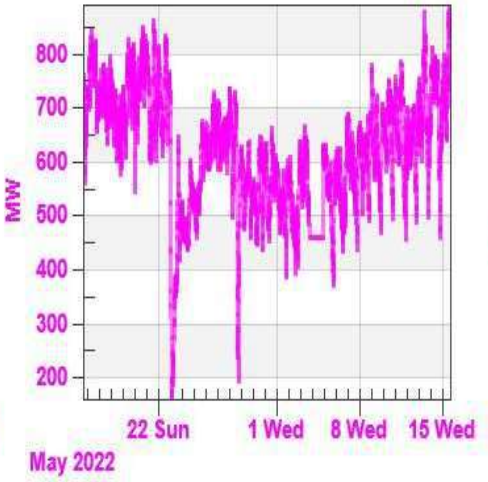

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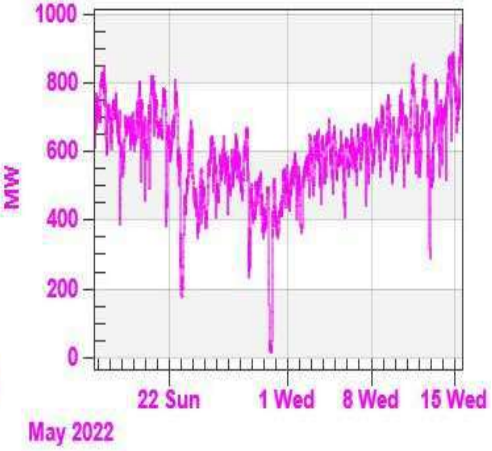

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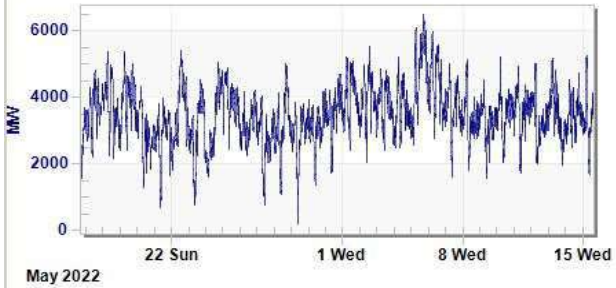

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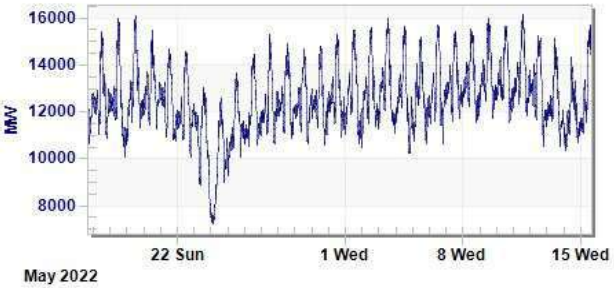

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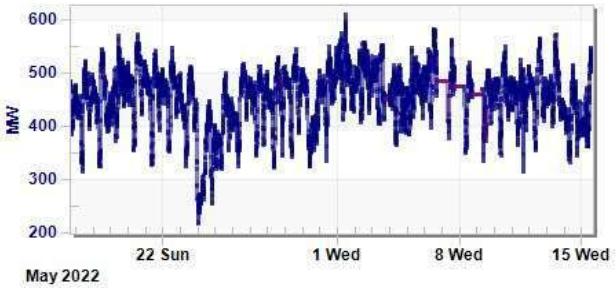

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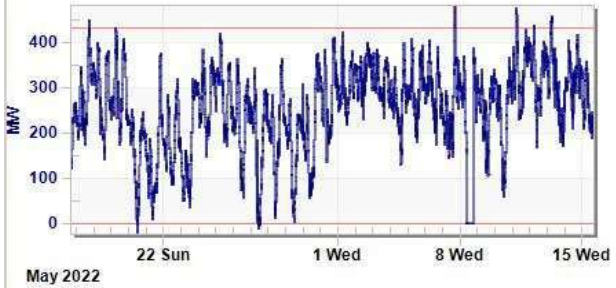

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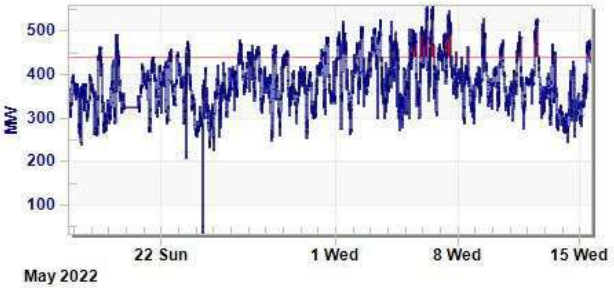

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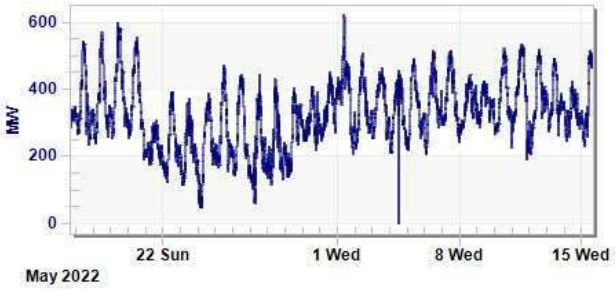

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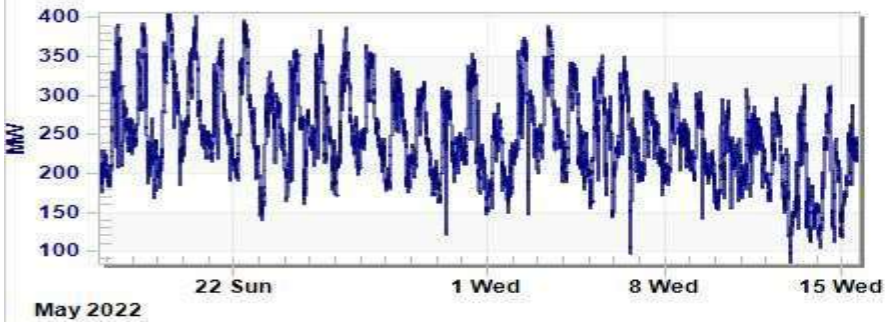

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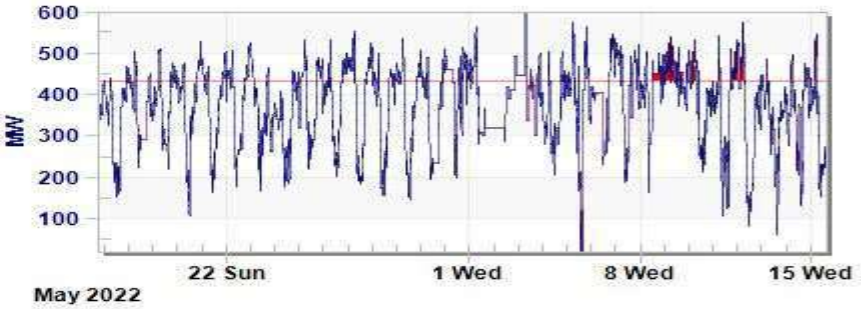

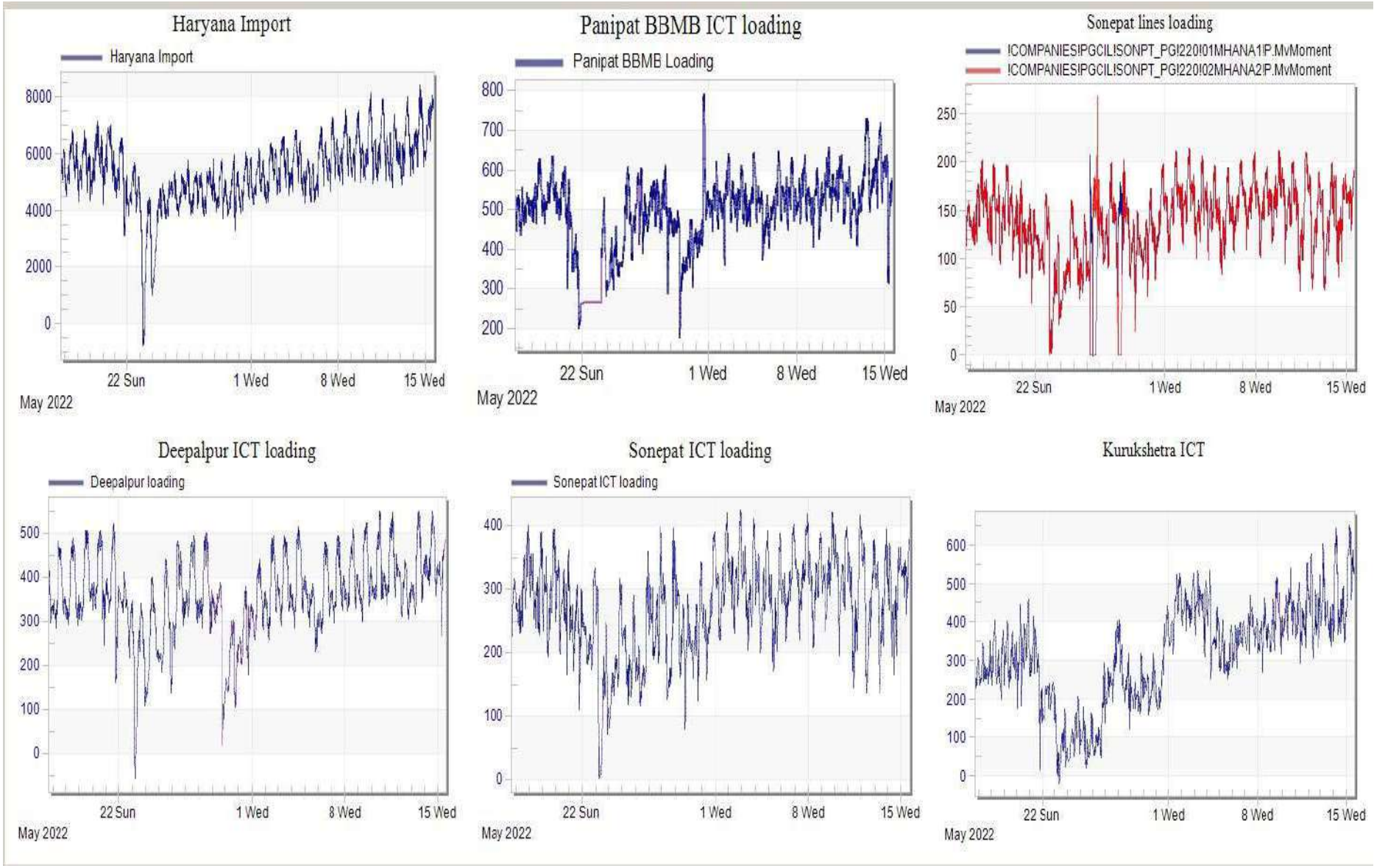
Haryana Import
Haryana Import
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Panipat BBMB ICT loading
Panipat BBMB Loading
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Sonepat lines loading
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!COMPANIES!PGCIL!SONPT_PG!220!02MHANA2!P.MvMoment
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Deepalpur ICT loading
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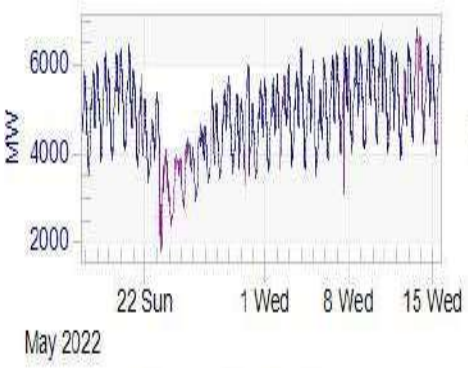
Delhi Import



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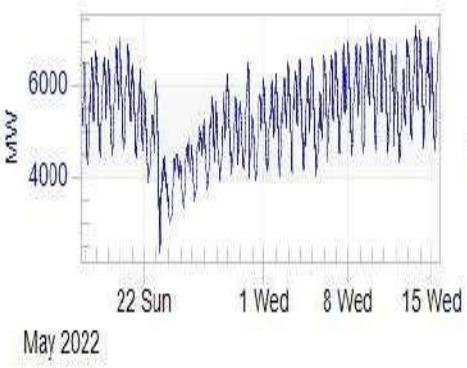

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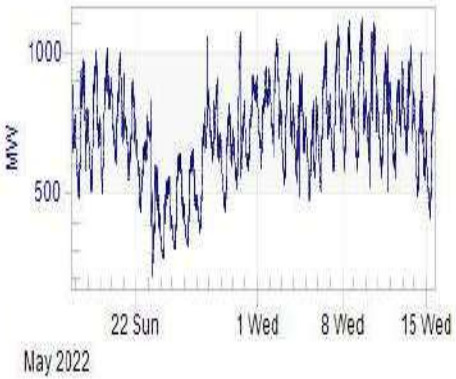

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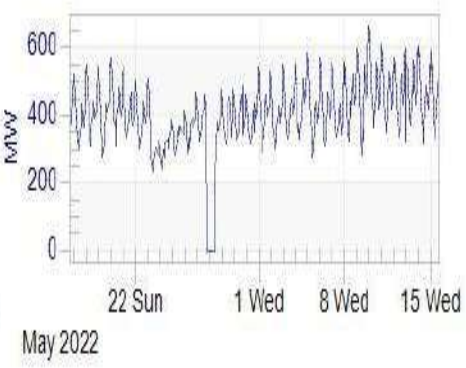

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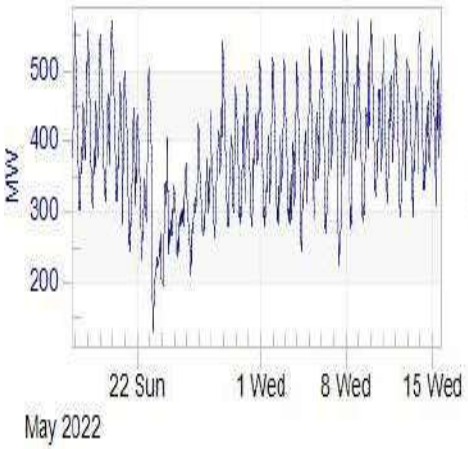

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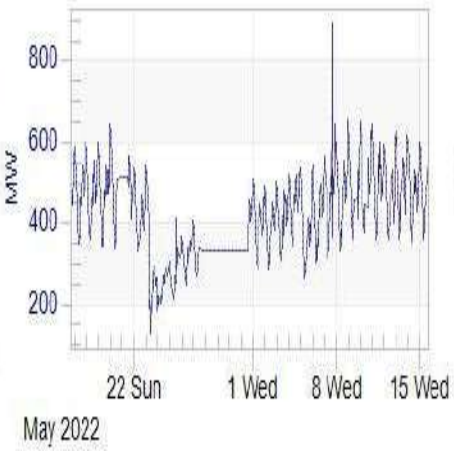

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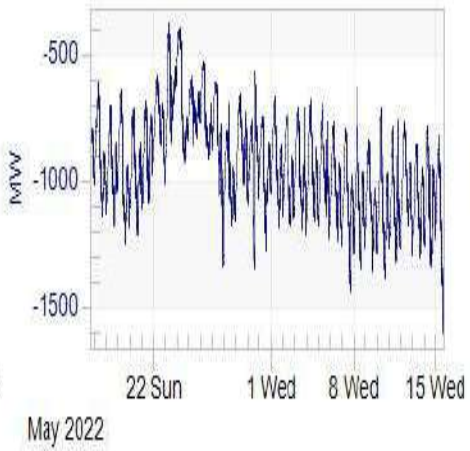

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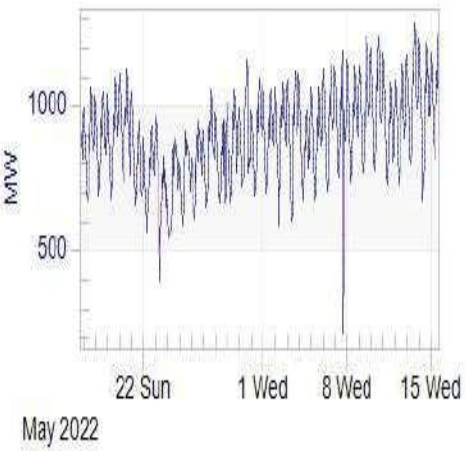

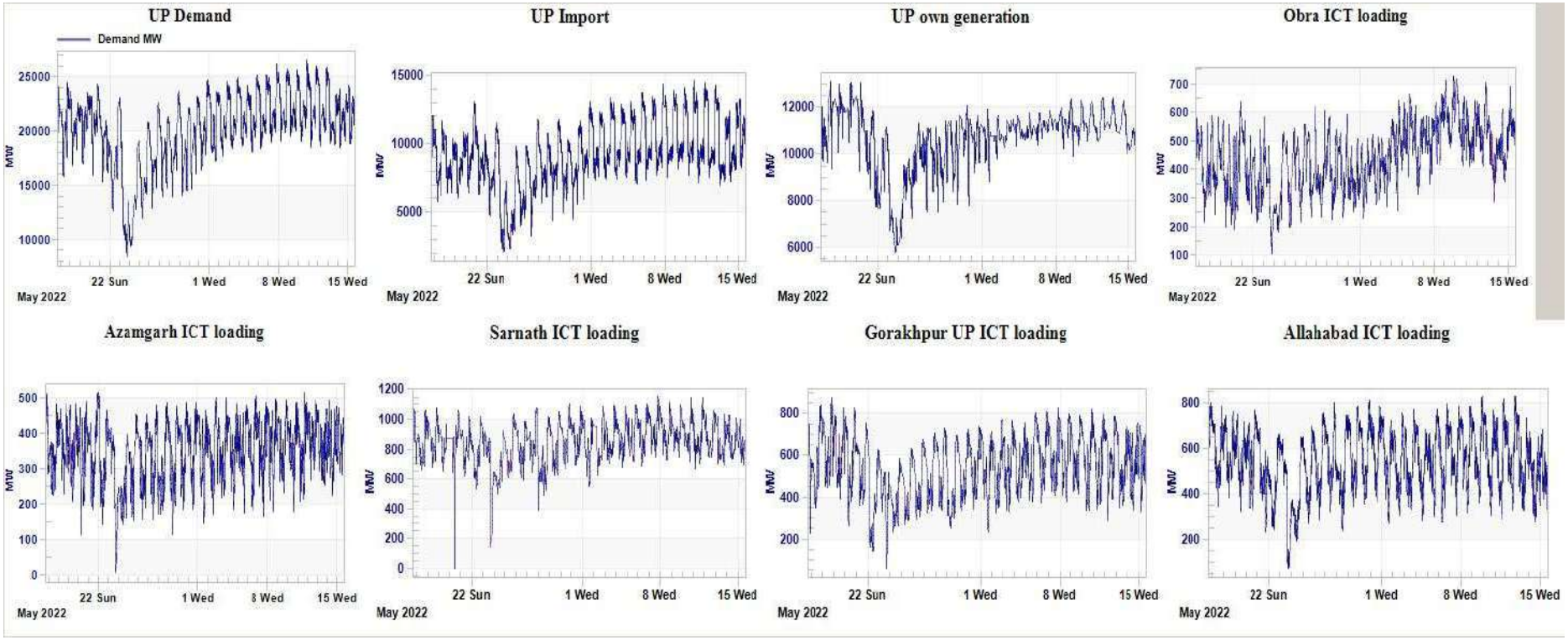
UP Demand
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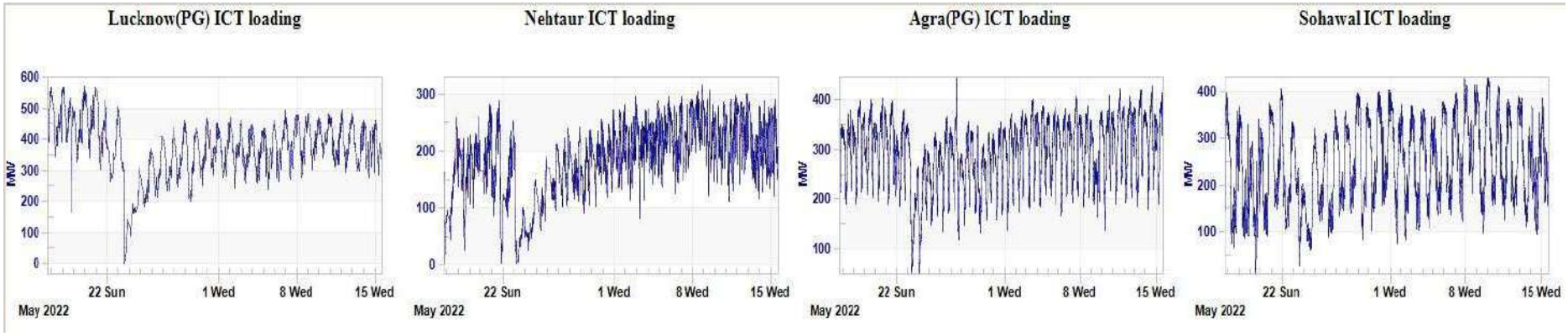
Allahabad ICT loading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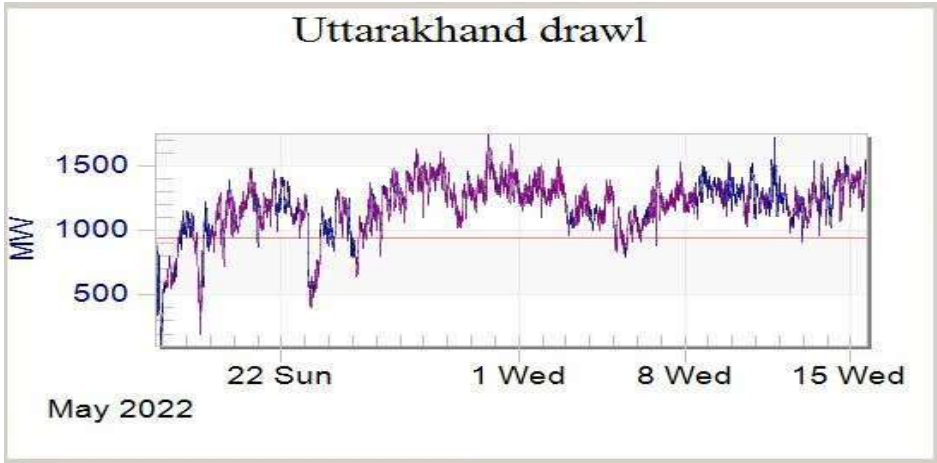
Agra(PG) ICT loading
Sohawal ICT loading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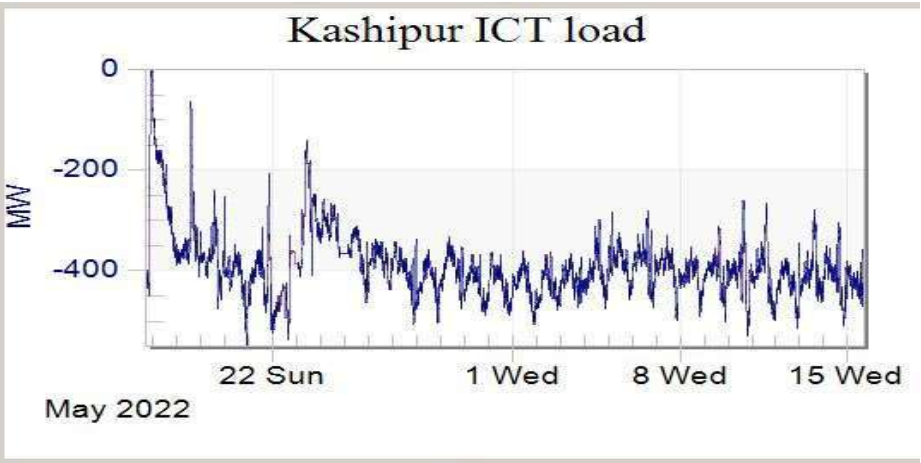
May 2022


Kashipur ICT load
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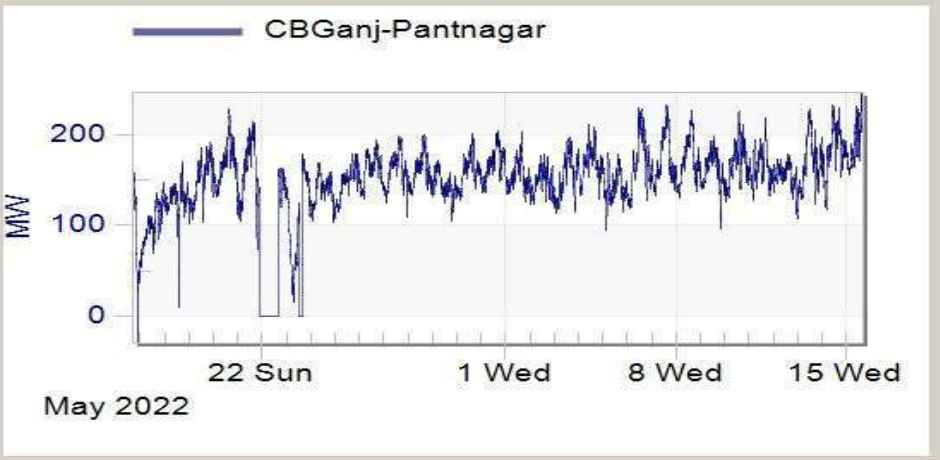
May 2022


CBGanj-Pantnagar
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May 2022

A. Details of Long Duration Transmission elements Outage :-

S.No	Element Name	Type	Owner	Outage			Reason / Remarks	Status updated during last OCC
1	400/220 kV 315 MVA ICT 2 at Mundka(DV)	ICT	DTL	20-09-2019	00:19	993	Due to fire in ICT	31.05.2022
2	80 MVAR Bus Reactor No 1 at 400KV Nathpa Jhakri(SJ)	BR	SJVNL	17-10-2019	12:58	965	Flashover/Fault in 80MVAR Bus Reactor cleared by Bus Bar Protection.	31.05.2022
3	400/220 kV 315 MVA ICT 1 at Muradnagar_1(UP)	ICT	UPPTCL	13-03-2020	02:46	818	Buccholz relay alarm and Local Breaker Backup protection operated. Tripped along with Hapur-Muradnagar line. Flags are not reset because of cable flashover.	TWC approved on 09.12.2021 for replacement with 500MVA new ICT . 30 Dec 2022
4	400/220 kV 500 MVA ICT 2 at Noida Sec 148(UP)	ICT	UPPTCL	19-08-2020	08:12	659	ICT tripped on REF protection. Transformer caught fire and got damaged.	30 June 2022
5	400 KV Kadarpur (GPTL) - Bus 1	BUS	GPTL	17-04-2021	13:18	417	E/S/D taken due to abnormal humming sound observed from 400KV B-phase BUS-1 CVT at Kadarpur.	31.05.2022
6	220 KV Sohawal(PG)-Gonda(UP) (UP) Ckt-1	Line	UPPTCL	12-08-2021	09:00	301	Emergency shutdown of line taken, as tower no. 34 is affected by flood.	30 May 2022
7	220 KV Sohawal(PG)-Bahraich(UP) (UP) Ckt-1	Line	UPPTCL	12-08-2021	09:12	301	Emergency shutdown of line taken, as tower no. 34 is affected by flood.	30 May 2022
8	50 MVAR Non-Switchable LR on Agra-Unnao (UP) Ckt-1 @Agra(UP)	LR	UPPTCL	28-10-2021	22:27	223	R and Y phase bushing damaged at Agra(UP).	31.05.2022. Bushing damaged , concerned written to OEM for inspection of reactor.
9	220 KV AGRA(PG)-FEROZABAD(UP) (UP) CKT-1	Line	UPPTCL	27-11-2021	09:55	194	Jumpering work for making Lilo point of 220 kv Firozabad(400)-Agra(765) PG line at 220 kv Tundla	30 Apr 2022. Jumpering work for making Lilo point of 220 kv Firozabad(400)- Agra(765) PG line at 220 kv Tundla. FTC process completed but yet to be charged due to PLCC issue at Tundla end.
10	400KV Bus 1 at Vishnuprayag(JP)	BUS	JPVL	02-12-2021	14:42	188	Bus bar protection operated at Vishnuprayag. Sparking in Bus Coupler CB.	30 Sep 2022
11	50 MVAR Bus Reactor No 1 at 400KV Moradabad(UP)	BR	UPPTCL	03-12-2021	22:22	187	R-phase bushing damaged.	
12	400/220 kV 240 MVA ICT 3 at Moradabad(UP)	ICT	UPPTCL	13-12-2021	22:38	177	Due to high DGA values, Hydrogen gas is above permissible limit.	30 Dec 2022. It has been informed that 315MVA ICT has been aproved
13	220/33 kV 125 MVA ICT 4 at Saurya Urja Solar(SU)	ICT	Saurya Urja	20-12-2021	20:15	170	ICT-4 tripped due to operation of of PRD, REF, Differential and Buchholz relay.	
14	50 MVAR BUS REACTOR NO 1 AT 400KV PANKI(UP)	BR	UPPTCL	29-01-2022	08:56	131	Replacement of 50 MVAR Bus reactor by new 125 MVAR Bus Reactor.	18.05.2022
15	765 KV ANPARA_D-UNNAO (UP) CKT-1	Line	UPPCL	08-02-2022	10:06	121	Shifting of Line Reactor from Anpara-D to Obra-C S/S (OCC 190)	30.05.2022. LILO of the line at Obra C under processing. Annexure-B documents awaited.
16	220 KV Kishenpur(PG)-Mir Bazar(PDD) (PDD) Ckt-1	Line	PDD JK	19-02-2022	21:45	109	Tower no. 170 collapsed.	31.05.2022
17	400 KV Parbati_3(NH)-Sainj(HP) (PKTCL) Ckt-1	Line	PKTCL	11-03-2022	03:21	90	Phase to earth fault R-N , Zone-1 from Parbati_3(NH). R-phase XLPE cable has been punctured between GIS and Pothead yard of Parbati-III PS.	
18	400/21 kV 776 MVA GT 7 at Suratgarh SCTPS(RVUN)	ICT	RRVPNL	15-03-2022	01:32	86	Due to failure of R-phase bushing of GT-7A.	31.05.2022
20	220 KV Charkhi Dadri(BB)-Khetri(RS) (BB) Ckt-1	Line	BBMB	04-04-2022	06:32	66	Bus-bar protection operated at Khetri(RS) due to B-phase CT burst of 220kV Khetri-Charkhi Dadri Ckt-I at Khetri(RS).	
21	220 KV KUNIHAR(HP)-PINJORE(HV) (HV) CKT-1	Line	HVPNL	04-04-2022	09:05	66	Destringing of conductor between towers T-331 to T-334 and T-338 to T-339 of 220 kV Kunihar-Pinjore ckt and stringing & sagging of conductor between T-331 to T-1 of 220kV Baddi-Kunihar ckt. and stringing & sagging of conductor between T-339 to T-5 of 220kV Baddi-Pinjore ckt for LILOing of 220kV Kunihar-Pinjore ckt. to 220/66/33/11kV Substation Baddi	
22	220 KV Anta(NT)-Lalsote(RS) (PG) Ckt-1	Line	POWERGRID	04-04-2022	12:31	65	Tripped due to mal-operation of master-trip relay at Anta end.	
23	411 TIE BAY - 400KV AGRA FATEHBAD-MATHURA (UP) CKT-1 AND 125 MVAR BUS REACTOR NO 1 AT 400KV AGRA FATEHBAD(UP)	BAY	UPPTCL	08-04-2022	18:22	61	To attend CT faulty alarm observed 411 tie bay CT.	
24	400/220 kV 315 MVA ICT 2 at Unnao(UP)	ICT	UPPTCL	17-04-2022	17:58	52	Tripped on Differential protection.	
25	220 KV Gazipur(DTL)-Shahibabad(UP) (UP) Ckt-2	Line	UPPTCL	30-04-2022	19:30	39	Line remains charge at No load from UP end. Manually open at 19:30 on 30/04/22 due bending of tower no. 4	
26	220 KV Gazipur(DTL)-Noida Sec62(UP) (UP) Ckt-1	Line	UPPTCL	30-04-2022	22:55	39	Tower tilted on one side at tower no 10 from Gazipur (DTL) end.	
27	125 MVAR Bus Reactor No 1 at 400KV Chamera_1(NH)	BR	NHPC	03-05-2022	09:33	37	Earth fault relay operated	
28	401A MAIN BAY - 400/66 KV 250 MVA ICT 1 AT HMEL (PS) (PSTCL) AND 400 KV HMEL (PS) - BUS 1 AT 400 KV HMEL (PS) (PSTCL)	BAY	PSTCL	12-05-2022	14:05	27	Transformer Differential protection operated.	
29	400/66 kV 250 MVA ICT 1 at HMEL (PS)	ICT	PSTCL	12-05-2022	14:05	27	Differential relay operated.	
31	403 MAIN BAY - 400/118 KV 253 MVA GT 2 AT BAWANA CCGTB(DTL) (DTL)	BAY	DTL	16-05-2022	13:30	23	To attend CB lock out.	
33	408 TIE BAY - 400KV MOGA-HISSAR (PG) CKT-1 AND 400/220KV 315 MVA ICT 4 AT MOGA(PG)	BAY	POWERGRID	17-05-2022	10:32	23	For retrofitting (overhauling) work	
36	70152T TIE BAY - 765KV PHAGI(RS)-BHIWANI(PG) (PG) CKT-2 AND 765/400KV 1500 MVA ICT 1 AT PHAGI(RS)	BAY	RRVPNL	20-05-2022	18:06	19	Due to damaged of 701-89BC-R isolator mechanism i.e Tie bay 701-52T. Both side isolator have been opened,Hence 701-52 A & 701-52B Circuit Breaker is operational condition & Tie bay of 701-Dia is under R&M work	
40	765/400 kV 1500 MVA ICT 2 at Hapur(UP)	ICT	UPPTCL	23-05-2022	05:31	17	Differential Protection operated	
41	50 MVAR Non-Switchable LR on Agra-Jaipur South (PG) Ckt-1 @Agra(PG)	LR	POWERGRID	23-05-2022	09:37	17	400kV Agra-Jaipur south ckt-1 manually hand tripped in emergency due to spark in Line reactor Isolator at Agra end at 0937 hrs, now the line isolator of reactor has been opened and line is ready to be charged without line reactor.	
44	220 KV Kursi road(UP)-Lucknow_1(PG) (UP) Ckt-2	Line	UPPTCL	23-05-2022	14:15	16	Shutdown required due to damage in tower location 2 of this ckt	
45	220 KV Kursi road(UP)-Lucknow_1(PG) (UP) Ckt-1	Line	UPPTCL	23-05-2022	14:15	16	Line tripped due to damage on tower no 2 of above circuit	

47	765 KV Bikaner(PG)-Khetri (PKTSL) (BKTL) Ckt-1	Line	BKTL	23-05-2022	18:50	16	Tripped on R-N fault during heavy wind storm in the in the Bikaner area.FLR:Bikaner-12.8 km/10.016kAkA,Khetri-163km.Line belongs to ADANI.Charging attempt failed at 22:46hrs from Bikaner end (tripped on SOTF)	

B. Details of Long Duration Generating Units Outage :-

S.No	Element Name	Type	Owner	Outage			Reason / Remarks	Status updated during last OCC
1	600 MW RGTPP(Khedar) - UNIT 2		HVPNL	02-03-2021	00:00	464	Existing turbine to be replaced. Issue of delivery of turbine from China.	01.09.2022
2	250 MW Chhabra TPS - UNIT 4		RRVPNL	09-09-2021	00:47	273	Due to Electrostatic precipitators (ESP) structure damage	
3	100 MW Koteshwar HPS - UNIT 1		THDC	04-11-2021	22:58	216	due to fault in GT	
4	108 MW Bhakra HPS - UNIT 1		BBMB	15-12-2021	12:05	175	Renovation Modernization and upgradation of capacity to 126MW	
5	200 MW Obra TPS - UNIT 13		UPPTCL	08-01-2022	06:36	152	High bearing vibration in turbine	
6	660 MW Meja TPS - UNIT 2		UPPTCL,NTPC	07-02-2022	18:59	121	Boiler tube leakage Boiler water wall under major repairs in progress.	15.06.2022
7	34 MW Delhi Gas Turbines - UNIT 9		DTL	12-02-2022	20:00	116	STG Governor oil leakage	
8	30 MW Delhi Gas Turbines - UNIT 5		DTL	12-02-2022	21:04	116	due to tripping of associated STG at 20:00 hrs	
9	660 MW Suratgarh SCTPS - UNIT 7		RRVPNL	15-03-2022	01:32	86	FAILURE OF R PHASE BUSHING OF GT-7A.	
10	600 MW Kalisindh TPS - UNIT 2		RRVPNL	08-04-2022	19:18	61	Due to Primary air (PA) Fan 2B high vibration problem. Hydrogen leakage problem in generator since 18.04.2022	
11	220 MW NAPS - UNIT 1		NPCIL	22-04-2022	00:31	48	Biannual Maintenance	
12	210 MW Unchahar TPS - UNIT 1		NTPC	28-04-2022	02:58	42	S/D facilitated to rectify the deteriorating condition of the turbine and other condenser tubes.	

पावर सिस्टम ऑपरेशन कॉर्पोरेशन लिमिटेड
(भारत सरकार का उद्यम)
POWER SYSTEM OPERATION CORPORATION LIMITED
(A Govt. of India Enterprise)
केन्द्रीय कार्यालय : 61, आई एफ सी आई टावर, 7,8 एवं 9वीं मंजिल, नेहरु प्लेस, नई दिल्ली -110019
Corporate Office : 61, IFCI Tower, 7,8 & 9th Floor, Nehru Place, New Delhi- 110019
CIN : U40105DL2009GOI188682, Website : www.posoco.in, E-mail : posococc@posoco.in, Tel.: 011- 40234672

Ref: NLDC/2022/SO/Bird_diverter

Date: 9th June 2022

To,

Fatehgarh Bhadla Transco Limited, B-9, Qutab Institutional Area, Katwaria Sarai, New Delhi-110 016	Sikar New Transmission Limited, B-9, Qutab Institutional Area, Katwaria Sarai, New Delhi-110 016
Sikar-II Aligarh Transmission Limited, B-9, Qutab Institutional Area, Katwaria Sarai, New Delhi-110 016	

Sub: Status of compliance of installation of Bird Divertor on Power Lines as directed by Hon'ble Supreme Court of India

Sir,

The Hon'ble Supreme court of India (SC) in order I.A. NO.85618 of 2020 (attached as Annex-I) against the writ petition no 838 of 2019 dated 19th Apr 2021 has directed the concerned to ensure the compliance of installing bird divertor within one year. The order directs to take steps required to protect two species of the birds namely the Great Indian Bustard (GIB) and the Lesser Florican, which are on the verge of extinction., Hon'ble SC has directed that " *In all cases where the overhead powerlines exist as on today in the priority and the potential GIB area the respondents shall takes steps forthwith to install divertors pending consideration of the conversion of overhead cables into underground powerlines. In all such cases where it is found feasible to convert the overhead cables into underground powerlines the same shall be undertaken and completed within a period of one year and till such time the divertors shall be hung from the existing powerlines.*"

Study team constituted by Ministry of Power to implement the order of the Hon'ble Supreme Court has submitted its report which was accepted in a joint meeting of MNRE and MoP at the Secretary

level. The major recommendation of the study report is to "*Exempt undergrounding of high voltage and extra high voltage lines i.e. 66 kV & above and allow overhead lines with installation of appropriate bird divertors*".

CEA has released the technical specifications of Bird flight divertor in January 2021 which is available on https://cea.nic.in/wp-content/uploads/pse___td/2021/01/Technical_Specifications_for_Bird_Flight_Diverter.pdf . CTU has furnished the list of powerlines falling under potential habitats of GIB as a part of submission in CERC order no. 136/TL/2021 which is attached as Annex-II.

It is noted that the list includes transmission systems owned by your organization. In this regard, it is requested to furnish the status report on compliance of order of Hon'ble SC regarding installing bird divertors on the EHV lines which are already commissioned. Compliance of the above order shall be ensured for the transmission systems under commissioning before seeking approval for first-time charging.

Encl: As Above

Thanking you,

Yours faithfully,

Debasis De
Executive Director, NLDC

Copy to:

1. Chairperson, Central Electricity Authority, Sewa Bhawan, R K Puram, New Delhi
2. Secretary, CERC
3. Member (GO & D), Central Electricity Authority, Sewa Bhawan, R K Puram, New Delhi
4. Member Secretary, NRPC/WRPC
5. CMD, POSOCO, B-9, Qutub Institutional Area, Katwaria Sarai, New Delhi
6. JS (R&R), Ministry of Power, New Delhi
7. COO, CTUIL, Saudamini, Plot No.2, Sector-29 Gurugram 122001, Haryana
8. Chief Engineer, NPC, CEA

REPORTABLE

IN THE SUPREME COURT OF INDIA

CIVIL ORIGINAL JURISDICTION

I.A. NO.85618 OF 2020

IN

WRIT PETITION (CIVIL) NO.838 OF 2019

M.K. Ranjitsinh & Ors. ..... Petitioner(s)

Versus

Union of India & Ors. ....Respondent(s)

O R D E R

1. The writ petition is filed in the nature of public interest seeking to protect two species of birds namely the Great Indian Bustard ('GIB' for short) and the Lesser

Florican, which is on the verge of extinction. The existence of overhead power lines is stated to have become a hazard due to which the said species of birds on collision are getting killed. In the pending writ petition, the application in I.A. No.85618/2020 is filed seeking interim directions to direct the State of Rajasthan (respondents No.5 and 6) and State of Gujarat (respondents No.9 to 11) to ensure predator proof fencing, controlled grazing in the enclosure development and to direct the said respondents not to permit installation of overhead power lines and also not permit further construction of windmills and installation of solar infrastructure in priority and potential habitat as identified by the Wildlife Institute of India. The petitioner is also seeking a direction to the respondents to install divertors for the powerlines which has been listed in the application.

2. The very subject matter indicates that though such directions are sought against the respondents, the litigation is not adversarial in nature as it is community interest. In fact, the petitioners being environmentalists, are seeking to protect the rare birds which are dwindling in number. It is contended that GIB is one of the heaviest flying birds in the

world, about a meter in height and wing span of around seven feet. It has disappeared from 90 per cent of habitat except parts of Rajasthan and Gujarat which is to be protected. According to the petitioners, overhead power lines are the biggest threat to the survival of the GIBs. The Wildlife Institute of India (WII) in its Report "Power Line Mitigation, 2018" has stated that every year 1 lakh birds die due to collision with power lines. The Report concluded that unless power line mortality is mitigated urgently, extinction of GIBs is certain. Surveys conducted by Wildlife Institute of India (WII) in Thar covering 80 km of power lines repeated 7 times over a year found 289 carcasses of around 30 species, including the Great Indian Bustard (GIB). The study estimated 3 bird mortalities/km/month for low-tension lines, 6 bird mortalities/km/month for high-tension lines, and about 1 lakh birds/per year within a 4200 sq.km area in/around Desert National Park, Rajasthan. In terms of GIB, 6 mortalities have been recorded in Thar during 2017-20, all due to high-tension transmission lines – some of them connected to wind turbine. Therefore, petitioner seeks undergrounding all future overhead power lines; selected

power lines in priority GIB habitat and installation of divertors in potential habitat.

3. In fact, it is admitted by the Ministry of Power, Union of India in their affidavit dated 15.03.2021 as follows: -

> "The Great Indian Bustard ("GIB") lacks frontal vision. Due to this, they cannot detect powerlines ahead of them, from far. As they are heavy birds, they are unable to manoeuvre across power lines within close distances. Thus, they are vulnerable to collision with power lines. In case of low voltage lines, electrocution is often the cause of death due to smaller phase to phase separation distance. High voltage lines do not cause death due to electrocution but cause death due to collision."

4. But, this Court while considering IA Nos.1433 and 1477 of 2005 in the case of ***T.N. Godavarman Thirumulpad Vs. Union of India & Ors.*** (2012) 3 SCC 277 has observed as hereunder:

> "17. Environmental justice could be achieved only if we drift away from the principle of anthropocentric to ecocentric. Many of our principles like sustainable development, polluter-pays principle, intergenerational equity have their roots in anthropocentric principles. Anthropocentrism is always human interest focussed and that non-human has only instrumental value to humans. In other words, humans take precedence and human responsibilities to non-human based benefits to

> humans. Ecocentrism is nature-centred where humans are part of nature and non-humans have intrinsic value. In other words, human interest does not take automatic precedence and humans have obligations to non-humans independently of human interest. Ecocentrism is therefore life-centred, nature-centred where nature includes both humans and non-humans. The National Wildlife Action Plan 2002-2012 and the Centrally Sponsored Integrated Development of Wildlife Habitats Scheme, 2009 are centred on the principle of ecocentrism."

In that context while taking note of the contention of the State relating to lack of funds, reference was made to the Centrally Sponsored Integrated Development of Wildlife Habitats Scheme, 2009 which provides for financial sharing between Centre and State. Though taken note in the context of conservation of wild buffalo the pattern of funding was taken note in para-23 which provides for 100% central assistance in respect of GIB, for both recurring and non-recurring items of expenditure.

5. Further this Court in the case of ***Centre for Environmental Law, World Wide Fund – India Vs. Union of India & Ors.***, (2013) 8 SCC 234 while considering the protection and conservation of endangered

species has observed as hereunder:

> "45. We may point out that there has been wide-ranging discussions and deliberations on the international platforms and conferences for re-building of certain principles laid down in the earlier conventions on the Principles of Sustainable Development. The United Nations Commission on Environment and Development defined the "sustainable development" as follows:
>
> "Sustainable development is the development that meets the needs of the present without compromising the ability of future generations to meet their own needs." (World Commission on Economic Development [WCED], 1987 : 43)

> 46. Sustainable development, it has been argued by various eminent environmentalists, clearly postulates an anthropocentric bias, least concerned with the rights of other species which live on this earth. Anthropocentrism is always human interest focussed thinking that non-human has only instrumental value to humans, in other words, humans take precedence and human responsibilities to non-human are based on benefits to humans. Ecocentrism is nature-centred, where humans are part of nature and non-humans have intrinsic value. In other words, human interest does not take automatic precedence and humans have obligations to non-humans independently of human interest. Ecocentrism is, therefore, life-centred, nature-centred where nature includes both humans and non-humans."

"48. Article 21 of the Constitution of India protects not only the human rights but also casts an obligation on human beings to protect and preserve a species becoming extinct, conservation and protection of environment is an inseparable part of right to life. In *M.C. Mehta* v. *Kamal Nath* [(1997) 1 SCC 388] , this Court enunciated the doctrine of "public trust", the thrust of that theory is that certain common properties such as rivers, seashores, forests and the air are held by the Government in trusteeship for the free and unimpeded use of the general public. The resources like air, sea, waters and the forests have such a great importance to the people as a whole, that it would be totally unjustified to make them a subject of private ownership. The State, as a custodian of the natural resources, has a duty to maintain them not merely for the benefit of the public, but for the best interest of flora and fauna, wildlife and so on. The doctrine of "public trust" has to be addressed in that perspective.

49. We, as human beings, have a duty to prevent the species from going extinct and have to advocate for an effective species protection regimes. NWAP 2002-2016 and the Centrally-sponsored scheme, 2009 indicate that there are many animal species which are close enough to extinction and some of the other species have already disappeared from this earth. No species can survive on the brink of extinction indefinitely and that the continued existence of any species depends upon various factors like human-animal conflict, epidemics, forest fire and other natural calamities, etc."

The State as well as the Central Government therefore,

have a duty cast to preserve the endangered species and as such the expenses incurred will have to be provided by them either under the schemes available or by earmarking the same in such manner. Needless to mention that in the instant case the preservation is by undergrounding the powerlines and in that context if cost is incurred, it would also be permissible to pass on a portion of such expenses to the ultimate consumer subject to approval of the Competent Regulatory Authority.

6. The respondents though are sensitive to the issue, have contended that the high-voltage lines do not cause GIB deaths due to electrocution but cause death due to collision. It is contended that the underground high-voltage line is not technically feasible due to several factors such as (i) high cost (ii) high downtime to repair any failed cable (iii) non-availability of cables at 765 Kv level and (iv) increase in the number of joints with length of run. The petitioners/applicants in order to controvert the same and contend that the undergrounding of high-

voltage line is not a novel move but has been undertaken in other cases, have referred to the tender notification issued by Power Transmission Corporation of Uttarakhand Limited for 220 KV transmission line and the one issued by Delhi Transport Limited for 220 KV underground cable.

7. In addition, the petitioners have also referred to the invitation of public comments for laying underground cable transmission line of 220 KV by the Government of India, Ministry of Road Transport and Highways. The report published by the Power Grid Corporation is referred to indicate that the undergrounding of 220 KV power line is possible and is being done in India. It is specifically contended that the 10 km long power lines were made underground by GETCO for the safety of Greater Flamingos in the Khadir Region of Kutch. Similar such instances of underground power lines being laid is also referred by Mr. Shyam Divan, learned senior counsel for the petitioner. Ms. Aishwarya Bhati, learned ASG and Dr. Manish Singhvi, learned senior counsel

appearing on behalf of the respondents however sought to indicate that the instances referred, wherein the tender notifications were issued for underground power lines cannot be made comparable in all cases inasmuch as the same would be possible depending on the area, terrain and the distance for which such cable line is to be laid which cannot be of universal application.

8. In that background, keeping in view, the sustainable development concept and on striking a balance the protection of the rare species of birds is essentially to be made, the effort being to save every bird while at the same time allowing transmission of power in an appropriate manner. Even as per the study/survey conducted by the Wildlife Institute of India, it would not be feasible to lay underground power cables in certain areas and the conversion of the already existing cables also cannot be made in certain locations. In such of the locations, it is recommended that 'bird divertors' be installed on the existing power lines and the undergrounding of the new power line wherever technically feasible in the vicinity of the habitats of the

rare species of birds be undertaken.

9. The report dated 11.07.2019 was submitted by the Wildlife Institute before the National Green Tribunal to that effect and para 4.2 of the report reads as hereunder:

> "4.2. Mitigate all power transmission lines passing through priority bustard habitats identified by WII (Please refer Annexure 10) by undergrounding cables (where technically/technologically feasible) or installing bird divertors to make them prominent to birds. The priority areas where this intervention is required has been mapped by the Wildlife Institute of India and a technical-cum-financial proposal has been submitted to RVPNL for necessary approvals from Rajasthan Energy Department for mitigation. This action must be expeditiously implemented in the short-term (1-3 years), as power-line mortality is currently the biggest threat to the species."

10. In addition to the death of the birds due to collision and electrocution, the conservation strategy also requires protecting the eggs of the said species of birds and the same being transferred to breeding centres for the purpose of hatching. In that regard, for conservation, the habitat restoration and for making it predator proof, appropriate fencing is to be provided to the breeding

grounds. In that regard, pictorial representation of the priority and potential area is indicated in Annexure A-7 (page 74) of I.A. No.85618/2020 which is also depicted here below.

11. In the above background, there cannot be disagreement whatsoever that appropriate steps are required to be taken to protect the said species of birds. In that view, insofar as the existing overhead powerlines are concerned the respondents shall take steps forthwith to install divertors and in respect of existing overhead powerlines all future cases of installing the transmission lines a study shall be conducted with regard to the feasibility for the lines to be laid underground. In all such cases where it is feasible, steps shall be taken to lay the transmission line underground. For the lines to be laid in future if as per the technical report the overhead line alone is feasible and the same is ratified by the Committee, in such event the installation of the divertors shall also be a condition attached in the contract to be entered with generating companies. Insofar as, the cost incurred in the said process, the concerned respondents

No. 5 to 8 and 9 to 11 shall work out and provide for the same and the respondents No.1 to 4 aid in this regard. It would be open to them to muster the resources in accordance with law. In cases where the power generators are required to bear the additional amount adding to the cost of production, it would be open to regulate the manner in which the cost would be mitigated in accordance with contractual terms. Irrespective of the cost factor the priority shall be to save the near extinct birds.

12. In fact, a few suggestions were made in the course of arguments, as to how financial resources can be mobilised. One of the options that could be explored, is to invite the attention of each electricity utility engaged in the generation of power, to Section 135 of the Companies Act, 2013, which imposes corporate social responsibility upon companies having a specified net worth or turnover or net profit. Section 166(2) of the Companies Act, 2013 ordains the Director of a Company to act in good faith, not only in the best interest of the Company, its employees, the

shareholders and the community, but also for the protection of environment. The word "environment", though not defined in the Companies Act, has to be given the meaning assigned to it under the Environment (Protection) Act, 1986. Section 2(a) of the Environment (Protection) Act, 1986, defines the word "environment" to include the *"inter-relationship which exists among and between water, air and land, and human beings, other living creatures, plants, micro-organisms and property"*

Moreover, with the implementation of the Compensatory Afforestation Fund Act, 2016 (CAF, 2016), substantial funds are available with the National and State Authorities. Sections 4, 5 and 6 of the Act, provide for the utilisation of the fund for measures to mitigate threats to wildlife. The State of Rajasthan has already set up a Compensatory Afforestation Fund Management and Planning Authority (CAMPA) on 12.11.2009. Rule 5(2)(i) of these Rules permit the use of the State Fund for the improvement of wildlife habitat. It appears, according to the petitioners that a sum of Rs.47,436 crores, out of a

total of Rs.54,685 crores CAMPA Fund have been transferred by the Union Environment Ministry to the States for afforestation projects.

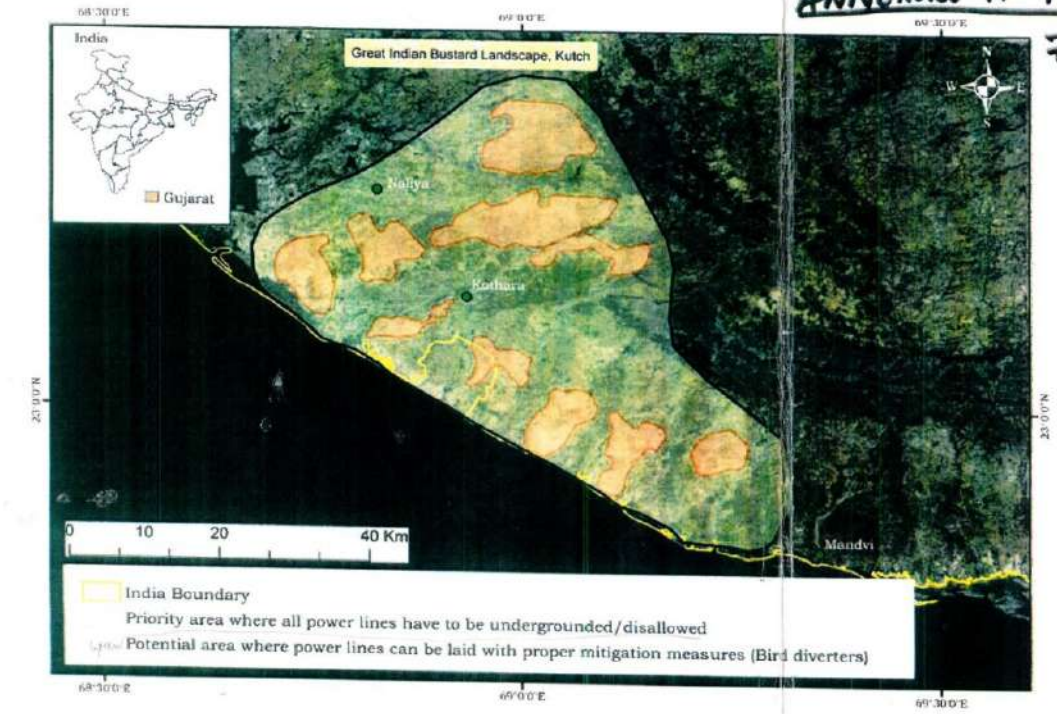
13. With regard to the conservation of the habitat to secure the safety of the eggs laid by the birds, the area earmarked and indicated as islands and shown in Annexure-A-7 and in light colour in sketch here below shall be fenced and protected from invasion by predators so that the eggs laid in these areas are protected. The power supply line regarding which underground passage is to be made should also avoid these areas.

14. In the light of the contentions urged on this aspect of the matter, we are conscious that the laying of the underground power line more particularly of high-voltage though not impossible, would require technical evaluation on case-to-case basis and an omnibus conclusion cannot be reached laying down a uniform method and directions cannot be issued unmindful of the fact situation. Though that be the position the consensus shall be that all low voltage powerlines to be laid in the priority and potential habitats of GIB shall in

all cases be laid underground in future. In respect of low voltage overhead powerlines existing presently in the priority and potential habitats of GIB, the same shall be converted into underground powerlines. In respect of high-voltage powerlines in the priority and potential habitats of GIB, more particularly the powerlines referred in the prayer column of I.A. No.85618/2020 and indicated in the operative portion of this order shall be converted into underground power line. The potential and priority area in Kutch and Thar respectively are as per the sketch shown below:

ANNEXURE A-7

79



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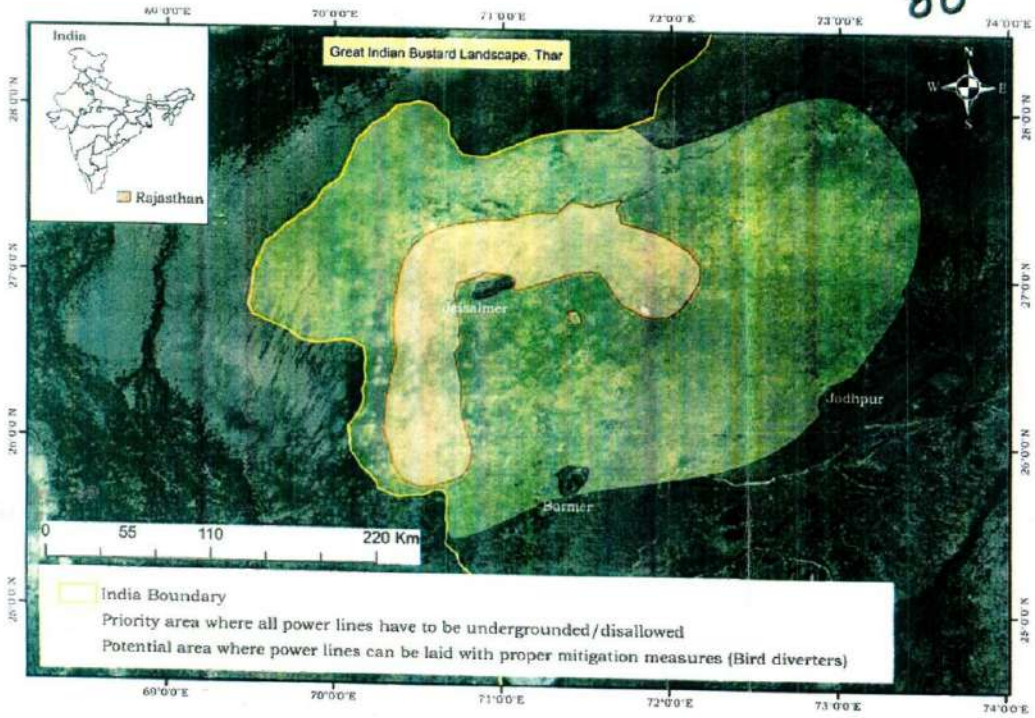
80



//TRUE COPY//

While considering the laying of underground power line the said habitats shall be kept in perspective and steps be taken for the safety of the GIB in the said habitat.

15. As already taken note above, the laying of high-voltage underground power line would require expertise to assess the feasibility of the same. For this specific purpose of assessing the feasibility after taking into consideration all technical details, we deem it proper to constitute a committee consisting of the following members:

(i) Dr. Rahul Rawat,
Scientist,
Room No.021, Block-14,
Ministry of New and Renewable Energy,
CGO Complex, Lodi Road,
New Delhi.

(ii) Dr. Sutirtha Dutta,
Scientist,
Wildlife Institute of India,
Dehradun.

(iii) Dr. Devesh Gadhavi,
Deputy Director,
The Corbett Foundation.

The above committee may also obtain technical reports if need be, from experts in the field of electricity

supply to arrive at their decision. The Government of India shall provide all assistance to the Committee.

16. The details of the powerlines from Kutch for installation of bird divertors is as follows:

a) List of powerlines from Kutch for installation of divertors	**Capacity**
1) Kukdau to Vingaber (8.86 Km)	Unknown
2) Vingaber to Lala (4.84 Km)	Unknown
3) Agriculture area near highway NH-41 (0.53 KM)	Unknown
4) Agriculture area near highway NH-41 (0.86 KM)	Unknown
5) Khirsara village to Khotara town (3.42 Km)	Unknown
6) Prajau Substation to Prajau Village on road side (2.81 Km)	Unknown
7) Part of Bhamedi to Naliya (4.44 Km)	Unknown
8) Part of Fulay vandh to Naliya-Jakhau Road (10.9 Km)	Unknown
9) Part of Kothara Naliya line (9.1 Km)	Unknown
10) Part of Kothara-Naliya Line (6.90 km)	Unknown
11) Part of Vanku to Fulay Vandh (6.25 km)	Unknown

The details of the powerlines for installation of divertors from Rajasthan are as follows:

b) List of powerlines for installation of divertors from Rajasthan	**Capacity**
1) Jaisalmer – Ramgarh -1 (40 Km)	132 kv
2) Jaisalmer – Ramgarh -2 (40 Km)	132 kv

3) Askandra (Pokran to Askandra) (30 Km)	132 kv
4) Askandra (Pokran to Askandra) (20 Km)	132 kv
5) Amarsagar – Ramgarh (40 Km)	220 kv
6) Amarsagar – Lilo (8 Km)	220 kv
7) Amarsagar – Phalodi (54 Km)	220 kv
8) Amarsagar – Phalodi (71 Km)	220 kv
9) Ramgarh Dechu (49 Km)	220 kv
10) Ramgarh Dechu (43 Km)	220 kv
11) Ramgarh Dechu (50 Km)	220 kv
12) Akai – Ramgarh (55 Km)	400 kv
13) Tejuva – Kuchadi (138 km)	33 kv
14) Kaladongar (70 Km)	33 kv
15) Mokla – Habur – Sanu (301 km)	33 kv
16) Tejuva – Kuchadi (25 km)	132 kv
17) Kaladongar (47 km)	132/220 kv
18) Mokla – Habur – Sanu (43 km)	132/220 kv
19) Chandan Via Bhagu ka Gaon to Mohangarh (70 km)	33 kv
20) Amarsagar – Ramgarh (40 km)	220 kv
21) Amarsagar – Ludarva (4 km)	33 kv

The details of the powerlines to be converted to underground subject to feasibility, if not, to immediately install divertors;

Lines from Kutch

a) List of powerlines from Kutch for undergrounding	**Capacity**
1) 220 KV GETCO line next to breeding site 13 cables (3.19 Km)	220 KV
2) Bhachunda GIB habitat to Sandhav River line (2.1 Km)	Unknown
3) Bhanada to Valram Society (6.1 Km)	66 KV
4) GETCO Substation to Dhanawada – Nanawada (9.81 Km)	Unknown

5) GETCO Substation to Kothara-Mothala Road (9.69 Km)	Unknown
6) Jakhau to Prajau road substation (10.9 Km)	Unknown
7) Jakhau to Sindhodi (8.39 Km)	Unknown
8) Jakhau to Sindhodi (8.53 Km)	Unknown
9) Jakhau to Sindhodi (8.57 Km)	Unknown
10) Jakhau-Vanku Road to Prajau Road substation (3.43 Km)	Unknown
11) Kalatalav Khirsara Road (9.0 Km)	Unknown
12) Khirsara Kothara (8.20 Km)	Unknown
13) Khirsara to Kothara River Wastelands (2.24 Km)	Unknown
14) Kunathiya GETCO to Bitta & around Adani Solar (6.65)	220 kv
15) Kunathiya GETCO to Tera (7.32 Km)	66 KV
16) Kunathiya GETCO towards Rava (3.34 km)	66 KV
17) Lala to Jakhau (11.6 Km)	Unknown
18) Line near Khorsara (2.77 Km)	Unknown
19) Line near Lala village (1.45 Km)	Unknown
20) Naliya-Kothara Road (6.58 Km)	Unknown
21) Naliya-Kothara Highway (15.0 Km)	Unknown
22) Naliya-Kothara Highway Line (15.7 km)	Unknown
23) Naliya-Kothara Road to Prajau (9.15 Km)	Unknown
24) Naliya-Kothara Road to Vanku-Lala Road (10.8 km)	66 KV
25) Prajau Road (5.57 Km)	Unknown
26) Prajau to Naliya-Jakhau Road	Unknown
27) Prajau Road line passing through Naliya Grasslands (4.43 km)	Unknown
28) Prajau Road substation to Naliya-Kothara Road substation	Unknown
29) Prajau village to Prajau Road (5.82 Km)	Unknown
30) Part of Bhamedi to Naliya-Jakhau Road (8.19 km)	Unknown
31) Part of Fulay Vandh to Naliya-	Unknown

Jakhau Highway (8.27 Km)	
32) Part of Kothara-Naliya (8.82 Km)	Unknown
33) Part of Kothara-Naliya line (9.36 km)	Unknown
34) Part of Vanku to Fulay Vandh line (1 km)	Unknown
35) Khirsara to Highway River Wastelands (1.59 Km)	Unknown
36) Kunathiya GETCO to Bhanada Village via Agri Farms (12.1 km)	66 KV

Lines from Rajasthan

b)	**List of powerlines from Rajasthan for undergrounding**	**Capacity**
1)	Kanoi-Salkha (21 Km)	33 kv
2)	Sam-Dhanana (45 Km)	33 kv
3)	Tejuva-Kuchr (17 Km)	33 kv
4)	Khuchri horizontal-parallel (21 Km)	33 kv

17. The respondents No.5, 6 and 9 to 11 while arranging to lay the powerlines underground in respect of the powerlines, the feasibility of which is not in doubt shall proceed with the work right away. However, in cases where the respondents find that there are issues relating to feasibility, the matter shall be referred to the committee with all relevant material and particulars. The committee shall assess the matter and arrive at a conclusion as to whether the underground powerline is feasible or not. Based on the report to be rendered by the committee the further action shall be taken by the respondent.

18. In all cases where the overhead powerlines exist as on today in the priority and potential GIB area the respondents shall take steps forthwith to install divertors pending consideration of the conversion of the overhead cables into underground powerlines. In all such cases where it is found feasible to convert the overhead cables into underground powerlines the same shall be undertaken and completed within a period of one year and till such time the divertors shall be hung from the existing powerlines.

19. Ordered accordingly.

.....CJI.
(S. A. Bobde)

.....J.
(A.S. Bopanna)

.....J.
(V. Ramasubramanian)

New Delhi,
April 19, 2021

Annexure-II

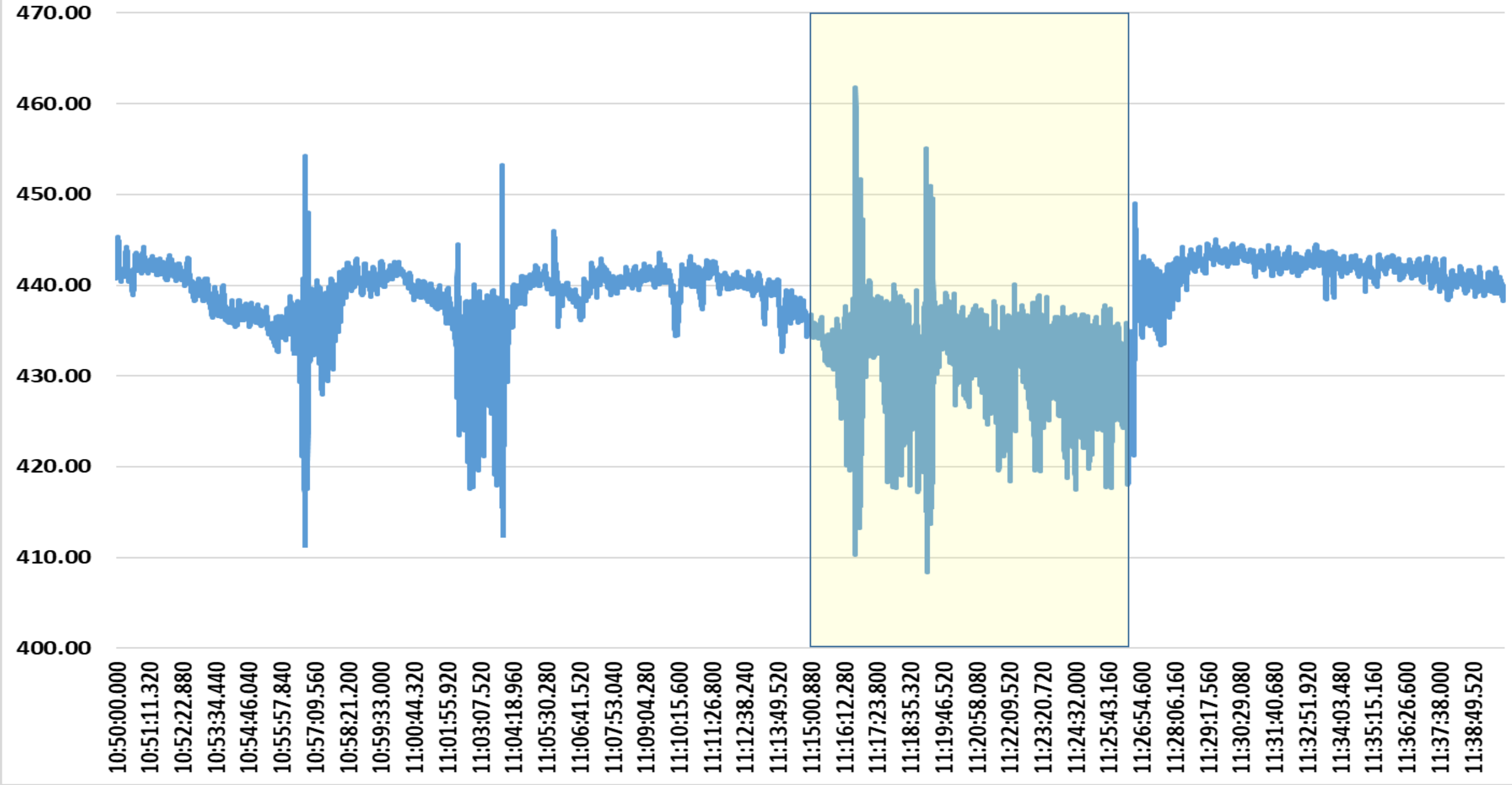
Sr. No.	Name of Asset	Length (km)/ Land (Acre)	GIB Priority Area/ Potential Area	Current Status
1.	**Fatehgarh Bhadla Transco Limited (Petition No.136/TL/2021 and Petition No.141/AT/2021)**			
A	765/400/220 kV Fatehgarh II PS	183 Acre	Substation is located within the potential habitat of GIB	Substation charged on August, 2021
B	LILO of both circuits of Fatehgarh (TBCB) – Bhadla (PG) 765 kV D/c line (operated at 400 kV) at Fatehgarh-II	78 km	Complete transmission line falls within the potential habitat of GIB	Ckt 1 charged- 06.03.2022 Ckt 2 charged- 30.03.2022
C	Fatehgarh II- Bhadla II (1st) 765 kV D/c Transmission Line	186 km	Complete transmission line falls within the potential habitat of GIB	Line charged in August, 2021
D	765/400/220 kV Bhadla-II PS	183 Acre	Substation is located within the potential habitat of GIB	Fully charged, 725 MW generation connected at present
E	LILO of both circuits of Ajmer-Bikaner 765 kV D/c line at Bhadla-II PS	262 km	188 Kms of Line is passing within the potential habitat of GIB	Line charged in July, 2021
F	Bhadla-II PS – Bhadla (PG) 400 kV D/c line	48 km	Complete transmission line falls within the potential habitat of GIB	Ckt 1 charged on- 03.12.2021 Ckt 2 charged on- 09.09.2021
G	Bhadla II – Sikar II (1st) 765 kV D/c Transmission Line	304 km	104 km of line is passing within the potential habitat of GIB	Part of Petition No. 136/TL/2021 for Licence recommendation, yet to be charged
2.	**Sikar New Transmission Limited (Petition No. 137/TL/2021 and Petition No.138/AT/2021)**			
A	765/400/220 kV Fatehgarh II PS	183 Acre	Substation is located within the potential habitat of GIB	Substation is partially charged
B	LILO of both circuits of Ajmer-Bikaner 765 kV D/c line at Bhadla-II PS	262 km	188 km of line is passing within the potential habitat of GIB	Line is charged
C	Bhadla-II PS – Bhadla (PG) 400 kV D/c line	48 km	Complete transmission line falls within the potential habitat of GIB	Under construction
D	Sikar-II – Aligarh (GIS) 765 kV D/c line	330 km	Line is not passing within the potential habitat of GIB	Part of Petition No. 139/TL/2021 for licence recommendation, yet to be charged

3.	**Sikar-II Aligarh Transmission Limited (Petition No.139/TL/2021 and Petition No.140/AT/2021)**			
A	765/400 kV Sikar-II PS	N.A	Substation is not located within the potential habitat of GIB	Part of Petition No. 137/TL/2021 for licence recommendation
B	Sikar-II – Neemrana 400 kV D/c line	140 km	Line is not passing within the potential habitat of GIB	Part of Petition No. 137/TL/2021 for licence recommendation, yet to be charged
C	765/400 kV Aligarh (GIS) substation & 765 kV Connectivity of Aligarh S/s to Jhatikara, Gr. Noida, Agra, Orai and Kanpur (GIS) and 400 kV interconnection with Prithla S/s	Existing	Substation/line is outside the State of Rajasthan, not located within the potential habitat of GIB	Existing Substation/Lines
D	765/400 kV Sikar-II PS	N.A	Substation is not located within the potential habitat of GIB	Part of Petition No. 137/TL/2021 for licence recommendation, yet to be charged

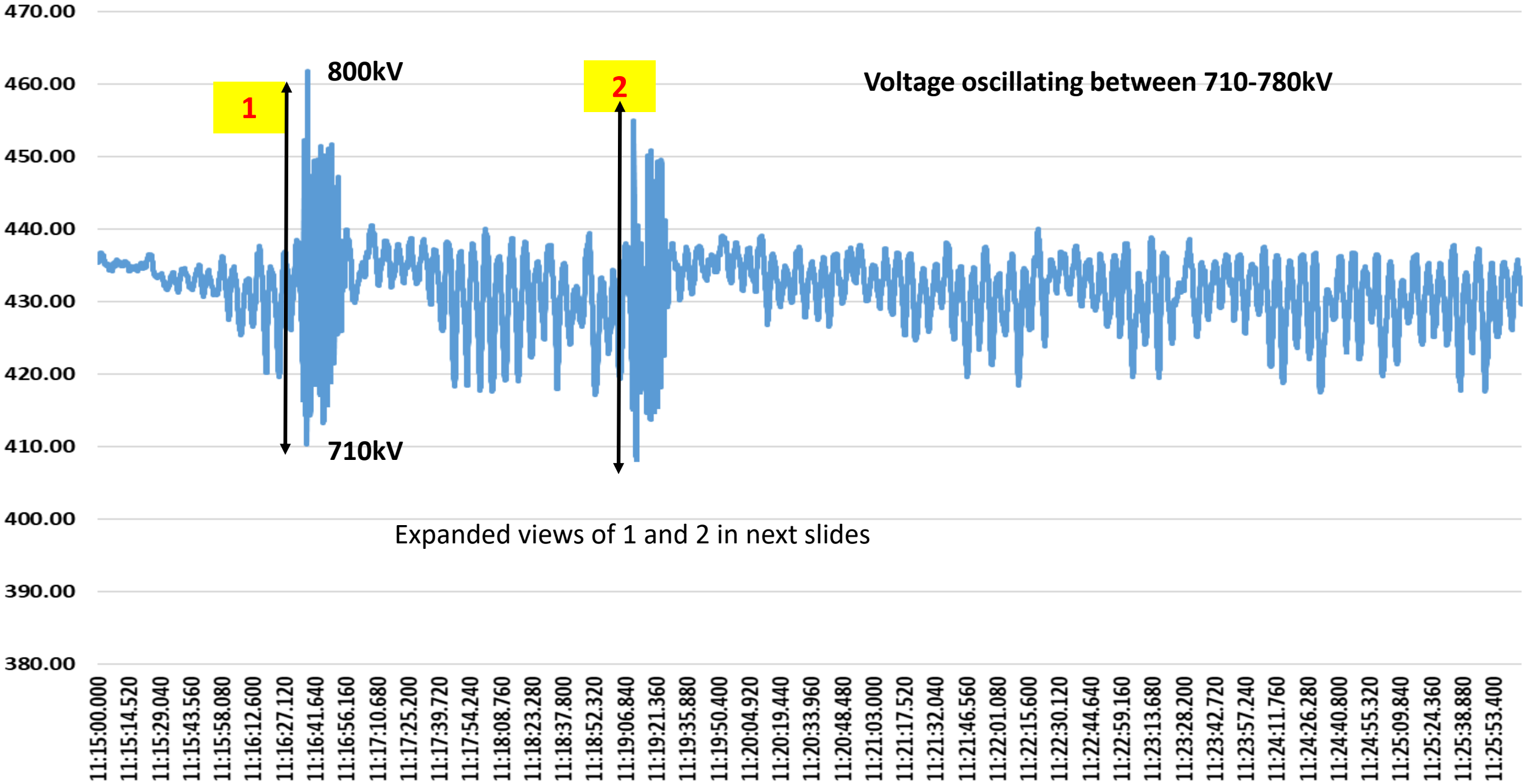
765 kV Lines for which S/d was availed to install the bird diverter in Calender year 2022

S. No	Name of Transmission Line	Region	Month in which S/d Availed	Reason
1	765kV Bhadla2-Fatehgarh2 Ckt-I	NR	Feb & Apr 2022	Installation of Bird Diverter
2	765kV Bhadla2-Fatehgarh2 Ckt-II	NR	Feb & Apr 2022	Installation of Bird diverters

Fatehgarh-II Voltage of Bhadla-II line (phase voltage)

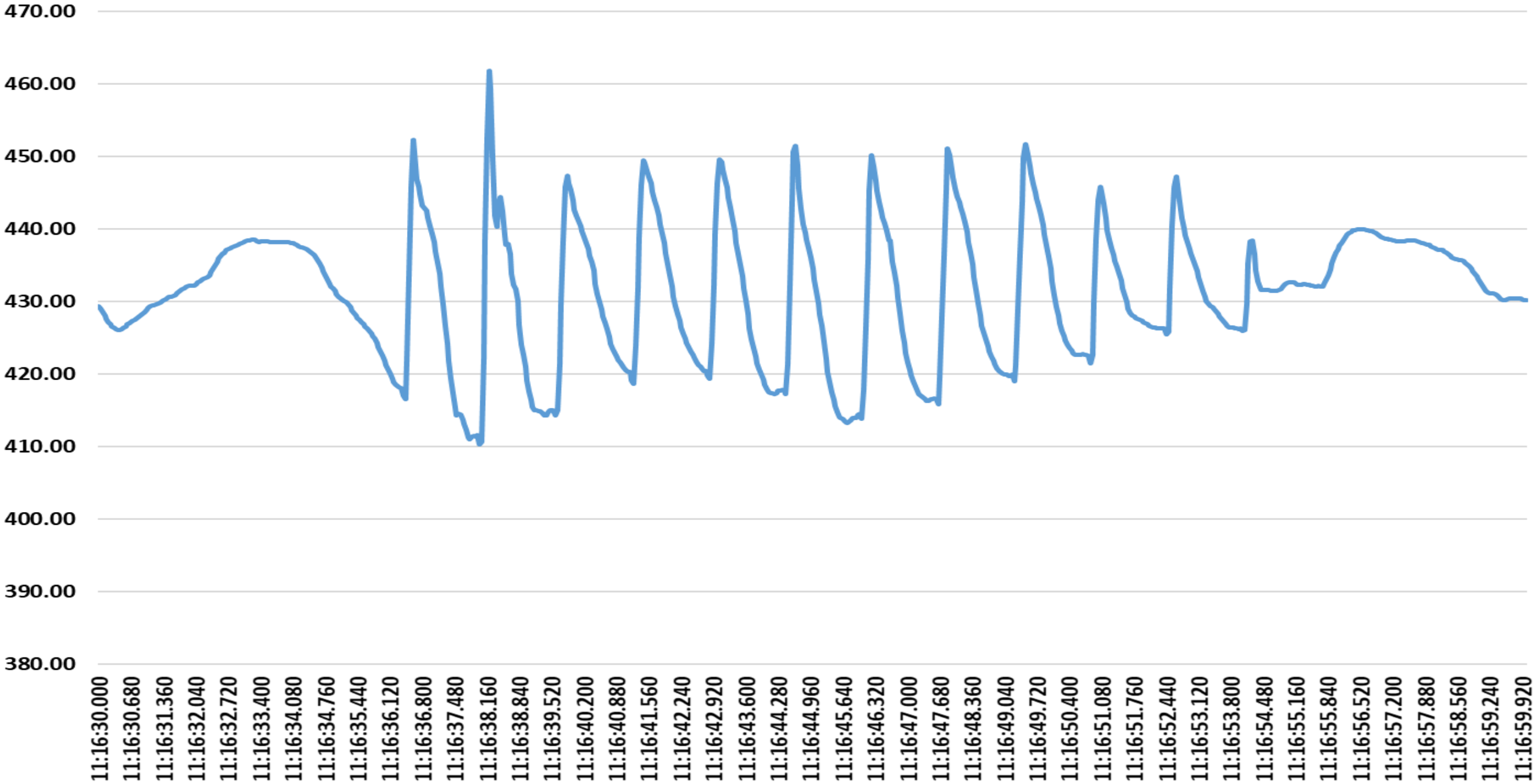


Fatehgarh-II Voltage of Bhadla-II line (R phase voltage)

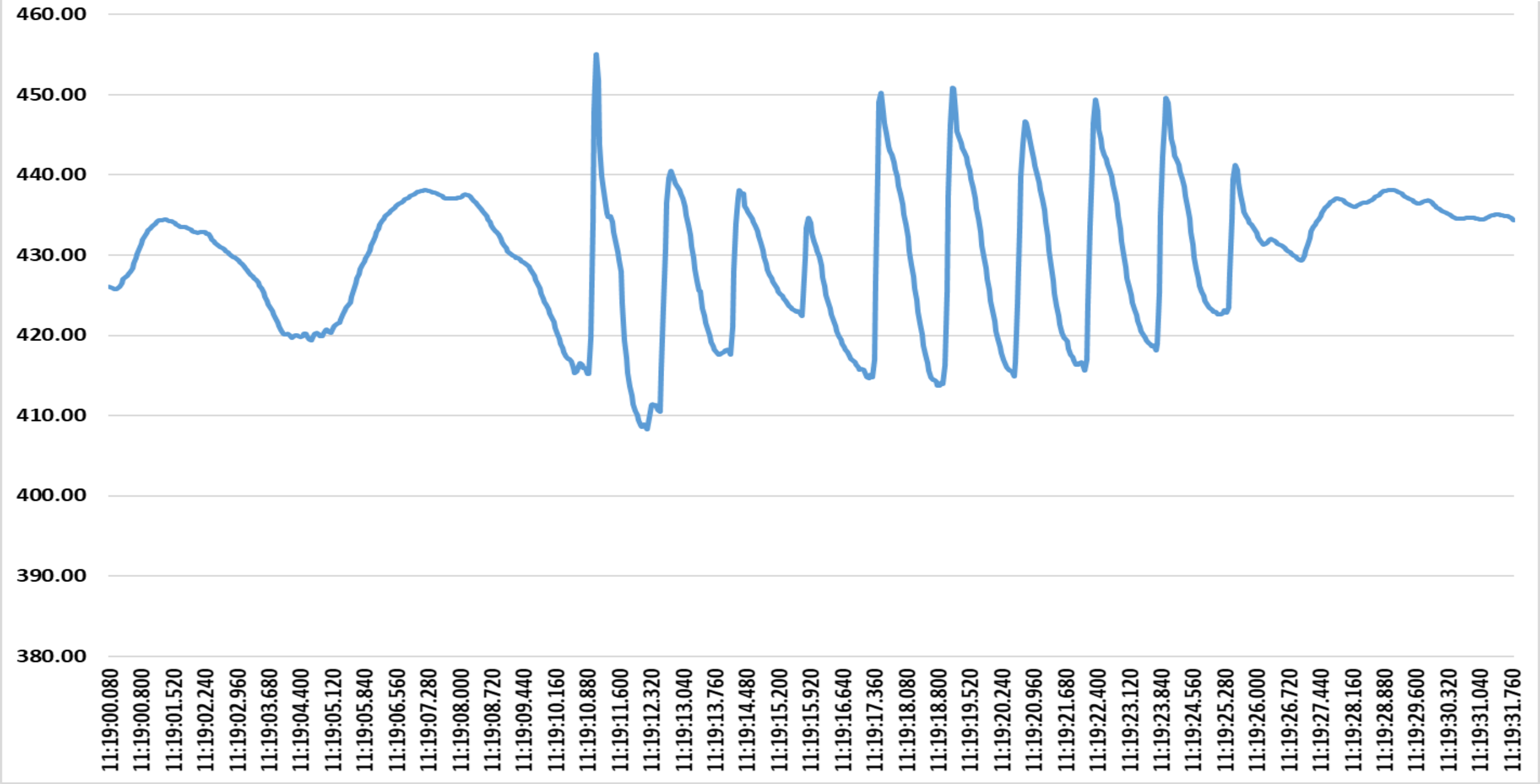


1

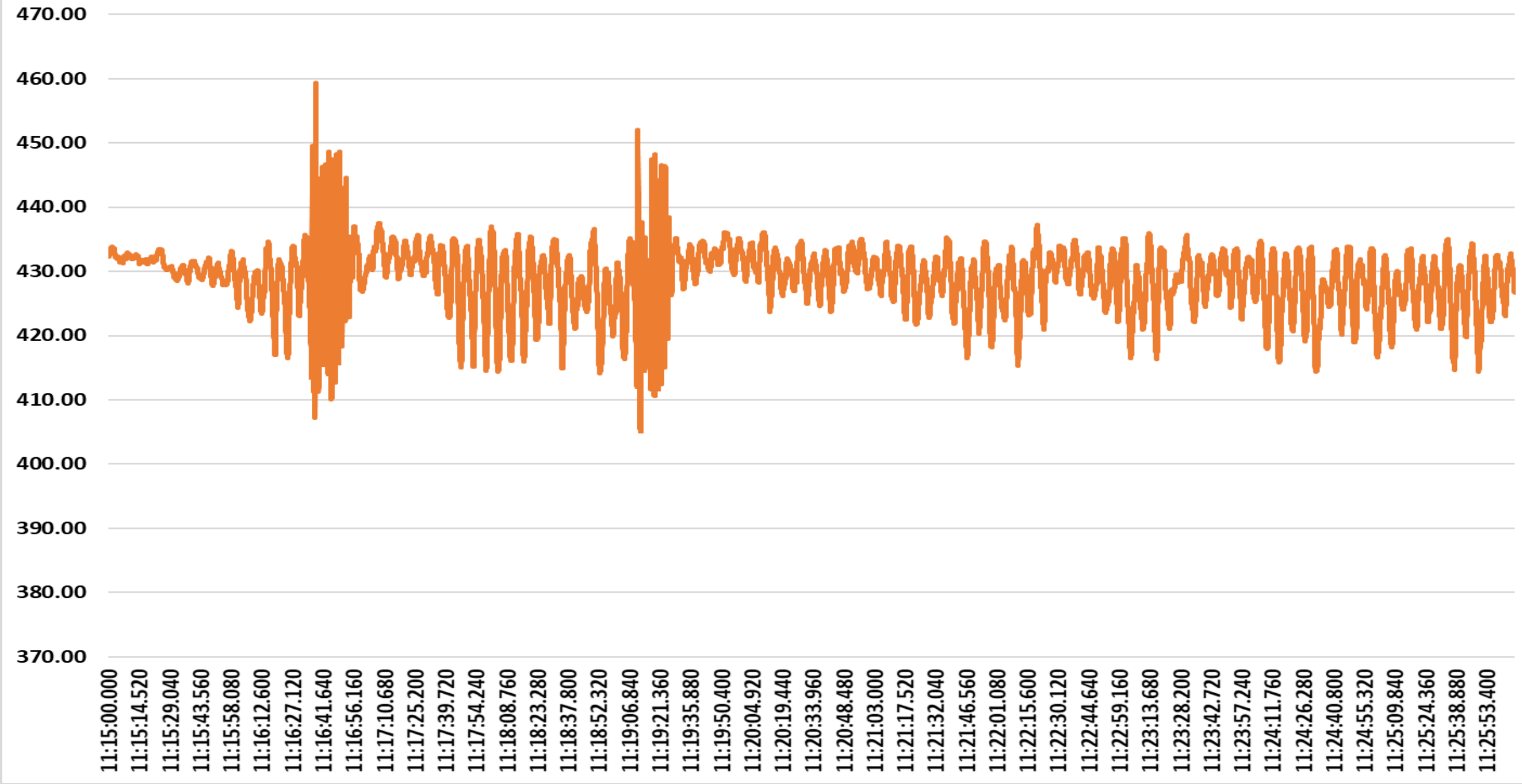
Fatehgarh-II Voltage of Bhadla-II line (R phase voltage)



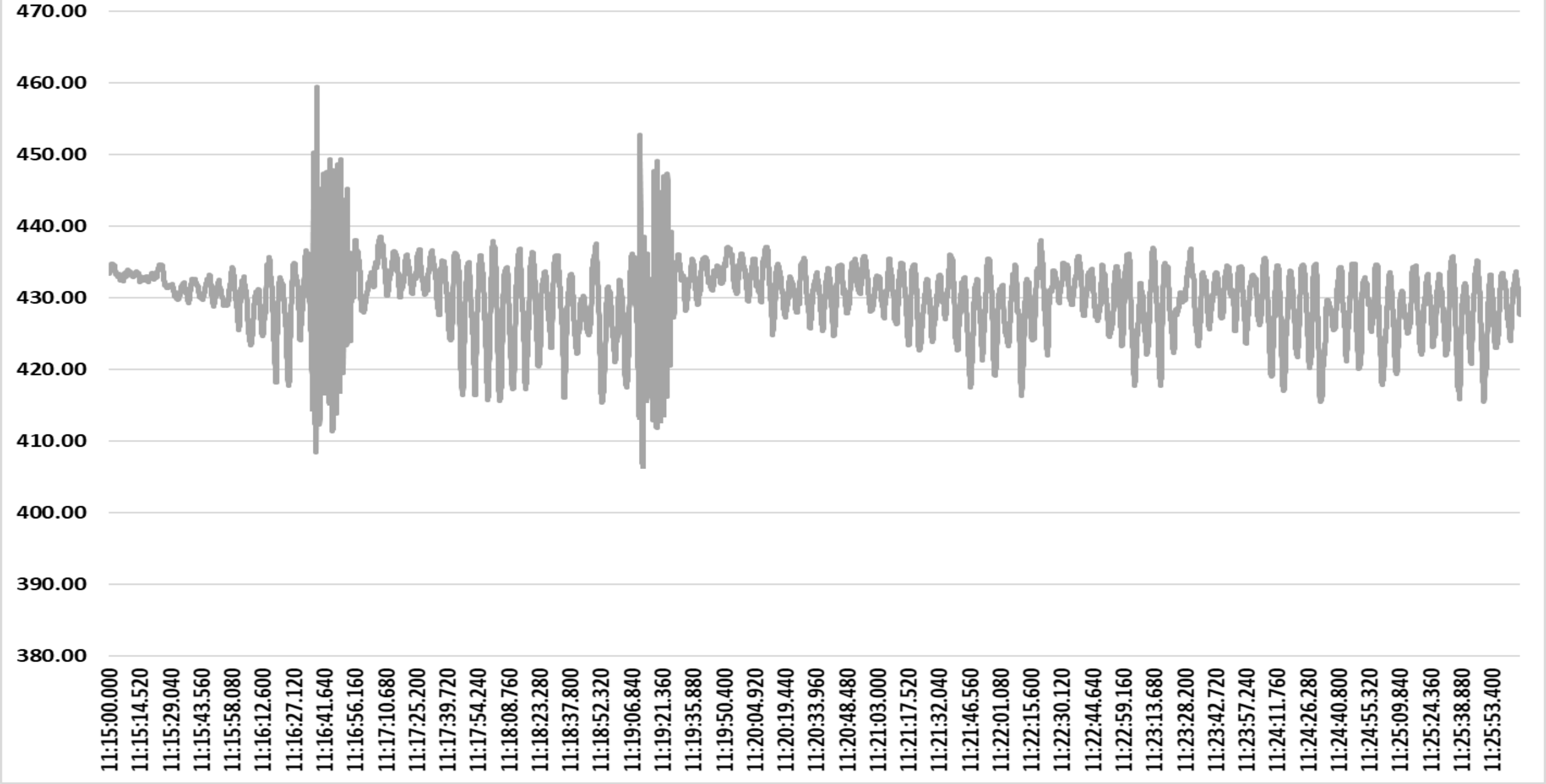
2 Fatehgarh-II Voltage of Bhadla-II line (R phase voltage)



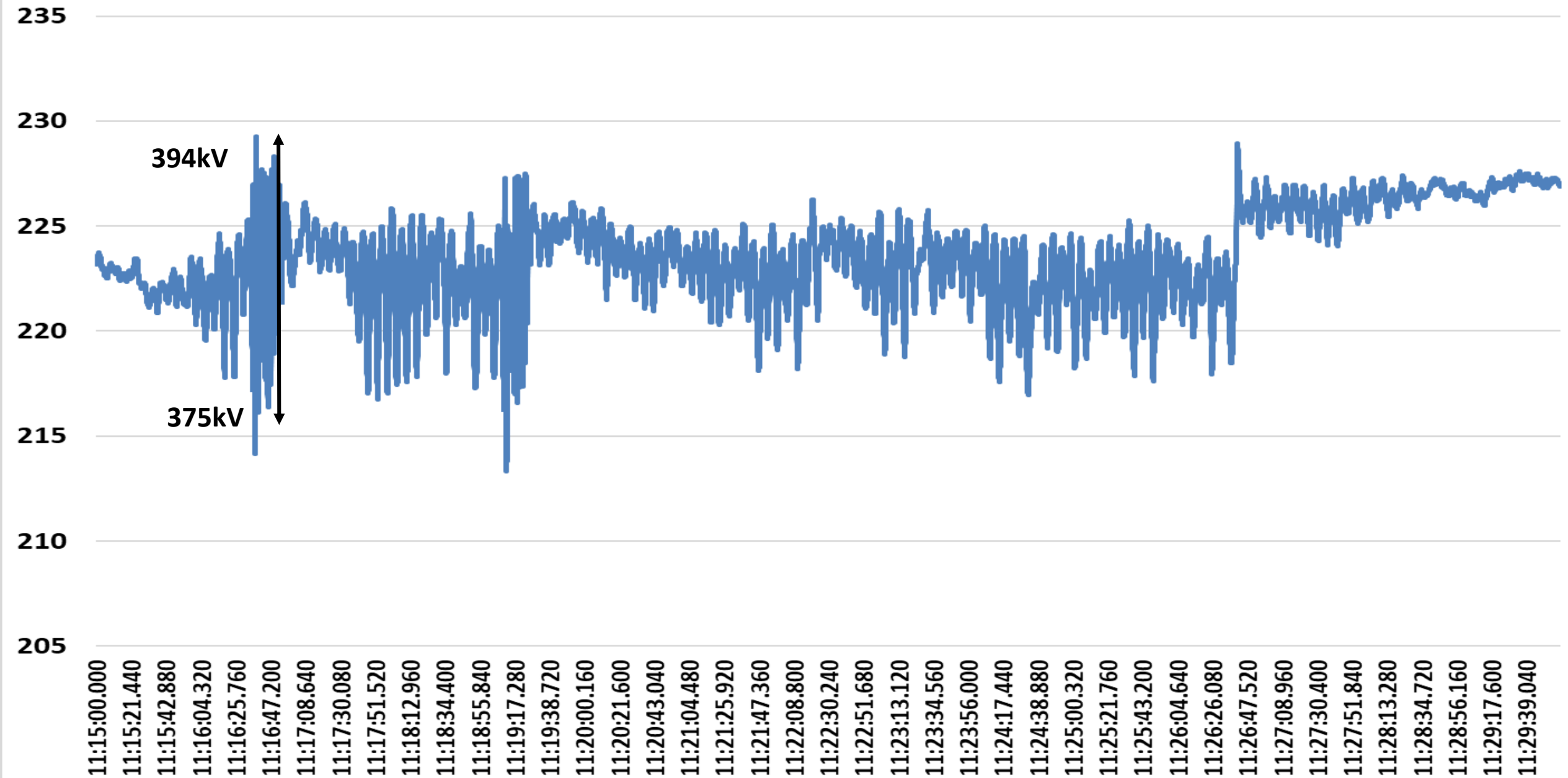
Fatehgarh-II Voltage of Bhadla-II line (Y phase voltage)



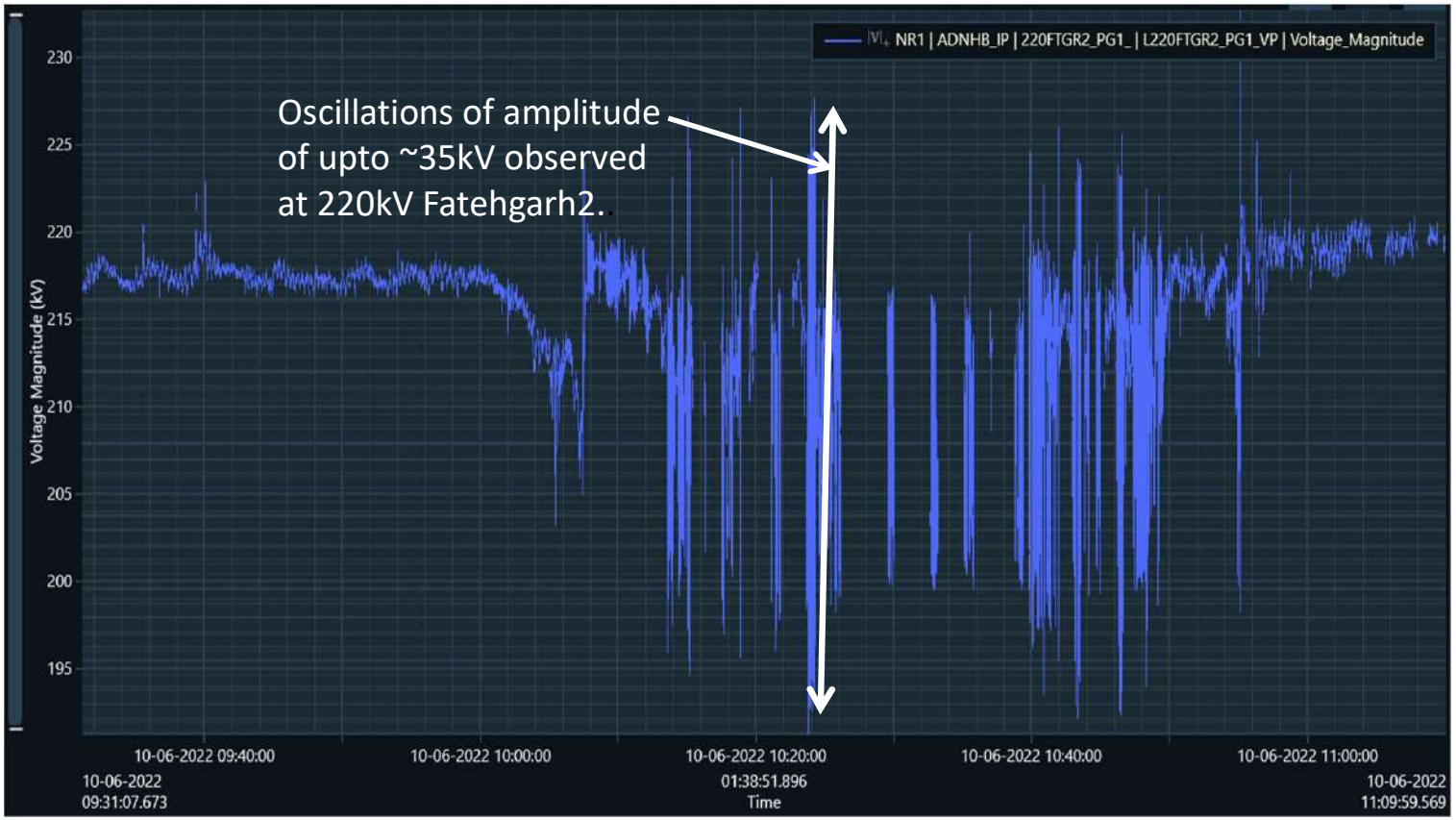
Fatehgarh-II Voltage of Bhadla-II line (B phase voltage)



Voltage of Jodhpur 400kV bus (R phase voltage)

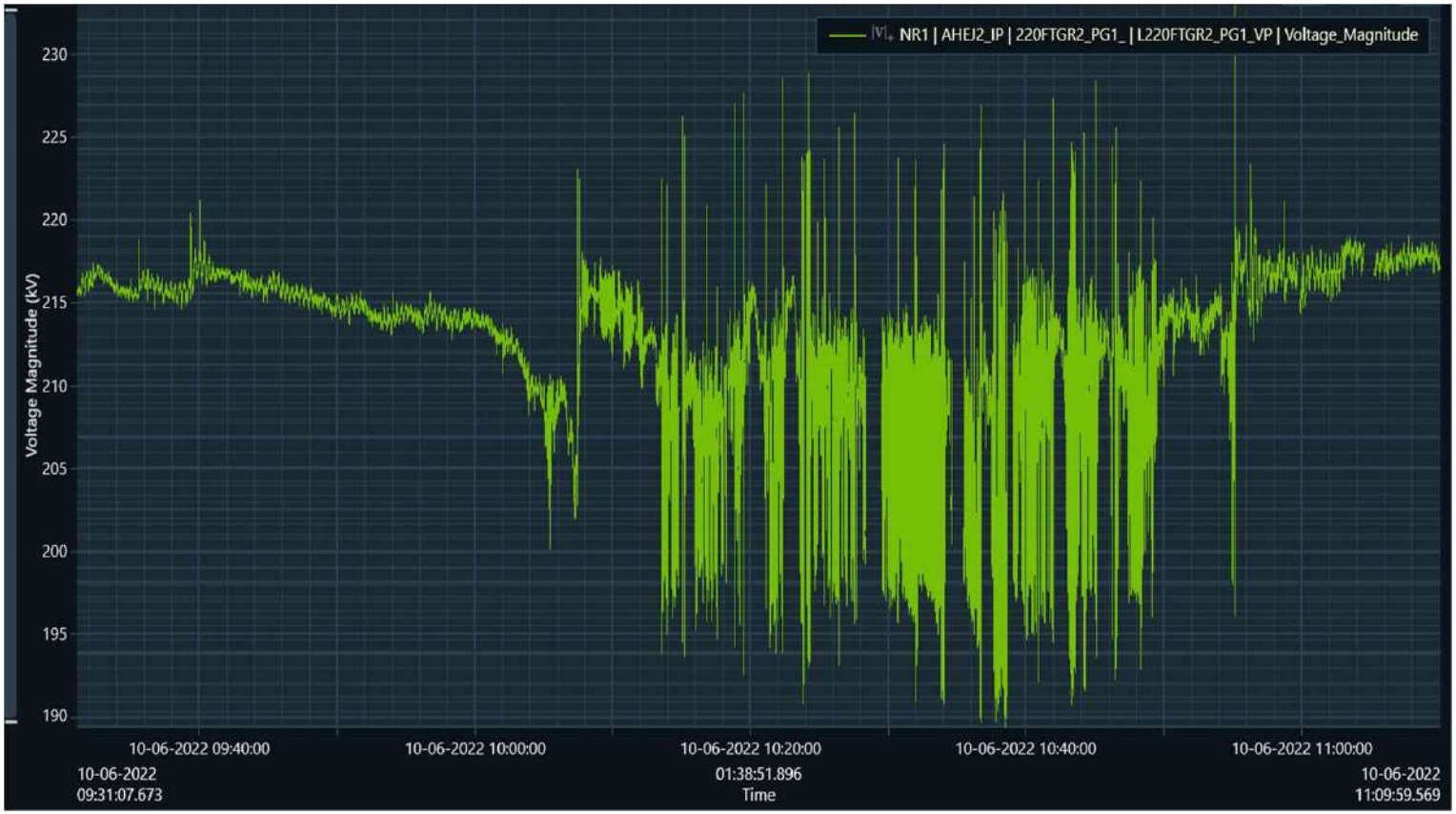


PMU data of Voltage of 220kV Fatehgarh2-AHEJOL ckt-1 at AHEJOL end (connected at Fatehgarh2)



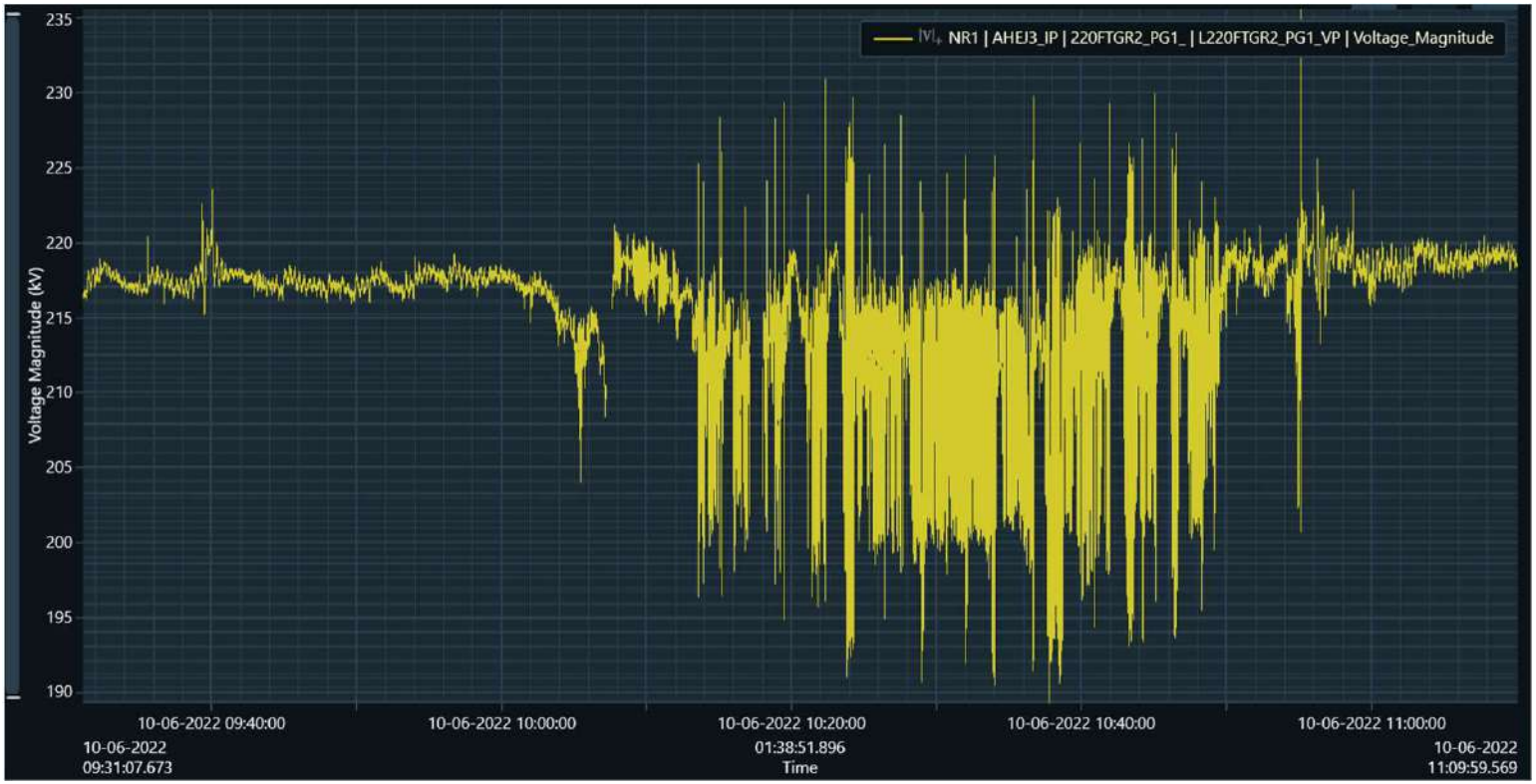
Oscillations in voltage in the range of 25-40kV during time period 10:05hrs-10:55hrs.

PMU data of Voltage of 220kV Fatehgarh2-AHEJ2L ckt at AHEJ2L end (connected at Fatehgarh2)



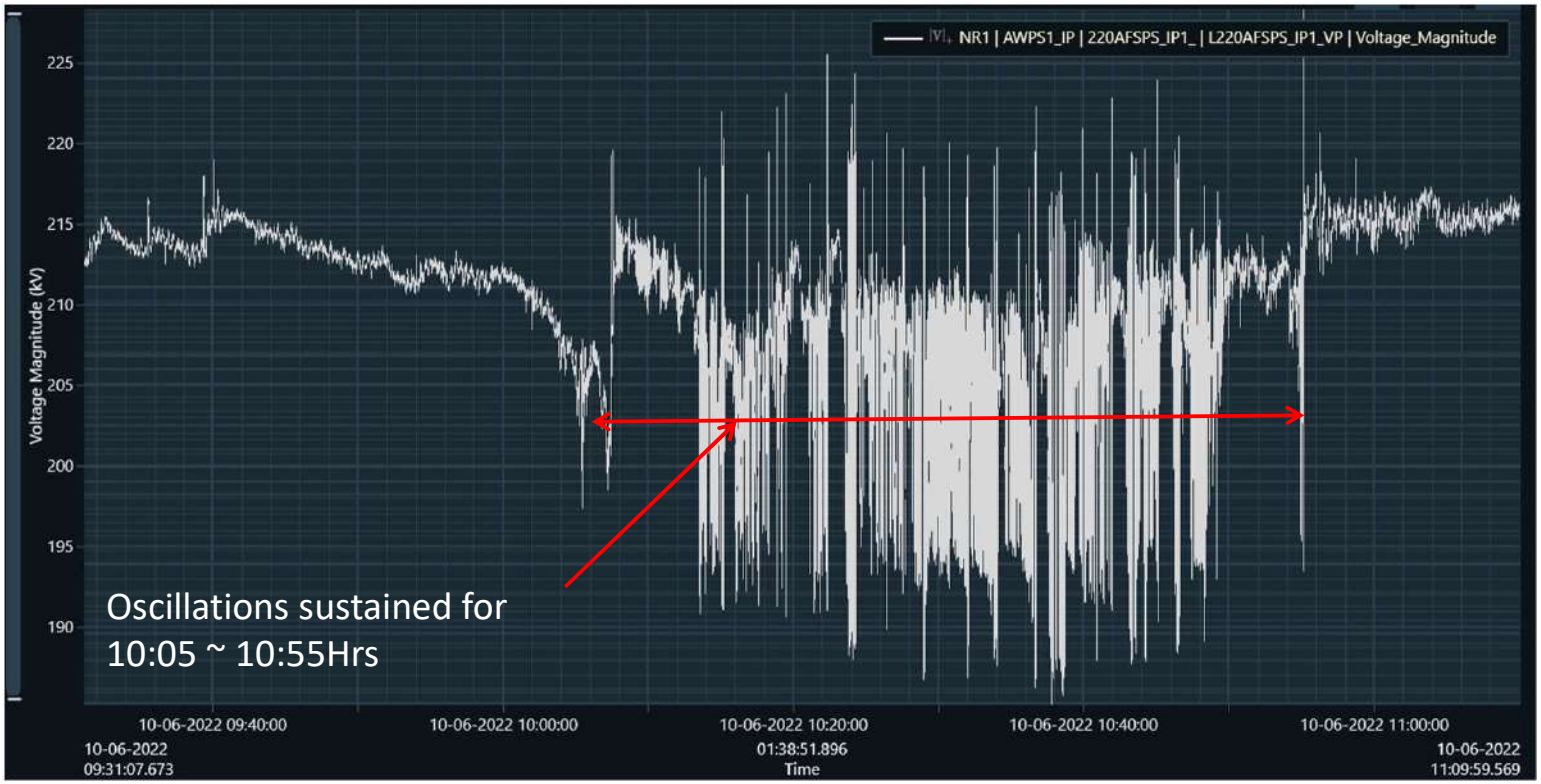
Oscillations in voltage in the range of 25-40kV during time period 10:05hrs-10:55hrs.

PMU data of Voltage of 220kV Fatehgarh2-AHEJ3L ckt at AHEJ3L end (connected at Fatehgarh2)



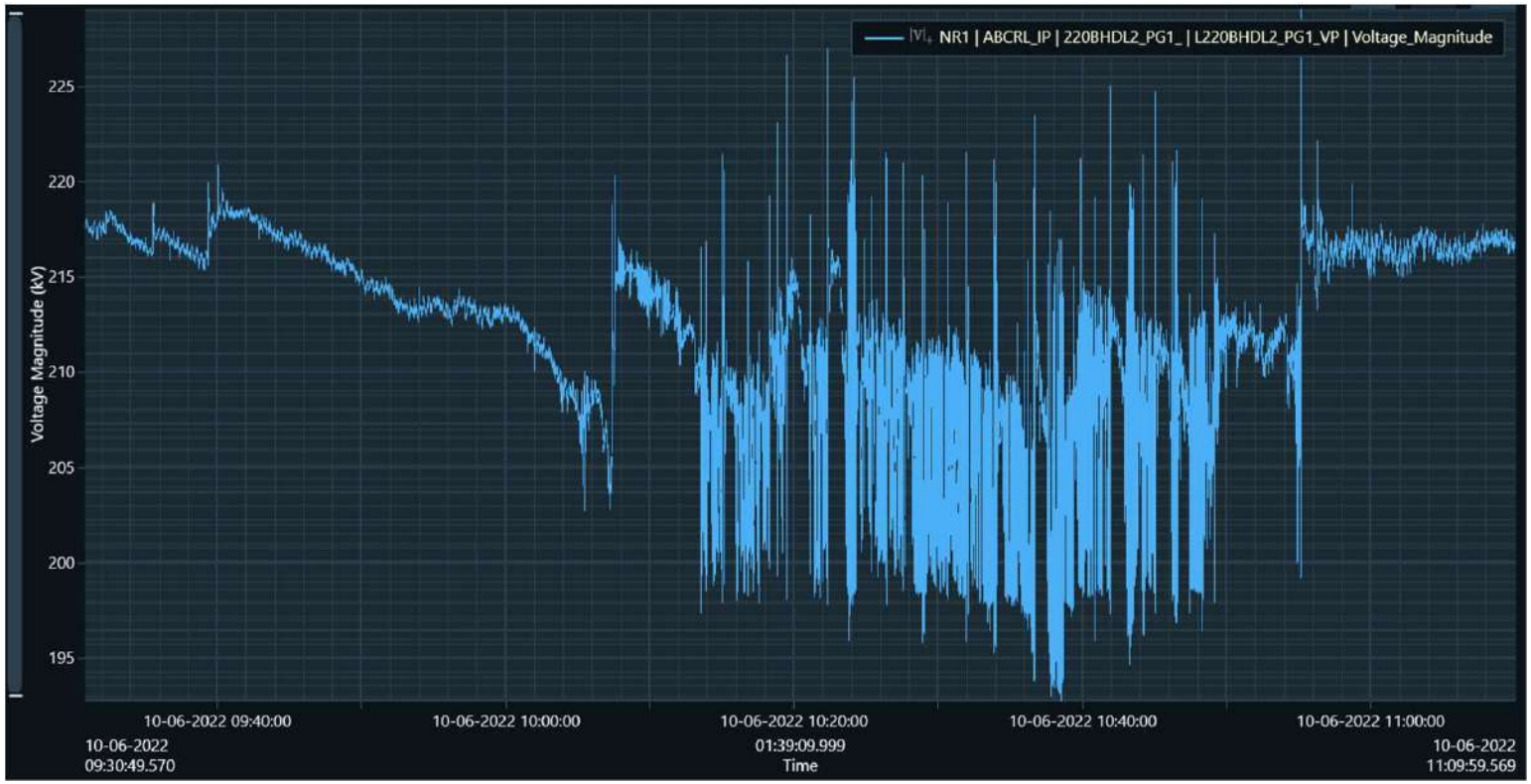
Oscillations in voltage in the range of 25-40kV during time period 10:05hrs-10:55hrs.

PMU data of Voltage of 220kV ADANI Fatehgarh Solar park-AWPS1 ckt at AWPS1 end (pooled at Fatehgarh2)



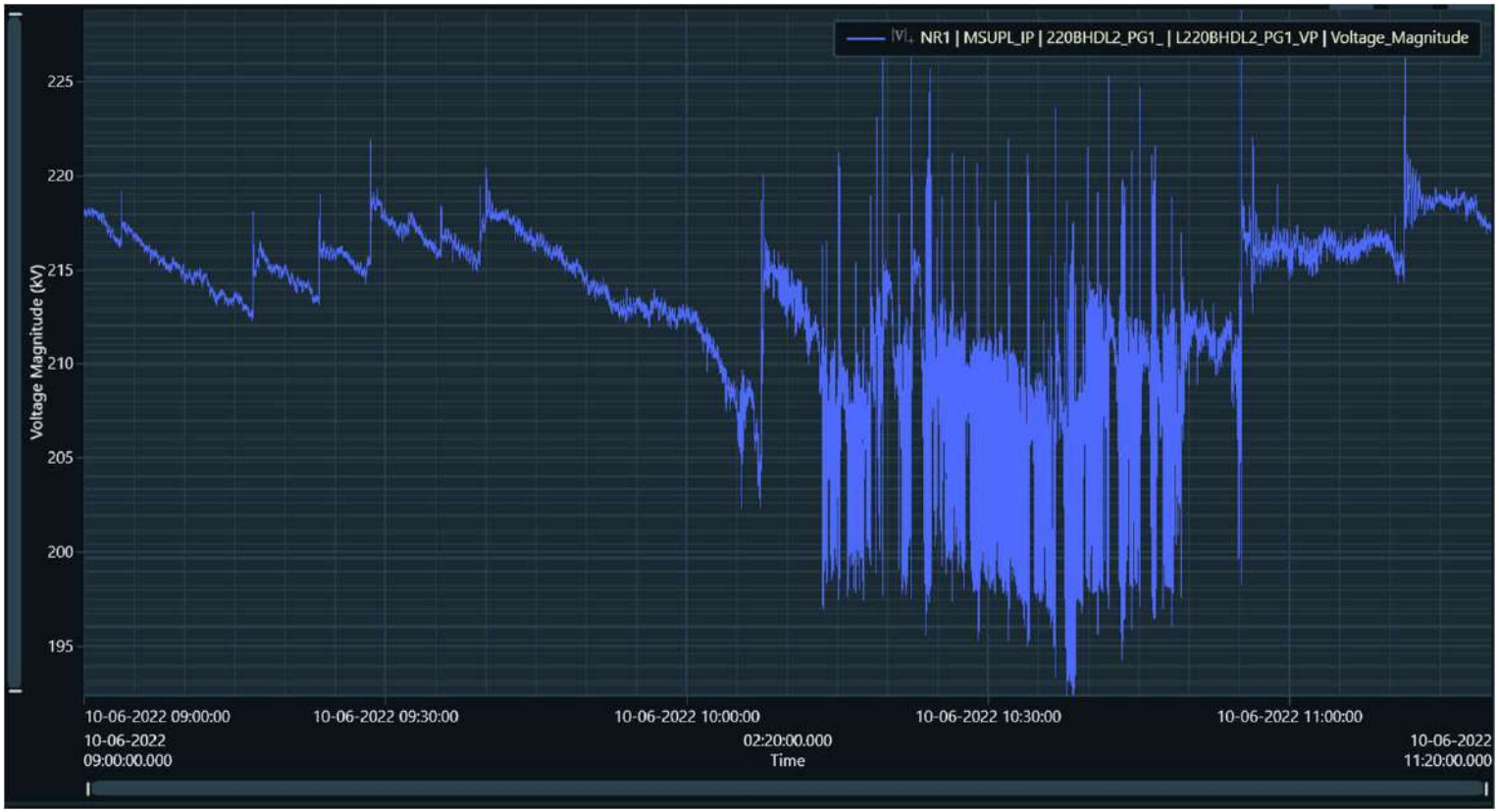
Oscillations in voltage in the range of 25-40kV during time period 10:05hrs-10:55hrs. Voltage dropped to 185kV.

PMU data of Voltage of 220kV Bhadla2-ABC Renewable ckt at ABCRL end (connected at Bhadla2)



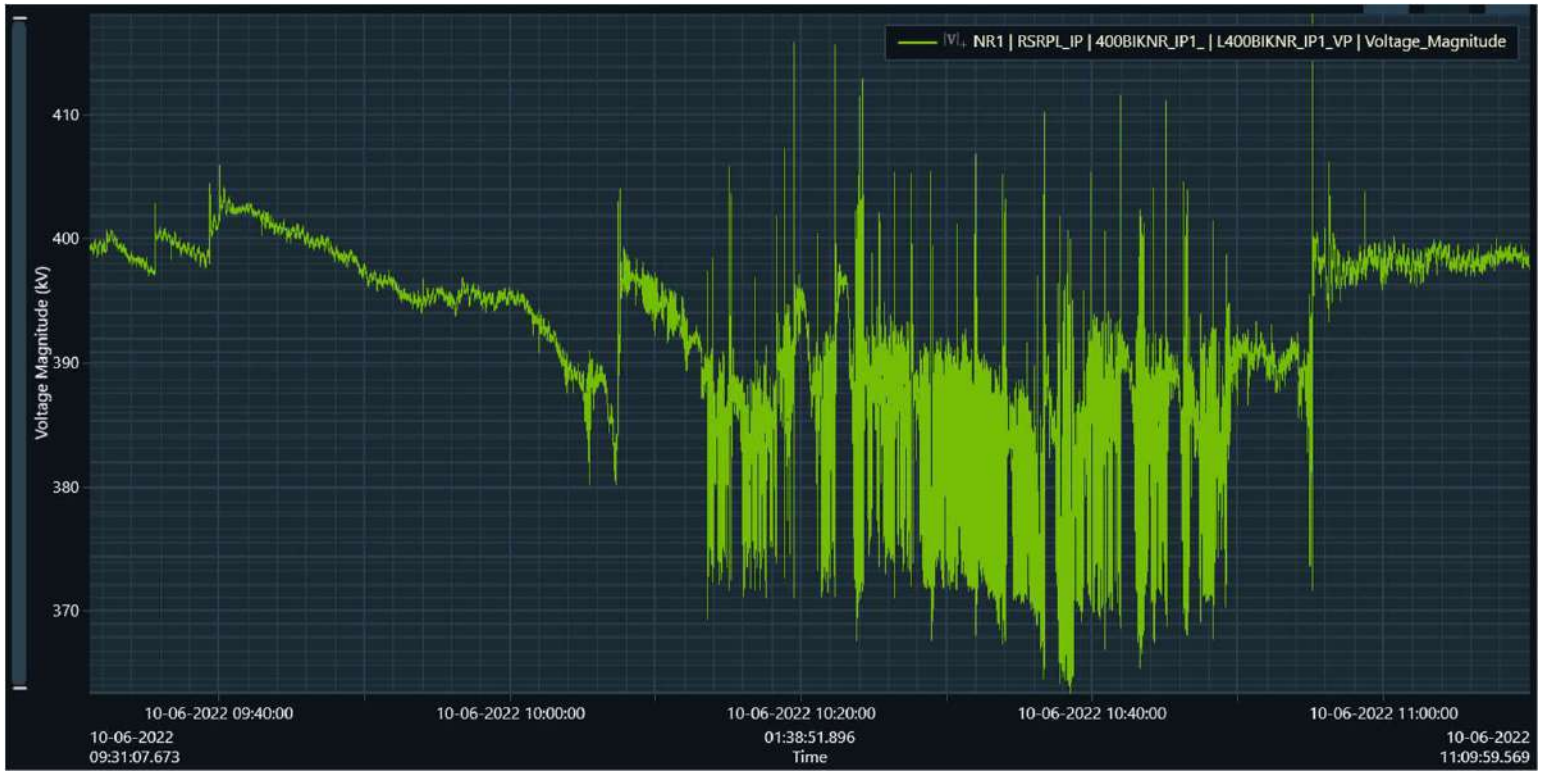
Oscillations in voltage in the range of 20-25kV during time period 10:05hrs-10:55hrs.

PMU data of Voltage of 220kV Bhadla2-MSUPL ckt at MSUPL end (connected at Bhadla2)

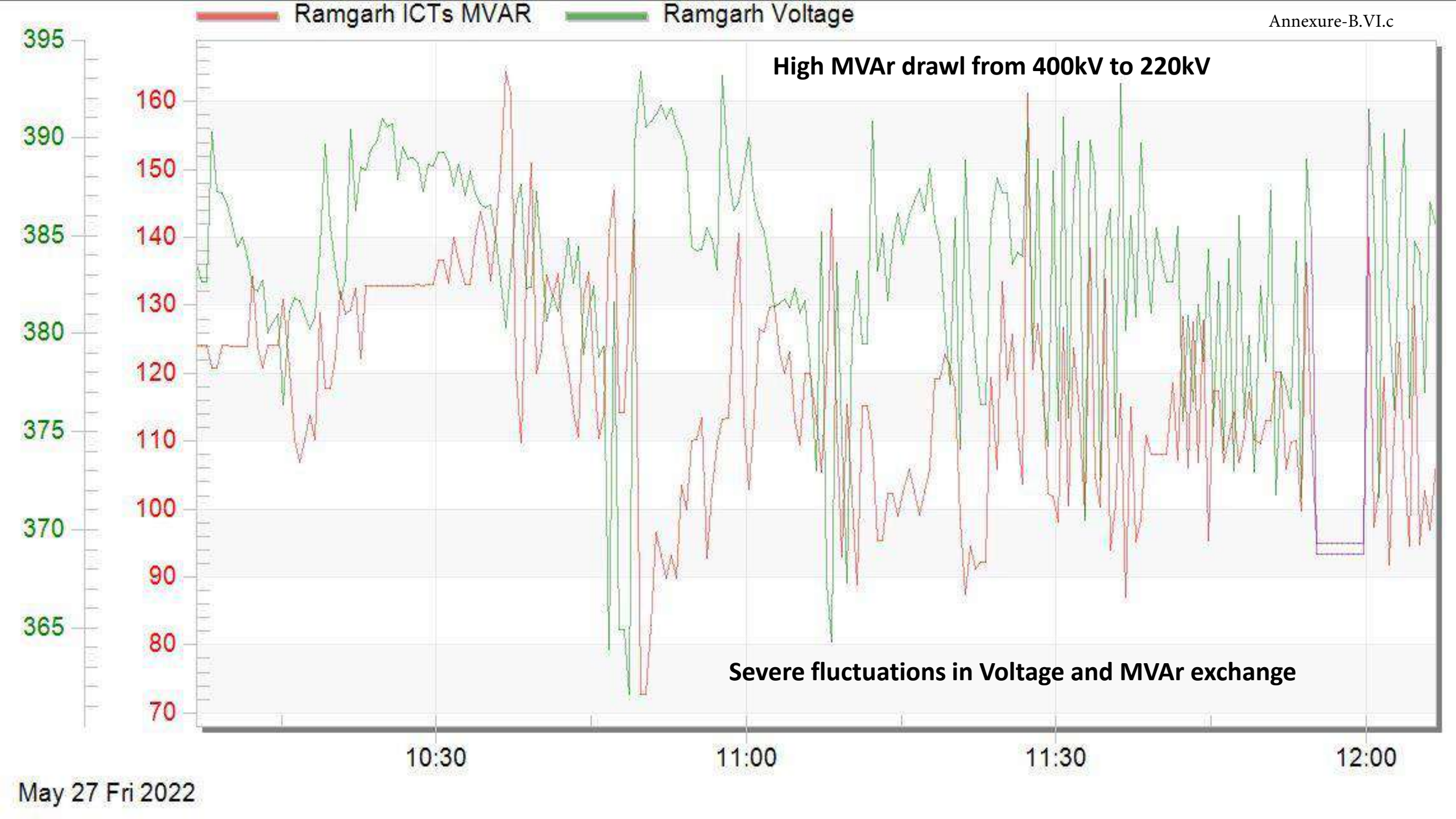


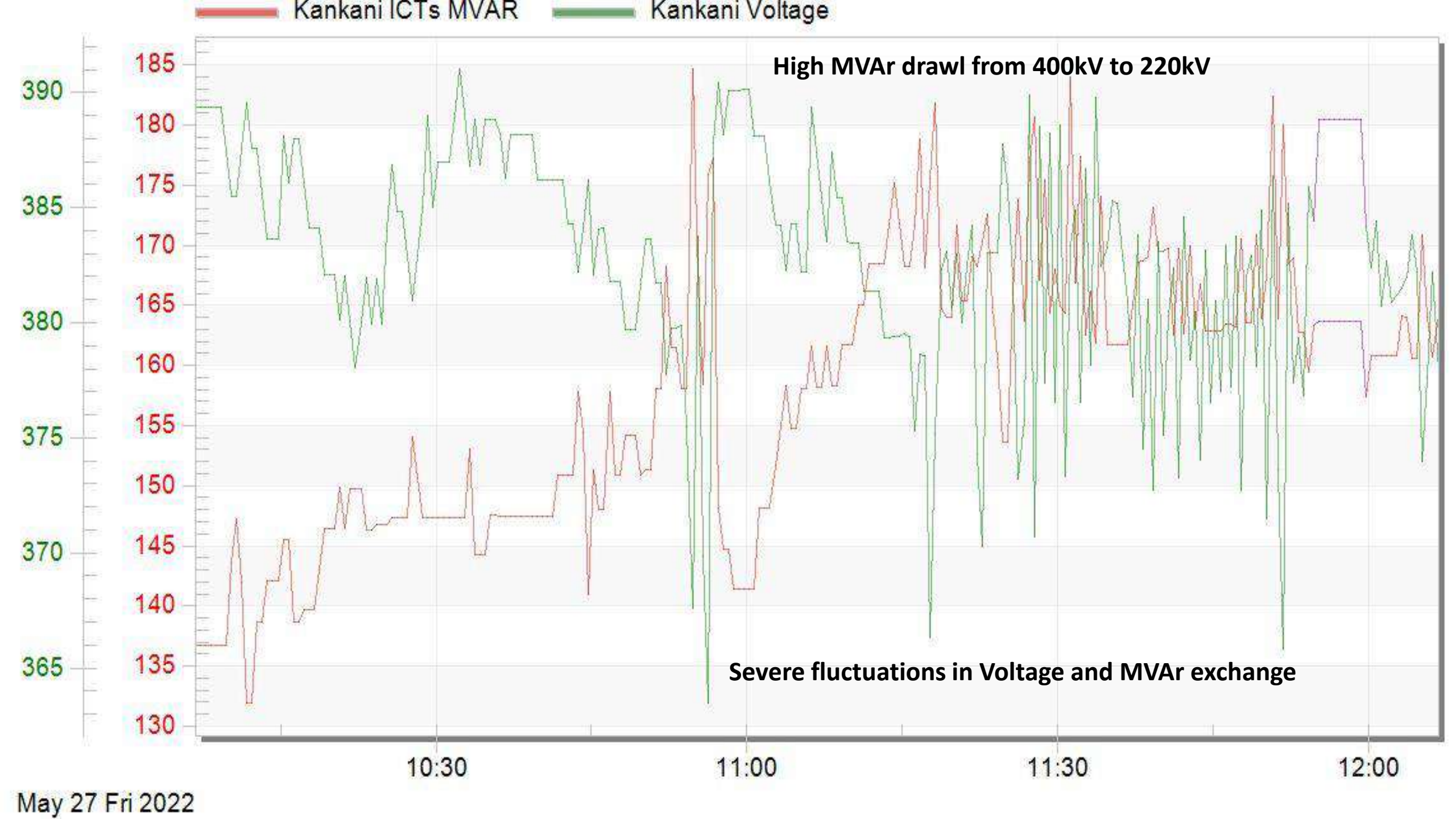
Oscillations in voltage in the range of 25kV during time period 10:05hrs-10:55hrs.

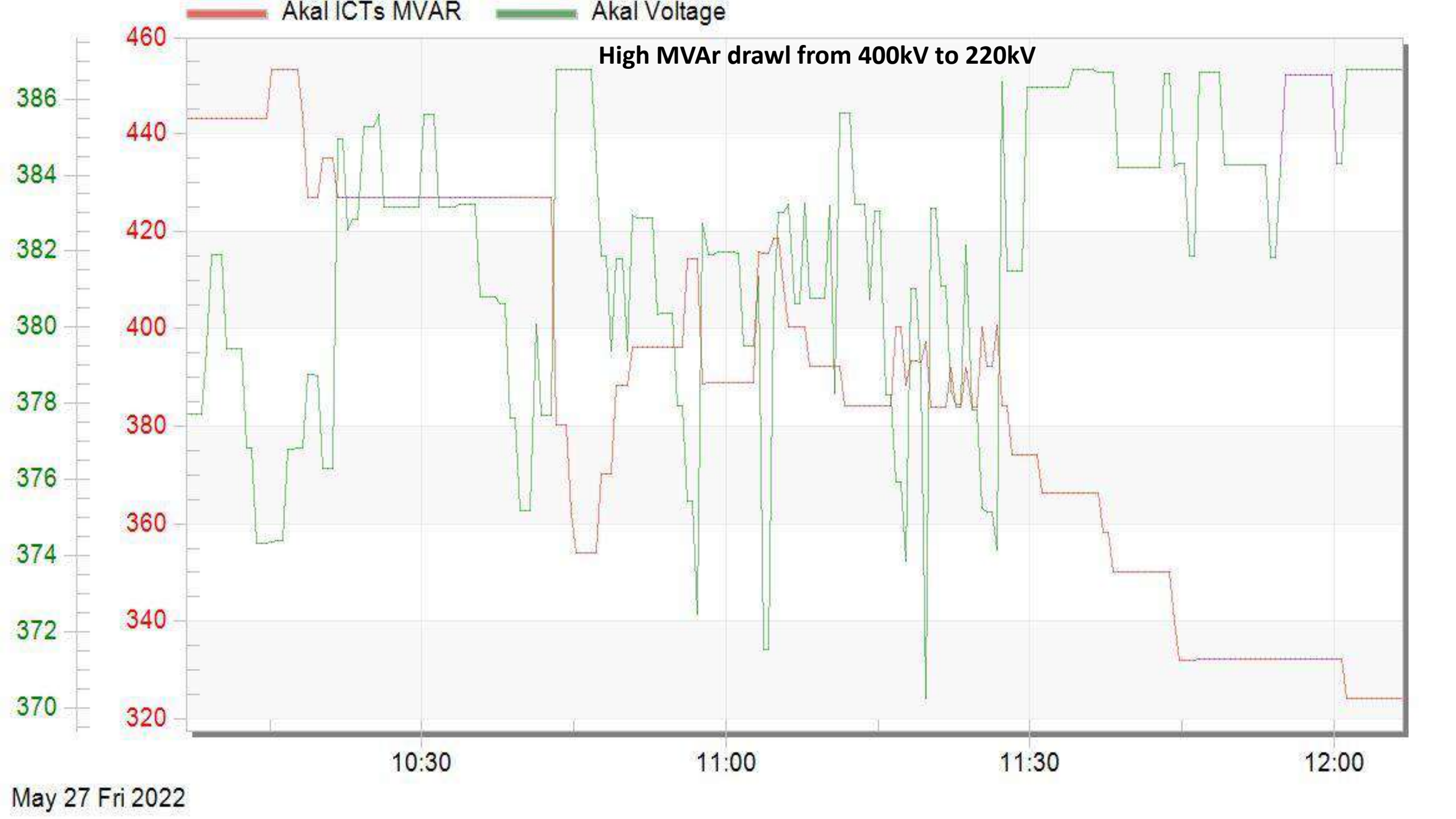
PMU data of Voltage of 400kV Bikaner-RSRPL ckt at RSRPL end (connected at Bikaner)



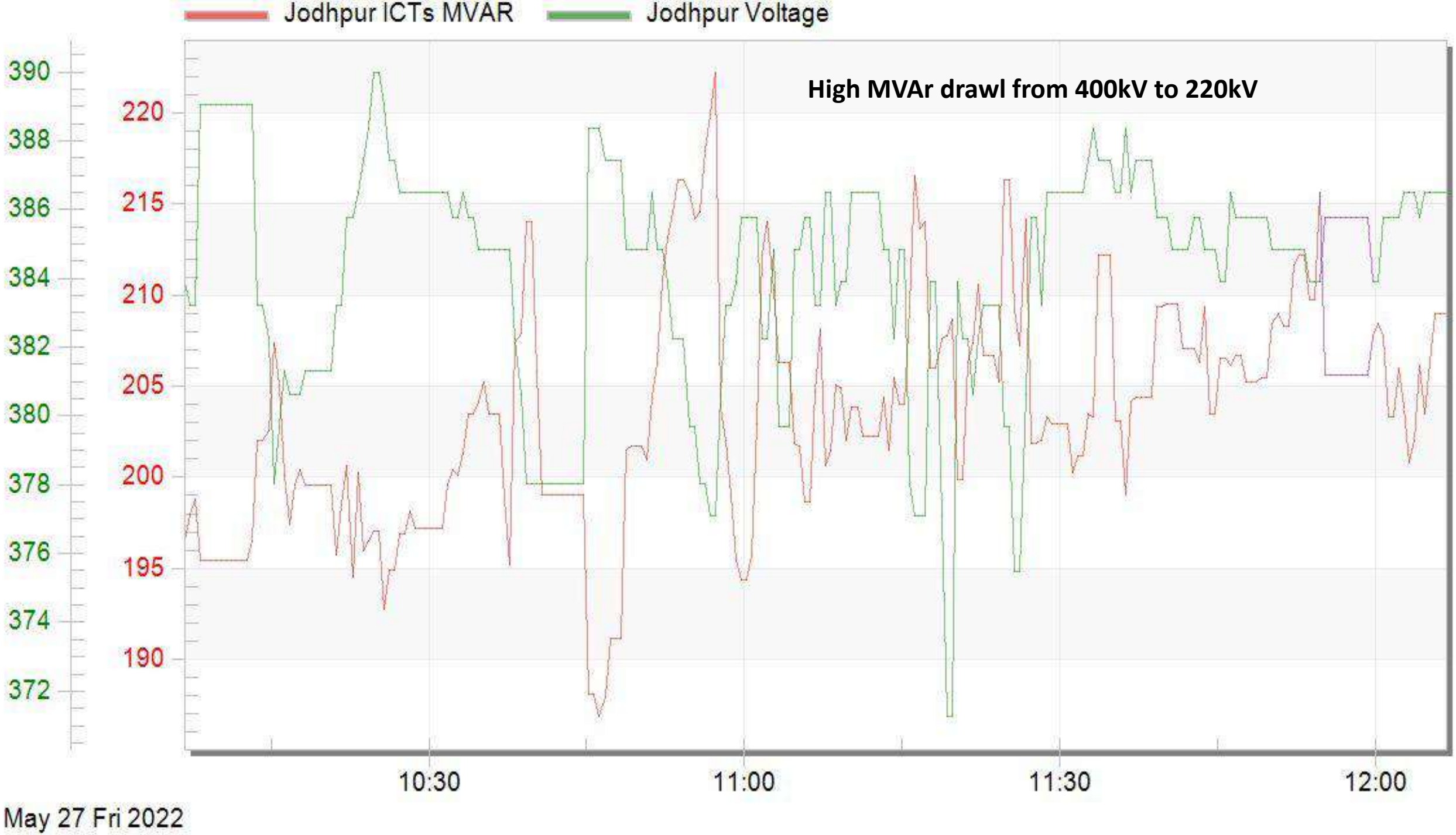
Oscillations in voltage in the range of 30-35kV during time period 10:05hrs-10:55hrs.


Ramgarh ICTs MVAR
Ramgarh Voltage
High MVAr drawl from 400kV to 220kV
Severe fluctuations in Voltage and MVAr exchange
395
390
385
380
375
370
365
160
150
140
130
120
110
100
90
80
70
10:30
11:00
11:30
12:00
May 27 Fri 2022

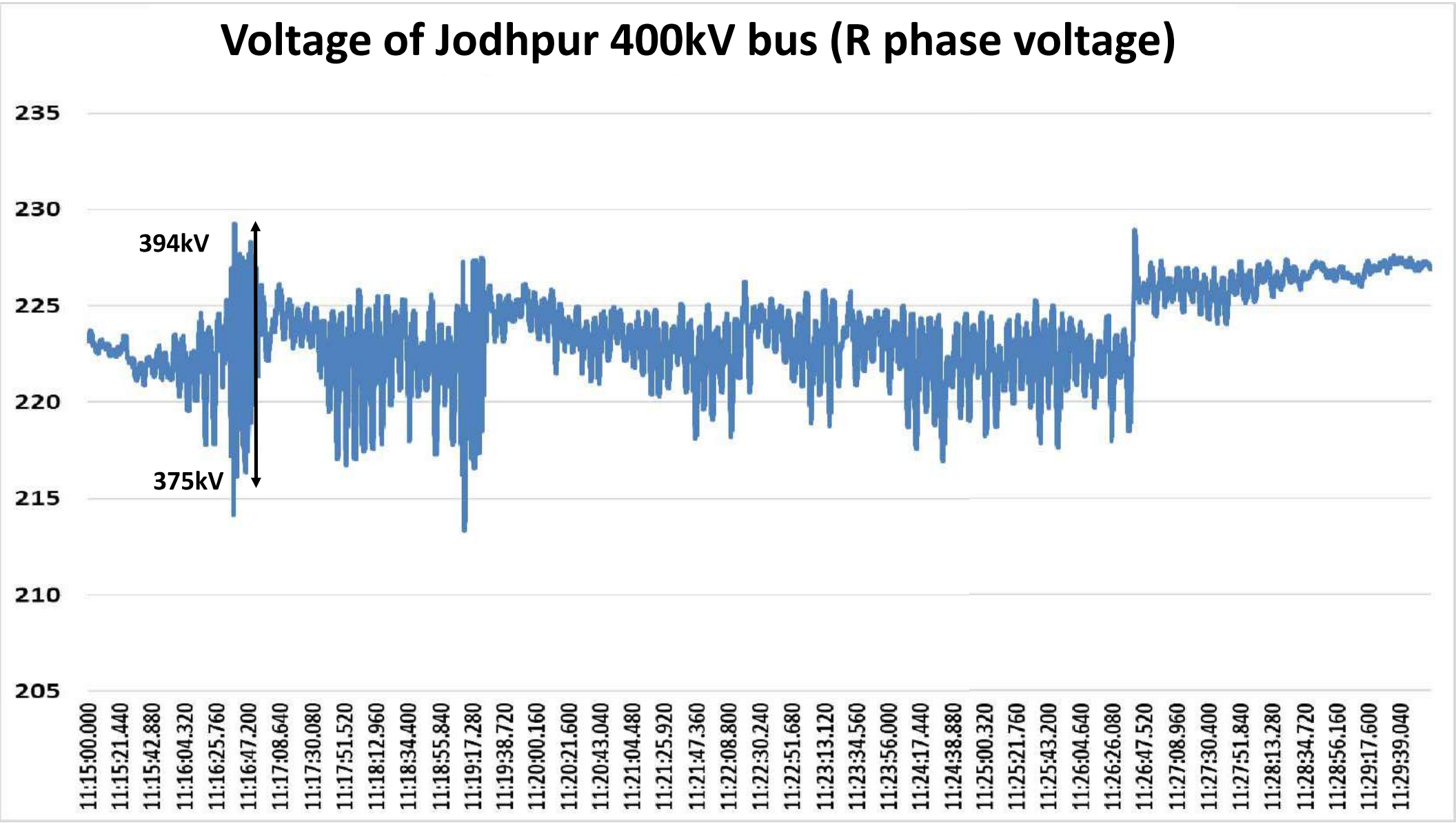

Kankani ICTs MVAR
Kankani Voltage
High MVAr drawl from 400kV to 220kV
Severe fluctuations in Voltage and MVAr exchange
390
385
380
375
370
365
185
180
175
170
165
160
155
150
145
140
135
130
10:30
11:00
11:30
12:00
May 27 Fri 2022


Akal ICTs MVAR
Akal Voltage
High MVAr drawl from 400kV to 220kV
460
440
420
400
380
360
340
320
386
384
382
380
378
376
374
372
370
10:30
11:00
11:30
12:00
May 27 Fri 2022


Barmer ICTs MVAR
Barmer Voltage
High MVAr drawl from 400kV to 220kV
190
188
186
184
182
180
178
176
174
384
382
380
378
376
374
372
10:30
11:00
11:30
12:00
May 27 Fri 2022


Jodhpur ICTs MVAR
Jodhpur Voltage
High MVAr drawl from 400kV to 220kV
390
388
386
384
382
380
378
376
374
372
220
215
210
205
200
195
190
10:30
11:00
11:30
12:00
May 27 Fri 2022

Voltage of Jodhpur 400kV bus (R phase voltage)



पावर सिस्टम ऑपरेशन कॉर्पोरेशन लिमिटेड
(भारत सरकार का उद्यम)
POWER SYSTEM OPERATION CORPORATION LIMITED
(A Govt. of India Enterprise)
केन्द्रीय कार्यालय : 61, आई एफ सी आई टावर, 8 एवं 9वीं मंजिल, नेहरु प्लेस, नई दिल्ली -110019
Corporate Office : 61, IFCI Tower, 8 & 9th Floor, Nehru Place, New Delhi - 110019
CIN : U40105DL2009GOI188682, Website : www.posoco.in, E-mail : posococc@posoco.in, Tel.: 011- 40234672

Ref: NLDC/SO/2022-23/ 38 **Date: 08/06/2022.**

To,

Member secretary,
ERPC/NERPC/NRPC/SRPC/WRPC

Subject: Review of planned outages from 1st September 22 to 15th October 22

Madam/Sir,

A meeting regarding coal supply issues to the power plants was chaired by Secretary(P) on 03.06.22(Minutes of the Meeting is attached as Annexe). The planned outages of thermal capacity in the month of Sep & Oct,22 was discussed. As per CEA LGBR 2022-23, it was appraised that all India thermal capacity outage would be of the order of 15000MW in the month of September 22 and 7500MW in October 22. It was opined that hydro and wind generation would come down drastically in these months, hence 15000MW planned outage of thermal capacity could not be affordable in these months.

In view of the above, it was decided that efforts should be made to reduce the all India planned outage in the month of Sept and Oct 22 and should be kept as minimum as possible. Following has been directed during the meeting:

Quote
As discussed in the meeting, planned outage from 01st September to 15th October 22 should be minimum possible so as to have adequate capacity available to meet he expected demand.
Unquote

Accordingly, all planned outages of thermal units during the month of September 22 to 15th October 22 may please be discussed among all stakeholders and ensure the bare minimum planned outage of thermal units in aforesaid months so that all India electricity demand in the upcoming months could be met without any constraint.

Yours sincerely,

(Debasis De)

CC:

1) Member (GO&D), CEA
2) Joint secretary (OM, R&R), MOP
3) ED, SRLDC/ERLDC/NERLDC/WRLDC.
4) CGM(I/C), NRLDC

Annexe

F. No. FU-33/2021-FSC
Government of India
Ministry of Power
****

Shram Shakti Bhawan, Rafi Marg,
New Delhi, the 06.06.2022

OFFICE MEMORANDUM

Sub: Minutes of the Daily Review Meeting on Coal Supply issues held on 03.06.2022 at 02:15 pm under the Chairmanship of Secretary

The undersigned is directed to forward herewith the Minutes of the Daily Review Meeting on Coal Supply issues held under the Chairmanship of Secretary on 03.06.2022 at 02:15 pm at Conference room, Shram Shakti Bhawan, New Delhi for information and necessary action.

Encl: as above

06/06/2022

(D. K. Sharma)
Joint Director

To,

1. Chairman, CEA
2. Chief Engineer TPP&D, CEA
3. Member (Planning), CEA
4. FM Division CEA
5. CMD, NTPC
6. CMD, PFC
7. CMD, POSOCO

Minutes of the daily review meeting held under the Chairmanship of Secretary on 03.06.2022 at 2.15 PM to review coal and power supply.

List of Participants is at Annexure.

The decisions taken during the meeting were as under:

1. During discussion NPTC informed that they are getting less rakes, defective rakes leading to delay in unloading of coal. Secretary (P) directed CMD, NTPC to write a letter to Chairman, Railway Board on the matter. **(Action: NTPC)**
2. CEA was directed to include RCR lifting by NTPC in RCR materialisation. **(Action: CEA)**
3. RCR lifting of KPCL and Haryana has not yet started and in case of Tamil Nadu and AP the lifting is insufficient. DO letter be issued to Secretary (Coal) for de-allocation of RCR coal to KPCL and Haryana (HPGCL). A separate DO letter to be issued to Tamil Nadu and AP for improving lifting of RCR. The de-allocated coal may be re-allocated to those willing GENCOs having higher RCR materialization. **(Action: Thermal Divn.)**
4. The coal stock at some of the NTPC stations are getting exhausted and need additional allocation of coal. DO letter from JS (Thermal) be issued to JS (Coal) for necessary action as NTPC are performing well on blending and generate a third of the country's power. **(Action: Thermal Divn.)**
5. Letter to be sent to Ministry of Coal and CIL with projected generation and consequent coal requirement for 2023-24. **(Action: CEA)**
6. As discussed in the meeting, planned outage from 1st September to 15th October 2022 should be minimum possible so as to have adequate capacity available to meet expected demand. **(Action: POSOCO.**

****

Annexure

List of Participants

Ministry of Power

1. Shri Alok Kumar, Secretary (In Chair)
2. Shri Vivek Kumar Dewangan, Additional Secretary
3. Shri Piyush Singh, Joint Secretary (Thermal)
4. Shri Ghanshyam Prasad, Joint Secretary (R&R and OM)
5. Shri Sanjeev Kumar Kassi, Chief Engineer (Thermal)
6. Shri G. Muthuraja, Director
7. Shri D.K. Sharma, Joint Director
8. Shri Sarat Chandra Dubba, Asst. Section Officer

CEA

1. Shri B. K. Arya, Chairman
2. Shri A. Balan, Member (Planning)
3. Shri M. P. Singh, CE (TPP&D)
4. Shri Mohd. Afzal, CE (FM)
5. Shri Naresh Kumar, Director
6. Shri Nitin Prakash, Director
7. Shri Ajay Telgaonkar

NTPC

1. Shri Gurdeep Singh, CMD
2. Shri Ramesh Babu, Director (Operations)
3. Shri P. K. Sinha, ED
4. Ms. Priya Kumar
5. Shri V. Santosh Kumar

POSOCO

1. Shri S.R.Narsimhan, CMD
2. Shri Ashok Kumar, GM

Sr No	Element Name	Outage Date	Outage Time	Reason
1	765 KV Orai-Jabalpur (PG) Ckt-1	06-May-22	15:53	Phase to earth fault Y-N. As per PMU, Y-N fault occured, no auto-reclosing observed.
		25-May-22	09:29	Phase to earth fault Y-N. As per PMU, Y-N fault and unsuccessful auto-reclosing observed.
		25-May-22	15:49	Phase to earth fault Y-N. As per PMU, Y-N fault and unsuccessful auto-reclosing observed.
		28-May-22	13:08	Over voltage. As per PMU, No fault observed.
2	800 KV HVDC Kurukshetra(PG) Pole-1	11-May-22	12:23	Tripped on DC line fault. As per PMU, No fault observed.
		21-May-22	18:35	Pole-1 blocked due to control mal-operation at Champa end. As per PMU, No fault observed.
		26-May-22	16:36	tripped on DMR-2 (dedicated metallic return) short circuit protection. As per PMU, No fault observed.
		28-May-22	21:52	Blocked from kurukshetra end due to VBE major fault in pole-1 lane-2 only at kurukshetra end. As per PMU, No fault observed.
3	400 KV Aligarh-Muradnagar_1 (UP) Ckt-1	13-May-22	18:29	Phase - y Zone - 1 Distance - 78.22km Fault current - 4.08 kamp. As per PMU, Y-N fault occured, no auto-reclosing observed.
		19-May-22	11:47	B-N fault, Zone-1, Dist. 38.48km, Fault current 2.322kA from Muradnagar_1 (UP). As per PMU, Y-N fault occured, no auto-reclosing observed.
		21-May-22	10:30	Phase to earth fault R-N. As per PMU, R-N fault and unsuccessful auto-reclosing observed.
		21-May-22	17:39	Tripping due to CVT faulty cable. As per PMU, No fault observed.
4	400 KV NewWanpoh(PG)-Baglihar(JK) (JKSPDCL) Ckt-1	12-May-22	18:08	Phase to earth fault Y-N. As per PMU, Y-N fault and unsuccessful auto-reclosing observed.
		16-May-22	00:14	Phase to earth fault R-N. As per PMU, R-N fault occurred and delayed clearance of 2000ms with no auto-reclosing observed.
		30-May-22	01:58	Line tripped from Wanpoh on DT received at New Wanpoh. As per PMU, No fault observed.
		30-May-22	02:38	Line tripped due to DT Receive at New Wanpoh end. As per PMU, No fault observed.
6	400 KV Shree Cement(SCL)-Kota(PG) (PG) Ckt-1	02-May-22	15:04	B-N fault.FLR-Kota-207.2km/2.26KA.Fault is in Shreecement portion. As per PMU, B-N fault and unsuccessful auto-reclosing observed.
		02-May-22	16:19	B-N Fault ,Distance : 18KM ,Fault Current: 4.41KA from Shree Cement end. As per PMU, B-N fault occured, no auto-reclosing observed.
		07-May-22	13:22	B-N fault, Dist. 207.2km, Fault current 2.2kA from Kota(PG). Fault is in Shreecement line portion. Tripped only at Shreecement end and remain charged from Kota PG end. As per PMU, B-N fault occured, no auto-reclosing observed.
		24-May-22	01:52	Tripped only at Shree Cement end and remain charged from Kota end. Shrecement-71.94KM/B-N. As per PMU, B-N fault occured, no auto-reclosing observed.
7	400 KV Talwandi Saboo(PSG)-Muktsar(PS) (PS) Ckt-2	06-May-22	15:41	Phase to phase fault Y-B. As per PMU, Y-B fault is observed.
		10-May-22	20:18	Phase to earth fault R-N. As per PMU, R-N fault occured, no auto-reclosing observed.
		12-May-22	21:08	R-N Fault . Fault Current- 12.26 KA. Dist- 17.6 KM from Mukatsar end. As per PMU, R-N fault occured, no auto-reclosing observed.
		15-May-22	21:59	Phase to earth fault R-N. As per PMU, R-N fault occured, no auto-reclosing observed.
8	400 KV Anpara_B(UPUN)-Mau(UP) (UP) Ckt-1	05-May-22	06:33	Phase to earth fault B-N. As per PMU, B-N fault and unsuccessful auto-reclosing observed.
		05-May-22	10:18	R-N fault, Zone-1, Fault current 2.66kA, Dist. 153.4km from Anpara end. As per PMU, R-N fault and unsuccessful auto-reclosing observed.
		26-May-22	16:40	B-N fault,FD:217.96 KM , Fc:3.13KA Z1 FROM ANPARA END. E/W broken between Loc No 435-436. As per PMU, No fault observed.
9	400 KV Bawana CCGTB(DTL)-Bhiwani(PG) (PG) Ckt-1	07-May-22	15:49	Phase to Earth fault. As per PMU, R-N fault and unsuccessful auto-reclosing observed.
		23-May-22	08:01	Over voltage. As per PMU, R-B fault occurred and delayed clearance of 1040ms observed.
		27-May-22	15:05	R-N fault, Zone-1, Dist. 70.4km from CCGTB Bawana & Dist. 18km, Fault current 10kA from Bhiwani end. As per PMU, R-N fault occured, no auto-reclosing observed.
10	400 KV Bawana-Mundka (DV) Ckt-2	29-May-22	13:29	R-N Fault, Zone-1, Dist. 11.07km, Fault current 18.19kA from Bawana & Zone-1, Dist. 7.83km, Fault current 16.35kA from Mundka. As per PMU, R-N fault occured, no auto-reclosing observed.
		29-May-22	15:42	R-N fault, Zone-1, Dist. 10.95km, Fault current 18.22kA from Bawana & Zone-1, Dist. 7.71km, Fault current 16.79kA from Mundka. As per PMU, R-N fault occured, no auto-reclosing observed.
		31-May-22	14:12	R-B Fault, Zone-1, Dist. 3.05km, Fault current Ir 8kA and Ib 9.8kA from Bawana. As per PMU, No fault observed.
11	400 KV Chamba-Jalandhar (PG) Ckt-1	03-May-22	09:40	Phase to earth fault Y-N. As per PMU, Y-N fault occured, no auto-reclosing observed.
		05-May-22	17:46	Phase to earth fault Y-N. As per PMU, Y-N fault and unsuccessful auto-reclosing observed.
		06-May-22	19:54	Tripped during testing of 400kV Bus-2 at Chamba. As per PMU, No fault observed.
12	400 KV Chamera_2(NH)-Kishenpur(PG) (PG) Ckt-1	03-May-22	09:33	Phase to earth fault Y-N. As per PMU, B-N fault followed by Y-N fault occured, no auto-reclosing observed.
		03-May-22	18:39	DT received at Chamera -II end. Line tripped from Chamera -II end only. As per PMU, No fault observed.
		09-May-22	17:57	R-N fault, Fault current 2.5kA, Dist.102 km from Chamera-2 & Fault current 13.74kA, Dist. 7.63km from Kishenpur. Line tripped during bad weather. As per PMU, R-N fault and unsuccessful auto-reclosing observed.
13	400 KV CLP Jhajjar(CLP)-Kabulpur(HV) (HVPNL) Ckt-1	02-May-22	13:01	B-N Fault .As intimated by Kabulpur end, line tripped due to Burning of wheat Waste Parali Below Line In Between JK Tower No. 58-89. As per PMU, B-N fault and unsuccessful auto-reclosing observed.
		23-May-22	05:00	Phase to earth fault R-N. As per PMU, B-N fault and unsuccessful auto-reclosing observed.

		23-May-22	22:13	DPR Z-1, I=14.18kA,d=13.1km,R-ph at Kabulpur end & DPR Z-1, R-ph, I=13.43kA,d=14.1km at MGTPS end. As per PMU, R-N fault and unsuccessful auto-reclosing observed.
14	400 KV Dadri(NT)-Panipat(BB) (PG) Ckt-1	04-May-22	16:53	Phase to earth fault B-N. As per PMU, B-N fault occured, no auto-reclosing observed.
		04-May-22	17:46	Phase to earth fault B-N. As per PMU, Y-N fault occured, no auto-reclosing observed.
		29-May-22	17:49	R-N fault, Dist. 90.78km, Fault current 1.664kA from Dadri & Dist. 15.63km, Fault current 6.3kA from Panipat. Windstorm reported at site. As per PMU, B-N fault and unsuccessful auto-reclosing observed.
15	400 KV Gr.Noida_2(UPC)-Noida Sec 148 (UP) Ckt-1	21-May-22	15:49	Flag at Gr. Noida end, BPhase, Fault Current-8.209kA, Zone-2, Fault Location-40.88KM. As per PMU, B-N fault and unsuccessful auto-reclosing observed.
		29-May-22	19:08	Phase to earth fault B-N. As per PMU, B-N fault occured, no auto-reclosing observed.
		21-May-22	15:59	flag at Gr noida end, BPhase, Fault Current-5.724kA, Zone-2, Fault Location-54.54 KM. As per PMU, Y-N fault occured, no auto-reclosing observed.
16	400 KV Gurgaon(PG)-Daulatabad(HV) (HV) Ckt-2	20-May-22	20:42	TRIPPED SHOWING Z-1, 4.3KM, B-PHASE, CARRIER RECEIVED AT DAULTABAD END. As per PMU, B-N fault and unsuccessful auto-reclosing observed.
		23-May-22	05:52	Z-1, RYB-ph, d=0.2km, trip1P-R ph, Ir=17.59kA. As per PMU, R-N fault followed by Y-N fault occured, no auto-reclosing observed.
		24-May-22	22:09	PLCC maloperation (Tripped from PG end showing DT RECEIVED). As per PMU, No fault observed.
17	400 KV Muzaffarnagar-Ataur (UP) Ckt-1	15-May-22	04:17	R-N Fault , Fault Current Ir : 6.22. KA & Fault Distance- 43.2 Km from Ataur end. As per PMU, R-N fault occured, no auto-reclosing observed.
		20-May-22	18:31	trip from both end, flags at muzzafarnagar. main-1 prot trip, z-1, c phase, distt=84.91km IC= 1.633KA 52TXI ,86 GB,. As per PMU, B-N fault and unsuccessful auto-reclosing observed.
		29-May-22	18:49	B-N fault, Zone-1, Dist. 87.65km, Fault current 3.811kA from Ataur(UP). As per PMU, R-N fault followed by B-N fault occured, no auto-reclosing observed.
18	220 KV Duni(RS)-Kota(PG) (RS) Ckt-1	05-May-22	03:15	R-N fault, Zone-1, Dist. 46.51km, Fault current 1.571kA from Dooni & Zone-1, Dist. 43.38km, Fault current 4.21kA from Kota end. As per PMU, R-N fault occured, no auto-
		11-May-22	09:37	B-N fault, Zone-1, Fault current 1.179kA, Dist. 64.40km from Dooni end & Zone-1, Fault current 5.2kA, Dist. 31.53km from Kota(PG). As per PMU, B-N fault occured, no auto-reclosing observed.
		11-May-22	11:47	B-N fault, Zone-1, Fault current 1.057kA, Dist. 72.94km from Dooni end & Zone-1, Fault current 6.8kA, Dist. 22.81km from Kota(PG). As per PMU, B-N fault occured, no auto-reclosing observed.
		13-May-22	13:59	C-G, zone-2, 11.17 Km, Fault Current-3.55 KA. As per PMU, B-N fault and unsuccessful auto-reclosing observed.
19	220 KV Badarpur(NT)-Alwar MIA(RS) (RS) Ckt-1	01-May-22	15:10	Phase to Earth fault. As per PMU, R-N fault and unsuccessful auto-reclosing observed.
		02-May-22	14:19	MI,A-N,IA 2.519 KA M2,Z1,A-N,Distance 15.40 KM,IA 5.123 KA Relay indication at BTPS -Line is already off from BTPS end,Line was charge on no load from MIA End. As per PMU, R-N fault and unsuccessful auto-reclosing observed.
		14-May-22	12:14	B-N, Z-1, 103.9 KM, Fault Current - 1.223 KA, Line was charged at No Load from MIA End only. As per PMU, Y-N fault and unsuccessful auto-reclosing observed.
		15-May-22	12:28	R-N, Z-2, 124.9 KM, Fault Current - 1.132 KA, Line was charged at No Load from MIA End and already off from BTPS End. As per PMU, R-N fault occurred and delayed clearance of 360ms with no auto-reclosing observed.
		21-May-22	08:52	MIA end :- M1 :- C-N , Z-II, Distance 124.5 KM , Fault current 1.241 KA M2:- C-N , Z-II , Distance 124.3 KM , Fault current 1.242 KA Note :- Line was charged at no load from MIA end and already off from BTPS end. As per PMU, B-N fault occurred and delayed clearance of 400ms with no auto-reclosing observed.
		23-May-22	09:55	Name of GSS :- 220 KV MIA GSS Name of line : 220 KV MIA- BTPS line tripping time :- 09:21 hrs dt. 23.05.2022 Relay indication :- MIA end :- M1 :- A-N , Z-I, Distance 53.02 KM , Fault current 2.656 KA M2:- A-N , Z-I , Distance 52.80 KM , Fault current 2.659 KA Note :- Line was charged at no load from MIA end and already off from BTPS end. As per PMU, No fault observed.
		29-May-22	18:27	R-N fault, Zone-1, Dist. 120.4km, Fault current 1.323kA from Alwar MIA(RS). As per PMU, R-N fault occurred and delayed clearance of 360ms with no auto-reclosing observed.
		30-May-22	16:44	B-N fault, Dist. 123.5km, Fault current 1.315kA from Alwar MIA(RS). As per PMU, B-N fault occurred and delayed clearance of 400ms with no auto-reclosing observed.
20	220 KV Debari(RS)-RAPS_A(NP) (RS) Ckt-1	08-May-22	13:25	B-N fault, Dist. 120.5km, Fault current 0.79kA from Debari(RS). As per PMU, B-N fault occured, no auto-reclosing observed.
		19-May-22	12:48	B-N fault, Dist. 134.6km from Debari end. As per PMU, No fault observed.
		19-May-22	18:30	B-N fault, Zone-1, Dist. 159.6km from Debari(RS) & Zone-1, Dist. 49.5km, Fault current 2.712kA from RAPP end. As per PMU, No fault observed.
		21-May-22	13:08	Debari End :- M-I, R-N Fault , D=96.2KM & FC=0.62KA AND RAPPA End :- M-I, R-Ph, Z-I, D=127.8KM If=1.36KA. As per PMU, R-N fault occured, no auto-reclosing observed.

S.No.	Category of Grid Disturbance (GD-I to GD-V)	Name of Elements (Tripped/Manually opened)	Affected Area	Owner/ Agency	Outage		Revival		Duration	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 Agra(PG)-Agra(UP) (PG) Ckt-1 2) 400 KV Agra(PG)-Agra Fatehbad(UP) (PG) Ckt-1 3) 765 KV Agra-Jhatikara (PG) Ckt-1	UTTAR PRADESH	POWERGRID	1-May-22	17:34	1-May-22	18:40	01:06	As reported at 17:34 Hrs, 400 KV Agra(PG)-Agra(UP) (PG) Ckt-1 tripped on B-N fault followed by tripping of 400 KV Agra(PG)-Agra Fatehabad(UP) (PG) Ckt-1 on R-N fault. Further after 1min at 17:35 Hrs, 765 KV Agra-Jhatikara (PG) Ckt-1 tripped on Y-N fault. Later at 17:51 Hrs, 400 KV Agra Fatehbad-Agra South (UP) Ckt-1 tripped on B-N fault followed by tripping of 765 KV Agra Fatehabad(UP)-Gr.Noida_2(UPC) (GTL) Ckt-1 at 17:55 Hrs on B-N fault. Multiple faults occurred due to thunderstorm / inclement weather condition. As per PMU, R-N & B-N fault at 17:34 Hrs, Y-N fault with unsuccessful A/R operation at 17:35 Hrs, B-N fault at 17:51 Hrs and R-N fault with unsuccessful A/R operation at 17:55 Hrs is observed. In antecedent condition, 400 KV Agra(PG)-Agra(UP) (PG) Ckt-1, 400 KV Agra(PG)-Agra Fatehabad(UP) (PG) Ckt-1, 765 KV Agra-Jhatikara (PG) Ckt-1 were carrying 5MW, 24MW & 741MW respectively.	0	0	0	0	0.000	0.000	46435	55421	80
2	GI-2	1) 800 KV HVDC Kurukshetra(PG)-Champa(PG) (PG) Ckt-4 2) 800 KV HVDC Kurukshetra(PG)-Champa(PG) (PG) Ckt-1 3) 800 KV HVDC Kurukshetra(PG)-Champa(PG) (PG) Ckt-2	HARYANA	POWERGRID	1-May-22	19:34	1-May-22	21:34	02:00	As reported, 800 KV HVDC Kurukshetra(PG)-Champa(PG) (PG) Ckt-1 tripped on DC line fault. At the same time, 800 KV HVDC Kurukshetra(PG)-Champa(PG) (PG) Ckt-2 & Ckt-4 both tripped on common longitudinal differential protection operation during thunderstorm / inclement weather condition. As per PMU, no fault is observed. In antecedent condition, 800 KV HVDC Kurukshetra(PG)-Champa(PG) Bipole-1 & Bipole-2 were carrying total 3000MW.	0	0	0	0	0.000	0.000	45296	54640	NA
3	GD-1	1) 400/220 kV 500 MVA ICT 2 at Adani RenewPark_SL_FGARH_FBTL (AREPRL) 2) 765 KV Bikaner-Bhadla_2 (PG) Ckt-1 3) 765 KV Ajmer-Bhadla_2 (PG) Ckt-1 4) 765 KV Bhadla_2 (PG)-Fatehgarh_II(PG) (PFTL) Ckt-1 5) 220 KV AzurePS541 SL_BHD_PG (APFCL)-Bhadla(PG) (Azure) Ckt-1 6) 220/33 kV 100 MVA ICT 1 at Mahindra SL_BHD_PG (MAHINDRA) 7) 765 KV Fatehgarh_II(PG)-Bhadla(PG) (FBTL) Ckt-1 8) 400/220 kV 500 MVA ICT 1 at Adani RenewPark_SL_FGARH_FBTL (AREPRL)	RAJASTHAN	AREPRL, Azure, FBTL, MAHINDRA, POWERGRID	2-May-22	11:06	2-May-22	11:39	00:33	As reported at 11:06 Hrs, 400/220 kV 500 MVA ICT 1 & ICT 2 at Adani RenewPark_SL_FGARH_FBTL (AREPRL) tripped on thermal over loading protection operation. With the tripping of both the ICTs which were carrying approx. 890MW total, sudden over voltage occurred. On this over voltage, 765 KV Bikaner-Bhadla_2 (PG) Ckt-1, 765 KV Ajmer-Bhadla_2 (PG) Ckt-1, 765 KV Bhadla_2 (PG)-Fatehgarh_II(PG) (PFTL) Ckt-1, 765 KV Fatehgarh_II(PG)-Bhadla(PG) (FBTL) Ckt-1, 220/33 kV 100 MVA ICT 1 at Mahindra SL_BHD_PG (MAHINDRA) and 220kV Bhadla-Azure Mapple ckt tripped. At the same time, 220 KV AzurePS541 SL_BHD_PG (APFCL)-Bhadla(PG) (Azure) Ckt-1 tripped on under voltage protection operation. During same time, tripping of incomer feeders observed at AYANA Solar. As per PMU plot of voltage at Fatehgarh2, over voltage is observed (voltage rose from 739kV to 825kV). As per SCADA, sudden drop of approx. 1860MW solar generation is observed, out of which around 600MW solar generation recovered within 2 min. In antecedent condition, 400/220 kV 500 MVA ICT 1 & ICT 2 at Adani RenewPark_SL_FGARH_FBTL (AREPRL), 220/33 kV 100 MVA ICT 1 at Mahindra SL_BHD_PG (MAHINDRA), 220 KV AzurePS541 SL_BHD_PG (APFCL)-Bhadla(PG) (Azure) Ckt-1 and 220kV Bhadla-Azure Mapple ckt were carrying 444MW, 444MW, 73MW, 228MW & 58MW respectively.	0.76	0	1300	0	2.422	0.000	53679	58291	NA
4	GD-1	1) 400 KV Bhinmal(PG)-Barmer(RS) (RS) Ckt-2 2) 400 KV Bhinmal(PG)-Barmer(RS) (RS) Ckt-1	RAJASTHAN	RRVPNL	2-May-22	11:23	2-May-22	15:20	03:57	As reported at 11:23 Hrs, 400 KV Bhinmal(PG)-Barmer(RS) (RS) Ckt-1 tripped on Y-N phase to earth fault after unsuccessful A/R operation, fault distance and fault current was 20km & 6.6kA from Bhinmal end. At the same time, 400 KV Bhinmal(PG)-Barmer(RS) (RS) Ckt-2 also tripped. As reported by POWERGRID, 400 KV Bhinmal(PG)-Barmer(RS) (RS) Ckt-2 tripped on DT received at their end. During same time, loss in wind generation of approx. 420MW occurred which recovered after approx. 17min. As per PMU, Y-N phase to earth fault with unsuccessful A/R operation is observed. As per SCADA, loss in Rajasthan wind generation of approx. 420MW is observed. In antecedent condition, 400 KV Bhinmal(PG)-Barmer(RS) (RS) Ckt-1 & Ckt-2 were carrying approx. 577MW each.	0.12	0	420	0	0.788	0.000	53288	57747	80
5	GD-1	1) 220/33 kV 100 MVA ICT 2 at Mahindra SL_BHD_PG (MAHINDRA) 2) 220/33 kV 100 MVA ICT 3 at Mahindra SL_BHD_PG (MAHINDRA)	RAJASTHAN	MAHINDRA	2-May-22	11:58	2-May-22	12:50	00:52	As reported, 220/33 kV 100 MVA ICT 1, ICT 2 & ICT 3 at Mahindra SL_BHD_PG (MAHINDRA) tripped on over voltage protection operation. As per PMU, voltage of 220kV Bhadla-Mahindra SL_BHD_PG ckt was 211kV during antecedent condition which shows that over voltage was not there. As per SCADA, drop in solar generation of approx. 240MW is observed. In antecedent condition, 220/33 kV 100 MVA ICT 1, ICT 2 & ICT 3 at Mahindra SL_BHD_PG (MAHINDRA) were carrying approx. 73MW, 95WM & 73MW respectively.	0.21	0	240	0	0.442	0.000	54310	59114	NA
6	GD-1	1) 220 KV Kishenpur(PG)-Udhampur(PDD) (PG) Ckt-2 2) 220 KV Kishenpur(PG)-Udhampur(PDD) (PG) Ckt-1 3) 220 KV Sarna(PS)-Udhampur(PDD) (PDD) Ckt-1	J & K	PDD JK, POWERGRID	4-May-22	12:49	4-May-22	13:51	01:02	As reported at 12:48 Hrs, 220 KV Kishenpur(PG)-Udhampur(PDD) (PG) Ckt-1 & Ckt-2 and 220 KV Sarna(PS)-Udhampur(PDD) (PDD) Ckt-1 tripped on B-N phase to earth fault. As per PMU B-N phase to earth fault is observed. As per SCADA SOE, it seems that 220 KV Kishenpur(PG)-Udhampur(PDD) (PG) Ckt-1 successfully autoreclosed from Kishenpur end. As per SCADA, change in load of approx. 75MW is observed. In antecedent condition, 220 KV Kishenpur(PG)-Udhampur(PDD) (PG) Ckt-1 & Ckt-2 were carrying 70MW each.	0	0.77	0	75	0.000	0.125	52396	59974	80
7	GD-1	1) 400/220 kV 315 MVA ICT 3 at Muzaffarnagar(UP) 2) 400/220 kV 315 MVA ICT 1 at Muzaffarnagar(UP) 3) 400/220 kV 315 MVA ICT 2 at Muzaffarnagar(UP)	UTTAR PRADESH	UPPTCL	5-May-22	00:35	5-May-22	01:35	01:00	As reported at 00:35 Hrs, B-N phase to earth fault occurred on 220kV Muzaffarnagar-Charla ckt in Z-1 with distance of 33km from Muzaffarnagar end. As CB of this line didn't open, fault kept persisting and later this CB got damage. Further after 3 sec, 400/220 kV 315 MVA ICT 1 & ICT 2 at Muzaffarnagar(UP) tripped on backup O/C, E/F protection operation. Further after 2sec, 220kV Muzaffarnagar-Shamli ckt and 220kV Muzaffarnagar-Jansath ckt tripped on SPS operation. Further after 300ms, 400/220 kV 315 MVA ICT 3 at Muzaffarnagar(UP) also tripped. At the same time, 220kV Muzaffarnagar-Modipuram ckt was hand tripped. 132kV line to Purqazi, Jolly Road and Jeneseth also tripped during same time. As per PMU, B-N phase to earth fault with delayed clearance in 5120ms is observed. As reported by SLDC-UP, load loss of around 19MW occurred during the event. In antecedent condition, 400/220 kV 315 MVA ICT 1,ICT 2 & ICT 3 at Muzaffarnagar(UP) were carrying 62MW, 69MW & 67MW respectively.	0	0.02	0	19	0.000	0.040	41361	48071	5120
8	GI-2	1) 400/220 kV 315 MVA ICT 2 at Wangtoo_GIS(HP) 2) 400/220 kV 315 MVA ICT 1 at Wangtoo_GIS(HP)	HIMACHAL PRADESH	HPSEB	5-May-22	11:43	5-May-22	12:54	01:11	As reported, 220kV bus bar at Wangtoo_GIS tripped on gas low level-2 alarm of G1 compartment (i.e. Bus isolator compartment) of Bay-201, which led to tripping of 400/220 kV 315 MVA ICT 1 & ICT 2, 220/66kV 100MVA Transformer-1 & 2 at Wangtoo_GIS(HP), 220kV Wangtoo-Kashmag ckt, 220kV Wangtoo-Bhoktoo ckt and 220kV Wangtoo-Bhabha-Kunihar ckt. On inspection terminals of gas level-2 in the density switch of Bay-201 was found loose. As per PMU, no fault is observed.	0	0	0	0	0.000	0.000	48723	53928	NA
9	GD-1	1) 80 MVAR Bus Reactor No 1 at 400KV Chamba(PG) 2) 400/220 kV 315 MVA ICT 1 at Chamba(PG) 3) 400/220 kV 315 MVA ICT 2 at Chamba(PG) 4) 400 KV Chamba-Jalandhar (PG) Ckt-1 5) 400 KV Chamba-Jalandhar (PG) Ckt-2 6) 400 KV Chamera_2(NH)-Chamba(PG) (PG) Ckt-1 7) 400KV Bus 1 at Chamba(PG)	HIMACHAL PRADESH ; PUNJAB	POWERGRID	6-May-22	19:54	6-May-22	20:10	00:16	As reported at 19:54 Hrs, busbar protection of 400kV Bus-1 at Chamba operated during testing of 400kV Bus-2 at Chamba which resulted into tripping of 400/220 kV 315 MVA ICT 1 & ICT 2 at Chamba(PG), 400 KV Chamba-Jalandhar (PG) Ckt-1 & Ckt-2, 400 KV Chamera_2(NH)-Chamba(PG) (PG) Ckt-1 and 80 MVAR Bus Reactor No 1 at 400KV Chamba(PG). With the tripping of above elements, all three 77MW unit of Chamera III tripped on loss of evacuation path. Due to loss of evacution path, Budhil and Lahal station also became dead. As per PMU, no fault is observed. As per SCADA, loss in generation of approx. 380MW (233MW at Chamera III, 70MW at Budhil & 77MW at Lahal) is observed. In antecedent condition, 400 KV Chamba-Jalandhar (PG) Ckt-1 & Ckt-2 were carrying 253MW & 25MW respectively.	0.1	0	380	0	0.768	0.000	49491	59152	NA
10	GD-1	1) 220 KV Hissar(BB)-Chirawa(RS) (BB) Ckt-1 2) 220 KV Hissar(BB)-Jindal Steel(HR) (HVPNL) Ckt-1 3) 220 KV Hissar-Sangrur (BB) Ckt-2 220 KV Hissar-Sangrur (BB) Ckt-1 4) 220KV Bus 2 at Hisar(BB), 220 KV 5) Bhiwani-Hissar (BB) Ckt-2 6) 220 KV Hissar(PG)-Hissar IA(HV) (PG) Ckt-2 7) 220 KV Hissar(BB)-Hissar IA(HV) (BBMB) Ckt-2 8) 220 KV Bhiwani-Hissar (BB) Ckt-1 9) 220 KV Hissar(BB)-Hissar IA(HV) (HVPNL) Ckt-1 10) 220 KV Hissar(PG)-Hissar IA(HV) (PG) Ckt-1	HARYANA	BBMB, HVPNL, POWERGRID	10-May-22	16:09	10-May-22	17:15	01:06	As reported at 16:09 Hrs, Bus fault occurred due to bursting of Y-Ph CT of 220 KV Hissar(BB)-Hissar IA(HV) (HVPNL) Ckt-1 at Hisar IA end. During same time, bus bar protection at Hisar_BB operated which resulted into tripping of all 220kV lines i.e, 220 KV Hissar(BB)-Chirawa(RS) (BB) Ckt-1, 220 KV Hissar(BB)-Jindal Steel(HR) (HVPNL) Ckt-1, 220 KV Hissar-Sangrur (BB) Ckt-1 & Ckt-2, 220 KV Bhiwani-Hissar (BB) Ckt-2, 220 KV Hissar(BB)-Hissar IA(HV) (HVPNL) Ckt-1 & Ckt-2. At the same time, 220 KV Hissar(PG)-Hissar IA(HV) (PG) Ckt-1 & Ckt-2 also tripped from Hissar IA end and 220kV Hissa IA-Masudpur ckt-1 & Ckt-2, 220kV Hissa IA-Narwana ckt-1 tripped from remote end only. As per PMU, Y-N fault which later converted into three phase fault with delayed clearance in 840ms is observed. As per SCADA, change in load of approx. 700MW in Haryana control area is observed. In antecedent condition, 220 KV Hissar(BB)-Hissar IA(HV) (HVPNL) Ckt-1 & Ckt-2, 220 KV Hissar(PG)-Hissar IA(HV) (PG) Ckt-1 & Ckt-2 were carrying 144MW, 119MW, 101MW & 110MW respectively.	0	0.77	0	700	0.000	1.124	51469	62265	840
11	GD-1	1) 110 MW Kishenganga - UNIT 3 2) 130 MW Dulhasti HPS - UNIT 2 3) 110 MW Kishenganga - UNIT 1 4) 130 MW Dulhasti HPS - UNIT 3 5)130 MW Dulhasti HPS - UNIT 1 6) 110 MW Kishenganga - UNIT 2	J & K	NHPC	11-May-22	19:56	11-May-22	21:08	01:12	As reported, 130 MW Dulhasti HPS - UNIT 1, UNIT 2 & UNIT 3 all tripped on negative phase sequence current protection operation. At the same time, 110 MW Kishenganga - UNIT 1, UNIT 2 & UNIT 3 also tripped GT over current protection relay (P141) operation. As per PMU plot of phase voltage at Kishenpur(PG), no fault is observed, however fluctuation in voltage is observed. And as per PMU plot of negative sequence current of 400kV Kishenpur-Dulhasti ckt-1, negative sequence current existed for around 12 sec and maximum negative sequence current was approx. 7kA. As per SCADA, loss in generation of approx. 335MW at Kishenganga HEP and 385MW at Dulhasti HEP is observed. As per SOE, first Units of Kishenganga tripped followed by tripping of Units of Dulhasti HEP.	0.86	0	720	0	1.417	0.000	50816	64406	NA
12	GD-1	1) 400/220 kV 315 MVA ICT 1 at Obra_B(UP) 2) 200 MW Obra TPS - UNIT 9 3) 200 MW Obra TPS - UNIT 1 4) 200 MW Obra TPS - UNIT 12 5) 400 KV Obra_B-Sultanpur (UP) Ckt-1 6) 400KV Bus 1 at Obra_B(UP)	UTTAR PRADESH	UPPTCL	14-May-22	11:34	14-May-22	12:53	01:19	As reported at 11:34 Hrs, air of CB of 200MW Unit-9 leaked and CB went under lockout condition. Further after approx. 25sec LBB of 200MW Unit-9 at Obra_B(UP) (connected to 400kV Bus-1) operated on stator earth fault. 400KV Bus 1 at Obra_B(UP) along with the elements 400 KV Obra_B-Sultanpur (UP) Ckt-1, 400/220 kV 315 MVA ICT 1 at Obra_B(UP), 200 MW Obra TPS - UNIT 9, UNIT 10 and UNIT 12 which were connected to 400kV Bus1 tripped on LBB operation. As per PMU, no fault is observed. As per SCADA, loss in generation of approx. 428MW is observed at Obra_B(UP). In antecedent condition, 400 KV Obra_B-Sultanpur (UP) Ckt-1 and 400/220 kV 315 MVA ICT 1 at Obra_B(UP) were carrying 158MW & 370MW respectively.	0	0	428	0	0.757	0.000	56576	66072	NA

S.No.	Category of Grid Disturbance (GD-I to GD-V)	Name of Elements (Tripped/Manually opened)	Affected Area	Owner/ Agency	Outage		Revival		Duration	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)	
13	GD-1	1) 400 KV Nathpa Jhakri(SJ)-Rampur HEP(SJ) (PG) Ckt-2 2) 250 MW Karcham Wangtoo HPS - UNIT 4 3) 250 MW Karcham Wangtoo HPS - UNIT 2 4) 400 KV Nathpa Jhakri(SJ)-Panchkula(PG) (PG) Ckt-1 5) 68.67 MW Rampur HEP - UNIT 4 6) 250 MW Nathpa-Jhakri HPS - UNIT 5 7) 250 MW Nathpa-Jhakri HPS - UNIT 3 8) 68.67 MW Rampur HEP - UNIT 5 9) 68.67 MW Rampur HEP - UNIT 3 10) 250 MW Nathpa-Jhakri HPS - UNIT 6	HIMACHAL PRADESH	JSW, POWERGRID, SJVNL	15-May-22	20:14	15-May-22	21:48	01:34	As reported, 400 kV Nathpa Jhakri(SJ)-Rampur HEP(SJ) (PG) Ckt-2 tripped on Y-N fault. Further after approx. 1min, 400kV Nathpa Jhakri(SJ)-Panchkula(PG) (PG) Ckt-1 also tripped on R-B phase to phase fault. With the tripping of both these lines Case-2 of SPS of Nathpa Jhakri, Rampur, Karcham HEP generation complex operated which led to tripping of 250 MW Karcham Wangtoo HPS - UNIT 2 & UNIT 4, 68.67MW Rampur HPS UNIT 4 & UNIT 5 and 250 MW Nathpa-Jhakri HPS - UNIT 3 & UNIT 5. Further after approx. 3min, 250 MW Nathpa-Jhakri HPS - UNIT 6 also tripped on stator overload protection operation, which further tripped 68.67MW Rampur HPS UNIT 3 because they were running in Tandem Operation (TOS). As per PMU, Y-N fault with delayed clearance in 760ms followed by R-B phase to phase fault is observed. As per SCADA, loss in generation of approx. 1500MW is observed due to tripping of 3*250MW Unit at N.Jhakri HEP, 2*68.67MW Unit at Rampur HPS and 1*250MW unit at Karcham Wangtoo HPS. In antecedent condition, 400 KV Nathpa Jhakri(SJ)-Rampur HEP(SJ) (PG) Ckt-2 and 400kV Nathpa Jhakri(SJ)-Panchkula(PG) (PG) Ckt-1 were carrying 346MW & 611MW respectively.	0	0	1500	0	2.957	0.000	50725	63283	760
14	GI-2	1) 220 KV Fatehabad(PG)-Sirsa(HV) (HVPNL) Ckt-1 2) 400/220 kV 315 MVA ICT 1 at Fatehabad(PG)	HARYANA	HVPNL, POWERGRID	16-May-22	00:40	16-May-22	02:50	02:10	As reported, 400/220 kV 315 MVA ICT 1 at Fatehabad(PG) tripped due to external flash over on 220 KV side dropper of ICT. At the same time, 220 KV Fatehabad(PG)-Sirsa(HV) (HVPNL) Ckt-1 also tripped from Fatehabad end. As per PMU, B-N phase to earth fault is observed. In antecedent condition, 400/220 kV 315 MVA ICT 1 at Fatehabad(PG) and 220 KV Fatehabad(PG)-Sirsa(HV) (HVPNL) Ckt-1 were carrying 82MW & 83MW respectively.	0	0	0	0	0.000	0.000	50307	65135	80
15	GD-1	1) 220 KV AD hydro(AD)-Phozal(HP) (ADHPL) Ckt-1 2) 220 KV AD hydro(AD)-Nallagarh(PG) (ADHPL) Ckt-1 3) 220 KV Phozal(HP)-Nallagarh(PG) (ADHPL) Ckt-1	HIMACHAL PRADESH	ADHPL	16-May-22	16:26	19-May-22	13:56	02:21:30	As reported, 220 KV AD hydro(AD)-Phozal(HP) (ADHPL) Ckt-1 and 220 KV Phozal(HP)-Nallagarh(PG) (ADHPL) Ckt-1 tripped on Y-B phase to phase fault. At the same time, 220 KV AD hydro(AD)-Nallagarh(PG) (ADHPL) Ckt-1 also tripped on R-N phase to earth fault, fault distance was 48.2km and fault current was 1.5kA from AD Hydro end. Faults occurred during thunderstorm/inclement weather condition. As per PMU, Y-B double phase to earth fault is observed. As per SCADA, loss in generation of approx. 140MW is observed at AD Hydro HEP. In antecedent condition, 220 KV AD hydro(AD)-Phozal(HP) (ADHPL) Ckt-1 220 KV AD hydro(AD)-Nallagarh(PG) (ADHPL) Ckt-1 and 220 KV Phozal(HP)-Nallagarh(PG) (ADHPL) Ckt-1 were carrying 49MW, 88MW and 82MW respectively.	0	0	140	0	0.257	0.000	54555	63100	80
16	GD-1	1) 400/220 kV 315 MVA ICT 2 at Chamba(PG) 2) 220 KV Chamba(PG)-Karian(HP) (HPSEB) Ckt-1 3) 220 KV Chamera_3(NH)-Chamba(PG) (PG) Ckt-1 4) 220 KV Chamera_3(NH)-Chamba(PG) (PG) Ckt-2 5) 220 KV Chamera_3(NH)-Budhil(LB) (LB) Ckt-1 6) 400/220 kV 315 MVA ICT 1 at Chamba(PG)	HIMACHAL PRADESH	HPSEB, Lanco Budhil, POWERGRID	19-May-22	21:59	20-May-22	01:01	03:02	As reported, 220 KV Chamera_3(NH)-Budhil(LB) (LB) Ckt-1 tripped on Y-N phase to earth fault, fault distance was 14.8km (Z-2) from Chamera_3 end, fault occurred during inclement weather condition. At the same time, 400/220 kV 315 MVA ICT 1 & ICT 2 at Chamba(PG) tripped on differential protection operation. As per information received from CPCC-2, there was some configuration issue at LV side(33kV, tertiary winding) in both the ICTs, which led to differential protection operation. Issue with the configuration has been resolved. With the tripping of ICTs, 77MW UNIT-1,2 & 3 at Chamera-III tripped on loss of evacuation path. Due to tripping of all three units of Chamera_3, 220 KV Chamera_3(NH)-Chamba(PG) (PG) Ckt-1 & Ckt-2 de-energized. As per PMU, Y-N phase to earth fault is observed which cleared within 80ms. As per SCADA, loss in generation of approx. 217MW at Chamera_3, 35MW at Budhil and 146MW odf Lahal is observed. In antecedent condition, 220 KV Chamera_3(NH)-Budhil(LB) (LB) Ckt-1 and 220 KV Chamera_3(NH)-Chamba(PG) (PG) Ckt-1 & Ckt-2 were carrying 181MW, 200MW & 199MW respectively.	1.2	0	400	0	0.799	0.000	50088	65708	80
17	GD-1	1) 400/220 kV 315 MVA ICT 2 at Panki(UP) 2) 220 KV Kanpur(PG)-Panki(UP) (PG) Ckt-1	UTTAR PRADESH	POWERGRID, UPPTCL	20-May-22	00:27	20-May-22	02:28	02:01	As reported, 400/220 kV 315 MVA ICT 2 at Panki(UP), 220 KV Kanpur(PG)-Panki(UP) (PG) Ckt-1, 220/33kV, 60MVA ICT-1 at Panki, 220/132kV, 160MVA ICT-2, ICT-3 & ICT-4 at Panki and 220kV Panki-kanpur South(UP) ckt all tripped on blast of Y-ph CT of 220/132kV, 160MVA ICT-2 at Panki. At the same time, 400/220 kV 315 MVA ICT 2 at Panki(UP) was hand tripped due to safety reason. As per PMU, Y-N phase to earth fault which later converted into three phase fault with delayed clearance in 15sec 780ms is observed. As per SCADA, change in load of approx. 500MW is observed in UP control area. In antecedent condition, 400/220 kV 315 MVA ICT-1 & ICT 2 at Panki(UP) and 220/132kV, 160MVA ICT-2, ICT-3 & ICT-4 at Panki were carrying 179MW, 184MW, 106MW, 99MW & 91MW respectively.	0	1	0	500	0.000	0.770	49283	64903	15680
18	GD-1	1) 765 KV Bhadla_2 (PG)-Fatehgarh_II(PG) (PFTL) Ckt-1 2) 765 KV Bhadla-Bikaner (PG) Ckt-1 3) 220 KV Bhadla(PG)-AzureMaplePSS SL_BHD_PG (APMPL) (APMPL) Ckt-1 4) 765 KV Fatehgarh_II(PG)-Bhadla(PG) (FBTL) Ckt-1	RAJASTHAN	APMPL, FBTL, POWERGRID	20-May-22	12:31	20-May-22	12:50	00:19	1. Triggering event was the B-N phase to earth fault on 765kV Bhadla-Bikaner(PG) ckt-1 at 12:31:03:800 Hrs. Fault current and fault distance was 5.3kA & 169km (100%) from Bhadla(PG) end. As reported, B-ph conductor of hexa zebra span from dead end tower to gantry at Bikaner end found broken. As per PMU, R-N fault cleared within 80ms. 2. During the fault, voltage at RE stations reduced to 0.53pu-0.65pu and MW drop observed on LVRT operation. However, different RE station showed different behavior during the event which is not inline with the standard LVRT operation. 3. During the event, total solar generation reduction of approx. 3014MW is observed (as per SCADA) which led to drop in frequency from 50.03Hz to 49.72Hz, drop of approx. 0.3Hz. 4. Power drop at most of RE stations led to sudden voltage rise (As per PMU at Fatehgarh2 end, voltage of 765kV Bhadla-Fatehgarh2 ckt-1 rose up to 816-821kV from 755kV). 5. Further after approx. 5secs & 10secs, 765kV Bhadla2-Fatehgarh2 ckt-1 & 765kV Fatehgarh2-Bhadla ckt-1 tripped on over voltage respectively. 6. With the tripping of aforementioned 765kV lines, MW loading of 765kV Bikaner-Bhadla ckt-2 increased to 2034MW at around 12:34 Hrs and MW loading of 765kV Fatehgarh2-Bhadla2 ckt-2 increased to 1979MW at around 12:34 Hrs. 7. As per PMU, oscillations in grid also observed at at around 12:33 hrs, which might have initiated due to over loading of 765kV Fatehgarh2-Bhadla2 ckt-2 (186km) & 765kV Bikaner-Bhadla ckt-2 (169km).	0.5	0	3014	0	5.239	0.000	57526	67253	80
19	GD-1	1) 400/220 kV 315 MVA ICT 4 at Daulatabad(HV) 2) 400/220 kV 315 MVA ICT 2 at Daulatabad(HV) 3) 400/220 kV 315 MVA ICT 3 at Daulatabad(HV)	HARYANA	HVPNL	20-May-22	18:38	20-May-22	20:29	01:51	At 18:38Hrs, 220 kV Daulatabad-Majra ckt-1, 220 kV Daulatabad- Sector 95 ckt-1 & 2, 400/220 kV 315 MVA ICT 1, ICT 2, ICT 3 & ICT 4 at Daulatabad(HV) all tripped on 220kV Bus-2 bus bar protection operation. Fault occurred due to broken earth wire of 220 kV Daulatabad- Sector 95 ckt-1. As per PMU, Y-N fault with delayed clearance in 360ms followed by R-N & Y-N fault is observed. As per SCADA, change in load of approx. 338MW is observed in Haryana control area. In antecedent condition, 400/220 kV 315 MVA ICT 1, ICT 2, ICT 3 & ICT 4 at Daulatabad(HV) were carrying approx. 109MW each.	0	0.67	0	338	0.000	0.550	48916	61444	440
20	GD-1	1) 400/220 kV 315 MVA ICT 1 at Gr.Noida(UPC) 2) 400/220 kV 315 MVA ICT 2 at Gr.Noida(UPC) 3) 400/220 kV 500 MVA ICT 5 at Gr.Noida(UPC) 4) 400/220 kV 500 MVA ICT 6 at Gr.Noida(UPC)	UTTAR PRADESH	UPPTCL	20-May-22	22:46	20-May-22	23:40	00:54	I. As per information received from Executive Engineer (T&C) Gr. Noida, R-N fault occurred on 220kV Gr. Noida-RC Green ckt.-1. 2. Auto Recloser attempt was taken by circuit breaker and got unsuccessful due to persistent fault. 3. After this, 3 phase tripping command did not issue by relay. 4. Due to this all ICTs at 400kV Gr. Noida tripped on E/F protection. As per PMU, R-B double phase to earth fault with delayed clearance in 1280ms is observed. As per SCADA, change in load of approx. 750MW observed in UP control area.	0	0.7	0	750	0.000	1.149	50684	65282	1280
21	GD-1	1) 220 KV Bhiwani(HV)-Bhiwani(BB) (HVPNL) Ckt-2 2) 400/220 kV 500 MVA ICT 1 at Bhiwani(BB)	HARYANA	BBMB, HVPNL	21-May-22	00:45	21-May-22	03:40	02:55	As reported by BBMB 220 KV Bhiwani(HV)-Bhiwani(BB) (HVPNL) Ckt-2 tripped on R-Phase to ground fault (Z1 ,769 m but no trip signal or fault was observed at Bhiwani HVPNL end. Tripping of ICT 400/220 kV, 500 MVA ICT (Relay: Trip Relay 86B, 86BX, Buch Relay30AT (A ph Buch optd)) at Bhiwani(BBMB).	0	0.24	0	80	0.000	0.127	46543	62905	80
22	GI-2	1) 400 KV Gr.Noida_2(UPC)-Noida Sec 148 (UP) Ckt-1 2) 400 KV Noida Sec 148-Noida Sec 123 (UP) Ckt-2	UTTAR PRADESH	UPPTCL	21-May-22	15:49	21-May-22	17:12	01:23	As per constituent detail 400 KV Gr.Noida_2(UPC)-Noida Sec 148 (UP) Ckt-1 tripped on Phase-Ground (B-Ph) 400 KV Noida Sec 148-Noida Sec 123 (UP) Ckt-2 B-N fault	0	0	0	0	0.000	0.000	52107	65832	80
23	GD-1	1) 400/220 kV 315 MVA ICT 1 at Muzaffarnagar(UP) 2) 400/220 kV 500 MVA ICT 4 at Muzaffarnagar(UP) 3) 400/220 kV 315 MVA ICT 3 at Muzaffarnagar(UP) 4) 400/220 kV 315 MVA ICT 2 at Muzaffarnagar(UP)	UTTAR PRADESH	UPPTCL	21-May-22	17:31	21-May-22	18:30	00:59	As informed by SLDC at the time of incident weather condition was stormy and as per information by concerned it is suspected that cable came in the range of both buses due to which Bus Bar Protection of both the buses operated and all elements at 220kV side tripped.	0	0.03	0	30	0.000	0.053	45317	57102	120

S.No.	Category of Grid Disturbance (GD-I to GD-V)	Name of Elements (Tripped/Manually opened)	Affected Area	Owner/ Agency	Outage		Revival		Duration	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)	
24	GI-2	1) 800 KV HVDC Kurukshetra(PG) Pole-4 2) 800 KV HVDC Kurukshetra(PG) Pole-2 3) 800 KV HVDC Kurukshetra(PG) Pole-03 4) 800 KV HVDC Kurukshetra(PG) Pole-1	HARYANA	POWERGRID	21-May-22	18:35	21-May-22	20:35	02:00	As reported, 800 KV HVDC Kurukshetra(PG) Pole-2 & Pole-4 tripped on dc fault. At the same time, 800 KV HVDC Kurukshetra(PG) Pole-1 & Pole-3 tripped on DMR-2 (dedicated metallic return) short circuit protection operation. As per PMU, no fault is observed and fluctuation in voltage is observed. In antecedent condition, 800 KV HVDC Kurukshetra(PG) Bipole 1 & Bipole 2 were carrying 1000MW each.	0	0	0	0	0.000	0.000	43761	54220	NA
25	GI-2	1)765 KV Chittorgarh-Banaskantha (PG) Ckt-1 2) 765 KV Chittorgarh-Banaskantha (PG) Ckt-2	RAJASTHAN	POWERGRID	23-May-22	01:09	23-May-22	01:50	00:41	As reported, 765 KV Chittorgarh-Banaskantha (PG) Ckt-1 tripped on DT received from Banaskantha end on over voltage protection oeperation at Banaskantha end. At the same time, 765 KV Chittorgarh-Banaskantha (PG) Ckt-1 tripped from Banasjantha end only. As per PMU, no fault is observed. In antecedent condition, 765 KV Chittorgarh-Banaskantha (PG) Ckt-1 & Ckt-2 were carrying 135MW each.	0	0	0	0	0.000	0.000	41737	56408	NA
26	GI-2	1) 400 KV Ataur-Hapur (UP) Ckt-1 2) 765/400 kV 1500 MVA ICT 2 at Hapur(UP)	UTTAR PRADESH	UPPTCL	23-May-22	05:31	23-May-22	17:38	12:07	As per PMU Line 400 KV Ataur-Hapur (UP) Ckt-1 tripped and auto reclosed .Even after opening of line fault continued and ICT tripped on REF ,Diff and PRV.	0	0	0	0	0.000	0.000	34422	34045	80
27	GI-2	1) 765/400 kV 1500 MVA ICT 3 at Jhatikara(PG) 2) 765/400 kV 1500 MVA ICT 1 at Jhatikara(PG) 3) 765/400 kV 1500 MVA ICT 4 at Jhatikara(PG) 4) 765 KV Khetri (PKTSL)-Jhatikara(PG) (PKTSL) Ckt-1	RAJASTHAN	PKTSL, POWERGRID	23-May-22	05:45	23-May-22	10:59	05:14	Line 765 KV Khetri (PKTSL)-Jhatikara(PG) (PKTSL) Ckt-1 tripped on Y-N fault. 765/400 kV 1500 MVA ICT 3 at Jhatikara(PG) 765/400 kV 1500 MVA ICT 1 at Jhatikara(PG) Both tripped on 3 phase differential trip .	0	0	0	0	0.000	0.000	36227	41469	80
28	GI-2	1) 400 KV Bahadurgarh-Sonipat (PG) Ckt-1 2) 400 KV Bawana CCGTB(DTL)-Bahadurgarh(PG) (PG) Ckt-1	HARYANA	POWERGRID	23-May-22	07:32	23-May-22	09:32	02:00	Tripped on over voltage protection operated due to sudden rise in voltage caused by load loss during heavy windstorm in the area	0	0	0	0	0.000	0.000	32220	34089	NA
29	GI-2	1) 400 KV Dadri(NT)-Maharanibagh(PG) (PG) Ckt-1 2) 400 KV Bawana CCGTB(DTL)-Bhiwani(PG) (PG) Ckt-1 3) 400 KV Mandola(PG)-Maharanibagh(PG) (DTL) Ckt-1 4) 400 KV Bawana(DV)-Maharanibagh(PG) (DTL) Ckt-1	NEW DELHI ; HARYANA	POWERGRID	23-May-22	08:01	23-May-22	11:20	03:19	Tripping of 400 KV Dadri(NT)-Maharanibagh(PG) (PG) Ckt-1 caused high voltage leading to multiple tripping in area due to high voltage.	0	0	0	0	0.000	0.000	34448	33990	800
30	GI-2	1) 400 KV Badaune(UP)-Rosa(UPC) (OCBTL) Ckt-1 2) 400 KV Badaune(UP)-Rosa(UPC) (OCBTL) Ckt-2 3) 400 KV Sambhal_PRSTL -Badaune (UP) Ckt-1 4) 400 KV Sambhal_PRSTL -Badaune (UP) Ckt-2	UTTAR PRADESH	UPPTCL	23-May-22	09:45	23-May-22	13:01	03:16	As reported at 09:45hrs, 400 KV Badaune(UP)-Rosa(UPC) (OCBTL) Ckt-1 successfully autoreclosed on B-N fault. Further after 5secs, 400 KV Badaune(UP)-Rosa(UPC) (OCBTL) Ckt-1 & Ckt-2 and 400 KV Sambhal_PRSTL -Badaune (UP) Ckt-1 & Ckt-2 all tripped on over voltage stage-1 protection operation at Baduane end. As per PMU at CB Garj(UP), B-N phase to earth fault is observed which cleared within 80ms. As per DR received from Baduane end of 400 KV Badaune(UP)-Rosa(UPC) (OCBTL) Ckt-1 & Ckt-2, over voltage protection operated correctly.	0	0	0	0	0.000	0.000	32620	36039	80
31	GI-2	1) 400 KV Panki-Aligarh (UP) Ckt-1 2) 400 KV Rewa Road-Panki (UP) Ckt-1 3) 400 KV Unnao-Panki (UP) Ckt-1	UTTAR PRADESH	UPPTCL	23-May-22	11:26	23-May-22	13:14	01:48	As reported, 400 KV Panki-Aligarh (UP) Ckt-1, 400 KV Rewa Road-Panki (UP) Ckt-1 and 400 KV Unnao-Panki (UP) Ckt-1 all tripped on B-N fault. Fault occurred during inclement weather condition. As per PMU, B-N phase to earth fault is observed which cleared within 80ms. In antecedent condition, 400 KV Panki-Aligarh (UP) Ckt-1, 400 KV Rewa Road-Panki (UP) Ckt-1 and 400 KV Unnao-Panki (UP) Ckt-1 were carrying 31MW, 99MW & 187MW respectively.	0	0	0	0	0.000	0.000	37061	40735	80
32	GI-2	1) 400/220 kV 500 MVA ICT 1 at Ataur(UP) 2) 400 KV Ataur-Muradnagar_1 (UP) Ckt-1 3) 400 KV Ataur-Indirapuram (UP) Ckt-1	UTTAR PRADESH	UPPTCL	23-May-22	23:36	24-May-22	01:31	01:55	As reported, at 23:36:01:080hrs, 400kV Ataur-Muradnagar_1 (UP) Ckt-1 tripped on B-N phase to earth fault. Further after approx. 600ms, again B-N fault occurred and 400/220 kV 500 MVA ICT 1 at Ataur(UP) & 400 KV Ataur-Indirapuram (UP) Ckt-1 both tripped on bus bar protection of 400kV Bus-1. As per PMU, B-N fault followed by another B-N fault after approx. 600ms is observed. In antecedent condition, 400kV Ataur-Muradnagar_1 (UP) Ckt-1, 400/220 kV 500 MVA ICT 1 at Ataur(UP) & 400 KV Ataur-Indirapuram (UP) Ckt-1 were carrying 68MW, 46MW & 72MW reispectively.	0	0	0	0	0.000	0.000	29175	37217	80
33	GI-2	1) 400 KV Anpara_B(UPUN)-Mau(UP) (UP) Ckt-1 2) 400 KV Anpara-Sarnath (UP) Ckt-1	UTTAR PRADESH	UPPTCL	26-May-22	16:34	27-May-22	04:43	12:09	As reported, 400 KV Anpara_B(UPUN)-Mau(UP) (UP) Ckt-1 tripped on B-N phase to earth fault, fault distance was 217.9km from Anpara end. At the same time, 400 KV Anpara-Sarnath (UP) Ckt-1 also tripped on Y-N phase to earth fault, fault distance was 196.7km from Anpara end. As per PMU, R-N & Y-N fault without A/R operation is observed. In antecedent condition, 400 KV Anpara_B(UPUN)-Mau(UP) (UP) Ckt-1 & 400 KV Anpara-Sarnath (UP) Ckt-1 were carrying 389MW & 457MW respectively.	0	0	0	0	0.000	0.000	45872	55222	80
34	GI-2	1) 800 KV HVDC Kurukshetra(PG) Pole-2 2) 800 KV HVDC Kurukshetra(PG) Pole-4	HARYANA	POWERGRID	27-May-22	18:59	27-May-22	20:58	01:59	As reported, at 18:59hrs, 800 KV HVDC Kurukshetra(PG) Pole-2 & Pole-4 both tripped on DC line fault. As per PMU, no fault observed and fluctuation in voltage is observed. In antecedent condition, 800 KV HVDC Kurukshetra(PG) Pole-1 & Pole-3 were carrying 450MW each.	0	0	0	0	0.000	0.000	43761	54220	NA

S.No.	Category of Grid Disturbance (GD-I to GD-V)	Name of Elements (Tripped/Manually opened)	Affected Area	Owner/ Agency	Outage		Revival		Duration	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)	
35	GI-2	1) 400 KV Singrauli(NT)-Anpara(UP) (PG) Ckt-1 2) 400 KV Singrauli(NT)-Allahabad(PG) (PG) Ckt-1 3) 400 KV Anpara-Obra_B (UP) Ckt-1	UTTAR PRADESH	POWERGRID, UPPTCL	28-May-22	15:44	28-May-22	17:22	01:38	As reported, 400 KV Singrauli(NT)-Allahabad(PG) (PG) Ckt-1 tripped on B-N phase to earth fault, fault distance was 12.5km from Singrauli end. At the same time, 400 KV Singrauli(NT)-Anpara(UP) (PG) Ckt-1 also tripped on B-N phase to earth fault, fault distance was 12.8km from Singrauli end and 400 KV Anpara-Obra_B (UP) Ckt-1 tripped on Y-B phase to phase fault. As per SCADA, line only tripped from Obra_B end. As per PMU plot of phase voltage & phase current of Singrauli end, at first, 400 KV Singrauli(NT)-Allahabad(PG) (PG) Ckt-1 tripped at 15:44:14.880hrs on B-N fault without A/R operation, fault current was approx. 6.7kA from Singrauli end. Further after approx. 5secs of tripping of 400 KV Singrauli(NT)-Allahabad(PG) (PG) Ckt-1 (PG) Ckt-1, 400 KV Singrauli(NT)-Anpara(UP) (PG) Ckt-1 also tripped on B-N phase to earth fault without A/R operation, fault current was approx. 6.1kA from Singrauli end. In antecedent condition, 400 KV Singrauli(NT)-Anpara(UP) (PG) Ckt-1 & 400 KV Singrauli(NT)-Allahabad(PG) (PG) Ckt-1 were carrying 688MW & 348MW respectively.	0	0	0	0	0.000	0.000	51511	60581	80
36	GI-2	1) 400 KV Sikar(PG)-Ratangarh(RS) (PG) Ckt-2 2) 400 KV Sikar(PG)-Ratangarh(RS) (PG) Ckt-1	RAJASTHAN	POWERGRID	28-May-22	21:31	29-May-22	00:08	02:37	As reported, 400 KV Sikar(PG)-Ratangarh(RS) (PG) Ckt-1 tripped on R-N fault, fault distance was 58.7km from Sikar end. At the same time, 400 KV Sikar(PG)-Ratangarh(RS) (PG) Ckt-2 also tripped on B-N fault after unsuccessful A/R operation. As per PMU, R-N fault followed by B-N fault with unsuccessful A/R operation is observed. In antecedent condition, 400 KV Sikar(PG)-Ratangarh(RS) (PG) Ckt-1 & Ckt-2 were carrying approx. 2MW each.	0	0	0	0	0.000	0.000	48030	61432	80
37	GI-2	1) 800 KV HVDC Kurukshetra(PG) Pole-1 2) 800 KV HVDC Kurukshetra(PG) Pole-03	HARYANA	POWERGRID	28-May-22	21:52	28-May-22	22:46	00:54	As reported, at 21:52hrs, 800 KV HVDC Kurukshetra(PG) Pole-1 & Pole-3 both tripped on DC line fault. As per PMU, no fault observed and fluctuation in voltage is observed. In antecedent condition, 800 KV HVDC Kurukshetra(PG) Pole-1 & Pole-3 were carrying 375MW each.	0	0	0	0	0.000	0.000	47896	61384	NA
38	GI-2	1) 400 KV Singrauli(NT)-Anpara(UP) (PG) Ckt-1 2) 400 KV Singrauli(NT)-Allahabad(PG) (PG) Ckt-1	UTTAR PRADESH	POWERGRID	29-May-22	12:56	29-May-22	13:48	00:52	As reported, 400 KV Singrauli(NT)-Anpara(UP) (PG) Ckt-1 tripped on B-N phase to earth fault, fault distance was 12.9km from Singrauli end. At the same time, 400 KV Singrauli(NT)-Allahabad(PG) (PG) Ckt-1 also tripped on B-N phase to earth fault, fault distance was 14.27km from Singrauli end. As per PMU plot of phase voltage & phase current of Singrauli end, at first, 400 KV Singrauli(NT)-Anpara(UP) (PG) Ckt-1 tripped at 12:56:38.720hrs on B-N fault without A/R operation. Further after approx. 160ms of tripping of 400 KV Singrauli(NT)-Anpara(UP) (PG) Ckt-1, 400 KV Singrauli(NT)-Allahabad(PG) (PG) Ckt-1 also tripped on B-N phase to earth fault with unsuccessful A/R operation. Fault current was approx. 6.5kA from Singrauli end. In antecedent condition, 400 KV Singrauli(NT)-Anpara(UP) (PG) Ckt-1 & 400 KV Singrauli(NT)-Allahabad(PG) (PG) Ckt-1 were carrying 86MW & 295MW respectively.	0	0	0	0	0.000	0.000	51397	57072	80
39	GI-2	1) 765 KV Orai-Aligarh (PG) Ckt-2 2) 765/400 kV 1500 MVA ICT 2 at Aligarh(PG)	UTTAR PRADESH	POWERGRID	29-May-22	19:44	29-May-22	22:59	03:15	As reported, at 19:44hrs, 765 KV Orai-Aligarh (PG) Ckt-2 tripped on R-N phase to earth fault. 765/400 kV 1500 MVA ICT 2 at Aligarh(PG) also tripped approx. 30sec before tripping of 765 KV Orai-Aligarh (PG) Ckt-2 on protection malopration. As per PMU, R-N fault with unsuccessful A/R operation is observed. In antecedent condition, 765 KV Orai-Aligarh (PG) Ckt-2 and 765/400 kV 1500 MVA ICT 2 at Aligarh(PG) were carrying 517MW & 324MW respectively.	0	0	0	0	0.000	0.000	43777	54500	80
40	GD-1	1) 220 KV Sohna Road (GPTL)-Badshahpur(HV) (HVPNL) Ckt-2 2) 220 KV Sohna Road (GPTL)-Badshahpur(HV) (HVPNL) Ckt-1 3) 400 KV Gurgaon(PG)-Sohna Road (GPTL) (GPTL) Ckt-1 4) 220 KV Sohna Road (GPTL)-GurgaonSec72(HV) (HVPNL) Ckt-1	HARYANA	HVPNL, POWERGRID	30-May-22	16:22	30-May-22	18:15	01:53	As reported at 16:22hrs, 220 KV Sohna Road (GPTL)-Badshahpur(HV) (HVPNL) Ckt-1 & Ckt-2 both tripped on R-N & B-N phase to earth fault respectively. As information received from SLDC-HR through verbal communication, fault occurred due to damage of wave trap of both the lines during thunderstorm/windstorm (inclement weather condition). At the same time, 220 KV Sohna Road (GPTL)-GurgaonSec72(HV) (HVPNL) Ckt-1 also tripped on R-Y phase to phase fault. Further after approx. 20secs(as per SCADA SOE at NRLDC), 400 KV Gurgaon(PG)-Sohna Road (GPTL) (GPTL) Ckt-1 also tripped on R-N phase to earth fault. Due to tripping of 220 KV Sohna Road (GPTL)-Badshahpur(HV) (HVPNL) Ckt-1 & Ckt-2, load loss of approx. 100MW occurred which later restored through Samaypur after approx. 15-20mins. As per PMU at Gurgaon(PG), at 16:22:30, R-Y-B three phase to earth fault with delayed clearance in 2240ms occurred followed by R-N phase to earth fault with unsuccessful A/R operation at 16:22:50. In antecedent condition, 220 KV Sohna Road (GPTL)-Badshahpur(HV) (HVPNL) Ckt-1 & Ckt-2 were carrying approx. 55MW each.	0	0.18	0	100	0.000	0.171	49652	58418	2240

Northern Regional inter regional lines tripping for May-22

S. No.	Name of Transmission Element Tripped	Owner/ Utility	Outage		Load Loss/ Gen. Loss	Brief Reason (As reported)	Category as per CEA Grid standards	Restoration		# Fault Clearance Time (>100 ms for 400 kV and 160 ms for 220 kV)	*FIR Furnished (YES/NO)	DR/EL provided in 24 hrs (YES/NO)	Other Protection Issues and Non Compliance (inference from PMU, utility details)	Suggestive Remedial Measures	Remarks
			Date	Time				Date	Time						
1	765 KV Agra-Gwalior (PG) Ckt-1	POWERGRID	1-May-22	21:22	Nil	Phase to earth fault R-N	NA	2-May-22	12:12	NA	Yes	Yes			As per PMU R-N fault with auto recloser was obseved.
2	765 KV Phagi(RS)-Gwalior(PG) (PG) Ckt-1	POWERGRID	5-May-22	19:14	Nil	Y-N fault, Dist. 74.4km, Fault current 8.26kA from Gwalior & Dist. 211.5km, Fault current 2.93kA from Phagi.	NA	6-May-22	17:15	NA	Yes(After 24Hrs)	No			As per PMU Y-N Fault with auto-recloser was observed
3	765 KV Orai-Jabalpur (PG) Ckt-1	POWERGRID	6-May-22	15:53	Nil	Phase to earth fault Y-N	NA	6-May-22	17:42	NA	Yes(After 24Hrs)	Yes(After 24Hrs)			As per PMU data: Y-N Fault and as reported line was in Non –auto mode.
4	800 KV HVDC Champa_Kurukshetra(PG) Pole-1	POWERGRID	11-May-22	12:23	Nil	Pole-1 blocked due to control mal-operation at Champa end.	NA	11-May-22	13:27	NA	NO	NO			As per PMU data: No fault was observed in AC system.
5	400 KV Varanasi-Biharshariff (PG) Ckt-1	POWERGRID	12-May-22	14:47	Nil	Phase to earth fault R-N	NA	12-May-22	16:54	NA	Yes(After 24Hrs)	Yes(After 24Hrs)			As per PMU data: R-N Fault with auto- recloser was observed
6	400 KV Balia-Patna (PG) Ckt-1	POWERGRID	13-May-22	18:38	Nil	Over voltage	NA	13-May-22	19:41	NA	Yes(After 24Hrs)	Yes(After 24Hrs)			As per PMU data: No Over Voltage at Balia end.
7	400 KV Balia-Biharshariff (PG) Ckt-2	POWERGRID	19-May-22	14:20	Nil	Phase to earth fault Y-N	NA	19-May-22	15:45	NA	NO	NO			As per PMU data: Y-N Fault , no auto- recloser was observed (No DR/EL)
8	400 KV Gorakhpur(PG)-Muzaffarpur(PG) (POWERLINK) Ckt-1	POWERLINK	19-May-22	16:11	Nil	Phase to earth fault R-N	NA	19-May-22	19:20	NA	Yes(After 24Hrs)	Yes(After 24Hrs)			As per PMU data: R-N Fault with successful auto- recloser was observed
9	800 KV HVDC Champa_Kurukshetra(PG) Pole-1	POWERGRID	21-May-22	18:35	Nil	tripped on DMR-2 (dedicated metallic return) short circuit protection	GI-2	21-May-22	19:54	NA	NO	NO			From PMU, No AC system fault observed.
10	800 KV HVDC Champa_Kurukshetra(PG) Pole-3	POWERGRID	21-May-22	18:35	Nil	tripped on DMR-2 (dedicated metallic return) short circuit protection	GI-2	21-May-22	20:35	NA	NO	NO			From PMU, No AC system fault observed.
11	800 KV HVDC Champa_Kurukshetra(PG) Pole-2	POWERGRID	21-May-22	18:35	Nil	tripped on HV Line-2 DC Line Fault	GI-2	21-May-22	20:35	NA	NO	NO			From PMU, No AC system fault observed.
12	800 KV HVDC Champa_Kurukshetra(PG) Pole-4	POWERGRID	21-May-22	18:35	Nil	tripped on HV Line-2 DC Line Fault	GI-2	21-May-22	20:43	NA	NO	NO			From PMU, No AC system fault observed.
13	765 KV Varanasi-Gaya (PG) Ckt-2	POWERGRID	21-May-22	22:05	Nil	Phase to earth fault B-N	NA	21-May-22	23:21	NA	Yes(After 24Hrs)	Yes(After 24Hrs)			As per PMU data: B-N Fault with auto- recloser was observed
14	765 KV Chittorgarh-Banaskantha (PG) Ckt-2	POWERGRID	23-May-22	01:09	Nil	Line charged from Chittor end. Tripped only from Banaskantha end.	GI-2	23-May-22	01:50	NA	Yes(After 24Hrs)	Yes(After 24Hrs)			As per PMU data: Over voltage was observed but not in range of sover voltage stage-I settings.
15	765 KV Chittorgarh-Banaskantha (PG) Ckt-1	POWERGRID	23-May-22	01:09	Nil	DT receive from Banaskantha end.	GI-2	23-May-22	02:02	NA	Yes(After 24Hrs)	Yes(After 24Hrs)			As per PMU data: Over voltage was not in above of stage 1 over voltage settings.As reported DT received from other end.
16	400 KV Balia-Biharshariff (PG) Ckt-2	POWERGRID	24-May-22	20:16	Nil	Phase to earth fault B-N	NA	25-May-22	22:23	NA	Yes(After 24Hrs)	Yes(After 24Hrs)			As per PMU data: B-N Fault with auto- recloser was observed.
17	765 KV Orai-Jabalpur (PG) Ckt-1	POWERGRID	25-May-22	09:29	Nil	Phase to earth fault Y-N	NA	25-May-22	13:32	NA	Yes(After 24Hrs)	Yes(After 24Hrs)			As per PMU data: Y-N Fault with auto- recloser was observed
18	765 KV Orai-Jabalpur (PG) Ckt-1	POWERGRID	25-May-22	15:49	Nil	Phase to earth fault Y-N	NA	25-May-22	21:21	NA	Yes(After 24Hrs)	Yes(After 24Hrs)			As per PMU data: Y-N Fault with auto- recloser was observed.

Northern Regional inter regional lines tripping for May-22

19	800 KV HVDC Kurukshetra(PG) Pole-1	POWERGRID	26-May-22	16:36	Nil	Blocked from kurukshetra end due to VBE major fault in pole-1 lane-2 only at kurukshetra end.	NA	26-May-22	18:14	NA	NO	NO			From PMU, No AC system fault observed.
20	800 KV HVDC Agra-Bishwanath Chariali (PG) Ckt-2	POWERGRID	27-May-22	15:04	Nil	Snaping of jumper	NA	27-May-22	18:34	NA	NO	NO			From PMU, No AC system fault observed.
21	800 KV HVDC Champa- Kurukshetra(PG) Pole-4	POWERGRID	27-May-22	18:59	Nil	Tripped on DC Line Fault.	GI-2	27-May-22	21:04	NA	NO	NO			From PMU, No AC system fault observed.
22	800 KV HVDC Kurukshetra(PG) Pole-2	POWERGRID	27-May-22	18:59	Nil	Tripped on DC Line Fault.	GI-2	27-May-22	20:58	NA	NO	NO			From PMU, No AC system fault observed.
23	765 KV Orai-Jabalpur (PG) Ckt-2	POWERGRID	27-May-22	19:35	Nil	Phase to earth fault B-N (As per A-B-C philosphy), in term of RYB, it is Y-N fault	NA	28-May-22	06:44	NA	Yes	Yes			As per PMU data: Y-N Fault with auto- recloser was observed
24	765 KV Orai-Jabalpur (PG) Ckt-1	POWERGRID	28-May-22	13:08	Nil	Over voltage	NA	28-May-22	22:01	NA	Yes(After 24Hrs)	Yes(After 24Hrs)			As per PMU data: Over Voltage was below stage 1 of over voltage settings.As reported Line tripped due to overvoltage at Jabalpur end.DT received at Orai end
25	800 KV HVDC Champa_Kurukshetra(PG) Pole-1	POWERGRID	28-May-22	21:52	Nil	Tripped on DC line fault	GI-2	28-May-22	22:57	NA	NO	NO			From PMU, No AC system fault observed.
26	800 KV HVDC Champa_Kurukshetra(PG) Pole-3	POWERGRID	28-May-22	21:53	Nil	Tripped on DC line fault	GI-2	28-May-22	22:46	NA	NO	NO			From PMU, No AC system fault observed.

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

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

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

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

Reporting of Violation of Regulation for various issues for above tripping

1	Fault Clearance time(>100ms for 400kV and >160ms for 220kV)	1. CEA Grid Standard-3.e 2. CEA Transmission Planning Criteria
2	DR/EL Not provided in 24hrs	1. IEGC 5.2(r) 2. CEA Grid Standard 15.3
3	FIR Not Furnished	1. IEGC 5.9.6.a 2. CEA Grid Standard 12.2 (Applicable for SLDC, ALDC only)
4	Protection System Mal/Non Operation	1. CEA Technical Standard of Electrical Plants and Electric Lines: 43.4.A 2. CEA (Technical Standards for connectivity to the Grid) Regulation, 2007: Schedule Part 1. (6.1, 6.2, 6.3)
5	A/R non operation	1. CEA Technical Standard of Electrical Plants and Electric Lines: 43.4.C 2. CEA Technical Planning Criteria

1st May 2022 - 31st May 2022														
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	0	**0**	0	1	**0**	0	1	**0**	0	0	**0**	
2	AHEJ2L	1	1	**100**	1	0	**100**	1	0	**100**	1	0	**100**	
3	AHEJ4L	3	3	**100**	2	1	**100**	2	1	**100**	3	0	**100**	
4	ANTA-NT	1	1	**100**	1	0	**100**	1	0	**100**	1	0	**100**	
5	AP43L	1	1	**100**	1	0	**100**	1	0	**100**	1	0	**100**	
6	APFOL	4	4	**100**	4	0	**100**	4	0	**100**	4	0	**100**	DR/EL & Tripping report
7	APMPL	2	2	**100**	2	0	**100**	2	0	**100**	2	0	**100**	needs to be submitted
8	AREPRL	4	2	**50**	2	0	**50**	2	0	**50**	4	0	**100**	
9	ARP1PL	1	1	**100**	1	0	**100**	1	0	**100**	1	0	**100**	
10	ASEPL	1	1	**100**	1	0	**0**	1	0	**0**	1	0	**100**	
11	AURAIYA-NT	3	1	**33**	1	0	**33**	1	0	**33**	1	0	**33**	
12	BAIRASUIL-NH	1	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	
13	BBMB	58	12	**21**	27	7	**53**	22	16	**52**	21	4	**39**	DR/EL & Tripping report
14	BUDHIL	1	1	**100**	1	0	**100**	1	0	**100**	1	0	**100**	needs to be submitted
15	CHAMERA-III-NH	3	0	**0**	0	2	**0**	0	2	**0**	0	0	**0**	
16	CHAMERA-II-NH	4	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	
17	CHAMERA-I-NH	1	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	
18	CPCC1	155	20	**13**	20	13	**14**	20	15	**14**	17	15	**12**	
19	CPCC2	102	13	**13**	13	9	**14**	14	10	**15**	22	0	**22**	DR/EL & Tripping report
20	CPCC3	76	10	**13**	11	6	**16**	10	6	**14**	10	1	**13**	needs to be submitted
21	DADRIGAS-NT	1	1	**100**	1	0	**100**	1	0	**100**	1	0	**100**	
22	DADRI-NT	8	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	
23	DHAULIGANGA-NH	1	0	**0**	0	1	**0**	0	1	**0**	0	0	**0**	
24	DULHASTI-NH	5	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	
25	FARIDABAD-NT	2	1	**50**	1	0	**50**	1	0	**50**	1	0	**50**	
26	INDIGRID	1	0	**0**	0	0	**0**	0	0	**0**	1	0	**100**	
27	JHAJJAR	1	1	**100**	1	0	**100**	1	0	**100**	1	0	**100**	DR/EL & Tripping report
28	KARCHAM	4	2	**50**	2	0	**50**	2	0	**50**	4	0	**100**	needs to be submitted
29	KISHENGANGA-NH	5	0	**0**	0	0	**0**	0	0	**0**	1	0	**20**	
30	KOLDAM-NT	2	1	**50**	1	0	**50**	1	0	**50**	2	0	**100**	
31	MAHINDRA	3	3	**100**	3	0	**100**	3	0	**100**	3	0	**100**	
32	NAPP	5	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	
33	NJPC	6	0	**0**	0	3	**0**	0	3	**0**	0	0	**0**	
34	PARBATI-II-NH	1	1	**100**	1	0	**100**	1	0	**100**	1	0	**100**	DR/EL & Tripping report
35	PKTSL	5	4	**80**	4	1	**100**	4	1	**100**	4	1	**100**	needs to be submitted
36	RAMPUR	3	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	
37	RAPPA	4	3	**75**	4	0	**100**	4	0	**100**	4	0	**100**	DR/EL & Tripping report
38	RAPPB	1	1	**100**	1	0	**100**	1	0	**100**	1	0	**100**	needs to be submitted
39	SAURYA	4	4	**100**	4	0	**100**	4	0	**100**	4	0	**100**	
40	SEWA-2-NH	5	0	**0**	0	1	**0**	0	1	**0**	0	0	**0**	
41	SHREE CEMENT	4	0	**0**	1	0	**25**	1	0	**25**	0	0	**0**	
42	SINGRAULI-NT	7	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	
43	SINGOLI	1	1	**100**	1	0	**0**	1	0	**0**	1	0	**100**	
44	SLDC-DV	41	5	**12**	13	2	**0**	15	3	**39**	14	1	**35**	
45	SLDC-HP	12	3	**25**	2	5	**29**	2	5	**29**	2	2	**20**	
46	SLDC-HR	69	5	**7**	7	2	**10**	13	2	**19**	10	0	**14**	
47	SLDC-JK	40	0	**0**	40	0	**100**	40	0	**100**	24	0	**60**	DR/EL & Tripping report
48	SLDC-PS	41	18	**44**	25	2	**64**	30	1	**75**	36	0	**88**	needs to be submitted
49	SLDC-RS	63	2	**3**	25	0	**40**	25	0	**40**	29	0	**46**	
50	SLDC-UK	38	22	**58**	23	2	**64**	23	13	**92**	23	3	**66**	
51	SLDC-UP	245	47	**19**	63	21	**28**	59	33	**28**	55	3	**23**	
52	STERLITE	17	0	**0**	0	2	**0**	0	1	**0**	4	2	**27**	
53	TANAKPUR-NH	5	0	**0**	0	1	**0**	0	0	**0**	0	0	**0**	
54	TANDA-NT	1	1	**100**	1	0	**100**	1	0	**100**	1	0	**100**	DR/EL & Tripping report
55	THAR SURYA 1 PRIVATE LIMITED	2	1	**50**	1	0	**50**	1	0	**50**	1	0	**50**	needs to be submitted
56	UNCHAHAR-NT	1	1	**100**	0	0	**0**	0	0	**0**	0	0	**0**	

As per the IEGC provision under clause 5.2 (r), detailed tripping report along with DR & EL has to be furnished within 24 hrs of the occurrence of the event

S. No.	Name of the Generatng Station (Capacity in MW)	Date of last PSS tuning / re-tuning performed (in DD/MM/YYYY format)	Date of last Step Response Test performed (in DD/MM/YYYY format)	Report submitted to NRLDC/NRPC (Yes/ No)	Remarks (if any)	Tentative schedule for PSS tuning / re-tuning in FY 2021-22
1	**THDC**					
	TEHRI HPS(4 * 250)	15.12.2021 to 20.12.2021	15.12.2021 to 20.12.2021	Yes	(Report shared vide email dt.19.01.2019)	
	KOTESHWAR HPS(4 * 100)	17/03/2019 to 19/03/2019	17/03/2019 to 19/03/2019	Yes	(Report shared vide email dt.11.02.2021)	
2	**SJVNL**					
	NATHPA-JHAKRI HPS(Unit1 #250)	10.03.2020	-	No	Excitation system upgraded in 2020	
	NATHPA-JHAKRI HPS(Unit2 #250)	14.03.2013	-	No	The existing excitation system is very old and obsoleted forwhich support for PSS tuning is not available from OEM (Mls Voith Hydro), although NJHPS, SJVN has placed work order on 08/12/201 5. Further being the critical component, it is not possible"io get the PSS tuning done from any other vender except OEM (Mls Voith Hydro) being the system and software specific job. Therefore, prpposal for upgradation of the excitation system of this unit is under process and PSS tuning shall be carried out during upgradation of excitation system.	3rd Quarter
	NATHPA-JHAKRI HPS(Unit3 #250)	03.03.2020	-	No	Excitation system upgraded in 2020	
	NATHPA-JHAKRI HPS(Unit4 #250)	14.03.2013	-	NO	The existing excitation system is very old and obsoleted forwhich support for PSS tuning is not available from OEM (Mls Voith Hydro), although NJHPS, SJVN has placed work order on 08/12/201 5. Further being the critical component, it is not possible"io get the PSS tuning done from any other vender except OEM (Mls Voith Hydro) being the system and software specific job. Therefore, prpposal for upgradation of the excitation system of this unit is under process and PSS tuning shall be carried out during upgradation of excitation system.	3rd Quarter
	NATHPA-JHAKRI HPS(Unit5 #250)	14.05.2016	14.05.2016	NO	Excitation system upgraded in 2013	3rd Quarter
	NATHPA-JHAKRI HPS(Unit6 #250)	14.05.2017	14.05.2017	NO	Excitation system upgraded in 2013	3rd Quarter
	RAMPUR HEP(6 * 68.67)	29.11.2014	27.10.2020,10.02.2021	YES	PSS tuning was done at the time of commissioning of Excitation System by OEM (M/s BHEL). Since then response of PSS is checked regularly and found satisfactory.	
3	**HVPNL**					
	PANIPAT TPS(unit1# 250)	29.03.2016	29.03.2016	YES	--	3rd Quarter
	PANIPAT TPS(unit2# 250)	15.01.2018	15.01.2018	YES	--	3rd Quarter
	DCRTPP (YAMUNA NAGAR)(unit1#300)	19-12-2018	19-12-2018	YES	(Report attached)	3rd Quarter
	DCRTPP (YAMUNA NAGAR)(unit1#300)	Will be carried out shortly				
	RGTPP(KHEDAR) (2*600)	5th to 6th July 2013	5th to 6th July 2013	Report attached. Previous record being looked into	No MW capacity addition after 2013 at RGTPP Khedar. No new line addition in vicinity of station	
	JHAJJAR(CLP) (2*660)	20-05-2017	20-05-2017	YES	--	3rd Quarter
4	**NTPC**					
	Rihand (Unit1#500)	03-03-2017	03-03-2017	YES	Next test will be done during re-commissioning of unit after O/H	3rd Quarter
	Rihand (Unit2#500)	02-07-2016	02-07-2016	YES	Next test will be done during re-commissioning of unit after O/H	3rd Quarter
	Rihand (Unit3#500)	15-08-2015	15-08-2015	YES	Next test will be done during re-commissioning of unit after O/H	3rd Quarter
	Rihand (Unit4#500)	25-05-2017	25-05-2017	YES	Next test will be done during re-commissioning of unit after O/H	3rd Quarter
	Rihand (Unit4#500)	11-12-2014	11-12-2014	YES	Next test will be done during re-commissioning of unit after O/H	3rd Quarter
	Rihand (Unit5#500)	11-12-2014	11-12-2014	YES	Next test will be done during re-commissioning of unit after O/H	3rd Quarter
	SINGRAULI STPS(Unit1#200)	-	-	-	Not done in last three years	
	SINGRAULI STPS(Unit2#200)	-	-	-	Not done in last three years	
	SINGRAULI STPS(Unit3#200)	-	-	-	Not done in last three years	
	SINGRAULI STPS(Unit4#200)	-	-	-	Not done in last three years	
	SINGRAULI STPS(Unit5#200)	-	-	-	Not done in last three years	
	SINGRAULI STPS(Unit6#500)	02.05.2018	02.05.2018	NO	--	3rd Quarter
	SINGRAULI STPS(Unit7#500)	15.07.2018	15.07.2018	NO	--	3rd Quarter

	UNCHAHAR I(2 * 210)	29-03-2016	29-03-2016	YES	--	3rd Quarter
	UNCHAHAR II TPS(unit1# 210)	13-07-2019	13-07-2019	YES	--	
	UNCHAHAR II TPS(unit2# 210)	10-08-2018	10-08-2018	YES	--	3rd Quarter
	UNCHAHAR UNIT6#500	-	31.03.2017	YES	--	3rd Quarter
	KOLDAM HPS(4 * 200)	01-07-2015	01-07-2015	YES	--	3rd Quarter
	DADRI GPS(2 * 154.51) (ST- Steam Turbine)	-	18-11-2015	YES	--	3rd Quarter
	ANTA GPS(3 * 88.71)(GT- Gas Turbine)	08-08-2014	08-08-2014	YES	--	3rd Quarter
	ANTA GPS(1 * 153.2)(ST- Steam Turbine)	08-08-2014	08-08-2014	YES	--	3rd Quarter
5	**Aravali Power Company Private Ltd**					
	ISTPP (JHAJJAR)(3 * 500)	-	25-08-2015	YES	--	3rd Quarter
6	**NHPC**					
	CHAMERA HPS (3*180)	06-08-2020	27-12-2019	YES	--	
	CHAMERA II HPS(3 * 100)	11-10-2015	11-10-2015	NO	Replacement of Excitation system in two units	3rd Quarter
	CHAMERA III HPS(Unit1#77)	29-10-2015	07-01-2012	YES	--	3rd Quarter
	CHAMERA III HPS(Unit2,3#77)	29-10-2015	19-06-2012	YES	--	3rd Quarter
	PARBATI III HEP (Unit1# 130)	21-01-2016	21-01-2016	YES	Have been done recetly. The report on PSS turning shall be submitted seperately.	3rd Quarter
	DULHASTI HPS(Unit2#130)	21-01-2020	21-01-2020	YES	--	
	DULHASTI HPS(Unit1#130)	29-12-2019	29-12-2019	YES	--	
	URI HPS(Unit3# 120)	10-01-2021	10-01-2021	YES	--	
	URI HPS(Unit4# 120)	15-02-2021	15-02-2021	YES	--	
	URI HPS(Unit2# 120)	07-03-2016	07-03-2016	YES	--	3rd Quarter
	URI-II HPS(4 * 60)	Mar-14	Mar-14		Re-tunning& Step response test shall be carriedout in 2021-22	
	SALAL HPS (Unit-3,4,5,6 # 115)	16-12-2014	16-12-2014	YES	--	3rd Quarter
	KISHANGANGA(3 * 110)	18-05-20 18	18-05-20 18	YES	--	3rd Quarter
	BAIRASIUL HPS(3 * 60)	30-07-2015	30-07-2016	YES	--	3rd Quarter
	SEWA-II HPS(3 * 40)	09-07-2016	09-07-2016	YES	--	3rd Quarter
	PARBATI III HEP(4 * 130)	16-12-2016	16-12-2016	YES	--	3rd Quarter
	TANAKPUR HPS(Unit1# 31.42)	09-01-2015	09-01-2015	YES	--	3rd Quarter
	TANAKPUR HPS(Unit2,3#31.4)	24-05-2014	24-05-2014	YES	--	3rd Quarter
	DHAULIGANGA HPS(Unit1 ,2# 70)	04-05-2014	17-04-2018	YES	--	3rd Quarter
	DHAULIGANGA HPS(Unit3,4# 70)	26-06-2014	17-04-2018	YES	--	3rd Quarter
7	**PUNJAB**					
	RAJPURA(NPL) TPS(2 * 700)	22-04-2014	22-04-2014	YES	--	3rd Quarter
8	**Rajasthan**					
	KAWAI TPS(Unt1# 660)	08-08-2014	08-08-2014	YES	--	3rd Quarter
	KAWAI TPS(Unt2# 660)	09-10-2014	09-10-2014	YES	--	3rd Quarter
	CHHABRA TPS(Unit 1#250)	22-05-2018	22-05-2018	NO	--	3rd Quarter
	CHHABRA TPS(Unit 2,3,4#250)	04-10-2015	04-10-2015	NO	--	3rd Quarter
	CHHABRA TPS(Unit5# 660)	10-02-2016	10-02-2016	YES	--	3rd Quarter
	CHHABRA TPS(Unit6# 660)	7/28/2018	7/28/2018	YES	--	3rd Quarter
	KALISINDH TPS(Unit1# 600)	10-02-2016	10-02-2016	YES	--	3rd Quarter
	KALISINDH TPS(Unit2# 600)	08-02-2016	08-02-2016	YES	--	3rd Quarter
	KOTA TPS(Unit1#110)	PSS tuning and step response test of Unit#1,2,3,4,6&7 were sucessfully done on 02.03.22 to 04.03.22		YES		3rd Quarter
	KOTA TPS(Unit2#110)				--	3rd Quarter
	KOTA TPS(Unit3#195)				--	
	KOTA TPS(Unit4#195)				--	
	KOTA TPS(Unit6#110)				--	3rd Quarter
	KOTA TPS(Unit7#110)				--	3rd Quarter
	SURATGARH TPS (Unit5#250)	14-03-2022	14-03-2022	Yes	--	3rd Quarter
	SURATGARH TPS (Unit2,4#250)	06-06-2022		Yes	--	
	SURATGARH TPS (Unit1,3,,6#250)	05.02.22 & 06.02.22		Yes	--	
	SURATGARH SSCTPS (Unit 7&8)	PSS tuning and step response test of Unit#7&8 were carried out on 28.11.20 & 30.03.21.				
	RAJWEST (IPP) LTPS(Unit1# 135)	26-04-2016	26-04-2016	No	--	3rd Quarter
	RAJWEST (IPP) LTPS(Unit2# 135)	14-07-2016	14-07-2016	No	--	3rd Quarter

	RAJWEST (IPP) LTPS(Unit3# 135)	03-01-2014	03-01-2014	No	--	3rd Quarter
	RAJWEST (IPP) LTPS(Unit4# 135)	03-11-2015	03-11-2015	No	--	3rd Quarter
	RAJWEST (IPP) LTPS(Unit5# 135)	21-09-2014	21-09-2014	No	--	3rd Quarter
	RAJWEST (IPP) LTPS(Unit6# 135)	14-08-2014	14-08-2014	No	--	3rd Quarter
	RAJWEST (IPP) LTPS(Unit7# 135)	20-02-2016	20-02-2016	No	--	3rd Quarter
	RAJWEST (IPP) LTPS(Unit8# 135)	11-06-2014	11-06-2014	No		3rd Quarter
9	**UTTAR PRADESH**					
	ANPARA-C TPS(Unit1# 600)	22-08-2015	22-08-2015	Yes	--	3rd Quarter
	ANPARA-C TPS(Unit2# 600)	08-03-2016	08-03-2016	Yes	--	3rd Quarter
	ROSA TPS(Unit1 #300)	05-10-2021	05-10-2021	Yes	--	
	ROSA TPS(Unit2# 300)	18/2/2018	18/2/2018	Yes	--	4th Quarter
	ROSA TPS(Unit3 # 300)	03-02-2017	03-02-2017	Yes	--	4th Quarter
	ROSA TPS(Unit4# 300)	05-10-2021	05-10-2021	Yes	--	
	Anpara-A (Unit1#210)	27.09.2021	27.09.2021	Yes	--	
	Anpara-A(Unit2#210)	27.09.2021	27.09.2021	Yes	--	
	Anpara-A(Unit3#210)	25.09.2020	25.09.2020	Yes	--	
	Anpara-B(Unit4#500)	07.12.2014	07.12.2014	Yes		3rd Quarter
	Anpara-B (Unit5#500)	17.08.2014	Dec., 2019	Yes	--	
	Anpara-D(Unit6#500)	15.11.2016	15.11.2016	No	--	3rd Quarter
	Anpara-D (Unit7#500)	15.04.2017	15.04.2017	No	--	3rd Quarter
	Obra-B(Unit9#200)	22.03.2016	22.03.2016	Yes	Report enclosed.	3rd Quarter
	Obra-B(Unit10#200)	28.06.2016	20.06.2016	Yes	Report enclosed.	3rd Quarter
	Obra-B (Unit11#200)	21.01.2017	21.01.2017	Yes	Report enclosed.	3rd Quarter
	Obra-B (Unit12#200)	Unit taken on load after R&M on 22		-	PSS tuning and SRT scheduled in April, 2021.	
	Obra-B(Unit13#200)	Unit closed under R&M.		-	PSS tuning and SRT scheduled in April, 2021.	
	Parichha-B(Unit3#210)	08.01.2016	08.01.2016	Yes	--	3rd Quarter
	Parichha-B (Unit4#210)	08.01.2016	08.01.2016	Yes	--	3rd Quarter
	Parichha-C (Unit5#250)	08.02.2020	08.02.2020	No	--	
	Parichha-C(Unit3#250)	09.01.2016	09.01.2016	No	--	3rd Quarter
	Harduaganj (Unit8#250)	20.08.2015	20.08.2015	No	--	3rd Quarter
	Harduaganj (Unit3#250)	13.04.2016	13.04.2016	No	--	3rd Quarter
	Harduaganj(Unit7#105)	16.07.2021	16.07.2021	yes	--	
	Harduaganj(Unit9#250)	16.07.2021	16.07.2021	yes	--	
	LALITPUR TPS(Unit1# 660)	23.02.2022	23.02.2022	yes	--	
	LALITPUR TPS(Unit2# 660)	30.03.2021	30.03.2021	yes	--	
	LALITPUR TPS(Unit3# 660)	15.01.2022	15.01.2022	yes	--	
	ALAKNANDA HEP(Unit1# 82.5)	12.072017	12.072017	No	--	3rd Quarter
	ALAKNANDA HEP(Unit2# 82.5)	12.072017	12.072017	No	--	3rd Quarter
	ALAKNANDA HEP(Unit3# 82.5)	12.072017	12.072017	No	--	3rd Quarter
	ALAKNANDA HEP(Unit4# 82.5)	12.072017	12.072017	No	--	3rd Quarter
	MEJA TPS(Unit1#660)	16.10.2018	05.09.2017	yes	--	3rd Quarter
	MEJA TPS(Unit2#660)	16.01.2021	18.05.2020	yes	--	
	Bara Unit#1				Step test for PSS checking was not performed since commissioning by erstwhile owner as per information available. PSS tuning along with step test will be performed in next AOH (May 2022 or planned shutdown)	
	Bara Unit#2	01.02.2022	01.02.2022	Yes		
	Bara Unit#3				Step test for PSS checking was not performed since commissioning by erstwhile owner as per information available. PSS tuning along with step test will be performed in next AOH (May 2022 or planned shutdown)	
	Vishnuprayag Unit#1	06/02/2021	06/02/2021	Submitted in the prescribed format provided by NRLDC to SE (R&A)		
	Vishnuprayag Unit#2	06/04/2021	06/04/2021			
	Vishnuprayag Unit#3	06/04/2021	06/04/2021			
	Vishnuprayag Unit#4	05/02/2021	05/02/2021			
10	**BBMB**					

	BHAKRA HPS(Unit1#108)	--	--	No	PSS is not provided ,shall be provided in ongoing RM&U	
	BHAKRA HPS(Unit1#108)	24.07.2015	24.07.2015	No	--	3rd Quarter
	BHAKRA HPS(Unit3#126)	--	--	No	PSS is not provided ,shall be provided in ongoing RM&U	
	BHAKRA HPS(Unit4#126)	--	--	No	--	
	BHAKRA HPS(Unit5#126)	--	--	No	--	
	BHAKRA HPS(Unit6#157)	--	--	No	The original Rusian excitation system is under replacement PO issued Hence,PSS not got tuned.	
	BHAKRA HPS(Unit7#157)	--	--	No	The original Rusian excitation system is under replacement PO issued Hence,PSS not got tuned.	
	BHAKRA HPS(Unit7#157)	--	--	No	The original Rusian excitation system is under replacement PO issued Hence,PSS not got tuned.	
	BHAKRA HPS(Unit7#157)	18.02.2016	18.02.2016	No	--	3rd Quarter
	BHAKRA HPS(Unit7#157)	18.02.2017	18.02.2017	No	--	3rd Quarter
	DEHAR HPS(Unit#1 165)	08.08.2017	08.08.2017	No	--	3rd Quarter
	DEHAR HPS(Unit#2 165)	08.08.2018	08.08.2018	No	--	3rd Quarter
	DEHAR HPS(Unit#3 165)	08.08.2019	08.08.2019	No	--	
	DEHAR HPS(Unit#4 165)	02.07.2017	02.07.2017	No	--	3rd Quarter
	DEHAR HPS(Unit#5 165)	08.08.2019	08.08.2019	No	--	
	DEHAR HPS(Unit#6 165)	02.07.2017	02.07.2017	No	--	3rd Quarter
	PONG HPS(6 * 66)	--	--	--	PSS not provided.RM&U agenda under considration.	