सत्यमेव जयते

भारत सरकार

Government of India

विद्युत मंत्रालय

Ministry of Power

उत्तर क्षेत्रीय विद्युत समिति

Northern Regional Power Committee

संख्या: उ.क्षे.वि.स./ प्रचालन/106/01/2021/8326-8367 दिनांक: 08 .09.2021

विषय: उत्तर क्षेत्रीय विद्युत समिति की प्रचालन समन्वय उप-समिति की 186वीं बैठक का कार्यवृत |

Subject: Minutes of 186th OCC meeting of NRPC.

उत्तर क्षेत्रीय विद्युत समिति की प्रचालन समन्वय उप-समिति की 186वीं बैठक दिनांक 18.08.2021 को आयोजित की गयी थी। उक्त बैठक का कार्यवृत्त उत्तर क्षेत्रीय विद्युत समिति की वेबसाइट http://164.100.60.165/ पर उपलब्ध है। यदि कार्यवृत पर कोई टिप्पणी हो तो कार्यवृत जारी करने के एक सप्ताह के अन्दर इस कार्यालय को भेजें |

186th meeting of the Operation Co-ordination Sub-Committee of NRPC was held on 18.08.2021. The Minutes of this meeting has been uploaded on the NRPC website http://164.100.60.165/. Any comments on the minutes may kindly be submitted within a week of issuance of the minutes.

संलग्नक: यथोपरि

08/09/2021.

(सौमित्र मजूमदार)

अधीक्षण अभियंता (प्रचालन)

सेवा में,

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

उत्तर क्षेत्रीय विद्युत समिति की प्रचालन समन्वय उप-समिति की 186वीं बैठक का कार्यवृत्त

186th meeting of OCC of NRPC was held on 18.08.2021 through video conferencing.

खण्ड-क:उ.क्षे.वि.स. **PART-A:NRPC**

1. Confirmation of Minutes

Minutes of 185rd OCC meeting, held on 20.07.2021, was issued on 06.08.2021.

OCC confirmed the minutes except point no. 17 (ii).

In respect of point no. 17 (ii) of the minutes, following comment was received from POWERGRID:

> "Records of Load-Generation backdown/loss are maintained by NRLDC control room hence it may be confirmed by them with due verification in such cases. Accordingly, last para of MOM point no. 17(ii) may be modified".

In the meeting, NRLDC representative stated to submit their comment separately. NRLDC vide mail dtd. 19.08.2021 submitted its following comment:

> "As per CERC Regulations 2019, Appendix-II, the transmission system availability factor for transmission elements has to be calculated by respective transmission licensee and submitted to RLDC for verification. The regulation, under chapter 12-51(b), also states that in case of outage of transmission element affecting evacuation of power from a generating station, then the outage hours shall be multiplied by a factor of 2. Hence, it is the responsibility of transmission licensees to consider generation loss details (irrespective of quantum) while calculating their transmission system availability factor for a month and submit to RLDC for verification."

MS, NRPC views

As per para-1 of Appendix-II of CERC tariff regulation, Transmission system availability factor for nth calendar month (TAFPn) shall be calculated by the respective transmission licensee. In para-2 of Appendix-II, how various power system elements are to be treated in computation of TAFPn is elaborated. Issues of impact on availability due to generation loss and more than 2 trippings in a year are explained in chapter-12 of CERC tariff regulation. It is therefore opined that anything other than TAFPn as given in para-1 and 2 of Appendix-II, may be done by NRLDC who is having full visibility such issues by way of automatic logging in SCADA.

2. Review of Grid operations of July 2021

2.1. Anticipated vis-à-vis Actual Power Supply Position (Provisional) for July 2021

Reasons submitted by states for significant deviation of actual demand from anticipated figures during the month of July 2021 are as under:

Uttar Pradesh

Actual energy consumption was higher due to weak monsoon in western part of the state.

Delhi

The demand of Delhi has not picked up due to post lockdown effect in Delhi to control second wave of COVID-19.

Punjab

Difference between actual energy and anticipated energy was due to dry weather and delayed monsoon during first half of July 2021.

Himachal Pradesh

The Anticipation in Energy requirement and peak demand in respect of Himachal Pradesh for the month of July 2021 came on higher side due to following reasons:

1. Heavy rush of tourists in the State.
2. Weather remained dry and the temperature rose in the lower belt of Himachal.

Haryana

Variation of Consumption of the Haryana was due to late monsoon arrival in the State.

Uttarakhand

No information submitted.

OCC again expressed concern about non-participation of official from some of the states and UTs in the meeting and requested all the utilities to participate in the meeting.

2.2. **Power Supply Position for NCR:**

The Sub-Committee was informed that the 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 July, 2021 was enclosed in the Agenda and same was discussed in the meeting.

No significant deviation in any of the states was observed.

2.3. **The highlights of grid operation during July 2021 are as follows**:

2.3.1. The new elements charged were discussed and the list is attached at **Annexure-A.I (A).**

2.3.2. Long outage of generating units were discussed in detail and the same is attached at **Annexure-A.I (B).**

2.3.3. Long outage of transmission line elements were discussed in detail and the same is placed at **Annexure-A.I (C)** and all constituents were requested to review the elements under long outage at the earliest.

3. Maintenance Programme of Generating Units and Transmission Lines

3.1. The maintenance programme of generating units and transmission lines for the month of September 2021 was deliberated in the meeting on 17.08.2021.

3.2. Following shutdowns of NTPC were also approved in the OCC meeting:

Element Name	Daily/ Cont.	Reason	Requested From	Requested To	Decision of OCC
660 MW TANDA TPS - UNIT 5	C	First s/d after COD for mandatory bearing inspection, annual over haul	01-Sep-2021 08:00	06-Oct-2021 00:00	The requested s/d may be reviewed in 1st week of September,2021 in view of high demand in beneficiary states.
500 MW SINGRAULI STPS - UNIT 6	C	Boiler+LPT+TG Bearing inspection Generator	01-Sep-2021 00:00	30-Sep-2021 18:00	
500 MW RIHAND-II STPS - UNIT 1	C	Boiler+Turbine+ Nox Modification +FGD	01-Sep-2021 00:00	10-Oct-2021 00:00	
210 MW UNCHAHAR TPS - UNIT 2	C	Annual over haul, major work- condenser tube replacement	01-Sep-2021 00:00	13-Oct-2021 00:00	

4. Planning of Grid Operation

4.1. **Anticipated Power Supply Position in Northern Region for September 2021**

The updated anticipated Power Supply Position for September 2021 is as below:

State / UT	Availability / Requirement	Revised Energy (MU)	Revised Peak (MW)	Date of revision
CHANDIGARH	Availability	170	350	No revision submitted
	Requirement	150	390	
	Surplus / Shortfall	20	-40	
	% Surplus / Shortfall	13.3%	-10.3%	
DELHI	Availability	4860	6962	16-Aug-21
	Requirement	3550	6800	
	Surplus / Shortfall	1310	162	
	% Surplus / Shortfall	36.9%	2.4%	
HARYANA	Availability	5960	11550	No revision submitted
	Requirement	6070	10500	

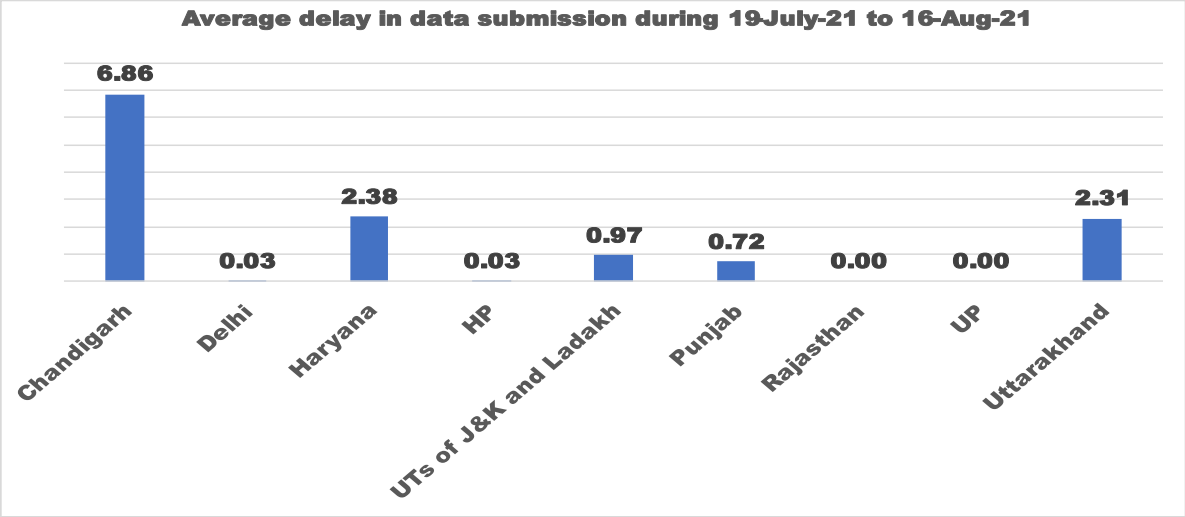
State / UT	Availability / Requirement	Revised Energy (MU)	Revised Peak (MW)	Date of revision
	Surplus / Shortfall	-110	1050	
	% Surplus / Shortfall	-1.8%	10.0%	
HIMACHAL PRADESH	Availability	972	1535	18-Aug-21
	Requirement	960	1553	
	Surplus / Shortfall	12	-18	
	% Surplus / Shortfall	1.3%	-1.2%	
J&K and LADAKH	Availability	1940	3340	No revision submitted
	Requirement	1480	2620	
	Surplus / Shortfall	460	720	
	% Surplus / Shortfall	31.1%	27.5%	
PUNJAB	Availability	7633	13500	17-Aug-21
	Requirement	7633	13500	
	Surplus / Shortfall	0	0	
	% Surplus / Shortfall	0.0%	0.0%	
RAJASTHAN	Availability	8490	18300	18-Aug-21
	Requirement	8250	14000	
	Surplus / Shortfall	240	4300	
	% Surplus / Shortfall	2.9%	30.7%	
UTTAR PRADESH	Availability	13800	25000	12-Aug-21
	Requirement	13500	25000	
	Surplus / Shortfall	300	0	
	% Surplus / Shortfall	2.2%	0.0%	
UTTARAKHAND	Availability	1390	2850	No revision submitted
	Requirement	1410	2150	
	Surplus / Shortfall	-20	700	
	% Surplus / Shortfall	-1.4%	32.6%	
NORTHERN REGION	Availability	45215	76600	
	Requirement	43003	70300	
	Surplus / Shortfall	2212	6300	
	% Surplus / Shortfall	5.1%	9.0%	

4.2. NRLDC representative expressed observation that Peak Availability anticipation

by Rajasthan seems unrealistic and it may be reviewed by Rajasthan for correctness.

5. Information about variable charges of all generating units in the Region

5.1. Members were informed about the average delay in submission of data of variable charges details on MERIT order portal during 19.07.2021 to 16.08.2021. The average delay is given below:



5.2. Delay for UT of Chandigarh is still persisting around 7 days.

5.3. Delay of Haryana & Uttarakhand is also noticeable.

5.4. All SLDCs were requested for timely submission of information on MERIT Portal.

6. Submission of breakup of Energy Consumption by the states

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

State / UT	From	To
Delhi	Apr-2018	Jun-2021
Haryana	Apr-2018	May-2021
Himachal Pradesh	Apr-2018	Jun-2021
Punjab	Apr-2018	Mar-2021
Rajasthan	Apr-2018	Jun-2021
Uttar Pradesh	Apr-2018	Apr-2021

6.2. OCC forum again raised expressed concern on non-submission of energy breakup data by Uttarakhand, UTs of J&K & Ladakh, and Chandigarh despite repeated reminders.

7. System Study for Capacitor requirement in NR for the year 2019-20

7.1. OCC forum was intimated that NRPC in its 48th meeting decided that the study report for 2019-20 along with the guidelines for finding the capacitor requirement at 11/33 kV level in NR would be submitted by CPRI. Accordingly, CPRI have submitted the system study report on 24.02.2021 and thereafter same was shared with the constituent states. The recommended capacitor compensation,

additionally required as per the report is 352MVAr. The report has brought out the additional requirement of 137MVar and 215MVar compensation for Punjab and J&K respectively. Moreover, empirical relationship for capacitor requirement against voltage profile at 11 kV, based on two configurations has been worked out in the report.

7.2. In the 45th TCC / 48th NRPC meeting, it was decided after the submission of report for 2019-20 and the guidelines, the same would be studied by the same sub-group who had earlier recommended for guidelines and foreclosure of the contract. Based on Committee's recommendations, NRPC Sectt. can process the pending bills of Rs. 14 lakhs (Rs. 2 + 12 Lakhs), excluding taxes along with foreclosure of the contract. Accordingly, submitted report needs to be examined by the Committee.

7.3. In 181st OCC, forum decided that sub-group comprising of following officers would study the report and submit the recommendation report within two weeks:

- Ms. Bhaavya Pandey, AEE(O), NRPC Sectt.
- Ms. Suruchi Jain, Chief Manager, NRLDC
- Sh. Naveen Kumar AM(T), Delhi SLDC
- Ms. Sona Shishodia, Ex.Engineer, Rajasthan SLDC
- Sh. Pankaj Saxena, Ex.Engineer, UPPTCL
- Sh. Subhash Chand, XEN/works
- Sh. Mohit Walia, Punjab SLDC
- Sh. Rajesh Kumar, SE/PR, PSPCL Patiala
- Sh. Vinayak Shailly, EE, Uttarakhand
- Sh. Abhishek Puri, AE(E)

7.4. NRPC Sectt. sought comments/observations on the CPRI report from all the states via e-mail. Comment from Delhi was received. Rajasthan, HP, Punjab, Haryana submitted NIL comment. Comment from rest of the members was not received.

7.5. In the 182nd OCC meeting, forum decided that a video-conferencing meeting may be held by members of sub-group to finalize the comments, latest by 30th April, 2021 and compiled comments may be sent to CPRI for necessary correction in the report.

7.6. The meeting of sub-group was held on 03.05.2021 (delayed as per request of some sub-group members due to health-related concerns/issues). Representative from Rajasthan could not attend as she was suffering from COVID-19 while Uttarakhand representative informed in the meeting that there is an acute shortage of available officers at the time and they will agree to the remarks made by NRLDC.

7.7. Based on the discussions of the meeting and comments submitted by UP, Delhi, Punjab and HP, a compiled observation has been prepared. The same was sent to CPRI for corrections in the final report.

7.8. Further, PSSE file was requested from CPRI as per the request of all sub-group members for better understanding and the same was later shared with them.

7.9. In 183rd OCC meeting, NRPC representative requested for any other comments on the CPRI report, if remaining, from any of the members. Sub-group committee member from Rajasthan stated that since the CPRI report is for the year 2019-20, old data needs to be collected and then values in the CPRI report would be checked. It was further intimated that around 2-3 days' time would be required for this task. Forum decided that after receiving observations/comments from Rajasthan, the compiled observations / comments may be sent to CPRI so that necessary corrections may be done in the draft report.

7.10. In 184th OCC, forum was apprised that compiled comments have been mailed to CPRI vide email dated 28th May'21 with a request to submit the corrected report within two weeks' time.

7.11. CPRI vide email dated 31st May'21 communicated that majority of comments are on the modeling of base case PSSE file. Since the file is given by NRPC and CPRI has not modeled it; so, they are not in position to make any comment on the accuracy & modeling of file.

7.12. Forum decided that a reminder may be sent to CPRI for submission of corrected Report as two weeks has already passed.

7.13. In the 185th OCC, NRPC stated that CPRI has submitted on 28th June 2021 its point-wise reply on the observations of sub-group along with updated report. OCC forum decided that a video-conferencing meeting may be held within sub-group members and CPRI for further discussion on reply of CPRI.

7.14. In the current (186th OCC meeting), NRPC representative apprised the forum that in line with decisions of 185th OCC, a meeting was held on 06.08.2021 under the chairmanship of MS, NRPC through Video Conferencing. It was attended by members of the sub-group, CPRI representatives, and officials from NRPC Sectt & NRLDC.

7.15. It was also stated that in the meeting dt. 06.08.2021, comments of the sub-group on the latest version of CPRI report were deliberated in detail. After weighing the merits of the original & revisions of the report, following were decided:

- First Report submitted by CPRI in September, 2020 shall be considered as the reference report. CPRI confirmed that the base-case of 11.07.2018 at 00:45 hrs. received from NRPC Sectt has been used for preparing September, 2020 report.

- Comments from all utilities and NRLDC on September 2020 report must be submitted to NRPC Sectt, latest by 24.08.2021.

- NRPC Sectt, after examination, shall share with CPRI the compiled comments of the utilities and NRLDC, latest by 31.08.2021.

- Thereafter, CPRI shall submit its reply on the compiled comments sent by NRPC Sectt, latest by 15.09.2021.

7.16. It was further intimated that base case file (11.07.2018 00:45 hrs) and CPRI September 2020 report has been e-mailed to all sub-group members on 10.08.2021 requesting to submit comments/observations thereon latest by 24.08.2021 as per decision of the meeting dtd. 06.08.2021.

8. Automatic Demand Management System

8.1. Forum was informed that as decided in the 175th OCC meeting, to conduct separate meeting with states, nominations are pending from PuVVNL, PVVNL, MVVNL, DVVNL, UPPTCL, UPCL, PTCUL, SLDC Uttarakhand, and J&K. They were requested on 01.03.2021 to submit nominations for the meeting.

8.2. Meetings on ADMS implementation roadmap have been held with the officers of Haryana, HP, 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.

8.3. As per the 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.

8.4. 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.

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

8.6. 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

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

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

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

10. NR Islanding Schemes

10.1. NRPC representative stated that Hon'ble Minister of State (IC) for Power and New & Renewable Energy chaired a meeting on 28.12.2020 to review Islanding Schemes in the country.

10.2. Thereafter, series of meetings were held amongst NR constituents during Apr-Jul'21 to review the existing Islanding Schemes and expedite the implementation of newly proposed Schemes. Special TCC meeting was also held on 15.06.2021, wherein following were decided:

a. Delhi: SCADA display work shall be done on priority basis and Delhi SLDC / DTL shall endeavor to complete the work by 31st July 2021. Further, Delhi SLDC was requested to provide updates on Delhi Islanding Scheme to NRPC on fortnightly basis.

b. Punjab: Punjab SLDC shall submit status on newly proposed Islanding Schemes to NRPC Sectt on monthly basis.

c. Uttar Pradesh: UP SLDC may conduct the required study for freezing the generator and corresponding critical loads for Islanding Scheme(s) within its control area. The tentative timeline for implementing the scheme may be submitted by UP SLDC within a weeks' time.

d. Jammu & Kashmir: J&K representative may consult Delhi DISCOMs (TPDDL / BRPL / BYPL) as they are preparing DPR for load shedding at 11kV or OEMs of R-APDRP project in J&K. Further, J&K to explore the possibility to club the implementation of its Islanding Scheme with the existing R-APDRP projects and in this regard, request may be made to MoP.

e. Ladakh: After the submission of feeder-wise data of load centers (Kargil and Ladakh) and historical generation data of Chutak and Nimmo Bazgo HEPs, preliminary study may be done by NRLDC.

f. Himachal Pradesh: HP SLDC to firm up all schemes and submit the outcome of studies by 31st July 2021.

g. Rajasthan: Rajasthan SLDC to put the process for Rajwest Islanding Scheme on fast track and get it implemented before 15 months. Also, Rajasthan SLDC may take up with state regulator for must-run status for the proposed generators for two schemes and submit the Suratgarh study data to NRPC Sectt / NRLDC by 31st July 2021.

h. Uttarakhand: Uttarakhand SLDC to submit concrete timelines for implementing Dehradun Islanding Scheme to NRPC Sectt within a month's time.

i. Haryana: Generation pattern of Yamunanagar TPS may be examined by Haryana SLDC. In case, its availability is at least 70%, then same may be considered for Islanding Scheme. Confirmation in this regard along with supporting data may be submitted by Haryana SLDC to NRPC Sectt in a weeks' time.

10.3. On 29.07.2021, a meeting was taken by Member (GO&D), CEA for reviewing the Islanding Schemes. In the meeting, following were decided:

a. BYPL to submit their proposal regarding revised critical load to DERC at the earliest.

b. Delhi SLDC may seek assistance for system study of the scheme with revised quantum of critical load from CEA/CTU, if required.

c. Delhi SLDC to take up the matter urgently with DERC for getting must run status of Dadri-II and APCPL Jhajjar for a conclusive approach.

d. Implementation of Delhi IS with revised critical load may be expedited.

e. Review the Delhi Islanding Scheme on fortnightly basis.

f. SOP format to be circulated amongst states/utilities so that status of healthiness of relays, communication channel and other equipment of operational Islanding Schemes are submitted to RPC on monthly basis.

g. Setting up separate display of Islanding Schemes on SCADA of respective states LDCs and RLDCs for real time monitoring of participating generators & critical loads.

h. Explore the possibility of utilizing PSDF fund for Islanding Schemes.

10.4. NRPC representative added that DTL has submitted data regarding SOP, Rajasthan has submitted UFR & communication healthiness self-certification to NRPC Sectt.

10.5. He also highlighted that as per discussion held in 10th NPC meeting, frequency setting for UFR has to be increased by 0.2 Hz.

10.6. Status with respect to tasks decided in special TCC meeting held on 15.06.2021, was discussed state-wise as mentioned below:

a. **Delhi, Punjab and Uttarakhand:** Concerned representative was not present in the meeting.

b. **Uttar Pradesh:** UPSLDC representative stated that steady-state study has been conducted by them for Lalitpur Islanding Scheme and details has been forwarded to NRLDC for transient-state study. He also added that as per preliminary study, 765 kV Lalitpur-Fatehabad transmission line seems feasible for Island that was earlier suspected for non-survival due to MVAR issue. He informed that data regarding scheduling of Lalitpur in a year has also been sent to NRLDC.

NRLDC representative stated that some machine parameters were not sent by UP; however, data of similar machine has been taken for study purpose. He added that one unit of Lalitpur is generally available for more than 70% time. He also highlighted that study by NRLDC is preliminary in nature and states should take consultation with other agency for design of Island.

c. **Himachal Pradesh:** HP representative stated that confirmation of generators is pending for participation in Island. BBMB representative stated that they are analyzing feasibility of Pong & Dehar for participation in Island and they will submit their study report within 10 days to HP.

HP representative was requested to send letter via email to NHPC for confirmation of generator to be participated in Island.

d. **Rajasthan:** Rajasthan representative stated that they are studying the feasibility of Island for 6 units of Rajwest and 1 unit of Suratgarh separately. Report of study will be shared within a week. She also added

that there seems no need for taking must run status for any generator as Rajwest and Suratgarh both are scheduled adequately.

e. **Haryana:** Its representative stated that they have analyzed the scheduling pattern of Yamunanagar TPS for last 4 years and it comes as low as 41% in 2019-20 & 60% in 2020-21.

10.7. NRPC representative requested the states to expedite the finalization of Island design and its implementation. Requisite data regarding Islanding Schemes may also be provided to NRPC within stipulated time. Moreover, necessary steps need to be taken for increasing the frequency setting for UFRs under AUFLS by 0.2 Hz without any further delay.

11. Review of availability of ADHPL Transmission system for the month of August & September 2020

11.1. NRPC representative stated that the matter was discussed in 181st OCC meeting. In that meeting, NRLDC representative mentioned that ADHEPL took considered decision to delay the outage for transmission line rectification activity till Oct'20 as commercial aspects of ADHEPL's both generation and transmission were involved.

11.2. It was also discussed that restoration time needs to be within the permissible limits, stipulated in the Standards of Performance of Inter-State Transmission Licensees (SPITL) Regulations 2012.

11.3. ADHEPL representative mentioned that ADHEPL-Nallagarh line evacuates powers of ADHEPL, HPSEB and Kanchanjunga; so non-availability of both circuits of ADHEPL-Nallagarh during peak Hydro month(s) could have affected multiple entities. Further, work execution in hilly terrain during rainy season is an uphill task.

11.4. In 43rd Commercial Sub-Committee meeting, MS, NRPC further stated that considering more than 1600 hours (19:30 Hours on 21.08.2020 to 15:18 Hours on 30.10.2020) outage period due to inclement weather as deemed available has not only financial implications but also would set precedence for other transmission licensees. Therefore, views of all NR beneficiaries may be taken before considering the request of ADHPL.

11.5. It was decided that NRPC Sectt. would seek views of all NR beneficiaries including Kunchenjunga HEP.

11.6. In 186th OCC, NRPC representative apprised that HPSEBL has submitted its views vide letter dtd. 23.07.2021 that action in the matter shall be in line with SPITL Regulations 2012, and review of availability of ADHPL Transmission System shall be denied.

11.7. He added that ADHEPL had mailed to NRLDC on 24th Aug 2020 stating that the restoration of 220 kV Circuit 2 (Phozal-Nalagarh) was planned to be carried out w.e.f. 15.10.2020 tentatively to minimize the generation loss.

11.8. He submitted that actual restoration time was less than 300 Hrs. However, the case of ADHPL is not for the restoration time. The case of ADHPL is for the

deemed availability of its Dedicated Transmission System on the basis of the fact that other utilities have used this transmission system commercially for desired capacity even during the outage of one circuit. NRLDC representative stated that ADHPL is confusing outage time with restoration time. The line was out for more than 1600 hrs, that is factual position. MS, NRPC agreed with views of NRLDC.

11.9. ADHEPL representative stated that they have submitted energy injection/drawl data of beneficiaries of ADHPL Dedicated Transmission System for Aug-Sept 2020 to NRPC Sectt.

11.10. It was decided that injection/drawl data submitted by ADHEPL shall be first scrutinized by NRPC Sectt and thereafter further discussion on the matter may be done.

12. Tanda-Basti line (220KV) tripping on unbalanced loading (Agenda by NTPC)

12.1. NTPC representative stated that instances of 220KV Tanda-Basti line tripping on Broken Conductor Protection has occurred in recent past. Each time it is observed that there is no actual open conductor fault, instead there is a large, unbalanced loading pattern among 3 phases. Hence, relay senses open conductor protection operating condition (Negative phase sequence component of current above the limit w.r.t. Positive sequence component) and gives trip command, causing 3 pole tripping of breaker at Tanda end.

12.2. This Protection has operated four times in recent past, details of line tripping are given below:

Sr. No.	Date	Time	Current	Setting
1.	01Oct.2020	15:23:00		I2/I1>0.2,20sec Time delay
2.	17Oct.2020	15:09:00		I2/I1>0.2,20sec Time delay
3.	25June2021	07:58:44	Ir=258.01,Iy=246.18,Ib=198.85	I2/I1>0.2,20sec Time delay
4.	01Aug.2021	16:51:20	Ir=197.65,Iy=152.78,Ib=116.61	I2/I1>0.2,20sec Time delay

12.3. In view of importance of this heavily loaded line particularly during peak hours for power evacuation, the issue of 3 phase unbalanced loading needs to be addressed on priority to ensure Grid stability.

12.4. UP representative stated that there is a Railway TSS in Govindgarh and there are 3 lines feeding it. When, other two lines are in open situation, and any train passes, then due to unbalanced load, Tanda-Basti line trips. It has never tripped due to heavy load/ peak load.

12.5. He also added that 400 kV Sultanpur-Basti is operational. Gonda line LILO will be done from Basti. 500 MVA transformer is under commissioning at Basti and load will come latest by Oct, 2021. Then, this issue of tripping will automatically get resolved.

13. Procedure on Outage Planning for Communication System

13.1. NRPC representative stated that in the 184th OCC meeting, draft procedure on Outage Planning for Communication System was discussed.

13.2. Forum decided that all the stakeholders may send their comments on the draft procedure latest by 30th June'21. Thereafter, the draft procedure will be sent to TeST committee for vetting.

13.3. In 185th OCC meeting, NRLDC representative stated that comments would be submitted by 31.07.2021. In view of this, last date for submission of comments by all stakeholders was extended till 31.07.2021.

13.4. In the meeting, forum was apprised that NRLDC has submitted its comments via letter dtd. 16.08.2021 as mentioned below:

a. Communication link outages which don't require transmission system outages should only be discussed in the outage planning for communication system. All the communication links outages which require transmission outage should be discussed in OCC Meetings.

b. Transmission licensee shall submit the list of all communication outages for next month to RPC by 15th of every month in Format COA-1 and COA-2 and RPC shall consolidate the list of outage proposals and approve the same for next month and the same can be displayed on NRPC Website. Meeting may be called if there is any important/critical outage or the same can be approved by circulation.

c. It is responsibility of communication owner to ensure that there should not be any data outage during scheduled communication system outages, rerouting etc if required may be carried out prior to taking outage.

d. It would be difficulty to give code for communication outage by control room since communication network visibility is not available to NRLDC control room and NRLDC would not be able to verify when the outage is taken and when it is restored. Only list approved by NRPC would serve as intimation to NRLDC regarding list of outages which would be taken.

e. Request for any emergency outage required by communication system owner shall be made to NRPC/NRLDC and communication equipment owner shall ensure that there should not be any real-time data outage due to communication system outage.

13.5. No observation on these comments of NRLDC was submitted by any stakeholder.

14. Keeping 1-Ph ICT unit as spare at BBMB Panipat (Agenda by NR-2/POWERGRID)

14.1. NR-2 representative submitted that 400/220/33kV 450MVA ICT-2 consisting of 03 nos. single phase units of 150 MVA at BBMB Panipat was owned by POWERGRID. These units were commissioned in 1985.

14.2. The spare single-phase unit belongs to BBMB which was common for ICT-1 and ICT-2. The detail of transformers at BBMB Panipat are as below:

Sl. No.	Unit identification	Ownership	Status
T1	ICT-1 R	BBMB	In service
T2	ICT-1 Y	BBMB	In service
T3	ICT-1 B	BBMB	In service
T4	ICT-2 R	POWERGRID	Now available as spare.
T5	ICT-2 Y	POWERGRID	Failed on 12.07.2020. Not in Service.
T6	ICT-2 B	POWERGRID	Failed on 30.06.2018. Not in Service.
T7	Spare Unit	BBMB	Available

14.3. After failure of above two 1-Ph units of 450 MVA ICT-II bank (POWERGRID owned) at BBMB Panipat, the same were replaced with a 3-ph 500 MVA unit which is in service since 02.10.2020.

14.4. In 174th OCC meeting, it was opined that BBMB would take up the matter for keeping 1-Ph (R-ph unit of ICT-2) unit as a spare with PGCIL management for their 3x150 MVA ICT-1 bank in case of any contingency.

14.5. In this line, matter was taken up with BBMB from POWERGRID side for their view to keep 150 MVA 1-Ph unit as spare for their use. BBMB has intimated to keep that unit as a spare. The letter received from BBMB is attached here with for reference.

14.6. In view of the above it is proposed to keep 1-Ph unit of (R-ph) ICT-2 at Panipat to be kept as regional spare at Panipat for future utilization till the replacement of 450 MVA ICT-1 bank by BBMB.

14.7. NRLDC representative stated that since the matter has implication on commercial aspect of spare unit, CERC may be approached. MS, NRPC opined that the matter may be taken up in next TCC/NRPC meeting before CERC is approached.

15. Procedure Time Extension of OCC approved Shutdown availed for Construction Works (Agenda by NR-3/POWERGRID)

15.1. NRPC NR-3 representative submitted that the approval for Shutdown of Grid Elements to facilitate Construction related works and maintenance activities are got approved in OCC and allowed by NRLDC as per Outage Planning Procedure of NR. The planning for such Shutdown is done months ahead with estimation of available data and resources on tentative basis only, which is further dependent upon any unforeseen circumstances, prevailing system and site constraints during real time work execution.

15.2. In this context it is worth to mention here that POWERGRID always make its best efforts to complete the scheduled work in stipulated/approved time period with minimum possible deviation however in some of the major construction related works of new integration, Renovation/ upgradation etc., duly approved by CERC/RPC, it is not possible due to unforeseen circumstances at site,

Change of Weather and ROW issues, statutory clearances, non-availability of OEM engineer/ T&P & test kit etc.

15.3. Even after completion of commissioning activities and readiness to charging, there may be delay due to pending statutory and RLDC clearances. To add on, Global health impact and hurdles caused by COVID-19 pandemic and Govt. restrictions have been badly affecting the work output. As a matter of fact, the outage period may vary on case to case basis depending upon real time constraints, which is beyond control of any utility/ transmission licensee and cannot be exactly predicted. It is also understood that any transmission element under outage cannot be restored until confirming its complete readiness.

15.4. Few cases are as follows:

Sl. No.	OCC No.	Name of Elements	Approved Outage Period	Actual Outage Period	Remarks
1	183	Vindhyachal Block-1	04.06.21 to 17.06.21	04.06.21 to 25.06.21	Due to Covid-19 situation and FTC formalities
2	183	400 KV Vindhyachal-Singrauli 1& 2	04.06.21 to 17.06.21	04.06.21 to 21.06.21	Due to Covid-19 situation
3	183	400 KV Vindhyachal-Vindhyachal(Feeder) 1& 2	04.06.21 to 17.06.21	04.06.21 to 21.06.21	Due to Covid-19 situation
4	184	400 KV Orai-Orai 1 & 2	26.07.21 to 29.07.21	26.07.21 to 11.08.21 (Tentative)	Due to bad weather and continuous rain at site

15.5. In view of above laid facts, approval for extension of these shutdown may be concurred by OCC. Further such extension in OCC approved outages, related to construction work, for more than a day, may be brought for concurrence in next OCC meeting however, request/ information for such extension is conveyed to NRLDC in advance at earliest possible as per provision of NRPC approved Outage Planning procedure and any deviation/ extension for less than a day shall be considered to be allowed accordingly.

15.6. NRLDC representative stated that extension may be allowed for one day, subject to anticipation information. For more than one day, it may be sent to OCC. MS, NRPC opined that this decision will be implemented from next OCC meeting and therefore outages mentioned at point 15.4 were approved.

16. Follow up with reference to discussion held in 10th NPC Meeting

16.1. NRPC representative stated that 10th NPC meeting was held on 09th April 2021, wherein status on following points was discussed:

a) Submission of the feeder mapping data.
b) Submission of AGC implementation data.
c) Monitoring for implementation of the sanctioned projects under PSDF.

16.2. States were requested to submit data for mapping of feeders. NLDC was requested for submitting AGC implementing status.

16.3. In-charge, NRLDC informed that implementation status of the sanctioned projects under PSDF is available on PSDF Sectt. website.

17. SEM- SCADA data mismatch (agenda by Punjab SLDC) (Table Agenda-I)

17.1. NRPC representative stated that Punjab SLDC vide email dtd. 17.08.2021 has submitted that Punjab SLDC SCADA office has been continuously calculating the SEM-SCADA mismatch as and when the SEM reading of Punjab drawl points are uploaded on NRLDC website. It is observed that there has been considerable data mismatch from 23th July onwards. Because of this SEM-SCADA mismatch PSPCL has been penalised heavily of more than Rs. 35 Crores for the period 23-7-2021 to 01.8.21.

17.2. Sample data of 24.7.21 at 0000 hours, is illustrated below:

S.N.	Punjab Drawl at SLDC End (Except 4 No. 400kv Moga ICTs) (In MW)	Punjab Drawl at NRLDC end (In MW) (Except 400kv Moga ICTs Calculation Point)	Difference (NRLDC Total -SLDC Total) (In MW)
1	5636.465925	5648.646733	12.18080795
	Drawl Points Individually SLDC End of 4 No. 400kv Moga ICTs Total	SCADA Drawl Point of 400kv Moga Total ICT Cal. Point according to NRLDC Calculation	Difference (NRLDC -SLDC)
2	1138.165527	103.1823425	-1034.983185
	Total of Punjab Drawl Points Individually at SLDC End	Total of SCADA Drawl Points according to NRLDC Calculation	Net Difference (NRLDC Total -SLDC Individual Point Total)
3	6774.631453	5751.829076	**-1022.802377**

17.3. As per their observation in SLDC SCADA, the total MW value of Moga 400KV PGCIL station 4 no. ICTs was not matching with the summation tag of these ICTs at NRLDC end and the variation in difference of values remained from 200 to 1100 MW during these days. This problem has been found to be persisting from 23.7.21 to 7.8.21. Further, the data from 7-8-2021 is being scrutinized.

17.4. In view of the above, Punjab representative requested that this mismatch of SEM-SCADA of the duration 23-7-21 to 7-8-21 may be corrected and penalty imposed upon Discom i.e., PSPCL may be re-looked into. Further, it may kindly

be ensured that this kind of problems shall not be repeated in future to avoid any penalty being imposed on PSPCL on account of SEM-SCADA data mismatch.

17.5. In-charge, NRLDC stated that NRLDC is looking into it in detail. However, Punjab may review data at ICT end.

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

18. Revision of Operating Procedure document of Northern Region 2020-21:

NRLDC representative stated that after requesting comments from utilities in 184th OCC meeting, the document "Operating procedure of Northern region" was revised. Major changes in the document were presented in 185th OCC meeting and it was discussed in detail.

Some of the utilities raised apprehensions regarding changes in point 3.2(b), point 4.4 (iii) and point 4.4(viii), therefore they were advised to send their comments on Operating Procedure document available on NRLDC website to NRPC/NRLDC within 10 days i.e. till 31.07.2021. Based on the comments received, NRPC would develop the common opinion and accordingly it would be discussed in next OCC meeting. Comments received were attached as Annexure-I of the agenda.

Two major issues were discussed in 186th OCC meeting:

1. Approval of bay shutdowns on D-3 basis:

POWERGRID representative stated the following:

- Applying bay SD on D-3 basis and follow up for approval will additionally engage for message exchange and put pressure on control room staff without any real benefit in the grid operation.
- Opening of a Bay within Substation does not affect main element power flow without any involvement of other station/ utility.
- Considering number of 400kV and 220kV breakers in system, there will be difficulty in rescheduling of bay SD as it will affect other maintenance activities
- However, SD of Bays/ Bus/ Filter bank and FSC etc within a substation (Not affecting Power Flow) may be applied on D-1 basis and approved accordingly.

NRLDC representative stated that:

- All switching operation should be carried out in planned manner. Grid code mentions that no part of grid shall be deliberately removed without intimation to RLDC. Bays are also part of grid and should only be switched on/off after timely intimation to NRLDC.
- With increasing penetration of renewable, substations with large number of bays are being commissioned. More bays are also planned at such stations in future. In such a case, given that there is no N-1 compliance for renewable evacuation even bay shutdowns become critical and need to be properly studied and planned for maintenance.

- It is difficult for operator in real-time to judge and study if any generation backing down is required. Generators need to be intimated well in advance for generation backing, if studies suggest.
- It provides additional benefit to transmission utility also as they would be able to plan in better manner and mobilise manpower and material accordingly.
- This is part of best practise being practised in other regions. NR may also adopt similar practise.

CGM(I/C) NRLDC added that it is always better to plan all the maintenance activities. It is not always possible for control room engineers to carry out study if required in real-time, so it is better that shutdowns are approved atleast on D-3 basis. Being planned activity, all bay S/D may be proposed in OCC itself so that list is available with NRLDC beforehand. NRLDC can then study the shutdown on D-3 basis. Since this is also part of best practise being practised in other regions, NR may also adopt similar practise.

With increasing renewable penetration and n-1 non-compliance observed at several stations, it becomes important that sufficient time is available with NRLDC to carry out necessary studies including generation backing down if required in case of shutdowns including bay shutdowns. All these actions would only help to ensure safe and secure grid operation.

Member Secretary, NRPC sought views of States on the issue. Punjab, Rajasthan, Haryana and UP did not agree with proposal of NRLDC of asking bay shutdown on D-3 basis as it is not a practical preposition. Therefore,

It was decided that 765kV and 400kV planned bay shutdowns shall be submitted to NRLDC such that at least one full day is available with NRLDC to carry out any study if required i.e. for example: a bay shutdown proposed on 24th day of a month, the transmission utility can apply for shutdown till 22nd day till 18:00 hrs. NRLDC shall confirm he approval for such requests by 1800 hrs of 23rd day. However, other emergency nature of shutdowns shall remain to be allowed on real time basis as per NRPC approved outage procedure.

2. Charging 400kV and above voltage level lines in case of ph-ph or 3-phase fault:

POWERGRID representative stated that:

- Majority of such tripping have been found temporary in nature without involving any line hardware etc. that is due to kite thread/ lightening/ swinging of conductor during abnormal weather as per previous records
- One charging must be allowed after obtaining request/ clearance form utility as per current practice. In case of failed attempt, the utility shall ensure due patrolling and rectification of problem, if any before asking for charging clearance.

Sekura representative stated that***:***

- Signature analysis takes time especially if two ends are of different utilities.
- Exercise becomes tedious in case where there are multilevel gantries (as in case of PGCIL Kurukshetra &Malerkotla Substations)

- One attempt for charging the lines should be provided to line's owners after receiving patrolling report from the line's owner.

Indigrid representative stated that*:*

- It will increase in time of outages due to use of Offline fault locators which in turn impact the availability and tariff of the licensee.
- There is always possibility of relay malfunctioning, detecting phase-phase fault instead of phase-ground
- Signature analysis takes time especially if two ends are of different utilities.
- Not all substations have offline fault locator and trained manpower
- May lead to generation loss or other grid related issue
- duration from line being declared fit for charging by licensee between the event should not be attributed to the line owner and should be considered as deemed available
- Test charging can be given after line maintenance team provides its healthiness to eradicate the complications arising out of use of offline fault locator.

CGM(I/C) NRLDC stated that it is desirable that line should be charged only after patrolling is carried out by transmission line owner in case of all phase-phase type faults having high fault currents. Charging in case of high fault current may damage substation, line equipments, and in case of protection maloperation, DC earth fault etc. may lead to complete station blackout. However, in case utility wishes to charge the line in case of any type of phase-phase faults, it shall solely be the responsibility of transmission utility in case of any grid event/ disturbance or damage to their elements.

Member Secretary, NRPC asked other representatives regarding their views. Most of the utilities were of the view that one charging attempt may be taken after transmission utility has informed preliminary tripping details and requested charging code. Accordingly, the same was agreed. CGM(I/C) NRLDC informed that it needs to be ensured by the transmission licensee that all protection schemes are functional before any charging attempt.

3. In the meeting, it was discussed that utilities have been requested number of times to update list of radial feeders which can be opened on the directions of NRLDC to regulate the demand. List of such radial feeders has been provided by respective utilities and is part of 'Operating Procedure of Northern Region'. Latest updated document is available at https://nrldc.in/download/operating-procedure-of-northern-region-for-2017-18-2/?wpdmdl=8251. Following are the attributes for such feeders:

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

List of radial feeders have been received from Rajasthan SLDC and Punjab SLDC, they are requested to provide above mentioned information also. Even after repeated requests, the respective information is pending from many utilities.

The opening of feeders is generally an extreme step which shall be required in case of threat to grid security and non-adherence to RLDC instructions to manage overdrawl

by SLDCs/ DISCOMs. In such a case, every utility needs to take actions to support RLDC by following their instructions including opening of feeders.

SLDCs were requested to review and share the list of the following:

- Intrastate 132kV feeders and 220/132 kV and 132kV / 33 kV transformers which supply load radially within the state and can be disconnected at the instruction of SLDC
- Tie lines which supply load radially within the state, which can be switched off from the substation belonging to a different entity, at the instruction of RLDC
- 400/220kV and 220/132kV ICTs at state boundary, which cater load radially and can be switched off from the substation belonging to ISTS or other entity

SLDCs were also requested to verify that

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

Utilities may also intimate in case no radial feeders are available to disconnect. In such a case, NRLDC along with constituent will study the grid connected feeders /ICTs for disconnection which has low impact in the NR Grid. For such states, it was requested to nominate one nodal officer from SLDC which shall coordinate with NRLDC and study about such feeders.

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

19. Computation of TTC/ATC of respective control areas

In last several OCC meetings, NRLDC had shared monthly ATC/TTC limits of NR control areas, worked out by respective SLDCs in coordination with NRLDC. Need for involvement of SLDC officials in ATC/TTC assessment has also been deliberated number of times.As per section4 of the detailed procedure approved by CERC, for relieving congestion in real time it is the responsibility of SLDCs to assess their ATC/TTC and get it vetted by NRLDC. To facilitate the same, NRLDC has also conducted many workshops and video Conferences over the last few years.

NR states except **Uttarakhand, J&K U/T and Ladakh U/T**, **Chandigarh** are sharing basecase and ATC/TTC assessment with NRLDC. ATC/TTC assessed by SLDCs in coordination with NRLDC and reliability issues expected for the upcoming months were discussed in the meeting. SLDCs were also requested to go through the tentative ATC/TTC limits for September 2021 (Annexure-II of agenda) and provide comments.

Reliability issues faced/ expected for next few months were discussed in the meeting:

Punjab:

- ATC/TTC limit of 7300/7900 MW (daytime) and 7700/8300MW (night time) have been declared till 31st Aug due to forced outage of Talwandi Saboo Unit-1.

- ATC/TTC Revised on several occasions this season due to outage of TalwandiSaboo generating units
- Bus –split work at 400kV Moga to be completed shortly. ATC/TTC would be enhanced if margin available after validation of simulation study results by NRLDC and Punjab SLDC.
- Plots showing ATC and N-1 violations at 400/220kV Rajpura, Nakodar, Moga and Ludhiana ICTs were presented in the meeting.
- Punjab SLDC was requested to ensure high generation at 220kV level during high demand, which would help in meeting high demand & also improve voltage profile. Loading of 400/220kV ICTs also to be ensured within their N-1 contingency limit.
- Punjab SLDC representative stated that in case of load crash, 220kV generating units are generally shut down based on merit order. The matter is being taken up and PSPCL is being asked to ensure sufficient generation at 220kV.
- NRLDC representative stated that in case of load crash events, Punjab shall try and back down these units to their technical minimum, because the load being weather dependent could rise very quickly and lead to overdrawl by state. Moreover, it was requested that if 220kV generating units are expected to remain out for more number of days, same shall be duly intimated to NRLDC alongwith revised ATC/TTC limits.

UP: ATC/TTC assessed by UP SLDC in coordination with NRLDC is:

State Gen	**TTC**	**ATC**
11000	13800	13200
11500	13500	12900
12000	13300	12700

- NRLDC representative stated that loading above N-1 contingency limits were observed at 400/220kV Azamgarh, Allahabad(PG), Sarnath, Gorakhpur(UP), Sohawal(PG) (most of the time), Lucknow(PG)and Tanda ICTs. UP SLDC was asked to ensure high intra-state generation during high demand, which would help in meeting high demand & also improve voltage profile. It is also requested to ensure loading at 400/220kV ICTs remains within their N-1 contingency limit.
- In 185th OCC meeting, it was highlighted that 400kV Meja-Allahabad (Twin Moose) line was observed to be highly loaded on several occasions during last few weeks. Under N-1 contingency of one line, the loading of other line is expected to reach beyond 900MW. Thus, there is need to carry out detailed simulation studies for different scenarios and suggest remedial measures.
- As per preliminary studies done by NRLDC, it was suggested that loading of 400kV Meja-Allahabad D/c may be restricted to 520MW on each ckt to ensure N-1 compliance. Moreover, there is significant impact of Singrauli generation. Due to outage of units/less generation at Singrauli, the loading from Meja to

Allahabad would increase. Studies attached as Annexure-I of 185 OCC minutes. It was also discussed that issue is likely to aggravate with commissioning of 765/400kV ICT-2 at Bara.

- In 186th OCC meeting, UP SLDC representative that with commissioning of 400/220kV Basti station and underlying network in next few months, the loading of Sohawal(PG) and Tanda is expected to reduce. Moreover, planning of SPS at Sohawal(PG) and Lucknow(PG) is being done and the details would shortly be shared with NRPC/NRLDC after receiving information regarding ICT settings from POWERGRID. The financial implication of the SPS would be discussed after finalization of the logic.
- UP SLDC representative stated that with commissioning of 765kV Vindhyachal-Varanasi the flows in this region have changed significantly, now the loading of 400kV Meja-Allahabad is largely reduced and is expected to remain this way in upcoming time. After analyzing the load of line and discussion with planning team, it seems that the issue would not be encountered in future.

Haryana:

- Haryana SLDC had shared revised studies for ATC/TTC assessment after meeting held on 7th July 2021 with UHBVN, Haryana SLDC, NRPC and NRLDC to discuss issues related to import capability of Haryana state control area. Subsequently, NRLDC has shared its observations on 13th July 2021.
- N-1 violations at 400/220kV Deepalpur and Kurukshetra ICTs were presented in the meeting. Loading of 400/220kV Sonepat and Panipat ICTs were also close to their N-1 limits.
- Haryana SLDC was once again requested to expedite implementation of SPS at400/220kV Deepalpur and Kurukshetra (PG) and carry out load management at Sonepat and Panipat to enhance their ATC/TTC limits at the earliest.

Delhi:

- Delhi SLDC have assessed ATC/TTC limits as 6500/6800 MW and had shared results with NRPC as well as NRLDC. Constraints observed in assessment by Delhi SLDC are at400/220kV Bamnauli and Mundka ICTs.
- Due to radial feeding of load from most of the stations, reliability is reduced and requirement of SPS may be explored by Delhi SLDC to avoid complete load loss as was seen in few events in July 2021. With SPS, loss of power supply to critical loads such as DMRC may be avoided.
- Moreover, Delhi SLDC was advised to display ATC/TTC limits on their website. As of now only violations of ATC/TTC are being displayed on Delhi SLDC website.

Rajasthan: Revised ATC/TTC figures have been shared with NRLDC for Jul-Aug 2021and are as:

State Gen	TTC	ATC
8200	6200	5900
4100	8100	7800

Rajasthan SLDC was asked to take up the matter for implementation of SPS at Jodhpur, Ajmer and Merta with STU and ensure loading below N-1 contingency limit at constrained 400/220kV ICTs.

Moreover, ATC/TTC assessed by NRLDC for states such as HP, Uttarakhand, J&K and Ladakh U/T were presented in the meeting:

State	State Generation	TTC (MW)	RM (MW)	ATC (MW)	Limting constraint
J&K and Ladakh	Low Hydro	1700	150	1550	N-1 contingency of 400/220kV Amargarh ICTs
HP	Low Hydro	1200	100	1100	N-1 contingency of 400/220kV Nallagarh ICTs and 220kV Nallagarh-Uperanangal D/C
Uttarakhand	Low Hydro	1600	100	1500	N-1 contingency of 400/220kV Dehradun and Kashipur ICTs

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 Uttarakhand, J&K and Delhi (real-time violation available) 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 (real-time violation reporting available)
Rajasthan	https://sldc.rajasthan.gov.in/rrvpnl/scheduling/downloads
HP	https://hpsldc.com/mrm_category/ttc-atc-report/
Uttarakhand	NA
J&K and Ladakh U/T	NA

J&K U/T and Ladakh U/T and Uttarakhand were 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.

All SLDCs were requested to share basecase as well as ATC/TTC assessment with NRLDC/NRPC on monthly basis as well as upload on their websites.

20. Grid operation related issues

(i) SPS Implementation at Bhadla (PG)

The SPS logic decided in the 45th TCC meeting and approved in the 48th NRPC meeting was explained to OCC members in 181st OCC meeting. POWERGRID representative had intimated that QR for the SPS tender has already been finalized and NIT may be floated within next two weeks

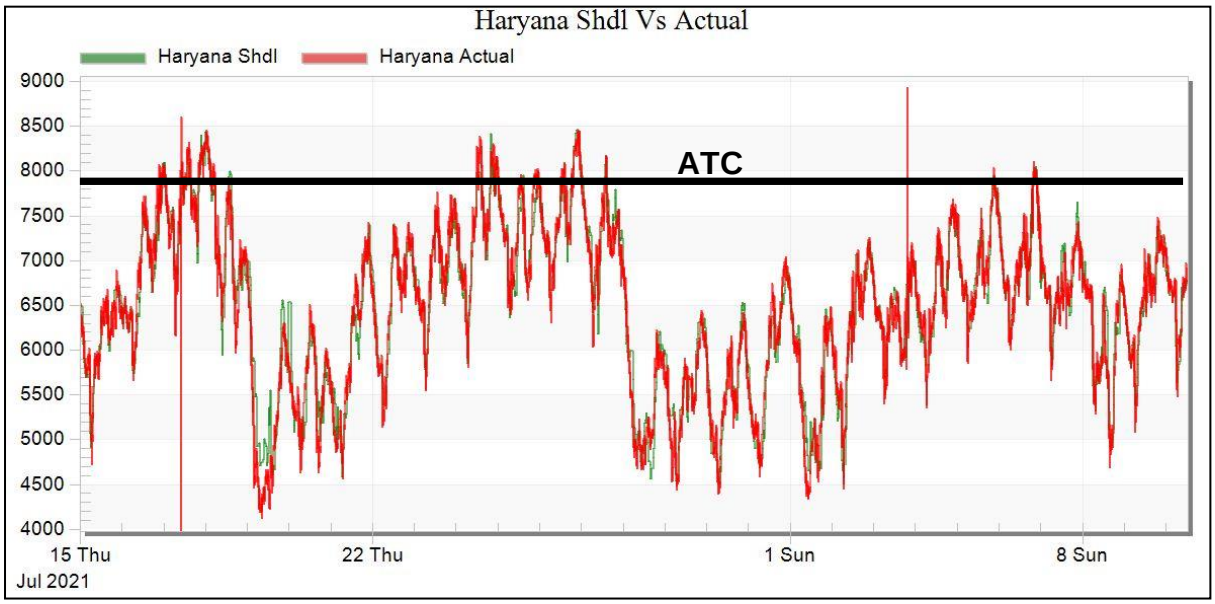
In 183 OCC meeting, POWERGRID representative stated that presently QR has been approved and tender documents are being prepared by C&M department. It is expected that the work is likely to awarded by June end. OCC expressed concern on the slow progress and asked POWERGRID to expedite the work in view of increasing solar generation and importance of SPS in the complex. NRLDC representative also highlighted the importance of SPS in the complex and asked POWERGRID to expedite the work as it is pending since long.

In 186th OCC meeting, POWERGRID representative stated that work is in tendering stage and is expected to be awarded in September 2021. NRLDC representative more generation is being commissioned at Bhadla and nearby Fatehgarh and Bikaner stations. The importance of SPS in the complex was once again highlighted and OCC expressed concern on the slow progress of work. POWERGRID was asked to expedite the work as same status is being furnished in last several OCC meetings. It was also mentioned that since new solar plants are being commissioned at Bhadla, there may be need to slightly modify the SPS.

(ii) 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 Haryana is scheduling power beyond the ATC limits assessed by SLDCs/NRLDC which should not be carried out.

Details shown below:



CGM(I/C), NRLDC stated that:

- NRLDC will be monitoring the TTC/ATC in real time operations and accordingly messages will be issued to constituents to restrict the drawal as per TTC/ATC.
- Core simulation studies team may be constituted at regional level including NRPC and they should regularly meet quarterly to assess the vulnerabilities in the grid. In this regard name and contact details of officials may be shared with NRLDC/NRPC.
- In view of increasing renewable penetration and grid complexity, it becomes important that utilities regularly assess their import capability limits and try to ensure their drawl within this limit. This shall help in ensuring safe and secure grid operation at state as well as regional level.

SLDCs were requested to ensure that the net power scheduled by them considering all long term, medium term and short term contracts remain strictly within their ATC limits for all time blocks of the day so that system operates in safe and secure manner.

(iii) Performance of Grid connected RE plants

NRLDC representative stated that number of RE plants are planned and are being commissioned. These RE plants seeking registration at NRLDC submit their Plant model as per the first time charging procedure. Model is tested and validated at NRLDC end to check whether Plant can meet the CEA compliances as per the Central Electricity Authority (Technical Standards for Connectivity to the Grid) (Amendment) Regulations, 2019. However, while analyzing the Capability curve of some of the Plants at POI drawn using PSSE model/case, it has been observed that plant won't be able to deliver required MVAR when generating its rated MW capacity. However, temperature also plays important role in RE generation, for reference inverter temperature de-rating curve is present below.

Capability curve of such a sample Plant was presented in the meeting.

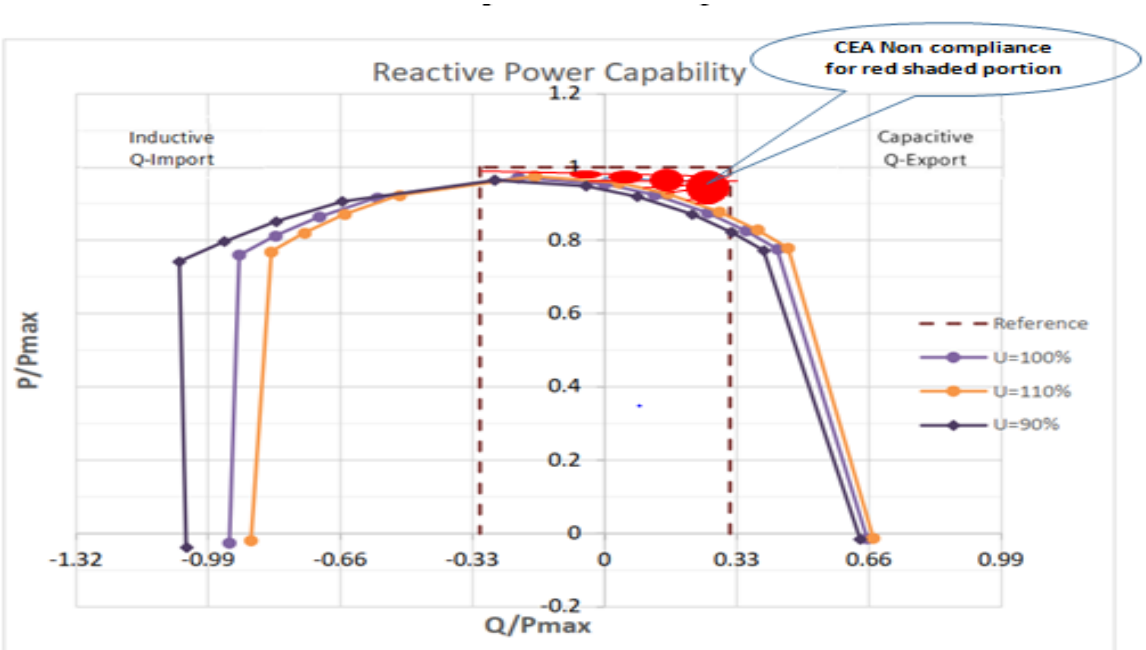
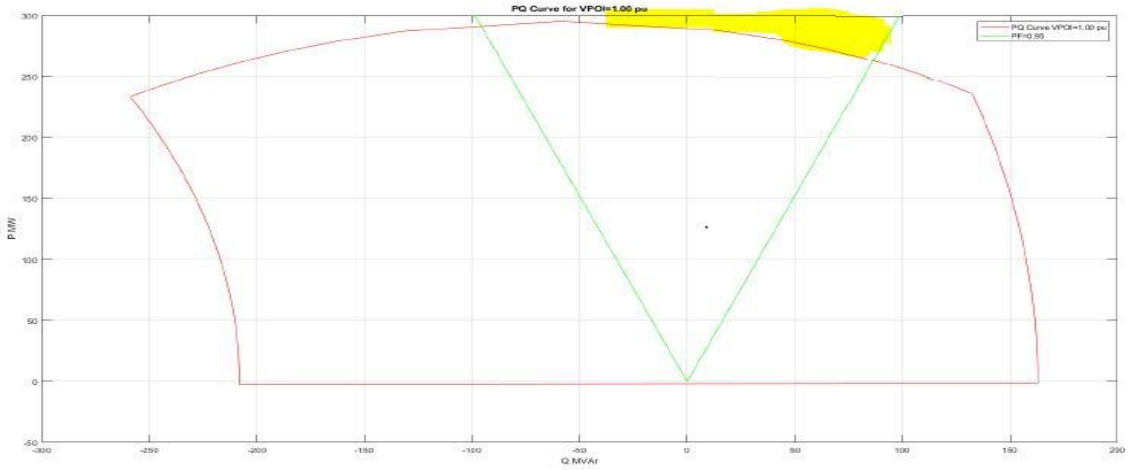


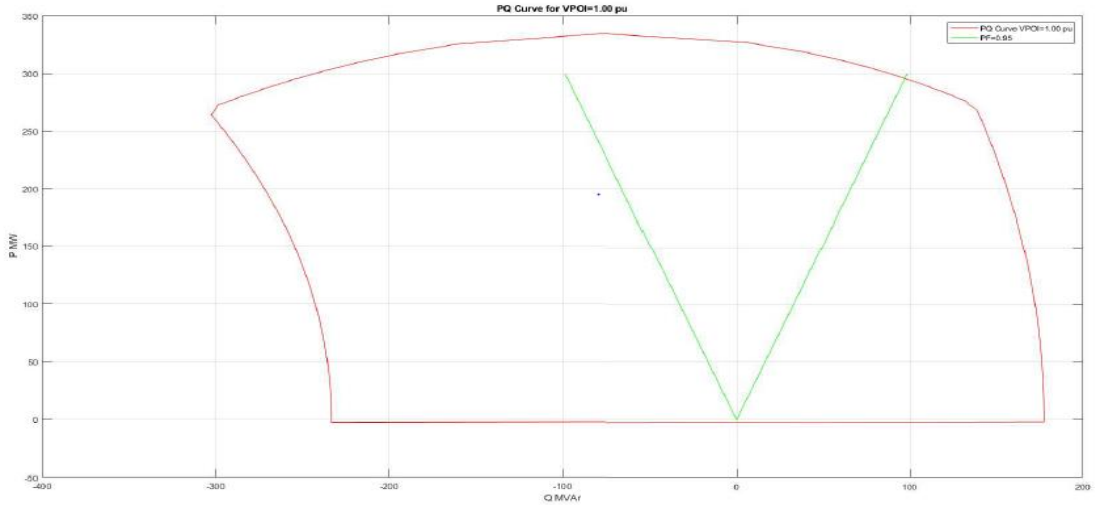
Figure 5-2 Reactive power capability curve at POI

Reactive power capability curve of 300 MW plant shows how it is meeting CEA compliance at 40◦C but not meeting CEA compliance at 50◦C was also presented in the meeting.

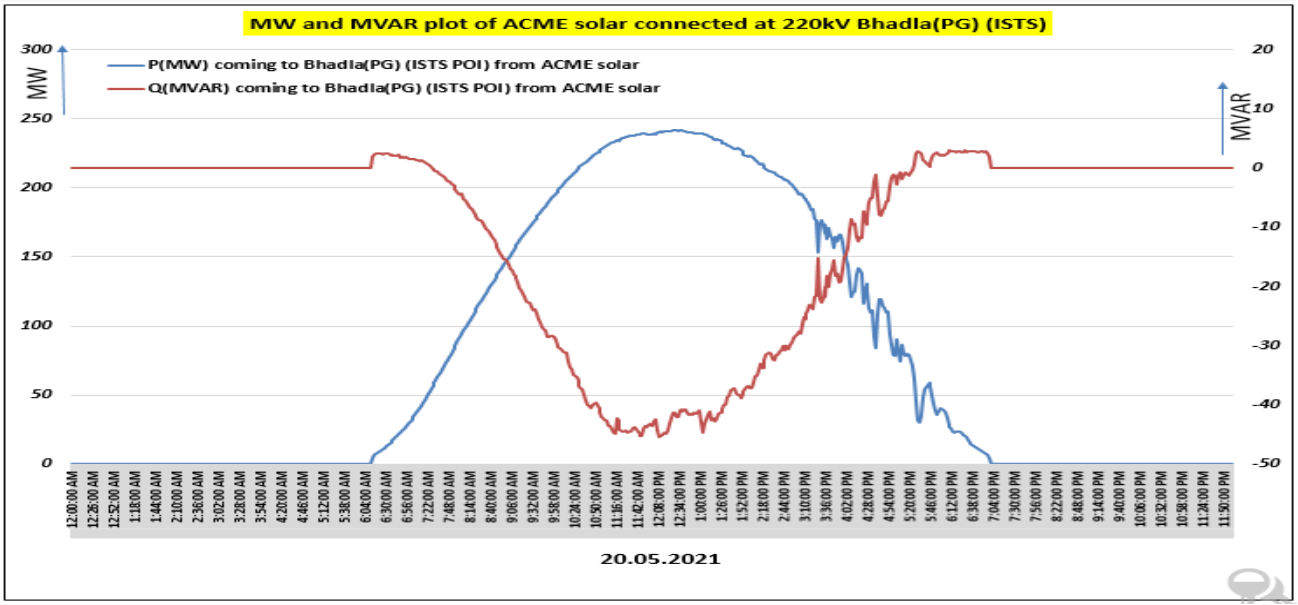
PQ Curve at 1.0pu POI voltage at 50 Deg

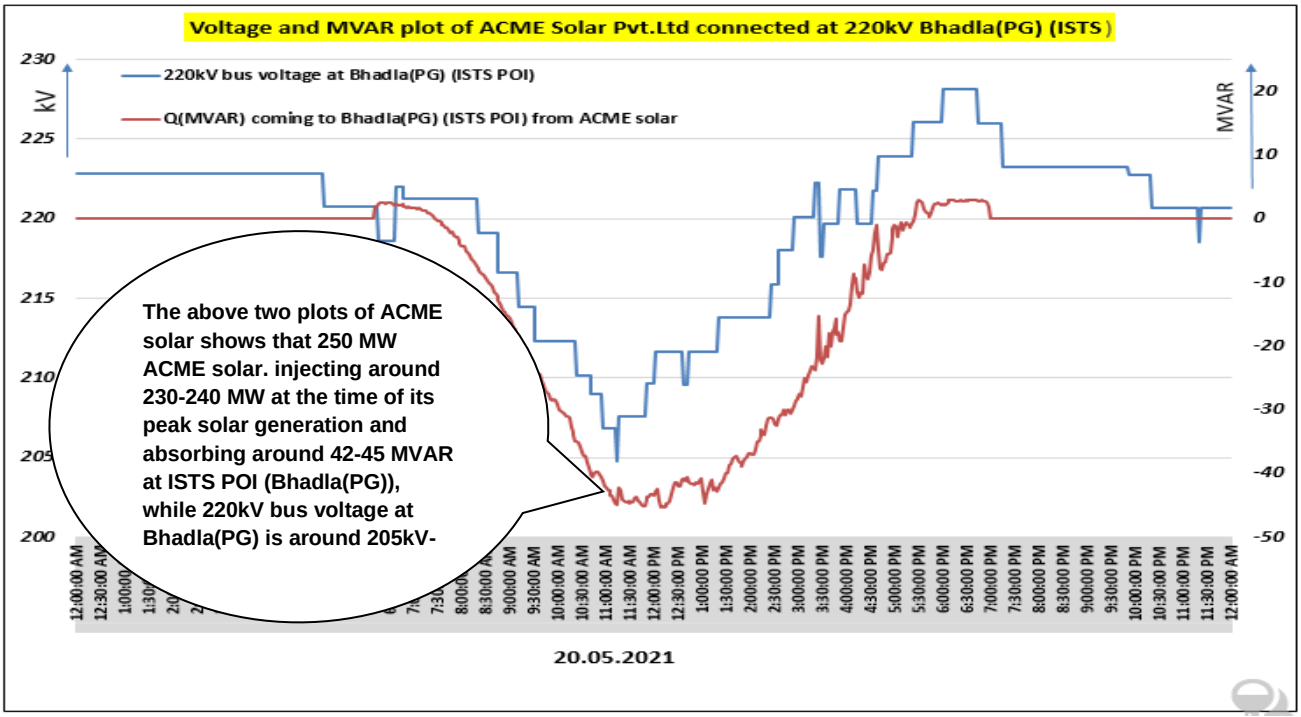


PQ Curve at 1.0pu POI voltage at 40 Deg



RE plants have a common characteristic that if they generate their maximum power (MW) they need sufficient amount of reactive power for their inverter and other equipment. RE plants generally operate in Power factor control mode in order to meet the CEA compliance and to maintain the power factor within the limits of 0.95 lagging to 0.95 leading at POI. Extra MVAR that RE plants need when they generate Max MW is absorbed from the grid by the RE plant at POI.





Following was discussed in the meeting:

- As per CEA regulations and grid requirements, it is required that plant should not be a liability to grid, and should only inject quality power having pf (0.95lag<pf<0.95 lead) at POI. For maintaining this power factor, plant has to see its own requirement of required capacitive/inductive compensation as all the elements (Transformer, cable, dedicated 220kV line connecting the plant to ISTS pooling) are of plant and dedicatedly used by plant to inject their own power to grid. If Plant Reactive power is getting limited to meet the requirements at POI, capacitor bank can be installed for required compensation.
- CEA regulation does not specify the temperature at which all compliances are to be checked. For example, some plants are complying with reactive power requirement at 40deg C but not complying at 50deg C. It needs to be deliberated that whether such plants are to be considered as compliant or non-compliant.

- Plant to operate in Voltage control mode, such that voltage at ISTS POI won't degrade.

The issue of LVRT non-compliance of wind generators has also been discussed in several OCC meetings. In 184th OCC meeting, it was discussed that:

- Rajasthan SLDC representative informed that proposal for PSDF funding for ensuring LVRT compliance in old plants is under process as per orders from higher management. In this regard, cost estimates are being taken from old wind generators. However, estimates are being received only from some of the wind generators.
- Separate meeting may be called with all wind developers in Rajasthan and participants from NRPC, NRLDC, Rajasthan SLDC so that all issues related to wind generators including LVRT non-compliance etc. may be discussed and resolved
- Certificate may be obtained from wind generator that turbine is LVRT compliant as per regulatory requirements. Moreover, it becomes important that during fault events, LVRT compliance is checked at SLDC level.

As per latest information available with NRLDC, status of LVRT compliance of wind generators in Rajasthan was presented:

OEM Name / WTG LVRT compliant	with LVRT compliant	without LVRT compliant	Total LVRT compliant commissioned Capacity (MW)	Total Non LVRT compliant commissioned Capacity (MW)
Siemens Gamesa	148	90	296	76.5
Regen Power Tech. Pvt. Ltd	151		226.5	
Vish Wind (India) Ltd. (Former Wind World)	12	1308	7.2	994.81
Suzlon Energy Ltd.	343	975	534.95	1411.8
GE India Industrial Pvt. Ltd.	93		154.1	
Inox Wind Ltd.	286		572	

Rajasthan SLDC representative stated that they are in process of collecting cost estimate from some of turbine developers to make the turbines LVRT compliant whereas some of the developers have already submitted. After receiving all estimates, proposal would be submitted for PSDF funding. It was agreed that the matter may be discussed in upcoming TCC/NRPC meeting.

(iv) Long outage of transmission elements/ generating units

Reasons and revival date for elements under long outage are being discussed regularly in OCC meetings. Update on the status of these elements as discussed in 186 OCC meeting is attached as **Annexure-A.I**.

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

(v) Maintaining frequency profile of the grid

In last several OCC meetings, SLDCs were asked to take necessary actions to minimize large fluctuations during real-time.

In 181st OCC meeting, it was deliberated that some improvement was seen in frequency profile and excursions were reduced in last month, however there is still need for significant improvement in load changeover and primary frequency response from generators. Still frequency excursion can be observed which need to be further minimized.

UP representative stated that they are regularly taking up the matter for primary frequency response from generators after every event. State generators have been asked to conduct primary frequency response testing. Initiatives are also being taken to minimize sudden load change at hourly boundaries.

Punjab representative informed that performance of generators is being monitored regularly and quarterly reports are being sent to SERC. The primary frequency response of generators under Punjab state control area has improved over the years.

In 182 OCC meeting, UP SLDC representative stated that they are trying to stagger supply hours such that some areas are provided supply five minutes before or after block change so as to minimize the change in demand during hourly/ block boundary. Apart from this, they are regularly taking up the matter for primary frequency response from generators after every event.

In spite of such persuasion, it is observed that there are frequency excursions especially at hourly boundaries. Moreover, on several occasions continuous low frequency operation was observed. To minimize this, as has been requested many times, all utilities shall try and ensure maximum possible intrastate generation.

In 186 OCC meeting, NR Constituents were once again requested to take initiatives to minimise sudden load changeovers at hourly boundaries and also monitor performance of generators under their jurisdiction when the frequency is having large excursions. Following necessary actions may be taken to minimize frequency excursions during real-time:

- Improving accuracy of load forecasting
- Backing down intra-state generation
- Buying/ Selling power in real-time market
- Surrendering/ Requesting ISGS power timely
- Avoiding manual opening of feeders in coordination with DISCOMs

Moreover, RGMO/FGMO shall be ensured in service by advising all state owned and intra- state generators and their compliance needs to be monitored and taken up with SERC if required in addition to staggering of loads. In addition all ISGS generators shall also ensure that RGMO/FGMO is in service and status signal is through from their station to NRLDC.

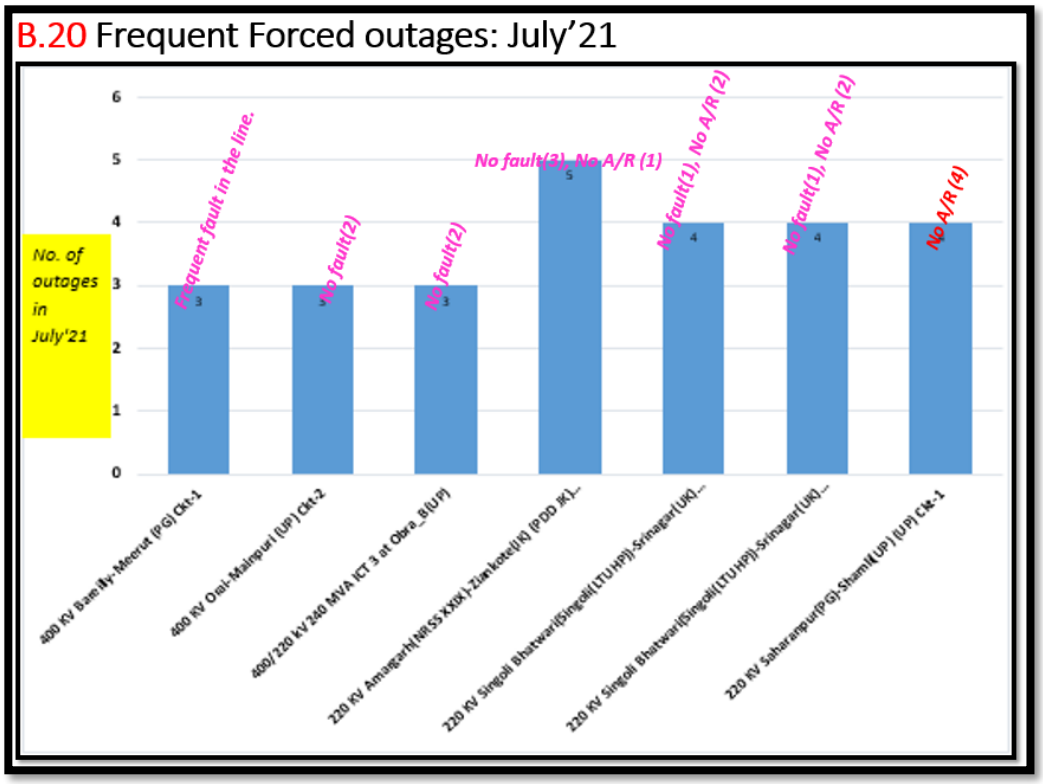
21. Frequent forced outages of transmission elements in the month of July'21:

The following transmission elements were frequently under forced outages during the month of **July'21**:

S. NO.	Element Name	No. of forced outages	Utility/SLDC
1	400 KV Bareilly-Meerut (PG) Ckt-1	3	POWERGRID
2	400 KV Orai-Mainpuri (UP) Ckt-2	3	UP
3	400/220 kV 240 MVA ICT 3 at Obra_B(UP)	3	UP
4	220 KV Amargarh(NRSS XXIX)-Ziankote(JK) (PDD JK) Ckt-2*	5	NRSS XXIX/ JK
5	220 KV Singoli Bhatwari(Singoli(LTUHP))-Srinagar(UK) (PTCUL) Ckt-1**	4	Uttarakhand
6	220 KV Singoli Bhatwari(Singoli(LTUHP))-Srinagar(UK) (PTCUL) Ckt-2	4	Uttarakhand
7	220 KV Saharanpur(PG)-Shamli(UP) (UP) Ckt-1	4	UP/POWERGRID

*- Tripped frequently in June'21 also.

** Tripped frequently in April'21 also.



The complete details are attached at **Annexure-B.II of the Agenda.**

Discussion during the meeting:

- **400 KV Bareilly-Meerut (PG) Ckt-1:***UPPTCL representative informed that tripping occurred on phase to phase fault.*
- **400 KV Orai-Mainpuri (UP) Ckt-2:***UPPTCL representative informed that two tripping on 20th& 27th July observed due to overvoltage at Mainpuri end and one tripping on 27th July observed due to transient fault and unsuccessful operation of autorecloser.*
- **400/220 kV 240 MVA ICT 3 at Obra_B(UP):***UPPTCL representative informed that tripping on 12th& 15th July observed due to operation of earth fault protection and tripping on 31st observed on operation of Differential protection. He further informed that there was issue in setting of earth fault protection which was corrected on 9th August, 2021.*
- **220 KV Saharanpur(PG)-Shamli(UP) (UP) Ckt-1:***UPPTCL representative informed that tripping on 14th& 29th July observed due to issue in polymer insulator at different location which was rectified by taking shutdown of the line. He further informed that on 3rd and 20th July no tripping observed at Shamli end and line tripped from Saharanpur end only on zone 2.*
- **220 KV Amargarh (NRSS XXIX)-Ziankote (JK) (PDD JK) Ckt-1 & 2**: *JK and NRSS XXIX representative was not present in the meeting for any comment.*
- **220 KV Singoli Bhatwari (Singoli (LTUHP))-Srinagar (UK) (PTCUL) Ckt 1 & 2** : *Uttarakhand and Singoli representative were not present in the meeting for any comment.*

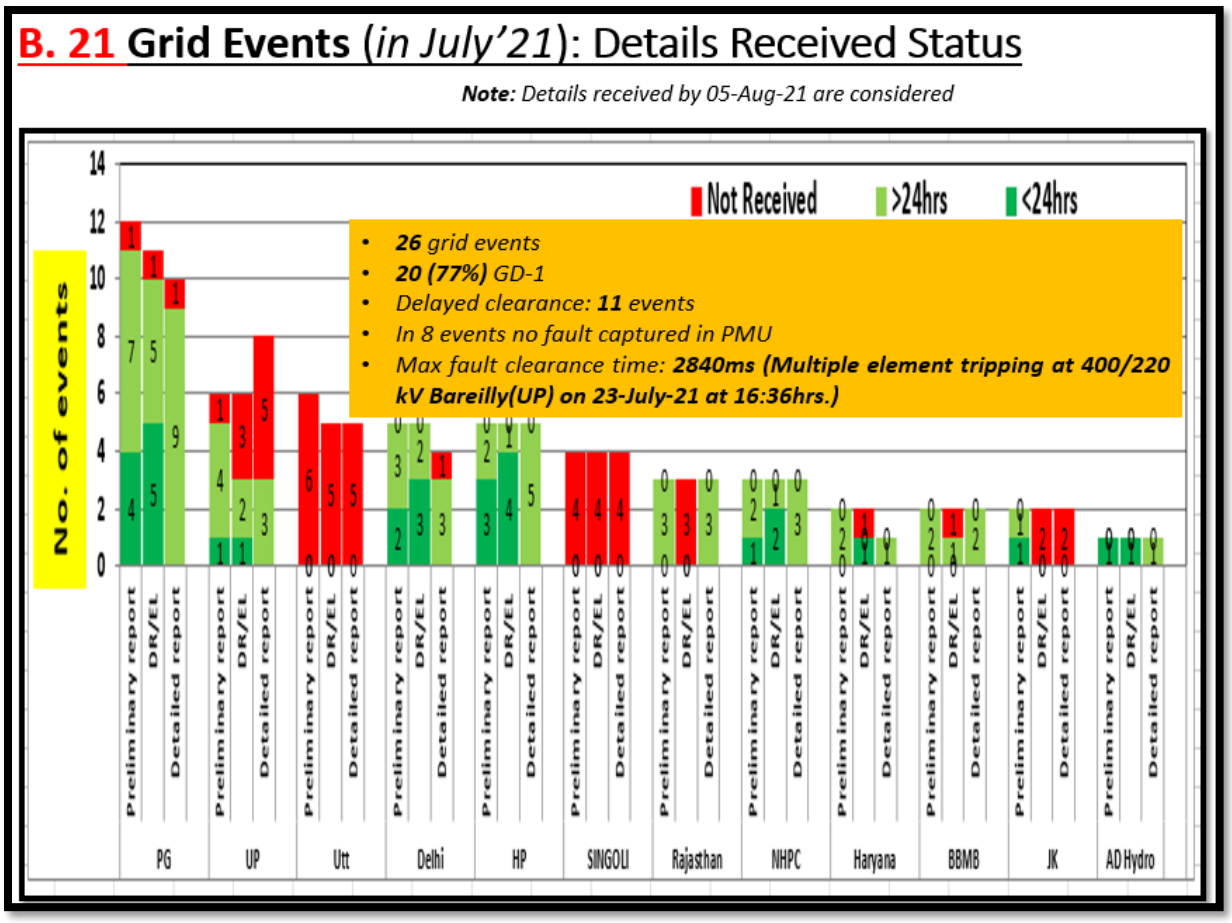
NRLDC representative emphasized that A/R (auto reclosure) issue was found in many of these tripping. He further sensitized all the utilities to ensure healthiness/ in service of A/R in 220 kV and above transmission lines in compliance to CEA Grid Standard. Most of the tripping are transient in nature but due to non-operation of A/R, it resulted into tripping of the transmission element and it further reduce the reliability of the grid. All the utilities shall endeavour to keep auto reclosure in service and in healthy condition for 220 kV and above voltage level transmission line.

Frequent outages of such elements affect the reliability and security of the grid. Hence, utilities are once again requested to look into such frequent outages and share the remedial measures taken/being taken in this respect.

22. Multiple element tripping events in Northern region in the month of July'21

A total of **26** grid events occurred in the month of July'21 of which**20** are of GD-1 category. The preliminary report of all the events have been issued from NRLDC. A list of all these events along with the status of details received by 05-August-2021 is attached at **Annexure-B.III of the Agenda.**

Monthly compiled information is presented in graphical form as below:



Further, despite persistent discussions/follow-up in various OCC/PCC meetings, the compliance of the regulations is still much below the desired level.

Maximum Fault Duration is **2840ms** in the event of multiple element tripping at 400/220 kV Bareilly (UP)on 23-July-21 at 16:36hrs.

Delayed clearance of fault (more than 100ms for 400kV and 160ms for 220kV system) observed in total **11** events out of **26** grid events occurred in the month. In 8number of events, fault signature couldn't be captured from PMU data.

NRLDC representative stated that in the event of tripping at 400/220 kV Bareilly (UP) on 23-July-21 at 16:36hrsdelayed clearance of around 2840ms is observed in the system. He further sensitized that delayed clearance of such large duration may hamper the system and further lead to cascade tripping. UP representative informed that there was fault in 315MVA ICT at Bareilly end but fault current was less due to which fault clearing got delayed. He further informed that Bus bar protection was not there and alternate arrangement of reverse zone of breaker operation had been implemented. But in this event same did not operate due to which 220kV lines got tripped from other end UP representative informed that detailed information regarding this tripping would be collected and shared with NRLDC.

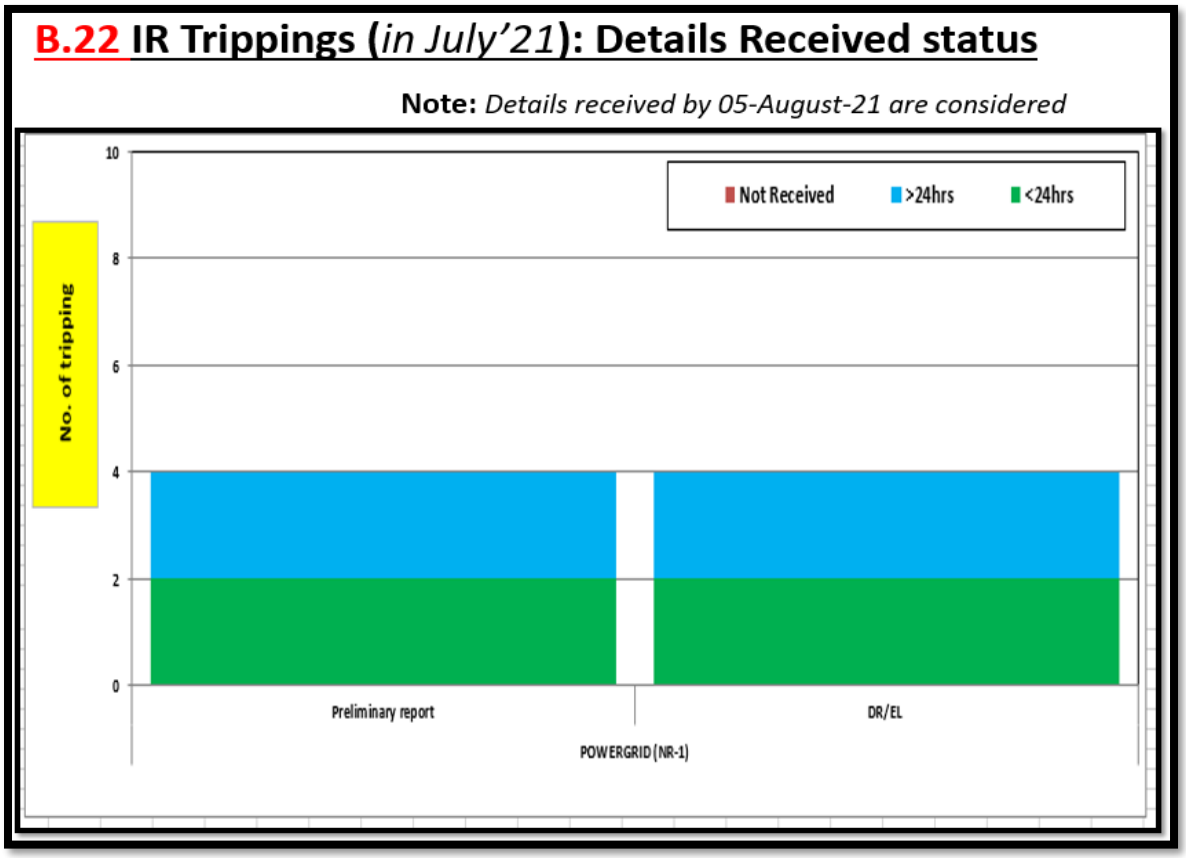
NRLDC representative raised concern about poor status of report updation on the tripping portal. He further stated that timely report submission is an important activity and all constituents are advised to take this on priority and upload the reports.

OCC suggested all the NR constituents to update the information on tripping portal developed by NRLDC. All the constituents agreed to take proactive actions in this regard to minimize the tripping.

Members were asked to take expeditious actions to avoid such tripping in future in order and to minimize the same. Moreover, utilities may direct all concerned for providing the Preliminary Report, DR/EL & Detailed Report of the events within 24 hrs in line with the regulations. Members agreed to take action in this regard.

23. Details of tripping of Inter-Regional lines from Northern Region for July'21:

A total of 4 inter-regional lines tripping occurred in the month of July'21. The list is attached at **Annexure-B. IV of the Agenda.**



Out of 4 number of tripping's, 4 tripping incidents are related to HVDC system. 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 is in violation of various regulations. 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 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.

24. Status of submission of DR/EL and tripping report of utilities for the month of July'21.

NRLDC representative informed the current status (as on 05th August 2021) of DR/EL and tripping report of utilities for the month of July 2021. Consolidated information is tabulated below:

S. No.	Utility	1st Jul 2021 – 31st Jul 2021											
		Total No. of tripping	First Information Report (Not Received)		Disturbance Recorder (Not Received)	Disturbance Recorder (NA) as informed by	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	Tripping Report (Not Received)
			Value	%	Value		%	Value		%	Value		%
1	AD HYDRO	4	0	**0**	0	2	**0**	0	2	**0**	2	0	**50**
2	ANTA-NT	3	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**
3	AURAIYA-NT	1	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**
4	BBMB	44	14	**32**	14	20	**58**	16	18	**62**	16	4	**40**
5	CPCC1	67	24	**36**	24	8	**41**	24	10	**42**	24	6	**39**
6	CPCC2	32	1	**3**	1	3	**3**	1	4	**4**	10	0	**31**
7	CPCC3	45	3	**7**	3	6	**8**	3	6	**8**	5	3	**12**
8	DADRIGAS-NT	1	1	**100**	1	0	**100**	1	0	**100**	1	0	**100**
9	DADRI-NT	7	0	**0**	2	3	**50**	2	3	**50**	4	1	**67**
10	DHAULIGANGA-N	2	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**
11	FARIDABAD-NT	3	1	**33**	0	0	**0**	0	0	**0**	0	0	**0**
12	JHAJJAR	1	1	**100**	1	0	**100**	1	0	**100**	1	0	**100**
13	KOLDAM-NT	1	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**
14	NAPP	3	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**
15	RAPPA	3	1	**33**	3	0	**100**	3	0	**100**	3	0	**100**
16	RAPPB	1	0	**0**	1	0	**100**	1	0	**100**	1	0	**100**
17	RAPPC	3	3	**100**	2	0	**67**	2	0	**67**	3	0	**100**
18	RIHAND-NT	1	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**
19	SALAL-NH	2	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**
20	SEWA-2-NH	1	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**
21	SINGOLI	8	8	**100**	8	0	**100**	8	0	**100**	8	0	**100**
22	SINGRAULI-NT	3	0	**0**	0	1	**0**	0	1	**0**	0	0	**0**
23	SLDC-DV	31	0	**0**	0	9	**0**	0	13	**0**	7	1	**23**
24	SLDC-HP	11	0	**0**	0	8	**0**	0	8	**0**	0	0	**0**
25	SLDC-HR	25	0	**0**	3	1	**13**	3	0	**12**	4	0	**16**
26	SLDC-JK	21	4	**19**	5	16	**100**	5	16	**100**	5	11	**50**
27	SLDC-PS	8	2	**25**	7	0	**88**	7	0	**88**	8	0	**100**
28	SLDC-RS	57	0	**0**	24	9	**50**	25	8	**51**	17	2	**31**
29	SLDC-UK	24	23	**96**	24	0	**100**	24	0	**100**	24	0	**100**
30	SLDC-UP	134	20	**15**	39	31	**38**	42	42	**46**	35	7	**28**
31	STERLITE	9	0	**0**	0	2	**0**	0	2	**0**	9	0	**100**
32	TANAKPUR-NH	7	0	**0**	0	0	**0**	0	0	**0**	1	0	**14**
33	TANDA-NT	1	0	**0**	0	1	**0**	0	1	**0**	0	0	**0**
34	TATAPOWER	1	1	**100**	1	0	**100**	1	0	**100**	1	0	**100**
35	UNCHAHAR-NT	2	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**

It may 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 CPCC3, Delhi, HP and Haryana in May, 2021 compared to the previous month.

All the members were once again requested to provide timely details of the grid events, detailed report in desired format along with remedial measure report. DR/EL of all the tripping needs to 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.

Members agreed for the same.

25. Frequency response characteristic:

Two FRC based event has occurred in the month of **July-2021**. Description of the event is as given below:

S. No.	Event Date	Time (in hrs.)	Event Description	Starting Frequency (in Hz)	End Frequency (in Hz)	*Δf*
1	20-July-21	10:25hrs	On 20th July 20201 at 10:25 hrs, As reported 220 KV Akal-Dangri (RS) Ckt-1 & Ckt-2 tripped on R-Y phase to phase fault. Fault distance	50.07	50.01	-0.06

			was 174meter and fault current was 18.14kA from Akal end. During the event, Rajasthan wind generation loss of approximately 1550MW is observed i. (as observed from SCADA data).			
2	22-July-21	15:08hrs	On 22nd July 2021 tripping of 400kV UPCL-Hassan-1 on R-N Fault and 400kV UPCL-Hassan-2 on Y-N fault was reported at 15:05 and 15:08 Hrs respectively. During the event, generation loss of 1400MW occurred in Southern Region, due to Unit tripping on SPS operation at UPCL (Units 1 & 2) and VARAHI Hydro (Units 1,2,3 & 4).	49.99	49.94	-0.05

The Hon'ble CERC approved procedure has already been shared with all concerned during previous OCC meetings. FRC observed for each state control area for the events is tabulated below:

States	20-Jul-21 event	Remarks
PUNJAB	24%	
HARYANA	40%	
RAJASTHAN	186%	Tripping in Rajasthan control area
DELHI	71%	
UTTAR PRADESH	3%	
UTTARAKHAND	19%	
CHANDIGARH	141%	Small Control Area
HIMACHAL PRADESH	10%	
JAMMU & KASHMIR	-6%	
NR	35%	

States	22-Jul-21 event	Remarks
PUNJAB	16%	
HARYANA	121%	
RAJASTHAN	28%	
DELHI	161%	
UTTAR PRADESH	10%	
UTTARAKHAND	17%	
CHANDIGARH	287%	Small Control Area
HIMACHAL PRADESH	-70%	
JAMMU & KASHMIR	4%	
NR	35%	

FRC calculation of ISGS stations based on NRLDC SCADA data is tabulated below:

Generator	20-Jul-21 event	Generator	20-Jul-21 event
Singrauli TPS	-1%	Salal HEP	-3%
Rihand-1 TPS	78%	Tanakpur HEP	-262%
Rihand-2 TPS	35%	Uri-1 HEP	-4%
Rihand-3 TPS	45%	Uri-2 HEP	Suspected SCADA Data
Dadri-1 TPS	No generation	Dhauliganga HEP	141%
Dadri -2 TPS	No generation	Dulhasti HEP	8%
Unchahar TPS	145%	Sewa-II HEP	No generation
Unchahar stg-4 TPS	-39%	Parbati-3 HEP	Suspected SCADA Data
Jhajjar TPS	125%	Jhakri HEP	54%
Dadri GPS	No generation	Rampur HEP	Suspected SCADA Data
Anta GPS	No generation	Tehri HEP	15%
Auraiya GPS	No generation	Koteswar HEP	42%
Narora APS	-92%	Karcham HEP	65%
RAPS-B	40%	Malana-2 HEP	Suspected SCADA Data
RAPS-C	15%	Budhil HEP	0%
Chamera-1 HEP	24%	Bhakra HEP	0%
Chamera-2 HEP	9%	Dehar HEP	-3%
Chamera-3 HEP	12%	Pong HEP	No generation
Bairasiul HEP	No generation	Koldam HEP	117%
		AD Hydro HEP	Suspected SCADA Data

Generator	22-Jul-21 event	Generator	22-Jul-21 event
Singrauli TPS	-3%	Salal HEP	-15%
Rihand-1 TPS	121%	Tanakpur HEP	-217%
Rihand-2 TPS	54%	Uri-1 HEP	13%
Rihand-3 TPS	-26%	Uri-2 HEP	21%
Dadri-1 TPS	No generation	Dhauliganga HEP	18%
Dadri -2 TPS	No generation	Dulhasti HEP	No generation
Unchahar TPS	606%	Sewa-II HEP	No generation
Unchahar stg-4 TPS	346%	Parbati-3 HEP	Suspected SCADA Data
Jhajjar TPS	162%	Jhakri HEP	4%
Dadri GPS	No generation	Rampur HEP	-11%
Anta GPS	No generation	Tehri HEP	397%
Auraiya GPS	No generation	Koteswar HEP	109%
Narora APS	78%	Karcham HEP	132%
RAPS-B	15%	Malana-2 HEP	Suspected SCADA Data
RAPS-C	-7%	Budhil HEP	-3%
Chamera-1 HEP	42%	Bhakra HEP	-1%
Chamera-2 HEP	-17%	Dehar HEP	-21%
Chamera-3 HEP	23%	Pong HEP	28%
Bairasiul HEP	1%	Koldam HEP	0%
		AD Hydro HEP	0%

FRC calculation of major state generators based on NRLDC SCADA data is tabulated below:

Generator	20-Jul-21 event	Generator	20-Jul-21 event
PUNJAB		UP	
Ropar TPS	0%	Obra TPS	Suspected SCADA Data
L.Mohabbat TPS	1%	Harduaganj TPS	116%
Rajpura TPS	11%	Paricha TPS	3%
T.Sabo TPS	79%	Rosa TPS	31%
Goindwal Sahib TPS	38%	Anpara TPS	-1%
Ranjit Sagar HEP	-3%	Anpara C TPS	54%
Anandpur Sahib HEP	-4%	Anpara D TPS	No generation
HARYANA		Bara TPS	-7%
Panipat TPS	No generation	Lalitpur TPS	49%
Khedar TPS	No generation	Meja TPS	Suspected SCADA Data
Yamuna Nagar TPS	No generation	Vishnuprayag HEP	Suspected SCADA Data
CLP Jhajjar TPS	-2%	Alaknanda HEP	5%
Faridabad GPS	No generation	Rihand HEP	No generation
RAJASTHAN		Obra HEP	-10%
Kota TPS	11%	UTTARAKHAND	
Suratgarh TPS	No generation	Gamma Infra GPS	-15%
Kalisindh TPS	23%	Shravanti GPS	Suspected SCADA Data
Chhabra TPS	No generation	Ramganga HEP	Suspected SCADA Data
Chhabra stg-2 TPS	-14%	Chibra HEP	Suspected SCADA Data
Kawai TPS	545%	Khodri HEP	-11%
Dholpur GPS	No generation	Chilla HEP	Suspected SCADA Data
Mahi-1 HEP	No generation	HP	
Mahi-2 HEP	No generation	Baspa HEP	4%
RPS HEP	No generation	Malana HEP	Suspected SCADA Data
JS HEP	No generation	Sainj HEP	0%
DELHI		Larji HEP	0%
Badarpur TPS	No generation	Bhabha HEP	-1%
Bawana GPS	-17%	Giri HEP	-27%
Pragati GPS	-17%	J&K	
		Baglihar-1&2 HEP	-2%
		Lower Jhelum HEP	No generation

Generator	22-Jul-21 event	Generator	22-Jul-21 event
PUNJAB		UP	
Ropar TPS	No generation	Obra TPS	Suspected SCADA Data
L.Mohabbat TPS	No generation	Harduaganj TPS	154%
Rajpura TPS	0%	Paricha TPS	-1%
T.Sabo TPS	0%	Rosa TPS	54%
Goindwal Sahib TPS	128%	Anpara TPS	-18%
Ranjit Sagar HEP	24%	Anpara C TPS	130%
Anandpur Sahib HEP	-3%	Anpara D TPS	No generation
HARYANA		Bara TPS	Suspected SCADA Data
Panipat TPS	No generation	Lalitpur TPS	-10%
Khedar TPS	No generation	Meja TPS	Suspected SCADA Data
Yamuna Nagar TPS	No generation	Vishnuprayag HEP	Suspected SCADA Data
CLP Jhajjar TPS	-3%	Alaknanda HEP	-1%
Faridabad GPS	No generation	Rihand HEP	No generation
RAJASTHAN		Obra HEP	-20%
Kota TPS	-7%	UTTARAKHAND	
Suratgarh TPS	No generation	Gamma Infra GPS	-26%
Kalisindh TPS	Suspected SCADA Data	Shravanti GPS	Suspected SCADA Data
Chhabra TPS	No generation	Ramganga HEP	Suspected SCADA Data
Chhabra stg-2 TPS	15%	Chibra HEP	Suspected SCADA Data
Kawai TPS	108%	Khodri HEP	-2%
Dholpur GPS	No generation	Chilla HEP	Suspected SCADA Data
Mahi-1 HEP	No generation	HP	
Mahi-2 HEP	No generation	Baspa HEP	11%
RPS HEP	No generation	Malana HEP	Suspected SCADA Data
JS HEP	No generation	Sainj HEP	6%
DELHI		Larji HEP	2%
Badarpur TPS	No generation	Bhabha HEP	-1%
Bawana GPS	16%	Giri HEP	-13%
Pragati GPS	1%	J&K	
		Baglihar-1&2 HEP	4%
		Lower Jhelum HEP	No generation

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

For event on 20th July, 2021, FRC information has been received from AD Hydro, Kawai, Koteshwar, Harduaganj, NHPC, NJPC, Rihand, Singrauli, Tanda, Unchahar, Rosa TPS & UP control area.

For event on 22nd July, 2021, FRC information has been received from AD Hydro, Kawai, Koteshwar, NHPC, Rihand, Singrauli, Talwandi sabo, Unchahar, Rosa TPS & UP control area.

Data of FRC for 20.08.2021 Akal				
Sr. No	Station name	FRC data(%)		
		NR	State/generator	Remarks
1	Singrauli TPS	-1%	86.83%	Only Unit 6 data received, Unit 7 was under shutdown
2	Rihand-1 TPS	78%	Rihand TPS Unit 1: 92.35% Rihand TPS Unit 1: 103.22%	
3	Rihand-2 TPS	35%	Rihand TPS Unit 3: 42.16% Rihand TPS Unit 4: -4.13%	Reason for poor response of Rihand TPS Unit 4: Due to poor coal quality and load was full at 502 MW . HPCV Valves were full opened during this period, hence RGMO effect was not visible during that period.
4	Rihand-3 TPS	45%	Rihand TPS Unit 5: 84.51% Rihand TPS Unit 6: 68.17%	
5	Koteshwar HEP	42%	83.87%	Raw data file not received
6	T.Sabo TPS	79%	117.20%	
7	Unchahar TPS	145%	Unchahar TPS Unit 1: 79.95% Unchahar TPS Unit 2: 106.1% Unchahar TPS Unit 3: -40.3% Unchahar TPS Unit 4: 0.18% Unchahar TPS Unit 5: 19.24% Unchahar TPS Unit 6: 26.37%	Poor response of Unchahar Unit 3&4
8	Unchahar stg-4 TPS	-39%		

Data of FRC for 20.08.2021 Akal				
Sr. No	Station name	FRC data(%)		
		NR	State/generator	Remarks
9	Chamera-1 HEP	24%	74.10%	
10	Jhakri HEP	54%	N. Jhakri Unit 1: 52.80% N. Jhakri Unit 2: 52.64% N. Jhakri Unit 3: 65.37% N. Jhakri Unit 4: 59.19% N. Jhakri Unit 5: -7.07% N. Jhakri Unit 6: 50.06%	Reason for poor response in N. Jhakri Unit 5: Due to problem in the R-phase measuring CT of Unit #5, an error is being observed in the calculated power.
11	AD Hydro HEP	Suspected SCADA Data	2.26%	RGMO was not active as units were running on overload to avoid spillage
12	Kawai TPS	545%	521%	
13	Harduaganj TPS	116%	168.45%	
14	Rosa TPS	31%	23%	
15	Bara TPS	-7%	Bara TPS unit 1: -52.87% Bara TPS unit 2: 25.60% Bara TPS unit 3: 0%	
16	Anpara C TPS	54%	-3.95%	Response is observed, but data mismatch w.r.t to time
17	Lalitpur TPS	49%	Lalitpur TPS Unit 1: 119.01% Lalitpur TPS Unit 2: -9.62% Lalitpur TPS Unit 3: -10.37%	

Data of FRC for 22.08.2021 Udpai				
Sr. No	Station name	FRC data(%)		
		NR	State/generator	Remarks
1	Dhauliganga HEP	18%	24.62	Raw data file not received
2	Rihand-1 TPS	121%	Rihand TPS Unit 1: 99.52% Rihand TPS Unit 2: No generation	121%
3	Rihand-2 TPS	54%	Rihand TPS Unit 3: 48.07% Rihand TPS Unit 4: 67.40%	54%
4	Rihand-3 TPS	-26%	Rihand TPS Unit 5: -82.99% Rihand TPS Unit 6: 66.75%	-26%
5	Koteshwar HEP	109%	108.70%	Raw data file not received
6	T.Sabo TPS	0%	-30.88%	
7	Unchahar TPS	606%	Unchahar TPS Unit 1: 520.54% Unchahar TPS Unit 2: 510.91% Unchahar TPS Unit 3: 15.36% Unchahar TPS Unit 4: -3.92% Unchahar TPS Unit 5: 212.20% Unchahar TPS Unit 6: 46.27%	Poor response of Unchahar Unit 3&4
8	Unchahar stg-4 TPS	346%		

Data of FRC for 22.08.2021 Udpai				
Sr. No	Station name	FRC data(%)		
		NR	State/generator	Remarks
9	Chamera-1 HEP	42%	56.77%	Raw data file not received
10	Chamera-3 HEP	23%	45.34%	Raw data file not received
11	AD Hydro HEP	0%	4.56%	At the time of the event Unit#2 was running on over load and Unit#1 power setter was at 99% by mistake, therefore RGMO not responded in Unit#1.
12	Kawai TPS	108%	108.25%	
13	Harduaganj TPS	154%	131.40%	
14	Rosa TPS	54%	Rosa TPS Unit 1: 2.62% Rosa TPS Unit 2: 10% Rosa TPS Unit 3: -5.83% Rosa TPS Unit 4: 9.45%	
15	Koldam HEP	0%	2.73%	Raw data file not received
16	Anpara C TPS	130%	Anpara C TPS unit 1:15.54% Anpara C TPS unit 2: -27.83%	Response is observed, but data mismatch w.r.t to time
17	Lalitpur TPS	-10%	Lalitpur TPS Unit 1:3.82% Lalitpur TPS Unit 2:8.15% Lalitpur TPS Unit 3: 13.32%	

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

All the concerned utilities may please go through the details and share the detailed reply considering all the points and supporting plant wise data to check the FRC response of the generator within week time to RPC/ RLDC.

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

Maintaining properly tuned Power System Stabilizers in service isessential for damping of inter area and local mode of oscillations in the grid. As we all know, Indian electricity grid is continuously expanding and lots of Power Electronics devices were also commissioned in recent years changing the dynamics of grid. As possibility of development of power oscillations under certain operating conditions cannot be ruled out, PSS tuning /re-tuning is required for damping of oscillations.

In this regard one committee at NRPC level was formed in year 2014 and it was agreed that If results of Step Response Test on concerned grid connected generators indicate sufficient damping, generating company would perform next Step Test after three year or at the time of major overhauling of the machine, whichever will be earlier and Generating Companies would arrange for re-tuning of PSS, if Step Response Test indicates insufficient damping of oscillations.

In 180th, 181st, 182nd, 183rd, 184th & 185th OCC meeting, 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)

Status report in above format updated till 08thAugust 2021is attached as **Annexure-B.VI of the Agenda.**

It may be noted that except Anpara-A U-3, Parichha-C U-5, Baspa U-2, Unchahar-II U-1, Jhakri U-1&3, all units of Tehri and Koteshwar, and all units of Rampur HPS, PSS of other major units were last tuned several years ago. Therefore, all utilities were requested to arrange exciter step-responsetest or tuning of their respective units and submit the plan to NRLDC/NRPC. Report of PSS tuning/ re-tuning/ Step Response Test may be shared through email to NRPC and NRLDC at seo-nrpc@nic.in and nrldcso2@posoco.in respectively.

27. Frequent multiple element tripping at 400kV Muzaffarnagar(UP), 400kV Alaknanda(UP) & 400kV Vishnuprayag(UP) complex:

Two major grid events of multiple element tripping at 400kV Muzaffarnagar(UP), 400kV Alaknanda(UP) & 400kV Vishnuprayag(UP) complex occurred recently which led to generation loss of approximately 850MW in Alaknanda HEP, Vishnuprayag HEP & Singoli Bhatwari generation complex.

a) In first incident at 14:39 Hrs on 20 Jul 2021, 400kV Alaknanda-Muzaffarnagar Ckt tripped on Y-N phase to earth fault, and no attempt forauto-reclosing was observed. Further, 400KV Muzaffarnagar (UP)-Vishnuprayag (JP) (UP) Ckt tripped on over current protection operation at Vishnuprayag end. Due to tripping of both evacuating lines, all the Units of Alaknanda HEP, Vishnuprayag HEP & Singoli Bhatwari (SINGOLI) tripped leading to generation loss of approximately 850MW.

   As per NR protection philosophy, over current protection should not be enabled in 400kV lines. SLDC-UP may ensure the disabling of over current protection at Vishnuprayag end. Further,Auto-reclosure operation during Line to ground fault in 400kV Alaknanda-Muzaffarnagar is to be ensured by UPPTCL

b) In thesecond incident at 03:02 Hrs on 07 Aug 2021, 400/220kV 315 MVA ICT 3 at Muzaffarnagar (UP) tripped on differential protection operation on blastingof R-ph CT of ICT 3, which was connected to Bus 2. At the same time, bus bar 1 protection operated which resultedinto tripping of ICT 1, ICT 4, 400kV lines to Meerut, Ataur and Vishnuprayag which were connected to Bus 1. Further, 400kV Alaknanda-Muzaffarnagar Ckt-1 also tripped on B-N phase to earth fault on B-ph CT damaged at MuzaffarnagarS/s. Due to tripping of evacuating lines

all the units ofAlaknanda HEP, Vishnuprayag HEP and Singoli Bhatwari tripped leadingto generation loss of approximately 850MW. As per PMU, R-N & B-N fault followed by Y-N fault observed with delayed clearance in **760ms**.

SLDC-UP may share the details regarding exact nature of fault, reason of operation of bus bar-1 (as fault was in ICT 3, which was connected to bus 2), reason of tripping 400kV Muzaffarnagar-Alaknanda Ckt.

The list of all the tripped elements andthe PMU plots of phase voltages for all aforementioned incidents are attached as **Annexure-B.VII of the Agenda**. Such delayed clearance of fault, non-operation of auto-reclosure during line to ground fault and sensitive protection setting may lead to multiple elements tripping and such incidents in generation complex area lead to sudden significant generation loss, which affect the reliability and security of the grid.

Therefore, it was requested that the events may be analyzed in detail and shortcomings in the operation and protection system may be immediately resolved. A confirmation of the actions taken along with detailed report may please be submitted to NRLDC/ NRPC.

Additional agenda

28. Non-Availability / Reliability of Telemetry

In order to have proper visualization and Situational awareness to control room operator for ensuring reliable grid operation, uninterrupted availability of telemetry is essential. It is essential to ensure 100% availability of the data from all the Sub-stations. However, it is seen that data is highly intermittent even for some of the 400kV/ 765kV Sub-stations.

The non-availability of various 400 KV / 765 stations was calculated for the month of June 2021. The list of stations where data availability is less than 95% is given below.

Central Sector	**UPPTCL**	**RRVPNL**
Shree Cement	Parichha	Heerapura
Bairaisuil	Noida Sec-148	Alwar
AD Hydro	Rosa	Kalisindh
Karcham Wangtoo	Muradnagar	Bhainsara
Parbati-2	Meja	Hindaun
Parbati-3	Bara	Rajwest
DTL	**PTCUL**	Hindaun
CCGTB	Srinagar	SSCTPS
	HPSEBL	Anta

HVPNL	WANGTU	
Nuhiyawali		
Kirori		

*Intermittency based on June'2021-month data availability

Telemetry of digital status

The importance of correct Digital telemetry was discussed in all the TeST sub-committee meeting and it is observed that there is no improvement in this regard. It was decided in previous TeST Sub-committee meeting that the constituent will furnish the availability status of 220 kV and above stations and improvement there off.

Availability of digital status based on snapshot of 2nd Aug 2021 (1100 hrs) is given below:

	Total	Available	Not Available	% Availability
PGCIL	3468	3359	109	96.86%
UPPTCL	2377	1563	814	65.76%
RRVPNL	2021	1449	572	71.70%
PSTCL	868	586	282	67.51%
HVPNL	769	642	127	83.49%
JKPDD	156	7	149	4.49%
PTCUL	174	124	50	71.26%
HPSEBL	156	125	31	80.13%
BBMB	261	233	28	89.27%
DTL	617	531	86	86.06%

Matter has been taken up with various constituents through letter / meetings for improvement of telemetry. It is requested to take up for improvement of telemetry for better system visualization and grid Operation. The matter was also discussed in **18h TeST Meeting,** wherein representative from SLDCs informed that they have been taking up the telemetry issue with transmission wing for improvement of telemetry.

Members were asked to take up the issues on priority

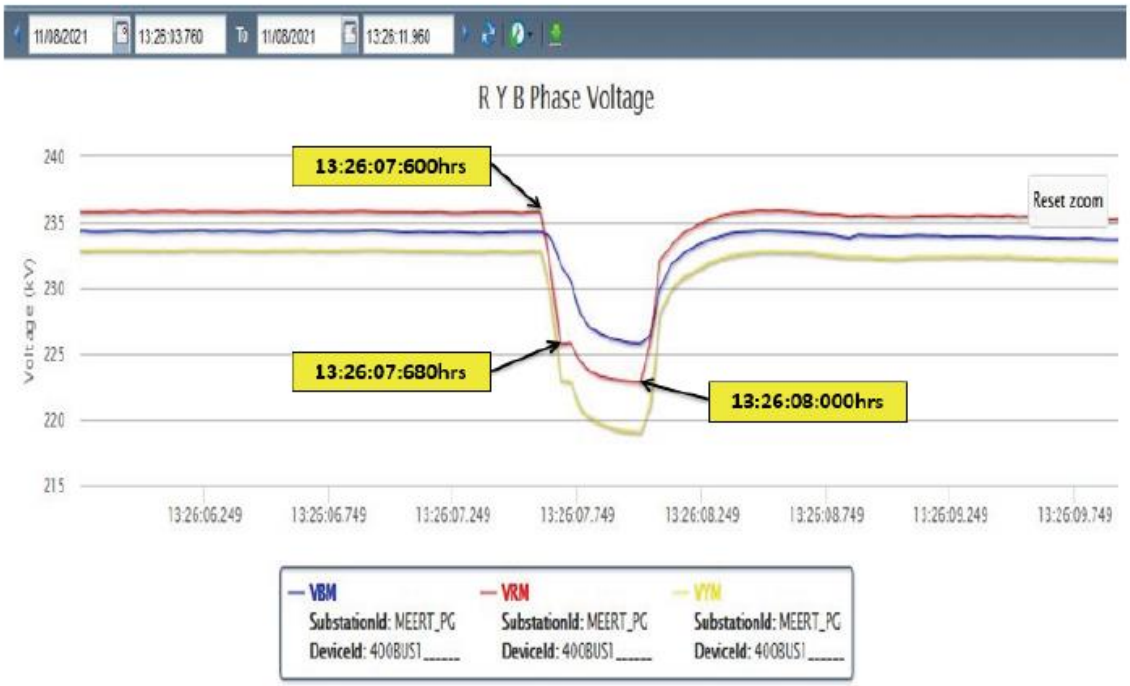
29. Multiple element tripping at 220kV NAPP(NP) on 11th August 2021 at 1335Hrs.

Grid event of multiple element tripping occurred at 220kV NAPP (NP) on 11th August 2021 at 1335Hrs, which led to generation loss of approximately 365MW in Narora Power plant and poisoning out of both the units.

As reported, R-ph CVT of 220kV NAPP-Sambhal Ckt got burst at NAPP, which converted into R-Y phase to phase fault. 220kV lines to Sambhal, Khurja, Atrauli, Simbholi and Debai all tripped from remote end in zone 2 (Z-2) and from NAPP end in main protection operation. At the same time, NAPP Unit 1 tripped on Class A (Over fluxing stage- 2) protection operation. After 20sec, NAPP Unit 2 tripped on over frequency protection operation as frequency rose up to 51.5Hz for 20sec. As per PMU, R-Y phase to phase fault is observed. As per SCADA, generation loss of approx. 365MW is observed at NAPP. In antecedent condition, 220kV lines to Sambhal, Simbholi, Atrauli, Khurja and Debai were carrying 67MW, 55MW, 59MW, 27MW and 139MW respectively.

PMU Plot of phase voltage magnitude at Meerut(PG)

13:26hrs/11-Aug-21



Preliminary report from 220kV NAPP (NP):

Preliminary Report on both unit outage due to R-phase CVT failure of Narora-Sambhal Line(Line-1) on 11.08.2021

1. Both units were operating at full power prior to the incident. Switchyard configuration was as follows:-

   i. Line-1 (Narora-Sambhal), Line-4 (Narora-Khurja), SUT-1 and GT-2 were connected on 220 KV Bus-C.

   ii. Line-2(Narora-Simbholi), Line-3(Narora-Dibai), Line-5(Narora-Atrauli), SUT-2 and GT-1 were connected on Bus-C.

   iii. Both Bus was connected through Bus coupler CB-1.

2. At 13:26:07 Hrs R-phase CVT of 220 KV Line-1 got bursted. During this oil of CVT spilled to near by area and caused phase to phase fault between R and Y phase of Line-1. This fault was sensed by other end CBs(all five lines) and all CBs tripped on R-Y phase zone-2 protection. This caused isolation of NAPS-2 switchyard from grid. CBs of Line-1 and Line-4 at NAPS tripped on main protection.

3. NAPS-1 TG tripped on Class-A protection (Over fluxing stage-II) at 13:26:16.

4. Due to sudden load through off, turbine speed got increased upto over frequency trip setting (51.5Hz) at 13:26:10. NAPS-2 TG tripped on over frequency protection with 20 seconds time delay as per scheme at 13:26:27.

5. In NAPS-1 auto transfer took place successfully at 13:26:16 and loads were transferred to SUT-1. SUT-1 continued to feed to 6.6 KV till NAPS-2 TG in operating stage through switchyard. After tripping of NAPS-2 TG at 13:26:27 and subsequently outage of SUT-2 on under frequency, there was complete loss of 6.6 KV supply in NAPS-1 resulting reactor trip on no PCP running.

6. In NAPS-2 auto transfer took place at 13:26:28, TG was coasting down and voltage was in reducing trend & SUT LV circuit breaker tripped on under frequency. At 13:26:38 all PCPs tripped on under voltage and resulting NAPS-2 reactor trip on no PCP running.

6.NAPS-2 TG was under coasting down after turbine trip, this caused actuation of under frequency at 13:26:33 and led to tripping of CBs of SUT-2, Line-2,3&5.

7. EMTR initiated successfully and restored Cl-III supply and respective loads in both the units. Both the Reactors maintained on Hot Shutdown state. Switchyard was charged back at 14:15Hrs. Subsequently both the SUTs were taken into service and class-IV supply was restored in both the units at 14:15 hrs and at 14.37 hrs respectively.

Delayed clearance of fault (400ms) as observed in PMU and tripping incidents in generation complex area lead to sudden significant generation loss, which affect the

reliability and security of the grid. Further, Nuclear plants get poisoned out if supply is not restored within 20 minutes and can be revived after 72 hours.

Therefore, it is requested that the events may be analyzed in detail and shortcomings in the operation and protection system/Auxiliary supply may be immediately resolved. A confirmation of the actions taken along with detailed report may please be submitted to NRLDC/ NRPC.

NAPP *representative was not present in the meeting hence the tripping could not be discussed in detail.*

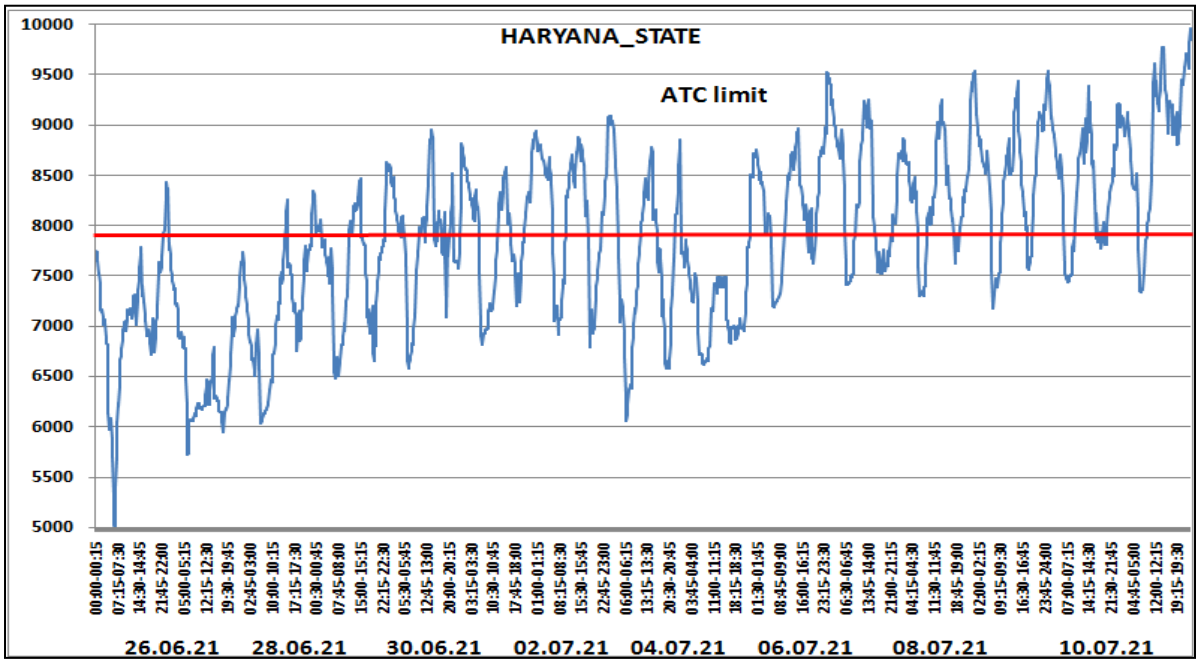
30. SEM- SCADA data mismatch (agenda by Punjab SLDC)

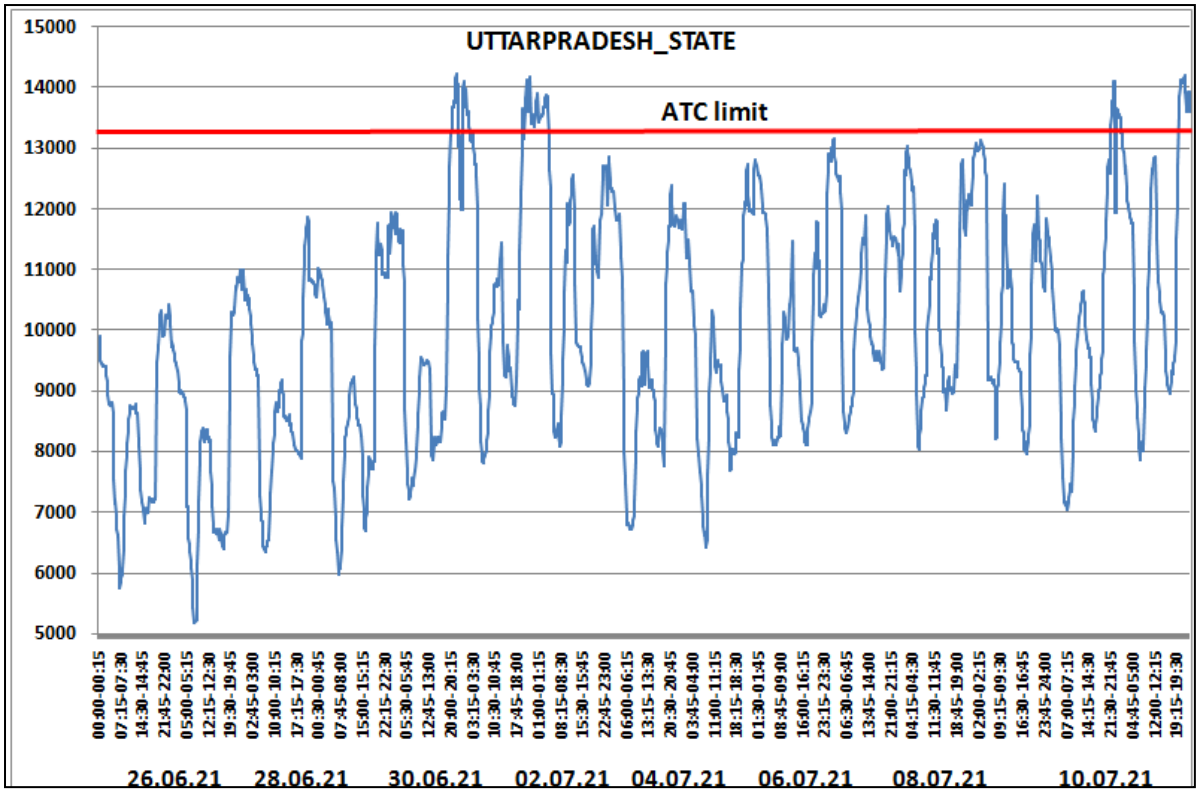
Already discussed at point-17 above.

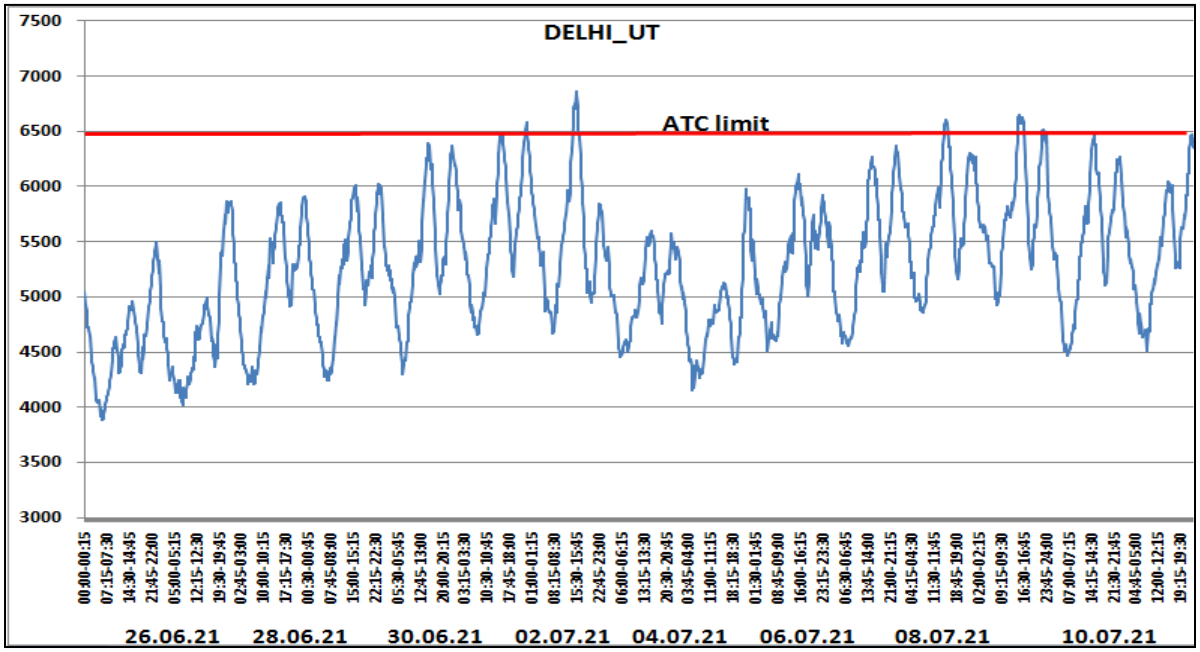
31. Grid operation related issues

(i) Schedule >ATC for state control areas

In the meeting, it was discussed that 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 and Delhi are scheduling power beyond the ATC limits assessed by SLDCs/NRLDC which should not be carried out. It was also discussed that 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.







SLDCs were asked to ensure that the net power scheduled by them considering all long term, medium term and short term contracts remain strictly within their ATC limits for all time blocks of the day so that system operates in safe and secure manner.

(ii) Availability Verification issues

NRLDC representative stated that in past several OCC meetings, it was requested to the constituents to submit the RVO mode operation details of HVDC poles along with the monthly outage data for availability verification. However, the same were not received in the submitted data for last month.

Utilities were asked to ensure the timely submission of RVO mode operation details of HVDC poles along with the monthly outage data.

32. Update of documents in line with Indian Electricity Grid Code (IEGC)

As per Indian Electricity Grid Code (IEGC), in respect of demand control, all efforts must be made to avoid situation of low frequency. Hon'ble CERC in its order in petition no 125/MP/2012 also directed to have the list of radial feeders which can be opened on the directions of NRLDC to regulate the demand. List of such radial feeders has been provided by respective utilities and is part of 'Operating Procedure of Northern Region'. Latest updated document is available at https://nrldc.in/download/operating-procedure-of-northern-region-for-2017-18-2/?wpdmdl=8251

As highlighted in previous meetings, in view of continuous network change and high demand period during summer, it is desirable to have updated list of feeders. Latest list available with NRLDC is attached as Annexure-VI of OCC agenda. Thus, each state control area was requested to update the information of feeders that can be used for demand regulation by NRLDC (in addition to action by SLDC). Following are the attributes for such feeders:

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

It is also important that it is duly verified by SLDCs that the list of feeders is actually radial in nature and is likely to provide the expected relief when such feeders are opened. If such feeders are part of any other scheme such as any SPS, UFR or df/dt, same may also be mentioned.

List of radial feeders have been received from Rajasthan SLDC and Punjab SLDC, they are requested to provide above mentioned information also. Even after repeated requests, the respective information is pending from many utilities.

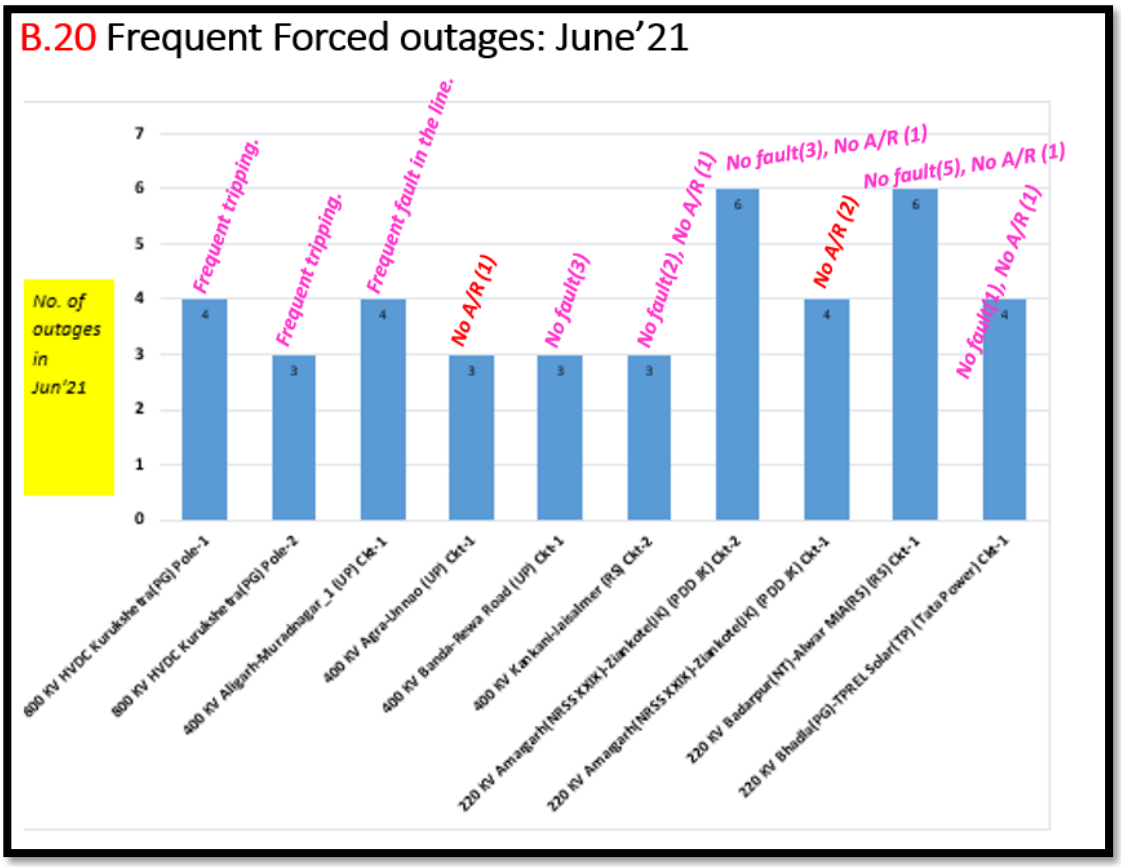
It was discussed that if no radial feeders are available to disconnect, constituent and NRLDC will study the grid connected feeders /ICTs for disconnection which has low impact in the NR Grid. Apart from this NRLDC shall continue giving messages to the respective state to take remedial measures for sustained over drawal at low frequencies as per the IEGC. Also telemetry is required for all such feeders to monitor in real time by SLDC/ NRLDC.

33. Frequent forced outages of transmission elements in the month of June'21

The following transmission elements were frequently under forced outages during the month of **June'21**:

Sl. No.	Element Name	No. of forced outages	Utility/SLDC
1	800 KV HVDC Kurukshetra(PG) Pole-1	4	POWERGRID
2	800 KV HVDC Kurukshetra(PG) Pole-2	3	POWERGRID
3	400 KV Aligarh-Muradnagar_1 (UP) Ckt-1	4	UP

Sl. No.	Element Name	No. of forced outages	Utility/SLDC
4	400 KV Agra-Unnao (UP) Ckt-1	3	UP
5	400 KV Banda-Rewa Road (UP) Ckt-1	3	UP
6	400 KV Kankani-Jaisalmer (RS) Ckt-2	3	Rajasthan
7	220 KV Amargarh(NRSS XXIX)-Ziankote(JK) (PDD JK) Ckt-2	6	NRSS XXIX/ JK
8	220 KV Amargarh(NRSS XXIX)-Ziankote(JK) (PDD JK) Ckt-1	4	NRSS XXIX/ JK
9	220 KV Badarpur(NT)-Alwar MIA(RS) (RS) Ckt-1	6	NTPC/Rajasthan
10	220 KV Bhadla(PG)-TPREL Solar(TP) (Tata Power) Ckt-1	4	POWERGRID/ Tata Power



The complete details are attached at **Annexure-B. II of the Agenda.**

Discussion during the meeting:

- **400 KV Aligarh-Muradnagar_1 (UP) Ckt-1**: *UPPTCL representative informed that tripping occurred on 09th& 30th June due to damage of polymer insulator. NRLDC representative informed that cases of polymer insulator damage should be looked into in detail, as it is understood that polymer insulators are less susceptible to damage compared to porcelain insulator. UPPTCL representative also informed that there is another issue of PLCC card damage at Muradnagar substation due to which A/R (auto reclosure) is not operating in this line. The issue of PLCC card is expected to be resolved by 10th August, 2021.*

- **400 KV Agra-Unnao (UP) Ckt-1**: *UPPTCL representative informed that frequent fault in this line is occurring due to design issue and low ground clearance in some section of the line leading to a number of A/R (auto reclosure) operation. Due to repeated A/R (auto reclosure) operation, breaker contacts may become loose and A/R (auto reclosure) may fail to operate in some cases. He further informed that letters have been issued to Agra and Unnao station to look into the tripping in detail, check the breaker contacts and ensure healthiness/ enabled condition of A/R in this transmission line in compliance to CEA Grid Standard.*

- **400 KV Banda-Rewa Road (UP) Ckt-1**: *UPPTCL representative informed that three tripping occurred in this line due to overvoltage. He further informed that there is CVT error in R & Y phase at Rewa road station of around 4-5% and CVT needs to be replaced, the work of which is expected to be completed by next month. NRLDC representative informed that the replacement of CVT should be done as early as possible to avoid unnecessary tripping of the line. He further informed that till replacement work is completed, the voltage setting ratio can be increased, corresponding to the error to avoid unnecessary tripping. UPPTCL representative agreed for the same.*

- **400 KV Kankani-Jaisalmer (RS) Ckt-2:** *Rajasthan representative informed that during tripping on 02nd June, 2021 A/R was in off condition. NRLDC representative advised RVPNL to ensure healthiness/ enabled condition of A/R in all 220 kV and above transmission lines in compliance to CEA Grid Standard. Rajasthan representative agreed for the same.*

  220 KV Badarpur(NT)-Alwar MIA(RS) (RS) Ckt-1: *Rajasthan representative informed that there is clearance issue in some section of the line due to which frequent fault is occurring in the line. NRLDC representative informed that as per PMU no fault was seen at the time of event. Rajasthan representative clarified that fault is occurring in the line and there may be time sync issue due to which wrong time was reported for the event. NRLDC representative asked Rajasthan representative to check the issue and share the detail report.*

- **220 KV Bhadla(PG)-TPREL Solar(TP) (Tata Power) Ckt-1:** *Tata Power representative was not present in the meeting for any comment. POWERGRID representative informed that he will collect the information regarding tripping of the line and share the report.*

- **220 KV Amargarh (NRSS XXIX)-Ziankote(JK) (PDD JK) Ckt-1 & 2:** *JK and NRSS XXIX representative was not present in the meeting for any comment.*

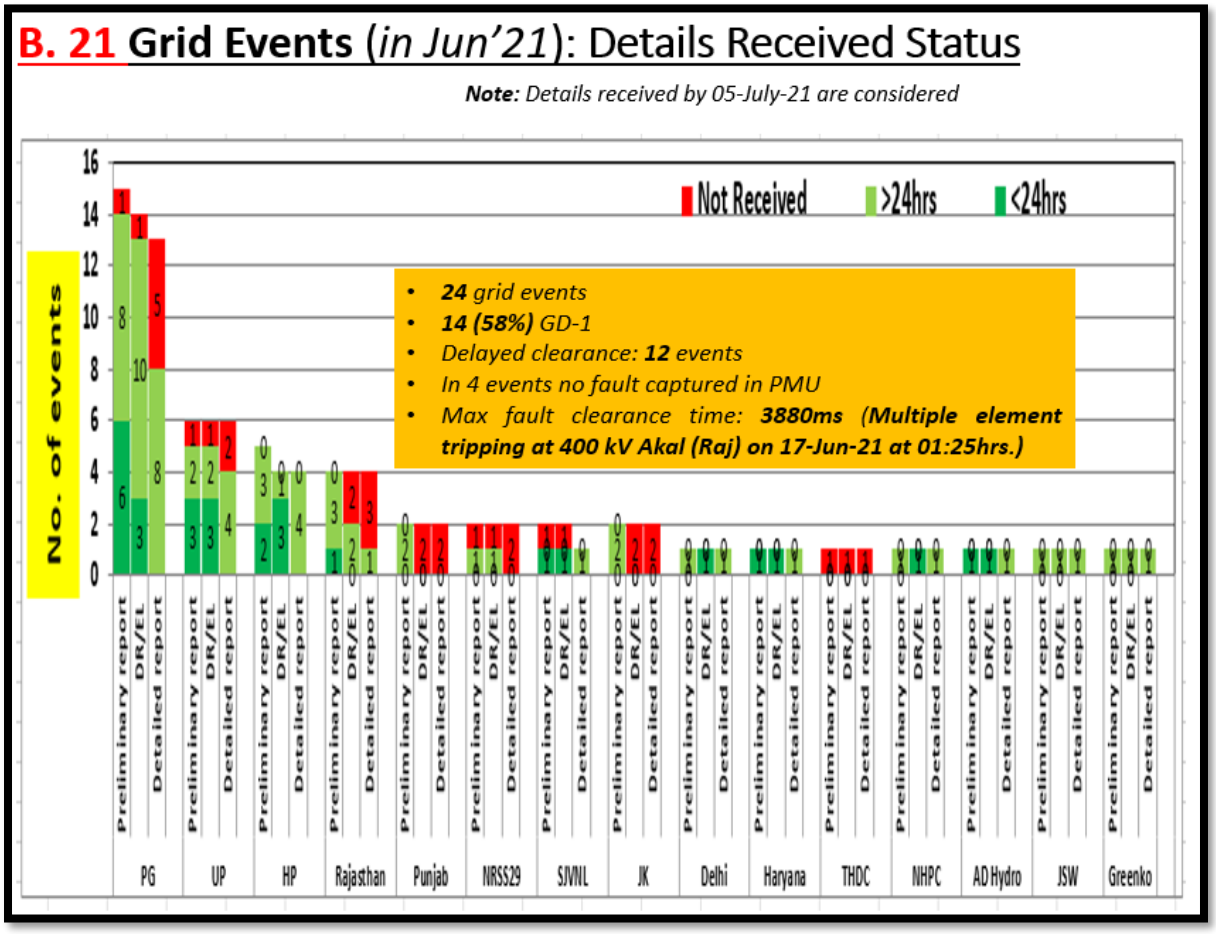
NRLDC representative emphasized that non-operation of A/R (auto reclosure) after SLG faults was found in many of these tripping. He further sensitized all the utilities to ensure healthiness of A/R in 220 kV and above transmission lines and keep the same enabled in compliance to CEA Grid Standard. He further informed that most of the tripping are transient in nature but due to non-operation of A/R, it resulted into tripping of the transmission element and it further reduced the reliability of the grid. All the utilities shall endeavour to keep auto reclosure in service and in healthy condition for 220 kV and above voltage level transmission line.

Frequent outages of such elements affect the reliability and security of the grid. ***Hence, utilities are once again requested to look into such frequent outages and share the remedial measures taken/being taken in this respect.***

34. Multiple elements tripping events in Northern region in the month of June'21

A total of **24** grid events occurred in the month of June'21 of which**14** are of GD-1 category. The preliminary reports of all the events have been issued from NRLDC. A list of all these events along with the status of details received by 05-July-2021 is attached at **Annexure-B.III of the Agenda.**

Monthly compiled information is presented in graphical form as below:



Further, despite persistent discussions/follow-up in various OCC/PCC meetings, the compliance of the regulations is still much below the desired level.

Maximum Fault Duration is **3880ms** in the event of multiple element tripping at 400 kV Akal (Raj)on 17-Jun-21 at 01:25hrs.

Delayed clearance of fault (more than 100ms for 400kV and 160ms for 220kV system) observed in total **12** events out of **24** grid events occurred in the month. In 4number of events, fault could not be captured through PMU data.

NRLDC representative stated that in the event of multiple tripping at 400 kV Akal (Raj) on 17-Jun-21at 01:25hrs delayed clearance of around 3880ms was observed in the system. He further sensitized that clearance of fault after such large duration may hamper the system stability and further lead to cascade tripping.

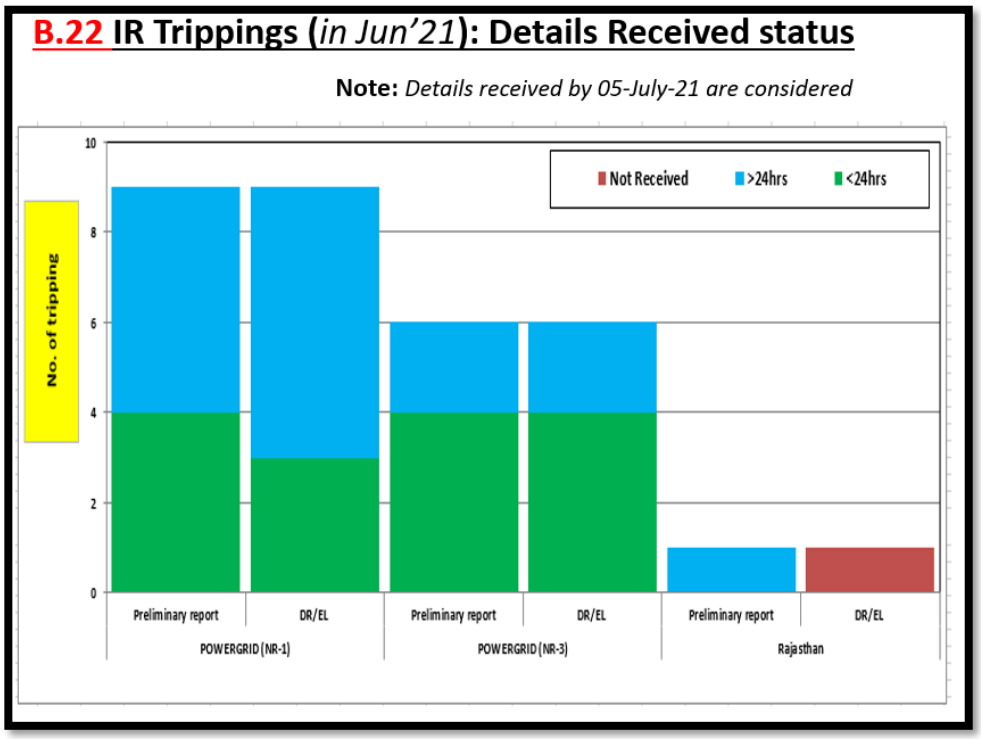
NRLDC representative expressed concern about poor status of report updating on the tripping portal by constituents. He emphasized that timely report submission is an important activity and all constituents are advised to ensure the same on priority basis and upload the reports.

OCC advised all the NR constituents to update the information on tripping portal developed by NRLDC, within the stipulated time. All the constituents agreed to take proactive actions in this regard.

Members were asked to take expeditious actions to avoid such tripping in future and discuss the root cause of the same. Moreover, utilities may impress upon all concerned for providing the Preliminary Report, DR/EL & Detailed Report of the events in line with the regulations without any undue delay. Members agreed to take action in this regard.

35. Details of tripping of Inter-Regional lines from Northern Region for Jun'21:

A total of **16** inter-regional lines tripping occurred in the month of June'21. The list is attached at **Annexure-B. IV of the Agenda.**



Out of 16 number of trippings, 9 tripping incidents are related to HVDC system. 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 is in violation of various regulations. 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 mandated by CEA (Grid Standard) Regulations.

NRLDC representative expressed concern about poor status of report updation on the tripping portal by Rajasthan.

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

36. Status of DR/EL and tripping report of utilities for the month of June-2021.

NRLDC representative informed the current status of receipt (as on 05th July 2021) of DR/EL and tripping report of utilities for the month of June 2021. Consolidated information is tabulated below:

S. No.	Utility	1st Jun 2021 - 30st Jun 2021											
		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)
			Value	%	Value		%	Value		%	Value		%
1	AD HYDRO	6	0	0	0	3	0	0	2	0	2	0	33
2	ANTA-NT	1	1	100	1	0	100	1	0	100	1	0	100
3	APTFL	1	0	0	0	1	0	0	1	0	0	1	0
4	BBMB	32	10	31	10	3	34	10	4	36	11	3	38
5	CHAMERA-II-NH	1	0	0	0	0	0	0	0	0	0	0	0
6	CHAMERA-I-NH	1	0	0	0	0	0	0	0	0	0	0	0
7	CPCC1	89	2	2	2	20	3	2	19	3	2	17	3
8	CPCC2	83	17	20	16	5	21	17	4	22	42	2	52
9	CPCC3	36	11	31	12	4	38	11	4	34	12	2	35
10	DADRI-NT	3	1	33	0	2	0	0	2	0	0	2	0
11	DULHASTI-NH	1	0	0	0	0	0	0	0	0	0	0	0
12	FARIDABAD-NT	3	3	100	3	0	100	3	0	100	3	0	100
13	KARCHAM	3	0	0	2	0	67	0	0	0	3	0	100
14	NAPP	2	0	0	0	0	0	0	0	0	0	0	0
15	NJPC	3	3	100	3	0	100	3	0	100	3	0	100
16	NLDC	19	18	95	18	0	95	18	0	95	18	0	95
17	RAMPUR	4	0	0	0	0	0	0	0	0	0	0	0
18	RAPPA	1	0	0	1	0	100	1	0	100	1	0	100
19	SEWA-2-NH	4	0	0	0	2	0	0	2	0	0	2	0
20	SINGOLI	3	3	100	3	0	100	3	0	100	3	0	100
21	SINGRAULI-NT	3	0	0	0	0	0	0	0	0	0	0	0
22	SLDC-DV	29	1	3	5	6	22	5	6	22	9	1	32
23	SLDC-HP	21	0	0	0	8	0	0	8	0	0	0	0
24	SLDC-HR	31	2	6	1	3	4	1	2	3	2	0	6
25	SLDC-JK	23	3	13	3	20	100	3	20	100	3	14	33
26	SLDC-PS	36	12	33	28	3	85	26	1	74	36	0	100
27	SLDC-RS	76	11	14	53	4	74	53	4	74	47	1	63
28	SLDC-UK	17	16	94	16	0	94	16	1	100	16	0	94
29	SLDC-UP	124	20	16	27	21	26	29	37	33	30	11	27
30	SORANG	2	0	0	0	1	0	0	1	0	0	1	0
31	STERLITE	20	9	45	9	3	53	10	3	59	19	0	95
32	TANAKPUR-NH	7	0	0	0	1	0	0	1	0	0	0	0
33	TANDA-NT	1	1	100	1	0	100	1	0	100	1	0	100
34	TATAPOWER	4	0	0	0	4	0	0	4	0	0	4	0
35	TEHRI	2	2	100	2	0	100	2	0	100	2	0	100
36	URI-II-NH	2	1	50	1	0	50	1	0	50	1	0	50
37	URI-I-NH	2	0	0	0	0	0	0	0	0	0	0	0
38	UNCHAHAR-NT	9	0	0	0	0	0	1	0	11	1	0	11
39	URI-II-NH	1	0	0	0	0	0	0	0	0	0	0	0
40	URI-I-NH	1	1	100	0	0	0	0	0	0	1	0	100

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 significant improvement. However, it is observed that status has improved in respect of CPCC1, Delhi, HP, Haryana, Rajasthan and UP in June, 2021 compared to the previous month.

NRLDC representative stated that despite of discussion in various OCC meetings, status of furnishing DR/EL/ RI as well as detailed report, is still poor for NTPC Anta, NTPC Tanda, NTPC Faridabad, BBMB, PG-NR3, PG-NR2, UP, Uttarakhand, Rajasthan, Punjab and J&K.

NTPC representative informed that concerned person who was looking after report updation of these stations has been recently transferred due to which there has been irregularity in submitting reports. He further informed that status of NTPC station in NCR region will improve in upcoming months.

PG-NR 2 representative agreed to further improve their performance in upcoming months.

NRLDC representative expressed serious concern about poor status of report updation by Uttarakhand control area. Uttarakhand representative was not present in the meeting for comment.

***All the members were once again requested to provide timely details of the grid events, detailed report in desired format along with remedial measure report. DR/EL of all the tripping needs to 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*.**

Members agreed for the same.

37. Frequency response characteristic

One event requiring FRC computation occurred in the month of **June-2021.** Description of the event is as given below:

S. No.	Event Date	Time (in hrs.)	Event Description	Starting Frequency (in Hz)	End Frequency (in Hz)	*Δf*
1	11-June-21	16:02hrs	As reported, On 11th June 220 kV Akal-Bhu Ckt-1 & Ckt-2 tripped due to snapping of B-phase jumper which resulted into 1200MW wind generation loss and 300MW solar generation loss in Northern region. At the same time, 400kV Barmer-Jaisalmer Ckt-1 & Ckt-2 also tripped due to over voltage after tripping of wind and solar generation.	50.08	50.00	-0.08

The Hon'ble CERC approved procedure for FRC calculation has already been shared with all concerned during previous OCC meetings. FRC observed for each state control area for the events is tabulated below:

States	11-Jun-21 event	Remarks
PUNJAB	-1%	
HARYANA	8%	
RAJASTHAN	326%	Affected Control Area
DELHI	-37%	
UTTAR PRADESH	48%	
UTTARAKHAND	-17%	
CHANDIGARH	70%	
HIMACHAL PRADESH	77%	
JAMMU & KASHMIR	-34%	
NR	51%	

FRC calculation of ISGS stations based on NRLDC SCADA data is tabulated below:

Generator	11-Jun-21 event	Generator	11-Jun-21 event
Singrauli TPS	36%	Salal HEP	0%
Rihand-1 TPS	Suspected SCADA data	Tanakpur HEP	Suspected SCADA data
Rihand-2 TPS	Suspected SCADA data	Uri-1 HEP	-14%
Rihand-3 TPS	-11%	Uri-2 HEP	Suspected SCADA data
Dadri-1 TPS	184%	Dhauliganga HEP	103%
Dadri -2 TPS	No generation	Dulhasti HEP	7%
Unchahar TPS	Suspected SCADA data	Sewa-II HEP	No generation
Unchahar stg-4 TPS	0%	Parbati-3 HEP	Suspected SCADA data
Jhajjar TPS	173%	Jhakri HEP	71%
Dadri GPS	-93%	Rampur HEP	Suspected SCADA data
Anta GPS	No generation	Tehri HEP	65%
Auraiya GPS	No generation	Koteswar HEP	110%
Narora APS	-6%	Karcham HEP	Suspected SCADA data
RAPS-B	-44%	Malana-2 HEP	Suspected SCADA data
RAPS-C	10%	Budhil HEP	2%
Chamera-1 HEP	41%	Bhakra HEP	-1%
Chamera-2 HEP	0%	Dehar HEP	3%
Chamera-3 HEP	15%	Pong HEP	-4%
Bairasiul HEP	31%	Koldam HEP	116%
		AD Hydro HEP	Suspected SCADA data

FRC calculation of major state generators based on NRLDC SCADA data is tabulated below:

Generator	11-Jun-21 event	Generator	11-Jun-21 event
PUNJAB		UP	
Ropar TPS	10%	Obra TPS	0%
L.Mohabbat TPS	-8%	Harduaganj TPS	111%
Rajpura TPS	6%	Paricha TPS	0%
T.Sabo TPS	19%	Rosa TPS	Suspected SCADA data
Goindwal Sahib TPS	79%	Anpara TPS	-8%
Ranjit Sagar HEP	12%	Anpara C TPS	26%
Anandpur Sahib HEP	-6%	Anpara D TPS	-5%
HARYANA		Bara TPS	6%
Panipat TPS	-21%	Lalitpur TPS	-9%
Khedar TPS	20%	Meja TPS	-11%
Yamuna Nagar TPS	No generation	Vishnuprayag HEP	Suspected SCADA data
CLP Jhajjar TPS	32%	Alaknanda HEP	-6%
Faridabad GPS	No generation	Rihand HEP	-210%
RAJASTHAN		Obra HEP	-6%
Kota TPS	5%	UTTARAKHAND	
Suratgarh TPS	No generation	Gamma Infra GPS	-27%
Kalisindh TPS	18%	Shravanti GPS	-21%
Chhabra TPS	No generation	Ramganga HEP	Suspected SCADA data
Chhabra stg-2 TPS	-155%	Chibra HEP	-5%
Kawai TPS	86%	Khodri HEP	-10%
Dholpur GPS	No generation	Chilla HEP	No generation
Mahi-1 HEP	No generation	HP	
Mahi-2 HEP	No generation	Baspa HEP	5%
RPS HEP	No generation	Malana HEP	-12%
JS HEP	No generation	Sainj HEP	-356%
DELHI		Larji HEP	-5%
Badarpur TPS	No generation	Bhabha HEP	378%
Bawana GPS	Suspected SCADA data	Giri HEP	-23%
Pragati GPS	20%	J&K	
		Baglihar-1&2 HEP	-4%
		Lower Jhelum HEP	No generation

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

FRC calculationhas been received from AD Hydro, Koteshwar, Lalitpur TPS, NHPC, BBMB, Haryana, Rosa TPS, UP and Delhicontrol area for the aforementioned event.

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

Frequency response characteristic of generators with respect to aforementioned incident have also been calculated as per NRLDC SCADA data and have been compared with the frequency response characteristic details received from constituents. It has been observed that some of the constituents have produced poor primary frequency response which is not conducive to arrest large change in grid frequency during disturbance.

Data of FRC for 11.06.2021 Akal				
Sr. No	Station name	FRC data(%)		
		NR	State/generator	Remarks
1	Singrauli TPS	36%	77.69%	Positive response (only unit 7 field data received)
2	Rihand-1 TPS	Suspected SCADA data	35.21%	Positive response (unit 2 response is poor)
3	Rihand-2 TPS	Suspected SCADA data	68.85	Positive response
4	Rihand-3 TPS	-11%	-12.87%	Poor response (due to wet coal from mine)
5	Chamera-1 HEP	41%	77%	Positive response
6	Jhakri HEP	71%	77.62%	Positive response
7	Tehri HEP	65%	109.37%	Positive response
8	Bhakra HEP	-1%	5%	Poor response
9	Dehar HEP	3%	5%	Poor response
10	Pong HEP	-4%	10%	Poor response
11	AD hydro HEP	Suspected SCADA data	39.66%	Positive but unsatisfactory response
12	T.Sabo TPS	19%	21.58	Positive but unsatisfactory response Field data mismatch with SCADA data
13	Alaknanda HEP	-6%	-6.60%	Negative response (Raw data not received)

Data of FRC for 11.06.2021 Akal				
Sr. No	Station name	FRC data(%)		
		NR	State/generator	Remarks
14	Kawai TPS	86%	131%	Field data mismatch with SCADA data
15	Pragati GPS	20%	10%	Suspected data
16	Obra TPS	0%	0%	No response (Raw data not received)
17	Harduaganj TPS	111%	142.48%	Positive response (Raw data not received)
18	Paricha TPS	0%	-2.94%	No response (Raw data not received)
19	Rosa TPS	Suspected SCADA data	121%	Raw data not received
20	Anpara TPS	-8%	0.48%	No response (Raw data not received)
21	Anpara C TPS	26%	27.20%	Raw data not received
22	Anpara D TPS	-5%	-5.032	Negative response (Raw data not received)
23	Bara TPS	6%	10.22%	Poor response (Raw data not received)
24	Lalitpur TPS	-9%	9.15%	Poor response (Raw data not received)
25	Meja TPS	-11%	-11.28%	Negative response (Raw data not received)
26	Obra HEP	-6%	-5.60%	Negative response (Raw data not received)

NRLDC representative expressed serious concern about poor/ negative response from many of the generators in central and state sector generating stations and non-reporting of plant wise data despite of regular follow up in various OCC meetings.

Primary response graph based on NRLDC SCADA data is available in the NRLDC presentation. Following are the outcome of the analysis:

- *No response in Rihand stage-3 units*
- *Early die out of response in Bhakra & Pong HEP.*
- *Early die out of response in Pragati GPS.*
- *Early die out of response in Meja TPS*
- *Delayed response in Talwandi Sabo TPS.*

NRLDC representative stressed upon calculating the FRC by states/ ISGS station and furnishing of high-resolution generator response data for assessing their PFR during sudden frequency change events to RPC/ RLDC. He further stated that Response of generators may be broadly categorised as satisfactory (>= 70% of ideal response) and unsatisfactory (<70% of ideal response).

All the concerned utilities may please go through the details and respond with the detailed calculations, considering all the points and supporting plant wise data to check the FRC response of the generator within a week's time to RPC/ RLDC.

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

Power System Stabilizer is an important part for damping of inter area and local mode of oscillations in the grid. As we all know, Indian electricity grid is continuously expanding and lots of Power Electronics devices were also commissioned in recent years changing the dynamics of grid. PSS tuning /re-tuning is required for damping of oscillations.

In this regard one committee at NRPC level was formed in year 2014 and it was agreed that If results of Step Response Test indicate sufficient damping, generating company would perform next Step Test after three year or at the time of major overhauling of the machine, whichever will be earlier and Generating Companies would arrange for re-tuning of PSS, if Step Response Test indicates insufficient damping or oscillations.

In 180th, 181st, 182nd, 183rd& 184thOCC meeting, this point was discussed and Utilities were requested to submit the present status of PSS tuning/re-tuning and Step Response Test 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)**

Status report in above format updated till 10th July 2021is attached as **Annexure-B.VI of the Agenda.**

It is once again requested to all the members to submit the report of PSS tuning/ re-tuning/ Step Response Test through email to NRPC and NRLDC at seo-nrpc@nic.in and nrldcso2@gmail.com respectively.

OCC members agreed to share the existing status with NRPC/ NRLDC within 15days.

39. Frequent tripping of 800kV HVDC Champa-Kurukshetra poles

Frequent tripping of 800kV HVDC Champa-Kurukshetra poles has been observed in the Grid. Total 27 number of trippings has so far occurred from January 2021 to June 2021. Tripping list is attached at **Annexure-B.VII of the Agenda**. Frequent tripping of high power carrying HVDC poles may create a threat for Grid security.

PGCIL may take expeditious actions to avoid such tripping in future and discuss the root cause of each event. Moreover, all concerned should furnish the Preliminary Report, DR/EL & Detailed Report of the events in line with the regulations.

NRLDC representative informed that in spite of continuous follow up on this issue in various OCC meetings, large number of tripping of 800kV HVDC Champa-Kurukshetra poles *has been observed. POWERGRID representative informed that earlier tripping was occurring due to Optical CT calibration issue, which has been resolved at Kurukshetra end. One tripping occurred due to lightning stroke at Champa end. NRLDC representative emphasized that frequent tripping of* 800kV HVDC Champa-Kurukshetra poles *needs to be seriously looked into and reliability of* 800kV HVDC Champa-Kurukshetra poles needs to be improved to avoid any undesirable event in the Grid.

Members agreed for the same.

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Annexure-A.I(A)

S. No.	Type of transmission element	Total No
1	765kV line	02
2	400kV line	02
3	220kV line	02
4	LILO of lines	08
5	Anti-theft charging of lines	02
6	1500 MVA ICT	02
7	500 MVA ICT	02
8	Bus Reactors	04
9	Line Reactors	04
10	765kV, 400kV, 220 kV Bays	47
Total New Elements charged		75

Transmission Lines
(220kV Lines- 536.14 Ckt. Kms)

Sr. No.	Name of element	Voltage Level (in kV)	Line Length (In kM)	Conductor Type	Agency/ Owner	Location	Remarks	Date & time of charging	
								Date	Time
1	220kV Shahjhanpur(PG)-Azizpur(UP) line-1	220	24.4	Zebra	UPPTCL	UP		**28.07.2021**	**13:01**
2	220kV Shahjhanpur(PG)-Azizpur(UP) line-2	220	24.4	Zebra	UPPTCL	UP		**28.07.2021**	**15:50**
3	400kV D/C Fatehgarh(FBTL) - Bhadla (PG) Line-1	400	145.97	Hexa Zebra	FBTL	Rajasthan		**16.07.2021**	**18:26**
4	400kV D/C Fatehgarh (FBTL)-Bhadla (PG) Line-2	400	145.97	Hexa Zebra	FBTL	Rajasthan		**16.07.2021**	**21:02**
5	765kV Varanasi(PG)-Vindhyachal Pooling DC line-1	765	97.7	Hexa Zebra	PVTSL	UP	Anti theft charged on 17.07.2021	**30.07.2021**	**18:54**
6	765kV Varanasi(PG)-Vindhyachal Pooling DC line-2	765	97.7	Hexa Zebra	PVTSL	UP		**30.07.2021**	**20:11**

LINE REACTOR

S.No.	Name of element	Voltage Level	MVAR Rating	New/replacement /augmentation	Make	Configuration	Agency/ Owner	Remarks	Actual date & time of charging	
									Date	Time
1	3*80 MVAR Line Reactor of Bikaner line-1 at Bhadla II(PG)	765	240	New	ABB	3*1-Phase	PGCIL		**24.07.2021**	**03:04**
2	3*80 MVAR Line Reactor of Bikaner line-2 at Bhadla II(PG)	765	240	New	ABB	3*1-Phase	PGCIL		**23.07.2021**	**22:26**
3	3*110 MVAR Line Reactor of Ajmer line-1 at Bhadla II(PG)	765	240	New	BHEL	3*1-Phase	PGCIL		**24.07.2021**	**09:11**
4	3*110 MVAR Line Reactor of Ajmer line-2	765	240	New	BHEL	3*1-Phase	PGCIL		**24.07.2021**	**19:56**

LILO of Transmission Lines

Sr. No.	Name of element	Voltage Level (in kV)	Line Length (Before LILO)	Line Length (Kms)	LILO Line Length (Kms)	Conductor Type	Agency/ Owner	Location	Remarks	Date & time of charging	
										Date	Time
1	132kV Rihand-Nagaruntari {LILO of 132kV Rihand-Sonenagar-1 at Nagaruntari}	132			59.23	Single Panthar	JUSNL	UP/Jharkhand	On no load	**14.07.2021**	**20:02**
2	765kV Bikaner-Bhadla II-1 line {LILO of 765kV D/C Ajmer-Bikaner-1 at Bhadla II(PG)}	765	260	197	131	Hexa Zebra	PGCIL	Rajasthan		**24.07.2021**	**03:44**
3	765kV Bikaner-Bhadla II-2 line {LILO of 765kV D/C Ajmer-Bikaner-2 at Bhadla II(PG)}	765	260	197	131	Hexa Zebra	PGCIL	Rajasthan		**23.07.2021**	**22:26**
4	765kV Ajmer-Bhadla II-1 line {LILO of 765kV D/C Ajmer-Bikaner-1 at Bhadla II(PG)}	765	260	326	131	Hexa Zebra	PGCIL	Rajasthan		**24.07.2021**	**09:11**
5	765kV Ajmer-Bhadla II-2 line {LILO of 765kV D/C Ajmer-Bikaner-2 at Bhadla II(PG)}	765	260	326	131	Hexa Zebra	PGCIL	Rajasthan		**24.07.2021**	**19:56**
6	400kV Lucknow(PG)-Basti-2 {LILO of 400kV Lucknow-Gorakhpur-3 at Basti}	400	262	203	24.3	twin moose	UP/PGCIL	UP		**31.07.2021**	**18:54**
7	400kV Gorakhpur(PG)-Basti-2 {LILO of 400kV Lucknow-Gorakhpur-3 at Basti}	400	262	107.855	24.3	twin moose	UP/PGCIL	UP		**31.07.2021**	**17:12**
8	400kV Balia(PG)-Rasra-1 {LILO of 400kV Balia-Mau 2 at 400kV Rasra}	400	9.215	46.284	37.269	twin moose	UP/PGCIL	UP		**31.07.2021**	**21:47**

ICT
(MVA Capacity Addition- 4000 MVA)

S.No.	Name of element	Voltage Level	Transformation Capacity (in MVA)	New/replacement /augmentation	Make	Configuration	Agency/ Owner	Remarks	Actual date & time of charging	
									Date	Time
1	400/220/33kV, 500 MVA Power Transformer-1 at Jaisalmer-2(Bhainsara)	400/220/33	500	New	T&R	3-Ph.	RRVPNL	On no load	07.07.2021	14:06
2	400/220/33kV, 500 MVA Power Transformer-4 at Bhadla(PG)	400/220/33	500	New	Bhel	3-Ph.	PGCIL		**01.08.2021**	**21:34**
3	1500 MVA ICT-1 at Bhadla II(PG)	765/400/33	1500	New	TBEA	1-Ph.	PGCIL		**26.07.2021**	**05:16**
4	1500 MVA ICT-2 at Bhadla II(PG)	765/400/33	1500	New	TBEA	1-Ph.	PGCIL		**27.07.2021**	**23:36**

BUS REACTOR

S.No.	Name of element	Voltage Level	MVAR Rating	New/replacement /augmentation	Make	Configuration	Agency/ Owner	Remarks	Actual date & time of charging	
									Date	Time
1	3*80 MVAR Bus Reactor-1 at Bhadla II(PG)	765	240	New	ABB	3*1-ph	PGCIL		**27.07.2021**	**12:22**
2	3*80 MVAR Bus Reactor-2 at Bhadla II(PG)	765	240	New	ABB	3*1-ph	PGCIL		**27.07.2021**	**09:36**
3	125 MVAR Bus Reactor-1 at Bhadla II(PG)	400	125	New	BHEL	3 ph	PGCIL		**26.07.2021**	**06:46**
4	125 MVAR Bus Reactor-1 at Fatehgarh I(Adani	400	125	New	Siemens	3 ph	FBTL		**16.07.2021**	**19:36**

Bus and Bays

Sr. No.	Name of element	Type	Voltage Level (in kV)	Agency/ Owner	Remarks	Date & time of charging	
						Date	Time
1	220kV Bay No 203 of Azizpur-2 line at Shahjahanpur(PG)	Bay	220	PGCIL		28.07.2021	15:50
2	765kV Bay No 719 of Khetri line-2 at Bikaner(PG)	Bay	765	Adani		06.07.2021	13:56
3	400kV Main Bay 401 of Mau line at Rasra	Bay	400	UPPTCL		31.07.2021	22:47
4	400kV Bus-1 at Rasra	Bus	400	UPPTCL		31.07.2021	22:47
5	400kV Main Bay 403 of 500 MVA ICT-4 at Bhadla(PG)	Bay	400	PGCIL		19.07.2021	19:03
6	220kV Bus-1 at Azizpur	Bus	220	UPPTCL		28.07.2021	13:01
7	220kV Bus-1 at Azizpur	Bus	220	UPPTCL		28.07.2021	15:50
8	TBC Bay No 201 at Azizpur	TBC	220	UPPTCL		28.07.2021	15:50
9	220kV Bay No 202 of Shahjhanpur-1 at Azizpur	Bay	220	UPPTCL		28.07.2021	13:01
10	220kV Bay No 203 of Shahjhanpur-2 at Azizpur	Bay	220	UPPTCL		28.07.2021	15:50
11	220kV Bay No 202 of Azizpur-1 line at Shahjahanpur(PG)	Bay	220	PGCIL		28.07.2021	15:50

Bus and Bays

Sr. No.	Name of element	Type	Voltage Level (in kV)	Agency/ Owner	Remarks	Date & time of charging	
						Date	Time
12	Main Bay 715 of ICT-1 at Bhadla II(PG)	Bay	765	PGCIL		25.07.2021	19:49
13	Tie Bay 714 of ICT-1 and Future at Bhadla II(PG)	Bay	765	PGCIL		25.07.2021	21:19
14	Main Bay 416 of ICT-1 at Bhadla II(PG)	Bay	765	PGCIL		26.07.2021	05:16
15	Tie Bay 417 of ICT-1 and 400kV Bhadla(PG)-1at Bhadla II(PG)	Bay	765	PGCIL		26.07.2021	05:21
16	Main Bay 718 of ICT-2 at Bhadla II(PG)	Bay	765	PGCIL		27.07.2021	20:57
17	Tie Bay 717 of ICT-2 and Future at Bhadla II(PG)	Bay	765	PGCIL		27.07.2021	22:05
18	Main Bay 419 of ICT-2 at Bhadla II(PG)	Bay	765	PGCIL		27.07.2021	23:36
19	Tie Bay 420 of ICT-2 and 400kV Bhadla(PG)-1at Bhadla II(PG)	Bay	765	PGCIL		27.07.2021	23:41
20	Main Bay 709 of Bus Reactor-1 at Bhadla II(PG)	Bay	765	PGCIL		27.07.2021	12:22
21	Main Bay 706 of Bikaner at Bhadla II(PG)	Bay	765	PGCIL		24.07.2021	03:44

Bus and Bays

Sr. No.	Name of element	Type	Voltage Level (in kV)	Agency/ Owner	Remarks	Date & time of charging	
						Date	Time
22	Tie Bay 705 of Bikaner- line 1 and 765kV Ajmer(PG)- line-1 at Bhadla II(PG)	Bay	765	PGCIL		24.07.2021	12:01
23	Main Bay 706R of 240 MVAR switchable line reactor-1 of Bikaner line-1 at Bhadla II(PG)	Bay	765	PGCIL		24.07.2021	03:44
24	Main Bay 703 of Bikaner line-2 at Bhadla II(PG)	Bay	765	PGCIL		23.07.2021	22:26
25	Tie Bay 702 of Bikaner- line 2 and 765kV Ajmer(PG)- line 2 at Bhadla II(PG)	Bay	765	PGCIL		24.07.2021	22:08
26	Main Bay 703R of 240 MVAR switchable line reactor-2 of Bikaner line-2 at Bhadla II(PG)	Bay	765	PGCIL		23.07.2021	22:26
27	Main Bay 704 of Ajmer line-1 at Bhadla II(PG)	Bay	765	PGCIL		24.07.2021	09:11
28	Main Bay 704R of 240 MVAR switchable line reactor-1 of Ajmer line-1 at Bhadla II(PG)	Bay	765	PGCIL		24.07.2021	09:11
29	Main Bay 701 of Ajmer line-2 at Bhadla II(PG)	Bay	765	PGCIL		24.07.2021	19:56
30	Main Bay 701R of 240 MVAR switchable line reactor-2 of Ajmer line-2 at Bhadla II(PG)	Bay	765	PGCIL		24.07.2021	19:56
31	Main Bay 422 of 125 MVAR Bus Reactor-1 at Bhadla II(PG)	Bay	765	PGCIL		26.07.2021	06:46

Bus and Bays

Sr. No.	Name of element	Type	Voltage Level (in kV)	Agency/ Owner	Remarks	Date & time of charging	
						Date	Time
32	Main Bay 423 of 125 MVAR Bus Reactor-1 and Future at Bhadla II(PG)	Bay	765	PGCIL		26.07.2021	06:46
33	Main Bay 418 of Bhadla PG-line 1 at Bhadla II(PG)	Bay	400	PGCIL		26.07.2021	05:24
34	Main Bay 421 of Bhadla PG-line 2 at Bhadla II(PG)	Bay	400	PGCIL		27.07.2021	23:42
35	400kV Bus-1 at Bhadla II(PG)	Bay	400	PGCIL		26.07.2021	05:16
36	400kV Bus-2 at Bhadla II(PG)	Bay	400	PGCIL		26.07.2021	05:21
37	765kV Bus-1 at Bhadla II(PG)	Bay	400	PGCIL		24.07.2021	04:01
38	765kV Bus-2 at Bhadla II(PG)	Bay	400	PGCIL		23.07.2021	20:35
39	Main Bay No 409 of 125 MVAR Bus Reactor-1 at Fatehgarh I (Adani)	Bay	400	FBTL		16.07.2021	19:53
40	Tie Bay No 408 of 125 MVAR Bus Reactor-1 and Future at Fatehgarh I (Adani)	Bay	400	FBTL		16.07.2021	19:36
41	Main Bay(Isolator) No 407 of Future at Fatehgarh I (Adani)	Bay	400	FBTL		16.07.2021	19:36

Bus and Bays

Sr. No.	Name of element	Type	Voltage Level (in kV)	Agency/ Owner	Remarks	Date & time of charging	
						Date	Time
42	Main Bay No 401 of Bhadla I (PG) line-1 at Fatehgarh I (Adani)	Bay	400	FBTL		16.07.2021	18:26
43	Main Bay No 404 of Bhadla I (PG) line-2 at Fatehgarh I (Adani)	Bay	400	FBTL		16.07.2021	21:02
44	400kV Main Bus-1 at Fatehgarh I(Adani)	Bay	400	FBTL		16.07.2021	18:26
45	400kV Main Bus-2 at Fatehgarh I(Adani)	Bay	400	FBTL		16.07.2021	19:53
46	Main Bay 404 of Lucknow line-2 line at Basti	Bay	440	UPPTCL		31.07.2021	18:54
47	Main Bay 406 of Gorakhpur line-2 line at Basti	Bay	440	UPPTCL		31.07.2021	17:12

Anti Theft charging of Transmission Lines

Sr. No.	Name of element	Voltage Level (in kV)	Line Length (In kM)	Conductor Type	Agency/ Owner	Location	Remarks	Date & time of charging	
								Date	Time
1	400kV D/C Firozabad(PJFTL)-Jawaharpur(TPS) Line-1 (Anti-theft charging from Firozabad(PJFTL) upto dead end tower)	400	40.06	Quad Moose	PJFTL	UP		07.07.2021	21:45
2	400kV D/C Firozabad(PJFTL)-Jawaharpur(TPS) Line-2 (Anti-theft charging from Firozabad(PJFTL) upto dead end tower)	400	40.06	Quad Moose	PJFTL	UP		08.07.2021	14:30

G	GENERATING UNITS						Annexure-A.I(B)
S.No	Station	Owner	Outage Reason	Outage Date	Outage Time	Outage duration(in days)	Discussion in 186 OCC meeting
1	126 MW Bhakra HPS - Unit 3	BBMB	Renovation and Maintenance work. Expected by July-2021.	01-04-2019	09:20	866	
2	126 MW Bhakra HPS - Unit 7	BBMB	Renovation and Maintenance work. Expected by July-2021	05-10-2020	08:43	313	
3	40 MW Sewa-II HPS - UNIT 2	NHPC	Excessive leakage in HRT between audit-II and Dam. Expected by Jan-2022.	25-09-2020	00:00	323	
4	40 MW Sewa-II HPS - UNIT 3	NHPC	Excessive leakage in HRT between audit-II and Dam. Expected by Jan-2022.	25-09-2020	00:00	323	
5	40 MW Sewa-II HPS - UNIT 1	NHPC	Excessive leakage in HRT between audit-II and Dam. Expected by Jan-2022.	25-09-2020	00:00	323	
6	600 MW RGTPP (Khedar) - UNIT 2	HVPNL	Capital Overhauling. Expected date to be confirmed from HVPNL.	02-03-2021	00:00	165	Dec 2021
7	60 MW Bairasiul HPS - UNIT 3	NHPC	Renovation and modernization of unit. Expected by September 2021	27-11-2020	10:00	260	Sep 2021

S.No	Station	Owner	Reason(s)	Outage Date & Time		Outage duration(in days)	
8	165 MW Dehar HPS - UNIT 4	BBMB	Penstock Inspection. Expected by July 2021.	28-10-2020	11:50	290	
9	200 MW Singrauli STPS - UNIT 7	NTPC	Overhauling	29-06-2021	00:00	46	
10	660 MW Talwandi Sabo TPS - UNIT 1	PSPCL	Due to abnormal sound in boiler.	04-07-2021	01:16	41	15 Sep 2021
11	300 MW DCRTPP (Yamuna Nagar) - UNIT 1	HVPNL	Furnace pressure high.	08-07-2021	17:16	36	

Annexure-A.I(C)

S. No`	Element Name	Type	Owner	Outage Date and Time		Outage days	Reason / Remarks	Discussion in 186 OCC meeting
A	LINE							
1	220 KV Kishenpur(PG)-Ramban(PDD) (PDD) Ckt-1	Line	PDD JK	31-03-2020	16:43	485	Due to heavy land slide near village Dalwas at Ramban damages occurred to 220 KV D/C KPTL at Location No :-187,188 &189 and there is every apprehension of collapsing Tower Loc No 189 .	
2	400 KV BHADLA(PG)-FATEHGARH POOLING(FBTL) (FBTL) CKT-1	Line	FBTL	28-07-2021	11:03	17	for contingency LILO arrangement at Fatehgarh-2	
B	BUS & BAYS							
1	714 TIE BAY - 765/400 KV 1500 MVA ICT 3 AT JHATIKARA(PG) AND FUTURE	BUS	POWERGRID	04-06-2021	10:19	71	For Erection of CT Isolator Breaker IPS tube ii) Testing & commissioning of switchyard equipments i.e Isolator CT Breaker (OCC-183)	Outage due to future bay construction. Expected by Aug end
2	713 MAIN BAY - 765 KV BHADLA(PG) - BUS 1 AND FUTURE AT BHADLA(PG)	BAY	POWERGRID	05-04-2021	09:43	131	Major Annual Maintenance.	
3	400 KV Kadarpur (GPTL) - Bus 1	BUS	GPTL	17-04-2021	13:18	118	E/S/D taken due to abnormal humming sound observed from 400KV B-phase BUS-1 CVT at Kadarpur. Replacement of VT pending.	
4	413 MAIN BAY - 50 MVAR BUS REACTOR NO 1 AT 400KV MOGA(PG)	BAY	POWERGRID	22-07-2021	08:31	23	Splitting of 400KV Bus is under progress at Moga due to increased fault level. Removal of dropper from Jack Bus for bay No 413 (B/R), installation of GAB (Gas to Air Bushings) HV Testing and protection shifting etc. (OCC 184)	
5	425 MAIN BAY - 765/400KV 1500 MVA ICT 2 AT MOGA(PG)	BAY	POWERGRID	23-07-2021	08:12	22	Removal of dropper from Jack Bus for bay No 425 (765KV ICT-2), installation of GAB (Gas to Air Bushings) and protection shifting etc.(OCC-185)	
6	717 TIE BAY - 765 KV BHADLA-BIKANER (PG) CKT-2 AND FUTURE AT BIKANER(PG)	BAY	POWERGRID	24-07-2021	12:43	20	SD taken by Adani for Commissioning of Future Bay No 716 (Khetri Line-2) with Tie breaker & its associated equipment and integration with existing system (OCC 184)	Outage due to future bay construction. Expected by Aug end
7	419 MAIN BAY - 400 KV KISHENPUR-MOGA (PG) CKT-2 (POWERGRID)	BAY	POWERGRID	25-07-2021	10:26	20	Splitting of 400KV Bus is under progress at Moga due to increased fault level. Removal of dropper from Jack Bus for bay No 419(Kishenpur-2), installation of GAB (Gas to	

S.No	Element Name	Type	Owner	Outage		Outage days	Reason / Remarks	Discussion in 186 OCC meeting
C	ICT							
1	400/220 kV 315 MVA ICT 1 at Bhilwara(rs)	ICT	RRVPNL	12-05-2019	23:42	824	Oil leakage in transformer. Expected revival in Dec-2021.	
2	400/220 kV 315 MVA ICT 1 at Muradnagar_1(UP)	ICT	UPPTCL	13-03-2020	02:46	519	Buccholz relay alarm and Local Breaker Backup protection operated. Tripped along with Hapur-Muradnagar line. Flags are not reset because of cable flashover. To be replaced by 500 MVA ICT. Expected revival in May-2021.	
3	400/220 kV 315 MVA ICT 2 at Bawana(DV)	ICT	DTL	30-03-2021	17:35	136	400kV side B-phase bushing blasted. Tripped on differential protection, REF protection. ICT catches fire and damaged.	
4	400/220 kV 500 MVA ICT 2 at Noida Sec 148(UP)	ICT	UPPTCL	19-08-2020	16:30	360	500 MVA ICT-I also got damaged due to fire in ICT-II, for protection testing. Expected revival in June-2021.	
5	400/220 kV 315 MVA ICT 2 at Orai(UP)	ICT	UPPTCL	22-03-2021	15:51	144	R-phase HV (400kV) & MV (220kV) Bushing of 315 MVA ICT-2 got damaged at 400 KV S/S ORAI.	
6	400/220 kV 315 MVA ICT 2 at Mundka(DV)	ICT	DTL	20-09-2019	00:419	694	Due to fire in ICT.	
7	220/33 kV 125 MVA ICT 1 at Saurya Urja Solar(SU)	ICT	Saurya Urja	27-05-2021	23:42	79	Operation of transformer protection	
8	400/220 kV 315 MVA ICT 1 at Lahal(HP)	ICT	HPSEB	18-04-2021	19:42	117	To attend low oil level alarm in ICT.	

D	BUS REACTORS							Discussion in 186 OCC meeting
1	80 MVAR Bus Reactor No 1 at 400KV Nathpa Jhakri(SJ)	BR	SJVNL	17-10-2019	12:58	666	Flashover/Fault in 80MVAR Bus Reactor cleared by Bus Bar Protection. Expected revival in Nov-2021.	
2	125 MVAR BUS REACTOR NO 3 AT 400KV VINDHYACHAL(PG)	BR	POWERGRID	04-06-2021	21:52	70	REFURBISHMENT OF COMMON SYSTEM AND CONTROL AND PROTECTION OF NORTH SIDE BUS REACTOR AR4 UNDER ADD CAP (OCC 183)	
3	125 MVAR BUS REACTOR NO 4 AT 400KV VINDHYACHAL(PG)	BR	POWERGRID	04-06-2021	21:52	70	REFURBISHMENT OF COMMON SYSTEM AND CONTROL AND PROTECTION OF NORTH SIDE BUS REACTOR AR4 UNDER ADD CAP (OCC 183)	
4	93 MVAR BUS REACTOR NO 2 AT 400KV VINDHYACHAL(PG)	BR	POWERGRID	04-06-2021	21:52	70	REFURBISHMENT OF COMMON SYSTEM AND CONTROL AND PROTECTION OF NORTH SIDE BUS REACTOR AR4 UNDER ADD CAP (OCC 183)	
5	93 MVAR BUS REACTOR NO 1 AT 400KV VINDHYACHAL(PG)	BR	POWERGRID	04-06-2021	22:40	70	REFURBISHMENT OF COMMON SYSTEM AND CONTROL AND PROTECTION OF NORTH SIDE BUS REACTOR AR4 UNDER ADD CAP (OCC 183)	

E	HVDC POLE							Discussion in 186 OCC meeting
1	70 KV VINDHYACHAL(PG) POLE-2	HVDC POLE	POWERGRID	20-04-2021	09:35	116	REFURBISHMENT OF HVDC BLOCK#2 UNDER O&M ADD CAP vide CERC Petition 543/TT/2014 (OCC-181)	

F	FSC							Discussion in 186 OCC meeting
1	SVC No 1(-140/+140MVAR) at 400 KV Kanpur(PG)	SVC	POWERGRID	24-08-2020	17:33	354	Hand tripped at 17:33hrs on 24.08.2020 after observation of heavy sparking in TSC Capacitor bank. Due to non support from OEM, the element has been decapitalized by Powergrid.	

Follow up issues from previous OCC meetings

1	Sub-stations likely to be commissioned by next two years.	All the concerned states had been requested in past OCC meetings to submit the details of the downstream network associated specially with POWERGRID substations along with the action plan of their proposed / approved networks.	Status details of downstream networks mentioned in **Annexure-A.II.I**.
2	Progress of installing new capacitors and repair of defective capacitors	Information regarding installation of new capacitors and repair of defective capacitors is to be submitted to NRPC Secretariat.	Data upto following months, received from various states / UTs: ◎ CHANDIGARH — Sep-2019 ◎ DELHI — Jul-2021 ◎ HARYANA — Apr-2021 ◎ HP — Mar-2021 ◎ J&K and LADAKH — Not Available ◎ PUNJAB — Mar-2021 ◎ RAJASTHAN — Jul-2021 ◎ UP — May-2021 ◎ UTTARAKHAND — Jun-2021 All States/UTs are requested to furnish updated status on monthly basis.
3	Healthiness of defence mechanism: Self-certification	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”.	Data upto following months, received from various states / UTs: ◎ CHANDIGARH — Not Available ◎ DELHI — Mar-2021 ◎ HARYANA — Jun-2021 ◎ HP — Jun-2021 ◎ J&K and LADAKH — Not Available ◎ PUNJAB — Mar-2021 ◎ RAJASTHAN — Jun-2021 ◎ UP — Jun-2021 ◎ UTTARAKHAND — Mar-2021 ◎ BBMB — Jun-2021 All States/UTs are requested to furnish updated status on monthly basis.
4	Status of FGD installation vis-à-vis installation plan at identified TPS	List of FGDs to be installed in NR was finalized in the 36th TCC (special) meeting dt. 14.09.2017. All SLDCs were regularly requested since 144th OCC meeting to take up with the concerned generators where FGD was required to be installed. Further, progress of FGD installation work on monthly basis is monitored in OCC meetings.	Status of the information submission (month) from states / utilities is as under: ◎ HARYANA — Feb-2021 ◎ PUNJAB — May-2021 ◎ RAJASTHAN — Jul-2021 ◎ UP — Jul-2021 ◎ NTPC — May-2021 FGD status details are enclosed as **Annexure-A.II.II**. All States/utilities are requested to furnish updated status of FGD installation progress on monthly basis.

5	Reactive compensation at 220 kV/ 400 kV level at 15 substations			
	State / Utility	Substation	Reactor	Status
i	POWERGRID	Kurukshetra	500 MVAr TCR	Anticipated commissioning: Dec' 2021 (delay due to pending supplies by GE)
ii	DTL	Peeragarhi	1x50 MVAr at 220 kV	PO awarded to M/s Kanohar Electricals Ltd. Drawings approved and under stage inspection. GIS Bay is already available. Work expected to be completed by Dec.21
iii	DTL	Harsh Vihar	2x50 MVAr at 220 kV	PO awarded to M/s Kanohar Electricals Ltd. Drawings approved and under stage inspection. GIS Bay is already available. Work expected to be completed by Dec.21
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	PR No 1100002374, Under Tendering
viii	PUNJAB	Dhuri	1x125 MVAr at 400 kV & 1x25 MVAr at 220 kV	Retendering to be done for 400kV reactors. LOA placed for 220kV reactors.
ix	PUNJAB	Nakodar	1x25 MVAr at 220 kV	Technical bids opened on 14.01.2021.
x	PTCUL	Kashipur	1x125 MVAR at 400 kV	Already submitted to PSDF. On hold due to policy decision
xi	RAJASTHAN	Akal	1x25 MVAr	LOA placed on dt. 4.1.2021. Agreement signed on dt. 8.02.2021. Case for 2nd installment would be forwarded to NLDC, POSOCO. The target date is Nov' 2021.
xii	RAJASTHAN	Bikaner	1x25 MVAr	LOA placed on dt. 4.1.2021. Agreement signed on dt. 8.02.2021. Case for 2nd installment would be forwarded to NLDC, POSOCO. The target date is Nov' 2021.
xiii	RAJASTHAN	Suratgarh	1x25 MVAr	LOA placed on dt. 4.1.2021. Agreement signed on dt. 8.02.2021. Case for 2nd installment would be forwarded to NLDC, POSOCO. The target date is Nov' 2021.

xiv	RAJASTHAN	Barmer & others	13x25 MVAr	Agreement signed on dt. 22.06.2020. Grant of Ist Installment received on dt.19.02.21. Bidding document is under approval.
xv	RAJASTHAN	Jodhpur	1x125 MVAr	Agreement signed on dt. 22.06.2020. Grant of Ist Installment received on dt.19.02.21. Bidding document is under approval.

Annexure-A.II.I

Sl. No.	Substation	Downstream network bays	Commissioning status of ICTs / Bays	Planned 220 kV system	Revised Target	Remarks
1	400/220kV, 3x315 MVA Samba	2 nos. bays utilized under ISTS. Balance 4 nos. to be utilized	Commissioning of ICT 1st & 2nd - Mar'13 3rd - Oct'16 Commissioning of Bays Mar'13	LILO of 220 kV Bishnha – Hiranagar D/c line. Original schedule - Nov'2019		Charged on 11.05.2021
				220 kV D/c Samba (PG) – Samba (JKPDD) approved in 1st NRSCT.		Bay charged on 17.05.2021; Line charged in July'21
2	400/220kV, 2x315 MVA New Wanpoh	6 Nos. of 220 kV bays to be utilized	Commissioning of ICT Jul'14 Commissioning of Bays Jul'14	220 kV New Wanpoh -Mirbazar D/c line	Not Available	Ckt-1 has been charged; Ckt-2 FTC is under process at NRLDC end
				220 kV Alusteng - New Wanpoh Line	Not Available	Information not submitted
3	Shahjahanpur, 2x315 MVA 400/220 kV	4 Nos. of 220 kV bays to be utilized	Commissioning of ICT Commissioning of Bays Jun/Sep'14	Shajahnapur-Azimpur D/C line		Connected to load on 28.07.2021
				LILO of 220kV Shajahanpur - Sitapur at Shajahanpur PG	Sep'21	Updated in 186th OCC
4	Hamirpur 400/220 kV 2x 315 MVA S/s (Augmentation by 3x105 MVA ICT)	2 nos. bays utilized under ISTS. Balance 6 nos to be utilized	Commissioning of ICT 1st -Dec'13 2nd - Mar'14 3rd - Mar'19 Commissioning of Bays 4 bays - Dec'13 2 bays - Mar'14 2 bays - Mar'19	220 kV D/C Hamirpur-Dehan line. Original schedule: Dec' 2020	Oct'21	Updated in 186th OCC
5	Sikar 400/220kV, 1x 315 MVA S/s	2 Nos. of 220 kV bays	Commissioned (date not available)	Not available	Sep'21	Work order was placed on dt. 13.04.2020 to M/s A to Z Ltd. Works start on dt. 4.12.2020. S/S-32/32, T/E-31/32 (T/E at 27 no. location is pending due to Rajasthan High Court stay), T/S-2.09/8.122 km completed. Targeted to be completed by June'2021.
6	Bhiwani 400/220kV S/s	6 nos. of 220kV bays	Commissioned (date not available)	220kV Bhiwani (PG) - Isherwal (HVPNL) D/c line	Dec'21	Delayed due to RoW issue
7	400/220kV Tughlakabad GIS	10Nos. of 220kV bays	Commissioned (date not available)	RK Puram – Tughlakabad (UG Cable) 220kv D/c line	Jul'22	PO for supply and ETC of D/C UG cable awarded.
				Masjid Mor – Tughlakabad 220kv D/c line	Mar'22	PO for supply and ETC of D/C UG cable awarded.
8	400/220kV Kala Amb GIS (TBCB)	6 Nos. of 220kV bays	Commissioned in Jul'2017	220kV D/c line from Kala Amb 400/220kV S/s to 220/132kV Kala Amb S/s	Dec'21	Details for utilizing remaining 4 bays is not available

FGD Status

Updated status of FGD related data submission

NTPC (16.06.2021)
MEJA Stage-I
RIHAND STPS
SINGRAULI STPS
TANDA Stage-I
TANDA Stage-II
UNCHAHAR TPS
UPRVUNL (16.08.2021)
ANPARA TPS
HARDUAGANJ TPS
OBRA TPS
PARICHHA TPS

PSPCL (20.07.2021)
GGSSTP, Ropar
GH TPS (LEH.MOH.)
RRVUNL (16.08.2021)
CHHABRA SCPP
CHHABRA TPP
KALISINDH TPS
KOTA TPS
SURATGARH SCTPS
SURATGARH TPS

Updated status of FGD related data submission

Lalitpur Power Gen. Co. Ltd. (24.07.2021)
Lalitpur TPS
Lanco Anpara Power Ltd. (24.07.2021)
ANPARA-C TPS
APCPL (17.08.2021)
INDIRA GANDHI STPP

Rosa Power Supply Company (24.07.2021)
Rosa TPP Phase-I
Prayagraj Power Generation Company Ltd. (24.07.2021)
Prayagraj TPP

Pending submissions

Adani Power Ltd.
KAWAI TPS
GVK Power Ltd.
GOINDWAL SAHIB
HGPCL
PANIPAT TPS
RAJIV GANDHI TPS
YAMUNA NAGAR TPS

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: 31-08-2020), KAWAI TPS U#2 (Target: 30-06-2020)
APCPL	INDIRA GANDHI STPP U#1 (Target: 31-12-2021), INDIRA GANDHI STPP U#2 (Target: 31-03-2022), INDIRA GANDHI STPP U#3 (Target: 30-06-2022)
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: 30-04-2020), DADRI (NCTPP) U#6 (Target: 29-02-2020), RIHAND STPS U#1 (Target: 28-02-2022), RIHAND STPS U#2 (Target: 31-12-2021), 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: 31-08-2022), SINGRAULI STPS U#2 (Target: 31-08-2022), SINGRAULI STPS U#3 (Target: 31-08-2022), SINGRAULI STPS U#4 (Target: 31-08-2022), SINGRAULI STPS U#5 (Target: 31-08-2022), SINGRAULI STPS U#6 (Target: 31-08-2022), SINGRAULI STPS U#7 (Target: 31-08-2022), UNCHAHAR TPS U#1 (Target: 30-09-2023), UNCHAHAR TPS U#2 (Target: 30-09-2023), UNCHAHAR TPS U#3 (Target: 30-09-2023), UNCHAHAR TPS U#4 (Target: 30-09-2023), UNCHAHAR TPS U#5 (Target: 30-09-2023), UNCHAHAR TPS U#6 (Target: 31-03-2023), MEJA Stage-I U#1 (Target: 31-03-2022), MEJA Stage-I U#2 (Target: 31-03-2022), TANDA Stage-I U#1 (Target:), TANDA Stage-I U#2 (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: 31-12-2020), LALITPUR TPS U#2 (Target: 28-02-2021), LALITPUR TPS U#3 (Target: 31-10-2021)
Lanco Anpara Power Ltd.	ANPARA C TPS U#1 (Target: 31-08-2022), ANPARA C TPS U#2 (Target: 30-06-2022)
Prayagraj Power Generation Company Ltd.	PRAYAGRAJ TPP U#1 (Target: 30-04-2020), PRAYAGRAJ TPP U#2 (Target: 30-06-2020), PRAYAGRAJ TPP U#3 (Target: 29-02-2020)
PSPCL	GH TPS (LEH.MOH.) U#1 (Target: 30-04-2022), GH TPS (LEH.MOH.) U#2 (Target: 30-04-2022), GH TPS (LEH.MOH.) U#3 (Target: 28-02-2022), GH TPS (LEH.MOH.) U#4 (Target: 28-02-2022), GGSSTP, Ropar U#3 (Target: 31-03-2022), GGSSTP, Ropar U#4 (Target: 31-03-2022), GGSSTP, Ropar U#5 (Target: 31-03-2022), GGSSTP, Ropar U#6 (Target: 31-03-2022)

Rosa Power Supply Company	ROSA TPP Ph-I U#1 (Target: 31-12-2021), ROSA TPP Ph-I U#2 (Target: 31-12-2021), ROSA TPP Ph-I U#3 (Target: 31-10-2021), ROSA TPP Ph-I U#4 (Target: 31-10-2021)
RRVUNL	KOTA TPS U#5 (Target: 31-12-2022), KOTA TPS U#6 (Target: 31-12-2022), KOTA TPS U#7 (Target: 31-10-2022), 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: 31-10-2022), ANPARA TPS U#2 (Target: 31-08-2022), ANPARA TPS U#3 (Target: 30-06-2022), ANPARA TPS U#4 (Target: 30-04-2022), ANPARA TPS U#5 (Target: 28-02-2022), ANPARA TPS U#6 (Target: 30-06-2021), ANPARA TPS U#7 (Target: 30-04-2021), HARDUAGANJ TPS U#8 (Target: 31-12-2021), HARDUAGANJ TPS U#9 (Target: 31-12-2021), OBRA TPS U#9 (Target: 31-08-2022), OBRA TPS U#10 (Target: 31-10-2022), OBRA TPS U#11 (Target: 31-12-2022), OBRA TPS U#12 (Target: 30-06-2022), OBRA TPS U#13 (Target: 30-04-2022), PARICHHA TPS U#3 (Target: 30-04-2022), PARICHHA TPS U#4 (Target: 30-04-2022), PARICHHA TPS U#5 (Target: 28-02-2022), PARICHHA TPS U#6 (Target: 31-12-2021)