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/106/01/2022/6038-6079 दिनांक: 19.07.2022

विषय: प्रचालन समन्वय उप-समिति की197वीं बैठक की कार्यसूची।
Subject: Agenda of 197th OCC meeting.

प्रचालन समन्वय उप-समिति की **197वीं** बैठक का आयोजन वीडियो कॉन्फ्रेंसिंग के माध्यम से दिनांक **22.07.2022** को **10:30** बजे से किया जायेगा। उक्त बैठक की कार्यसूची उत्तर क्षेत्रीय विद्युत् समिति की वेबसाइट http://164.100.60.165 पर उपलब्ध है।

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

197th meeting of the Operation Co-ordination sub-committee will be conducted through Video Conferencing on **22.07.2022** 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.

19/07/2022

(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 196th OCC meeting were issued vide letter of even number dated 11.07.2022.

Sub-committee may deliberate and kindly confirm the Minutes.

2. Review of Grid operations

2.1 Power Supply Position (Provisional) for June 2022

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

State / UT	Req. / Avl.	Energy (MU)			Peak (MW)		
		Anticipated	Actual	% Variation	Anticipated	Actual	% Variation
CHANDIGARH	(Avl)	180	198	9.8%	410	407	-0.7%
	(Req)	160	198	23.6%	380	407	7.1%
DELHI	(Avl)	5138	3916	-23.8%	7500	7695	2.6%
	(Req)	4100	3917	-4.5%	7500	7695	2.6%
HARYANA	(Avl)	5620	6328	12.6%	11720	12768	8.9%
	(Req)	6941	6349	-8.5%	12030	12768	6.1%
HIMACHAL PRADESH	(Avl)	1020	1017	-0.3%	1621	1739	7.3%
	(Req)	1009	1047	3.8%	1620	1739	7.3%
J&K and LADAKH	(Avl)	2070	1525	-26.3%	3530	2723	-22.9%
	(Req)	1660	1569	-5.5%	2810	2723	-3.1%
PUNJAB	(Avl)	6340	7433	17.2%	12160	14207	16.8%
	(Req)	8454	7437	-12.0%	15500	14207	-8.3%
RAJASTHAN	(Avl)	9420	8720	-7.4%	18840	16012	-15.0%
	(Req)	8560	8883	3.8%	15000	16012	6.7%
UTTAR PRADESH	(Avl)	14850	14817	-0.2%	25500	25755	1.0%
	(Req)	14550	15090	3.7%	25500	26165	2.6%
UTTARAKHAND	(Avl)	1305	1461	11.9%	2420	2594	7.2%
	(Req)	1320	1494	13.2%	2475	2594	4.8%
NORTHERN REGION	(Avl)	45943	45416	-1.1%	77500	76600	-1.2%
	(Req)	46754	45984	-1.6%	75900	77000	1.4%

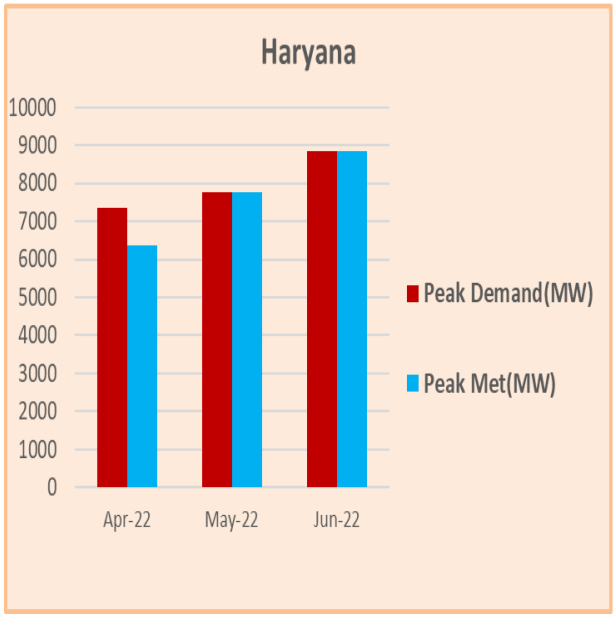
As per above, negative / significant variation (≥5%) in Actual Power Supply Position (Provisional) vis-à-vis Anticipated figures is observed for the month of June-2022 in terms of Energy Requirement for Chandigarh, Delhi, Haryana, UTs of J&K and Ladakh, Punjab, and Uttarakhand and in terms of Peak Demand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

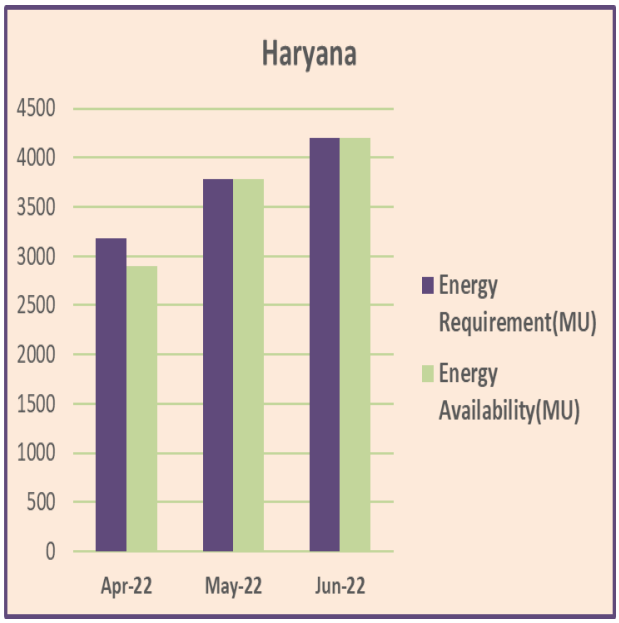
same can be deliberated in the meeting.

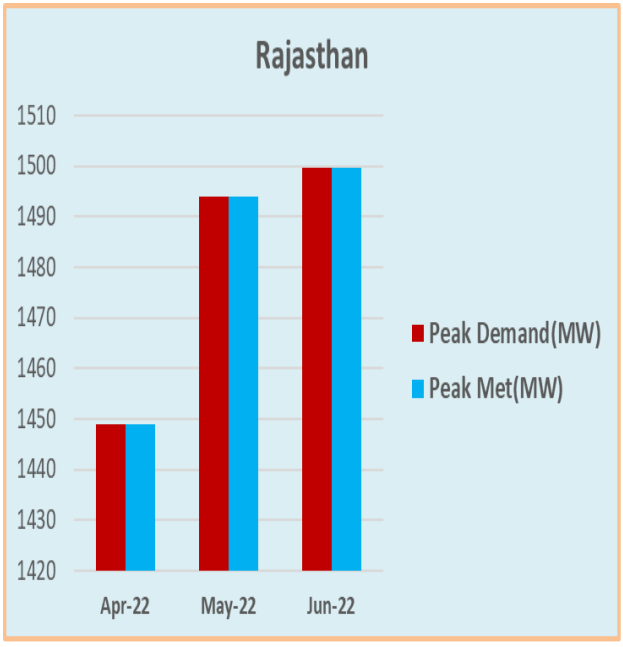
All SLDCs are requested to furnish provisional and revised power supply position in prescribed formats on NRPC website portal by 2nd and 15th day of the month respectively for the compliance of Central Electricity Authority (Furnishing of Statistics, Returns and Information) Regulations, 2007.

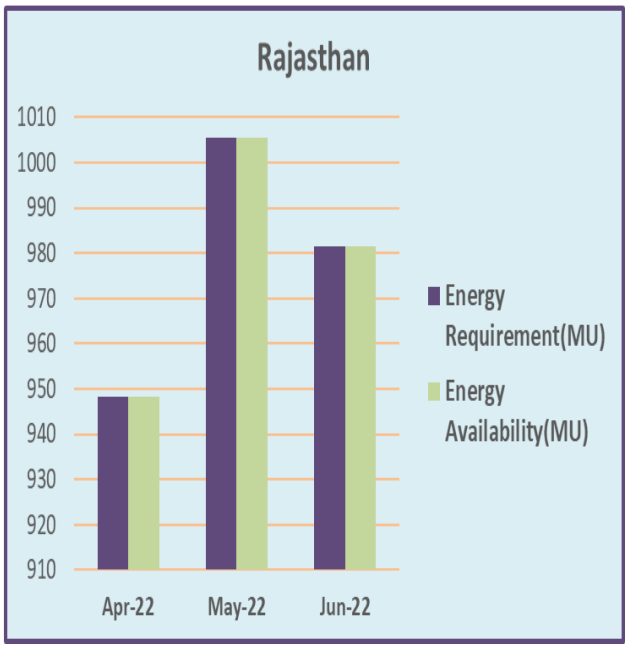
2.2 Power Supply Position of NCR

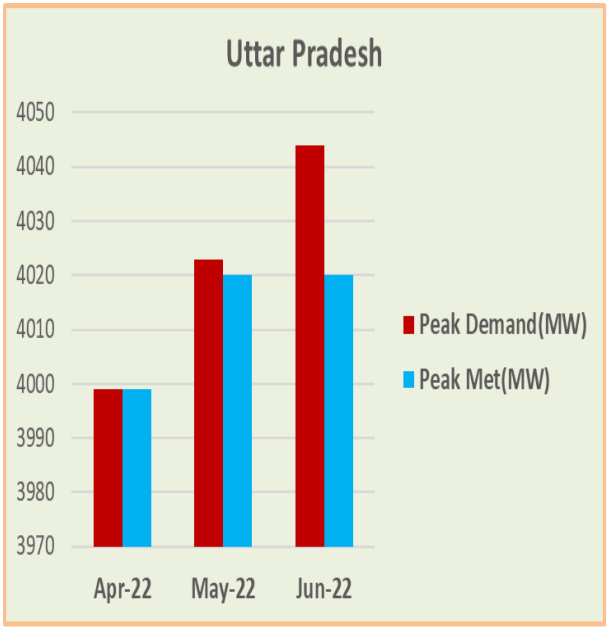
NCR Planning Board (NCRPB) is closely monitoring the power supply position of National Capital Region. Monthly power supply position for NCR till the month of June-2022 is available on NRPC website (http://164.100.60.165). Power supply position during the current financial year is shown as under:

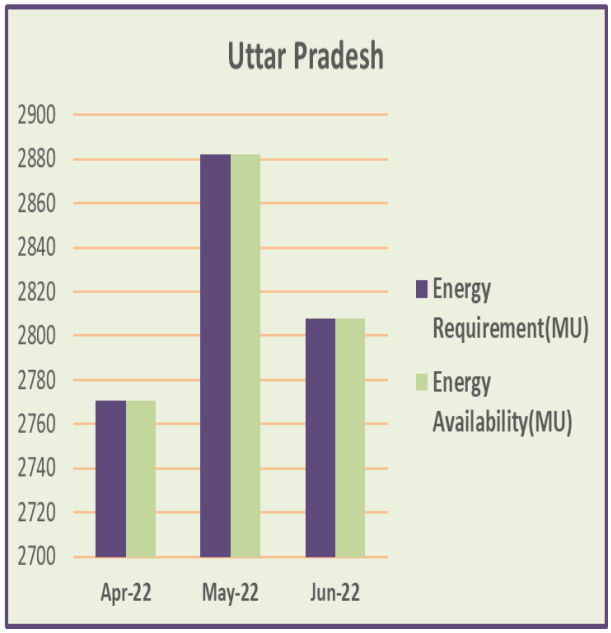


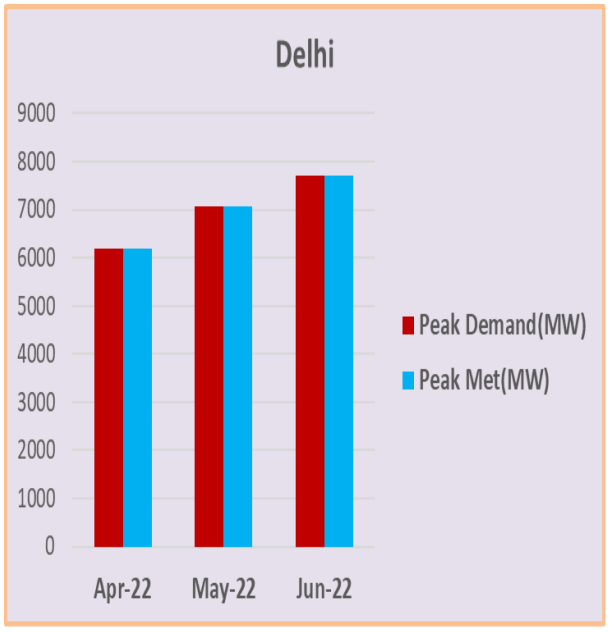


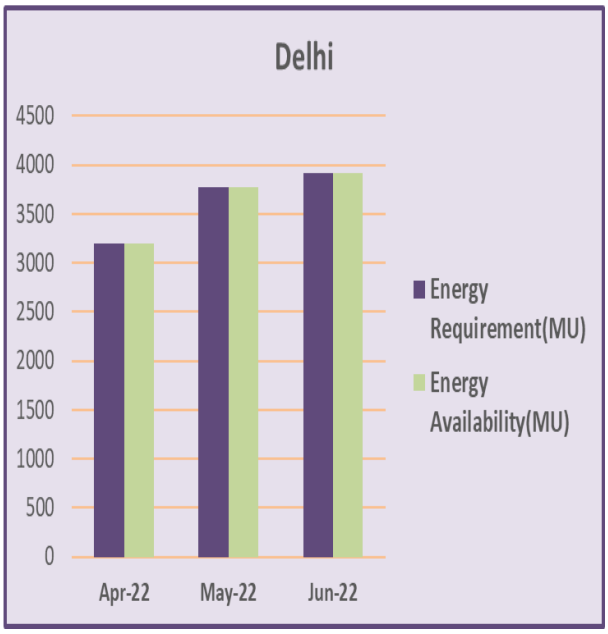












3. Maintenance Programme of Generating Units and Transmission Lines

3.1. Maintenance Programme for Generating Units

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

3.2. Outage Programme for Transmission Elements

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

4. Planning of Grid Operation

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

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

State / UT	Availability / Requirement	Revised Energy (MU)	Revised Peak (MW)	Date of revision
CHANDIGARH	Availability	230	420	No Revision submitted
	Requirement	190	360	
	Surplus / Shortfall	40	60	
	% Surplus / Shortfall	21.1%	16.7%	
DELHI	Availability	2770	6170	No Revision submitted
	Requirement	3750	7050	
	Surplus / Shortfall	-980	-880	
	% Surplus / Shortfall	-26.1%	-12.5%	
HARYANA	Availability	5730	11650	No Revision submitted
	Requirement	6680	11990	
	Surplus / Shortfall	-950	-340	
	% Surplus / Shortfall	-14.2%	-2.8%	
HIMACHAL PRADESH	Availability	1151	1658	12-Jul-22
	Requirement	1072	1668	
	Surplus / Shortfall	79	-10	
	% Surplus / Shortfall	7.4%	-0.6%	
J&K and LADAKH	Availability	2180	3510	No Revision submitted
	Requirement	1330	2400	
	Surplus / Shortfall	850	1110	
	% Surplus / Shortfall	63.9%	46.3%	
PUNJAB	Availability	6680	12100	No Revision submitted
	Requirement	8670	14700	
	Surplus / Shortfall	-1990	-2600	
	% Surplus / Shortfall	-23.0%	-17.7%	
RAJASTHAN	Availability	9610	18200	No Revision submitted
	Requirement	8820	15500	
	Surplus / Shortfall	790	2700	
	% Surplus / Shortfall	9.0%	17.4%	
UTTAR PRADESH	Availability	15500	25500	12-Jul-22
	Requirement	15190	25500	
	Surplus / Shortfall	310	0	
	% Surplus / Shortfall	2.0%	0.0%	
UTTARAKHAND	Availability	1451	2235	8-Jul-22
	Requirement	1457	2300	
	Surplus / Shortfall	-6	-65	
	% Surplus / Shortfall	-0.4%	-2.8%	
NORTHERN REGION	Availability	45302	75500	
	Requirement	47159	75500	
	Surplus / Shortfall	-1857	0	
	% Surplus / Shortfall	-3.9%	0.0%	

SLDCs are requested to update the anticipated power supply position of their respective state / UT for the month of August-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	Apr-2022
HIMACHAL PRADESH	Apr-2018	Apr-2022
PUNJAB	Apr-2018	Mar-2022
RAJASTHAN	Apr-2018	Apr-2022
UTTAR PRADESH	Apr-2018	Apr-2022
UTTARAKHAND	Apr-2018	Mar-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.
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

State/ Utility	Status
	(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 had 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 In the 193rd OCC, Punjab and J&K representative were requested to convene a meeting in the last week of March with the officials of NRPC and NRLDC to deliberate about the updated status of the islanding scheme in their control area.

8.28 Observing slow pace of implementation of Islanding Schemes in NR states, a series of review meetings has been conducted by NRPC Secretariat as detailed below:

State	Meeting Date
Punjab	05/07/2022
Rajasthan	06/07/2022
Uttar Pradesh	07/07/2022

Delhi	13/07/2022
Himachal Pradesh	15/07/2022

States are requested to expedite the submission of data/study results as discussed in meetings above.

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

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 July 2022) is as follows:

Station	Capacity (MW)	PLF % (prev. months)	Normative Stock Reqd (Days)	Actual Stock (Days)
ANPARA C TPS	1200	72.01	14	**1.9**
ANPARA TPS	2630	91.05	14	7.0
BARKHERA TPS	90	36.42	22	4.5
DADRI (NCTPP)	1820	72.37	22	9.7
GH TPS (LEH.MOH.)	920	47.79	22	21.5
GOINDWAL SAHIB TPP	540	46.30	22	**2.7**
HARDUAGANJ TPS	1265	76.35	22	**1.2**
INDIRA GANDHI STPP	1500	82.88	22	14.1
KAWAI TPS	1320	78.54	22	6.5
KHAMBARKHERA TPS	90	42.85	22	**3.2**
KOTA TPS	1240	75.74	22	11.0
KUNDARKI TPS	90	46.99	22	**3.4**
LALITPUR TPS	1980	73.25	22	**1.6**
MAHATMA GANDHI TPS	1320	83.41	22	4.3
MAQSOODPUR TPS	90	38.07	22	4.7
MEJA STPP	1320	43.07	22	8.3
OBRA TPS	1094	56.09	22	**4.0**
PANIPAT TPS	710	84.28	22	4.6
PARICHHA TPS	1140	62.13	22	**0.6**
PRAYAGRAJ TPP	1980	63.99	22	11.2
RAJIV GANDHI TPS	1200	58.46	22	7.2
RAJPURA TPP	1400	95.08	22	22.6
RIHAND STPS	3000	94.16	14	26.8
ROPAR TPS	840	60.24	22	29.3
ROSA TPP Ph-I	1200	76.37	22	**0.7**

Station	Capacity (MW)	PLF % (prev. months)	Normative Stock Reqd (Days)	Actual Stock (Days)
SINGRAULI STPS	2000	90.95	14	18.9
SURATGARH TPS	1500	56.49	22	14.8
TALWANDI SABO TPP	1980	67.86	22	6.4
TANDA TPS	1760	81.57	22	8.1
UNCHAHAR TPS	1550	74.11	22	7.8
UTRAULA TPS	90	44.45	22	4.3
YAMUNA NAGAR TPS	600	86.99	22	5.8
CHHABRA-I PH-1 TPP	500	86.85	22	**0.9**
KALISINDH TPS	1200	47.05	22	10.8
SURATGARH STPS	1320	0.00	22	6.5
CHHABRA-I PH-2 TPP	500	47.01	22	15.1
CHHABRA-II TPP	1320	78.81	22	4.9

10. Declaration of high demand season and low demand season (Agenda by RRVPNL)

10.1. CERC has notified regulatory framework of differential tariff, applicable to thermal generating station, during peak and off-peak hours, during high demand season of three months and low demand season of remaining nine months in Tariff Regulations, 2019. In view of above, concerned RLDC has to declare high demand season and low demand season in region after consultation with stakeholders in accordance with 2019 Tariff Regulations, six months before any financial year.

10.2. Based on the deliberations in 176th OCC meeting, it was decided that peak season be decided after considering average NR consumption data of all months for previous five years.

10.3. In the same manner, energy demand data has been compiled from CEA website and is as under:

Year	May	June	July	August	September
2018	35206	37624	38331	38567	33405
2019	37338	41624	41377	39153	38422
2020	30905	37782	41309	39527	40958
2021	32109	39393	45180	44175	36878
2022	43463	46083	47240	46450	46040
Average	**35804**	**40501**	**42687**	**41574**	**39141**

From the above, it may be seen that three high demand months for next FY may be **June, July and August**.

Members may kindly deliberate.

11. Deemed Availability of relocation/height raising of 400 kV Jharli-Mundka Transmission line at Silani Chowk (Km. 396+400) in Jhajjar Distt. (Agenda by NHAI)

11.1. NHAI vide letter dated 05.07.2022 (copy enclosed as **Annexure-A.III**) has requested to provide deemed availability for shifting/height raising of 400 kV D/C Jharli-Mundka Transmission line for proposed underpass at Silani Chowk (Km. 396+400), Jhajjar district in the project Rohtak – Bawal section of NH – 71 (new NH – 352).

Members may kindly deliberate.

12. Adequacy of Transmission Lines emanating from Bhakra Power House Complex post uprating of Bhakra Left Bank Power House - approval for replacement of ACSR conductor of five no. Bhakra-Ganguwal circuits with HTLS conductor (Agenda by BBMB)

12.1. The above said agenda was also deliberated in 194th OCC meeting wherein forum desired that BBMB shall share with NRLDC the results of study they have got conducted from Himachal Pradesh for further examination.

12.2. BBMB vide letter dated 11.07.2022 (copy enclosed as **Annexure-A.IV**) has communicated that the requisite data was submitted to NRLDC and NRLDC validated the load flow studies as carried out by HPPTCL.

12.3. In view of the above result of the load flow study, BBMB proposes to replace the existing ACSR conductors with relevant HTLS conductors at all the five circuits emanating from Bhakra Complex to Ganguwal i.e. Bhakra-Ganguwal circuit No. 1 to 5, so as to get the constraints removed along with making it N-1 complaint.

Members may kindly deliberate.

13. Proposed SPS for 400/220 kV ICTs at RVPN's 400kV GSS Jodhpur/ Bhadla/ Ratangarh (Agenda by RVPN)

13.1. RVPN vide letter dated 28.06.2022 (copy enclosed as **Annexure-A.V**) have proposed SPS for 400/220 kV ICTs at RVPN's 400kV GSS Jodhpur/ Bhadla/ Ratangarh along with schematic diagram and load details for consideration and approval of OCC forum.

Members may kindly deliberate.

14. Modification in SPS (SPS/NR/GEN/01) for reliable evacuation of power of NJHPS, Rampur, Baspa KWHEP, and Sawra-Kuddu required for evacuation of power from 60 MW Naitwar-Mori HEP (Agenda by HPPTCL)

14.1. HPPTCL vide letter dated 13.07.2022 (copy enclosed as **Annexure-A.VI**.) have communicated that a meeting was held under the chairmanship of CEA dt. 09.09.2021 (MoM of meeting is attached as **Annexure-A.VII**.) to discuss the transmission system for evacuation of Naitwar-Mori HEP of SJVNL wherein it was decided that the proposed switching substation at Snale which was agreed in 3rd

NRPC(TP) for evacuation of Naitwar-Mori HEP would be deferred by 4 years and as interim arrangement for evacuation, one ckt. Of 220 kV D/C (Single Zebra) Hatkoti Switching Substation (HPPTCL)- 111 MW Sawra-Kuddu HEP would be LILO at 60 MW Naitwar-Mori HEP through 220 KV 220 kV Naitwar-Mori-Sawra Kuddu D/C (Single Zebra) transmission line under construction by SJVNL. This arrangement was ratified in the 4th NRPC (TP) meeting dt. 05.10.2021.

14.2. For the LILO arrangement in N-1 contingency, the switchyard capacity of Naitwar-Mori HEP, Hatkoti Switching Station is adequate, however, the line CT's installed at Sawra-Kuddu HEP are not adequate (400/200/ 1 A) for N-1 contingency and have to to be upgraded.

14.3. Further, HPPTCL has mentioned that commissioning schedule of Naitwar-Mori HEP and associated transmission line has been intimated by SJVNL as Sep-2022, which is earlier than the anticipated timeline of up-gradation of CTs by HPPTCL. Therefore, to avoid the stranding of NMHEP generation till the CTs at SKHEP are upgraded, there is a requirement for implementation of SPS for the protection of line CTs at Sawra Kuddu HEP.

14.4. In view of the above, a draft SPS scheme is submitted by HPPTCL for consideration and approval of OCC forum.

Members may kindly deliberate.

15. Calibration and testing of Interface Energy Meters installed at Generating stations (Agenda by NHPC)

15.1. The above said agenda was also deliberated in 194th OCC meeting wherein MS, NRPC desired that a separate meeting may be conveyed with the CTU, POWERGRID, NRPC, NRLDC and generators wherein the matter may be discussed.

15.2. Subsequently, a meeting was held under the chairmanship of MS, NRPC on 09th May 2022 for discussion on calibration and testing of Interface Energy Meters installed at Generating stations in Northern region (MoM of meeting is attached as **Annexure-A.VIII**).

15.3. NHPC vide its email dtd. 14.07.2022 that intimated that the calibration of Interface Energy Meters installed at their Generating Power Station is due as per CEA Metering Regulations. It is further highlighted that any error in SEM may impact commercially to the Utilities as well as generating stations.

Members may kindly deliberate.

16. Outage regularization of 765 kv Bus-I at Kanpur (GIS) for root cause analysis of unbalance current in tie bays (Agenda by NR-III Powergrid)

16.1 NR-III Powergrid vide mail dtd. 15.07.2022 (copy enclosed as **Annexure-A.IX**.) has intimated that Outage of 765 kv Bus-I at 765/400 kv Kanpur (GIS) sub-station was approved for one day in 195th OCC meeting for re-measurement of CRM due to very high resistance and root cause analysis of unbalance current in tie bays 705,708,711 & 714.

16.2 Accordingly, outage was availed on 20.06.22 for rectification of unbalance current issue however there is some deviation in approved outage and availed outage. NR-III

has requested that the outage period may kindly be be regularized/concurred by OCC.

Members may kindly deliberate.

17. Confirmation requested from beneficiary states for allowing deemed availability to POWERGRID due to outages for NHAI diversion cases in month of June-2022 (agenda by NRPC Sectt.)

17.1 As per directions of Member (PS), CEA vide note dt. 17.08.2021 in view of the meeting held on 11.08.2021 under the chairmanship of Secretary, MoP, NRPC Secretariat has been directed to consider deemed availability for the shutdown period availed by the transmission licensee for shifting their transmission lines in the case of NHAI projects, provided that transmission customers are not affected by the shutdown of these lines.

17.2 POWERGRID has reported following shutdown for NHAI diversion cases in June'22:

CODE	EVENT NO.	ELEMENT NAME	OUTAGE SINCE DATE/ TIME	RESTORATION DATE/TIME	NRLDC CODE	REASON OF OUTAGE
NR222042	606050	220KV ALUSTENG-DRASS	12-06-22 09:20	12-06-22 20:44	NR 2206-1878	Line taken under shutdown on behalf of NHAI for Highway diversion near Zozilla Pass on Sonamarg-Kargil section of NH-01
NR222042	606054	220KV ALUSTENG-DRASS	13-06-22 09:27	13-06-22 14:51	NR 2206-1994	Line taken under shutdown on behalf of NHAI for Highway diversion near Zozilla Pass on Sonamarg-Kargil section of NH-01

17.3 Beneficiary states may confirm whether customers were affected by the shutdown of these lines.

Members may kindly deliberate.

18. Issues with NTPC NR NCT Stations (agenda by NTPC)

18.1 Dadri Gas Station with one GT and one ST in service in close cycle is supplying power to UP under TOP clause, with a condition that technical minimum schedule would be provided by UP.

18.2 Depending upon availability of fuel, the station punching DC is 110 MW which is the technical minimum under the close cycle. However, UP is unable to punch drawl schedule of more than 76 MW. A total 33.13 % power of station is surrendered by the beneficiaries.

18.3 In addition to above, Over injection is causing a huge loss to the station.

18.4 Accordingly, it is requested to kindly resolve the issue and necessary changes to be incorportaed in NRLDC Software.

Members may kindly deliberate.

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

19.1 The above said agenda was also deliberated in 196th OCC meeting.

19.2 A review meeting was conducted by NRPC Sectt. on 06.07.2022 with Rajasthan SLDC to deliberate on the updated status of islanding scheme in their control area.

19.3 Based on the discussions held in the above cited meeting, RRVPNL was requested to review the Islanding Schemes for the Rajasthan Atomic Power Station (RAPS-A & B) accordingly.

19.4 RRVPNL vide letter dated 19.07.2022 (copy enclosed as **Annexure-A.X**.) has submitted the updated revised Islanding scheme for the Rajasthan Atomic Power Station (RAPS-A & B) units for consideration and approval of the OCC forum.

Members may kindly deliberate.

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

20. NR Grid Highlights for June 2022

Maximum energy consumption of Northern Region was 1737.09 MUs on 28th June'22 and it was 9.0 % higher than June' 2021(1594.09 MUs 30th June'21)

Average energy consumption per day of Northern Region was 1520.09 MUs and it was 16.90 % higher than June'21 (1300.35 Mus per day)

Maximum Demand met of Northern Region was 76572 MW on 28th June'22 @12:00 hours (based on data submitted by Constituents) as compared to 70691 MW on 30th June'21 @21:00 hours.

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

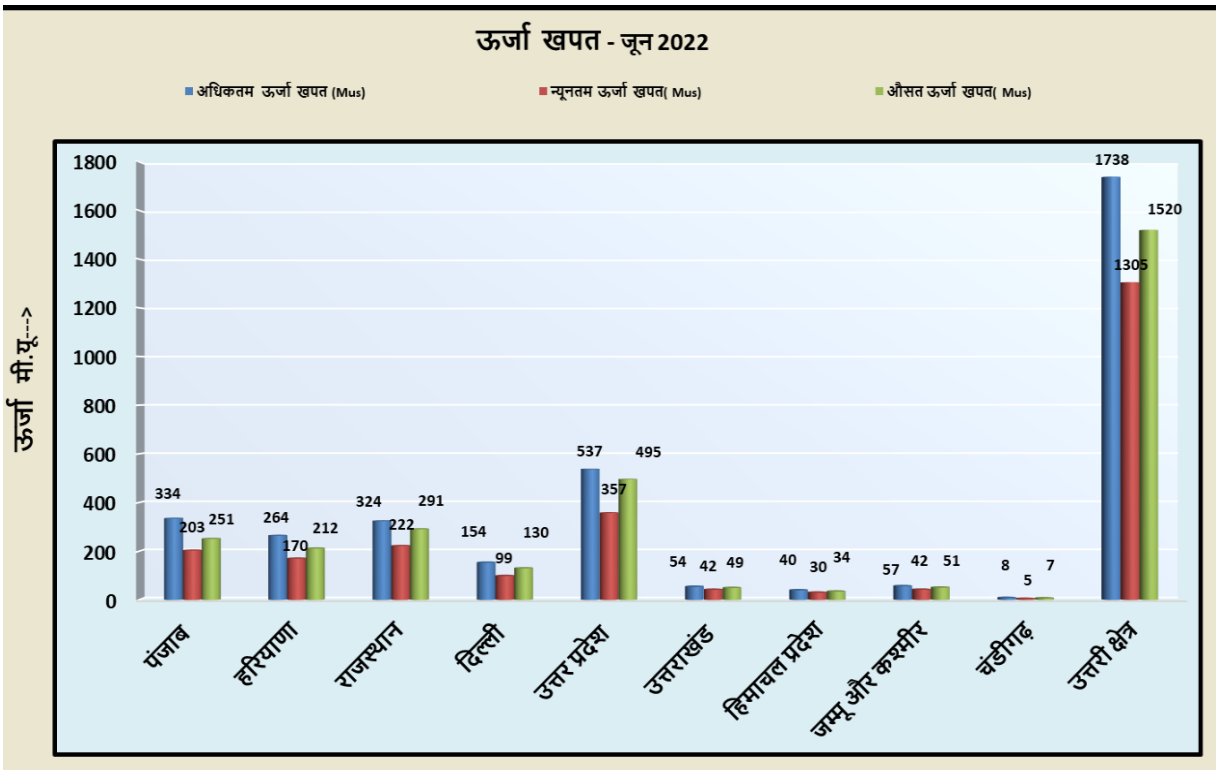
State (Maximum Demand Met)	All Time High Record		Previous Record (upto May-22)	
	Value (MW)	Achieved on	Value (MW)	Achieved on
Uttar Pradesh	**25755**	**07.06 .22 at 21:00**	25046	On 15.05.22 @ 22:00 hrs
Uttarakhand	**2517**	**15.06 .22 at 17:00**	2468	On 24.01.22@ 09:00 hrs
Delhi	**7528**	**28.06.22 at 17:00**	7409	On 02.07.19 @ 15:35 hrs
Haryana	**12540**	**28.06.22 at 12:00**	12120	On 07.07.21 @ 14:45 hrs
Rajasthan	**15850**	**28.06.22 at**	15797	On 19.05.22

State (Maximum Demand Met)	All Time High Record		Previous Record (upto May-22)	
	Value (MW)	Achieved on	Value (MW)	Achieved on
		14:00		@ 13:00 hrs
Punjab	**14189**	**29.06.22 at 13:00**	13633	On 01.07.19 @ 12:00 hrs

State (Max Energy Consumption)	All Time High Record		Previous Record (upto May-22)	
	Value (MU)	Achieved on	Value (MU)	Achieved on
Rajasthan	**323.84**	**09.06.22**	311.080	20.05.22
Uttar Pradesh	**536.97**	**09.06.22**	514.49	07.07.21
Uttarakhand	**54.27**	**15.06.22**	50.37	31.05.22
Delhi	**153.52**	**28.06.22**	147.10	02.07.19
Himachal Pradesh	**36.91**	**28.06.22**	36.90	29.12.20
Punjab	**334.45**	**29.06.22**	306.09	01.07.21

Solar Generation	All Time High Record		Previous Record (upto May-22)	
	Value (MU)	Achieved on	Value (MU)	Achieved on
	116.78	**26.06.22**	109.85	14.05.22

Energy Consumption



- **Comparison of Average Energy Consumption (MUs/Day) of NR States for the June'21 vs June '22**

क्षेत्र/राज्य	जून -2021	जून -2022	% अंतर
चंडीगढ़	5.57	6.59	18.29
दिल्ली	108.75	130.10	19.63
हिमाचल प्रदेश	30.02	34.47	14.81
हरियाणा	187.63	211.70	12.83
जम्मू और कश्मीर	50.01	50.85	1.68
पंजाब	234.38	251.09	7.13
राजस्थान	243.32	290.78	19.51
उत्तराखंड	40.78	49.29	20.87
उत्तर प्रदेश	399.89	495.23	23.84
उत्तरी क्षेत्र	1300.35	1520.09	16.90

Frequency Data Comparison

Month	Avg. Freq. (Hz)	Max. Freq. (Hz)	Min. Freq. (Hz)	<49.90 (% time)	49.90 – 50.05 (% time)	>50.05 (% time)
June'22	49.99	50.36	49.48	12.5	73.4	14.2
June'21	50.00	50.27	49.64	6.1	74.5	19.4

In June'22, frequency remained within IEGC band for only 74.5 % 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
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.

Members may like to discuss.

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

Most of the NR states except J&K, Ladakh and Chandigarh U/Ts are sharing basecase and ATC/TTC assessment with NRLDC. OCC has advised all states to timely declare TTC/ATC for prospective months and revise the figures as per requirement.

Based on feedbacks received till date, SLDCs are requested to go through the tentative ATC/TTC limits for August 2022 (**Annexure-B.I**) 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.II**.

Punjab

In 196 OCC meeting, NRLDC representative stated that 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.

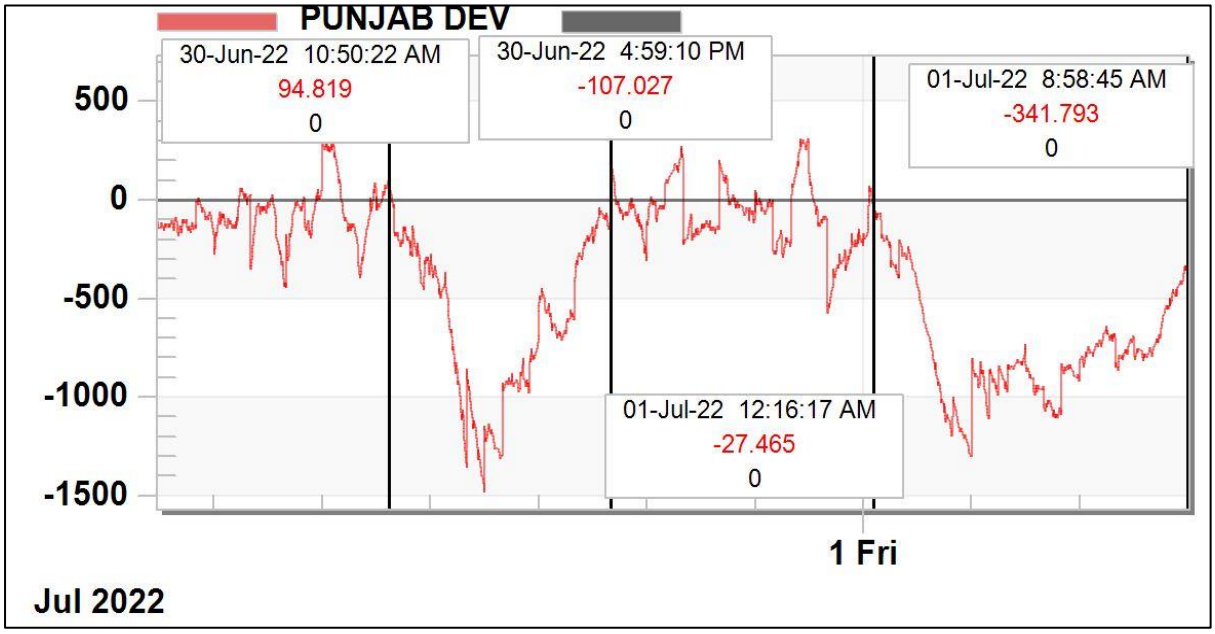
Although simulation studies suggest no major low voltage issues, Punjab SLDC needs to monitor continuously the voltage profile, load power factor and availability of shunt compensation.

In 196 OCC meeting, it was discussed that with import close to 7000-7500MW, severe 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. It was also mentioned that proposal may be put up for approval by Punjab SLDC with their higher officials to effectively develop and implement the procedure. Punjab SLDC agreed for the same.

On 30th June and 1st July 2022, it was observed that Punjab had continuous overdrawl for number of time blocks as shown below. For example, on 30th June,

Punjab had underdrawl for more than 6 hours whereas on 1st July it had under drawl for more than 8-10 hrs. Thus, it is important that Punjab SLDC starts selling power in real-time market in such situations and also instructs for backing down internal generation as specified by CEA standards.



As per loading observed for Jun-Jul 2022, it is observed that with import close to ATC limits, loading of 400/220kV Nakodar ICTs is above N-1 contingency limit while at other 400/220kV stations such as Ludhiana, Malerkotla, Patiala, Patran, Moga and Nallagarh ICTs it is just around N-1 contingency limits.

Punjab SLDC to provide update.

UP

In 196 OCC meeting, it was discussed that 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 was advised to restrict loadings of these ICTs below their N-1 contingency limit.

UP representative informed following:

- SPS implemented at Nehtaur and mock test would be completed on 2 July 2022.
- SPS is to be implemented at Obra. Budgetary offer to be received from Siemens.
- UP will share mock-testing report of existing SPS
- UPPTCL and Obra representatives stated that LILO of 765kV AnparaD-Unnao which were to be terminated at Obra have been reversed i.e. the bay in which AnparaD was to be terminated, Unnao line has been commissioned and vice-versa. The issue is there because reactor was to be commissioned in Obra-Unnao section whereas as per this scheme it is physically for AnparaD-Obra section.
- UPPTCL and Obra representatives stated that enquiry has been set up to investigate in the matter and matter is being taken up at the highest level.

- SPS at Sohawal would be implemented after shifting from Bareilly (UP). The works are in progress in this regard.

NRLDC and NRPC representatives expressed concern on the negligence observed and stated that the matter needs to be resolved at the earliest as the line 765kV AnparaD-Unnao is very critical for safe power evacuation from Singrauli-Anpara complex in case of shutdowns/ contingency.

It was also informed that SPS requirement at 400/220kV Allahabad may be explored by UP. At all stations it may be ensured that loading of all 400/220kV ICTs may be ensured below N-1 contingency limits. For stations having SPS, it may be ensured that loading is restricted up to such limits that SPS relief is able to manage loading of ICTs within safe limits. UP SLDC agreed for the same.

UP SLDC to provide update.

Rajasthan

In 196 OCC meeting, it was discussed that N-1 non-compliance was observed at 400/220kV Merta, Ajmer, Chittorgarh 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 and also status of implementation of SPS as agreed in last OCC meetings. In the meeting, it was discussed that SPS would be commissioned at Merta, Ajmer and Chittorgarh in June 2022. New ICT would also be added at 400/220kV Bikaner.

Rajasthan SLDC to provide update.

Delhi

ATC/TTC is not being uploaded in website.

In 196 OCC meeting, it was discussed that loading of 400/220kV Mundka, Bawana (section having two ICTs) and Harshvihar ICTs was close to N-1 contingency limits during last few weeks.

DTL representative informed that SPS has been implemented at Mundka on 22.06.2022.

Delhi SLDC representative informed that issue of N-1 non-compliance at Bawana would be there since inter-connector is opened. Delhi SLDC was asked to explore requirement of SPS for these two ICTs to avoid loss of critical supplies during tripping of one ICT. Delhi SLDC agreed for the same. Delhi SLDC was also asked to display ATC/TTC on their websites.

Delhi SLDC is requested to provide update.

Haryana

In 196 OCC meeting, it was discussed that N-1 non-compliance was observed at 400/220kV Deepalpur and Panipat (BBMB) ICTs. 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.

Haryana representative stated that Delhi SLDC representative informed that same would be discussed in Delhi's internal OCC meeting and if issues persist same shall be further taken up by Haryana and Delhi mutually.

In the meeting, it was discussed that SPS may be proposed jointly by Haryana and Delhi for short-term and as long-term measure new ICT may be commissioned after discussions with CTU/CEA/Haryana/BBMB/DTL/POSOCO.

NRLDC representative expressed concern on the slow progress of SPS implementation at 400/220kV Kurukshetra and asked HVPN to coordinate with POWERGRID and expedite SPS implementation. HVPN representative agreed for the same and stated they would also try and shift some load if possible to Kaithal(PG) till commissioning of SPS.

Haryana SLDC to provide update.

Uttarakhand

For Uttarakhand, N-1 compliance was observed at 400/220kV Kashipur ICTs along with high loading of 220kV CBGanj-Pantnagar. Uttarakhand SLDC was also asked to explore requirement of SPS at Kashipur. Two tripping events were also observed since last OCC meeting, in which after tripping of 220kV CBGanj-Pantnagar, loading of 400/220kV Kashipur ICTs also increased ultimately tripping on overload and leading to load loss. In last OCC meeting, Uttarakhand SLDC was also advised to explore possibility of SPS at Kashipur or any other option to avoid of load management to avoid tripping on overloading.

Uttarakhand SLDC to provide update.

HP have shared their ATC/TTC assessment for summer 2022. High loading of 220kV Nallagarh-Upernangal D/C was observed.

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.

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**

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. NRLDC is continuously sending emails in real-time for ensuring N-1 compliances as well as restricting schedule till ATC limit and maximizing internal generation. SLDCs need to ensure this during real-time operation.

Members may like to discuss.

22. 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.III**).

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
- 400/220 kV 315 MVA ICT 1 at Muradnagar_1(UP)
- 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) Switching operation without NRLDC code

The subject matter has already been deliberated in 175th, 178th, 179th and 184th OCC meetings. In the meetings it was mentioned that this is clear violation of IEGC as well as procedure agreed in Operating procedure document. NRLDC has also been communicating the same vide letters:

- NRLDC/SO-I/ dtd. 27.10.2020
- NRLDC/SO-I/151/1088-1090 dtd. 10.12.2020
- NRLDC/SO-I/151/1134-1136 dtd. 07.01.2021
- NRLDC/SO-I/151/ dtd 08.06.2021

It has already been deliberated number of times that it is always better to inform NRLDC before taking any element under outage/ charging of element, since it may result in increased flows on parallel paths and the substation personnel does not have the holistic scenario/ load-flows of the grid.

On 29th June 2022, at 11:40 hrs both 400/220kV 315MVA ICTs at Kashipur tripped due to over loading and both ICTS were charged at 11:52hrs without taking NRLDC code. It is clear violation of IEGC.

All NR constituents are once again requested to avoid unilateral switching operation of Grid elements in future in the interest of smooth and reliable Grid operation.

Members may like to discuss.

(iv) Schedule >ATC for state control areas

ATC/TTC assessment exercise for respective state control area is being carried out by SLDCs in coordination with NRLDC. Some of the states are also publishing ATC/TTC limits on their website. ATC limits suggest that there are likely n-1 violations

in system if import of state is close to or higher than ATC limits. These constraints are also mentioned in ATC/TTC assessment reports of SLDC/ NRLDC. However, it is being observed that some of the states such as Haryana, UP, Uttarakhand and Delhi are scheduling power beyond the ATC limits assessed by SLDCs/NRLDC. Details attached as **Annexure-B.IV**.

It is requested that SLDCs may request schedule within their ATC limits so that system operates in safe and secure manner. Moreover, if no constraint are being observed when drawl crosses ATC limit, same may be duly intimated to studies team of SLDC/ NRLDC so that ATC/TTC limits are accordingly revised.

Members may like to discuss.

(v) High MVAR drawl from 400kV grid

With demand of Northern region increasing beyond 76GW, loading of ICTs has increased substantially. Apart from high loading on various 400/220 kV ICT nodes, it has been observed that MVAr drawal (400kV to 220kV) is also very high leading to low voltages in that pocket.

As per IEGC 6.6.1,

"Reactive power compensation should ideally be provided locally, by generating reactive power as close to the reactive power consumption as possible. The Regional Entities except Generating Stations are therefore expected to provide local VAr compensation/generation such that they do not draw VArs from the EHV grid, particularly under low-voltage condition."

Poor power factor (less than 0.9) for some of the nodes based on SCADA data of June-2022 is tabulated here along with plots at **Annexure-B.V**:

State	400/220kV ICT	Power factor
J&K	Kishenpur	0.20
J&K	Wagoora	0.61
Haryana	Kaithal	0.64
HP	Hamirpur	0.76
Haryana	Fatehabad	0.78
Uttarakhand	Dehradun	0.79
Uttarakhand	Roorkee	0.83
Haryana	Panchkula	0.86
UP	Saharanpur	0.86
UP	Bagpat	0.87
Punjab	Amritsar	0.87
Uttarakhand	Kashipur	0.88
Haryana	Sonepat	0.88
J&K	Amargarh	0.89
UP	Nehtaur	0.89

As per NRPC reactive power account of 13th June 2022 to 19th June 2022, reactive power drawal at low voltages is observed at following nodes:

Drawl of MVAr at ISTS during Low voltage (As per NRPC Reactive energy account)

State	As per NRPC Reactive energy account: drawl of MVAr at ISTS during Low voltage most of the time
Punjab	Govindgarh (BBMB), Jamsher(BBMB), Jalandhar(BBMB), Ropar(BBMB), Mohali(BBMB),
Haryana	Bhiwani(BBMB), Sohna Road
Rajasthan	Khetri(BBMB), Hisar(BBMB), Kotputli(PG),
Uttar Pradesh	Saharanpur(PG), Sahupuri, CBganj
Uttarakhand	Sitarganj
J&K	Mahanpur, Kathua,
HP	Banala, Pong(BBMB), Bhakra(BBMB), Kangoo(BBMB)

It is well known that high reactive power drawal from 400kV system lead to low voltages and high losses in the system. Hence such reactive power transfer should be avoided by proper planning of reactive power compensation locally. All the users are requested to limit the reactive power transfer from the EHV grid and take appropriate action to compensate it locally.

Identification of nodes at lower voltage level where actual MVAR drawl/injection is taking place need to be ascertained. New reactors and capacitors are being planned at several locations. Therefore, it is necessary to identify locations where actually there is need for MVAR support. This would help in better and more efficient utilization of resources.

Member may please discuss.

(vi) Statutory Clearances for Modification/Replacement/Diversion

As per the Central Electricity Authority (Measures Relating to Safety & Electric Supply) Regulations,2010 and Amendment Regulations 2015 & 2018 and MoM of the meeting held with Chief Electrical Inspector, CEA dated 26.05.2022, approval of concerned Electrical Inspectorate is to be taken in writing before charging an element after replacement/alteration.

However, in some cases, State utilities are not submitting concerned Electrical Inspector clearance timely resulting in delay in restoration of elements after replacement/modification. State utilities are requested to take up the matter with respective Electrical Inspectorate to avoid such delay and last-minute difficulties.

As per the letter dated 06.05.2022 from CEA-PCD division, for diversion cases involving change in course of transmission line or change in nature of power flow, suitable advisory on requirement of fresh PTCC clearance obtained from CEA-PCD division is to be submitted along with the Electrical safety clearance.

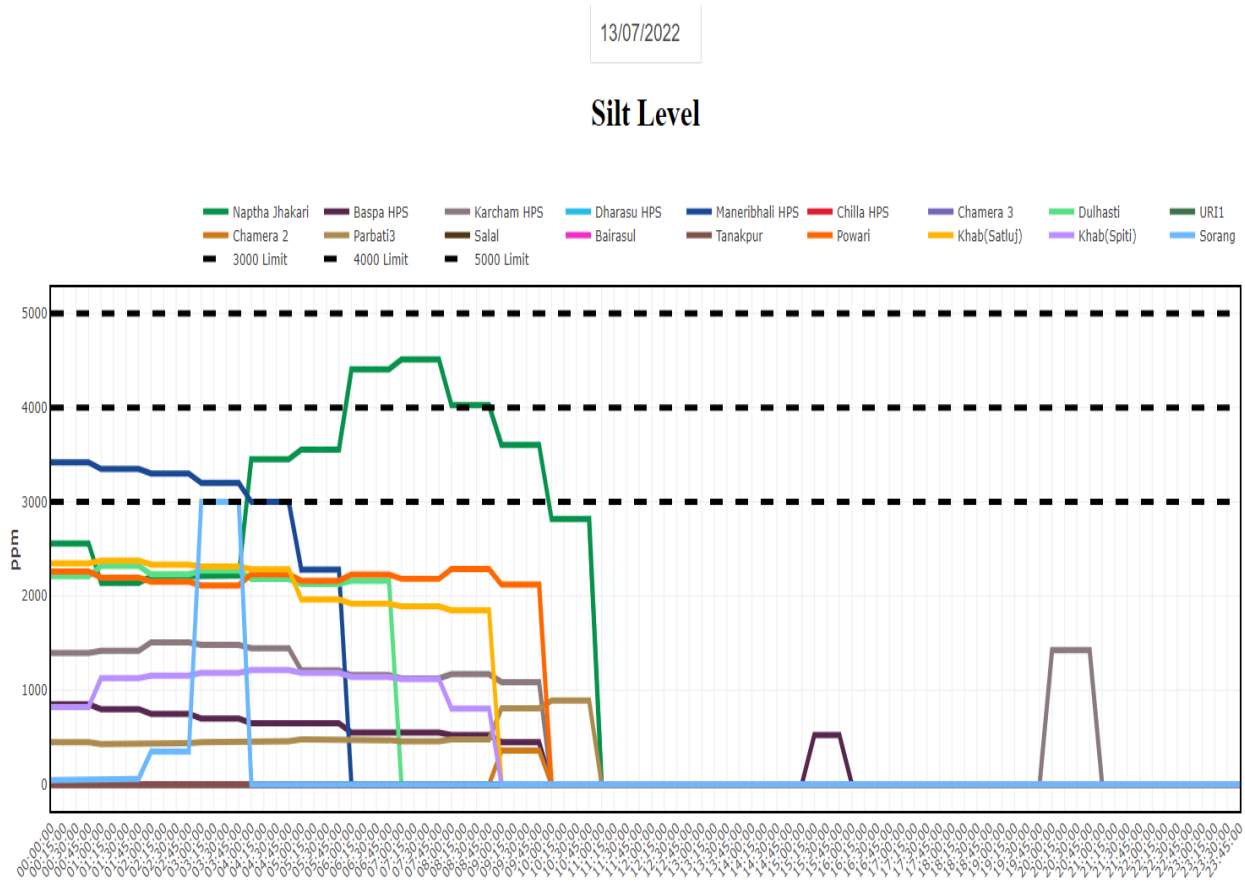
The Minutes of the meeting held with Chief Electrical Inspector, CEA and the letter dated 06.05.2022 from CEA-PCD division is enclosed at **Annexure-B.VI** for reference.

Member may please discuss.

(vii) Near Real Time Silt Monitoring of hydro stations

Silt data has been made available in NRLDC control room from 07.07.2021 onwards and is being utilized by NRLDC system operators for advance actions and better system operation during hydro unit outages due to silt.

All concerned hydro stations are advised to regularly and timely update on the silt measurements from site and upload on portal for monitoring at NRLDC control room.



Name of the Plant	Minimum Silt Value (PPM) of Intake (Lean Period)	Total Silt Value (PPM) of Intake at which plants under alert mode and start reducing generation if PPM values in increasing trends	Maximum Silt Value (PPM) of Intake at which machine goes under complete shutdown
Naptha Jhakri	200-300	> 4000	> 4500
Karcham	200-300	> 4000	> 4500
Baspa	50-100	> 1500	>1600
Salal	800-1000	> 3500	> 5000
Tanakpur	< 100	> 4500	> 5000
Bairasul	400-500	> 2500	> 3000
Dharasu	300-400	> 2500	> 3000

This is for kind information of OCC members and necessary action from respective hydro generating stations.

All hydro generating stations are advised to timely intimate in case of requirement of silt flushing so that adequate time is available with NRLDC so as to take necessary actions.

(viii) Maximising hydro generation during peak hydro season:

Jun-Sep months are generally associated with high hydro generation period in Northern region. However, it is being observed that some of the generators are generating less than 100%. Detailed list is attached as **Annexure-B.VII**.

It is requested to provide the reasons for the same and actions for maximizing generation during peak hydro season.

(ix) Update of Operating Procedure document in line with IEGC:

Based on the inputs received from utilities and discussions held in 195th and 196th OCC meetings, Operating Procedure document is to be updated by NRLDC in mid-July 2022.

NRLDC vide their letter dated 5th July 2022 again requested for feedback from utilities (**Annexure-B.VIII**).

Latest available document is available @ https://nrldc.in/download/operation-procedure-of-northern-region-2021-22/?wpdmdl=9306.

Link for updated document for 2022 will be shared in OCC meeting.

This is for kind information of OCC members.

23. Frequent forced outages of transmission elements in the month of June'22

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

S. NO.	Element Name	No. of forced outages	Utility/SLDC
1	400 KV Anpara_B(UPUN)-Mau(UP) (UP) Ckt-1	3	UP
2	220 KV Kishenpur(PG)-Ramban(PDD) (PDD) Ckt-1	6	POWERGRID/ PDD
3	220 KV Amargarh(INDIGRID)-Ziankote(JK) (PDD JK) Ckt-2	5	PDD JK
4	220 KV Saharanpur(PG)-Shamli(UP) (UP) Ckt-1	4	UP/ POWERGRID
5	220 KV Baghpat(PG)-Shamli(UP) (UP) Ckt-1	4	UP/ POWERGRID

The complete details are attached at **Annexure-B.IX**. It may be noted that frequent outages of such elements affect the reliability and security of the grid. Hence, utilities are requested to analyze the root cause of the tripping and share the remedial measures taken/being taken in this respect.

Members may like to discuss.

24. Multiple element tripping events in Northern region in the month of June'22

A total of 16 grid events occurred in the month of June'22 of which 12 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.X**.

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 1.6 seconds in the event of multiple element tripping at 400/220kV Bikaner(RS) on 21-June -22 at 15:24hrs.

Delayed clearance of fault (more than 100ms for 400kV and 160ms for 220kV system) observed in total 2 events out of 16 grid events occurred in the month. In 5 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.

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

A total of 4 inter-regional lines tripping occurred in the month of June'22. The list is attached at **Annexure-B.XI**. 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.

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

The status of receipt of DR/EL and tripping report of utilities for the month of June'2022 is attached at **Annexure-B.XII**. 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.

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

In last 16 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.XIII**.

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 196th 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.

28. Frequent Grid disturbance in Uttarakhand control area due to overloading of transmission network

Since last month frequent events of multiple elements tripping has been observed in Uttarakhand control area specifically in Kashipur, Dhauliganga, and Pithoragarh complex area. It is observed that outage of transmission lines in this complex led to overloading of ICTs & other transmission lines and resulted into tripping of multiple lines / ICTs on over current protection. During these events, large quantum of load also affected. Such frequent grid events are very detrimental to the safety and security of the state grid as well as regional and national grid.

The list of all the tripped elements along with supporting graph as per SCADA data is attached as **Annexure-B.XIV**. In view of aforementioned events, vigilant and corrective actions are required with respect to load management in Uttarakhand control area so that any such grid disturbance may be avoided in future.

Members may please discuss.

29. Mock trial run for crises management plant

As per IEGC clause 5.8 (b) "Detailed plans and procedures for restoration after partial/total blackout of each Constituents' system within a Region, will be finalized by the concerned User's/STU/CTU in coordination with the RLDC. The procedure will be reviewed, confirmed and/or revised once every subsequent year. Mock trial runs of the procedure for different sub-systems shall be carried out by the User's/STU/CTU at least once every six months under intimation to the RLDC. Diesel Generator sets for black start would be tested on weekly basis and test report shall be sent to RLDC on quarterly basis."

In view of above concerned constituent are requested to conduct mock trial run of their DG sets and share the test report with NRPC/NRLDC.

Members may please discuss.

30. Black start procedure of Ramgarh Gas Power Station

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

Mock Black-start exercise of power stations therefore needs to be carried out in-order to ensure healthiness of black start facility. We don't have any restoration procedure for RE complex of Rajasthan subsystem. As large quantum of state and central sector RE generation evacuates from this complex, there is a needs of restoration procedure for this region. Ramgarh gas power station is only gas station near to this region. Hence, SLDC-Rajasthan is requested to explore the possibility of black start of Ramgarh GTs and prepare a black start procedure by identifying nearby load and necessary facility required at Ramgarh & nearby substation to carry out the black start exercise. SLDC-Rajasthan may share the black start procedure with NRPC/NRLDC by September 2022, so that mock exercise can be conducted during winter 2022-23.

Members may please discuss.

31. HVRT/LVRT non-compliance at RE stations

Issue of LVRT/HVRT non-compliance of RE generators have been raised many of time. From number of events during recent past it is observed that RE generators drops their power during occurrence of any through fault and don't revive back to its antecedent value in defined time. In view of the same, detailed analysis of behavior of RE generators during grid disturbance which occurred on 09th July, 2022 is attached as **Annexure-B.XV**. It can be observed that almost all the RE stations dropped their active power during through fault and revived back with delay. Hence, RE generators are LVRT/HVRT non-compliance.

Sudden drop in this much of quantum of RE generations lead to significant drop in frequency / rise in voltage. Thus, Non-compliance of LVRT/HVRT of RE generators hampers the security and reliability of grid. Hence, corrective actions need to be taken to ensure to LVRT/HVRT compliance of RE generators on priority.

Members may please discuss.

32. Delhi Load Loss

Frequent Load loss event occurred and reported by Delhi SLDC. However, no data or report in many cases was submitted to NRLDC in recent past. Kindly share, precautionary /remedial steps taken by Delhi SLDC to avoid such tripping associated load loss.

Date	Event	Load loss (MW-hrs)	Remark	Preliminary Report submitted
23.05.2022	Transmission constraint	111.6	Transmission constraint	NO
07.06.2022	Transmission constraint	736	Transmission constraint and Distribution constraint	NO
11.06.2022 (19:00 Hrs)	Transmission constraint	188	Transmission constraint	NO
12.06.2022 (23:00 Hrs)	SUPPLY FAIL FROM 220KV PPG DUE TO TRIPPING OF I/C NO.1 &2	137	Transmission constraint	NO
14.06.2022 (15:00 Hrs)	62MW DUE TO SUPPLY FAIL FROM 220KV LODHI ROAD & DUE TO SUPPLY FAIL FROM 220KV IP & 10MW TRIPPING 220KV LODHI RD TO HUDCO	72	Transmission constraint and Distribution constraint	NO

Date	Event	Load loss (MW-hrs)	Remark	Preliminary Report submitted
14.06.2022 (16:00 Hrs)	DUE TO TRIPPING OF WZP3 GRID TO 33KV I/C - 1 AND ASHOK VIHAR CKT1 & CKT2 TIPPED AT 16:17 HRS.AT WZP-3 END ONLY A/W ASHOK VIHAR - CKT3 AT ASHOK VIHAR END ONLY.	91	Distribution constraint	NO
27.06.2022 (11:00 Hrs)	Transmission constraint	80	Transmission constraint	NO
27.06.2022 (15:00 Hrs)	Transmission constraint	49.4	Transmission constraint	NO
27.06.2022 (21:00 Hrs)	Emergency load shedding due to Security and reliability of the Grid- Over Drawl	198.4	Emergency load shedding due to Security and reliability of the Grid-Over Drawl	NO
28.06.2022 (13:00 Hrs)	SUPPLY FAILED FROM 220KV PPK-3, 220KV MEHRAULI & 220KV VKJ, SUPPLY FAIL FROM 220KV RAJGHAT DUE TO FIRE IN I/C NO-1 ISOLATOR	268	Transmission constraint	NO
28.06.2022 (14:00 Hrs)	SUPPLY FAILED FROM 220KV PPK-1	110.7	Transmission constraint	NO
01.07.2022 (09:49 Hrs)	A monkey electrocuted in GTPS Yard (Pragati Power station)	35(MW)	220 kV Bus coupler was in open condition at 220 kV Pragati (IP EXT) Generation loss at GTPS# GT 4 - 28MW and GTPS#STG 3 - 8.8MW	YES
08.07.2022 (11:54 Hrs)	Tripping occurred in Delhi syste m on 08.07.2022 at 400kV Bawana S/Stn & 220kV Khanjawala S/Stn.	165(MW)	400kV inter connector was in OFF position	YES

Date	Event	Load loss (MW-hrs)	Remark	Preliminary Report submitted
14.07.2022 (08:56 Hrs)	Tripping occurred in Delhi system on 14.07.2022 at 220kV Wazirabad S/Stn.220 kV Mandola -Wazirabad ckt-4 tripped on Z1 at same time other Bus Bus Bar protection operated.	135 (MW)	Bus inter connector at Wazirabad was ON.	YES
16.07.2022 (11:35 Hrs)	As informed by DTL both BUS at 220kV Shalimarbagh tripped due to falling of kite string	400(MW)	_ _	NA

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

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<tr><td></td><td></td><td></td><td>
<table>
<tr><td>◎</td><td>UTTARAKHAND</td><td>Increased</td></tr>
<tr><td>◎</td><td>BBMB</td><td>Increased</td></tr>
</table>
BBMB was requested to submit the updated self certification report indicating increase of 0.2 Hz in AUFR settings, within one week. J&K and LADAKH were requested to update status for increasing settings of UFRs.
</td></tr>
<tr><td>4</td><td>Status of FGD installation vis-à-vis installation plan at identified TPS</td><td>List of FGDs to be installed in NR was finalized in the 36th TCC (special) meeting dt. 14.09.2017. All SLDCs were regularly requested since 144th OCC meeting to take up with the concerned generators where FGD was required to be installed.
Further, progress of FGD installation work on monthly basis is monitored in OCC meetings.</td><td>Status of the information submission (month) from states / utilities is as under:
<table>
<tr><td>◎</td><td>HARYANA</td><td>Mar-2022</td></tr>
<tr><td>◎</td><td>PUNJAB</td><td>Jun-2022</td></tr>
<tr><td>◎</td><td>RAJASTHAN</td><td>Jun-2022</td></tr>
<tr><td>◎</td><td>UP</td><td>Jun-2022</td></tr>
<tr><td>◎</td><td>NTPC</td><td>Feb-2022</td></tr>
</table>
FGD status details are enclosed as Annexure-A.I.II.
All States/utilities are requested to update status of FGD installation progress on monthly basis.</td></tr>
<tr><td>5</td><td>Information about variable charges of all generating units in the Region</td><td>The variable charges detail for different generating units are available on the MERIT Order Portal.</td><td>All states/UTs are requested to submit daily data on MERIT Order Portal timely.</td></tr>
</table>

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	Price bid has been opened and is under evaluation

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. 07.04.2022 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. 07.04.2022 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: 5 Unutilized: 1 (1 bays to be utilized shortly) Approved/Under Implementation:1	• 220 kV D/C Shahajahanpur (PG) - Gola line	Oct'22	Updated in 196th OCC by UPPTCL
				• LILO of Sitapur – Shahjahanpur 220 kV SC line at Shahjahanpur (PG)	Commissioned	Energization date: 25.02.2022 updated by UPPTCL in 196th OCC
7	Hamirpur 400/220 kV Sub-station	Commissioned: 8 Total: 8	Utilized: 4 Unutilized: 4 (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 Sub-station	Commissioned: 8 Total: 8	Utilized: 0 Unutilized: 8	• LILO of both circuits of 220 KV Pali - Sector 56 D/C line at Kadarpur along with augmentation of existing conductor from 220 KV Sector-56 to LILO point with 0.4 sq inch AL-59 conductor.	-	HVPNL to update the status.
				• 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.

Sl. No.	Substation	Downstream network bays	Status of bays	Planned 220 kV system and Implementation status	Revised Target	Remarks
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	Nov'22	Updated in 196th OCC by HVPNL
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	Oct'22	• Lucknow -Kaurasa (Sitapur), 220 kV D/C line expected energization date Oct'22 updated by UPPTCL in 196th OCC _____ • No planning for 2 no. of bays upated by UPPTCL in 196th OCC
22	400/220kV Gorakhpur Sub-station	Commissioned: 6 Total: 6	Utilized: 4 Unutilized: 2	• Network to be planned for 2 bays	Dec'22	• Gorakhpur(PG)- Maharajganj, 220 kV D/C line expected energization date Dec'22 updated by UPPCL in 196th OCC
23	400/220kV Fatehpur Sub-station	Commissioned: 8 Under Implementation:2 Total: 10	Utilized: 6 Unutilized: 2 Under Implementation:2	• Network to be planned for 4 bays	-	• UPPTCL intimated that 02 no. of bays under finalization stage _____ • No planning for 2 no. of bays upated by UPPTCL in 196th OCC
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	Aug'22	Updated in 196th 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
26	400/220kV Amritsar S/s	Commissioned:7 Approved in 50th NRPC- 1 no. Total: 8	Utilized: 6 Unutilized: 1 Approved in 50th NRPC- 1 no.	• Amritsar – Patti 220kV S/c line	-	PSTCL to update the status.
				• 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	Aug'22	Updated in 196th OCC by UPPTCL
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
		Commissioned: 8	Utilized: 8	• Sohawal - Barabanki 220kV D/c line	Commissioned	Energization date: 14.04.2018 updated by UPPTCL in 196th OCC
				• Sohawal - New Tanda 220kV D/c line	Commissioned	Energization date: 28.05.2019 updated by UPPTCL in 196th OCC

Sl. No.	Substation	Downstream network bays	Status of bays	Planned 220 kV system and Implementation status	Revised Target	Remarks
30	400/220kV Sohawal S/s	Commissioned: 6 Total: 8	Utilized: 6	• Network to be planned for 2 bays	Commissioned	• Sohawal - Gonda 220kV S/c line (Energization date: 27.04.2020) updated by UPPTCL in 196th OCC _____ • Sohawal - Bahraich 220kV S/c line (Energization date: 15.02.2021) updated by UPPTCL in 196th OCC
31	400/220kV, Kankroli	Commissioned: 6 Total: 6	Utilized: 4 Unutilized: 2	• 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	Sept'22	Saharanpur(PG)-Devband D/c line expected energization date Sept'22 updated by UPPTCL in 196th OCC
34	400/220kV, Wagoora	Commissioned: 10 Total: 10	Utilized: 6 Unutilized: 4	• Network to be planned for 4 bays	-	PDD, J&K to update the status.
35	400/220kV, Ludhiana	Commissioned: 9 Total: 9	Utilized: 8 Unutilized: 1	• Network to be planned for 1 bay	-	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	-	• 02 no. of bays under finalization stage updated by UPPTCL in 196th OCC
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 (Updated by UP on 18.06.2022)
RIHAND STPS
SINGRAULI STPS
TANDA Stage-I
TANDA Stage-II
UNCHAHAR TPS
UPRVUNL (18.06.2022)
ANPARA TPS
HARDUAGANJ TPS
OBRA TPS
PARICHHA TPS

PSPCL (21.06.2022)
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. (18.06.2022)
Lalitpur TPS
Lanco Anpara Power Ltd. (18.06.2022)
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 (18.06.2022)
Rosa TPP Phase-I
Prayagraj Power Generation Company Ltd. (18.06.2022)
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: 31-03-2023), 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: 31-12-2024), PRAYAGRAJ TPP U#2 (Target: 31-12-2024), PRAYAGRAJ TPP U#3 (Target: 31-12-2024)
PSPCL	GH TPS (LEH.MOH.) U#1 (Target: 31-12-2024), 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)

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	List of officials in-charge and relays in Delhi IS submitted by DTL on 16.08.2021.
2	NAPS IS	UP	Implemented	Yes (08-10-2021)	Yes	Yes	-
3	RAPS IS	Rajasthan	Implemented	16-Aug-21	Yes	Yes	List of officials in-charge, format for generation, islanding scheme sld and relays in RAPP IS submitted by RVPN on 04.12.2021.

Under Implementation/ Newly Proposed/Under Discussion

Sl. No.	Islanding Scheme	SLDC	Status	Details of progress	DPR for PSDF funding (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 conducted steady state study and the same has been discussed in meeting with UP on 07.07.2022. Finalized scheme is awaited from UP.		-		-	-	-	-	-	-	-	-
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. Acceptance of offer is awaited at UP end.		-		-	-	-	-	-	-	-	-
3	Jodhpur-Barmer-Rajwest IS	Rajasthan	Newly Proposed	Scheme has been approved in 195th OCC meeting.	-	-		-	-	-	-	-	-	-	-
4	Patiala-Nabha Power Rajpura IS	Punjab	Newly Proposed	Punjab has sent the offer to CPRI for study of Islanding Schemes.		-		-	-	-	-	-	-	-	-
5	Pathankot-RSD IS	Punjab	Newly Proposed	Punjab has sent the offer to CPRI for study of Islanding Schemes.		-		-	-	-	-	-	-	-	-
6	Talwandi Sabo IS	Punjab	Newly Proposed	Punjab has sent the offer to CPRI for study of Islanding Schemes.		-		-	-	-	-	-	-	-	-
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 has been approved in 195th OCC meeting.	-	-		-	-	-	-	-	-	-	-
10	Chamba-Chamera IS	HP	Withdrawn	Scheme has been withdrawn by HPSLDC in meeting dtd. 15/07/2022.		-	-	-	-	-	-	-	-	-	-
11	Kangra-Chamba-Bairasuil IS	HP	Withdrawn	Scheme has been withdrawn by HPSLDC in meeting dtd. 15/07/2022.		-	-	-	-	-	-	-	-	-	-
12	Kullu-Dehar IS	HP	Withdrawn	HP has withdrwan this scheme and has proposed Kullu-Manali-Mandi islanding scheme, and Shimla-Solan Islanding scheme in meeting dtd. 15/07/2022.		-	-	-	-	-	-	-	-	-	-
13	Kullu-Manali-Mandi IS	HP	Newly Proposed	Scheme has been discussed on 15/07/2022. Finalization of scheme is pending at HP end.											
14	Shimla-Solan IS	HP	Newly Proposed	Scheme has been discussed on 15/07/2022. Finalization of scheme is pending at HP end.											
13	Butari-Jamsher-Verpal IS	Punjab	Under Discussion	-		-	-	-	-	-	-	-	-	-	-
14	Kargil-Ladakh IS	Ladakh	Under Discussion	-		-	-	-	-	-	-	-	-	-	-

भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
(सड़क परिवहन एवं राजमार्ग मंत्रालय, भारत सरकार)
परियोजना कार्यान्वयन इकाई – भिवानी
National Highways Authority of India
(Ministry of Road Transport & Highways, Govt. of India)
Project Implementation Unit – Bhiwani
खेरड़ी मोड, एनएच152डी, रोहतक भिवानी रोड (हरियाणा) – 124113
Kherdi Mor, NH-152D Rohtak-Bhiwani Road (Haryana) – 124113
फोन / Phone: 01258-296005, वेबसाइट /Website: www.nhai.gov.in
ईमेल / Email: piubhiwani@nhai.org, piubhiwani@gmail.com

भारतमाला
प्रगति के पथ पर अग्रसर

भाराराप्रा / पकाईभि / रारा71 / 26009 / 2022 / इले. / 10242 05-07-2022

सेवा में,

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

विषयः Four laning of Rohtak-Bawal section of NH-71 from Km 363+300 (Design Km 363+300) to Km 450+800 (Design Km. 445+853) under NHDP III in the state of Haryana on Design, Build, Finance, Operate and Transfer (DBFOT) basis- **Deemed Availability of relocation/height raising of 400 kV Jharli-Mundka Transmission line at Silani Chowk (Km. 396+400) in Jhajjar Distt. -reg.**

संदर्भः M/s APCPL letter dtd 04-07-2022.

महोदय,

This has reference to the above letter in the captioned subject. It is submitted that the project of Rohtak - Bawal section of NH-71 (new NH-352) is one of the important project which connects Rohtak & other adjoining cities like Jhajjar, Rewari with NH-44 (Delhi-Jaipur Expressway). The said project is under operation & maintenance.

2. It is intimated that there is a 400kV D/C Jharli - Mundka transmission line which is infringing the proposed underpass at Silani Chowk of NH-71 at Ch. 396+400 whose construction is held-up since more than 1½. The said HT line requires relocation/height raising. The estimate for the said line was submitted by POWERGRID on behalf of M/s APCPL which have already been approved by Competent Authority of NHAI and the supervision charge is already deposited.

3. A Tripartite Agreement between M/s APCPL, POWERGRID & NHAI has been executed on 04-07-2022 & a letter of go ahead for the work has been issued by M/s APCPL on 04-07-2022.

4. Accordingly, the work of foundation of towers is going to be taken up. However, M/s APCPL -

a) is asking for payment of generation outage of 500 MW@Rs. 1.83 cr. per day.
b) they are also demanding the outage charges as Rs. 2,89,093/- per day.

As per Office Memorandum dated 16.08.2021 of Ministry of Power vide its clause 5.3, it is mentioned that *"that in case of projects of national importance (NHAI projects), deemed availability may be given for the shutdown period availed by transmission licensees for shifting of their transmission lines, provided that transmission customers are not affected by the shutdown."*

Further its clause 5.4, in case of NHAI projects, RPC secretariat would provide deemed availability certificate for shutdown period availed by transmission licensees for shifting of their transmission lines, provided that transmission customers are not affected by the shutdown of the line. Shutdown charges would be computed by CEA as per standard norms and would be included in the cost estimates to be provided to NHAI for shifting of lines.

भाराराप्रा / पकाईभि / रा.रा.–152डी / 26009 / 2022 / इले. / 10242 05-07-2022

Since the above project is of national importance, it is therefore requested to provide deemed availability certificate so that the shifting/height raising of the said transmission line may be completed & the abnormal charges of generation /transmission losses being asked by M/s APCPL may be waived off.

सधन्यवाद्!

भवदीय

(के०एम०शर्मा)
परियोजना निदेशक

संलग्नः– यथोक्त

प्रतिलिपीः

1) महाप्रबंधक(तक०), सह क्षेत्रीय अधिकारी, क्षेत्रीय कार्यालय -चण्डीगढ़– *for information.*
2) M/s APCPL, Jharli – *for information*
3) Sh. H.R. Lodha, Sr. GM, POWERGRID – *for information*
4) Independent Engineer M/s MSV International Inc. with LSI Engineering Consultants Ltd. – *for information & necessary action please.*

एपीसीपीएल
APCPL

अरावली पावर कम्पनी प्राइवेट लिमिटेड
(एनटीपीसी, एचपीजीसीएल एवं आईपीजीसीएल का संयुक्त उद्यम)
Aravali Power Company Private Limited
(A joint venture of NTPC, HPGCL and IPGCL)

Date: 04.07.2022

To

The Project Director
NHAI, PIU, Bhiwani

Subject: Permission Letter to Go Ahead with the work-SHIFTING AND MODIFICATION OF 400 KV D/C JHARLI – MUNDKA TRANSMISSION LINE OF ARAVALI POWER COMPANY PRIVATE LIMITED DUE TO FOUR LANING OF ROHTAK – BAWAL SECTION OF NH-71 FROM 363.00 KMS TO 450.853 KMS IN THE STATE OF HARYANA NEAR SILANI CHAUK, JHAJJAR Reg.

Dear Sir

In line with the Tripartite agreement between APCPL, POWEGRID and NHAI for the subjected work on dated 04.07.2022 in the office of APCPL at Jharli Power Plant, the go-ahead permission for execution of work at site is hereby granted. You are requested to go ahead with the work in line with the said Tripartite Agreement. And, it is to inform that the overhead lines are in charged condition.

It may further be noted that the activities involving shutdown of existing lines will be dealt separately for clearance from APCPL as per prevailing conditions at that time. This issues with the permission of Competent Authority of APCPL, please.

04/07/2022
K.E.Swamy
AGM(EMD)
On behalf of APCPL

के. ई. स्वामी / K. E. SWAMY
अपर महाप्रबन्धक (ई.एम.डी.)
Addl. General Manager (EMD)
NTPC Limited - APCPL
IGSTPP, P.O. Jharli
Distt. Jhajjar - 124141 (HR)

CC: Shri. Laxmidhar Sahoo, GM(O&M)
Shri. Rajiv Sudan, Sr. GM, POWERGRID, Bahadurgarh, Haryana

भा०रा०रा०प्रा०प०का०ई०-भिवानी
आवक सं. 13324 दिनांक 05-07-2022

	प्रबंधक (तक)						✓	लेखाकार			
	उप प्रबंधक (तक)			1	2			IT Expert	कानूनगो/ पटवारी		
	स्थल अभियन्ता							OA	Steno		
	1	2	3	4	5	6	7	1	2	1	2

फा.सं. 26009/1 प.वि.

निदेशक / विद्युत विनियम
भाखड़ा ब्यास प्रबन्ध बोर्ड
Director / Power Regulation
Bhakra Beas Management Board
SLDC Complex, Industrial Area, Phase – I
Chandigarh - 160002. Tel.: 0172-2652820 (Tel. FAX)
E-mail: dirpr@bbmb.nic.in

प्रेषित

Email copy

अधीक्षण अभियन्ता/ ऑपरेशन सर्कल
एनआरपीसी नई दिल्ली। (ईमेल: seo-nrpc@nic.in)

क्रमांक सं 1768-72 /पीसीटी -82 दिनांक 11-7-22

विषय: **Inclusion of agenda BBMB for discussion in 197th OCC meeting of NRPC.**

In reference of above please find herewith attached **"Agenda note regarding approval for replacement of ACSR conductor of five no. Bhakra-Ganguwal circuits with HTLS Conductor"** with a request that the same may please be included in the agenda(s) for discussion in 197th OCC meeting.

यह आपको सूचनार्थ एवं अग्रिम कार्यवाही हेतु प्रेषित है जी ।

संलगन: उपरोक्तनुसार

निदेशक/विद्युत विनियम
बीबीएमबी, चण्डीगढ़ ।

प्रतिलिपि:

1. प्रमुख अभियन्ता/ प्रणाली परिचालन, बीबीएमबी, चण्डीगढ़।
2. मुख्य अभियन्ता/ पारेषण प्रणाली, बीबीएमबी, चण्डीगढ़ ।
3. निदेशक/ यो.एवं रु. (पारे. प्र.), बीबीएमबी, चण्डीगढ़ को उनके कार्यालय पत्र क्रमांक सं: 2422-24/ पीएनटी-449 भाग 2 दिनांक 01-07-2022 के संधर्भ में एनआरपीसी की 197वीं ओसीसी बैठक में उपरोक्त चर्चा में संबधित अधिकारी द्वारा भाग लेने हेतु। जिसका कार्यक्रम सूचित कर दिया जाएगा जी।
4. मास्टर फाईल कार्या: निदेशक/विद्युत विनियम, बीबीएमबी, चण्डीगढ़ ।

Agenda Note for OCC meeting regarding approval for replacement of ACSR conductor of five no. Bhakra – Ganguwal circuits with HTLS conductor

Subject: Adequacy of Transmission Lines emanating from Bhakra Power House Complex post uprating of Bhakra Left Bank Power House - approval for replacement of ACSR conductor of five no. Bhakra – Ganguwal circuits with HTLS conductor

1. The above said agenda was discussed in the meeting of NRPC held on 20.4.2022 as Item no. 14 wherein BBMB presented its case detailing about the generation capacity of Bhakra Complex and the limitations brought out in the load flow studies done by HPPTCL in the evacuation network of the Bhakra Complex. Due to this, BBMB highlighted the need for requirement of comprehensive study for adequacy of transmission lines from Bhakra Power House Complex and requested that load flow study may please be carried out by NRLDC to identify possible constraints for evacuation of power of Bhakra Left Bank and Bhakra Right Bank Power House after considering their uprating and load changes. In the meeting, NRLDC requested BBMB to share the results of load flow study done by HPPTCL.

2. Accordingly, the requisite data was submitted to NRLDC and NRLDC validated the load flow studies as carried out by HPPTCL. In the mail dated 10.05.2022 NRLDC has observed : *"The generation of Bhakra left is being evacuated from three 220 KV circuits to Ganguwal. Power flow on these circuits doesn't seem to be N-1 compliant while high generation at Bhakra Left (installed capacity = 519 MW). The sensitivity studies also suggest that the flows on 220 kV Bhakra Right Jamalpur and Bhakra Right-Ganguwal circuits are not N-1 compliant at the time of high generation at Bhakra Right (installed capacity = 911 MW) considering the ampacity of the installed conductors. Therefore, suitable conductor type may be selected to cater these evacuations with desired N-1 compliance."*

3. The details of the conductors of all the five circuits of Bhakra Complex to Ganguwal are as below :

Circuit	Name of the Conductor	Strands	Diameter (mm)
Bhakra-Ganguwal Circuit 1 & 2	ACSR Goat	30/3.71 7/3.71	25.97
Bhakra-Ganguwal Circuit 3, 4 & 5	ACSR Zebra	54/3.18 7/3.18	28.62

4. The results of the load flow studies has brought out that the over loading with N-1 contingency in case of Bhakra-Ganguwal circuit 1&2 is 70.5%, Bhakra-Ganguwal circuit 3 is 40.5% and Bhakra-Ganguwal circuit 4&5 is 42%.

5. In view of the above result of the load flow study, BBMB proposes to replace the existing ACSR conductors with relevant HTLS conductors at all the five circuits emanating from Bhakra Complex to Ganguwal i.e. Bhakra-Ganguwal circuit No. 1 to 5, so as to get the constraints removed along with making it N-1 complaint. Further the case for re- conductoring of 220 kV Bhakra Right - Jamalpur double circuit is also under process.

The proposal at sr. no. 5 above may be got approved in the next OCC meeting.

सुरजीत सिंह 11/7/2022

निदेशक/योजना एवं रूपांकन (टी एस),

बी बी एम बी, चण्डीगढ़।

RVPN
An ISO 9001:2000 Certified Company

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)
+91-141-2740623, Fax:+91-141-2740794;
e-mail: se.pp@rvpn.co.in; website:www.rvpn.co.in

No. RVPN/SE(P&P)/XEN-2(P&P)/AE-2/ F. /D 697 Jaipur, Dt. 28/6/22

To
The General Manager (NRLDC)
Power System Operation Corporation Ltd. (POSOCO)
18-A, Shaheed Jeet Singh Sansanwal Marg, Katwaria Sarai
New Delhi-110016.

Sub:- Proposed SPS for 400/220 kV ICTs at RVPN's 400 KV GSS Jodhpur/Bhadla/Ratangarh

On the above captioned subject, please find attached the 'Title' proposed SPS for 400/220 KV ICTs at RVPN's 400 KV GSS Jodhpur/Bhadla/Ratangarh alongwith schematic diagram and load details for consideration and approval.

Encl: As above

(K.K. Meena)
Chief Engineer (PP&D)
RVPNL, Jaipur.

Copy to the following for information and necessary action please-

1. The Member Sceratry (NRPC), 18-A, Shaheed Jeet Singh Marg, Katwaria Sarai, New Delhi-110016
2. The Chief Engineer (LD/T&C/MPT&S), RVPN, Jaipur/Jodhpur/Jodhpur.
3. The Chief Engineer, Power System Planning & Appraisal-I Division, CEA, Sewa Bhawan, RK Puram-I, New Delhi-110066
4. The Superintending Engineer (Operation), NRPC, 18-A, Shaheed Jeet Singh Marg, Katwaria Sarai, New Delhi-110016.

Encl: As above

SE

Kindly prepare a power point ppt

Chief Engineer (PP&D)
RVPNL, Jaipur

Proposed SPS for 400/220 kV ICTs at RVPN's 400 KV GSS Jodhpur(Surpura)/Bhadla/Ratangarh

1) SPS for 2x315 MVA, 400 kV GSS Jodhpur (Surpura)

- Percentage impedance of 315 MVA, 400/220 kV ICT-I is 12.5% (HV to IV) & 45% (HV to LV) & 30% (IV to LV) and Percentage impedance of 315 MVA, 400/220 kV ICT-II is 12.392% (HV to IV) & 39.47% (HV to LV) & 26.02% (IV to LV). Load sharing on both ICTs will be almost equal.
- Peak Loads recorded on the 400/220 kV ICTs and 220 kV lines associated with 400 kV GSS Jodhpur (Surpura) are detailed below in Table 1.

Table 1: Load Details on ICTs and Transmission Lines Associated with 400 kV GSS Jodhpur (Surpura)

S. No.	Name of 220 kV line/ICTs	Peak Load	Average Load	Remark
1	315 MVA, 400/220 kV ICT-I	315 MVA	212 MVA	
2	315 MVA, 400/220 kV ICT-II	300 MVA	209 MVA	
3	220 kV Jodhpur-Bilara line	189 MVA	106 MVA	220 kV GSS Bilara is also connected with 220 kV GSS Beawer.
4	220 kV Jodhpur-Bhawad Ckt-I line	269 MVA	94 MVA	These circuits feed power to 220 kV GSS Bhawad, Bhoplagarh, Aau, Baithwasia, Badisid and Bhadla. Tripping of these lines will create load shedding in large area. Further, tripping of these lines will also increase loading on the 2x315 MVA, 400/220 kV ICTs at 400 kV GSS Merta. Therefore, these lines are not included in SPS.
5	220 kV Jodhpur- Bhawad Ckt-II line	238 MVA	95 MVA	
6	220 kV Jodhpur-Tinwari Ckt-I line	185 MVA	81 MVA	These circuits feed power to 220 kV GSS Tinwari, Dechu, Phalodi, Bap, Amarsagar and Bhadla. Alternatively when these lines are tripped then load of the region will be catered from the BLTPS and Ramgarh TPS and solar/wind generators in the Bhadla/Dechu region.
7	220 kV Jodhpur- Tinwari Ckt-II line	218 MVA	94 MVA	
8	220 kV Jodhpur- Barli line	155 MVA	54 MVA	These lines are used to cater

9	220 kV Jodhpur- Jhalamand line	111 MVA	50 MVA	load of Jodhpur city. These GSSs are also fed from 400 kV GSS Kankani.

- Power Map of Transmission System at 400kV GSS Jodhpur region is shown in Fig. 1.

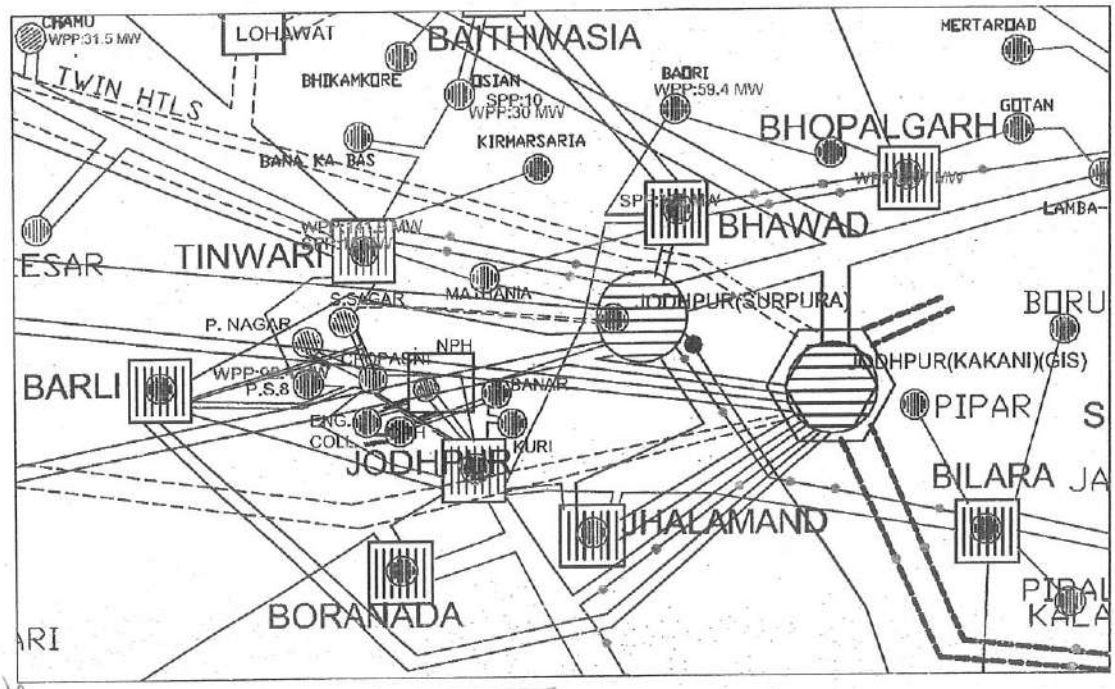


Fig. 1 Power map of Jodhpur region

- After detailed analysis of above loading conditions & grid interconnection issues, following lines are considered for tripping as soon as any one of the 1x315 MVA, 400/220 kV ICTs is tripped on fault/protection:-
  - 220 kV Jodhpur-Bilara line
  - 220 kV Jodhpur-Tinwari Ckt-I line
  - 220 kV Jodhpur- Tinwari Ckt-II line
- Tripping command for the 220 kV lines are to be taken from the 86 relay installed on 220 kV side of both the 2x315 MVA, 400/220 kV ICTs which will be utilized to trip the above 220 kV lines when any one ICTs trip on fault/protection.
- Schematic diagram for tripping of 220 kV lines included in SPS for 2x315 MVA, 400/220 kV ICTs at 400 kV GSS Jodhpur (Surpura) is shown below in Fig. 2:-

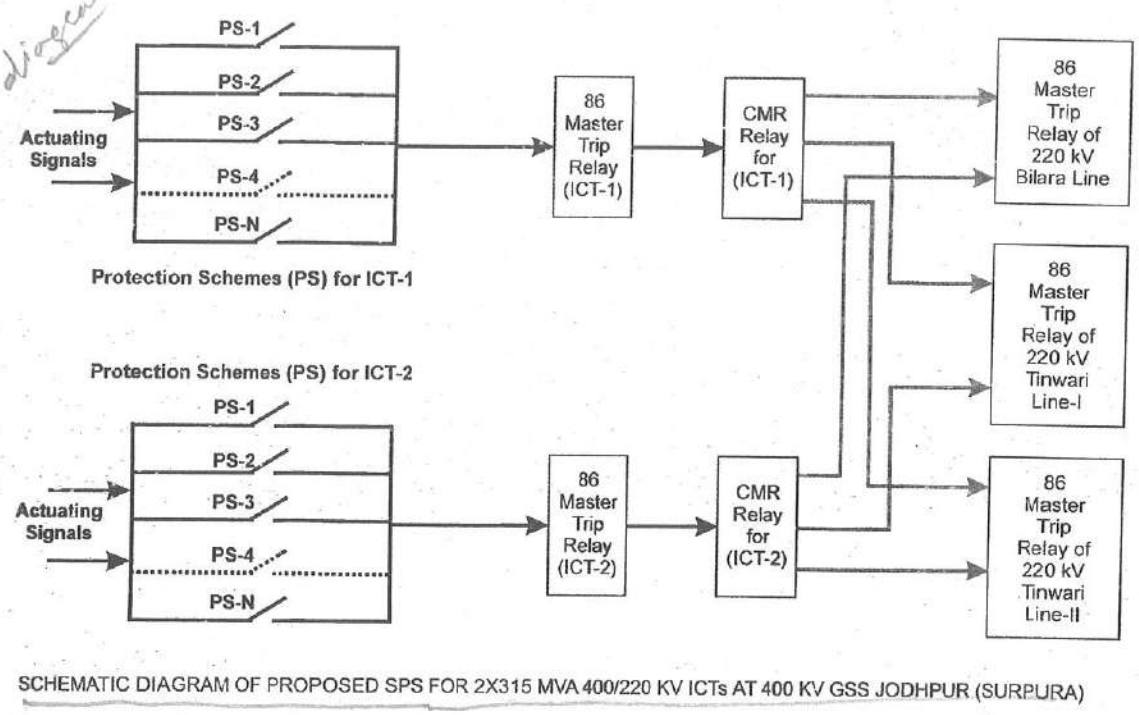


Fig. 2 Schematic diagram of proposed logics for SPS of 2x315 MVA, 400/220 kV ICTs at 400 kV GSS Jodhpur (Surpura)

2) **SPS for 3x500 MVA, 400/220 kV ICTs at 400 kV GSS Bhadla**

- There are 3x500MVA, 400/220 kV ICTs at 400 kV GSS Bhadla. Mainly these ICTs are used to stepped up the RE power to evacuate through 400 kV lines to Jodhpur, Merta and Bikaner. Load sharing on all the ICTs is almost equal and each ICT is loaded near to rated capacity of 500 MVA.
- Peak Loads recorded on the 400/220 kV ICTs and 220 kV lines associated with 400 kV GSS Bhadla are detailed below in Table 2. RE power injected by the lines to 220 kV Bus of 400 kV GSS Bhadla is also mentioned in the Table 2.

Table 2: Load Details on ICTs and Transmission Lines Associated with 400 kV GSS Bhadla

S. No.	Name of 220 kV line/ILTs	Peak Load (MW)	RE Generation
1	500 MVA, 400/220 kV ICT-I	488	
2	500 MVA, 400/220 kV ICT-II	446	
3	500 MVA, 400/220 kV ICT-III	446	
4	400 kV Bhadla-Bikaner Ckt-I Line	598	
5	400 kV Bhadla-Bikaner Ckt-II Line	710	
6	400 kV Bhadla-Ramgarh Ckt-I Line	520	
7	400 kV Bhadla-Ramgarh Ckt-II Line	520	
8	400 kV Bhadla-Merta Line	406	

9	400 kV Bhadla-Jodhpur (Surpura) Line	600	
10	400 kV Bhadla (RVPN)-Bhadla(PGCIL) Ckt-I Line	562	
11	400 kV Bhadla (RVPN)-Bhadla(PGCIL) Ckt-II Line	548	
12	220 kV Bhadla-Kanasar Ckt-I Line	134	190 MW
13	220 kV Bhadla-Kanasar Ckt-II Line	134	
14	220 kV Bus Sectionalizer-II to evacuate power of Saurya Urja-II (300 MW)	-	300 MW
15	220 kV Bhadla-RSDCL-1 Ckt-I Line	153	340 MW
16	220 kV Bhadla-RSDCL-1 Ckt-II Line	152	
17	220 kV Bhadla-RSDCL-2 Ckt-I Line	154	340 MW
18	220 kV Bhadla-RSDCL-2 Ckt-II Line	156	
19	220 kV Bhadla-Adani REPRL Ckt-I Line	132	250 MW
20	220 kV Bhadla- Adani REPRL Ckt-II Line	131	

- Power map of transmission system at 400 kV GSS Bhadla is shown in Figure 3.

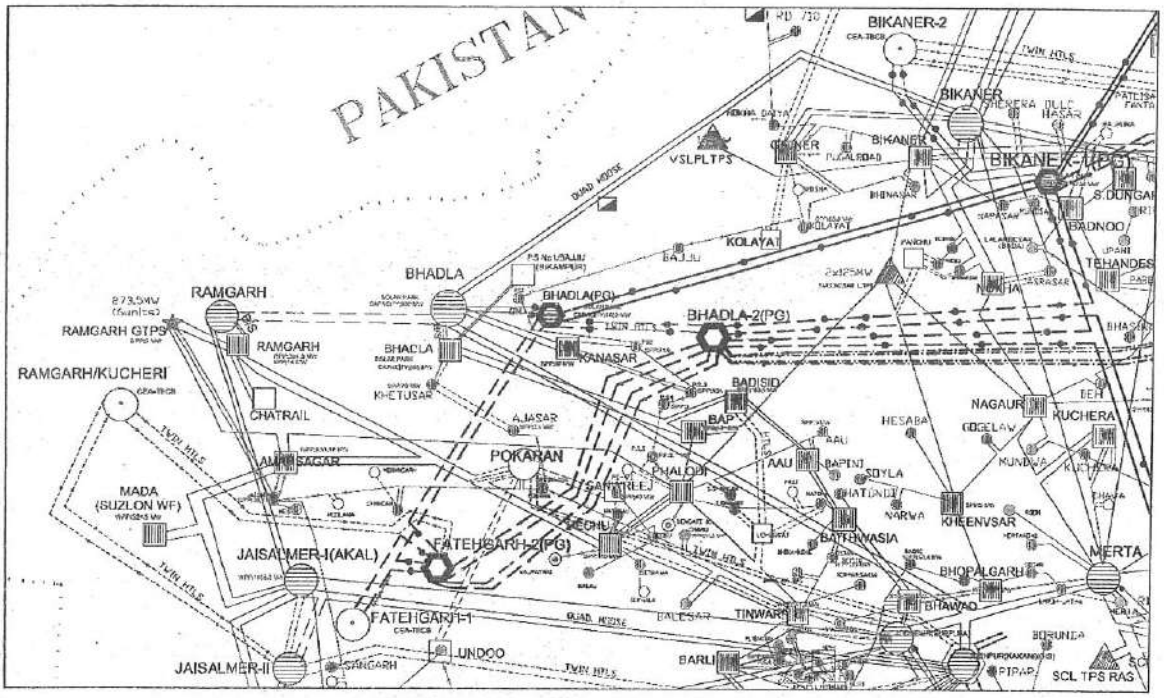


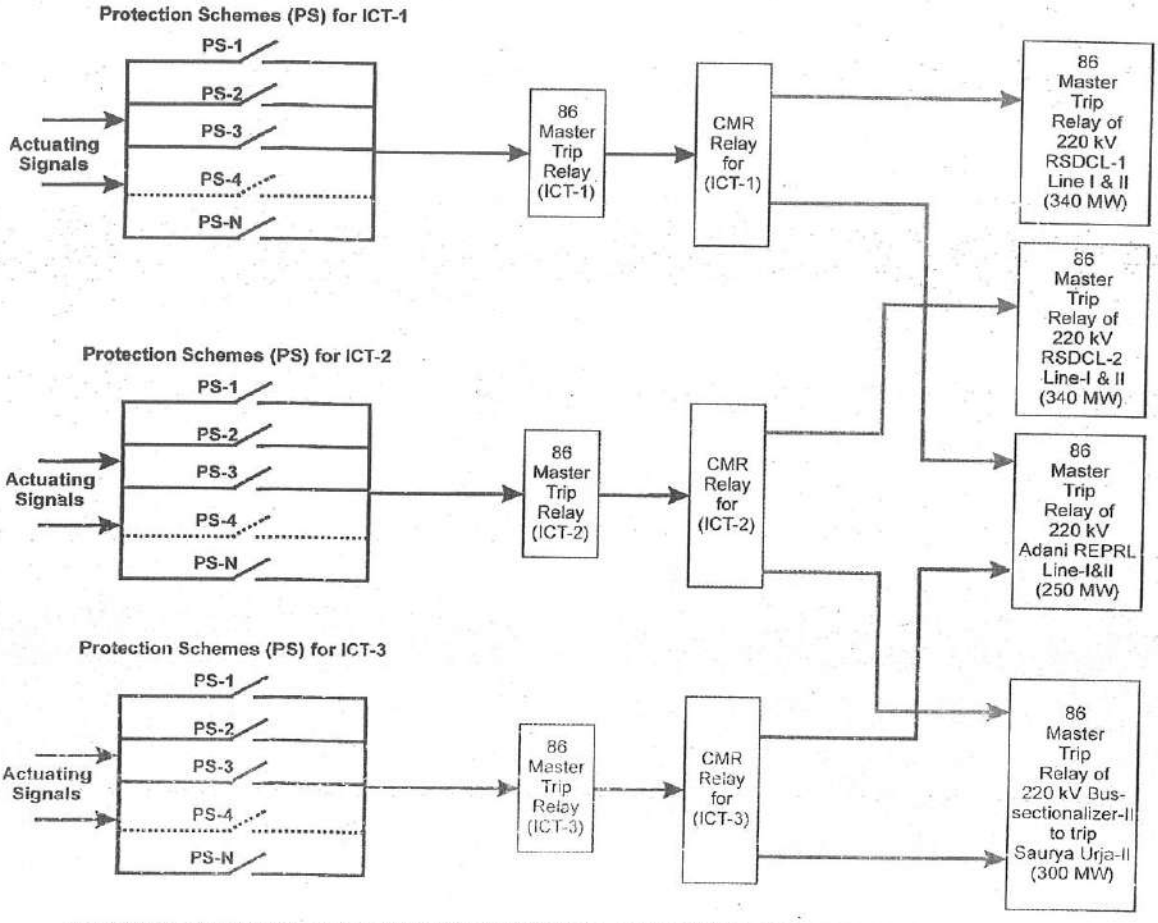
Fig. 3 Power map of Bhadla region

- After detailed analysis of above loading conditions, RE power injection & grid interconnection issues, following lines are considered for tripping as soon as any one of the 3x500 MVA, 400/220 kV ICTs is tripped on fault/protection:-
  - 220 kV Bhadla-RSDCL-1 Ckt-I Line
  - 220 kV Bhadla-RSDCL-1 Ckt-II Line
  - 220 kV Bhadla-RSDCL-2 Ckt-I Line
  - 220 kV Bhadla-RSDCL-2 Ckt-II Line

- 220 kV Bhadla- Adani REPRL Ckt-I Line
- 220 kV Bhadla- Adani REPRL Ckt-II Line
- 220 kV Bus Sectionalizer-II used to evacuate 300 MW RE power of Saurya Urja-II

- Tripping command for the 220 kV lines and 220 kV Bus Sectionalizer-II used to inject RE power on the 220 kV bus of 400 kV GSS Bhadla is to be taken from the 86 relay installed on 220 kV side of all the 3x500 MVA, 400/220 kV ICTs which will be utilized to trip the above 220 kV lines and/or 220 kV Bus Sectionalizer-II when any one ICT trips on fault/protection.

- Schematic diagram for tripping of 220 kV lines included in SPS for 3x500 MVA, 400/220 kV ICTs at 400 kV GSS Bhadla is shown below in Figure 4.



SCHEMATIC DIAGRAM OF PROPOSED SPS FOR 3X500 MVA 400/220 KV ICTs AT 400 KV GSS BHADLA

Fig. 4 Schematic diagram of proposed logics for SPS of 3x500 MVA, 400/220 kV ICTs at 400 kV GSS Bhadla

- To facilitate the RE generators for evacuation of RE powers of all generators in proportionate quantum, the tripped lines may be re-connected after curtailing the RE generation from all generators in such a quantum to maintain the loadings on the healthy 400/220 kV ICTs within permissible limits.

3) **SPS for 3x315 MVA, 400/220 kV ICTs at 400 kV GSS Ratangarh**

- Percentage impedance of 315 MVA, 400/220 kV ILT-I is 11.52%, percentage impedance of 315 MVA, 400/220 kV ILT-II is 11.65% and percentage impedance of 315 MVA, 400/220 kV ILT-III is 12.18. Load sharing on both ILTs will be almost equal.
- Peak Loads recorded on the 400/220 kV ILTs and 220 kV lines associated with 400 kV GSS Ratangarh are detailed detailed below in Table 3.

Table 3: Load Details on ILTs and Transmission Lines Associated with 400 kV GSS Ratangarh

S. No.	Name of 220 kV line/ILTs	Peak Load (MVA)	Average Load (MVA)	Remark
1	315 MVA, 400/220 kV ILT-I	241	149	
2	315 MVA, 400/220 kV ILT-II	241	149	
3	315 MVA, 400/220 kV ILT-III	241	148	
4	220 kV Ratangarh-Sujangarh Line	154	104	
5	220 kV Ratangarh-Khetri Ckt-I Line	146	76	Both circuits are to be tripped simultaneously else one circuit will be overloaded and ILT loading will not reduce.
6	220 kV Ratangarh-Khetri Ckt-II Line	146	79	
7	220 kV Ratangarh-Sikar (PGCIL) Ckt-I Line	96	78	Both circuits are to be tripped simultaneously else one circuit will be overloaded and ILT loading will not reduce.
8	220 kV Ratangarh-Sikar (PGCIL) Ckt-II Line	96	79	
9	220 kV Ratangarh (400 kV GSS)-Ratangarh (220 kV GSS) Ckt-I Line	303	158	Both circuits are to be tripped simultaneously else one circuit will be overloaded and ILT loading will not reduce.
10	220 kV Ratangarh (400 kV GSS)-Ratangarh (220 kV GSS) Ckt-II Line	225	158	
11	220 kV Ratangarh-Badnoo Line	212	154	Both circuits are to be tripped simultaneously else one circuit will be overloaded and ILT loading will not reduce.
12	220 kV Ratangarh-Sridungargarh Line	176	162	

- Power map of transmission system at 400 kV GSS Ratangarh region is shown in Fig. 5.

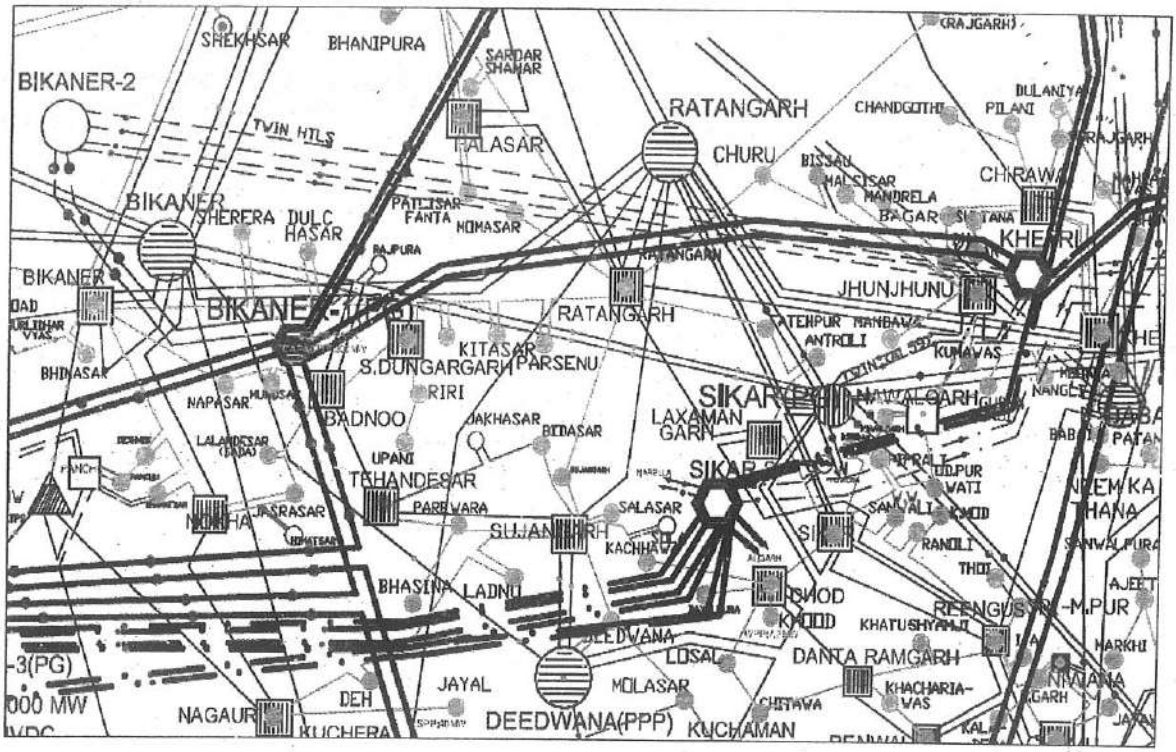
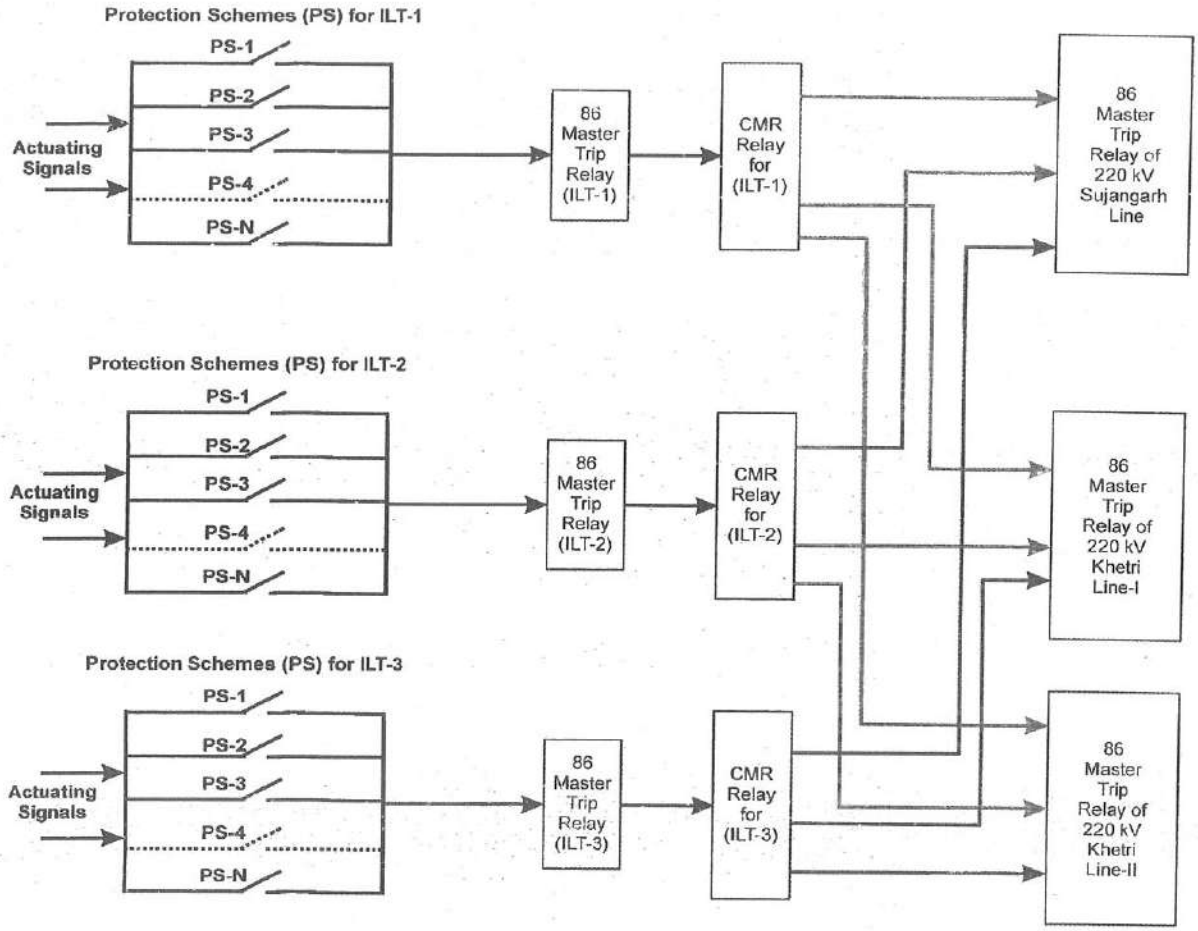


Fig. 5 Power map of Ratangarh region

- After detailed analysis of above loading conditions & grid interconnection issues, following lines are considered for tripping as soon as any one of the 3x315 MVA, 400/220 kV ILTs is tripped on fault/protection:-
  - 220 kV Ratangarh-Sujangarh Line
  - 220 kV Ratangarh-Khetri Ckt-I Line
  - 220 kV Ratangarh-Khetri Ckt-II Line
- Tripping command for the 220 kV lines are to be taken from the 86 relay installed on 220 kV side of both the 3x315 MVA, 400/220 kV ILTs which will be utilized to trip the above 220 kV lines when any one ILTs trip on fault/protection.
- Schematic diagram for tripping of 220 kV lines included in SPS for 3x315 MVA, 400/220 kV ILTs at 400 kV GSS Ratangarh is shown below in Fig. 6:-



SCHEMATIC DIAGRAM OF PROPOSED SPS FOR 3X315 MVA 400/220 KV ILTs AT 400 KV GSS RATANGARH

Fig. 6 Schematic diagram of proposed logics for SPS of 3x315 MVA, 400/220 kV ILTs at 400 kV GSS Ratangarh

HPPTCL

H. P. POWER TRANSMISSION CORPORATION LTD.

(A State Govt. Undertaking)

Web: - www.hpptcl.com

Office: HimfedBhawan, New ISBT Road,Panjari, Shimla-171005
Ph.:- 0177-2831283, 2831284 FAX:-0177-2831284
(CIN):U40101HP2008SGC030950
(GSTIN):02AACCH1548M1ZP

HPPTCL/ Proj./ F-105/2022-23/ 6431 **13 Jul, 2022**

To

The Assistant Secretary
Northern Regional Power Committee
18-A, Qutab Institutional Area, Shaheed Jeet Singh Marg,
Katwaria Sarai, New Delhi-110 016

Sub: Modification in SPS **(SPS/NR/GEN/01)** for reliable evacuation of power of NJHPS, Rampur, Baspa KWHEP, and Sawra-Kuddu required for evacuation of power from **60 MW Naitwar-Mori HEP** (SJVNL). - **Agenda for 197th Meeting of Operation Coordination Sub-Committee**

Ref: **1.** MoM_3rd_NRPCTP_19.02.2021 Point 5.7
2. MoM File No.CEA-PS-11-22(14)/1/2018-PSPA-I Division /I-18022/2021 dt. 28- 09-2021 (Meeting dt. 09-09-2021)
3. MoM_4th_NRPCTP_meeting 05.10.21 Point 32
4. This office Letter no. HPPTCL/Proj.F-105/22-23/5011 dt. 02-07-2022 to NRLDC

Sir,

This is with reference to the 3rd NRPC(TP) meeting held on 19-02-2021 wherein the issues related to the transmission system for evacuation of power from Naitwar-Mori HEP (60 MW) were discussed. It was agreed in the meeting that 60 MW Naitwar Mor- HEP shall be evacuated through HPPTCLs transmission system in the region and power will ultimately be injected on 400kV Nathpa-Jhakri-Gumma-Panchula Lines at 400/220kV Gumma(Pragatinagar) HPPTCL substation. POSOCO had in the said meeting intimated that the SPS implemented in the Rampur-Jhakri-Karcham-Gumma complex would need revision in case of any additional injection from Gumma HEP.

Further, a meeting was held under the chairmanship of CEA dt.09.09.21 to discuss the transmission system for evacuation of Naitwar-Mori HEP of SJVNL wherein it was decided that the proposed switching substation at Snale which was agreed in 3rd NRPC(TP) for evacuation of Naitwar-Mori HEP would be deferred by 4 years and as an interim arrangement for evacuation, one ckt. of 220kV D/C (Single Zebra) Hatkoti Switching SubStation(HPPTCL)- 111 MW Sawra-Kuddu HEP would be LILO at 60 MW Naitwar-Mori HEP through 220kV Naitwar-Mori-Sawra Kuddu D/C (Single Zebra) transmission line under construction by SJVNL. This arrangement was ratified in the 4th NRPC(TP) meeting dt. 05.10.21.

For the LILO arrangement in N-1 contingency, the switchyard capacity of Naitwar-Mori HEP, Hatkoti Switching Station is adequate, however, the line CTs installed at Sawra-Kuddu HEP are not adequate (400/220/1 A) for N-1 contingency and have to be upgraded.

After consultations with HPPCL(SKHEP) and SJVNL(NMHEP) this required work for up-gradation of CTs at Sawra-Kuddu HEP was taken up with OEM of GIS equipment at SKHEP, which intimated a timeline of 10 months for up-gradation of CTs.

The commissioning schedule of Naitwar-Mori HEP and associated transmission line has been intimated by SJVNL as Sep-2022, which is earlier than the anticipated timeline of up-gradation of CTs by HPPCL. Therefore, to avoid the stranding of NMHEP generation till the CTs at SKHEP are upgraded, there is a requirement for implementation of SPS for the protection of Line CTs at Sawra Kuddu HEP.

In view of the above, A draft SPS scheme for the interim arrangement has been prepared in consultation with SJVNL and HPPCL and a copy of the same is enclosed as **Annexure-A.** This draft scheme was also shared with NRLDC vide letter referred above at -4- for their perusal and comments if any.

It is requested that proposed modifications in the SPS scheme may please be considered & approved by Sub-Committee so that based on the final approval, work for implementation of the same can be taken up before the commissioning of the Naitwar-Mori HEP.

Yours faithfully

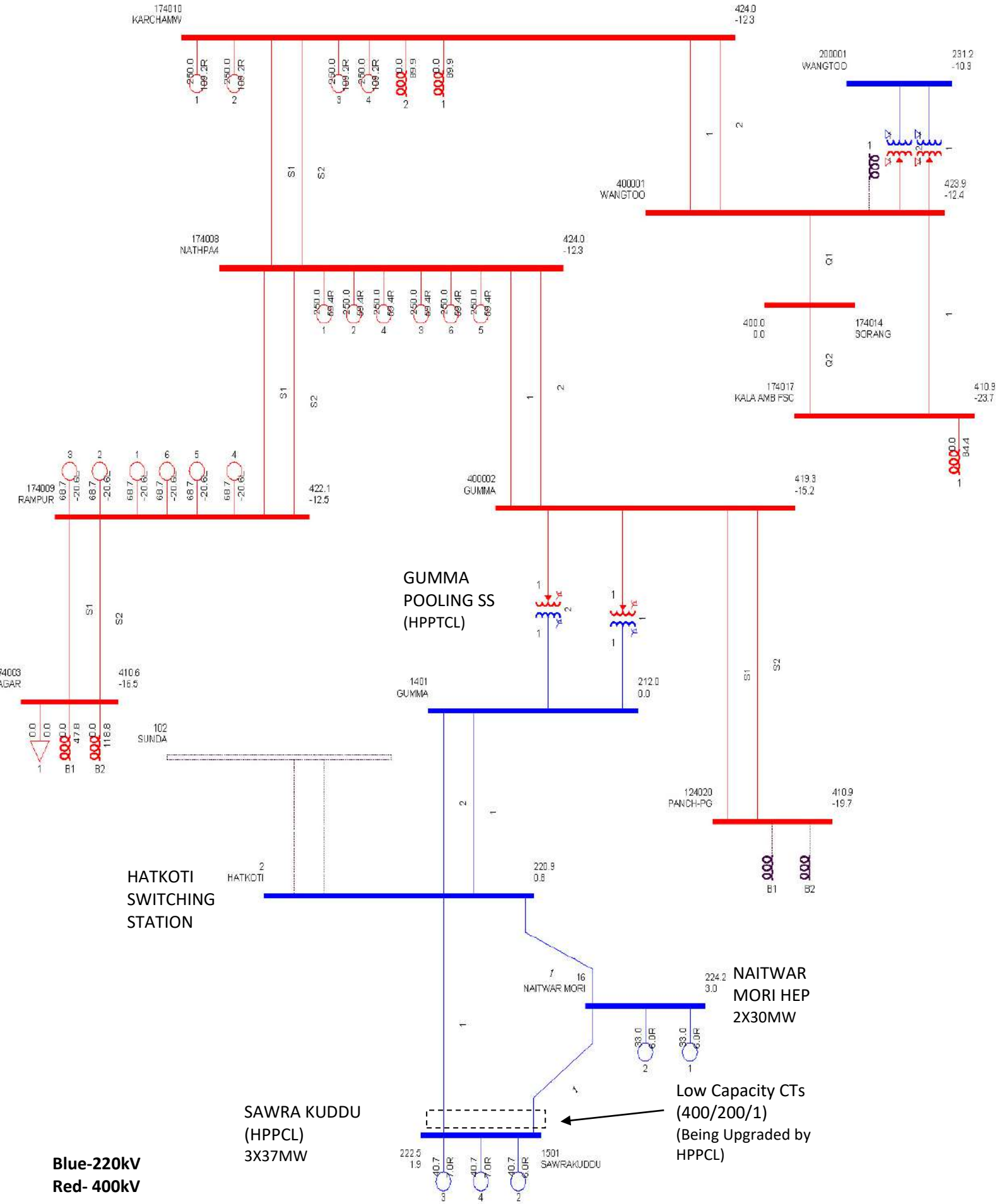
General Manager (Projects)
HPPTCL
Himfed Bhawan, Panjari
Shimla-171005

PROPOSED MODIFICATION TO THE SPS SCHEME: SPS/NR/GEN/01

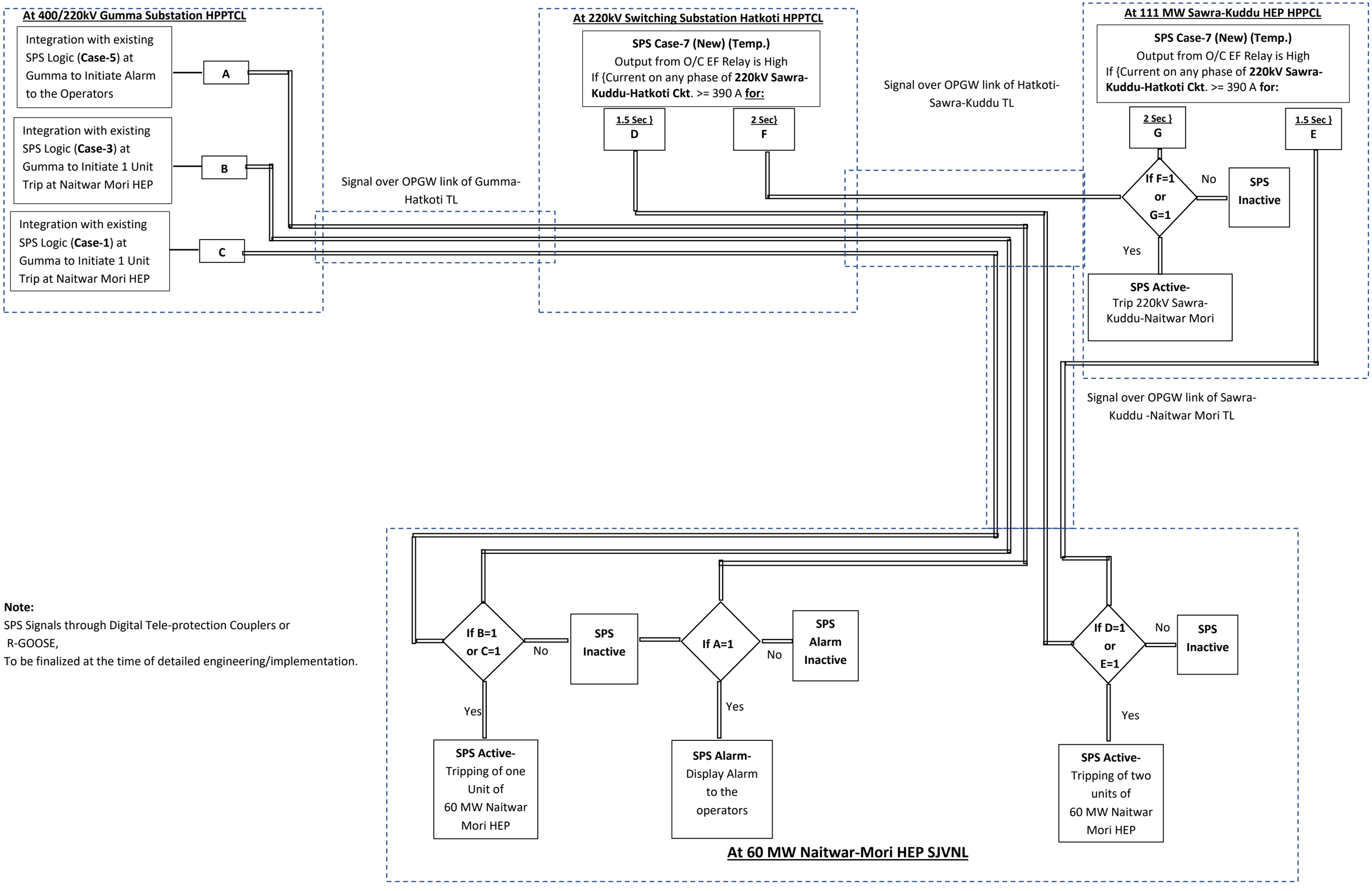
Case	Contingency (Existing)	Contingency (To be modified)	Action (Existing)	Action (To be Modified)
Case-1 (Modification)	Load on any of the lines at Jhakri, Rampur or Gumma towards Nalagarh or Panchkula exceeds 850 MW	(No modification required)	Trip: 1 Unit of Wangtoo HPS, 1 Unit of Jhakri HPS, 1 Unit of Rampur HPS Trip 1 Unit of Sawra-Kuddu HPS	Trip: 1 Unit of Wangtoo HPS, 1 Unit of Jhakri HPS, 1 Unit of Rampur HPS Trip 1 Unit of Sawra-Kuddu HPS 1 Unit of Naitwar Mori
Case-2 (No Change)	400 kV bus voltage at Wangtoo drops below 395 kV	(No modification required)	Trip 2 Units of Karcham-Wangtoo HPS	(No modification required)
Case-3 (Modification)	Any two outgoing lines of Jhakri (Jhakri-Rampur or Jhakri-Gumma) or Rampur HPS (Rampur-Nalagarh D/C) or Gumma (Gumma-Panchkula) trip except in case of tripping of one ckt of 400 kV Jhakri-Gumma and one ckt of Gumma-Panchkula ckt or one ckt of Jhakri-Rampur and one ckt of Rampur-Nalagarh ckt	(No modification required)	Trip 2 Units of Jhakri, 2 Units of Rampur HPS, 2 Units of Wangtoo and 2 Units of Sawra Kuddu HEP No need to trip 2 Units of Swara-Kuddu HEP in case of tripping of 400kV Jhakri-Gumma D/C as Sawra Kuddu generation will evacuate easily through 400 kV Gumma-Panchkula D/C	Trip 2 Units of Jhakri, 2 Units of Rampur HPS, 2 Units of Wangtoo and 2 Units of Sawra Kuddu HEP 1 Unit of Naitwar Mori No need to trip 2 Units of Swara-Kuddu HEP & 1 Unit of Naitwar Mori in case of tripping of 400kV Jhakri-Gumma D/C as their generation will evacuate easily through 400 kV Gumma-Panchkula D/C
Case-4	Both 400 kV Karcham-Wangtoo- Wangtoo (HP) lines trip or 400kV Wangtoo(HP)-Sorang and Wangtoo(HP)-Kalaamb lines trip	(No modification required)	Trip 2 units of Karcham Wangtoo HPS	(No modification required)
Case-5 (Modification)	Power Flow of any outgoing line of Rampur or Jhakri or Gumma Substation exceed by 800MW	(No modification required)	Initiate the Alarm to the operators at Jhakri, Rampur, Karcham Wangtoo, Sorang HEP, Sawra Kuddu HEP	Initiate the Alarm to the operators at Jhakri, Rampur, Karcham Wangtoo, Sorang HEP, Sawra Kuddu HEP and Naitwar Mori HEP
Case-6	Both 400kV Kalaamb-Abdullapur lines trip or 400kV Wangtoo(HP)-Kalaamb and 400kV Sorang HEP- Kalaamb Trip	(No modification required)	Trip 2 units of Karcham-Wangtoo HPS and 1 unit of Sorang HEP	(No modification required)

Case	Contingency	Action
Case-7 (New) (Temporary) (Remarks: CTs at Sawra Kuddu HEP are required to be upgraded after LILO of one ckt of 220kV Sawra-Kuddu-Hatkoti(Gumma) TL at Naitwar Mori, Scheduled Commissioning of Naitwar Mori HEP is before the scheduled commissioning of upgraded CTs at Sawra-Kuddu HEP. Temporary Provision of SPS is therefore required to protect lower capacity CTs at Sawra-Kuddu HEP till the CTs are upgraded)	1. Current (Any phase) on 220kV Sawra-Kuddu-Hatkoti or 220kV Sawra-Kuddu-HEP - Naitwar Mori-HEP exceed 390A for 1.5 sec 2. Current (Any phase) on 220kV Sawra-Kuddu-Hatkoti or 220kV Sawra-Kuddu-HEP - Naitwar Mori-HEP exceed 390A for 2 sec	Action in case of 1.: Trip 2 Units of Naitwar Mori HEP Action in case of 2. : Trip 220kV Naitwar Mori-Sawra Kuddu Circuit

SLD of Jhakri-Gumma-Rampur-Wangtoo



Proposed Modification in SPS for reliable evacuation of power from NJPS, Rampur, Baspa, Karcham-Wangtoo, Sawra Kuddu HEP to include Naitwar-Mori HEP:



Note:

SPS Signals through Digital Tele-protection Couplers or R-GOOSE,

To be finalized at the time of detailed engineering/implementation.

Annexure - VIII
File No.CEA-PS-11-22(14)/1/2018-PSPA-I Division 331

I/18022/2021

भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
केन्द्रीय विद्युत प्राधिकरण
Central Electricity Authority
विद्युत प्रणाली योजना एवं मूल्यांकन-I प्रभाग
Power System Planning & Appraisal-I Division

सेवा में / To

1. COO (CTUIL), Saudamini, Plot No. 2, Sector - 29, Gurugram - 122001
2. CEO, POSOCO, B-9, Qutab Institutional Area, Katwaria Sarai, New Delhi-110010
3. MD, HPPTCL, Himfed Bhawan,Panjari, Shimla-171005
4. MD, HPPCL, Himfed Building, BCS, New Shimla-171009
5. Director (Tech.), SJVNL, Shakti Sadan, Corporate Office Complex, Shanan, Shimla-171006

विषय/Subject: Meeting to discuss the issue pertaining to transmission system for evacuation of power from 60 MW Naitwar Mori HEP of SJVNL

महोदय/Sir,

A meeting through VC was held on 09.09.2021 to discuss the issue pertaining to transmission system for evacuation of power from 60 MW Naitwar Mori HEP of SJVNL.

The Minutes of the meeting are attached herewith.

Encl: As above

भवदीय / Yours faithfully,

Signature Not Verified
Digitally signed by NITIN DESWAL
Date: 2021.09.28 18:02:23 IST

(नितिन देसवाल / Nitin Deswal)
सहायक निदेशक/Asst. Director, के.वि.प्रा/CEA

प्रतिलिपि/ Copy to -

1. PPS to Member (PS), CEA

Minutes of the meeting to discuss the issue pertaining to transmission system for evacuation of power from 60 MW Naitwar Mori HEP of SJVNL

List of participants is attached at **Annexure-I.**

1. Chief Engineer (PSPA-I), CEA, welcomed the participants and stated that the transmission system for evacuation of power from 60 MW Naitwar Mori HEP of SJVNL had been finalized in the 3rd NRPC(TP) meeting held on 19.02.2021 (Figure 1). The same is given below:

   - Creation of 220kV Pooling station near Snail with LILO of both circuits of Snail – Hatkoti 220kV D/c line.
   - SJVNL to construct 220 kV Naitwar Mori to Hatkoti/Snail PS D/c line and the 220 kV Pooling Station near Snail S/S as a dedicated system

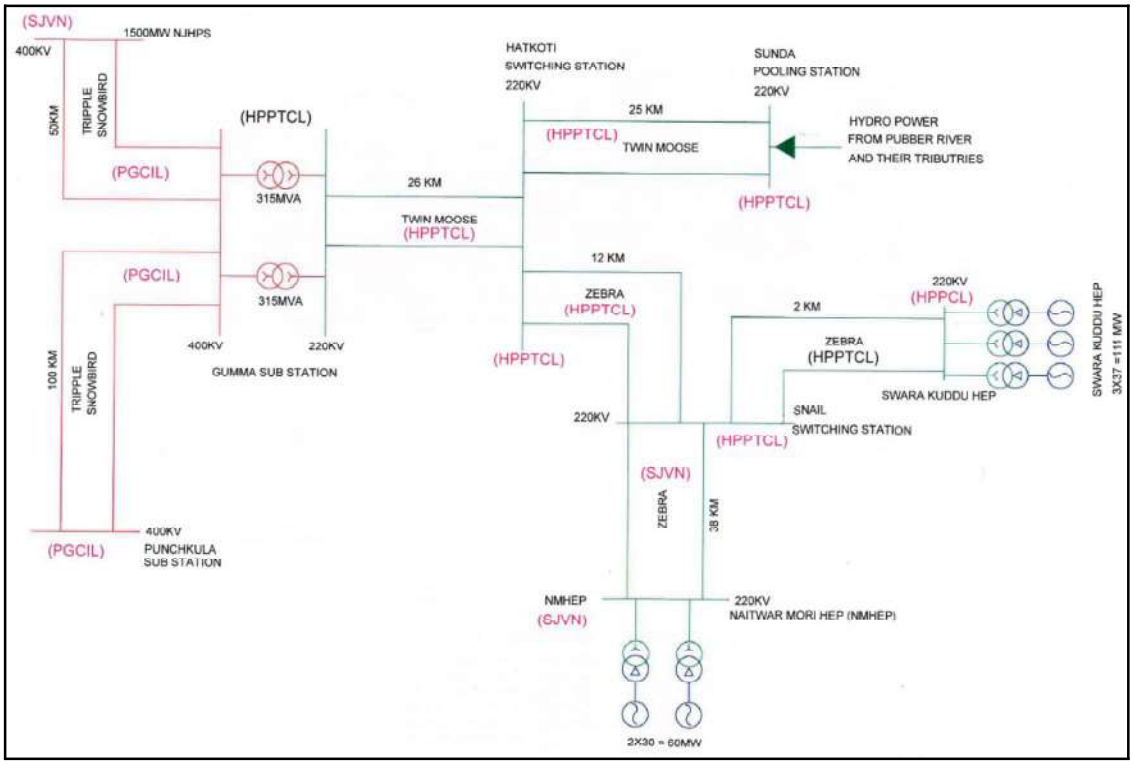


Figure1: The power evacuation system for Naitwar Mori HEP

SJVNL has proposed to defer the construction of Switching Station near Snail by four years and requested for evacuation of power from Naitwar Mori HEP through S/c LILO of Sawara Kuddu HEP- Hatkoti 220kV D/c line as an interim arrangement (Figure 2).

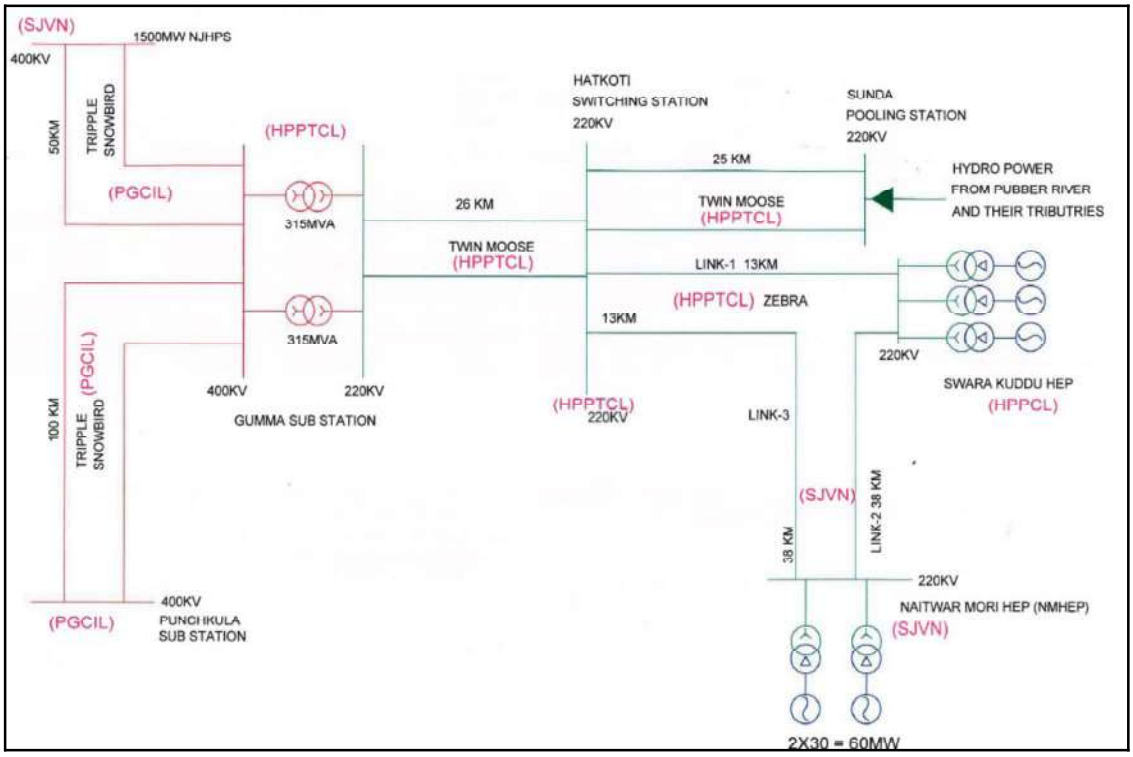


Figure 2: Interim Arrangement proposed for NMHEP by SJVNL (without JKHEP)

2. Regarding the LILO arrangement proposed by SJVNL, Director, CEA, stated that the same proposal was earlier deliberated in a meeting held on 14.01.2021, wherein SJVNL intimated that their switchyard had already been designed and it might not be capable of handling the additional power from Swara Kuddu HEP under 'n-1' condition of Sawara Kuddu- Hatkoti line.

3. SJVNL informed that a joint meeting was recently held between SJVNL, HPPTCL and HPPCL and the technicalities of the proposed system have been broadly seen. He added that the proposed system is 'n-1' compliant and the technical capabilities of switchyard equipment such as CT, busbar, etc. has already been explored and a Committee has already been constituted among SJVNL, HPPTCL and HPPCL for the same.

   SJVNL added that SJVNL is also implementing Jakhol Sankri HEP, which would also be evacuated through LILO of one circuit of Naitwar Mori - Snail 220 kV D/c line at Jakhol Sankri HEP (44 MW). Investment approval for Jakhol Sankri is under process. Further, the proposed system would be an interim arrangement and the same can be revised in the time frame of JSHEP or other projects in that area.

4. HPPCL stated that a committee has been constituted for finalization of modalities and suggesting changes in the switchyard of Swara Kuddu HEP and inputs on the above arrangement proposed by SJVNL would be communicated after the finalization of report of Committee.

   SJVNL informed that the Committee has already approved the interim arrangement and only some issues pertaining to CTs, communication equipment etc. are left for deliberation.

5. On a query from CTUIL regarding the revision of Connectivity from HPPTCL for interim arrangement, HPPTCL intimated that at present the Connectivity has been granted to SJVNL for

the long term arrangement of Naitwar Mori HEP. Now, as per the interim arrangement proposed by SJVNL, revised Connectivity would be granted till the commissioning of the agreed switching station near Snail. CTUIL stated that on the basis of Connectivity granted to SJVNL by HPPTCL, the original Connectivity granted by CTUIL would be revoked.

6. NRLDC stated that the quantum of power planned to be injected at 220 kV Sunda (from Pubber valley river projects) and its expected date of commissioning is important because this may create 'N-1' non-compliance at 400/220kV, 2x315 MVA ICTs at Gumma substation in future. NRLDC added that as discussed in 49th LTA/connectivity meeting of NR constituents, it is important to carry out a comprehensive study considering all upcoming hydro projects/Solar projects in HP as per the expected timelines of the projects.

   NRLDC added that in the final arrangement, the maximum power expected to be injected at Hatkoti 220kV S/stn from SKHEP, NMHEP and JSHEP is around 235 MW, assuming 10% overload capacity of all the three Hydro Power Stations. Therefore, under 'n-1' contingency of 220kV Snail-Hatkoti D/C line, the other 220kV Zebra ckt may have to carry full 235MW. Given the hilly terrain, reconductoring would be an issue if any additional project comes up in the area; hence, HPPTCL may study the same and plan accordingly.

   Further, NRLDC stated that since Gumma substation is part of Karcham-Jhakri-Baspa-Rampur generation complex, it is important that any SPS logic, as approved by NRPC/OCC, is duly implemented by all HEPs connected beyond 220 kV Gumma.

7. SJVNL informed that the ambient temperature being low in the area, they do not envisage overloading of 220kV Snail - Hatkoti D/c line under 'n-1'conditions. However, they would study the same. HPPTCL added that adequate margins are available and the system would be 'n-1' complaint.

8. On a query regarding upcoming load at Gumma substation, HPPTCL informed that the about 100MVA of drawl capacity has been planned, out of which about 30 MVA of load is expected by June 2022.

9. As per SJVNL and HPPTCL, interim arrangement would be sufficient for evacuation of power from Naitwar Mori HEP. Hence, CEA/CTUIL proposed that in place of four years, the switching station at Snail may be deferred till the commissioning of Jakhol Sankari or any other generation in that area. HPPTCL stated that the switching station at Snail cannot be deferred indefinitely as a 50MVAr reactor has also been proposed at Snail and further, there would be operational issues and it has been mutually agreed between SJVNL and HPPTCL that the interim arrangement would only be for four years.

10. On query from CTUIL regarding space availability for reactor and additional ICT at Gumma S/s, HPPTCL stated that there is no additional space at Gumma for either ICT or bus reactor. On query from CEA regarding provision of bus reactor at Naitwar Mori switchyard, SJVNL informed that no reactor has been planned at Naitwar Mori switchyard. On the proposal of NRLDC to install bus reactor at Hatkoti Switching station, HPPTCL informed that no space is available at Hatkoti switching station for the bus reactor.

11. CEA/CTUIL enquired from SJVNL about the possibility of accommodating the bus reactor at Naitwar Mori switchyard. SJVNL stated that they can review the same but immediately that would not be possible as Naitwar Mori HEP is proposed for commissioning by June, 2022.

12. SJVNL further informed that the tariff of Naitwar Mori HEP is on the higher side and the cost of switching station at Snail would further increase the tariff. Further, switching station cannot be completed in the matching timeframe of Naitwar Mori Generation. Therefore, SJVNL proposed to defer the commissioning of Snail switching station by four years, as agreed between SJVNL and HPPTCL.

After further deliberations, following was agreed:

1. Evacuation of power from Naitwar Mori HEP (60 MW) through LILO of one ckt of Sawra Kuddu HEP - Hatkoti 220 kV D/C line at Naitwar Mori HEP. This interim arrangement would be for four years and accordingly the construction of Snail switching station may be deferred at present.
2. SJVNL and HPPTCL to ensure that the switchyard equipment at Naitwar Mori HEP and Sawra Kuddu HEP should be capable of carrying additional power from Swara Kuddu or Naitwar Mori generation project under 'n-1' contingency outage of Sawra Kuddu HEP - Hatkoti 220 kV line or Naitwar Mori HEP - Hatkoti 220 kV D/C line.
3. The interim arrangement for evacuation of power from Naitwar Mori HEP has to be ratified through NRPC(TP) meeting.
4. The final arrangement for evacuation of power from Naitwar Mori HEP would be as agreed in the 3rd NRPC(TP) meeting.

Meeting ended with thanks to the chair.

* * *

Annexure-I

List of Participants of the meeting to f discuss the issue pertaining to transmission system for evacuation of power from 60 MW Naitwar Mori HEP of SJVNL

Date: 09.09.2021

	Name (Sh/Smt/Ms)	**Designation**
	CEA	
1	Ishan Sharan	Chief Engineer
2	Manjari Chaturvedi	Director
3	Nitin Deswal	Asst. Director
4	Komal Dupare	Asst. Director
	CTUIL	
5	Kashish Bhambhani	Sr. DGM
	POSOCO/NRLDC	
6	Alok Kumar	GM
7	Gaurav Malviya	Deputy Manager
	HPPTCL	
8	Rajiv Sood	Director (P&C)
	HPPCL	
9	Virender Sharma	Manager (Elec.)
	SJVNL	
10	Sushil Sharma	Director (Tech.)
11	Romesh Kapoor	Executive Director
12	Harish Sharma	GM
13	Vikas Marwah	Sr. AGM
14	Aman Katoch	DGM
15	Balwant Singh Negi	DGM
16	Keshav Attri	Sr. Consultant

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/01/106/2022/ दिनांक:19.05.2022

विषय: MoM of the meeting held on 09.05.2022 for discussing Calibration and testing of Interface Energy Meters installed at Generating stations.

Please find attached minutes of the meeting held on 09.05.22 at 02:30 p.m. for discussing calibration and testing of Interface Energy Meters installed at Generating stations through VC.

संलग्नक:यथोपरि

सौमित्र
19/05/2022.

(सौमित्र मजूमदार)
अधीक्षण अभियंता (प्रचालन)

सेवा में,

1. **In-charge, NRLDC**
2. **COO, CTU**
3. **ED (AM), Powergrid**
4. **GM (O&M), NHPC**
5. **GM (Operations), NTPC**

MoM of the meeting held on 09.05.2022 for Calibration and testing of Interface Energy Meters installed at Generating stations.

The meeting was held on 09.05.2022 at 02:30 p.m. for discussing the issues pertaining to calibration and testing of Interface Energy Meters installed at generating stations under the chairmanship of MS, NRPC. It was attended by officers from NRPC Sectt, CTU, NRLDC, NHPC, NTPC and POWERGRID.

- The meeting started with the briefing of the matter and issues raised by NHPC regarding the calibration & testing of Interface Energy Meters installed at their generating stations by quoting the Metering Regulations viz. Central Electricity Authority (Installation and Operation of Meters) Regulations 2006 and subsequent amendment vide CEA Metering Regulations 2019.
- Deliberations made during 192nd OCC meeting were taken under reference in which CTU representative had informed the NRPC forum that as per the applicable regulations, they don't have the mandate to carry out calibration & testing of IEMs; moreover, presently they are not having any regional setup for facilitating the same.
- The forum took cognizance of the past precedents of generating companies getting calibration and testing of IEMs installed at their stations through POWERGRID.
- Minutes of various meetings of other RPCs such as ERPC and WRPC were also referenced wherein it was highlighted that POWERGRID was doing the calibration and testing Interface Energy Meters (IEM) installed at generating stations in those regions.
- Similar issue on the subject cited matter related to SEMs of NTPC at Tanda, Dadri, Unchahar, Singrauli, Rihand and Auriya was also discussed.
- In view of the cited issues, NHPC representative informed the forum that last calibration and testing of about more than 115 energy meters at NHPC generating stations in NR region was done in 2016 through POWERGRID. NHPC representative requested that calibration and testing of meters at NHPC should be done again by POWERGRID under single order like before.
- Representative from CTU mentioned that the calibration and testing of installed meters is not the direct responsibility of CTU. Ownership of CTU lies for the purpose of electricity accounting & billing of all interface energy meters installed at the points of interconnection with Inter-State transmission system.
- Representative from NRLDC said that as per clause 18(c) of CEA Metering Regulations 2006, the owner has the liability regarding informing about the testing and calibration of IEMs, but as per subsequent amendment vide CEA Metering Regulations 2019 clause 14 i(c), the liability of owner regarding testing was taken off, by mentioning that "Testing and calibration of Interface Meters shall be carried out in the presence of the representatives of the

supplier and buyer by giving the advance notice to the other party regarding the date of testing." Quoting the clause 15(3) of CEA Metering Regulations 2006, NRLDC representative said that POWERGRID is still doing the rectification and replacement work of meters. He also said that the calibration work can be economical if done by POWERGRID at large.

- Representative from POWERGRID said that POWERGRID at present is a transmission licensee and metering work i.e IEM replacement and new procurement is under the authority of CTU. So, POWERGRID cannot directly take up this issue under its authority. The procurement that POWERGRID is doing at present is on behalf of CTU according to an agreement made with CTU.
- In reply to deliberations made by representative from NRLDC and POWERGRID, CTU representative clarified that procurement of new meters or replacement of old meters by new one is under the authority of CTU. But, testing and calibration being an O&M activity is under the authority of respective licensee or generating company.
- MS, NRPC concluded the deliberation by mentioning that the calibration and testing of interface energy meters, installed in generating stations can be done on chargeable basis. POWERGRID has been carrying out similar work in other regions and same methodology can be implemented for Northern Region also. In this process, the CTU may be kept informed regarding the testing and calibration of Interface Energy Meter by providing it timely information.
- MS, NRPC further added that POWERGRID having pan India presence would be in better position to carry out the calibration and testing of SEMs. POWERGRID representative agreed for the same on chargeable basis, but mentioned that they can confirm on the matter after getting some details from the regional headquarters. The request of the POWERGRID was agreed.
- The meeting ended with the vote of thanks.

***

AGENDA of POWERGRID-NR-III for 197th OCC Meeting

Outage regularization of 765 kv Bus-I at Kanpur(GIS) for root cause analysis of unbalance current in tie bays.

Outage of 765 kv Bus-I at 765/400 kv Kanpur (GIS) sub-station was approved for 01 day in 195 OCC meeting for re-measurement of CRM due to very high resistance and root cause analysis of unbalance current in tie bays 705,708,711 & 714.

Accordingly outage was availed on 20.06.22 for rectification of unbalance current issue however there is some deviation in approved outage and availed outage due to following reasons-

1. During investigation, CRM of one section (70789AE to 700-89PAE) of Y-ph, 765 kV Bus-1 was found OPEN. Therefore it was decided to carry out internal inspection of that section.

2. During internal inspection black spot was found on conductor before 707 bay and Female contact was also found damaged and pitting marks were observed on one side of GIS Bus conductor (Length 8640 mm, Dia 160mm, photograph attached).Accordingly Female contact was replaced with available spare but spare conductor of same size was not available at any site of POWERGRID.

3. Thereafter possibility for repair of conductor was explored and damaged conductor was sent to M/s Youngseong Pune (Manufacturer of GIS conductor) for repair on 26.06.22.

4. After repair, conductor has been received at Kanpur site on 03.07.2022 and this job took another 04 days for erection, vacuum processing ,SF6 gas filling and testing. Finally 765 kv Bus-I came into service on 07.07.22

In this context it is worth to mention that POWERGRID always make it's best efforts to complete the scheduled work in stipulated/approved time period with minimum possible deviation however in some of the major O&M works, it is not possible due to unforeseen circumstances at site like damage of internal part of element, availability of spare etc which is beyond control of any utility.

In view of above laid facts, approval for extension of 765 kv Bus-I at Kanpur (GIS) shutdown may please be regularized/concurred by OCC.

Members may kindly approve.

RAJASTHAN RAJYA VIDYUT PRASARAN NIGAM LIMITED.
[Corporate Identity Number (CIN):U40109RJ2000SGC016485]
(Regd. Office: Vidyut Bhawan, Jan Path, Jyoti Nagar, Jaipur - 302 005)
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RVPN An ISO 9001:2000 Certified Company

No. RVPN/SE(P&P)/XEN-2(P&P)/AE-2/ F. /D 846 Jaipur, Dt. 19/2022

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

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

Ref: 1. 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.
2. No. RVPN/SE(P&P)/XEN-2(P&P)/AE-2/D. 490 dated 06.06.2022

Dear Sir,

In reference to the above captioned subject and email dated 29.07.2021, revised Islanding Schemes for the Rajasthan Atomic Power Station (RAPS-A & B) units for consideration and approval was submitted to your office vide above referred letter dated 06.06.2022. This islanding scheme is updated after incorporating the suggestion and inputs received in the meeting held on dated 06.07.2022. Please find attached the updated 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 be kept blocked during island formation.
5. 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. If load is not managed as per requirement of RAPS units within 10

minute to 20 minute time period after taking the units on house load then RAPS units will be switched off.

6. If load in the network of island is very low and frequency is increasing after island formation then one or more units will be taken on house load at (51.5 Hz + 0.5 sec.)*. If load is not managed as per requirement of RAPS units within 10 minute to 20 minute time period after taking the units on house load then RAPS units will be switched off.
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.**

* This is based on the reference document of RAPS for "Operating procedure for infrequent Event" indicating unit operation under high/low grid frequency (Copy enclosed for reference at **Annexure-D).**

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

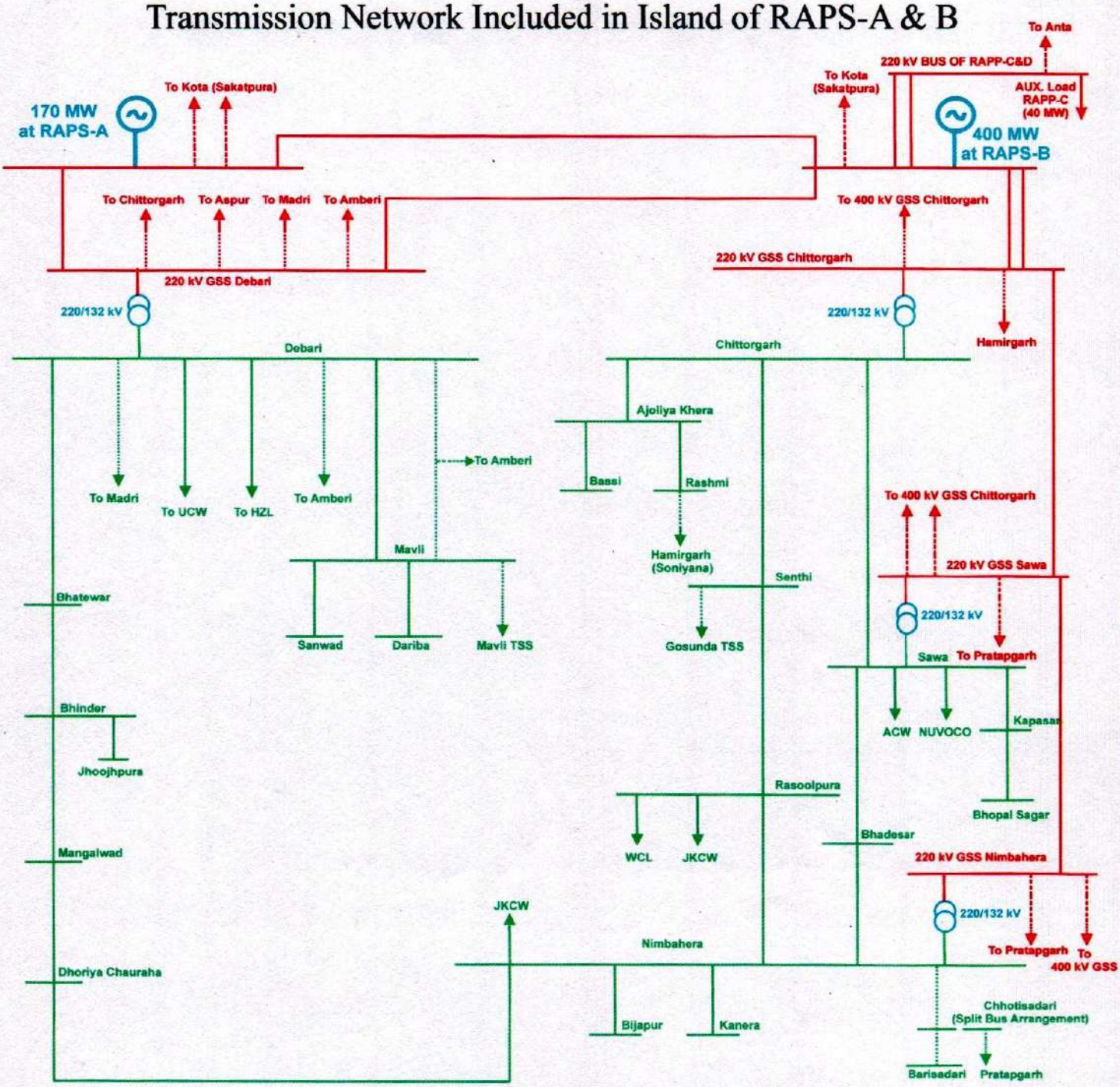
S. No.	Name of GSS	Maximum Load (MW)	Average Load (MW)
A	**Gourp-A for 370 MW**		
A.1	**Load at 220 kV GSS Debari**		
1	220 KV GSS Debari	26	16
2	132 KV GSS Mavli	26.28	12
3	132 KV GSS Sanwad	21.85	13
4	132 KV GSS Dariba	24.43	15
5	132 KV Hindustan Zinc Limited (Industry)	41	24.7
6	132 KV GSS Bhatewar	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.	

Transmission Network Included in Island of RAPS-A & B



	NUCLEAR POWER CORPORATION OF INDIA LIMITED RAJASTHAN ATOMIC POWER STATION		
	OPERATING PROCEDURE FOR INFREQUENT EVENT	USI: 50000	
		OPIE No. 15	Rev. 03
	UNIT OPERATION UNDER HIGH/LOW GRID FREQUENCY	Issue In: April 2019	
		Next Rev. Due: April 2024	

1.0 PURPOSE:

These guidelines are for unit operation during high or low grid frequency conditions (reference: station instruction no. 39B,). Variations in grid frequency away from normal band of operation (i.e. 49.8-50.2 Hz) occur due to change in demand/supply condition in grid (ie generating station connected to grid or tripping of generating station / load pickup or tripping), grid transients etc.

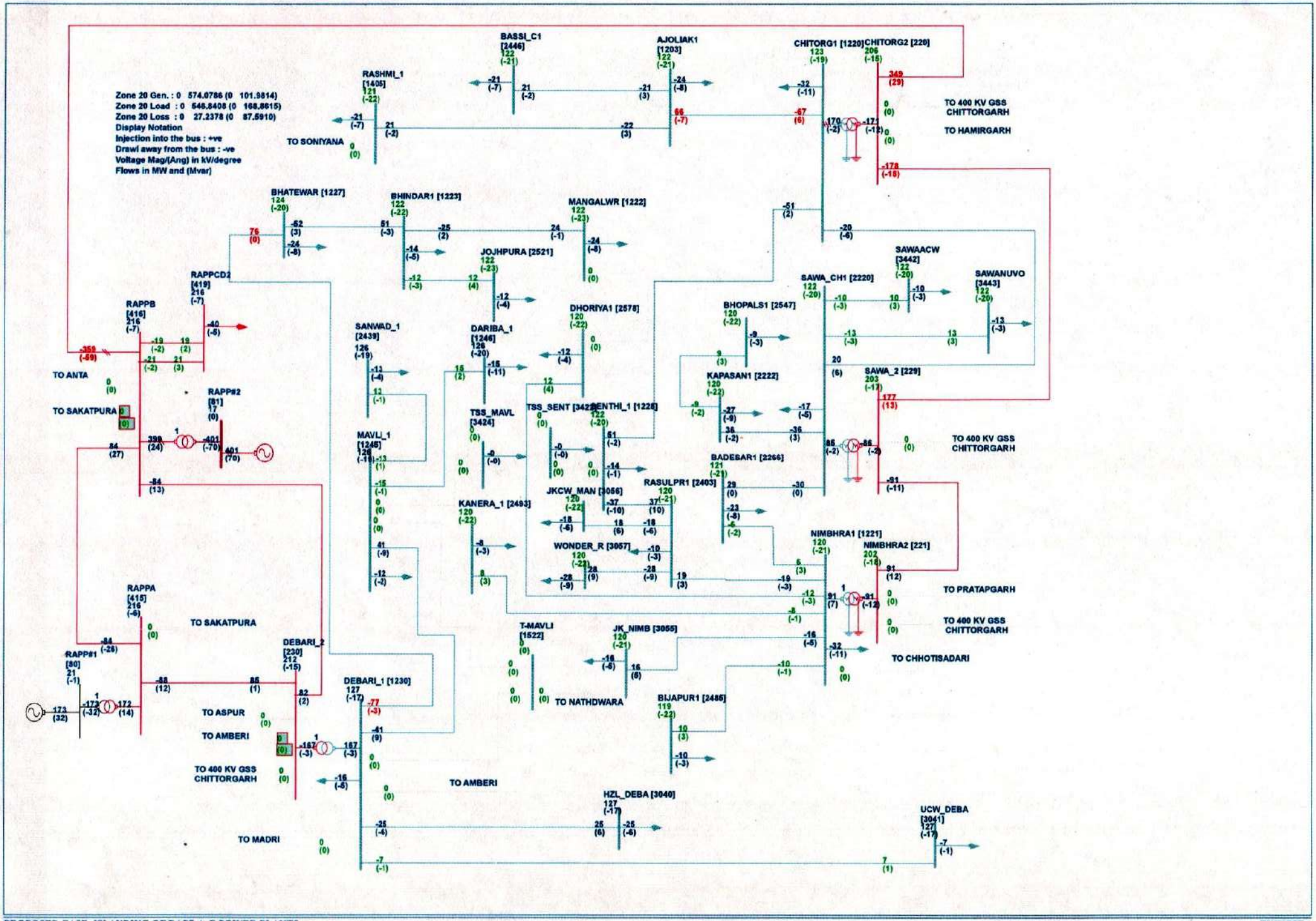
2.0 EFFECT ON STATION:

2.1 AUTO ACTIONS ON HIGH FREQUENCY

S. No.	Frequency (O/F Scenario)	Unit-3	Unit-4
1.	51.2Hz, INST	"412-Generator under/over frequency alarm" Alarm initiates	"412-Generator under/over frequency alarm" Alarm initiates
2.	51.5 Hz, INST	"Gen. over frequency trip timer initiated" alarm initiated	"Gen. over frequency trip timer initiated" alarm initiated
3.	51.5 Hz + 0.2 sec	SUT HV CB trip & ATS will initiate	SUT HV CB trip & ATS will initiate
4.	51.5 Hz + 0.5 sec	Class -C trip initiates	Class -C trip initiates
5.	51.5 Hz + 15 sec	Class -B trip initiates	---
6.	51.5 Hz + 20 sec	---	Class-B trip initiates

2.2 AUTO ACTIONS ON LOW FREQUENCY

S. No.	Frequency (U/F Scenario)	Unit-3 & Unit-4
1.	48 Hz, INST	U/F Alarm initiates and Kota Line Will Trip and Anta Line Will Trip at RRS 5&6 End Rajasthan sub system separates from Northern grid (Chittor Ckt 1,Chittor Ckt 2 ,Udaipur Line and RRS 5&6 Tie Line Will remain Close)
2.	47.7 Hz + 5 Sec or 47.5 Hz, INST.	Speeder auto signal gets cut off.
3.	47.5 Hz + 3 Sec	SUT HV CB trips & ATS will initiate (Islanding unsuccessful, Prepares for House-load operation)
4.	47.5 Hz + 5 Sec	Class -C trip initiates (For House-load operation)



PROPOSED CASE- ISLANDING OF RAPS-A_B POWER PLANTS

EXHIBIT-1

National Load Despatch Centre

Import Capability of Uttar Pradesh for August 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 August 2022 to 31st August 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 August 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 August 2022 to 31st August 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 August 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 August 2022 to 31st August 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 August 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 August 2022 to 31st August 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 August 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 August 2022 to 31st August 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

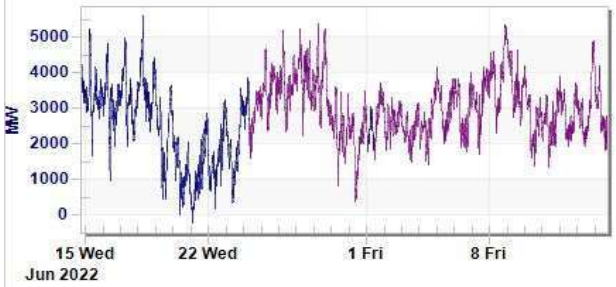
Import Capability of Uttarakhand for August 2022

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

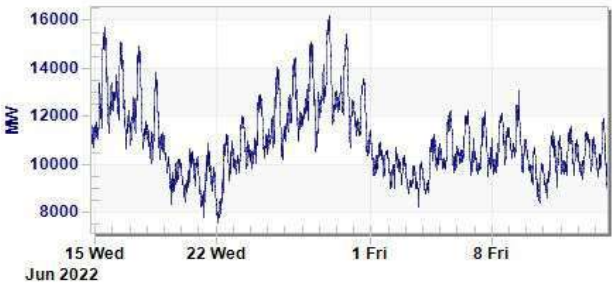
Date	Time Period in IST (hrs)	Total Transfer Capability (TTC) (MW)	Reliability Margin (MW)	Available Transfer Capability (ATC) (MW)	Long Term Access (LTA)/ Medium Term Open Access (MTOA) (MW)	Margin Available for Short Term Open Access (STOA) (MW)	Changes in TTC w.r.t. Last Revision	Comments
1st August 2022 to 31st August 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

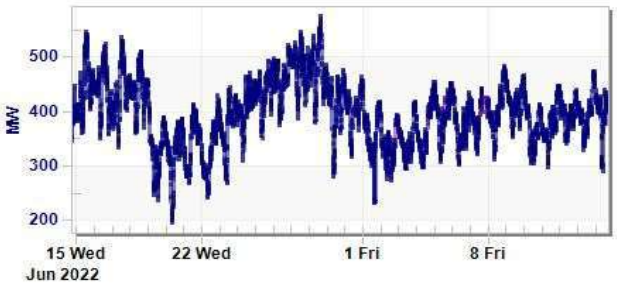
Rajasthan import



Rajasthan Load



Ajmer ICT loading



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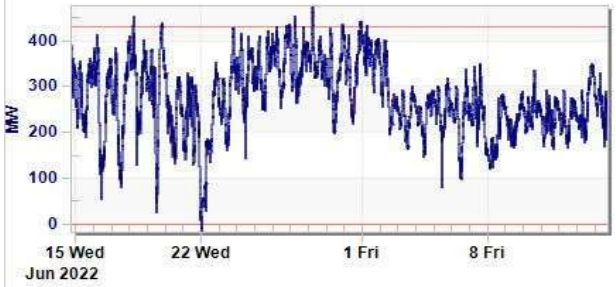
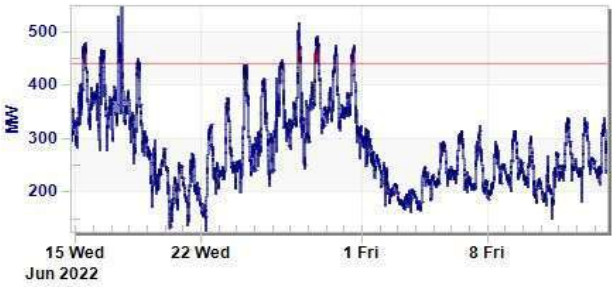
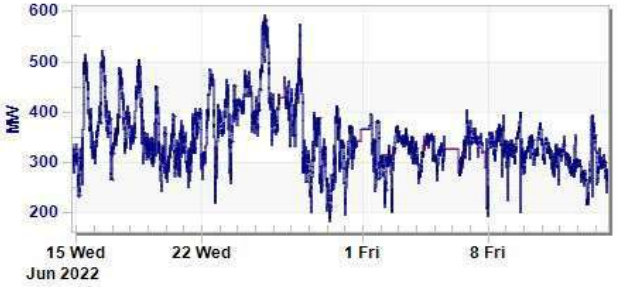


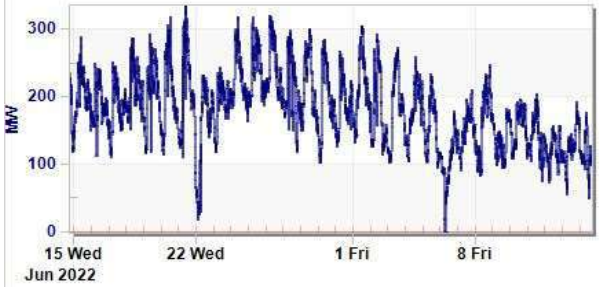
Merta ICT loading



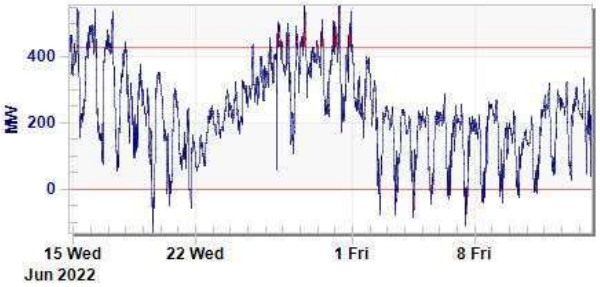
Chittorgarh ICT loading



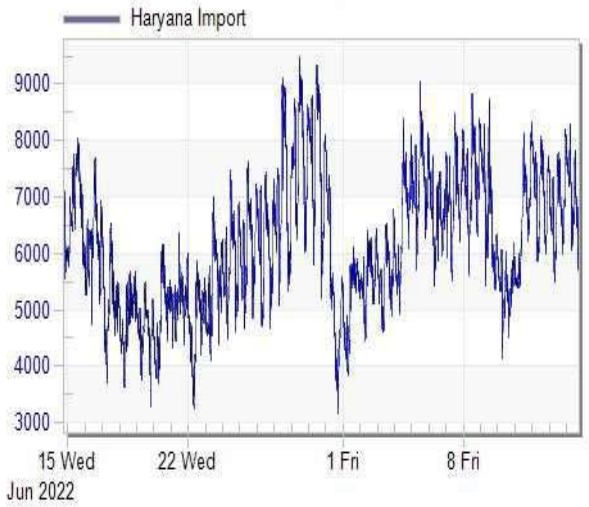
Bhinmal ICT loading



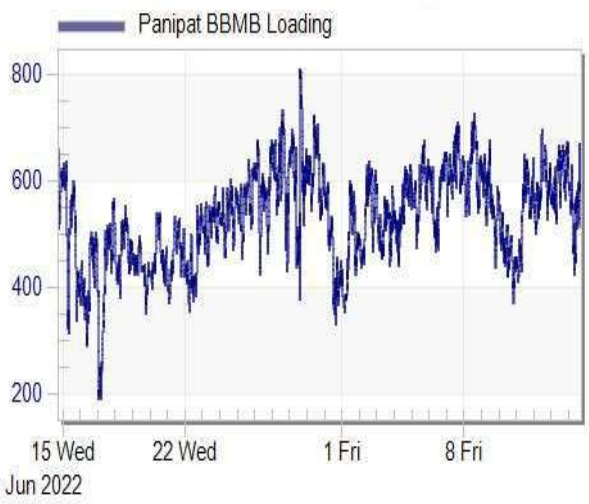
Bikaner ICT loading



Haryana Import



Panipat BBMB ICT loading



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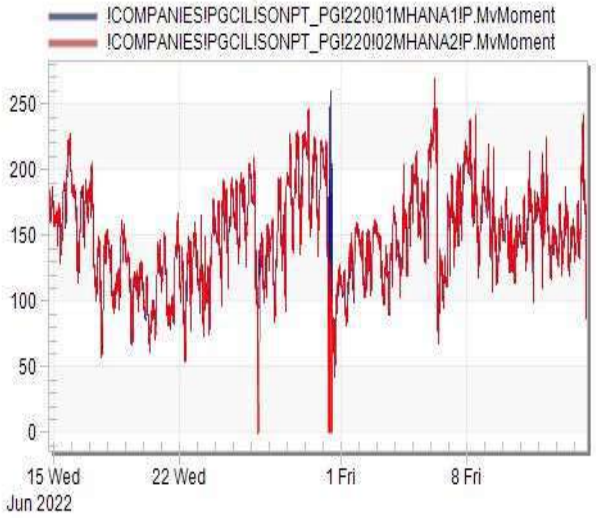
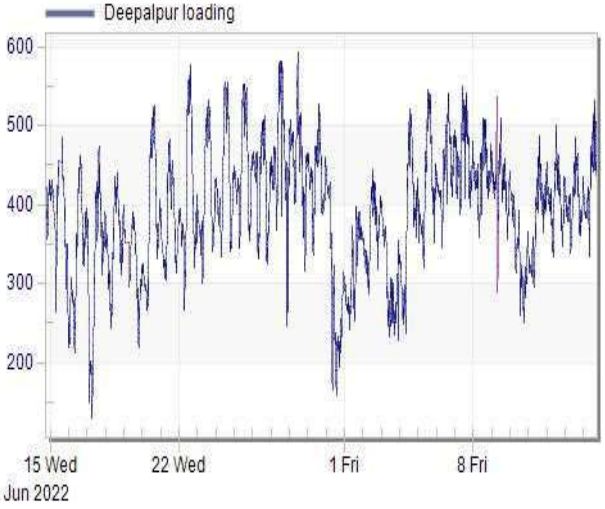


Deepalpur ICT loading



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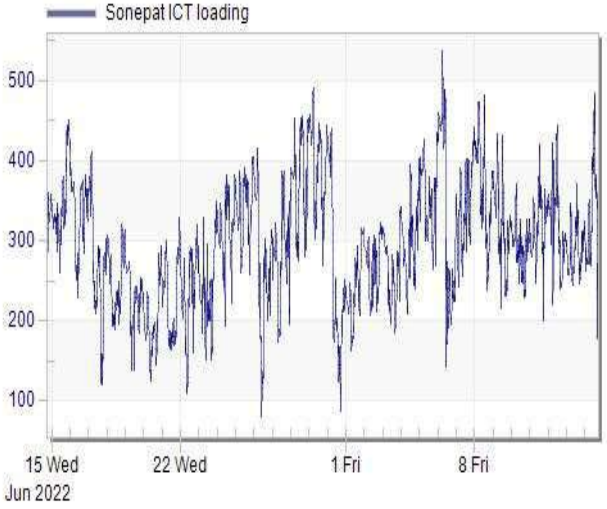
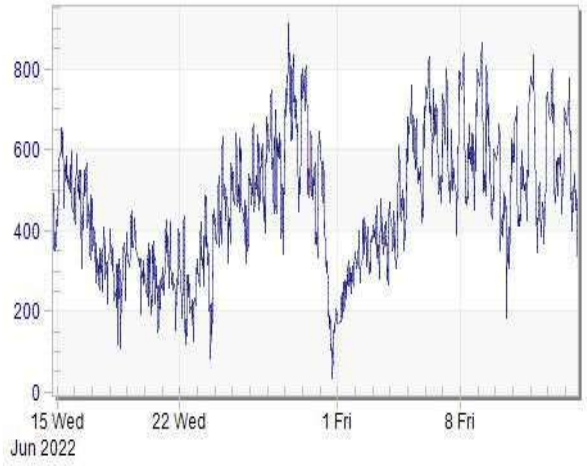
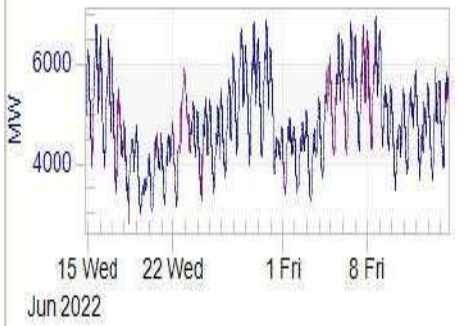


Kurukshetra ICT



Delhi Import



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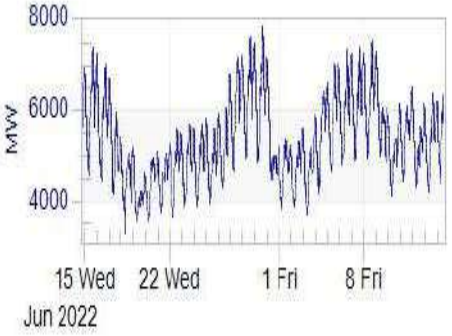
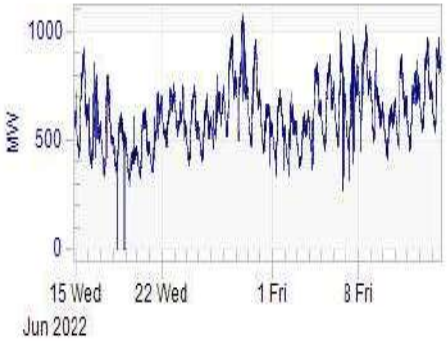


Maharanibagh ICT loading



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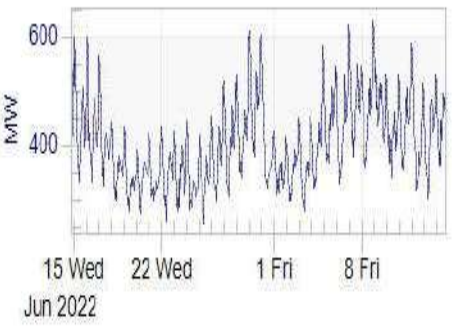
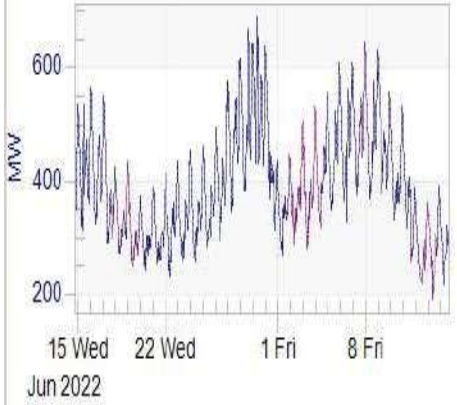
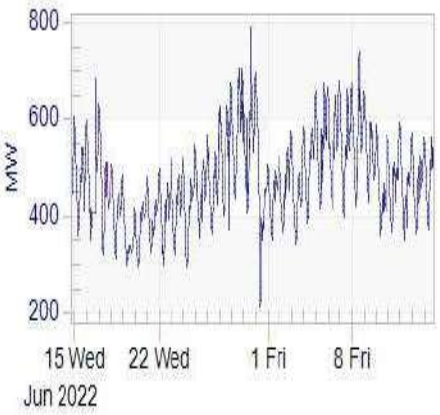


Bamnoli ICT loading



Mundka ICT loading



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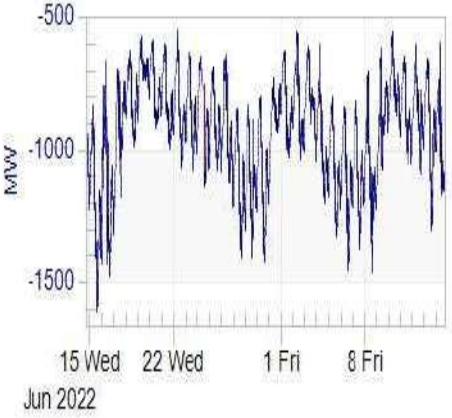

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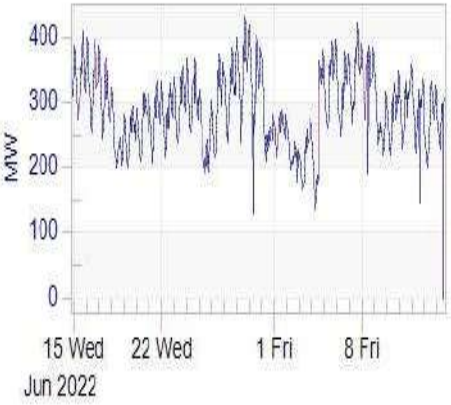

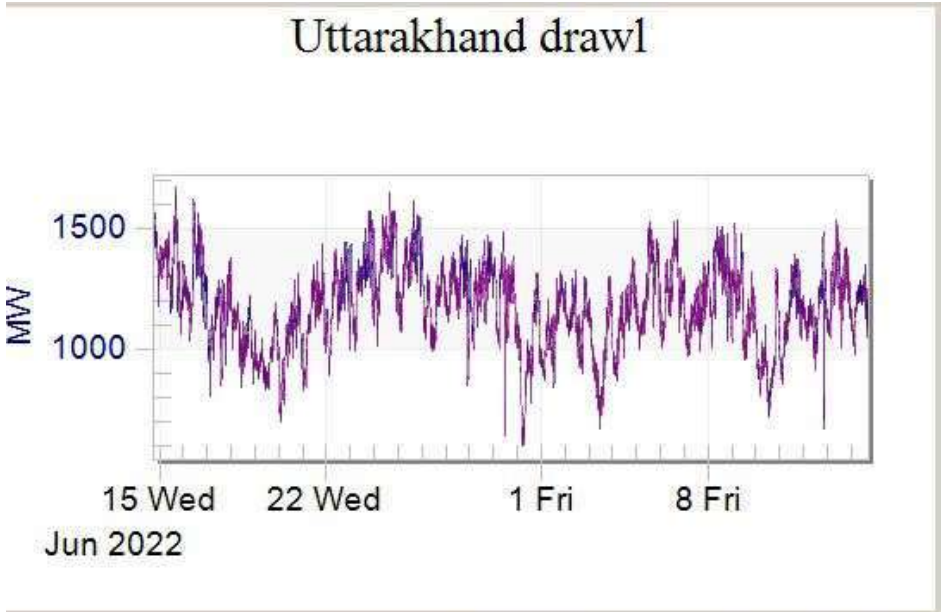
Uttarakhand drawl
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1000
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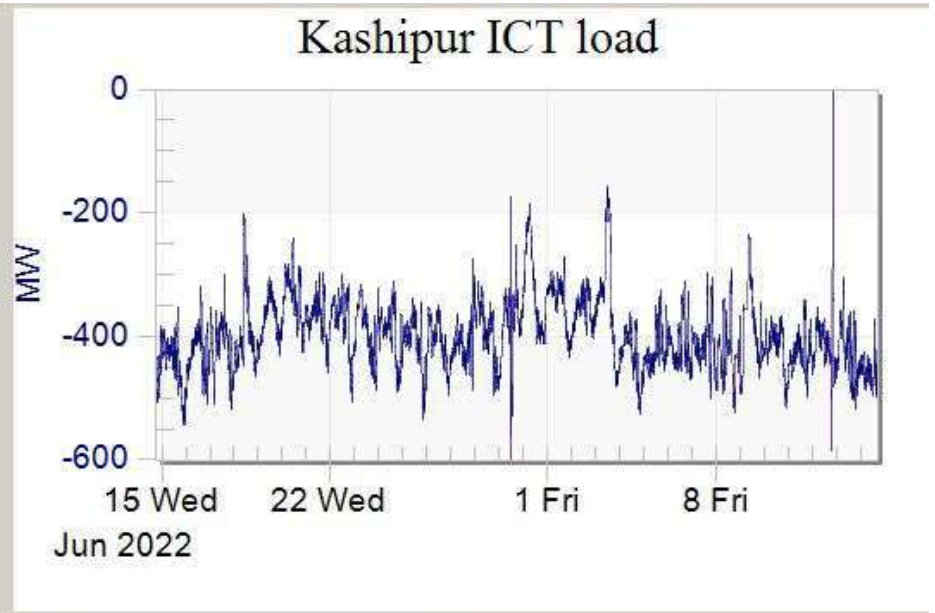
22 Wed
1 Fri
8 Fri
Jun 2022


Kashipur ICT load
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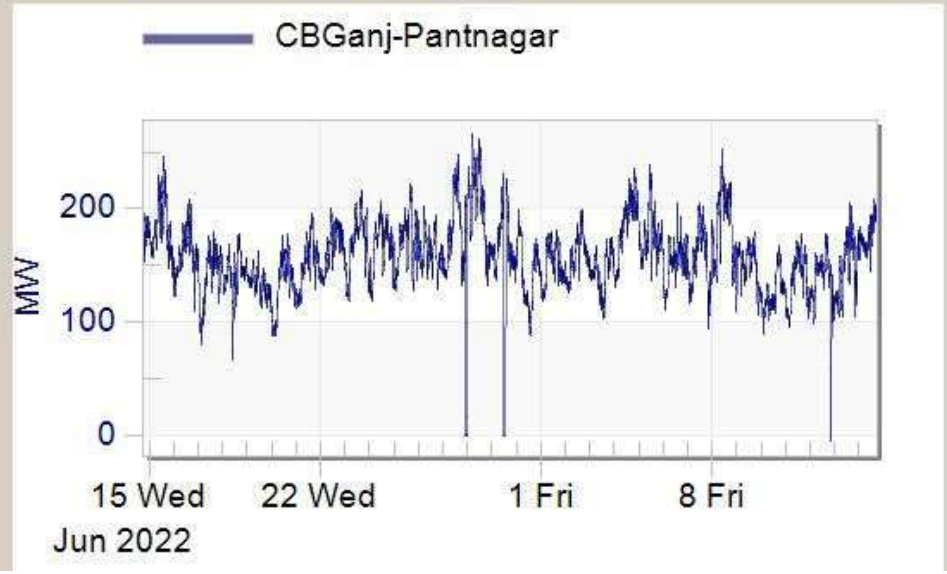
0
-200
-400
-600
15 Wed
22 Wed
1 Fri
8 Fri
Jun 2022


CBGanj-Pantnagar
MW
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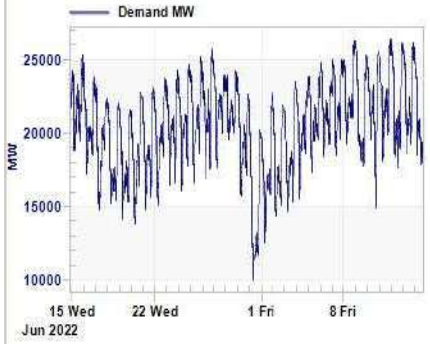
22 Wed
1 Fri
8 Fri
Jun 2022

UP Demand



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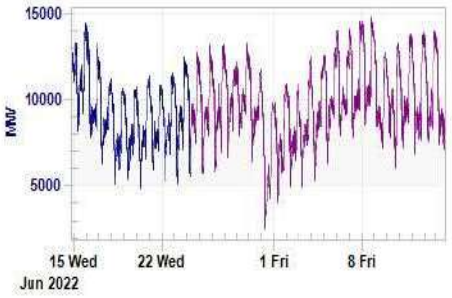
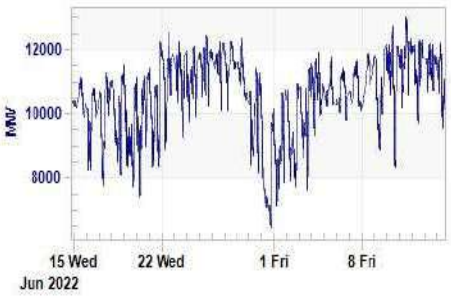
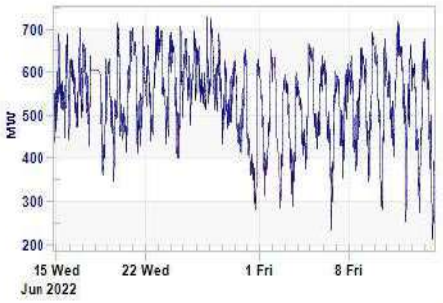


UP own generation



Obra ICT loading



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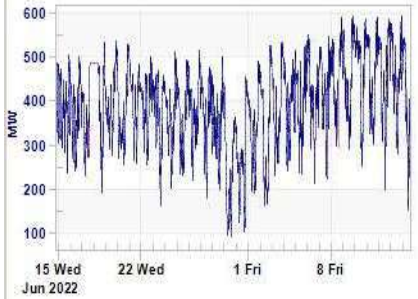
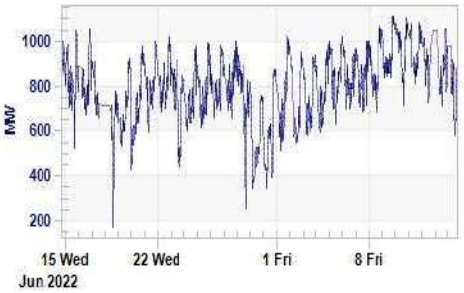


Sarnath ICT loading



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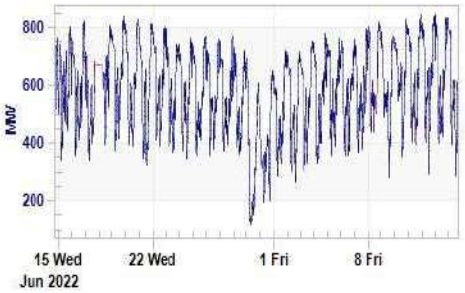
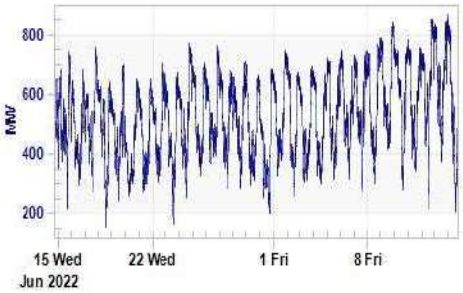
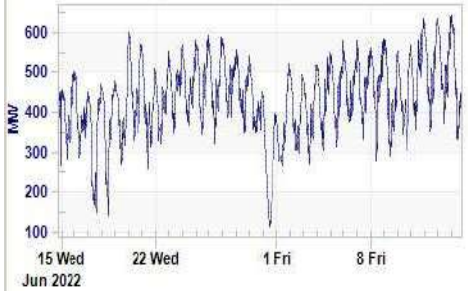


Allahabad ICT loading



Lucknow(PG) ICT loading



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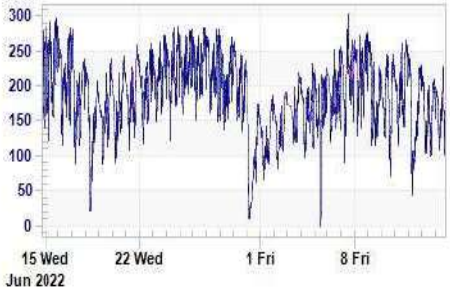
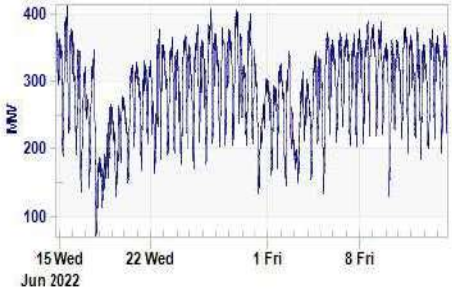
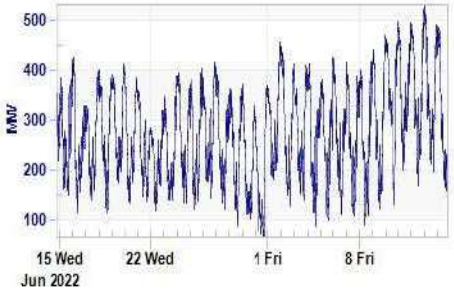


Agra(PG) ICT loading



Sohawal ICT loading



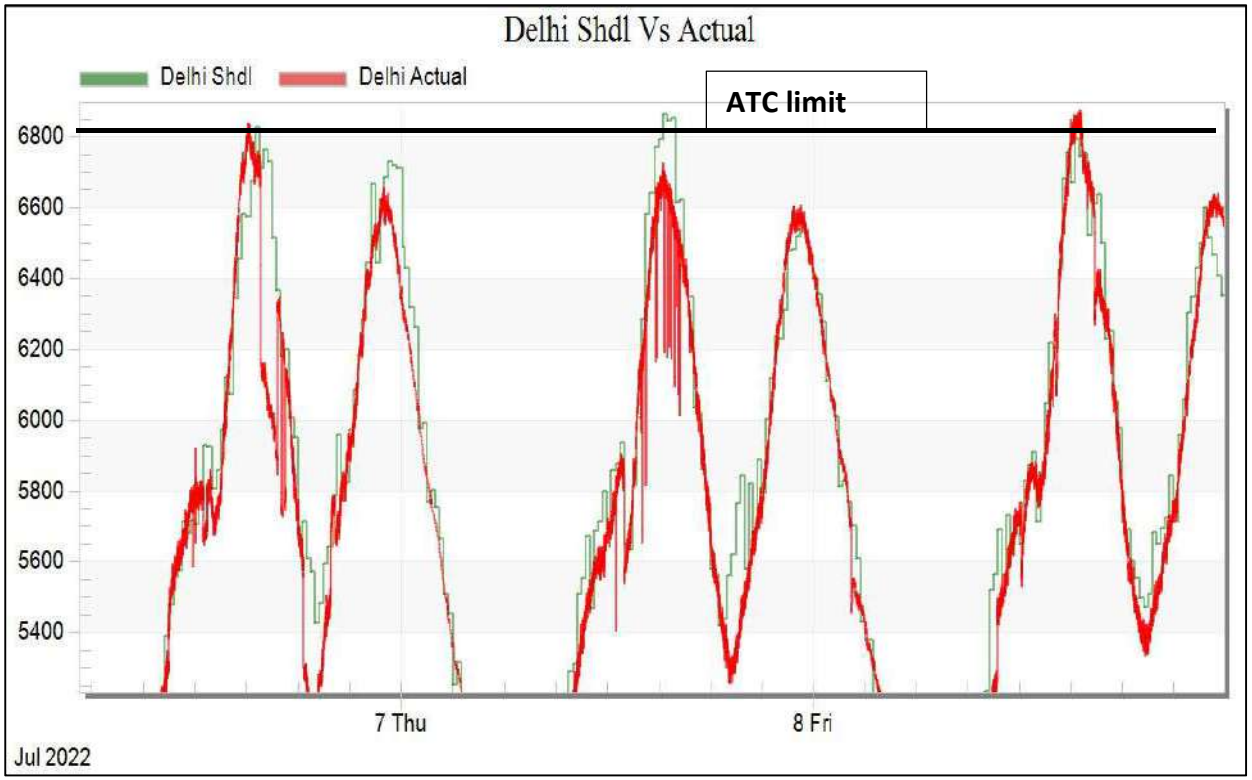
A. Details of Long Duration Transmission elements Outage :-

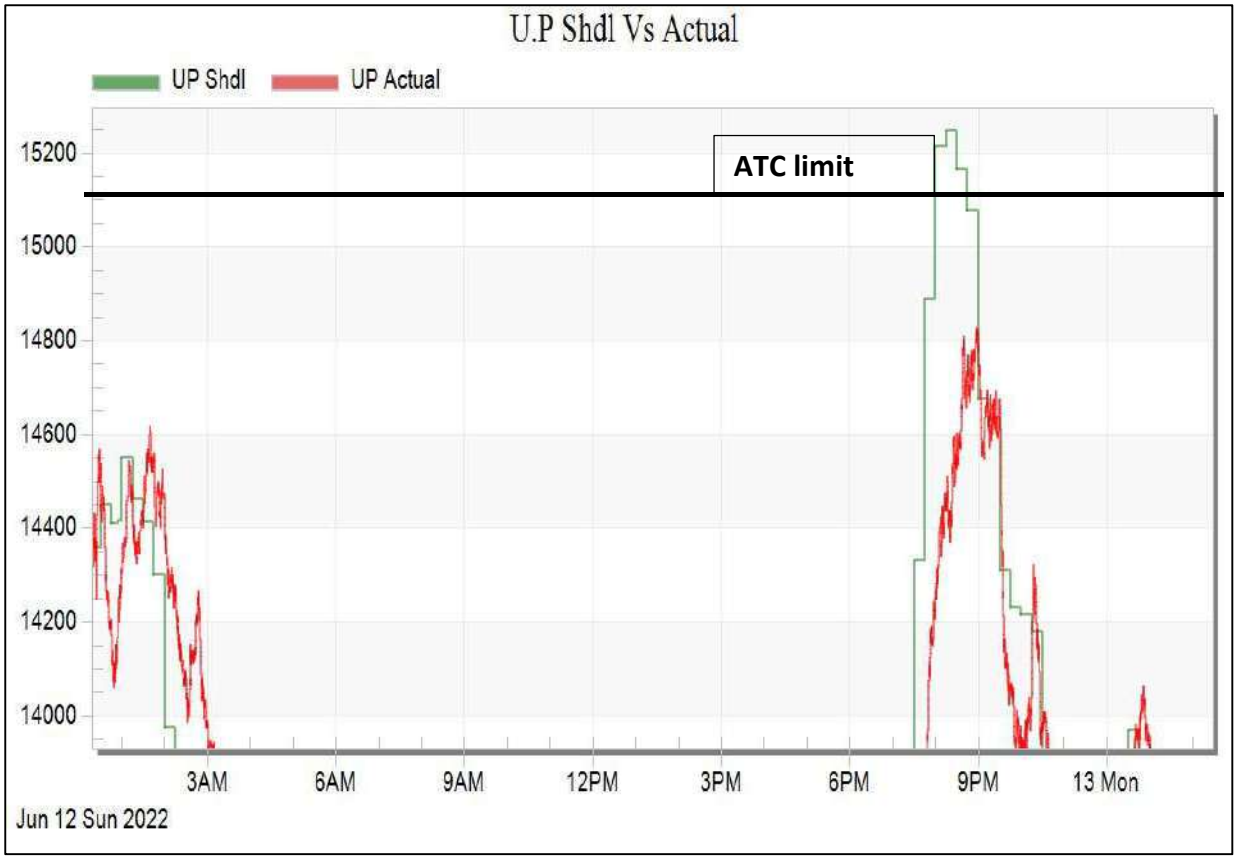
S.No	Element Name	Type	Owner	Outage			Reason / Remarks	Status updated during last OCC
1	400/220 kV 315 MVA ICT 2 at Mundka(DV)	ICT	DTL	20-09-2019	00:19	1029	Due to fire in ICT	30.07.2022
2	80 MVAR Bus Reactor No 1 at 400KV Nathpa Jhakri(SJ)	BR	SJVNL	17-10-2019	12:58	1001	Flashover/Fault in 80MVAR Bus Reactor cleared by Bus Bar Protection.	30.07.2022
3	400/220 kV 315 MVA ICT 1 at Muradnagar_1(UP)	ICT	UPPTCL	13-03-2020	02:46	854	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	695	ICT tripped on REF protection. Transformer caught fire and got damaged.	30 June 2022
5	50 MVAR Non-Switchable LR on Agra-Unnao (UP) Ckt-1 @Agra(UP)	LR	UPPTCL	28-10-2021	22:27	259	R and Y phase bushing damaged at Agra(UP).	31.07.2022. Bushing damaged , concerned written to OEM for inspection of reactor.
6	220 KV AGRA(PG)-FEROZABAD(UP) (UP) CKT-1	Line	UPPTCL	27-11-2021	09:55	230	Jumpering work for making Lilo point of 220 kv Firozabad(400)-Agra(765) PG line at 220 kv Tundla	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.
7	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.	Nov-22
8	50 MVAR Bus Reactor No 1 at 400KV Moradabad(UP)	BR	UPPTCL	03-12-2021	22:22	223	R-phase bushing damaged.	
9	400/220 kV 240 MVA ICT 3 at Moradabad(UP)	ICT	UPPTCL	13-12-2021	22:38	213	Due to high DGA values, Hydrogen gas is above permissible limit.	30 Dec 2022. It has been informed that 315MVA ICT has been aproved
10	50 MVAR BUS REACTOR NO 1 AT 400KV PANKI(UP)	BR	UPPTCL	29-01-2022	08:56	167	Replacement of 50 MVAR Bus reactor by new 125 MVAR Bus Reactor.	30.07.2022
11	765 KV ANPARA_D-UNNAO (UP) CKT-1	Line	UPPCL	08-02-2022	10:06	157	Shifting of Line Reactor from Anpara-D to Obra-C S/S (OCC 190)	LILO of the line at Obra C under processing. Annexure-B documents awaited.
12	220 KV Kishenpur(PG)-Mir Bazar(PDD) (PDD) Ckt-1	Line	PDD JK	19-02-2022	21:45	145	Tower no. 170 collapsed.	
13	400 KV Parbati_3(NH)-Sainj(HP) (PKTCL) Ckt-1	Line	PKTCL	11-03-2022	03:21	126	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.	
14	400/21 kV 776 MVA GT 7 at Suratgarh SCTPS(RVUN)	ICT	RRVPNL	15-03-2022	01:32	122	Due to failure of R-phase bushing of GT-7A.	15.09.2022
15	400/220 kV 315 MVA ICT 2 at Unnao(UP)	ICT	UPPTCL	17-04-2022	17:58	88	Tripped on Differential protection.	
16	220 KV Gazipur(DTL)-Shahibabad(UP) (UP) Ckt-2	Line	UPPTCL	30-04-2022	19:30	75	Line remains charge at No load from UP end. Manually open at 19:30 on 30/04/22 due bending of tower no. 4	
17	220 KV Gazipur(DTL)-Noida Sec62(UP) (UP) Ckt-1	Line	UPPTCL	30-04-2022	22:55	75	Tower tilted on one side at tower no 10 from Gazipur (DTL) end.	
18	50 MVAR Bus Reactor No 1 at 400KV Bikaner(RS)	BR	RRVPNL	02-06-2022	19:11	42	Reactor Back-up Impedance protection operated.	
19	125 MVAR BUS REACTOR NO 1 AT 400 KV RASRA (UP)	BR	UPPTCL	25-06-2022	11:23	20	125 MVAR Bus Reactor tripped on Buchholz relay.	
20	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	63	Transformer Differential protection operated.	
21	400/66 kV 250 MVA ICT 1 at HMEL (PS)	ICT	PSTCL	12-05-2022	14:05	63	Differential relay operated.	
22	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	59	For retrofitting (overhauling) work	
23	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	55	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	
24	765/400 kV 1500 MVA ICT 2 at Hapur(UP)	ICT	UPPTCL	23-05-2022	05:31	17	Differential Protection operated	
25	50 MVAR NON-SWITCHABLE LR ON OBRA_B-SULTANPUR (UP) CKT-1 @SULTANPUR(UP)	LR	UPPTCL	03-12-2021	11:15	224	For Centrifuging of transformer oil of 50MVAr line Reactor) (OCC 189)	
26	220 KV BHIWANI-CHARKHI DADRI (BB) CKT-1	Line	BBMB	28-06-2022	07:54	17	for Sub-station Automation Work.	15.07.2022
27	201 MAIN BAY - 220KV BUS 1 AT PATRAN(PATR) (STERLITE) AND FUTURE AT 220 KV PATRAN(PATR) (STERLITE)	BAY	Sterlite	10-06-2022	20:01	34	201 main Bay Y-ph hydraulic pump Is running continuously and the Spring is not getting charged, which may lead to CB Lockout.	
28	201 TRANSFER BUS BAY - 220 KV BIKANER(PG) - BUS 3 (POWERGRID) AT 220 KV BIKANER(PG)	BAY	POWERGRID	26-06-2022	21:02	18	For completing the stringing work of TPGEL Circuit on the shared Multi Circuit Towers.	
29	FSC of 400 KV Koteshwar-Meerut (PG) Ckt-1 at Meerut(PG)	FSC	POWERGRID	20.02.2020	10:02		FSC out for upgradation work at 765kV. Upgraded to 765kV. Expected revival status awaited from PG-NR1.Waiting for CEA clearance.	
30	FSC of 400 KV Koteshwar-Meerut (PG) Ckt-2 at Meerut(PG)	FSC	POWERGRID	15.05.2020	17:45		FSC out for upgradation work at 765kV. Upgraded to 765kV. Expected revival status awaited from PG-NR1.Waiting for CEA clearance.	
31	FSC of 400 KV Fatehpur-Mainpuri (PG) Ckt-1 at Mainpuri(PG)	FSC	POWERGRID	24.10.2021	21:07		BHEL breaker hydraulic pressure could not be developed in B phase and (loss of N2 pressure) doesn't allow the FSC-1 taken into service as reported by CPCC3.	
32	FSC of 400 KV Fatehpur-Mainpuri (PG) Ckt-2 at Mainpuri(PG)	FSC	POWERGRID	29.10.2021	8:25		VME protection system was blocking the FSC back in service as reported by CPCC3.	
33	FSC(40%) of 400 KV Kanpur-Ballabhgarh (PG) Ckt-3 at Ballabhgarh(PG)	FSC	POWERGRID	10.06.2022	23:07		FSC-3 at Ballabgarh SS bypassed on MOV over temperature	

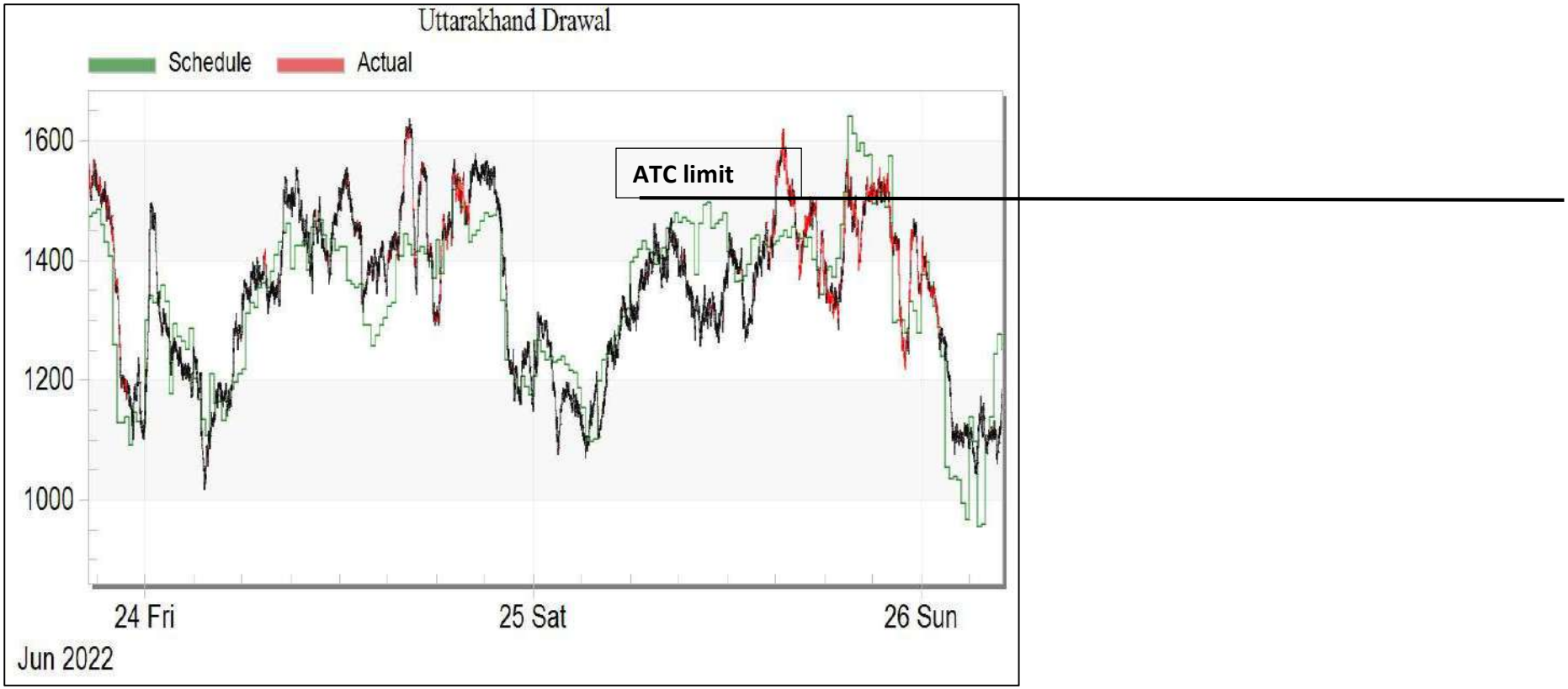
B. Details of Long Duration Generating Units Outage :-

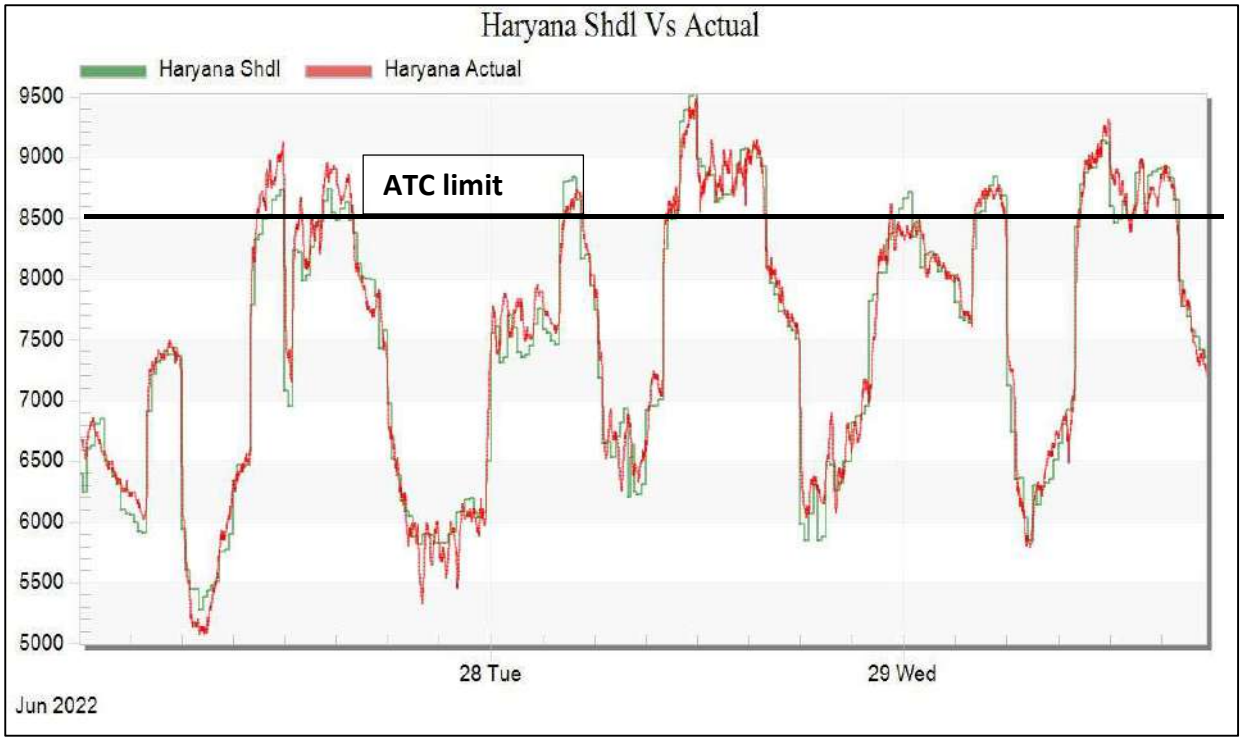
S.No	Element Name	Type	Owner	Outage			Reason / Remarks	Status updated during last OCC
1	250 MW Chhabra TPS - UNIT 4		RRVPNL	09-09-2021	00:47	309	Due to Electrostatic precipitators (ESP) structure damage	

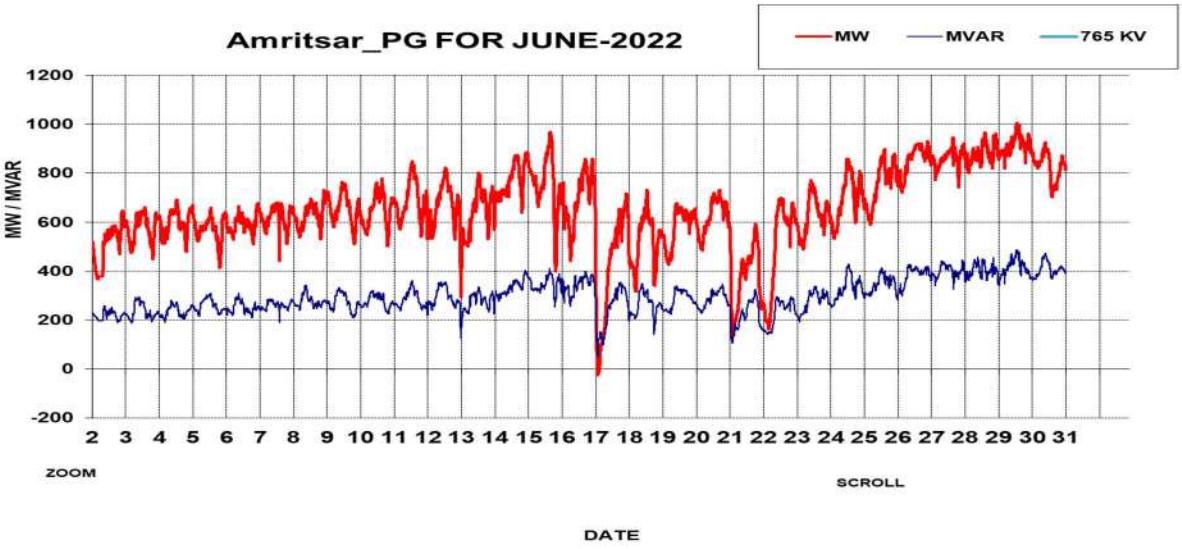
2	100 MW Koteshwar HPS - UNIT 1		THDC	04-11-2021	22:58	252	Due to fault in GT	
3	108 MW Bhakra HPS - UNIT 1		BBMB	15-12-2021	12:05	211	Renovation Modernization and upgradation of capacity to 126MW	
4	200 MW Obra TPS - UNIT 13		UPPTCL	08-01-2022	06:36	188	High bearing vibration in turbine	
5	660 MW Meja TPS - UNIT 2		UPPTCL,NTPC	07-02-2022	18:59	157	Boiler tube leakage Boiler water wall under major repairs in progress.	01.08.2022
6	34 MW Delhi Gas Turbines - UNIT 9		DTL	12-02-2022	20:00	152	STG Governor oil leakage	
7	30 MW Delhi Gas Turbines - UNIT 5		DTL	12-02-2022	21:04	152	Due to tripping of associated STG at 20:00 hrs	
8	660 MW Suratgarh SCTPS - UNIT 7		RRVPNL	15-03-2022	01:32	122	FAILURE OF R PHASE BUSHING OF GT-7A.	15.09.2022
9	210 MW Guru Hargobind Singh TPS (Lehra Mohabbat) - UNIT 2		PSPCL	13-05-2022	21:36	62	ESP breakdown. Rectification works under progress as confirmed by SLDC-PS.	
10	210 MW Kota TPS - UNIT 3		RRVPNL	28-05-2022	16:30	47	SEAL OIL LEAKAGE	
11	253 MW Bawana GPS - UNIT 5		DTL/Pragati CCGT	03-06-2022	22:04	41	C&I problem	
12	Ramgarh GPS - UNIT 2		RRVPNL	04-06-2022	01:17	41	Due to fire accident in GT - 2	
13	220 MW RAPS-B - UNIT 2		NPCIL	06-06-2022	00:10	39	For biennial preventive maintenance & surveillance to fulfil mandatory regulatory requirements of AERB (GOI).	
14	250 MW Suratgarh TPS - UNIT 4		RRVPNL	10-06-2022	12:25	34	Rotor earth fault	


Delhi Shdl Vs Actual
Delhi Shdl
Delhi Actual
ATC limit
6800
6600
6400
6200
6000
5800
5600
5400
7 Thu
8 Fri
Jul 2022


U.P Shdl Vs Actual
UP Shdl
UP Actual
ATC limit
15200
15000
14800
14600
14400
14200
14000
3AM
6AM
9AM
12PM
3PM
6PM
9PM
13 Mon
Jun 12 Sun 2022


Uttarakhand Drawal
Schedule
Actual
1600
1400
1200
1000
ATC limit
24 Fri
25 Sat
26 Sun
Jun 2022


Haryana Shdl Vs Actual
Haryana Shdl
Haryana Actual
ATC limit
9500
9000
8500
8000
7500
7000
6500
6000
5500
5000
28 Tue
29 Wed
Jun 2022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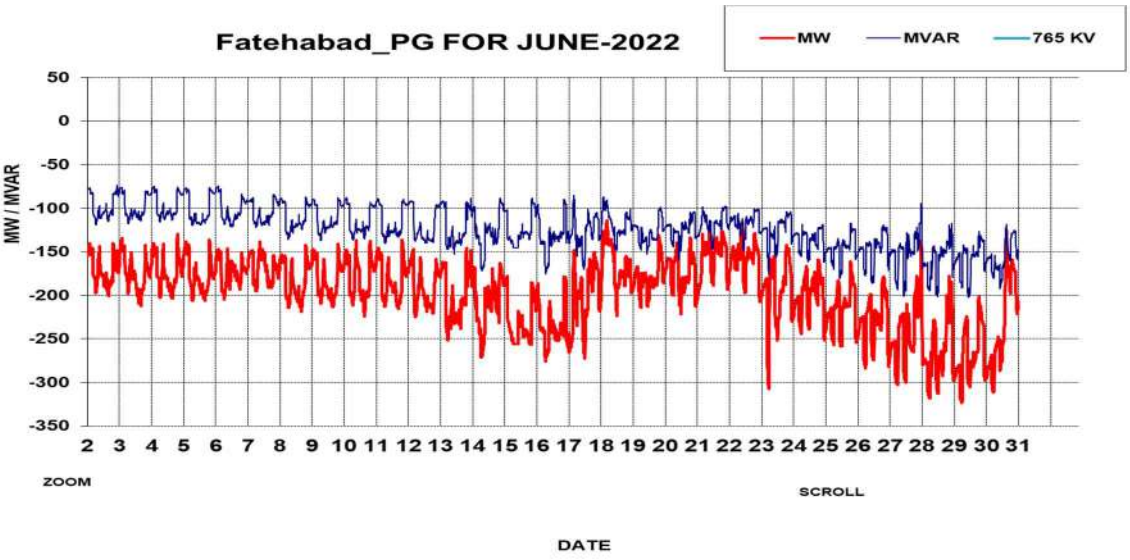
MW
MVAR
765 KV
MW / MVAR
1200
1000
800
600
400
200
0
-200
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
ZOOM
SCROLL
DATE


Fatehabad_PG FOR JUNE-2022
MW
MVAR
765 KV
MW / MVAR
50
0
-50
-100
-150
-200
-250
-300
-350
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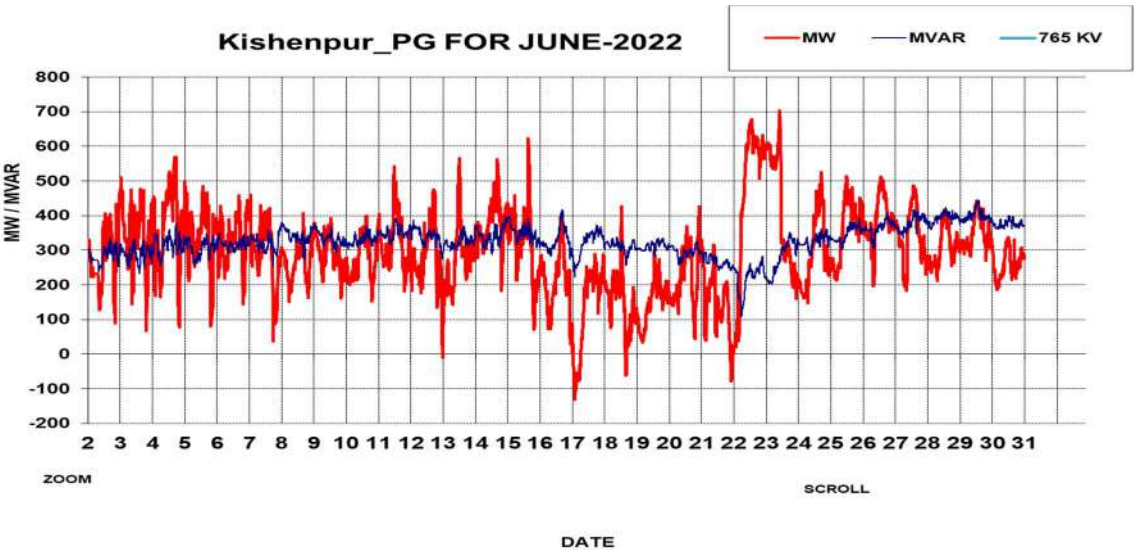
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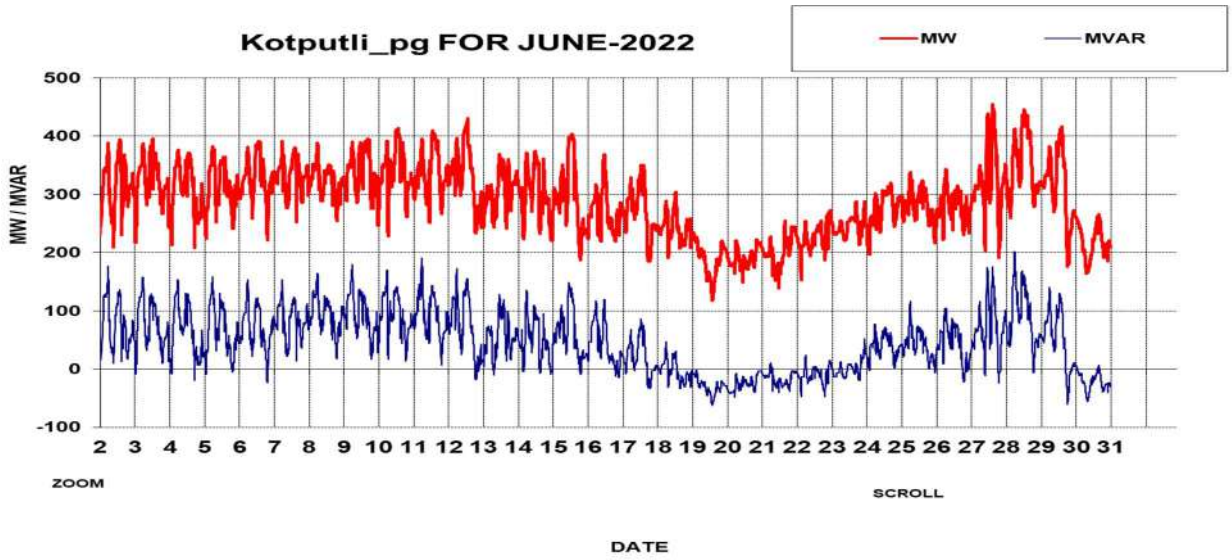
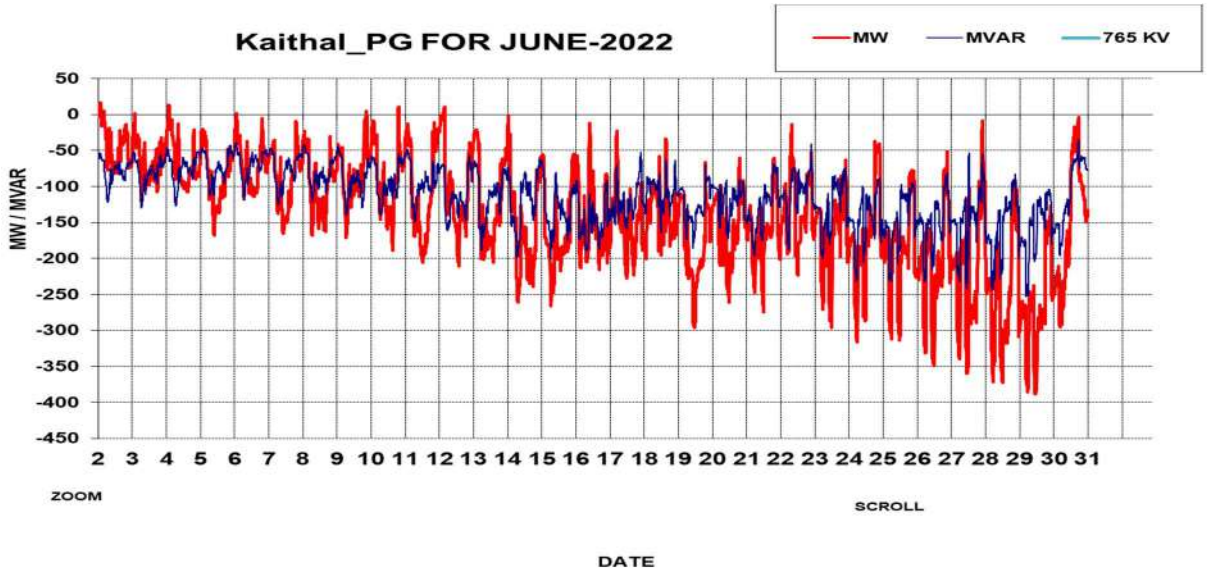
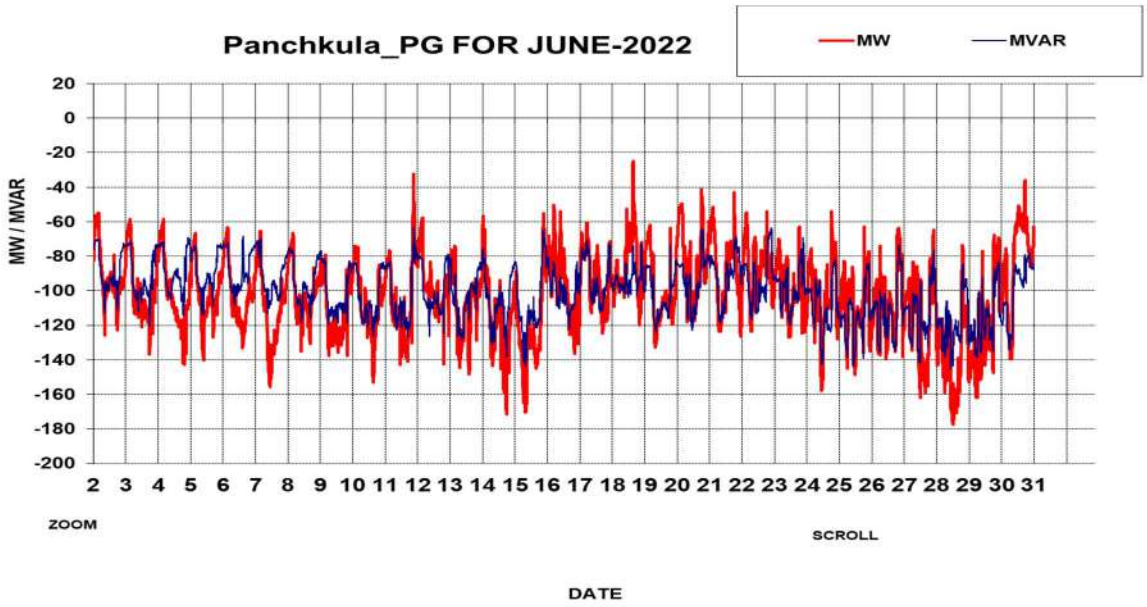
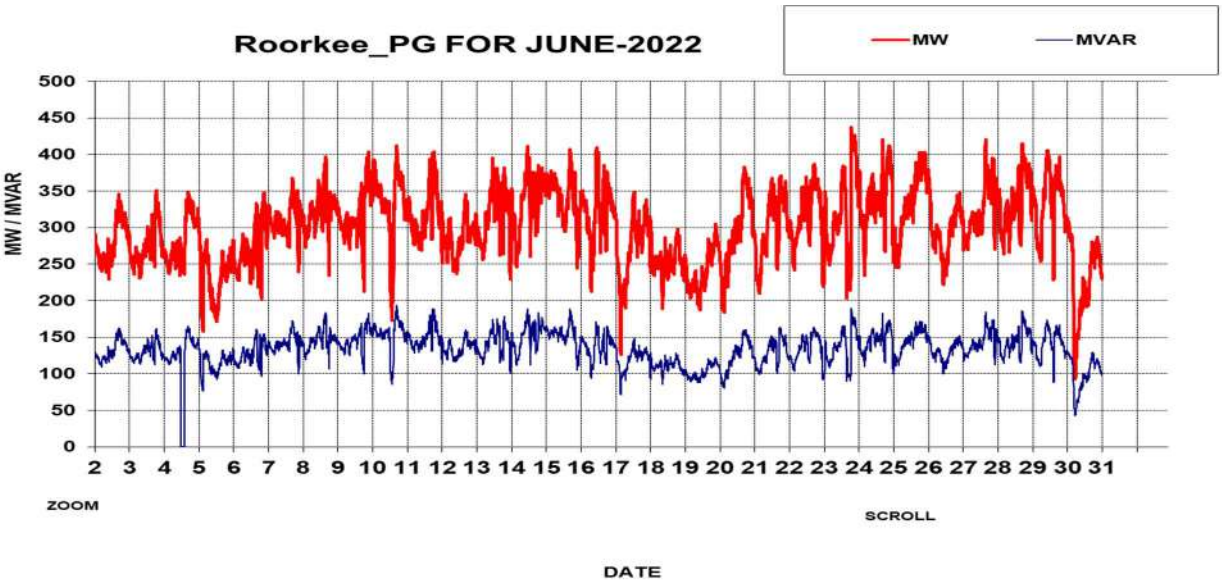
MW
MVAR
765 KV
MW / MVAR
800
700
600
500
400
300
200
100
0
-100
-200
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
ZOOM
SCROLL
DATE


Kotputli_pg FOR JUNE-2022
MW
MVAR
MW / MVAR
500
400
300
200
100
0
-100
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
ZOOM
SCROLL
DATE


Kaithal_PG FOR JUNE-2022
MW
MVAR
765 KV
MW / MVAR
50
0
-50
-100
-150
-200
-250
-300
-350
-400
-450
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
ZOOM
SCROLL
DATE


Panchkula_PG FOR JUNE-2022
MW
MVAR
MW / MVAR
20
0
-20
-40
-60
-80
-100
-120
-140
-160
-180
-200
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
ZOOM
SCROLL
DATE


Roorkee_PG FOR JUNE-2022
MW
MVAR
MW / MVAR
500
450
400
350
300
250
200
150
100
50
0
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
ZOOM
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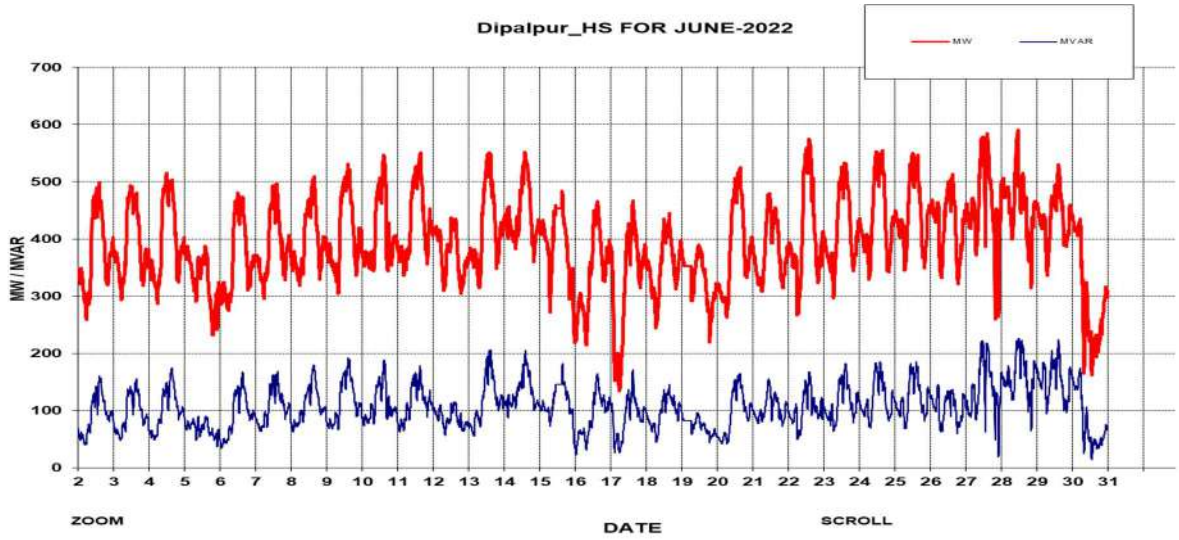
DATE


Dipalpur_HS FOR JUNE-2022
MW
MVAR
MW / MVAR
700
600
500
400
300
200
100
0
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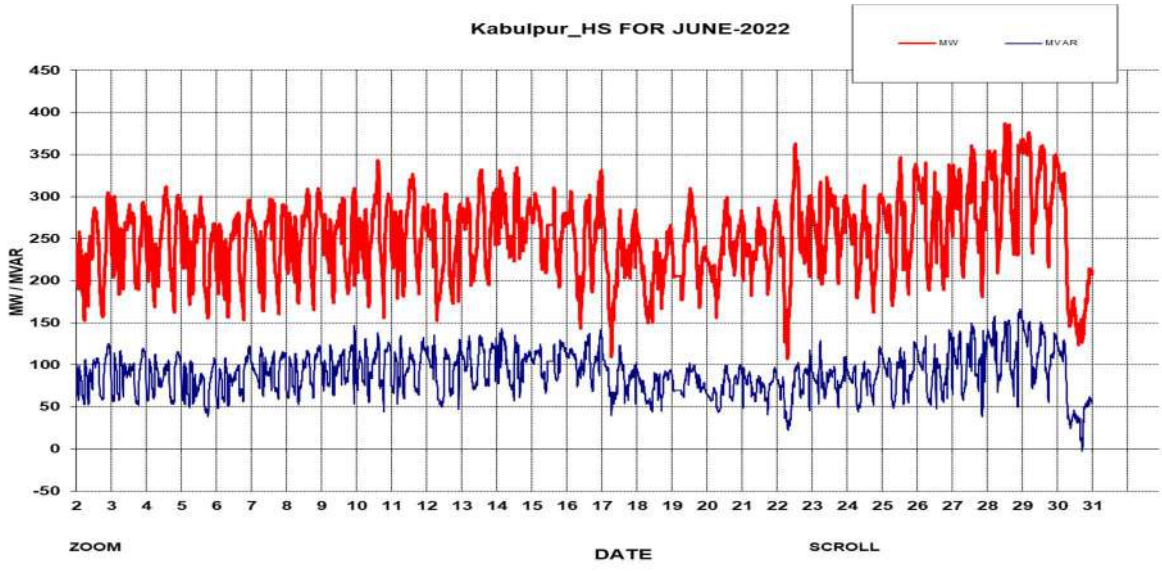
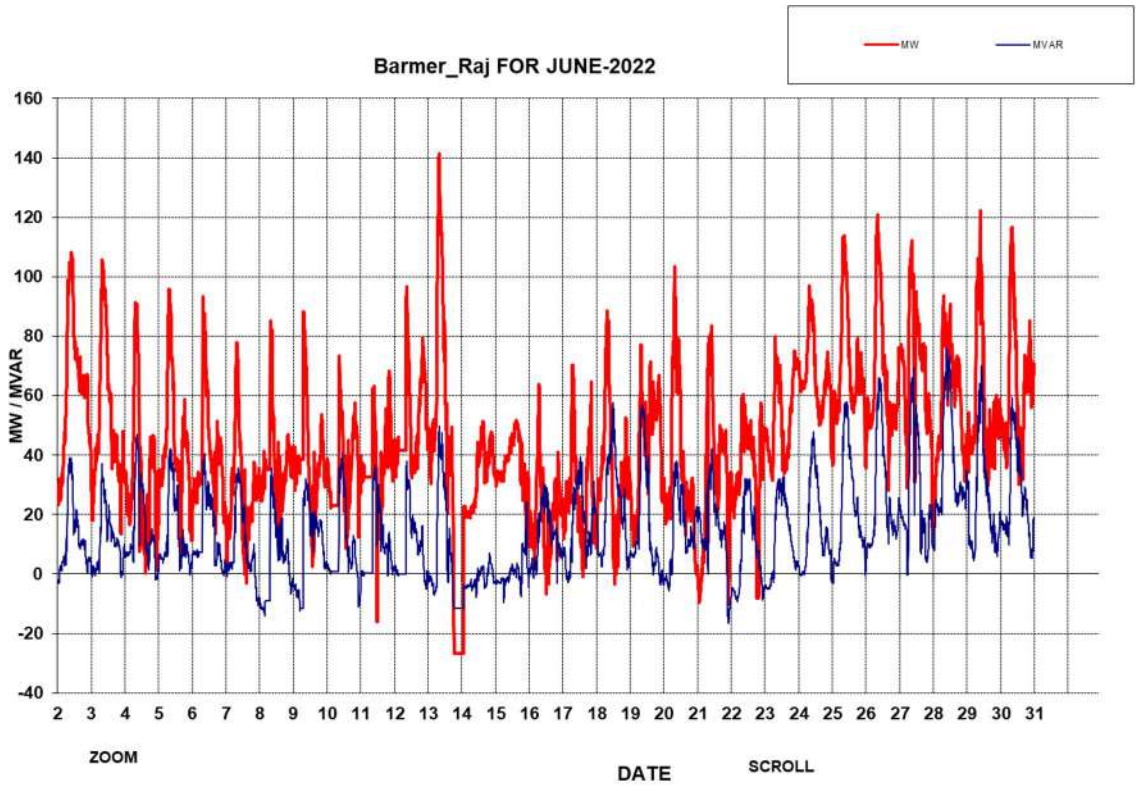
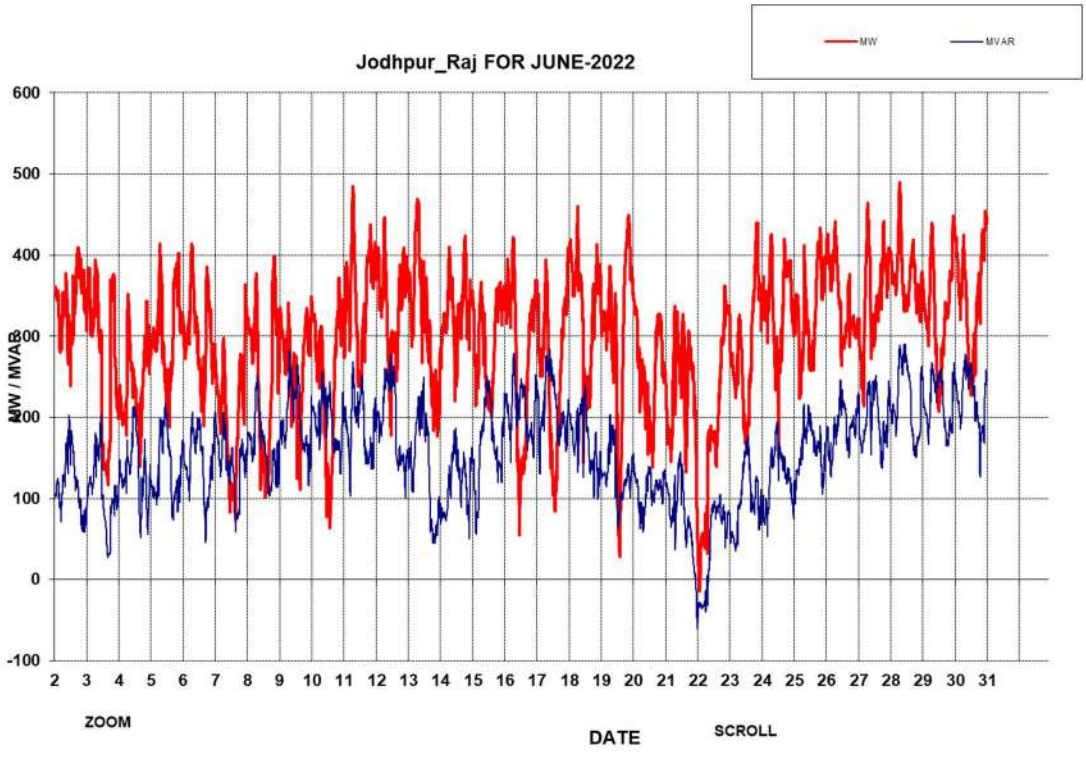
ZOOM
SCROLL
DATE


Kabulpur_HS FOR JUNE-2022
MW
MVAR
MW / MVAR
450
400
350
300
250
200
150
100
50
0
-50
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
ZOOM
SCROLL
DATE


Barmer_Raj FOR JUNE-2022
MW
MVAR
MW / MVAR
160
140
120
100
80
60
40
20
0
-20
-40
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
ZOOM
DATE
SCROLL


Jodhpur_Raj FOR JUNE-2022
MW
MVAR
MW / MVAR
600
500
400
300
200
100
0
-100
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
ZOOM
DATE
SCROLL

सत्यमेव जयते

भारत सरकार/Govt. of India
विद्युत मंत्रालय/Ministry of Power
केन्द्रीय विद्युत प्राधिकरण/Central Electricity Authority
मुख्य विद्युत निरीक्षणालय प्रभाग/Chief Electrical Inspectorate Division
****

No. CEI/1/4/2022/270 **Dated: 26.05.2022**

To,

As per list of Participants at Annex-I.

Sub: Minutes of the Meeting on "Submission of statutory clearances for charging of modified/replaced power system elements" held on 10-05-2022-reg.

Please find the enclosed minutes of the meeting on the above mentioned subject.

Mukul Kumar
26-05-22
(Mukul Kumar)
Assistant Director

Minutes of the Meeting on Submission of statutory clearances for charging of modified/replaced power system elements held on 10-05-2022.

***

List of Participants is at **Annex-I.**

At the outset, Chief Electrical Inspector (CEI), CEA welcomed all the participants and requested Deputy Director (CEI), CEA to brief the background and agenda of the meeting.

Then Deputy Director (CEI), CEA gave the background by stating that CEA vide letter dated 08.09.2015 requested POSOCO to ensure the statutory inspection as per CEA (Measures Relating to Safety and Electric Supply) regulation, 2010 before allowing charging of any modified Electrical installation. He also mentioned that this discussion is only for utilities which falls under jurisdiction of Central Government.

Thereafter, Deputy Director (CEI), CEA stated that this meeting has been called to discuss the difficulties faced by utilities in respect of processing of approval for Charging after routine/emergency replacement and upgradation of substation equipment like CT, PT, CVT, Isolator, CB, LA, Bushing and Wave trap. Deputy Director (CEI), CEA, further stated that after understanding the difficulties being faced by the utilities, way forward to mitigate the difficulties would be discussed and consensus would be made for modalities for processing of approval for Charging. After that he requested the utilities to deliberate on the issue.

Executive Director, PGCIL requested for devising any methodology for expediting the process of getting safety clearance from Electrical Inspector in emergency situations. He emphasized that they usually ensure healthiness and safety of the system whenever they replace the faulty elements for restoring the system without any change in modifications.

Representative of PGCIL, Corporate Centre emphasized that replacement of any substation element of same type and rating does not require approval of Electrical Inspector. However, CEI, CEA explained that as per Sub-regulation 43(7) , any installation shall not connect to the supply unless and until such alteration or addition has been approved in writing by the Electrical Inspector. He further added that as per Regulation 29, any alteration or addition includes replacement also expect for plug and play equipment of voltage not exceed 250 Volts.

Representative of BBMB Panipat appreciated that CEA was giving prompt response to their requests, however, he expressed his concern for obtaining safety clearances during night hours and requested to develop some framework to address such issues. In this regard, CEI, CEA stated that as per prevailing regulations, the consent of Electrical Inspector is statutory requirement and not possible to waive off. However, CEA is providing all possible assistance in giving the consent at the appropriate time.

Representative of NPCIL Narora said that they have experience that CEA is giving prompt response in obtaining safety clearances from Electrical Inspectors for their installations. However, he requested for a change in Work Completion format for emergency situations and CEI, CEA agreed for such modifications.

CEI, CEA stated that the diversion work, restoration of damaged/collapsed towers are planned activity and utilities have sufficient time to apply. Also, these applications/requests for diversion work were pro-actively attended by CEA.

Representative of PGCIL, Bhiwani raised the concern that RLDC are also insisting that the consent from CEA is required for switching over the single phase transformer which is already energized. In this regard, CEI, CEA clarified that any transformer bank which is already energized can be switched with spare transformer without the consent of Electrical Inspector, however, replacement with spare transformer would require the consent of Electrical Inspector.

After the detailed deliberation, CEI,CEA elaborated the procedure which may be used for obtaining consent for charging after emergency replacement and upgradation of substation equipment like CT, PT, CVT, Isolator, CB, LA, Bushing and Wave trap :

- Apply online for clearance on CEA web portal which is readily and universally accessible and details of nodal officers are also available therein.
- Upload the latest and relevant Test Reports of equipment or any test report asked by the electrical inspector.
- Submit the planned maintenance schedule beforehand.
- If the documents are found in order, Consent for Charging would be granted.
- Physical inspection would be done during the next Periodical Inspection.
- For any assistance, the nodal officers of the respective jurisdiction may be contacted for better coordination.

CEI, CEA stated the following procedure would be followed for restoration of line through Emergency Restoration system towers: -

- ERS plan, schedule to be shared to the concerned RIO over email and telephonic intimation to be conveyed beforehand.
- All Electrical Safety measures at the ERS site must be followed strictly.
- Time span for the ERS work should be reasonable & limited and have approval from the concerned RIO.
- Subsequent to completion of Diversion/restoration works, Electrical inspection would have to be done under regulation 43 for charging the line.

CEI, CEA also requested to utilities to submit safety guidelines to be followed by them for restoration of line through Emergency Restoration system towers.

Further CEI, CEA stated that replacement of one phase of a failed Transformers /Reactor takes time and thus can apply as regular application for approval for energization. The approval for energization of such equipment would be given after inspection.

CEI, CEA informed that the draft safety regulations would be available in public domain for comments and therefore, requested the utilities to give suggestions on the draft of CEA Electrical safety regulations to address such issues for ease of doing business.

The meeting ended with vote of thanks.

—— X ——

Annex-I

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47	manoj kumar jain	manoj.jain@adani.com
48	Rajeev Kumar	rajivkumar@powergrid.in
49	V. Balaji	x@posoco.in
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67	Kamalesh Das	kdasdtl@gmail.com
68	Nimish Sheth	nimish.sheth@sekura.in
69	Ashwini Kumar	ashwinikumar@tatapower.com
70	Rahul hooda	amt2tkl@gmail.com
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File No.CEA-PS-17-11(19)/1/2022-PCD Division

भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
केन्द्रीय विद्युत प्राधिकरण
Central Electricity Authority
विद्युत संचार विकास प्रभाग
Power Communication Development Division

No. PTCC/Misc/2022/391-393

Subject: Clarifications regarding submission of PTCC clearance for FTC of existing transmission lines after modification/route diversion and safety clearance for FTC of existing power system elements after any modification/replacement – regd.

Reference: Your letter no. POSOCO/NLDC/FTC/2022/01/232 dated 08.04.2022

The matter stated in your letter under reference has been examined and submissions from PCD Division on requirement of PTCC clearance of existing transmission lines after modification/route diversion are as under:

1. The referred CEA letter dated 18.01.2019 does not mention "new transmission line" but advises, in general, to seek documentary evidence of PTCC clearance from the concerned transmission licensee before issuing charging code/permission.
2. PTCC clearance for existing transmission line is not required for increase in tower height, provided that other factors like course of transmission line and nature of power flow remain unaltered, as the interference with communication system will be further reduced.
3. In cases involving change in course of transmission line or change in nature of power flow, induction on nearby telecom assets may change and Induced Voltage may exceed the safe limit. Such cases may be forwarded to CEA for examination and issuing suitable advisory on requirement of fresh PTCC clearance.

This issues with the approval of Chief Engineer, PCD.

आपवेन्द्र प्रताप सिंह
06.05.22
Director

To:-
1. Executive Director, NLDC, B-9, First Floor, Qutab Institutional Area, Katwaria Sarai, New Delhi – 110016

Copy to:-
1. Principal Chief Engineer-I, Central Electricity Authority
2. Member (Power System), Central Electricity Authority

File No.CEA-PS-17-11(19)/1/2022-PCD Division

आज़ादी का अमृत महोत्सव

भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
केन्द्रीय विद्युत प्राधिकरण
Central Electricity Authority
विद्युत संचार विकास प्रभाग
Power Communication Development Division

सं.सीटीयू/वि.प्र./2022/391 ******* 393

विषय: संशोधन/रूट डायवर्जन के बाद मौजूदा ट्रांसमिशन लाइनों के एफटीसी के लिए पीटीसीसी अनुमोदन जमा करने के संबंध में स्पष्टीकरण और किसी भी संशोधन/प्रतिस्थापन के बाद मौजूदा पावर सिस्टम तत्वों के एफटीसी के लिए सुरक्षा मंजूरी - के संबंध में

सन्दर्भ: आपका पत्र सं. POSOCO/NLDC/FTC/2022/01/232 दिनांकित 08.04.2022

उपरोक्त संदर्भ पत्र में उल्लिखित मामले की जांच की गई है और संशोधन/रूट डायवर्जन के बाद मौजूदा ट्रांसमिशन लाइनों की पीटीसीसी अनुमोदन की आवश्यकता पर पीसीडी डिवीजन से प्रस्तुतीकरण निम्नानुसार हैं:

1. संदर्भित के.वि.प्रा. पत्र दिनांक 18.01.2019 में "नई ट्रांसमिशन लाइन" का उल्लेख नहीं है, यद्यपि सामान्य तौर पर सलाह दी गयी है कि चार्जिंग कोड/अनुमति जारी करने से पहले संबंधित ट्रांसमिशन लाइसेंसधारी से पीटीसीसी अनुमोदन के दस्तावेजी साक्ष्य प्राप्त करें।

2. टावर की ऊंचाई में वृद्धि के लिए मौजूदा ट्रांसमिशन लाइन के लिए पीटीसीसी अनुमोदन की आवश्यकता नहीं है, बशर्ते कि ट्रांसमिशन लाइन के मार्ग और बिजली प्रवाह की प्रकृति जैसे अन्य कारक अपरिवर्तित रहें, क्योंकि संचार प्रणाली में प्रेरण और कम हो जाएगा।

3. ट्रांसमिशन लाइन के मार्ग परिवर्तन या बिजली प्रवाह की प्रकृति में परिवर्तन से जुड़े मामलों में, पास की दूरसंचार संपत्तियों पर प्रेरण बदल सकता है और प्रेरित वोल्टेज सुरक्षित सीमा से अधिक हो सकता है। ऐसे मामलों को पीटीसीसी अनुमोदन की आवश्यकता पर जांच और उपयुक्त सलाह जारी करने के लिए कि.वि.प्रा. को भेजा जा सकता है।

इसे मुख्य अभियंता, पी.सी.डी. के अनुमोदन से जारी किया जाता है।

आर्यवर्धन प्रताप सिंह
06.05.22
निदेशक

सेवा में:-

कार्यकारी निदेशक, एनएलडीसी, बी-9, प्रथम तल, कुतुब इंस्टिट्यूशनल एरिया, कटवारिया सराय, नई दिल्ली – 110016

प्रति:-

1. प्रधान मुख्य अभियंता – I, के.वि.प्रा.
2. सदस्य (विद्युत् प्रणाली), के.वि.प्रा.

POWER STATION	MONITORED CAP. (MW)	Details of Units	Auxilary Consumption	GENERATION (MU)		GENERATION (MU)		Today Gross PLF %	Gross PLF %: APRIL 1 TILL DATE (2022-23)	Previous Year Gross PLF %	Gross PLF%: APRIL 1 TILL DATE (2021-22)	Unit Outages as on 14-07-2022
		No. of units X Capacity		Today's Actual	APRIL 1 TILL DATE (2022-23) Actual	Previous Year Actual	APRIL 1 TILL DATE (2021-22) Actual					
Rihand HPS	300	6x50	1.2	0.00	82.40	0.00	0.00	0.00	11.03	0.00	0.00	
PARBATI-II	800	4x200	1.2	2.25	120.20	2.10	127.24	11.86	6.03	11.07	6.39	
SORANG HYDROELECTRIC PROJECT	100	2x50	1.0	0.33	119.08	0.00	0.00	13.89	47.73	0.00	0.00	Unit: 50 MW Sorang - UNIT 1 Reason: Out on High SILT Unit: 50 MW Sorang - UNIT 2 Reason: Out on High SILT
TEHRI HPS	1000	4x250	1.2	7.17	652.12	6.55	476.51	30.23	26.19	27.62	19.14	
PONG HPS	396	6x66	1.2	2.87	283.99	3.26	200.97	30.56	28.80	34.71	20.38	
KOTESHWAR HPS	400	4x100	1.0	3.24	329.88	2.87	241.21	34.09	33.05	30.19	24.17	Unit: 100 MW Koteshwar HPS - UNIT 1 Reason: due to fault in GT
Ranjit Sagar Power Plant	600	4x150	1.0	4.95	426.40	5.33	408.34	34.72	28.48	37.38	27.28	
BAIRASIUL HP	180	3x60	1.2	1.58	204.52	0.09	219.28	37.01	45.63	2.11	48.92	Unit: 60 MW Bairasiul HPS - UNIT 1 Reason: Due to High Silt ppm Unit: 60 MW Bairasiul HPS - UNIT 2 Reason: Due to High Silt ppm Unit: 60 MW Bairasiul HPS - UNIT 3 Reason: Due to High Silt ppm
SEWA-II HPS	120	4x30	1.2	1.26	141.76	0.00	0.02	44.27	47.44	0.00	0.01	
Mukerian Hydro Plant	225	6 x15 + 6 x19.5+2 x9	1.0	2.50	258.45	3.14	195.47	46.76	46.04	58.73	34.82	
SINGRAULI HYDRO	8	1x8	1.0	0.09	8.86	0.09	11.11	47.34	44.39	47.34	55.66	
PARBATI III HEP	520	4x130	1.2	6.36	188.82	5.16	180.27	51.57	14.58	41.84	13.92	Unit: 130 MW Parbati III HEP - UNIT 4 Reason: To attend problem of LGB Pad high temperature
DEHAR HPS	990	6 x165	1.2	14.48	1094.63	14.65	1061.08	61.67	44.40	62.40	43.04	
BHAKRA HPS	1397	1x 108 + 4 x126 + 5x157	1.2	22.12	1653.90	21.16	1478.55	66.77	47.54	63.87	42.50	Unit: 108 MW Bhakra HPS - UNIT 1 Reason: Renovation Modernization and upgradation of capacity to 126MW
BAJOLI HOLI	180	3x60	1.2	2.86	182.58	0.00	0.00	67.00	40.73	0.00	0.00	
SINGOLI-BHATWARI	99	3x33	1.0	1.68	136.22	2.48	140.52	71.41	55.15	105.42	56.89	Unit: 33 MW Singoli Bhatwari HEP - UNIT 2 Reason: Stator Earth Fault
SAWARA KUDDU	111	3x37	1.2	1.88	76.38	0.00	0.00	71.42	27.63	0.00	0.00	
UBDC	92	3x15 + 3x15.5	0.9	1.57	108.24	1.44	89.45	71.75	47.11	65.80	38.93	
Shanan	110	4 x15 + 1x 50	2.0	2.21	209.17	2.73	198.79	85.39	76.97	105.48	73.15	
Ananadpur Sahib Hydro Plant	134	2x33.5+ 2x33.5	0.65	2.86	154.45	0.54	150.10	89.51	46.04	16.90	44.74	
DULHASTI HPS	390	3x130	1.2	8.72	906.69	9.62	828.86	94.28	93.36	104.01	85.35	
URI HPS	480	4x120	1.2	10.94	1161.72	11.07	1172.88	96.10	97.19	97.25	98.13	

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
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संदर्भ संख्या.: NRLDC/SO-II/OPR/ **दिनांक: - 05.07.2022**

सेवा मे,

वितरण सूची के अनुसार

विषय: - उत्तरी क्षेत्र के लिए संचालन प्रक्रिया के अद्यतन हेतु

महोदय/महोदया,

Regulation 5.1(f) of the Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2010, stipulates that a set of detailed internal operating procedure for each regional grid shall be developed and maintained by respective Regional Load Despatch Centres, in consultation with the regional constituents. In line with same NRLDC is updating the document "Operating procedure of Northern region".

The same was also discussed in 195th and 196th OCC meetings, wherein NRLDC had requested for feedback from all utilities. Thus, it is requested that any feedback regarding Operating procedure document of Northern region may be shared by 12th July 2022 for consideration during update of the document.

धन्यवाद,

आलोक

(अलोक कुमार)
महाप्रबंधक, प्रणाली प्रचालन

प्रतिलिपि विनम्र सूचनार्थ:

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Sr No	Element Name	Outage Date	Outage Time	Reason
1	400 KV Anpara_B(UPUN)-Mau(UP) (UP) Ckt-1	18-Jun-22	16:44	R-N fault, Zone-1, Fault current 2.496kA, Dist. 150km from Anpara end. As per PMU auto recloser operated.
		29-Jun-22	3:35	R-N fault, Zone-1, Fault current 3.49kA, Dist. 137.7 km from Anpara end.As per PMU auto recloser operated.
		29-Jun-22	6:16	B-N fault, Fault current 2.31kA, Dist. 165.7km from Anpara end.As per PMU auto recloser operated.
2	220 KV Kishenpur(PG)-Ramban(PDD) (PDD) Ckt-1	1-Jun-22	16:35	Phase to earth fault B-N.As per PMU auto recloser did not operate.
		8-Jun-22	16:42	Phase to earth fault B-N.As per PMU auto recloser did not operate.
		10-Jun-22	17:23	R -ph fault at a distance of 57.8 km from Kishenpur end with fault current 3.05 KA
		16-Jun-22	14:58	Phase to earth fault R-N
		16-Jun-22	18:22	Phase to earth fault B-N
		18-Jun-22	12:10	Y-N fault, Dist. 30km, Fault current 5.5kA from Kishenpur end.As per PMU auto recloser did not operate.
3	220 KV Amargarh(NRSS XXIX)-Ziankote(JK) (PDD JK) Ckt-2	1-Jun-22	8:26	Phase to phase fault Y-B
		6-Jun-22	17:51	At 05:52 hrs wagoora zainakote ckt ist tripped . At the same time amragrah zainakote circuit Ist and 2nd tripped with breaker closed from amargarh end. during patrolling it was found that the disc string of wagoora zainakote ckt ist was damaged resulting in fault which got reflected on amargarh zainakote ckt ist and 2nd . As per PMU auto recloser did not operate.
		11-Jun-22	8:58	At around 8.58 AM 220 KV Amaragh zainakote ckt II tripped from zainakote end.As per PMU auto recloser did not operate.
		16-Jun-22	15:14	Phase to phase fault Y-B
		25-Jun-22	10:19	Due to tripping of 220kV Ziankote - Alusteng line, 220kV Amargarh -Ziankote -2 tripped from Ziankote end.
4	220 KV Saharanpur(PG)-Shamli(UP) (UP) Ckt-1	3-Jun-22	8:48	As per PMU, Y-N fault occurred and delayed clearance of 450ms with no auto-reclosing observed.
		4-Jun-22	14:55	R-Y fault, Zone-1, Dist. 41.32km, Fault current 2.7kA from Shamli end.
		18-Jun-22	19:30	B-N fault, Zone-1, Dist. 8.34km, Fault current 4.56kA from Shamli & Dist. 50.5km, Fault current 2.82kA from Saharanpur end.As per PMU auto recloser did not operate.
		30-Jun-22	16:17	B-N fault, Fault current 2.9kA, Dist. 47.5km from Saharanpur. Line tripped only from Saharanpur end.As per PMU auto recloser did not operate.
5	220 KV Baghpat(PG)-Shamli(UP) (UP) Ckt-1	2-Jun-22	11:28	Phase to earth fault B-N.As per PMU auto recloser operated.
		3-Jun-22	13:27	B-N fault, Dist. 0.20 km, Fault current 4.56kA from Shamli end & Dist. 41.1km, Fault current 3.78kA from Baghpat end.As per PMU auto recloser operated.
		4-Jun-22	12:12	Phase to earth fault R-N.As per PMU auto recloser operated.
		5-Jun-22	14:22	Phase to earth fault Y-N .Not observed in pMU

Grid Event summary for June 2022

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	GD-1	1) 220 KV Jalandhar-Pong (BB) Ckt-1 2) 220 KV Bairasiul(NH)-Pong(BB) (PG) Ckt-1 3) 220 KV Pong(BB)-Dasuya(PS) (BBMB) Ckt-1 4) 220 KV Jalandhar-Pong (BB) Ckt-2 5) 66MW Unit-3 at Pong(BBMB) 6) 66MW Unit-5 st Pong(BBMB)	HIMACHAL PRADESH	BBMB, POWERGRID, NHPC	2-Jun-22	19:45	2-Jun-22	20:58	1:13	1.) 220kV Pong(BBMB) substation have double main transfer bus scheme. During antecedent condition, 66MW Unit-3&5 and 220kV feeders to Baira, Jalandhar-I, Dasuya-III were connected to 220kV bus-1 and 66MW Unit-4 and 220kV feeders to Jasor, Jalandhar-II, Dasuya-IV were connected to 220KV bus-2. 2.) At 19:45hrs, Y-Phase CT of UNIT 5 at Pong(BB) damaged, which led to bus bar protection of 220kV bus1 at Pong(BB). 3.) Due to tripping of 220kV bus-1, 66MW Unit-3&5 and 220kV feeders to Baira, Jalandhar-I, Dasuya-III tripped as they were connected to 220kV bus-1 during antecedent condition. 4.) At the same time, 220 KV Jalandhar-Pong (BB) Ckt-2 also tripped whch was connected to 220kV bus-2. 5.) Other elements connected at 220kV bus-2 were remained in service. 6.) As per PMU, Y-N phase to earth fault which cleared within 80ms is observed. As per SCADA, change in generation of approx. 120MW is observed at Pong(BBMB).	0.15	0	120	0	0.243	0.000	49439	62775	120
2	GD-1	1) 400/220 kV 315 MVA ICT 1 at Suratgarh(RVUN) 2) 250 MW Suratgarh TPS - UNIT 5 3) 250 MW Suratgarh TPS - UNIT 4 4)250 MW Suratgarh TPS - UNIT 2 5) 400/220 kV 315 MVA ICT 2 at Suratgarh(RVUN)	RAJASTHAN	RRVPNL	5-Jun-22	13:03	5-Jun-22	15:25	2:22	1.) In antecedent condition, 250 MW Suratgarh TPS - UNIT 2, UNIT 4 & UNIT 6, 400/220 kV 315 MVA ICT 1 & ICT 2 at Suratgarh(RVUN) were carrying 175MW, 265MW, 233MW, 197MW & 196MW respectively. 2.) As reported, at 13:03 hrs, 250 MW Suratgarh TPS - UNIT 2 along with 400/220 kV 315 MVA ICT 1 & ICT 2 at Suratgarh(RVUN) tripped on over current protection operation. 3.) As per the verbal communication with Suratgarh SCTPS, 400/220 kV 315 MVA ICT 2 loading went up to 252MW (602A) which led to tripping of ICT-2 on over current protection operation followed by tripping of ICT-1. 4.) With the tripping of 250MW Unit-2 (connected at 220kV bus) and 400/220kV 315MVA ICT-1&2, 220kV side became dead and 6.6kV supply to 250MW Unit-4 & 5 also became dead which led to tripping of 250MW UNIT 4 & UNIT 5. 5.) As per PMU, no fault is observed. As per SCADA, change in Suratgarh SCTPS generation of approx. 670MW is obsrerved. As reported by SLDC-RS, load loss of approx. 500MW occurred in Rajasthan control area.	0	1.02	670	500	1.222	0.796	54806	62843	NA
3	GD-1	1) 220 KV Amargarh(NRSS XXIX)-Ziankote(JK) (PDD JK) Ckt-2 2) 220 KV Wagoora(PG)-Ziankote(JK) (PDD JK) Ckt-1 3) 220 KV Amargarh(NRSS XXIX)-Ziankote(JK) (PDD JK) Ckt-1	J & K	PDD JK, POWERGRID, INDIGRID	6-Jun-22	17:51	6-Jun-22	19:06	1:15	1.) In antecedent condition, 220 KV Wagoora(PG)-Ziankote(JK) (PDD JK) Ckt-1 & Ckt-2 and 220 KV Amargarh(NRSS XXIX)-Ziankote(JK) (PDD JK) Ckt-1 & Ckt-2 were carrying 27MW, 19MW, 102MW & 102MW respectively. 2.) As reported, at 17:51hrs, 220 KV Wagoora(PG)-Ziankote(JK) (PDD JK) Ckt-1 tripped on B-N phase to earth fault, fault was in Z-1 with distance 1.5km & 9.5kA from Ziankote end. 3.) At the same time, 220 KV Amargarh(NRSS XXIX)-Ziankote(JK) (PDD JK) Ckt-1 tripped from both ends and 220 KV Amargarh(NRSS XXIX)-Ziankote(JK) (PDD JK) Ckt-2 tripped from Ziankote end only. 4.) During patrolling, disc string of 220kV Wagoora-Ziankote ckt-1 was found damaged. 5.) As per PMU, B-N phase to earth fault which cleared within 120ms is observed. As per SCADA, change in load of approx. 80MW is observed in J7K control area.	0	0.1	0	80	0.000	0.129	50264	61990	120
4	GD-1	1) 400 KV Bawana CCGTB(DTL)-Bahadurgarh(PG) (PG) Ckt-1 2) 400 KV Bawana CCGTB(DTL)-Bhiwani(PG) (PG) Ckt-1 3) 216MW GT-3 at CCGT Bawana 4) 254MW STG-2 at CCGT Bawana	NEW DELHI	POWERGRID, DTL	7-Jun-22	15:59	8-Jun-22	6:47	14:48	1.) In antecedent condition, CCGT bawana bus was importing 198 MW from bahadurgarh and 309 MW from Bhiwani. GT-3 and STG-2 were generating at CCGT and total generation was 300 MW (110+190). 2.) Whole of this 800 MW power being fed to 315 MVA ICT-1,4,5 & 6 situated at Bawana(DTL) and further to 220 kV Rohini-1&2, Shalimar Bagh-1&2 and DSID-1&2. 3.) The Interconnector between Bawana (DTL) and CCGT was open with ICT-2&3 on other section. The corresponding bus sectionaliser at 220 kV level was also open. The interconnector is being kept open to reduce fault level. 400 kV CCGT – Bhiwani and 400 kV CCGT – Bahadurgarh moves on common tower after existing from the CCGT gantry. 4.) At 15:59 hrs R – Phase conductor of CCGT – Bhiwani snapped and fell on B- Phase conductor of CCGT – Bahadurgarh thereby causing R-Phase to Earth fault in former line followed by B-phase to earth fault in latter. 5.) As per PMU, CCGT-Bhiwani line tripped after unsuccessful A/R operation on persisted fault and followed by tripping of CCGT – Bahadurgarh after 4 secs on B-N fault. 6.) Due to tripping of both these lines Import of around 500 MW tripped thereby causing Generation load mismatch at CCGT due to which running GT-3 and STG-2 also tripped on Exhaust temperature high and under frequency operation respectively. 7.) As confirmed by SLDC Delhi and DTL all the 220 kV feeders from Bawana (DTL) were running in radial mode therefore as CCGT units tripped the 400 kV bus got dead and load loss of around 750 MW occurred in and around DSIDC, Shalimarbagh and Rohini. DTL also confirmed that these feeders are being run in radial mode (in spite of parallel source being available) in order to reduce fault level. 8.) It is also to be noted that no tripping has happened at Bawana (DTL) and all ICTs and 220 kV CBs remained intact and closed. Restoration was carried out by closing 400 kV CCGT – Bawana (DTL) interconnector and extending supply to CCGT bus.	0	1.13	295	750	0.511	1.111	57723	67500	80
5	GD-1	1) 400 KV Dehar(BB)-Panchkula(PG) (PG) Ckt-1 2) 400 KV Dehar(BB)-Rajpura(PS) (PG) Ckt-1 3) 165MW Unit-6 at Dehar(BB)	PUNJAB	BBMB	11-Jun-22	18:15	11-Jun-22	19:44	1:29	1. 400/220kV Dehar(BB) have double main single breaker scheme however 400 KV Dehar(BB)-Panchkula(PG) (PG) Ckt & 400 KV Dehar(BB)-Rajpura(PS) (PG) Ckt are connected with both the buses with separate breaker (which also act as bus coupler) just like as double main double breaker scheme. 2. During antecedent condition, 165MW Unit-6 at Dehar(BB) was connected to 400kV Bus-1 and generating 165MW & 400/220kV 315MVA ICT at Dehar(BB) was connected to 400kV Bus-2 and carrying 53MW. 3. At 18:15hrs, 400 KV Dehar(BB)-Rajpura(PS) (PG) Ckt (carrying 77MW) tripped on R-N phase to earth fault, fault was at distance 95km from Rajpura end. As reported, line successfully autoreclosed from Rajpura end but tripped from Dehar end. At the same time, 400 KV Dehar(BB)-Panchkula(PG) (PG) Ckt (carrying 35MW) also tripped from Dehar end only. 4. With the tripping of both these lines, both the buses became decoupled and 165MW Unit-6 at Dehar(BB) tripped due to loss of evacuation path. 5. As per PMU, R-N phase to earth fault is observed which cleared within 80ms. As per SCADA, change in generation of approx. 165MW is observed of Dehar(BB).	0	0	165	0	0.336	0.000	49047	62691	80
6	GI-2	1) 400/220 kV 315 MVA ICT 3 at Muzaffarnagar(UP) 2) 400/220 kV 315 MVA ICT 2 at Muzaffarnagar(UP) 3) 400/220 kV 315 MVA ICT 1 at Muzaffarnagar(UP)	UTTAR PRADESH	UPPTCL	11-Jun-22	23:00	12-Jun-22	0:03	1:03	1. 400/220kV Muzaffarnagar(UP) substation have double main transfer bus scheme at both 400kV & 220kV level. During antecedent condition, 400/220 kV 315 MVA ICT 1 & 500 MVA ICT 4 at Muzaffarnagar(UP), 220/132kV 160MVA ICT-2 at Muzaffarnagar(UP), 220kV Muzaffarnagar-Badhaikalan ckt & 220kV Muzaffarnagar-Charla ckt were connected to 220kV bus-2 and 400/220 kV 315 MVA ICT 2 & ICT 3 at Muzaffarnagar(UP), 220kV Muzaffarnagar-Shamli ckt, 220kV Muzaffarnagar-Modipuram ckt, 220kV Muzaffarnagar-Jansath ckt & 220/132kV 160MVA ICT-1 were connected to 220kV Bus-1. 2. At 23:00hrs, Y-ph CT of 220kV Muzaffarnagar-Shamli ckt damaged and created bus fault. On this fault, bus bar protection of 220kV Bus-1 operated and led to the tripping of elements connected to bus-1. As per PMU, Y-N phase to earth fault is observed which cleared within 80ms. 3. At the same time, 400/220 kV 315 MVA ICT 1 & 220/132kV 160MVA ICT-2 at Muzaffarnagar(UP) was hand tripped. 4. No load loss reported as sufficient connectivity is available there from other stations.	0	0	0	0	0.000	0.000	51734	71057	80
7	GD-1	1) 210 MW Guru Gobind Singh TPS (Ropar) - UNIT 5 2) 210 MW Guru Gobind Singh TPS (Ropar) - UNIT 3 3) 210 MW Guru Gobind Singh TPS (Ropar) - UNIT 4	PUNJAB	PSPCL	13-Jun-22	12:18	13-Jun-22	14:50	2:32	1. 220kV Guru Gobind Singh TPS (Ropar) have double main single breaker bus scheme. Bus 1 is divided into three part (Bus1A, Bus1B, Bus1C) by two bus sectionalisers. 2. During antecedent condition, 210 MW Guru Gobind Singh TPS (Ropar) - UNIT 3, UNIT 4 & UNIT 5 were generating approx. 187MW, 195MW & 151MW respectively. 3. As reported, at 12:18hrs, LBB protection of bus coupler breaker (connected to bus1A & bus2) maloperated which led to the tripping of Bus1A & Bus-2. Due to tripping of aforementioned buses, 210 MW Guru Gobind Singh TPS (Ropar) - UNIT 3, UNIT 4 & UNIT 5 and 220kV lines connected to Bassi Pathana, Ghulal, Gongarh, Goray, Khara, Mohali & Gobio-II tripped. 4. Due to tripping of aforementioned UNITs, generation loss of approx. 530MW is observed (as per SCADA). 5. 220kV bus1B & bus1C were remained in service as Bus coupler and bus sectionaliser opened. 220kV lines to Gobio-I & Jmshr were remained in service via these buses. 6. As per PMU, no fault is observed.	0	0	530	0	0.927	0.000	57203	69435	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)	
8	GD-1	1) 132 KV Pithoragarh(PG)-Almora(PTCUL) (PTCUL) Ckt-1, 2) 70 MW Dhauliganga HPS - UNIT 2 3) 70 MW Dhauliganga HPS - UNIT 1	UTTRAKHAND	NHPC, PTCUL	15-Jun-22	10:19	15-Jun-22	11:59	1:40	1. In antecedent condition, 70MW Dhauliganga Unit-3 & 4, 220kV Dhauliganga-CB Ganj ckt (carrying 110MW) were connected to 220kV Bus-1 at Dhauliganga HEP and 70MW Dhauliganga Unit-1 & 2, 220kV Dhauliganga – Pithoragarh ckt (carrying 167MW) were connected to 220kV Bus-2 at Dhauliganga HEP. 220kV Pithoragarh- Almora ckt was carrying 67MW during antecedent condition. 2. At 10:18:52:990 (as per SOE), 220kV Pithoragarh-CB Ganj ckt was opened to avail shutdown. At the same time, oscillations also observed (as per PMU plot of frequency and voltage at Pithoragarh). 3. With the opening of 220kV Pithoragarh-CB Ganj ckt, MW loading of 220kV Dhauliganga-CB Ganj ckt & 220kV Pithoragarh- Almora ckt rose to 145MW & 137MW respectively (as per SCADA). 4. Further after approx. 16secs, at 10:19:09:161(as per SOE,), 132kV Pithoragarh- Almora ckt tripped on over current protection. (approx. loading during antecedent condition was 137MW (~600A) as per SCADA. As per PMU, no fault is observed. 5. With the tripping of 132kV Pithoragarh- Almora ckt, path of evacuation of Dhauliganga generation from Pithoragarh side lost. 6. Further after approx. 4secs at 10:19:13 (as per SOE), bus coupler breaker at Dhauliganga opened (on SPS operation) and 70MW Dhauliganga Unit-1 & 2 tripped on loss of evacuation path.	0.23	0	140	0	0.239	0.000	58490	70383	11893
9	GD-1	1) 220 KV Kishenganga(NH)-Wagoora(PG) (PG) Ckt-1 2) 220 KV Kishenganga(NH)-Wagoora(PG) (PG) Ckt-2 3) 220 KV Kishenganga(NH)-Delina(PDD) (PG) Ckt-2 4) 110 MW Kishenganga - UNIT 1, 110 MW Kishenganga - UNIT 2	J & K	NHPC, POWERGRID	17-Jun-22	18:27	17-Jun-22	20:51	2 Hours 24 Minutes	1. 220kV Kishenganga(NHPC) HEP have double main single breaker bus scheme. 2. During antecedent condition, 220 KV Kishenganga(NH)-Wagoora(PG) (PG) Ckt-1 (carrying 69MW), 220 KV Kishenganga(NH)-Delina(PDD) (PG) Ckt-2 (carrying 97MW), 110 MW Kishenganga - UNIT 1 & UNIT 2 were connected at 220kV Bus-1 and 220kV Kishenganga(NH)-Wagoora(PG) (PG) Ckt-2 (carrying 69MW), 220 KV Kishenganga(NH)-Delina(PDD) (PG) Ckt-1 (carrying 99MW), 110 MW Kishenganga - UNIT 3 were connected at 220kV Bus-2. 3. At 18:27 Hrs, Y-B phase to phase bus fault occurred due to snapping of jumper between isolator and bus-1 of 110 MW Kishenganga - UNIT 1. As per PMU at New Wanpoh, Y-B phase to phase fault is observed which cleared within 80ms. 4. On this bus fault, bus bar protection of 220kV Bus-1 at Kishenganga HEP operated and 220 KV Kishenganga(NH)-Wagoora(PG) (PG) Ckt-1, 220 KV Kishenganga(NH)-Delina(PDD) (PG) Ckt-2, 110 MW Kishenganga - UNIT 1 & UNIT 2 all tripped. 5. At the same time, 220 KV Kishenganga(NH)-Wagoora(PG) (PG) Ckt-2 which was connected to bus-2 tripped on SOTF protection operation from Main-1 relay (as per telephonic communication with Kishenganga HEP). 6. As per SCADA, generation loss of approx. 220MW is observed due to tripping of 110 MW Kishenganga - UNIT 1 & UNIT 2	0.55	0	220	0	0.472	0.000	46572	57921	80
10	GD-1	1) 220 KV Kishenpur(PG)-Barn(JK) (PDD JK) Ckt-1 2) 220 KV Kishenpur(PG)-Barn(JK) (PDD JK) Ckt-2	J & K	PDD JK	18-Jun-22	15:11	18-Jun-22	16:01	1 Hours 50 Minutes	1. During antecedent condition, 220 KV Kishenpur(PG)-Barn(JK) (PDD JK) Ckt-1 & Ckt-2 were carrying 19MW each. 2. At 15:27 hrs, 220 KV Kishenpur(PG)-Barn(JK) (PDD JK) Ckt-1 tripped on R-N phase to earth fault during inclement weather condition, fault distance was 4.1km & fault current was 4.7kA from Barn ened. 3. At the same time, 220 KV Kishenpur(PG)-Barn(JK) (PDD JK) Ckt-2 also tripped from Barn end only. 4. As reported by SLDC-JK, load loss of approx. 90MW occurred, which was restored by charging 220 KV Kishenpur(PG)-Barn(JK) (PDD JK) Ckt-2 at 16:01hrs.	0	0.08	0	90	0.000	0.156	50663	57573	80
11	GI-2	1) 400 KV Bikaner-Bhadla (RS) Ckt-1 2) 400 KV Bikaner(RS)-Sikar(PG) (RS) Ckt-1 3) 400 KV Bikaner(PG)-Bikaner(RS) (PG) Ckt-1 4) 400 KV Bikaner(RS)-Deedwana(MTS) (RS) Ckt-1 5) 400 KV Suratgarh SCTPS(RVUN)-Suratgarh(RS) (RS) Ckt-1 6) 400 KV Suratgarh SCTPS(RVUN)-Suratgarh(RS) (RS) Ckt-2 7) 400 KV Suratgarh(RVUN)-Bikaner(RS) (RS) Ckt-1 8) 400 KV Bikaner-Merta (RS) Ckt-1 9) 400/33 kV 125 MVA ICT 1 at Bikaner RENEW Solar(RENEW) 10) 400/220 kV 315 MVA ICT 2 at Bikaner(RS) 11) 125 MVAR Bus Reactor No 2 at 400KV Bikaner(RS) 12) 400/220 kV 315 MVA ICT 1 at Bikaner(RS) 13) 400 KV Suratgarh SCTPS(RVUN)-Bikaner(RS) (RS) Ckt-1 14) 400 KV Suratgarh SCTPS(RVUN)-Bikaner(RS) (RS) Ckt-2 15)400 KV Suratgarh(RVUN)-Ratangarh(RS) (RS) Ckt-2	RAJASTHAN	RRVPNL	21-Jun-22	15:24	21-Jun-22	17:26	2 Hours 2 Minutes	1. 400/220kV Bikaner(RS) have one and half breaker bus scheme. 2. During antecedent condition, 400 KV Bikaner(RS)-Deedwana(MTS) (RS) Ckt-1, 400/220 kV 315 MVA ICT 1 & ICT 2 at Bikaner(RS) and 125 MVAR Bus Reactor No 2 at 400KV Bikaner(RS) were connected to 400kV Bus-2 and 400kV lines to Merta, Sikar-ckt-1&2, Bhadla(PG), SCTPS ckt-1&2 and STPS were connected to 400kV Bus-1. 3. At 15:24 hrs, during wind storm/sand storm, Tower no 91 & 92 of 400 KV Bikaner(RS)-Deedwana(MTS) (RS) Ckt-1 collapsed followed by blast of R-ph pole of CB of 400 KV Bikaner(RS)-Deedwana(MTS) (RS) Ckt-1. As per PMU, Y-N phase to earth fault with delayed clearance in 1600ms followed by R-N fault is observed. 4. As per details received from SLDC-RS, bus bar protection of bus-2 operated which resulted in tripping of 400 KV Bikaner(RS)-Deedwana(MTS) (RS) Ckt-1, 400/220 kV 315 MVA ICT 1 & ICT 2 at Bikaner(RS) and 125 MVAR Bus Reactor No 2 at 400KV Bikaner(RS). 5. At the same time, elements connected at 400kV Bus-1 of Bikaner(RS) also tripped on protection operation at remote end and DT received at Bikaner. 6. 400/33 kV 125 MVA ICT 1 at Bikaner RENEW Solar(RENEW) also tripped during same time on LV SEF (stand by earth fault) protection operation.	0	0	0	0	0.000	0.000	46244	56639	1600
12	GD-1	1) 220 KV AD hydro(AD)-Nallagarh(PG) (ADHPL) Ckt-1 2) 220 KV AD hydro(AD)-Phozal(HP) (ADHPL) Ckt-1	HIMACHAL PRADESH	ADHPL	22-Jun-22	16:15	22-Jun-22	16:40	0 Hours 25 Minutes	1. 220kV Ad Hydro -Nallagarh ckt & 220kV AD Hydro-Phozal ckt are on same tower. 2. During antecedent condition, 96MW MW Unit-1 at AD Hydro was not running and 96MW Unit-2 was generating around 45MW. 3. At 16:15 hrs, R-N phase to earth fault occurred on 220kV Ad Hydro -Nallagarh ckt at distance around 9.2km from AD Hydro end. As per PMU, R-N phase to earth fault which cleared within 80ms is observed. 4. At the same time, 220kV AD Hydro-Phozal ckt also tripped from Phozal end only. As per the information received, Phozal end distance protection relay sensed R-N fault in Z-2 with distance 35km. 5. With the tripping of both the lines, 96MW MW Unit-2 at AD Hydro tripped due to loss of evacuation path. 6. As per SCADA, change in generation of approx. 50MW is observed at AD Hydro HEP.	0	0	50	0	0.098	0.000	51064	61003	80
13	GI-2	1) 765 KV Bikaner-Moga (PG) Ckt-1 2) 765 KV Bhadla_2 (PG)-Fatehgarh_II(PG) (PFTL) Ckt-1 3) 765 KV Fatehgarh_II(PG)-Bhadla(PG) (FBTL) Ckt-1 4) 65 KV Bhadla-Bikaner (PG) Ckt-1 5) 765 KV Ajmer-Bhadla_2 (PG) Ckt-1	RAJASTHAN	POWERGRID	22-Jun-22	17:10	22-Jun-22	18:32	1 Hours 22 Minutes	1. At 17:10:26 hrs, 765 KV Bikaner-Moga (PG) Ckt-2 was manually opened due to high voltage on account of voltage regulation. 2. In antecedent condition, SCADA Bus voltage at 765kV Fatehgarh2, Bhadla, Bhadla2, Bikaner & Ajmer was 818kV, 824kV, 818kV, 829kV & 810kV respectively. 3. With the opening of 765 KV Bikaner-Moga (PG) Ckt-2, rise in voltage by 4-5kV is observed as per PMU which sustained for around 5-6secs. 4. At around 17:10:31hrs, 765 KV Fatehgarh_II(PG)-Bhadla(PG) (FBTL) Ckt-1, 765 KV Bhadla_2 (PG)-Fatehgarh_II(PG) (PFTL) Ckt-1, 765 KV Ajmer-Bhadla_2 (PG) Ckt-1, 765 KV Bhadla-Bikaner (PG) Ckt-1 and 765 KV Bikaner-Moga (PG) Ckt-1 all tripped on over voltage protection operation.	0	0	0	0		0.000	47977	59061	NA
14	GI-2	1) 400 KV Bhiwani(BB)-Hissar(PG) (PG) Ckt-1 2) 400 KV Bhiwani(PG)-Bhiwani(BB) (PG) Ckt-1 3) 400KV Bus 1 at Bhiwani(BB) 4) 400 KV Bhiwani(BB)-Rajpura(PS) (PG) Ckt-1	HARYANA	BBMB, POWERGRID	28-Jun-22	14:50	28-Jun-22	16:20	1:30	1. 400/220kV Bhiwani(BB) have double bus double breaker bus scheme. 2. At 14:50hrs, Y-ph CT of 400kV Bhiwani-Hissar ckt bursted at Bhiwani end and caused bus fault. As per PMU, Y-N phase to earth fault which cleared within 80ms. 3. On this bus fault, bus bar protection of Bus-1 operated and resulted into tripping of all the breakers connected to Bus-1 4. At the same time, 400kV Bhiwani(BB)-Bhiwani(PG) ckt tripped on maloperation of LBB protection and 400kV Bhiwani-Rajpura ckt from Rajpura end only on DT recrived from Bhiwani(BB) end.	0	0	0	0	0.000	0.000	59609	76263	80
15	GD-1	1) 400/220 kV 315 MVA ICT 1 at Kashipur(UK) 2) 400/220 kV 315 MVA ICT 2 at Kashipur(UK)	UTTRAKHAND	PTCUL	29-Jun-22	11:38	29-Jun-22	11:52	0:14	1. At 11:35 hrs, 220kV Pantnagar-Bareilly ckt-1 was taken under emeregncy shutdown to attend hotspot. 2. At 11.40 hrs, 400/220KV 315MVA ICT1 & ICT2 at Kashipur tripped on over current earth fault protection operation. As per PMU, no fault is observed. 3.As per SCADA, load loss of approx. 500 MW occurred in Uttarakhand control area. 4.In antecedent condition, 400/220KV 315MVA ICT1 & ICT2 at Kashipur and 220kV Kashipur-Pantnagar were carrying 280MW, 280MW & 43MW respectively	0	0.08	0	500	0.000	0.692	58677	72293	NA

S.No.	Category of Grid Disturbance	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)
	(GD-I to GD-V)				Date	Time	Date	Time					Generation Loss(MW)	Load Loss (MW)	% Generation Loss(MW)	% Load Loss (MW)	Antecedent Generation (MW)	Antecedent Load (MW)	
16	GD-1	1) 765 KV Fatehgarh_II(PG)-Bhadla(PG) (FBTL) Ckt-1 2) 220 KV Fatehgarh_II(PG)-Renew_Jharkhand 3 SL_FGARH_PG (RSEJ3PL) (RSEJ3PL) Ckt-1	RAJASTHAN	POWERGRID, RENEW	29-Jun-22	15:09	29-Jun-22	15:52	0:43	1. At 15:09hrs, 220kV Fatehgarh2-Renew Jharkhand3 ckt tripped on B-N fault. As reported, B phase jumper of line, found open at location no-80. As per PMU at Renew Sunwave, B-N phase to earth fault with delayed clearance in 600ms is observed. In antecedent condition, Renew Jharkhand3 was generating approx. 247MW. 2. Further after approx. 120ms (as per SCADA SOE), 220/33kV 150MVA ICT-1 & ICT-2 at Renew Sunwave and 220/33kV 150MVA ICT-2 at Renew Sunbright tripped from LV (33kV) side. In antecedent condition, Renew Sunwave and Renew Sunbright were generating approx. 241MW & 245MW respectively. 3. As per SCADA, solar generation drop of approx. 820MW is observed during the event. (247MW at Renew Jharkhand3, 241MW at Renew Sunwave, 122MW at Renew Sunbright and 245MW at Renew Solarurja. 4. Due to sudden drop in generation of ~820MW, over voltage occurred. On this over voltage, 765 KV Fatehgarh_II(PG)-Bhadla(PG) (FBTL) Ckt-1 tripped on over voltage protection stage-1 operation at Fatehgarh2 end. As per PMU plot of phase voltage at Fatehgarh2, rise in phase voltage of approx. 20kV is observed. Phase voltage rose from 453kV (~785kV line voltage) to 473kV (~820kV line voltage).	0.16	0	820	0	1.377	0.000	59551	73880	600

Annexure-I

Northern Regional inter regional lines tripping for April-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 Varanasi-Gaya (PG) Ckt-2	POWERGRID	30-Jun-22	3:18	Nil	Phase to earth fault Y-N	NA	30-Jun-22	4:32	NA	Yes(After 24Hrs)	No			Why A/R did not operate ? What happened at 600 ms in DR.
2	800 KV HVDC Kurukshetra(PG) Pole-2	POWERGRID	9-Jun-22	20:57	Nil	Due to WTI (line) trip initiated from YY-Y phase converter transformer. at Champa end due to maloperation of RTD sensor.	NA	10-Jun-22	1:40	NA	Yes(After 24Hrs)	No			RTD replaced .
3	765 KV Orai-Satna (PG) Ckt-1	POWERGRID	8-Jun-22	17:25	Nil	Phase to earth fault R-N	NA	8-Jun-22	18:52	NA	Yes	Yes			
4	220 KV Ranpur(RS)-Bhanpura(MP) (RS) Ckt-1	POWERGRID	7-Jun-22	17:36	Nil	bhanpura end-due to Earth fault from remote end in B-phase IB: 3333.70.70 Amps IN: 2465.02 Amps	NA	11-May-22	13:27	NA	NO	NO			

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

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

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

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

Reporting of Violation of Regulation for various issues for above tripping

1	Fault Clearance time(>100ms for 400kV and >160ms for 220kV)	1. CEA Grid Standard-3.e 2. CEA Transmission Planning Criteria
2	DR/EL Not provided in 24hrs	1. IEGC 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 June 2022 - 30th June 2022

Annexure-B.XII

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	ACME	1	1	**100**	1	0	**100**	1	0	**100**	1	0	**100**	DR/EL & Tripping report needs to be submitted
2	AD HYDRO	3	0	**0**	0	1	**0**	0	1	**0**	0	0	**0**	
3	ADANI	1	1	**100**	1	0	**100**	1	0	**100**	1	0	**100**	
4	AHEJ3L	1	1	**100**	1	0	**100**	1	0	**100**	1	0	**100**	
5	AHEJ4L	1	1	**100**	1	0	**100**	1	0	**100**	1	0	**100**	
6	ANTA-NT	3	0	**0**	1	0	**33**	1	0	**33**	0	0	**0**	DR/EL & Tripping report needs to be submitted
7	APMPL	1	1	**100**	1	0	**100**	1	0	**100**	1	0	**100**	
8	AREPRL	1	1	**100**	1	0	**100**	1	0	**100**	1	0	**100**	
9	BAIRASUIL-NH	1	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	
10	BBMB	42	19	**45**	21	5	**0**	23	10	**0**	20	1	**49**	
11	BUDHIL	2	0	**0**	0	0	**0**	0	0	**0**	2	0	**100**	
12	CHAMERA-III-NH	2	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	
13	CHAMERA-II-NH	2	0	**0**	0	2	**0**	0	2	**0**	0	0	**0**	
14	CHAMERA-I-NH	1	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	
15	CLEANSOLAR_JODHPUR	1	1	**100**	1	0	**100**	1	0	**100**	1	0	**100**	
16	CPCC1	72	8	**11**	9	12	**15**	8	12	**13**	8	10	**13**	DR/EL & Tripping report needs to be submitted
17	CPCC2	60	5	**8**	5	6	**9**	5	7	**9**	5	6	**9**	
18	CPCC3	35	15	**43**	15	1	**44**	16	1	**47**	16	0	**46**	
19	DADRI-NT	2	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	
20	DHAULIGANGA-NH	5	1	**20**	1	4	**100**	1	0	**20**	1	0	**20**	DR/EL & Tripping report needs to be submitted
21	DULHASTI-NH	2	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	
22	ESUCRL	1	1	**100**	1	0	**100**	1	0	**100**	1	0	**100**	
23	INDIGRID	3	1	**33**	1	0	**0**	1	0	**0**	1	2	**100**	DR/EL & Tripping report needs to be submitted
24	JHAJJAR	2	2	**100**	2	0	**100**	2	0	**100**	2	0	**100**	
25	KARCHAM	1	0	**0**	0	0	**0**	0	0	**0**	1	0	**100**	
26	KISHENGANGA-NH	5	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	
27	KOLDAM-NT	2	1	**50**	1	0	**50**	1	0	**50**	2	0	**100**	DR/EL & Tripping report needs to be submitted
28	Mega_SuryaUrja	2	2	**100**	2	0	**100**	2	0	**100**	2	0	**100**	
29	NAPP	1	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	
30	NJPC	1	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	
31	PARBATI-II-NH	2	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	
32	PKTSL	1	1	**100**	1	0	**100**	1	0	**100**	1	0	**100**	DR/EL & Tripping report needs to be submitted
33	RAMPUR	1	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	
34	RAPPA	1	1	**100**	1	0	**100**	1	0	**100**	1	0	**100**	DR/EL & Tripping report needs to be submitted
35	RENEW	1	1	**100**	1	0	**100**	1	0	**100**	1	0	**100**	
36	RSEJ3PL	1	1	**100**	1	0	**100**	1	0	**100**	1	0	**100**	
37	SALAL-NH	1	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	

38	SBSRPC-11	1	1	**100**	1	0	**100**	1	0	**100**	1	0	**100**	DR/EL & Tripping report needs to be submitted
39	SEWA-2-NH	2	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	
40	SHREE CEMENT	1	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	
41	SINGRAULI-NT	4	0	**0**	4	0	**100**	4	0	**100**	4	0	**100**	DR/EL & Tripping report needs to be submitted
42	SLDC-DV	20	6	**30**	8	1	**0**	8	1	**0**	8	0	**40**	
43	SLDC-HP	6	0	**0**	0	3	**0**	0	2	**0**	0	0	**0**	
44	SLDC-HR	16	0	**0**	0	1	**0**	0	1	**0**	0	0	**0**	
45	SLDC-JK	28	0	**0**	28	0	**100**	28	0	**100**	28	0	**100**	DR/EL & Tripping report needs to be submitted
46	SLDC-PS	16	5	**31**	9	1	**60**	9	0	**56**	14	0	**88**	
47	SLDC-RS	85	7	**8**	48	0	**56**	48	0	**56**	48	0	**56**	
48	SLDC-UK	11	3	**27**	2	3	**25**	3	3	**38**	3	1	**30**	
49	SLDC-UP	91	14	**15**	17	11	**21**	17	23	**25**	16	6	**19**	
50	STERLITE	13	1	**8**	0	6	**0**	0	6	**0**	1	6	**14**	
51	UNCHAHAR-NT	1	1	**100**	1	0	**100**	1	0	**100**	1	0	**100**	
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	27.10.2020,10.02.2012 1	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)	12/19/2018	12/19/2018	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)	5/20/2017	5/20/2017	YES	--	3rd Quarter
4	**NTPC**					
	Rihand (Unit1#500)	3/3/2017	3/3/2017	YES	Next test will be done during re-commissioning of unit after O/H	3rd Quarter
	Rihand (Unit2#500)	7/2/2016	7/2/2016	YES	Next test will be done during re-commissioning of unit after O/H	3rd Quarter
	Rihand (Unit3#500)	8/15/2015	8/15/2015	YES	Next test will be done during re-commissioning of unit after O/H	3rd Quarter
	Rihand (Unit4#500)	5/25/2017	5/25/2017	YES	Next test will be done during re-commissioning of unit after O/H	3rd Quarter
	Rihand (Unit4#500)	12/11/2014	12/11/2014	YES	Next test will be done during re-commissioning of unit after O/H	3rd Quarter
	Rihand (Unit5#500)	12/11/2014	12/11/2014	YES	Next test will be done during re-commissioning of unit after O/H	3rd Quarter

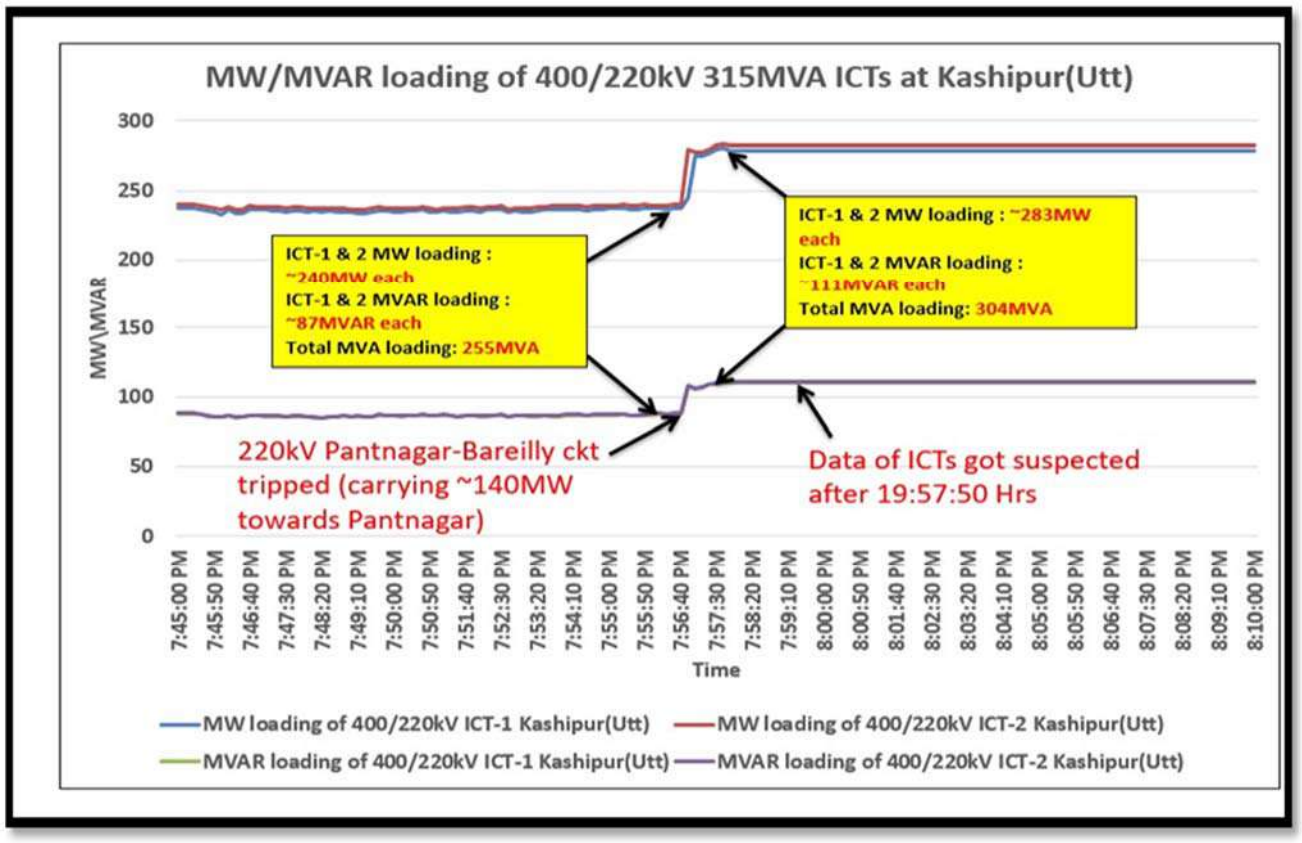
	SINGRAULI STPS(Unit1#200)	-	-	-	Not done in last three years	
	SINGRAULI STPS(Unit2#200)	-	-	-	Not done in last three years	
	SINGRAULI STPS(Unit3#200)	-	-	-	Not done in last three years	
	SINGRAULI STPS(Unit4#200)	-	-	-	Not done in last three years	
	SINGRAULI STPS(Unit5#200)	-	-	-	Not done in last 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)	3/29/2016	3/29/2016	YES	--	3rd Quarter
	UNCHAHAR II TPS(unit1# 210)	7/13/2019	7/13/2019	YES	--	
	UNCHAHAR II TPS(unit2# 210)	8/10/2018	10-08-2018	YES	--	3rd Quarter
	UNCHAHAR UNIT6#500	-	31.03.2017	YES	--	3rd Quarter
	KOLDAM HPS(4 * 200)	7/1/2015	7/1/2015	YES	--	3rd Quarter
	DADRI GPS(2 * 154.51) (ST- Steam Turbine)	-	11/18/2015	YES	--	3rd Quarter
	ANTA GPS(3 * 88.71)(GT- Gas Turbine)	8/8/2014	8/8/2014	YES	--	3rd Quarter
	ANTA GPS(1 * 153.2)(ST- Steam Turbine)	8/8/2014	8/8/2014	YES	--	3rd Quarter
5	**Aravali Power Company Private Ltd**					
	ISTPP (JHAJJAR)(3 * 500)	-	8/25/2015	YES	--	3rd Quarter
6	**NHPC**					
	CHAMERA HPS (3*180)	8/6/2020	12/27/2019	YES	--	
	CHAMERA II HPS(3 * 100)	10/11/2015	10/11/2015	NO	Replacement of Excitation system in two units	3rd Quarter
	CHAMERA III HPS(Unit1#77)	10/29/2015	1/7/2012	YES	--	3rd Quarter
	CHAMERA III HPS(Unit2,3#77)	10/29/2015	6/19/2012	YES	--	3rd Quarter
	PARBATI III HEP (Unit1# 130)	1/21/2016	1/21/2016	YES	Have been done recetly. The report on PSS turning shall be submitted seperately.	3rd Quarter
	DULHASTI HPS(Unit2#130)	1/21/2020	1/21/2020	YES	--	
	DULHASTI HPS(Unit1#130)	12/29/2019	12/29/2019	YES	--	
	URI HPS(Unit3# 120)	1/10/2021	1/10/2021	YES	--	
	URI HPS(Unit4# 120)	2/15/2021	2/15/2021	YES	--	
	URI HPS(Unit2# 120)	3/7/2016	3/7/2016	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)	12/16/2014	12/16/2014	YES	--	3rd Quarter
	KISHANGANGA(3 * 110)	18-05-20 18	18-05-20 18	YES	--	3rd Quarter
	BAIRASIUL HPS(3 * 60)	7/30/2015	7/30/2016	YES	--	3rd Quarter
	SEWA-II HPS(3 * 40)	7/9/2016	7/9/2016	YES	--	3rd Quarter
	PARBATI III HEP(4 * 130)	12/16/2016	12/16/2016	YES	--	3rd Quarter
	TANAKPUR HPS(Unit1# 31.42)	1/9/2015	1/9/2015	YES	--	3rd Quarter
	TANAKPUR HPS(Unit2,3#31.4)	5/24/2014	5/24/2014	YES	--	3rd Quarter
	DHAULIGANGA HPS(Unit1 ,2# 70)	5/4/2014	4/17/2018	YES	--	3rd Quarter
	DHAULIGANGA HPS(Unit3,4# 70)	6/26/2014	4/17/2018	YES	--	3rd Quarter
7	**PUNJAB**					
	RAJPURA(NPL) TPS(2 * 700)	4/22/2014	4/22/2014	YES	--	3rd Quarter
8	**Rajasthan**					
	KAWAI TPS(Unt1# 660)	8/8/2014	8/8/2014	YES	--	3rd Quarter
	KAWAI TPS(Unt2# 660)	10/9/2014	10/9/2014	YES	--	3rd Quarter
	CHHABRA TPS(Unit 1#250)	5/22/2018	5/22/2018	NO	--	3rd Quarter
	CHHABRA TPS(Unit 2,3,4#250)	10/4/2015	10/4/2015	NO	--	3rd Quarter
	CHHABRA TPS(Unit5# 660)	2/10/2016	2/10/2016	YES	--	3rd Quarter
	CHHABRA TPS(Unit6# 660)	7/28/2018	7/28/2018	YES	--	3rd Quarter
	KALISINDH TPS(Unit1# 600)	2/10/2016	2/10/2016	YES	--	3rd Quarter
	KALISINDH TPS(Unit2# 600)	2/8/2016	2/8/2016	YES	--	3rd Quarter
	KOTA TPS(Unit1#110)					3rd Quarter

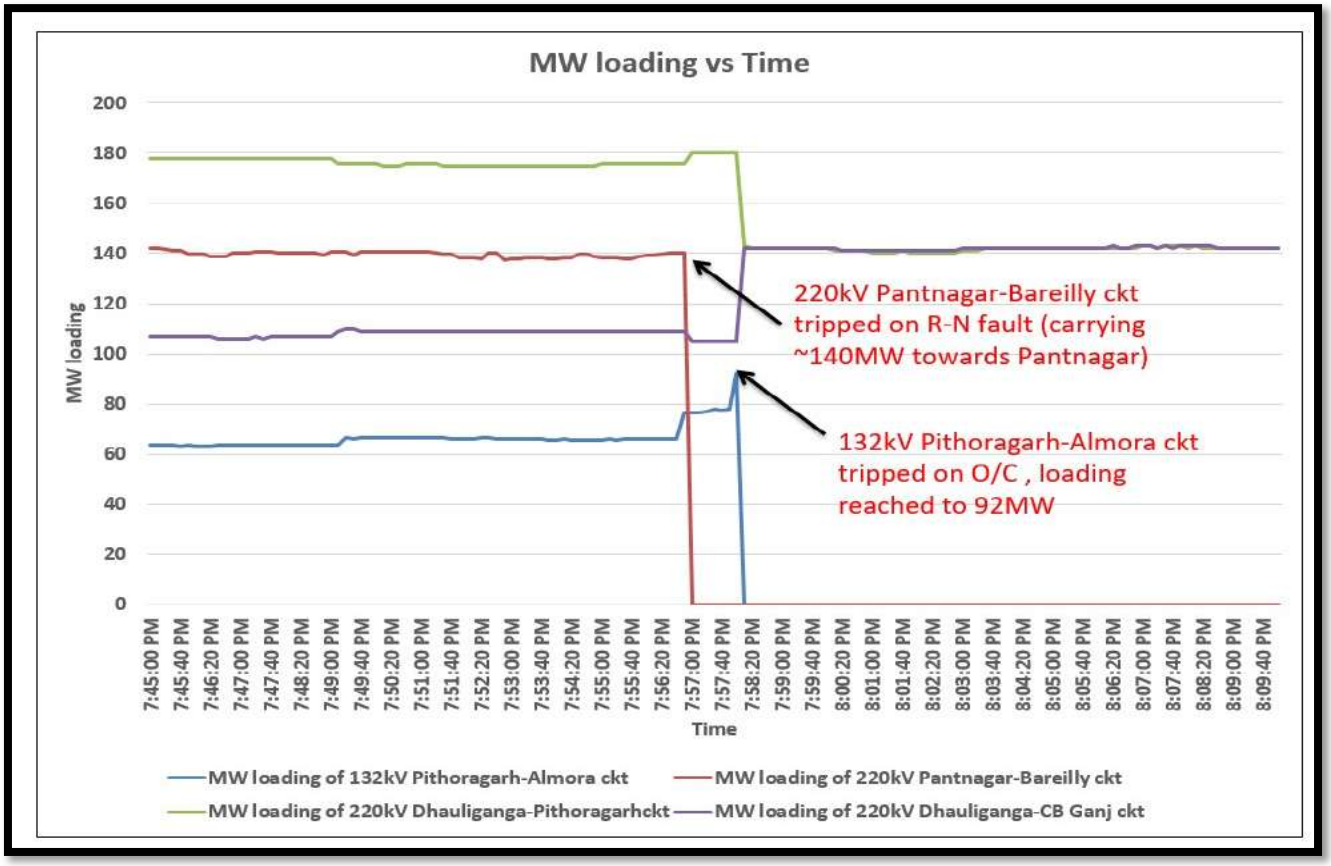
	KOTA TPS(Unit2#110)	PSS tuning and step response test of Unit#1,2,3,4,6&7 were sucessfully done on 02.03.22 to 04.03.22		YES	--	3rd Quarter
	KOTA TPS(Unit3#195)				--	
	KOTA TPS(Unit4#195)				--	
	KOTA TPS(Unit6#110)				--	3rd Quarter
	KOTA TPS(Unit7#110)				--	3rd Quarter
	SURATGARH TPS (Unit5#250)	3/14/2022	3/14/2022	Yes	--	3rd Quarter
	SURATGARH TPS (Unit2,4#250)	6/6/2022		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)	4/26/2016	4/26/2016	No	--	3rd Quarter
	RAJWEST (IPP) LTPS(Unit2# 135)	7/14/2016	7/14/2016	No	--	3rd Quarter
	RAJWEST (IPP) LTPS(Unit3# 135)	1/3/2014	1/3/2014	No	--	3rd Quarter
	RAJWEST (IPP) LTPS(Unit4# 135)	11/3/2015	11/3/2015	No	--	3rd Quarter
	RAJWEST (IPP) LTPS(Unit5# 135)	9/21/2014	9/21/2014	No	--	3rd Quarter
	RAJWEST (IPP) LTPS(Unit6# 135)	8/14/2014	8/14/2014	No	--	3rd Quarter
	RAJWEST (IPP) LTPS(Unit7# 135)	2/20/2016	2/20/2016	No	--	3rd Quarter
	RAJWEST (IPP) LTPS(Unit8# 135)	6/11/2014	6/11/2014	No		3rd Quarter
9	**UTTAR PRADESH**					
	ANPARA-C TPS(Unit1# 600)	8/22/2015	8/22/2015	Yes	--	3rd Quarter
	ANPARA-C TPS(Unit2# 600)	3/8/2016	3/8/2016	Yes	--	3rd Quarter
	ROSA TPS(Unit1 #300)	10/5/2021	10/5/2021	Yes	--	
	ROSA TPS(Unit2# 300)	18/2/2018	18/2/2018	Yes	--	4th Quarter
	ROSA TPS(Unit3 # 300)	2/3/2017	2/3/2017	Yes	--	4th Quarter
	ROSA TPS(Unit4# 300)	10/5/2021	10/5/2021	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 January,		-	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.	

Annexure-IX

Sr. No	Elements Name	Date and Time	Remarks
1	1. 1) 400/220 kV 315 MVA ICT 1 at Kashipur(UK) 2. 2) 400/220 kV 315 MVA ICT 2 at Kashipur(UK)	29 June 2022 at 11:38 Hrs	400/220KV 315MVA ICT-1 & ICT-2 at Kashipur tripped on over current protection operation
2	1. 1) 400/220 kV 315 MVA ICT 1 at Kashipur(UK) 2. 2) 400/220 kV 315 MVA ICT 2 at Kashipur(UK) 3. 220 KV Pantnagar(UK)-Bareilly(UP) (UP) Ckt 4. 132 KV Pithoragarh (PG)-Almora (PTCUL) (PTCUL) Ckt	12 July 20212 at 19:56 Hrs	220 KV Pantnagar(UK)-Bareilly(UP) (UP) Ckt tripped on R-N phase to earth fault and 400/220KV 315MVA ICT-1 & ICT-2 at Kashipur and 132 KV Pithoragarh (PG)-Almora (PTCUL) (PTCUL) Ckt tripped on over current protection operation




MW loading vs Time
MW loading
200
180
160
140
120
100
80
60
40
20
0
7:45:00 PM
7:45:40 PM
7:46:20 PM
7:47:00 PM
7:47:40 PM
7:48:20 PM
7:49:00 PM
7:49:40 PM
7:50:20 PM
7:51:00 PM
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7:59:00 PM
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8:01:00 PM
8:01:40 PM
8:02:20 PM
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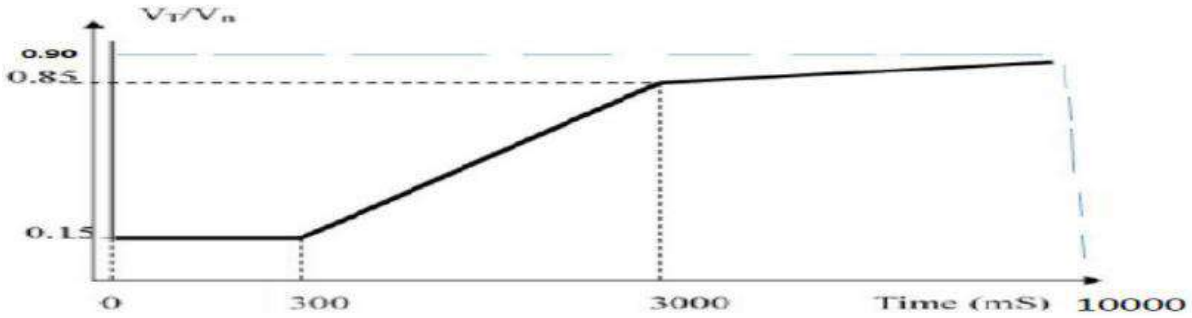
8:03:40 PM
8:04:20 PM
8:05:00 PM
8:05:40 PM
8:06:20 PM
8:07:00 PM
8:07:40 PM
8:08:20 PM
8:09:00 PM
8:09:40 PM
Time
220kV Pantnagar-Bareilly ckt tripped on R-N fault (carrying ~140MW towards Pantnagar)
132kV Pithoragarh-Almora ckt tripped on O/C , loading reached to 92MW
MW loading of 132kV Pithoragarh-Almora ckt
MW loading of 220kV Pantnagar-Bareilly ckt
MW loading of 220kV Dhauliganga-Pithoragarhckt
MW loading of 220kV Dhauliganga-CB Ganj ckt

Solar Generation loss event on 09.07.2022
Assessment of LVRT & HVRT Performance of RE Generators

On 09.07.2022 at 13:42 hrs multiple element tripping happened in Rajasthan solar complex and drop in solar generation of approx. 3485MW also took place. The sequence of events was as below:

- At 13:42hrs, 400 KV Bikaner(PG)-Bikaner(RS) (PG) Ckt-1 tripped on R-Y phase to phase fault. As per DR received from Bikaner(PG) end, fault current was ~12kA. As per PMU at Fatehgarh2(PG), R-Y phase to phase fault which cleared within 80ms is observed.
- At the same time, 400 KV Avaada Pooling SL_BKN_PG (AEPL)-Bikaner(PG) (AEPL) Ckt-1 (carrying 727MW) also tripped on maloperation of SOTF protection. With the tripping of line, solar generation of approx. 727MW at Avaada also tripped due to loss of evacuation path.
- During same time, drop in solar generation is observed at many other RE stations connected at different RE pooling stations. Drop in total solar generation was approx. 3485MW (including Avaada solar generation).
- Within around 03 mins approx. 2300MW solar generation recovered.
- Further after 5secs of fault, over voltage occurred due to significant generation drop and 765 KV Bhadla_2 (PG)-Fatehgarh_II(PG) (PFTL) Ckt-1 tripped on over voltage protection operation at Bhadla2 end.

As per CEA Technical Standards for connectivity to Grid 2019, *The RE generating stations connected to the grid, shall remain connected to the grid when voltage at the interconnection point on any or all phases dips up to the level depicted by the thick lines in the following curve, namely: —*
VT : Actual Voltage; Vn: Nominal Voltage—

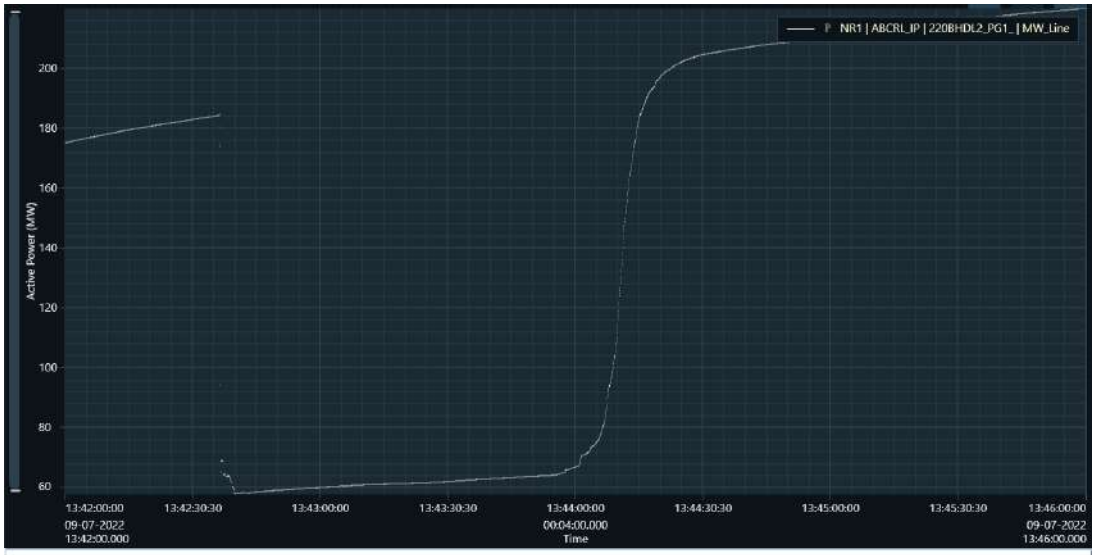


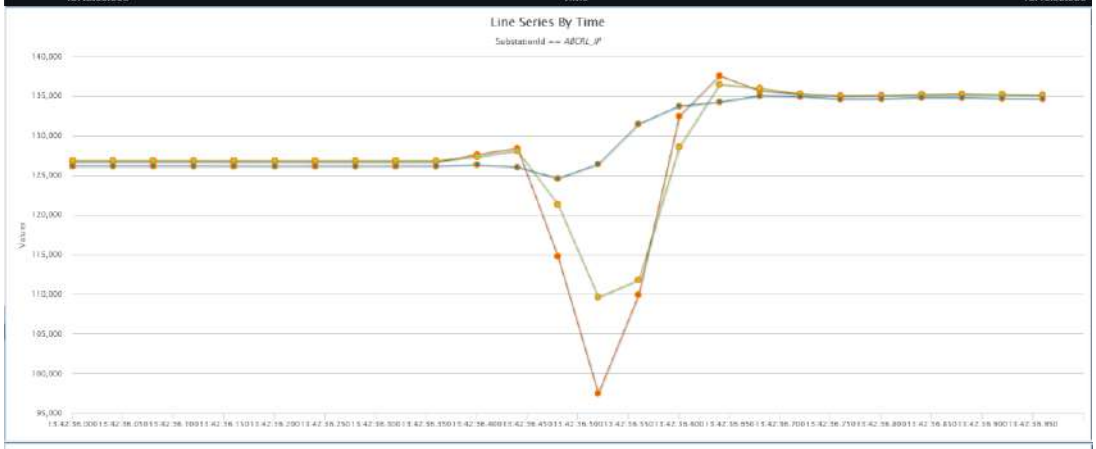
Provided that during the voltage dip, the supply of reactive power has first priority, while the supply of active power has second priority and the active power preferably be maintained during voltage drops, provided, a reduction in active power within the plant's design specifications is acceptable and active power be restored to at least 90% of the pre-fault level within 1 sec of restoration of voltage.
The generating station connected to the grid, shall remain connected to the grid when voltage at the interconnection point, on any or all phases (symmetrical or asymmetrical overvoltage conditions) rises above the specified values given below for specified time —

Over voltage (pu)	Minimum time to remain connected (Seconds)
1.30 < V	0 Sec (Instantaneous trip)
1.30 ≥ V > 1.20	0.2 Sec
1.20 ≥ V >1.10	2 Sec
V ≤ 1.10	Continuous

As fault in the system for subject event was cleared within 80 ms, therefore as is evident from curve and table above Generation drop is allowed only if voltage at the point of interconnection drops below 0.15 PU under LVRT and Generation drop is allowed only if voltage sustains above 1.1PU for 2 secs.

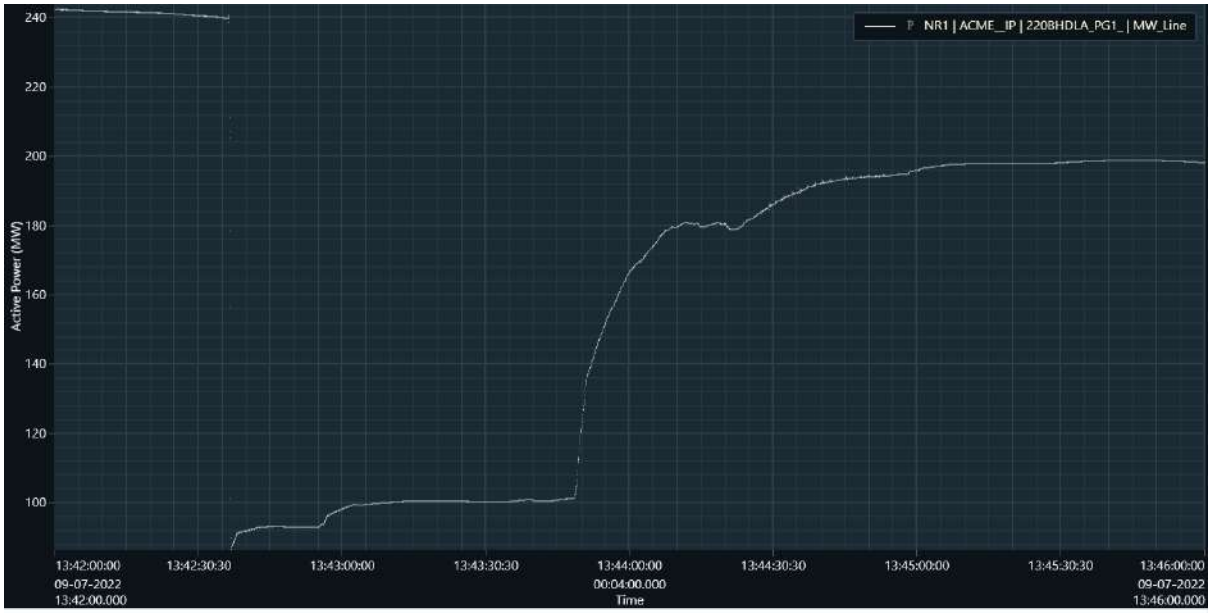
Input from PMUs installed at RE generator end were used for said analysis.
Accordingly Voltage at point of interconnection of all the RE generators and Active power being injected by each generator were analysed and followings were the observations:

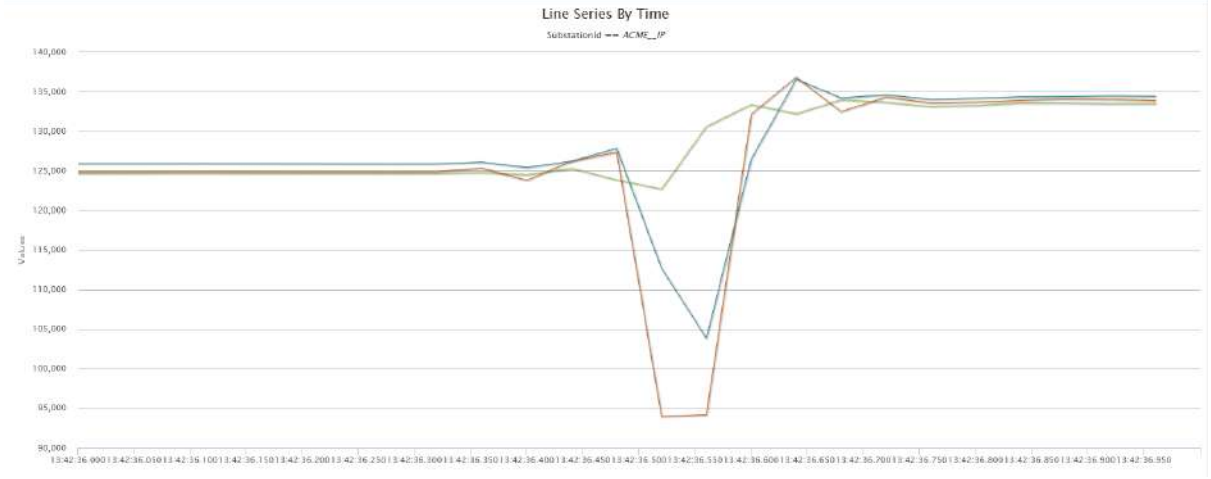




ABCRL:

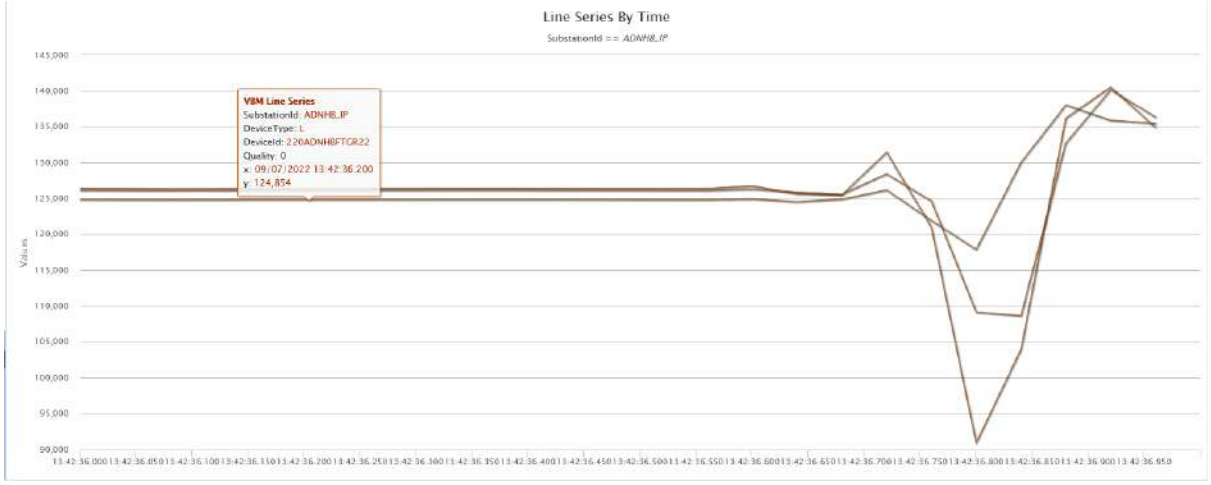
Voltage dipped to 0.76PU on lower side and 1.07PU on higher side. Generation dropped from 180 MW to 60 MW and came back after 2 mins. Generator is LVRT/HVRT non-compliant.

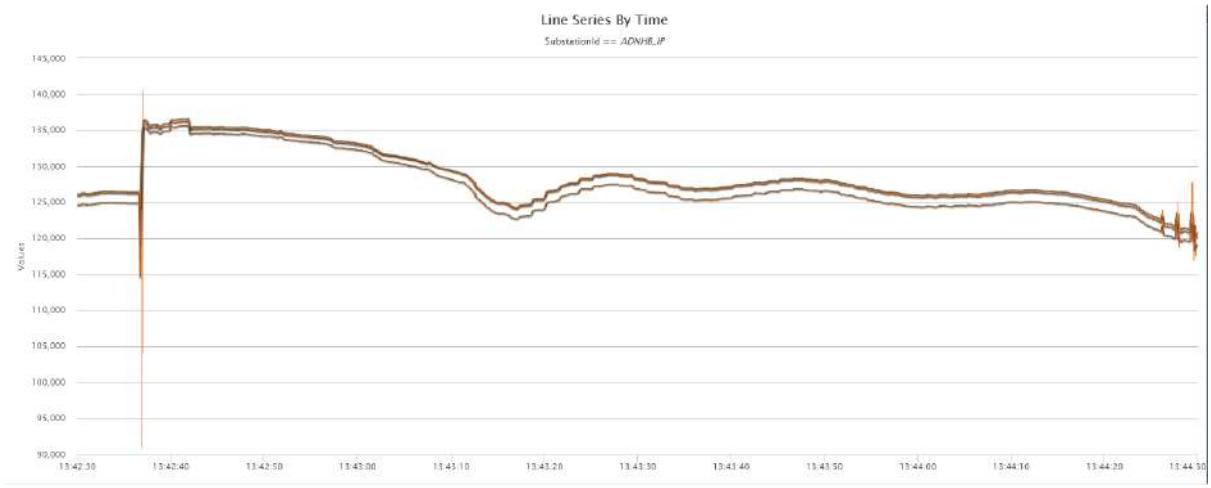




ACME:

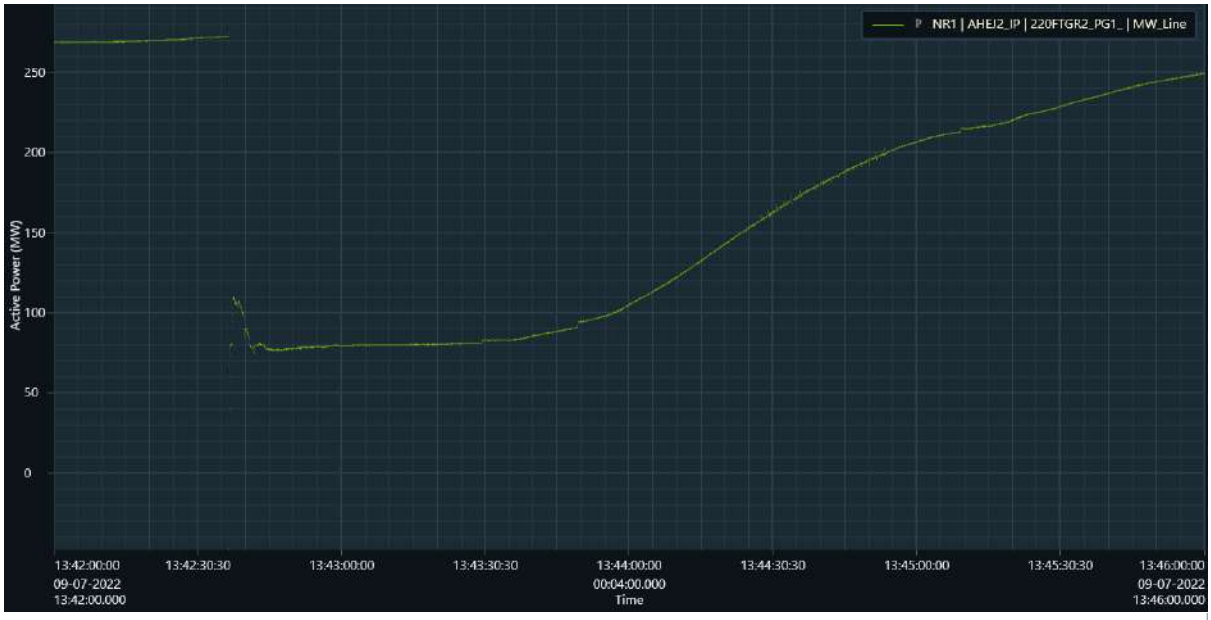
Voltage dipped to 0.74PU on lower side and 1.07PU on higher side. Generation dropped from 240 MW to 0 MW and came back after 2 mins. Generator is LVRT/HVRT non-compliant.

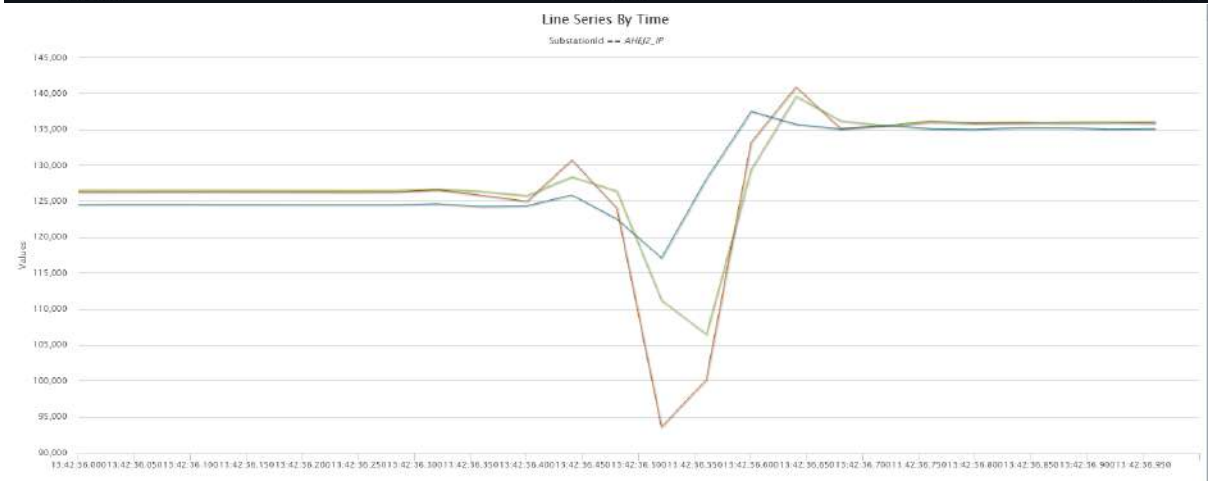


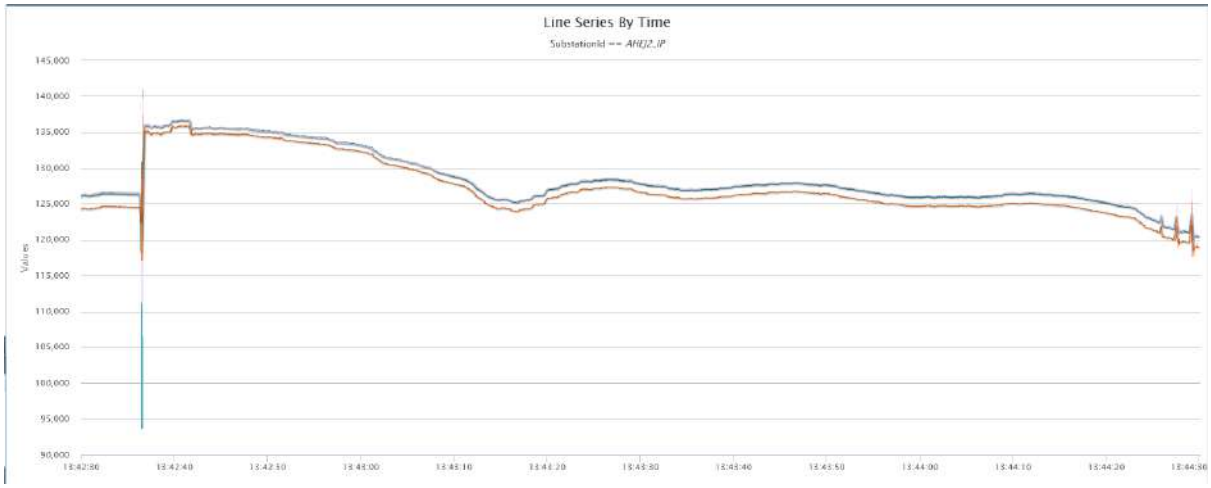


ADNHB:

Voltage dipped to 0.73PU on lower side and 1.10PU on higher side, sustained on higher side for less than 40 ms. Generation dropped from 180 MW to 60 MW and came back after 1 min. Generator is LVRT/HVRT non-compliant.

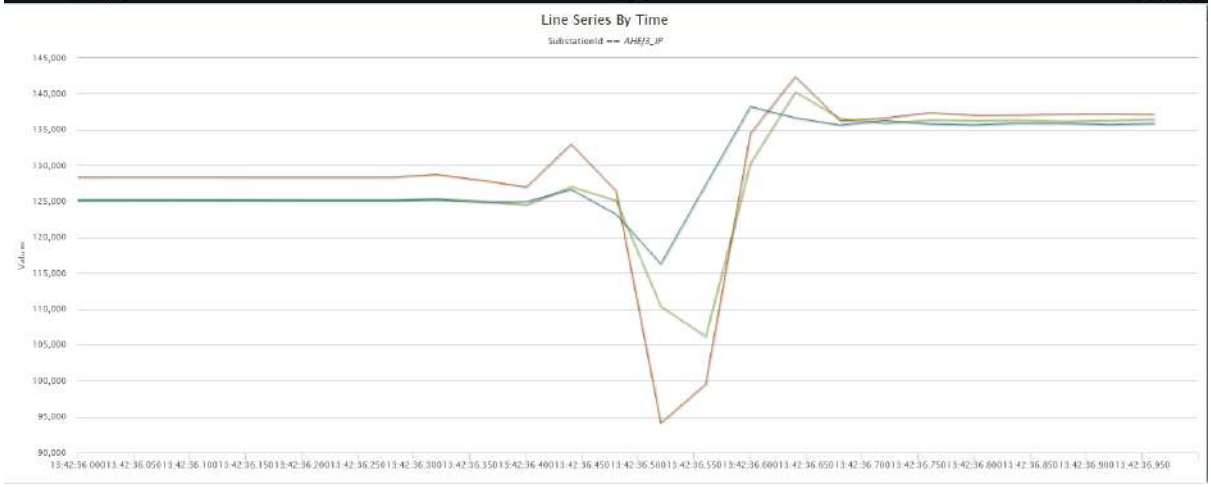






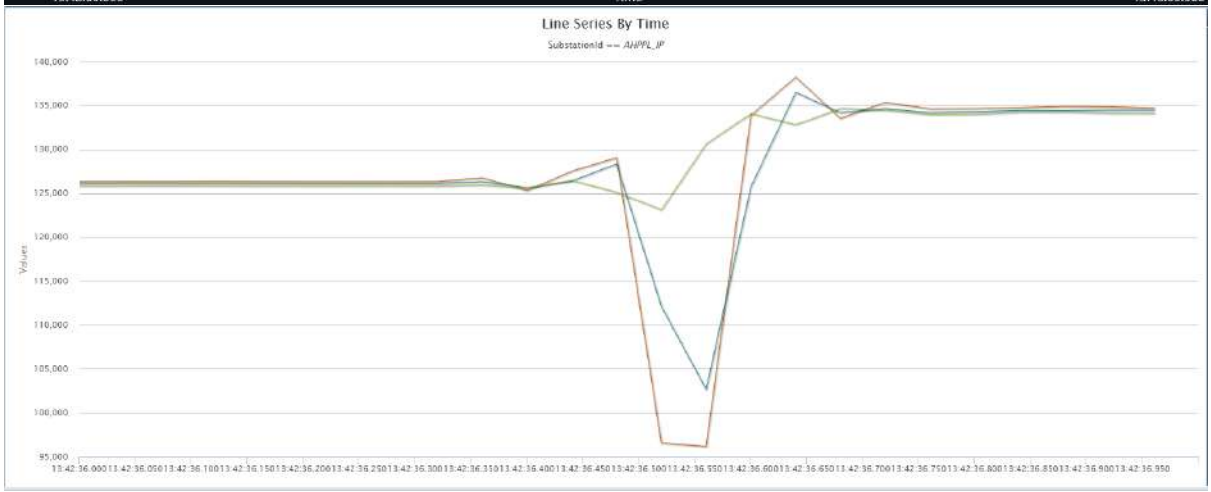
AHEJ2:

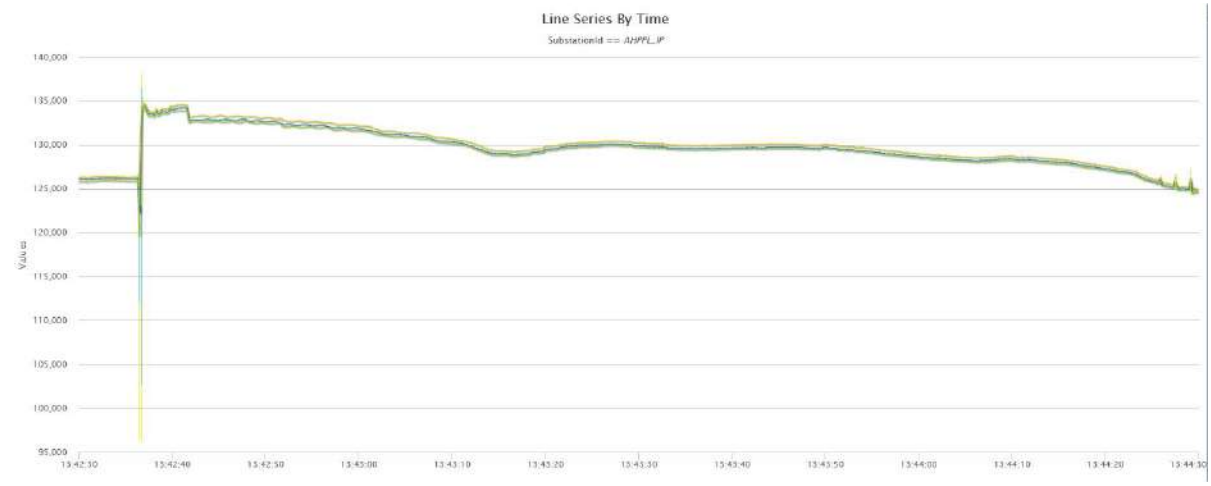
Voltage dipped to 0.74PU on lower side and 1.11PU on higher side, sustained on high level for less than 40 ms. Generation dropped from 265 MW to 70 MW and came back after 5 mins. Generator is LVRT/HVRT non-compliant.



AHEJ3:

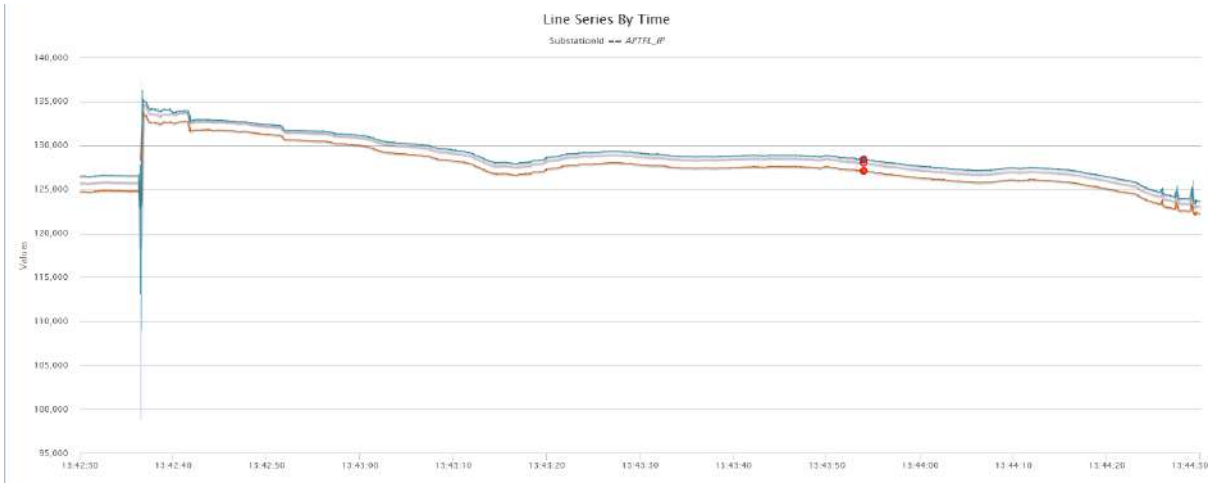
Voltage dipped to 0.74PU on lower side and 1.11PU on higher side, sustained on high value for less than 40 ms. Generation dropped from 300 MW to 70 MW and came back after 4 mins. Generator is LVRT/HVRT non-compliant.





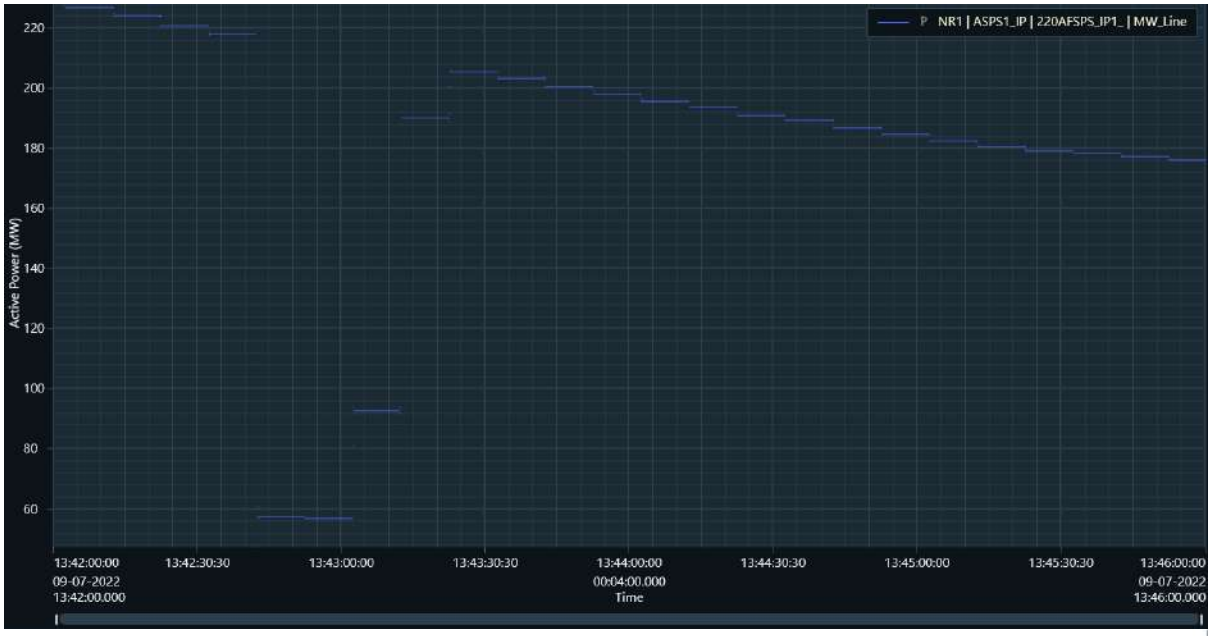
AHPPL:

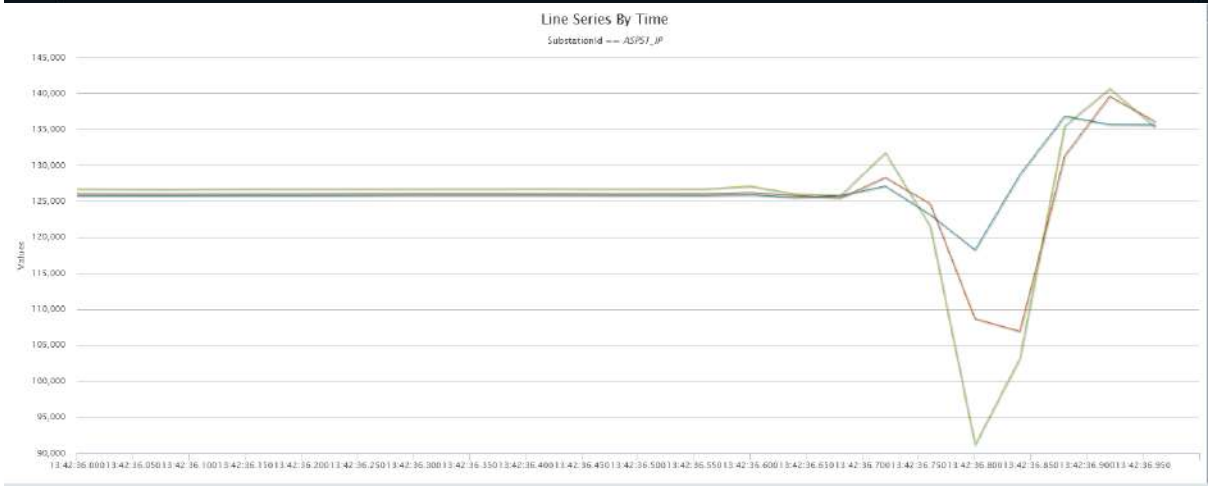
Voltage dipped to 0.75PU on lower side and went to 1.08PU on higher side. Generation dropped from 156 MW to 140 MW and came back after 3 mins. Generator is LVRT/HVRT non-compliant.



APTFL:

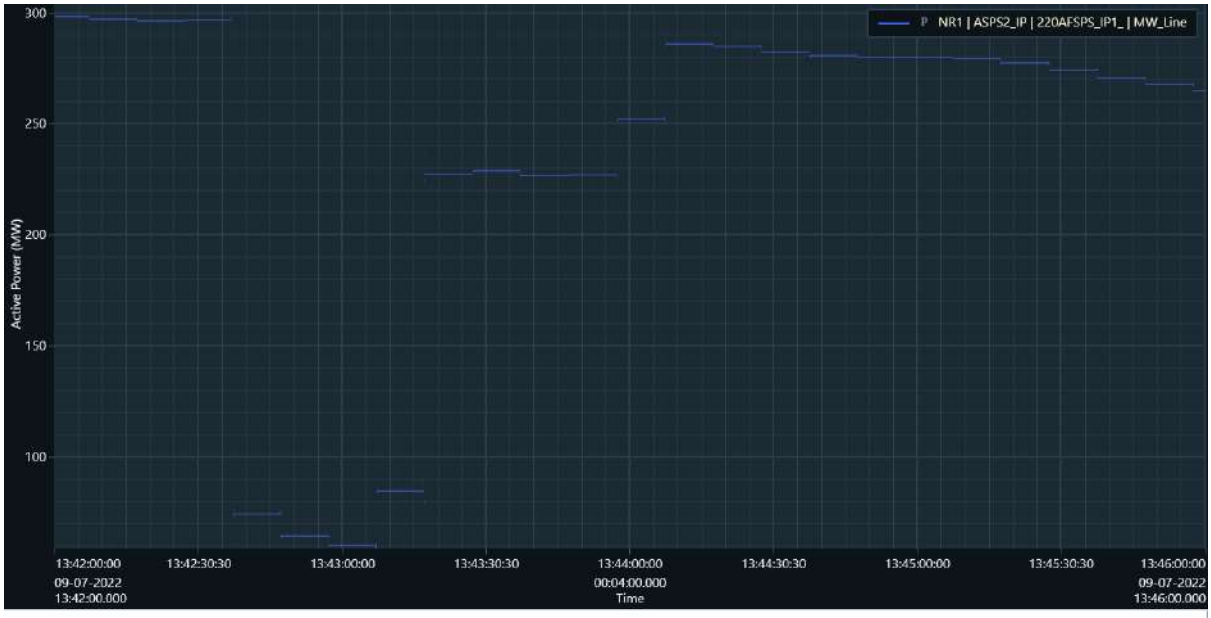
Voltage dipped to 0.78PU on lower side and 1.08PU on higher side. Generation dropped from 110 MW to 0 MW and came back after 3 mins. Generator is LVRT/HVRT non-compliant.

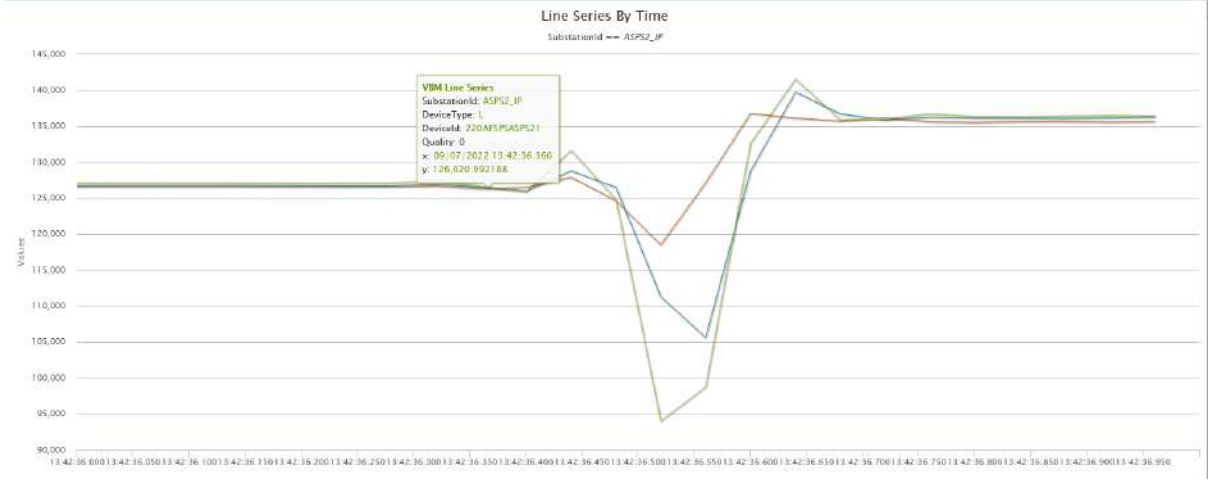




ASPS1:

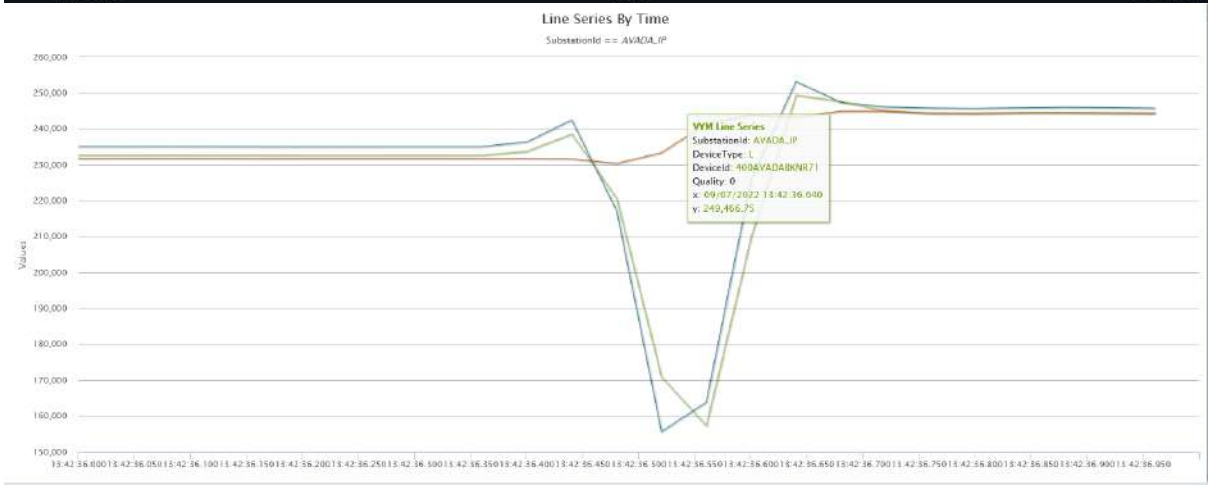
Voltage dipped to 0.70PU on lower side and 1.11 PU on higher side, sustained on higher side for less than 40 ms. Generation dropped from 220 MW to 60 MW and came back after 1 mins. Generator is LVRT/HVRT non-compliant.

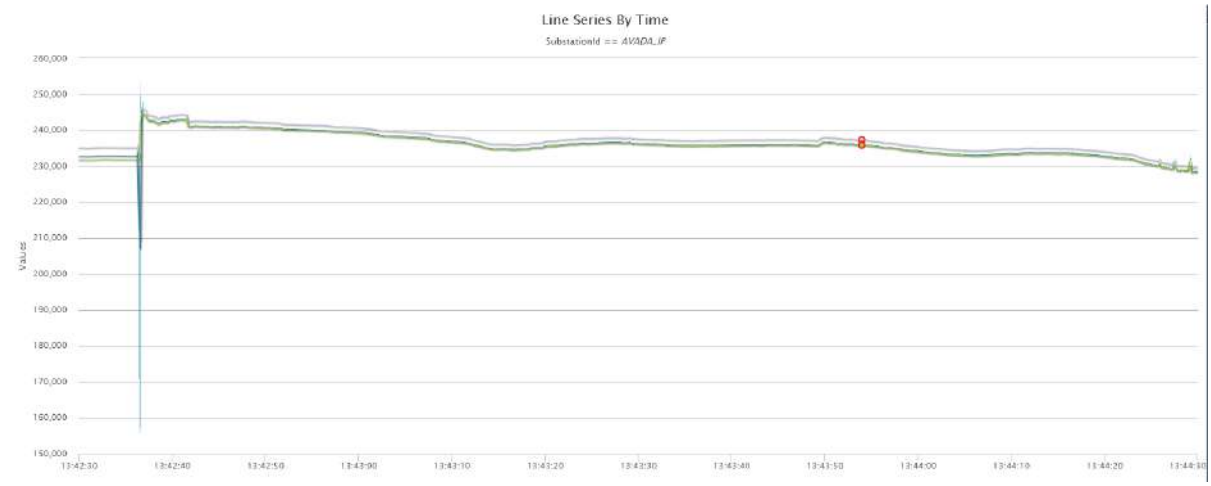




ASPS2:

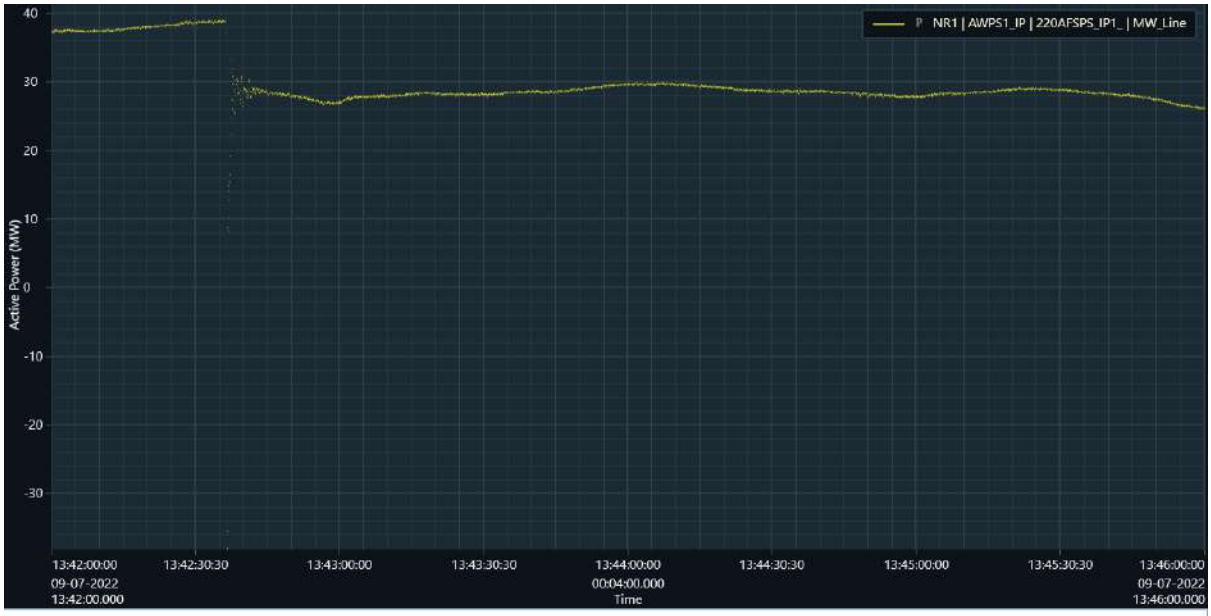
Voltage dipped to 0.74PU on lower side and 1.11PU on higher side, sustained on higher side for less than 40 ms. Generation dropped from 300 MW to 50 MW and came back after 1.5 mins. Generator is LVRT/HVRT non-compliant.

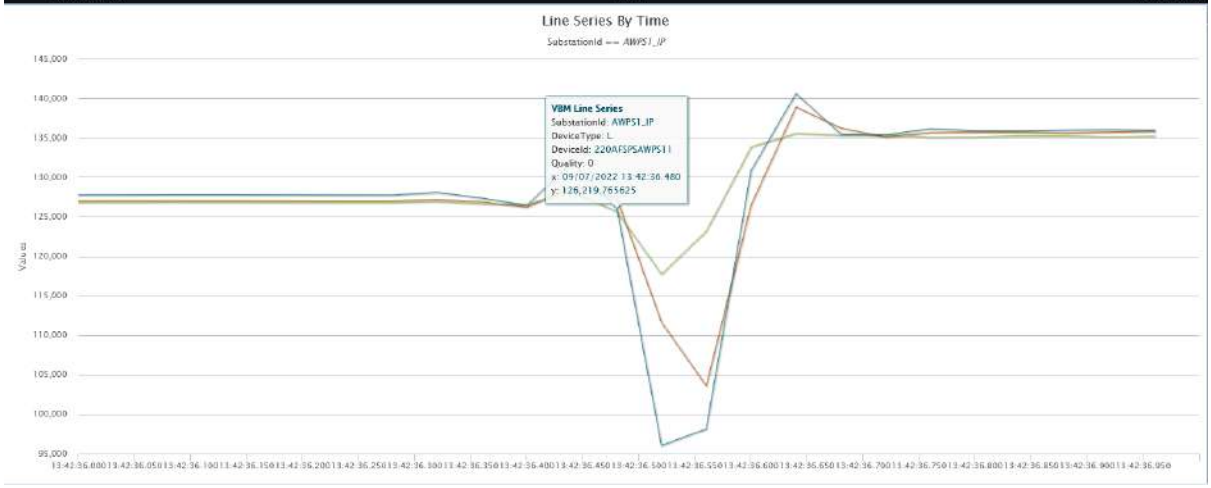




AVADA:

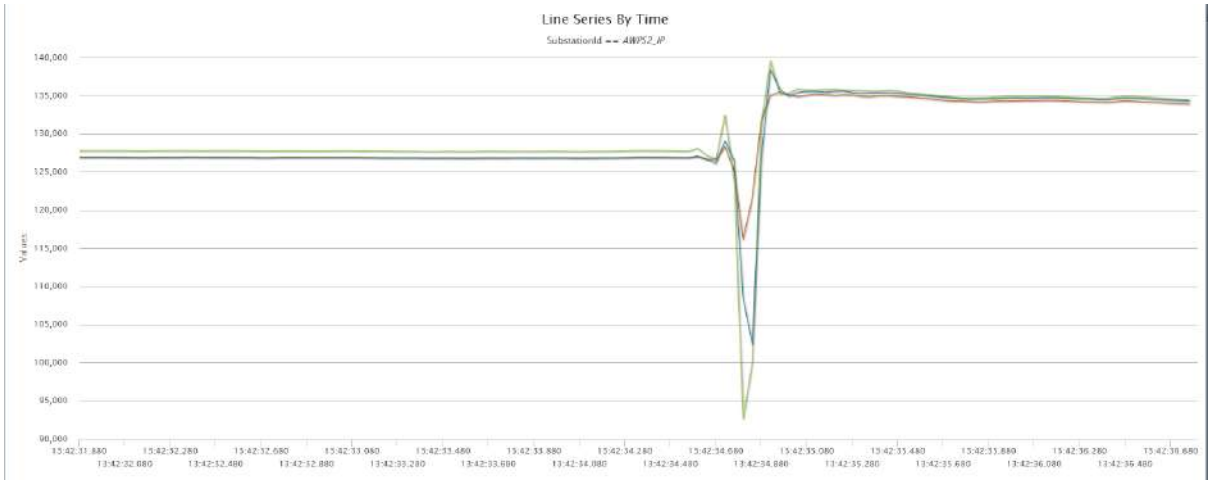
Generator got disconnected as 220 Line tripped on Protection Mal-operation.





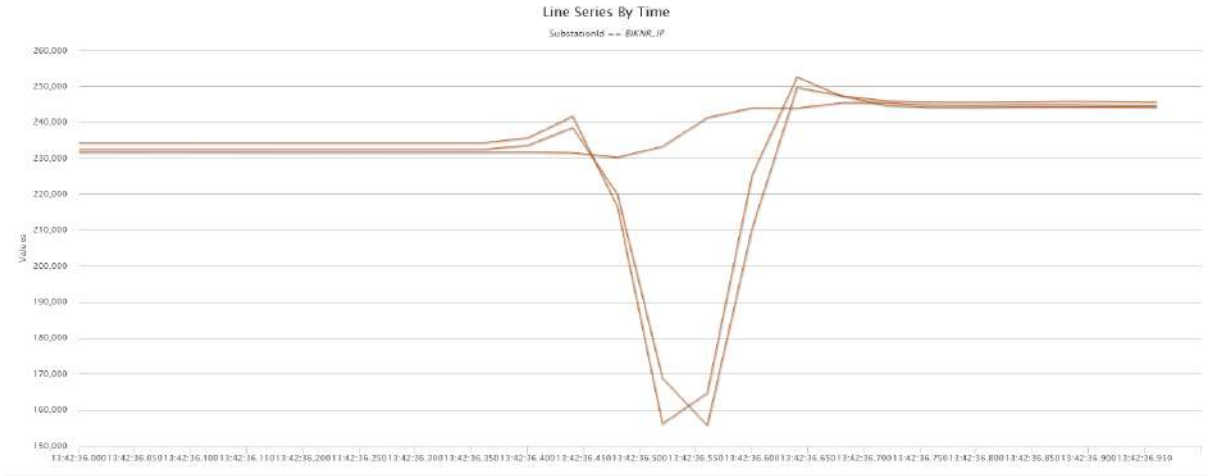
AWPS1:

Voltage dipped to 0.74PU on lower side and 1.10PU on higher side, sustained on higher side for less than 40 ms. Generation dropped from 40 MW to 30 MW and Didn't came back. Generator is LVRT/HVRT non-compliant.



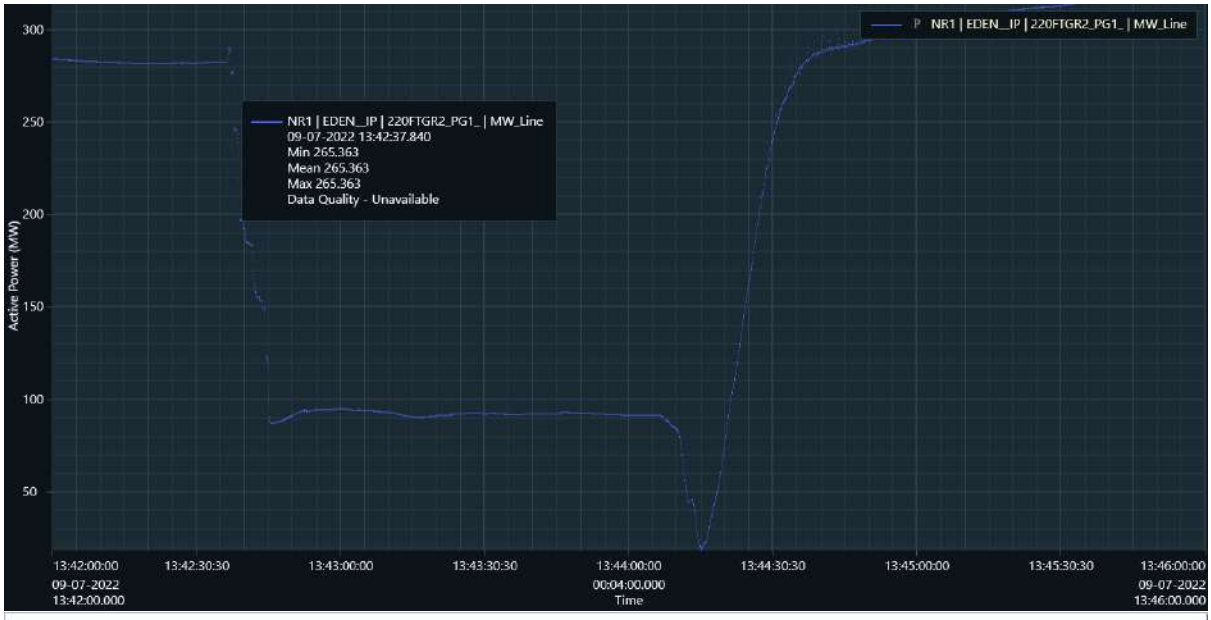
AWPS2:

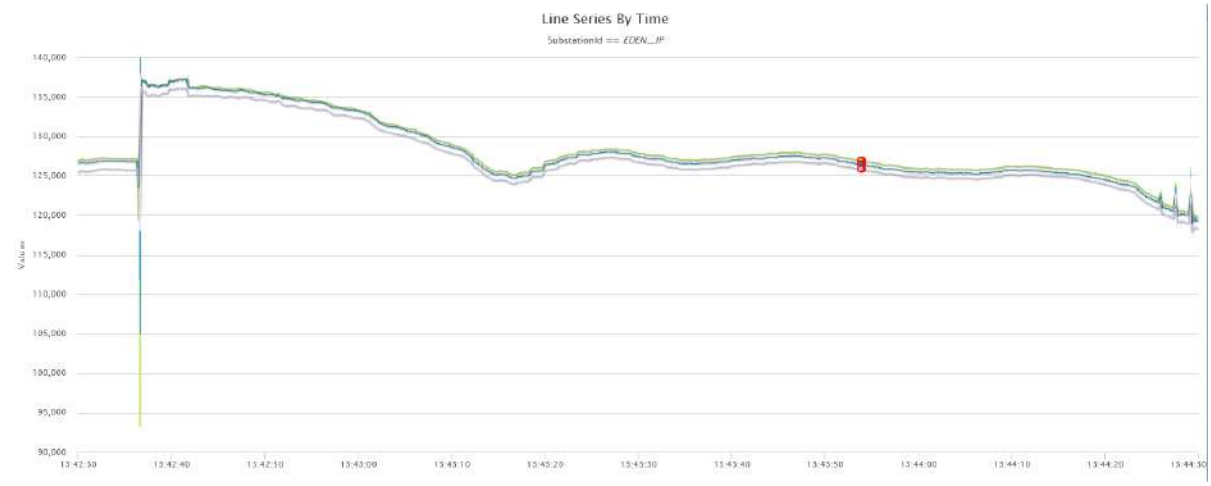
Voltage dipped to 0.74PU on lower side and 1.09PU on higher side. No drop in generation.
Generator is LVRT/HVRT compliant.



BIKNR:

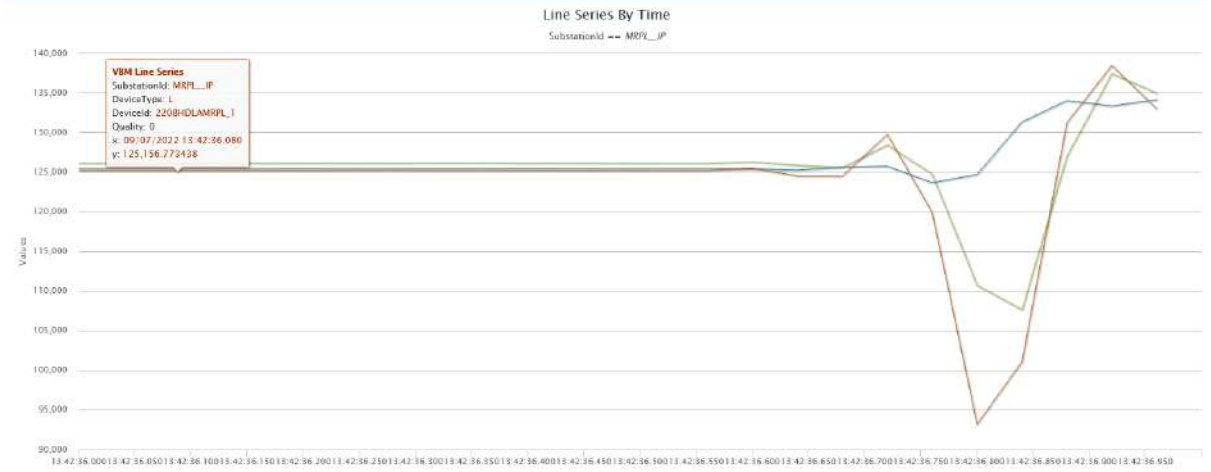
Voltage dipped to 0.62PU on lower side and 1.08PU on higher side. Generation dropped from 140 MW to 0 MW and came back after 3 mins. Generator is LVRT/HVRT non-compliant.

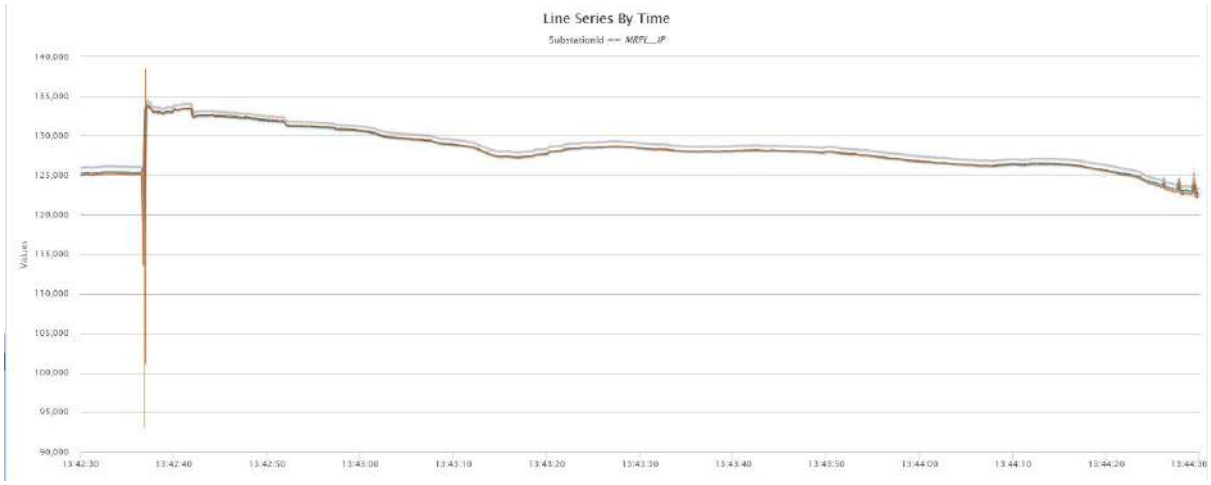




EDEN:

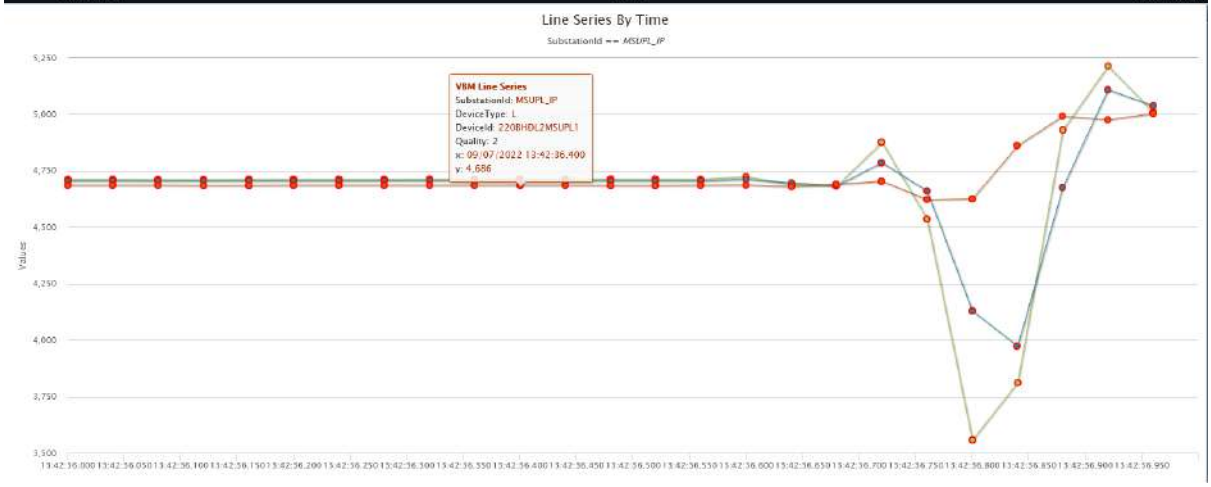
Voltage dipped to 0.73PU on lower side and 1.10PU on higher side, sustained on higher side for less than 40 ms. Generation dropped from 280 MW to 0 MW and came back after 2 mins. Generator is LVRT/HVRT non-compliant.





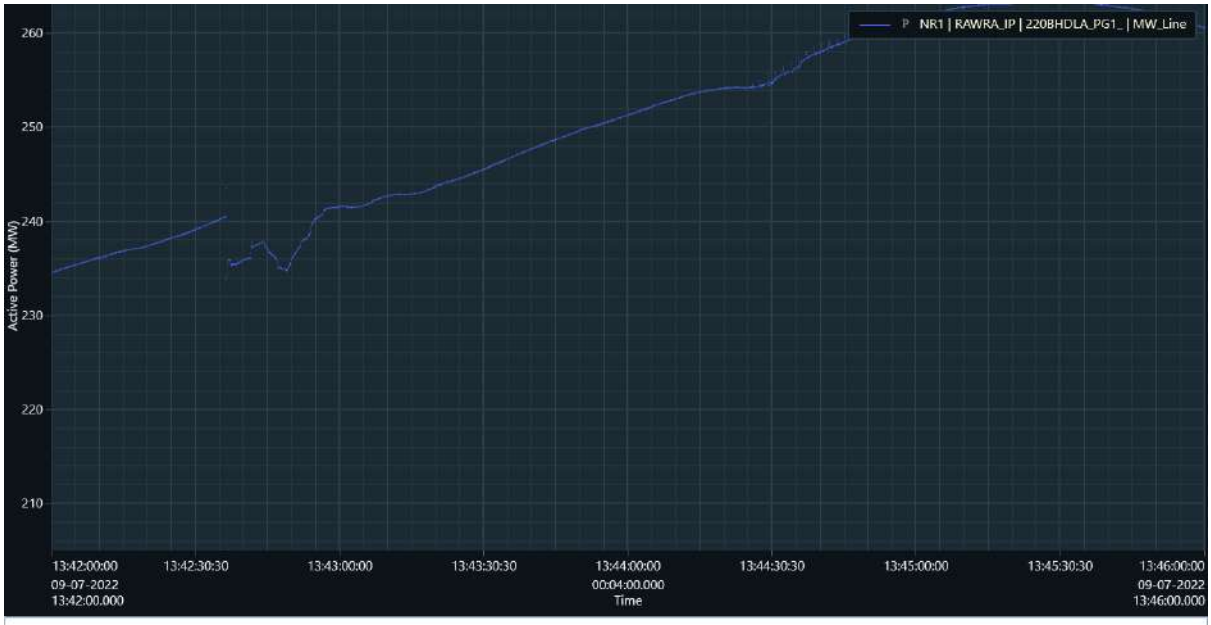
MRPL:

Voltage dipped to 0.76PU. Generation was already 0MW.



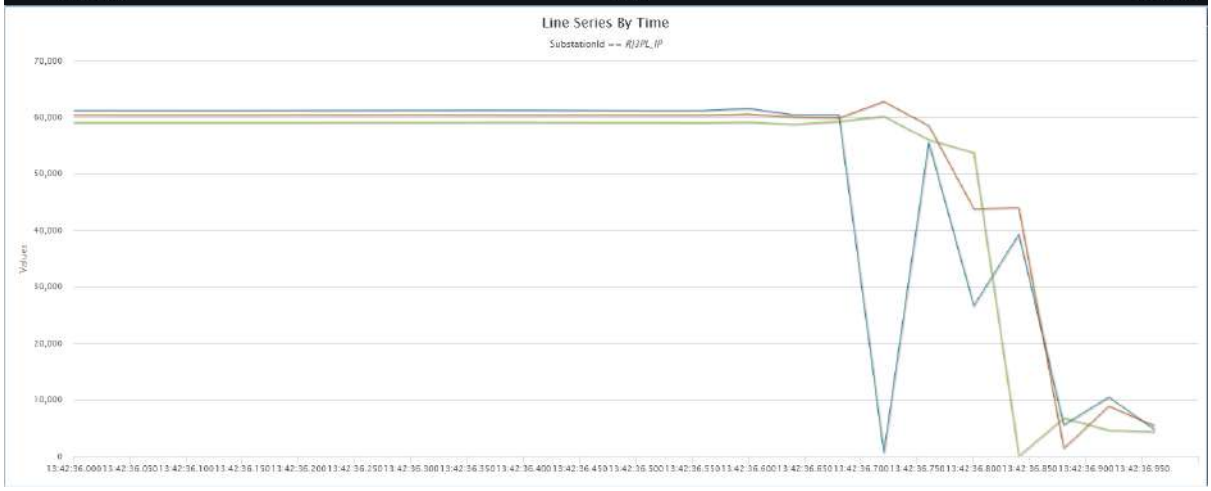
MSUPL:

Correct voltage phasor not being reported. Generation dropped from 220 MW to 0 MW and didn't come back. Generator is LVRT/HVRT non-compliant.



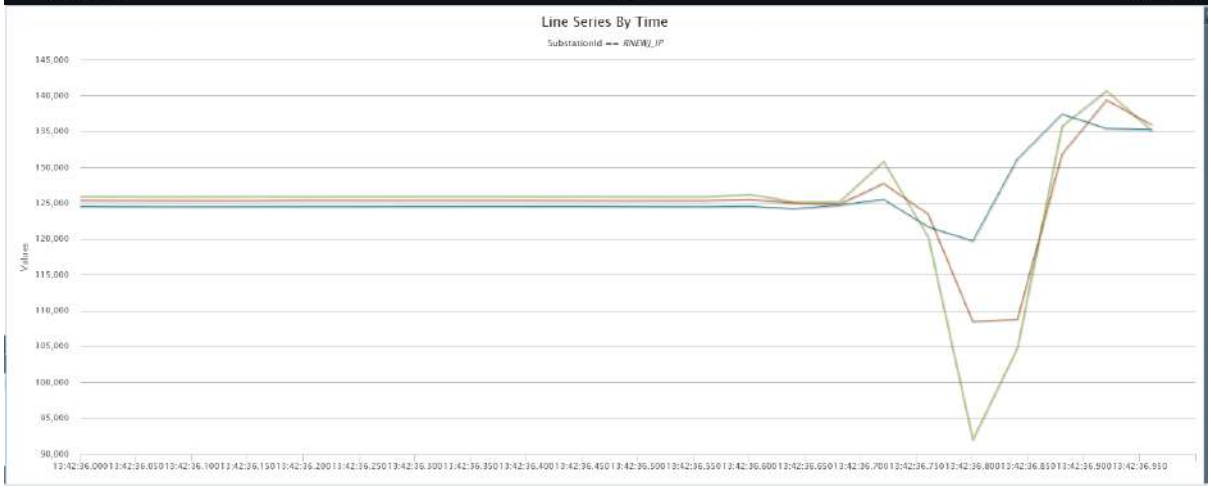
RAWRA:

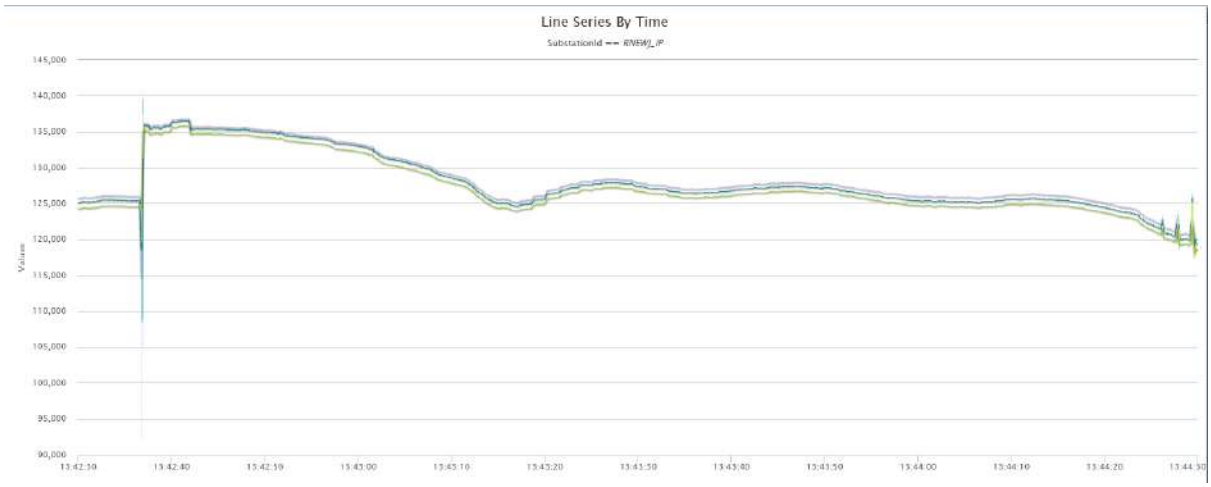
Voltage dipped to 0.76PU. Generation dropped from 240 MW to 235 MW momentarily. Generator is LVRT/HVRT non-compliant.



RJ3PL:

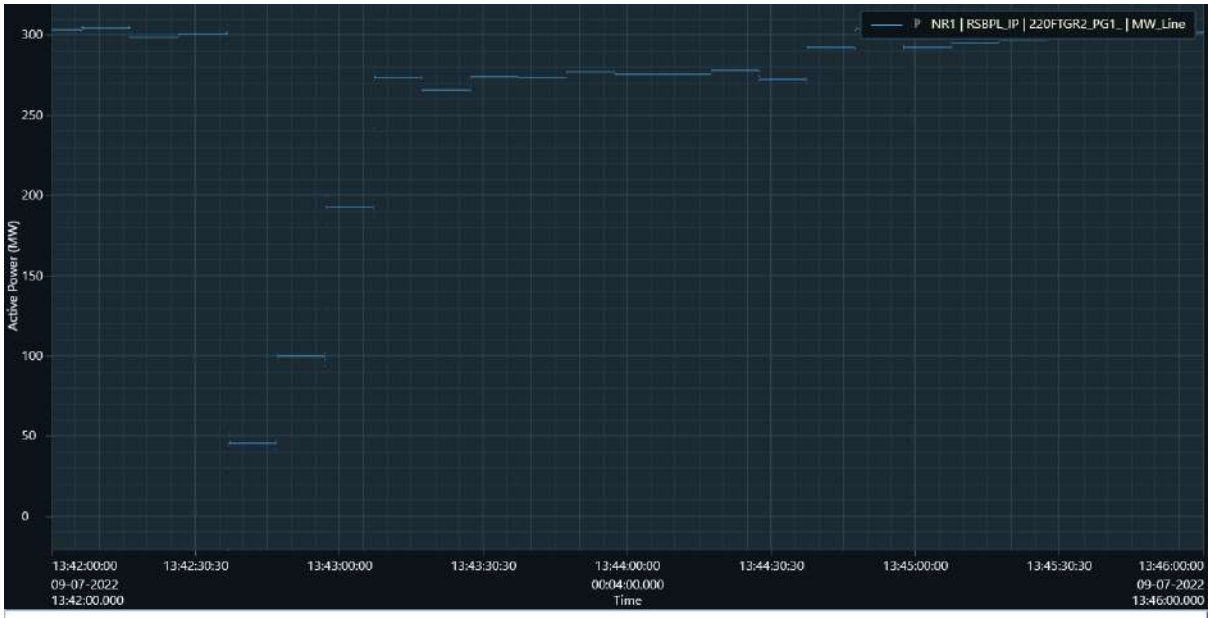
Correct voltage phasor not being reported. Generation dropped from 260 MW to 215 MW and came back after 2 mins. Generator is LVRT/HVRT non-compliant.

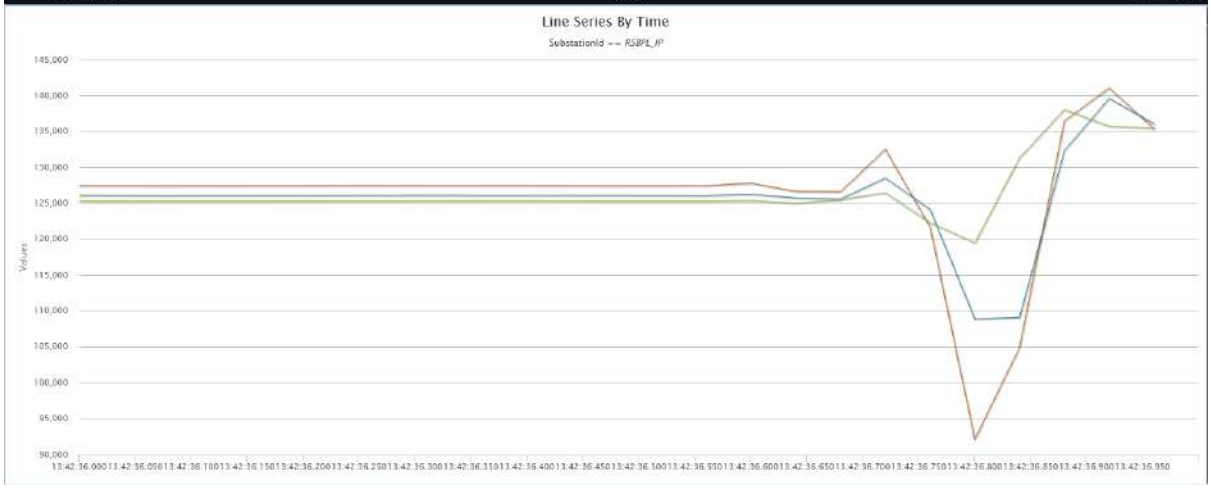




RNEWJ:

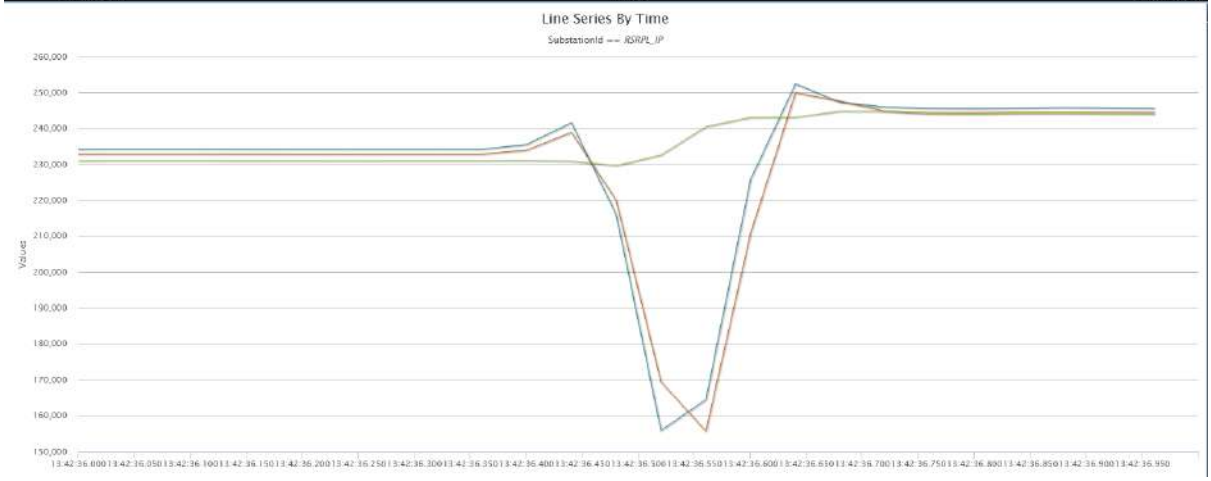
Voltage dipped to 0.76PU on lower side and 1.1PU on higher side, sustained on higher side for less than 40 ms. Generation dropped from 310 MW to 100 MW and came back after 3 mins. Generator is LVRT/HVRT non-compliant.

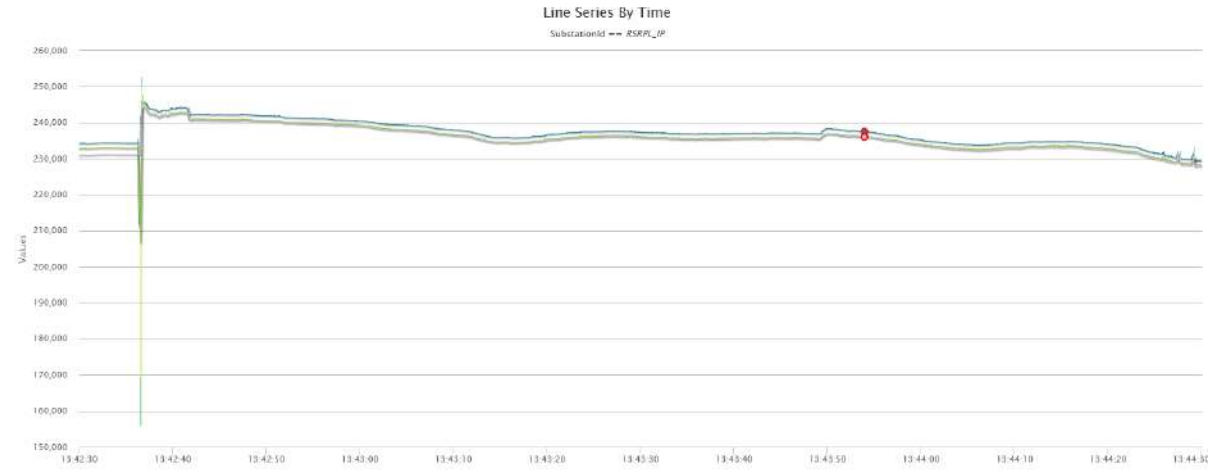




RSBPL:

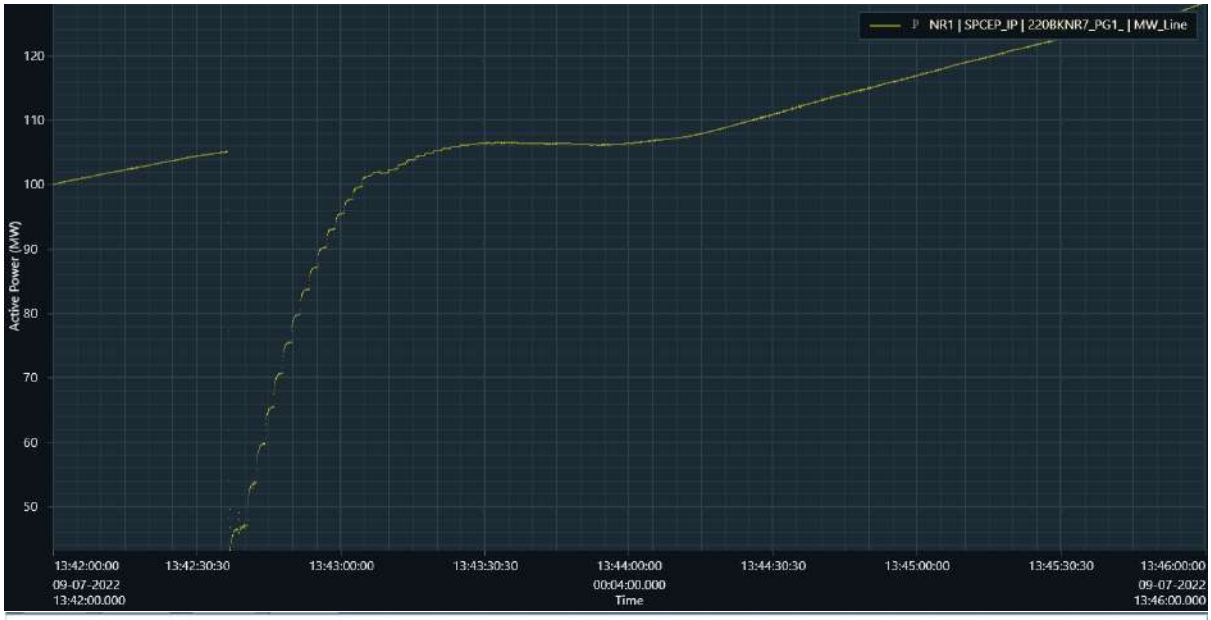
Voltage dipped to 0.75PU on lower side and 1.11 PU on higher side, sustained on higher side for less than 40 ms. Generation dropped from 300 MW to 50 MW and came back after 1 min. Generator is LVRT/HVRT non-compliant.





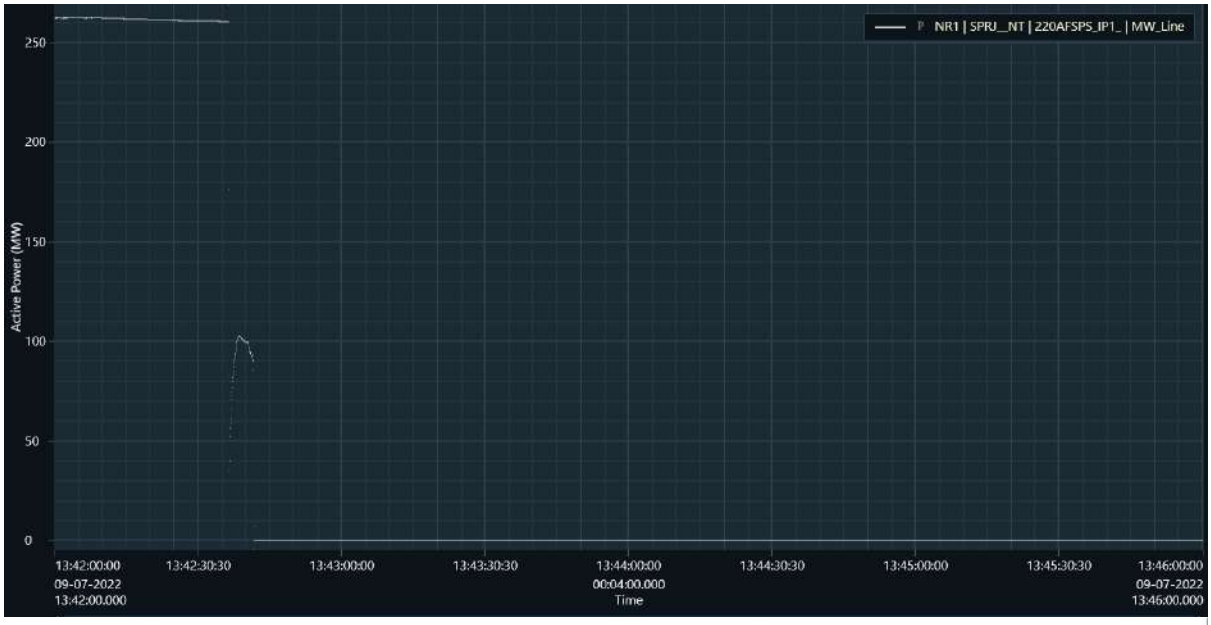
RSRPL:

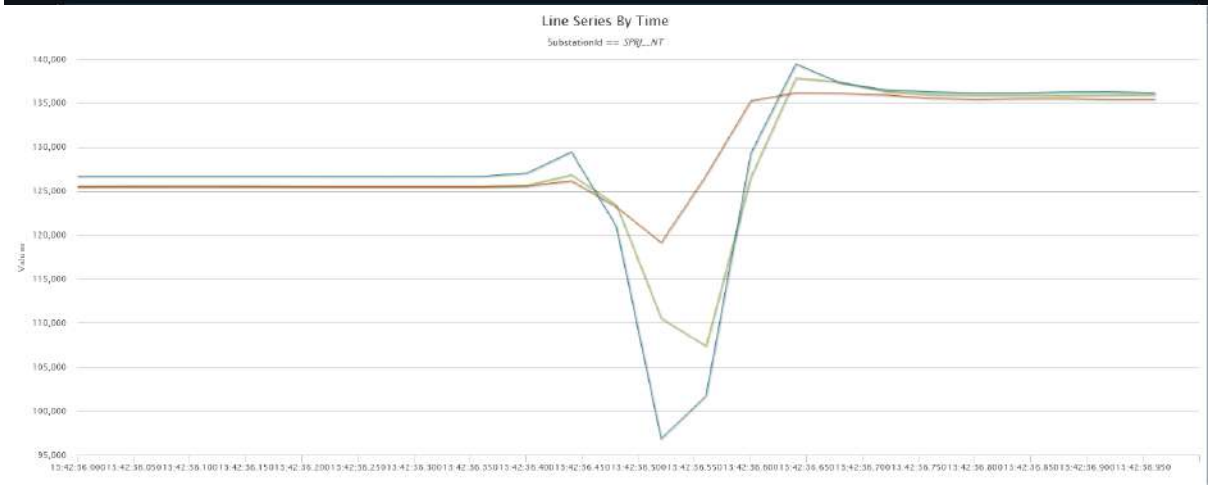
Voltage dipped to 0.66PU on lower side and 1.09PU on higher side. Generation dropped from 140 MW to 0 MW and came back after 2 mins. Generator is LVRT/HVRT non-compliant.

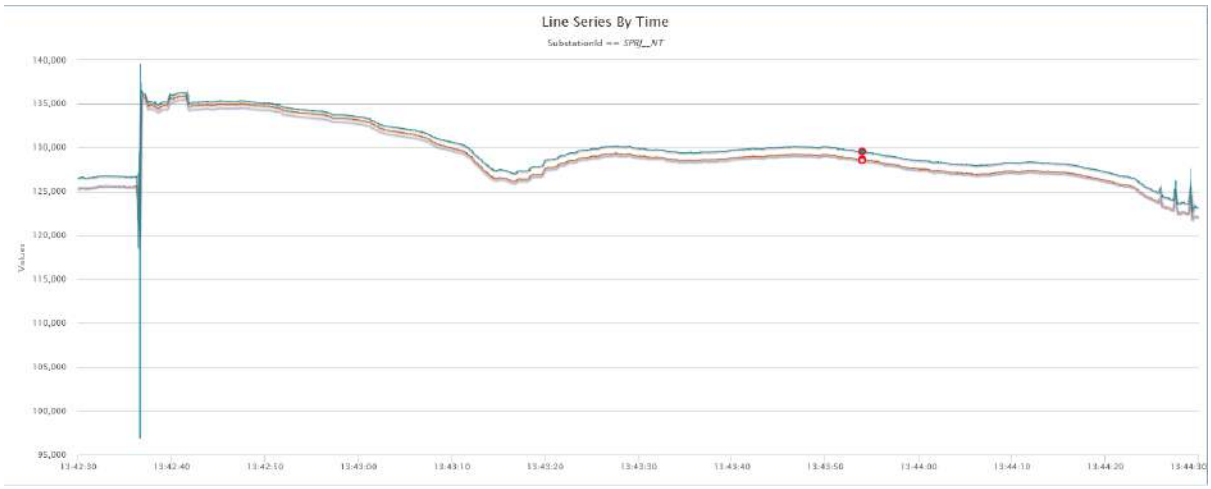


SPCEP:

Voltage dipped to 0.70PU on lower side and 1.09PU on higher side. Generation dropped from 102 MW to 0 MW and came back after 1 mins. Generator is LVRT/HVRT non-compliant.

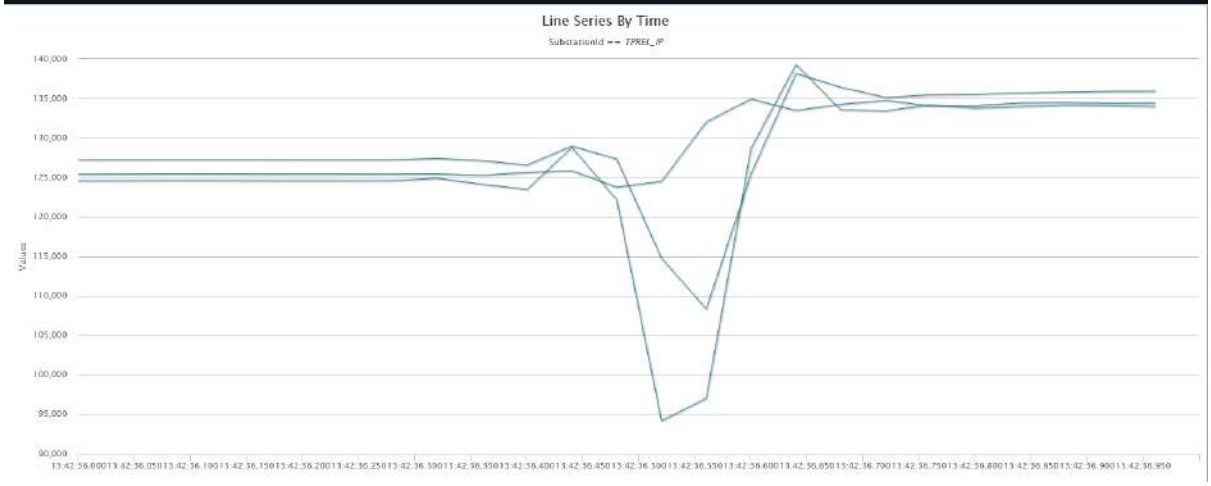


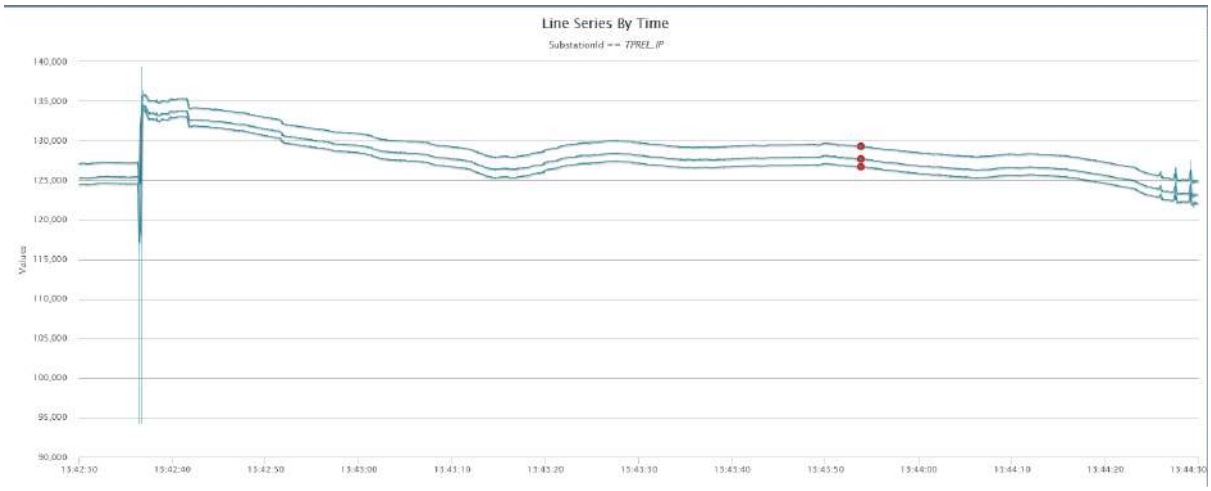




SPRJ:

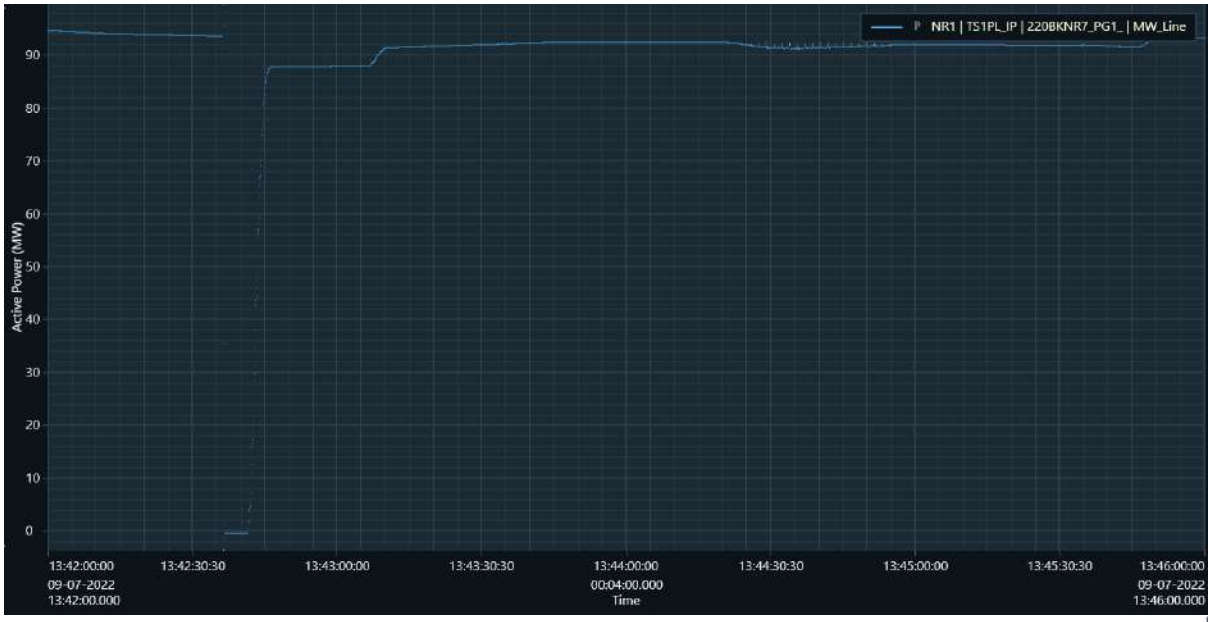
Voltage dipped to 0.76PU on lower side and 1.09PU on higher side. Generation dropped from 260 MW to 0 MW and didn't come back. Generator is LVRT/HVRT non-compliant.

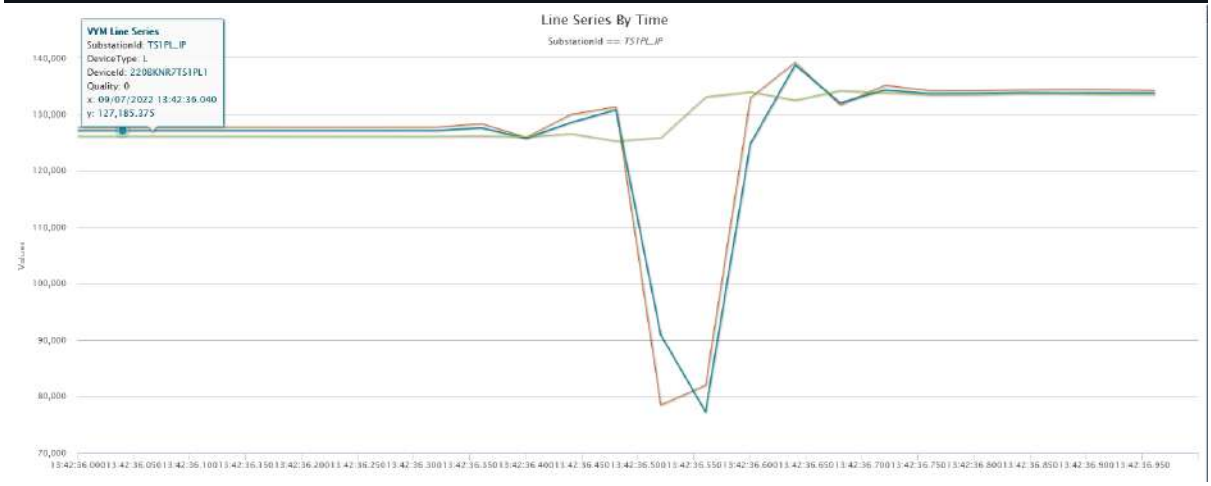




TPREL:

Voltage dipped to 0.74PU on lower side and 1.08 PU on higher side. Generation dropped from 260 MW to 225 MW and came back after 30 sec. Generator is LVRT/HVRT non-compliant.





TS1PL:

Voltage dipped to 0.62PU on lower side and 1.09PU on higher side. Generation dropped from 92 MW to 0 MW and came back after 5 sec. Generator is LVRT/HVRT non-compliant.