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/106/01/2022/ 9680-9721 दिनांक: 12.10.2022

**विषय:** उत्तर क्षेत्रीय विद्युत समिति की प्रचालन समन्वय उप-समिति की 199वीं बैठक का कार्यवृत |

**Subject:** Minutes of 199th OCC meeting of NRPC.

उत्तर क्षेत्रीय विद्युत समिति की प्रचालन समन्वय उप-समिति की 199वीं बैठक दिनांक 16.09.2022 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 |

199th meeting of the Operation Co-ordination Sub-Committee of NRPC was held on 16.09.2022. 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

(संतोष कुमार)
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 199वीं बैठक का कार्यवृत्त

199th meeting of OCC of NRPC was held on 16.09.2022 through video conferencing.

| खण्ड-क: उ.क्षे.वि.स. | PART-A:NRPC |
|---|---|

### 1. Confirmation of Minutes

Minutes of 198th OCC meeting was issued on 09.09.2022.OCC confirmed the minutes.

### 2. Review of Grid operations of August 2022

#### 2.1. Anticipated vis-à-vis Actual Power Supply Position (Provisional) for August 2022

Reasons submitted by states for significant deviation of actual demand from anticipated figures during the month of August 2022 are as under:

- **Delhi**

The Peak demand did not pick up due to rain and drop in temperature in the month of Aug-22.

- **Himachal Pradesh**

The actual energy requirement in respect of Himachal Pradesh came on lower side than anticipated due to heavy rains in the state.

- **Haryana**

Variation between actual and anticipated demand (in MW) is within 3% and the variation between actual and anticipated energy consumption (MUs) during the month is near about 7% due to heavy rainfall which has resulted in to the less Agricultural load.

- **Rajasthan**

The Energy consumption & Peak Demand decreased by 6.8% & 4.8% respectively w.r.t. Anticipated Energy requirement & Anticipated Peak Demand for August '2022 due to sufficient rains in the state during the month of August' 2022.

- **Uttarakhand**

The reason for negative variation (-1.8%) in energy requirement was due to increase in energy requirement/demand growth approximately 8%, however the energy requirement for the month was anticipated @10% based on the available data/trend for the month of May & June 2022 viz-a-viz 2021 which has significant rise of approximately 26%.

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 August 2022 was enclosed in the agenda and same was discussed in the meeting.

**3. Maintenance Programme of Generating units and Transmission Lines**

The maintenance programme of generating units and transmission lines for the month of October 2022 was deliberated in the meeting on 15.09.2022.

Following shutdown request was also approved/denied in the OCC meeting:

| Element Name | Owner | Reason | Requested From | Requested To | Daily/ Continuous | Decision of OCC |
|---|---|---|---|---|---|---|
| Dadri St-2 U#2 (490 MW) | NTPC | Overhauling | 10-Oct-22 | 23-Nov-22 | Continuous | OCC approved the shutdown from 1st November as beneficiary BRPL denied consent for the month of October due to high demand. |
| 220kV Narela - Rohtak Road D/C transmission line of BBMB (shutdown of both the circuits) | BBMB | (i) Dismantling of existing conductors (3days).<br>(ii) Erection of 6 monopoles (6days).<br>(iii) Dismantling of existing | 12-Oct-22 | 30-Oct-22 | Continuous | Shutdown was rejected as Delhi SLDC denied consent. |

| Element Name | Owner | Reason | Requested From | Requested To | Daily/ Continuous | Decision of OCC |
|---|---|---|---|---|---|---|
| | | lattice towers (3days).<br><br>(iv) Stringing of conductors on the newly erected monopoles and making termination (3days).<br><br>(v) Testing & all other related activities (1day).<br><br>(vi) EIG approval of the new installations (2days).<br><br>(vii) Commissioning of the line (1day). | | | | |

**Agenda No. 3.2: Revival Plan of Generating Units in NR under Long Outage**

- Following generating units in northern region have been under long outages. In the meeting, respective SLDC were requested to confirm their expected revival dates.

| Station | Location | Unit No. | Capacity | Reason(s) | Outage (Date & Time) | Revival Date intimated in OCC meeting |
|---|---|---|---|---|---|---|
| Chhabra TPS | Rajasthan | 4 | 250 MW | Due to Electrostatic precipitators (ESP) structural damage | 09-09-21 (00:47) | 15-Oct-22 |
| Suratgarh SCTPS | Rajasthan | 7 | 660 MW | Failure of R-phase Bushing of GT-7A | 15-03-22 (01:32) | 30-Sept-22 |
| Suratgarh TPS | Rajasthan | 1 | 250 MW | Stator Earth Fault | 30-06-22 (18:24) | 30-Sept-22 |
| Guru Hargobind Singh TPS (Lehra Mohabbat) | Punjab | 2 | 210 MW | ESP Breakdown | 13-05-22 (21:36) | 12-14 months from the outage date as reported by Punjab SDLC |

## 4. Planning of Grid Operation

### 4.1. **Anticipated Power Supply Position in Northern Region for October 2022**

The updated anticipated Power Supply Position for October 2022 is as below:

| State / UT | Availability / Requirement | Revised Energy (MU) | Revised Peak (MW) | Date of revision |
|---|---|---|---|---|
| CHANDIGARH | Availability | 140 | 400 | No Revision submitted |
| | Requirement | 110 | 220 | |
| | Surplus / Shortfall | 30 | 180 | |
| | % Surplus / Shortfall | 27.3% | 81.8% | |
| DELHI | Availability | 3273 | 5400 | 15-Sep-22 |
| | Requirement | 2750 | 5400 | |
| | Surplus / Shortfall | 523 | 0 | |
| | % Surplus / Shortfall | 19.0% | 0.0% | |
| HARYANA | Availability | 4660 | 11220 | 07-Sep-22 |
| | Requirement | 5750 | 9356 | |
| | Surplus / Shortfall | -1090 | 1864 | |
| | % Surplus / Shortfall | -19.0% | 19.9% | |
| HIMACHAL PRADESH | Availability | 981 | 1714 | 07-Sep-22 |
| | Requirement | 961 | 1740 | |
| | Surplus / Shortfall | 20 | -26 | |
| | % Surplus / Shortfall | 2.1% | -1.5% | |
| J&K and LADAKH | Availability | 1200 | 3040 | No Revision submitted |
| | Requirement | 1510 | 2470 | |
| | Surplus / Shortfall | -310 | 570 | |
| | % Surplus / Shortfall | -20.5% | 23.1% | |
| PUNJAB | Availability | 5420 | 11410 | 15-Sep-22 |
| | Requirement | 5745 | 12500 | |
| | Surplus / Shortfall | -325 | -1090 | |
| | % Surplus / Shortfall | -5.7% | -8.7% | |
| RAJASTHAN | Availability | 7930 | 17920 | 19-Sep-22 |
| | Requirement | 8500 | 14360 | |
| | Surplus / Shortfall | -570 | 3560 | |
| | % Surplus / Shortfall | -6.7% | 24.8% | |
| UTTAR PRADESH | Availability | 12400 | 23500 | 12-Sep-22 |
| | Requirement | 12090 | 23500 | |
| | Surplus / Shortfall | 310 | 0 | |
| | % Surplus / Shortfall | 2.6% | 0.0% | |
| UTTARAKHAND | Availability | 1215 | 2129 | 05-Sep-22 |

| State / UT | Availability / Requirement | Revised Energy (MU) | Revised Peak (MW) | Date of revision |
|---|---|---|---|---|
| | Requirement | 1225 | 2200 | |
| | Surplus / Shortfall | -9 | -71 | |
| | % Surplus / Shortfall | -0.8% | -3.2% | |
| NORTHERN REGION | Availability | 37220 | 72000 | |
| | Requirement | 38640 | 67400 | |
| | Surplus / Shortfall | -1421 | 4600 | |
| | % Surplus / Shortfall | -3.7% | 6.8% | |

## 5. Submission of breakup of Energy Consumption by the states

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

| State / UT | From | To |
|---|---|---|
| Delhi | Apr-2018 | Jul-2022 |
| Haryana | Apr-2018 | Jun-2022 |
| Himachal Pradesh | Apr-2018 | Jun-2022 |
| Punjab | Apr-2018 | Jun-2022 |
| Rajasthan | Apr-2018 | Jul-2022 |
| Uttar Pradesh | Apr-2018 | Jul-2022 |
| Uttarakhand | Apr-2018 | Mar-2022 |

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

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

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

6.2. In 195$^{th}$ OCC, SLDCs were requested to again to coordinate with respective Transmission utilities of states/UT's and submit details about the updated status of Down Stream network by State utilities from ISTS Station (enclosed as ***Annexure-A-I.I***) before every OCC meeting.

## 7. NR Islanding scheme

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

7.2. In 187th OCC, it was decided that states shall submit MIS report before every OCC meeting so that same may be discussed. Format was circulated vide agenda of 187th OCC.

7.3. It was also highlighted that MoP has agreed for PSDF funding for implementation of islanding schemes and states were requested to prepare and submit DPR for the same. Further, a sample DPR on implementation of Islanding scheme for PSDF funding has been already circulated vide email dated 07.10.2021 and requested to expedite the preparation of DPR.

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

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

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

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

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

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

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

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

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

7.13. UPSLDC vide letter dated 01.12.2021 has submitted the names of islands for which system study from CPRI is required. UPSLDC has highlighted, inter-alia, that involvement of long length 765kV line and high number of buses

necessitates them to go for system study by CPRI. It has mentioned that SLDC/STU has no expertise in such studies and before doing any investment on the project, proper study is must for successful implementation and operation of Islands.

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

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

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

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

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

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

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

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

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

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

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

7.25. In 192nd OCC, UPSLDC informed that they have received techno-commercial offer from CPRI for both the islanding schemes of UP and accessing the inputs from CPRI they will be conveying a meeting in last week of February 2022.

7.26. NRLDC representative informed modelling data on PSSE software received from Rajasthan has not been modelled for islanding scheme. Further, NRLDC representative asked Rajasthan SLDC to send their team next week for modelling the data on PSSE software.

7.27. MS, NRPC asked Uttarakhand SLDC to expedite the study they are conducting to access the feasibility of Dehradun islanding scheme.

7.28. NRPC representative informed that a meeting was convened by HPSLDC with officials of NRPC Sectt., NRLDC, HPSEBL, & HPPTCL on 11.02.2022. It was observed that system study work has been pending due to pre-occupation of the concerned resource. Therefore, it was decided that HPSLDC shall write letters to MDs of HPSEBL & HPPTCL. It was decided to review the status in another meeting in the first week of March 22. It was intimated that HPSLDC has written letter dt. 14.02.2022 to HPSEBL, & HPPTCL.

7.29. Punjab SLDC also informed that they will be convening a meeting with STU within a week to track the progress.

7.30. In meeting (193rd OCC), NRPC representative informed forum that HPSLDC convened a meeting on 4th March 2022 wherein they presented the results of static and dynamic study conducted by them. NRLDC suggested that dynamic data used by HPSLDC is common data and it was decided that they will use data of particular generators and then apprise about the same.

7.31. UPSLDC also convened a meeting on 7th March 2022 wherein they informed that CPRI has submitted the offer with a completion target of 5 months. It was also discussed that as there are two islanding schemes in UP control area hence it was suggested that CPRI may be asked to do it in 2 parts preferably 2.5 months each for both the islanding scheme.

7.32. UPSLDC representative informed that CPRI would not be able to bifurcate the time separately for both the islanding scheme and acceptance is under consideration by the management.

7.33. HPSLDC representative informed that they have communicated to all generators for providing dynamic data, and only reply from Karcham Wangtoo has been received from till date.

7.34. Rajasthan representative informed that next week they will send their team to NRLDC for modelling the data on PSSE software.

7.35. J&K representative informed that load has been identified and no further update. MS, NRPC asked J&K representative expedite the study work.

7.36. Further, MS NRPC suggested that states shall coordinate with NRPC and NRLDC officials for carrying out the study.

7.37. Further, Punjab and J&K representative were requested to convene a meeting in the last week of March with the officials of NRPC and NRLDC to deliberate about the updated status of the islanding scheme in their control area.

7.38. In the 194$^{th}$ OCC, Punjab representative informed that CPRI has asked for PSSE file for dynamic study which is being coordinated with NRLDC. STU has given timeline of 6 months for implementation after CPRI study.

7.39. MS, NRPC along with NRLDC have desired that all states of northern region where islanding scheme is to be implemented shall convene meeting with the officials of NRPC and NRLDC wherein the study requirements can be discussed.

7.40. OCC forum was of opinion that all generating units (especially 660MW units) shall make an effort to ensure successful household operations. UP representative was requested to expedite the implementation work of Unchahar-Lucknow Islanding scheme after analyzing load-generation balance and conducting steady state study.

7.41. Further, OCC forum was of view that states shall go for implementation of islanding scheme after steady state study along with load generation balancing and dynamic study, if desired, may be carried out in later stage.

7.42. In the 195$^{th}$ OCC, NRLDC representative intimated that steady state study for Rajasthan islanding scheme has been completed. It was decided that Rajasthan may go ahead for implementing the scheme.

7.43. NRPC representative informed that a sub-group will be formulated shortly that would review all proposed islanding schemes of NR and assess the reason for delay.

7.44. In the 196$^{th}$ OCC, MS NRPC asked UP representative to take up the matter with CPRI for Agra islanding scheme and ask them to complete the work in one month time from the date of acceptance of offer by CPRI.

7.45. UP representative informed that steady state study along with load generation balancing is complete for Unchahar-Lucknow Islanding scheme and the same would be submitted to NRLDC in one week time.

7.46. Rajasthan representative informed that for Jodhpur-Barmer-Rajwest and Suratgarh islanding scheme work of DPR preparation is under progress and same would be submitted to NLDC to avail PSDF funding before next OCC meeting.

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

7.48. MS NRPC asked Himachal Pradesh representative to coordinate with NRLDC officials to converge the study carried out by them.

7.49. Further, MS NRPC also asked Punjab representative to coordinate with NRLDC officials in order to converge the steady state study carried out by them.

7.50. In the 197$^{th}$ OCC, NRPC representative informed that UPSLDC has submitted the updated status of Unchahar Islanding scheme as per the deliberation held in the review meeting held on 07.07.2020. Moreover, order for system study of Agra-Lalitpur IS has been placed on CPRI.

7.51. In regard to Delhi Islanding scheme, NRPC representative informed that as per the deliberation held in the review meeting held on 13.07.2020, response from Delhi Discoms is awaited regarding whether trippings through ADMS system can be facilitated for Delhi Islanding scheme.

7.52. MS, NRPC expressed apathy over no significant progress in implementation of Delhi Islanding Scheme since last 18 months. He suggested that in view of allocation of Dadri-II to Haryana and non-scheduling of Jhajjar and Dadri-II due to high cost, the proposed islanding may not survive. Therefore, it would be better to have two small islands – one with GTs and the other with Bawana. Mostly, these plants operate and therefore survival chances for islands would be more. Moreover, these islands could be controlled through UFRs at 220kV level by STU and not at 33kV by Discoms as envisaged in proposed scheme. It was suggested that DTL may bring out proposal for further discussion at NRPC Sectt and NRLDC level.

7.53. NRPC representative informed that HPSLDC has been requested to provide load wise details for the islanding scheme finalized by them.

7.54. In the 198th OCC, NRPC Sectt representative informed forum that Delhi SLDC has been asked to submit generation data for last 2 years (96 blocks) of power stations in Delhi control area and they need to expedite the submission of requisite data. Further, forum was of view that after submission of data, a meeting may be conducted between NRPC Sectt., NRLDC and Delhi SLDC to review the same.

7.55. In regard to Unchahar Islanding scheme, NRPC Sectt representative informed that complete proposal has been received. On analysis of same, it is felt that logic needs to be discussed and NTPC Unchahar needs to confirm whether machines can be operated in FGMO mode in islanding operation. Further, NRPC Sectt representative informed that they would be their sharing their observations with UPSLDC/NTPC and thereafter, comments/confirmation of NTPC on the same may kindly be communicated to NRPC Sectt.

7.56. NRPC Sectt representative intimated that based on the discussion in the 56th NRPC meeting for Rajwest and Suratgarh islanding schemes, RVPN was asked to review the Load in Suratgarh and Rajwest islands and reduce it so that there may be some adequate gap between island load and generation.

7.57. NRPC Sectt representative apprised that Punjab has submitted the details and same has been scrutinized. Observations of NRPC Sectt have been shared with Punjab and they may kindly submit their response on the same. Punjab representative mentioned that reply on the observations would be submitted within two-three days.

7.58. As regards to Dehradun Islnading Scheme, NRPC Sectt representative reiterated that a report may kindly be submitted to OCC forum after analyzing the past generation and demand data pertaining to the proposed scheme. Based on the report, further decision would be taken.

7.59. NRPC Sectt representative intimated that data from Himachal Pradesh has been received and same is under examination.

7.60. In the meeting (199$^{th}$ OCC), NRPC Sectt representative informed forum that a meeting was conducted with the officials of HP and NRLDC to review the implementation of HP islanding scheme. In the meeting, average generation and load pattern of last two years were observed for both the islanding schemes. MoM of the meeting is attached at **Annexure-A.II**.

7.61. Further, NRPC representative informed forum that a review meeting was conducted with the officials of UP and NRLDC to discuss the implementation of Unchahar-Lucknow Islanding scheme. MoM of the meeting is attached at **Annexure-A.III**.

7.62. Rajasthan representative intimated forum that they have conducted a mock trial in which it took 79 ms for UFR command to reach RTU from data centre which is quite high and same is being reassessed with STLMS. Further, NRPC representative mentioned that as discussed in 56$^{th}$ NRPC meeting, Load of Suratgarh & Rajwest island may also be reduced to have appropriate gap in load generation. In this regard, Rajasthan representative informed that revised load setting will be shortly submitted to NRPC Sectt.

7.63. MS, NRPC expressed apathy over no significant progress in implementation of Islanding Scheme for NR states and was of view that nodal officer for each

islanding scheme shall be nominated by each State/UT and concerned representative of NRPC and NRLDC shall visit respective NR State/UT where the islanding scheme is being proposed and discuss the issues being faced in the implementation of cited scheme with the concerned higher officials.

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

8.1. In the meeting, NRPC representative apprised the forum about the coal stock position of generating stations in northern region during current month (till 10th September 2022).

8.2. Average coal stock position of generating stations in northern region, having critical stock, during first nine days of September 2022 is as follows:

| Station | Capacity (MW) | PLF % (prev. months) | Normative Stock Reqd. (Days) | Actual Stock (Days) |
|---|---|---|---|---|
| ANPARA C TPS | 1200 | 78.51 | 13 | 1.2 |
| BARKHERA TPS | 90 | 64.55 | 21 | 1.5 |
| GOINDWAL SAHIB TPP | 540 | 47.60 | 21 | 2.0 |
| HARDUAGANJ TPS | 1265 | 58.00 | 21 | 3.8 |
| KHAMBARKHERA TPS | 90 | 59.81 | 21 | 1.7 |
| KUNDARKI TPS | 90 | 59.53 | 21 | 0.1 |
| LALITPUR TPS | 1980 | 77.28 | 21 | 2.0 |
| MAQSOODPUR TPS | 90 | 58.66 | 21 | 1.7 |
| OBRA TPS | 1094 | 50.78 | 21 | 3.0 |
| PARICHHA TPS | 1140 | 57.15 | 21 | 2.6 |
| ROSA TPP Ph-I | 1200 | 72.88 | 21 | 1.5 |
| UTRAULA TPS | 90 | 65.87 | 21 | 1.9 |
| KALISINDH TPS | 1200 | 74.54 | 21 | 2.2 |

8.3. In the meeting, above mentioned generating stations were requested to take adequate measures.

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

9.1. In the meeting, NRPC representative presented the matter to the forum.

9.2. MS, NRPC Haryana representative informed forum that they have also planned the shutdown of 400 kV Jhajjar (APCL) - Daulatabad (HV) of both circuit one at a time for replacement of Porcelain insulator work. OCC forum advised Haryana STU to complete the work between 22nd Sep'22 to 14th Oct. Moreover, one circuit shutdown from Jhajjar end could be given at a time.

9.3. MS, NRPC was of view that shutdown of both the circuits of 400 kV Jhajjar (APCL) - Daulatabad (HV) must be availed first so that the system at Daulatabad end is strengthened before availing shutdown of 400kV Jharli-Mundka Transmission line for cited NHAI work.

9.4. OCC provisionally approved the shutdown of 400kV Jharli-Mundka Transmission line from 15th Oct to 25th Oct, subject to completion of porcelain insulator work by Haryana on Jhajjar-Daulatabad circuit before 15th Oct'22.

**10. Third party protection audit at PTCUL sub-stations (Agenda by PTCUL)**

10.1. NRPC representative presented the matter to the forum and informed that the aforesaid agenda was also deliberated in 196th OCC meeting, wherein PTCUL/UJVNL was requested to submit the name and details of the coordinator for this activity and also the details (name, location, distance from Dehradun) of all sub-stations (to be audited). The OCC forum is intimated that cited information has been received from PTCUL.

10.2. NRPC representative also intimated that as per MoM of 196th OCC meeting NRLDC, POWERGRID, UPPTCL/UPSLDC, THDC and PTCUL were asked to submit two/three nominations each for the said protection audit to NRPC Sectt. However, till date two nominations each from NRLDC and THDC and one nomination from NR-3 POWERGRID has been received for this activity. Further, UP has shown its reservation by citing manpower shortage.

10.3. In the meeting, PTCUL gave nominations of two officers for this work.

10.4. MS, NRPC asked NR-1 and NR-3, POWERGRID to nominate 2 officials each for this activity within 2 working days.

10.5. SE(O), NRPC proposed two officers from NRPC Sectt. for this activity and mentioned that at least 5 teams comprising of 2 officials each can be formed to carry out the third-party audit work at 20 substations (10 PTCUL and 10 UJVN).

10.6. Further, OCC forum was of the view that boarding/lodging and logistics support to the teams carrying out the aforesaid audits would be taken care of by the concerned organization, i.e., PTCUL/UJVNL in the present case.

**11. Utilization of 01 no. 500MVA 400/200/33kV Transformer at Maharani Bagh or 01 no. 315MVA 400/200/33kV Transformer available at Ballabhgarh. (Agenda by DTL)**

11.1. In the meeting, DTL representative presented the matter to the forum.

11.2. NR-1 POWERGRID representative intimated forum that presently there are no regional spares available with them as the transformer mentioned by DTL in their letter have been decapitalized. Further, he intimated that the 500MVA 400/200/33kV Transformer at Maharani Bagh would not meet the requirement of DTL; however, with regard to 315MVA 400/200/33kV Transformer at

Ballabhgarh the matter is being discussed internally with POWERGRID management.

11.3. MS, NRPC was of view that NRPC Sectt. would write a letter to Director (Operations), POWERGRID for exploring possibility of providing the decapitalized 315MVA 400/200/33kV Transformer at Ballabhgarh to DTL for ensuring power supply reliability for Delhi transmission system.

**12. Request for shutdown approval of 800kV HVDC Champa-Kurukshetra & 500kV HVDC Rihand-Dadri Transmission Line infringing the Rail network of Jawaharpur thermal Power project being constructed by JVUNL, diversion work being executed by Powergrid (Agenda by NR-3 Powergrid)**

12.1. In the meeting, NRPC representative informed forum that the aforesaid matter has already been discussed in the outage meeting of NRPC held on 15.09.2022.

12.2. OCC forum noted.

**13. Additional Agenda No.1: Preliminary Report on Grid event in Rajasthan Region on 11.09.2022 at 12:22:02 hrs (Agenda by NR-I POWERGRID)**

13.1. NR-1, POWERGRID vide letter dated 14.09.2022 (copy enclosed as **Annexure-A.IV**) shared with NRPC Sectt., the preliminary report on grid event occurred in Rajasthan Region at 12:22 Hrs. on 11.09.2022 for further deliberation in 199$^{th}$ OCC meeting of NRPC.

13.2. In the meeting, NRPC representative presented the matter to the forum.

13.3. NRLDC representative presented his observations on these tripping and the cause of fault on the 220 kV Bhadla Solar energy line which led to cascaded tripping of other 765 kV transmission elements. Further, it was submitted that NRLDC has discussed the matter in detail in series of meetings with all the stakeholders viz., RE developers and OEMs of Inverters and have proposed suggestions for avoiding such trippings.

13.4. The OCC forum noted the observations of NRLDC.

**14. Additional Agenda No.2: Special Protection Scheme (SPS) at 400/220kV Fatehgarh Park (Agenda by Adani Green Energy Limited)**

14.1. Adani Green Energy Limited vide its mail dated 13.09.2022 has shared Special Protection Scheme (SPS) (copy enclosed as **Annexure A.V**) for implementation at 400/220kV 1000 MW Fatehgarh solar Park (Adani Renewable Energy Park Rajasthan Limited) for avoiding black out at time of tripping of any one ICT.

14.2. In the meeting, Adani Green Energy Limited representative presented the matter to the forum.

14.3. NRLDC representative requested Adani Green Energy Limited for sending the detailed study for further analysis.

14.4. MS, NRPC desired that detailed plan may be taken up in the NRPC meeting for the present proposed SPS by Adani Green Energy Limited as well as for the other critical SPS schemes.

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

## 15. NR Grid Highlights for August 2022

NRLDC representative highlighted following points related to NR grid operation for Aug 2022:

- Maximum energy consumption of Northern Region was 1618.68 Mus on 31st August'2022 and it was 0.9 % lower than August' 2021 (1633.79 Mus 18th August'21)
- Average energy consumption per day of Northern Region was 1473.63 Mus and it was 5.1 % higher than August'2021 (1402.08 Mus per day)
- Maximum Demand met of Northern Region was 72045 MW on 31st August'22 @13:00 hours (based on data submitted by Constituents) as compared to 73191 MW on 18th August'2021 @13:00 hours.

**Northern Region all time high value recorded in August'22:**

| State (Maximum Demand Met) | All Time High Record | | Previous Record (upto July-22) | |
|---|---|---|---|---|
| | Value (MW) | Achieved on | Value (MW) | Achieved on |
| पंजाब | 14267 | 22.08.2022 at 15:00 | 14189 | 29.06.2022 को 23:00 बजे |

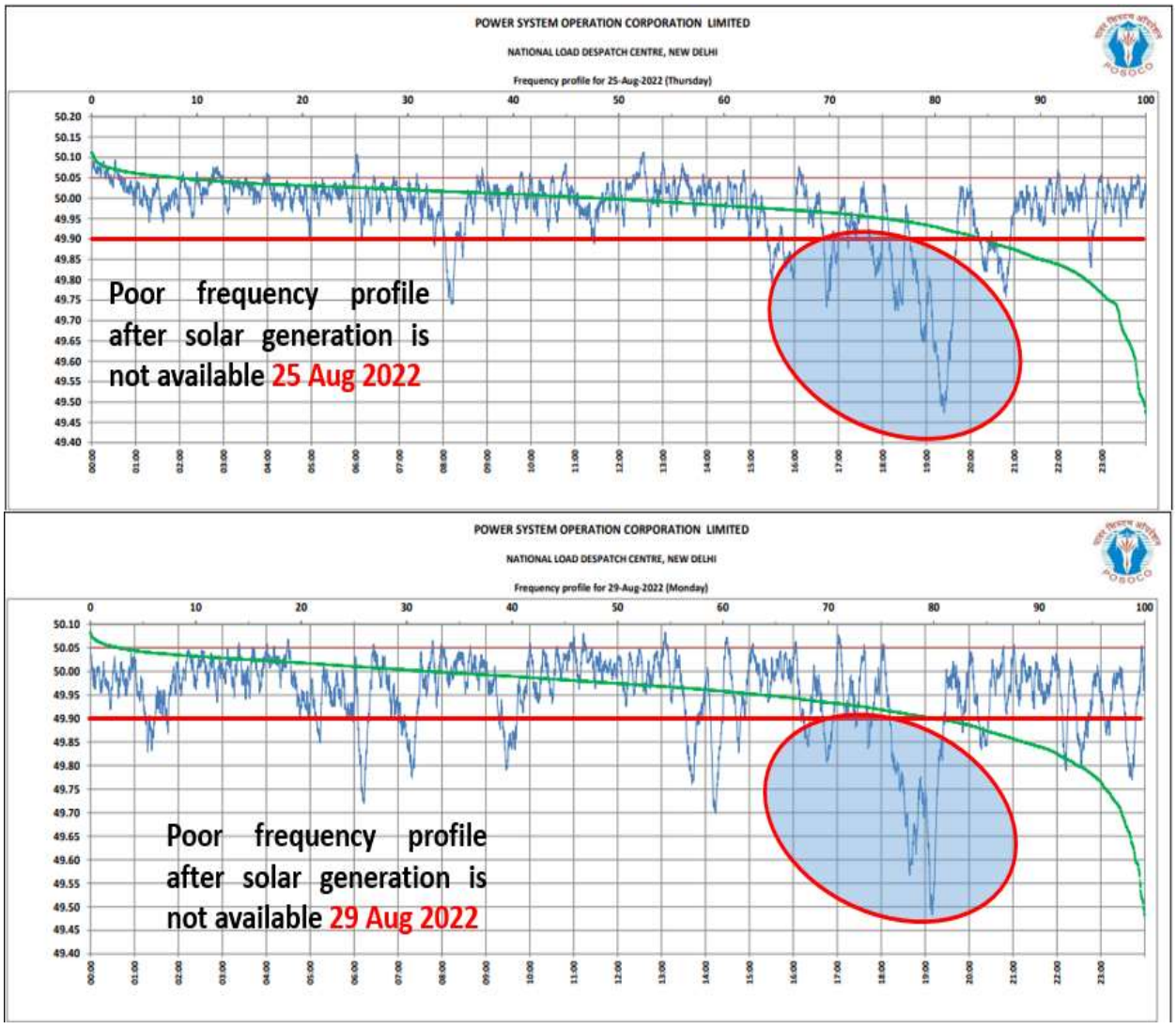
| State (Max Energy Consumption) | All Time High Record | | Previous Record (upto July-22) | |
|---|---|---|---|---|
| | Value (MU) | Achieved on | Value (MU) | Achieved on |
| उत्तर प्रदेश | 547.36 | 19.08.2022 | 541.77 | 08.07.2022 |

| Hydro Generation | All Time High Record | | Previous Record (upto July-22) | |
|---|---|---|---|---|
| | Value (MU) | Achieved on | Value (MU) | Achieved on |
| | 408.61 | 22.08.2022 | 400.08 | 11.08.2021 |

**Frequency Data**

| Month | Avg. Freq. (Hz) | Max. Freq. (Hz) | Min. Freq. (Hz) | <49.90 (% time) | 49.90 – 50.05 (% time) | >50.05 (% time) |
|---|---|---|---|---|---|---|
| **Aug'22** | 50.00 | 50.31 | 49.47 | 8.8 | 75.8 | 15.5 |
| **Aug'21** | 50.00 | 50.22 | 49.53 | 7.7 | 76.9 | 15.4 |

***In last week of August 2022, on number of occasions low frequency operation of grid was observed as shown below:***




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

1. Managing the demand portfolio and making prearrangements for procurement of power and ensuring portfolio balancing through STOA/RTM market segments
2. More units shall be kept on bar in order to meet the increased demand safely as well as maintaining reserves
3. Keeping sufficient coal stock and maintaining adequate reserves.

4. Restricting deviations from schedule and ensuring no under injection by the generators from schedule.
5. Advance action is required for bringing the units on bar
6. Ensure that ADMS is in service and expedite its implementation if not commissioned.
7. Ensure healthiness and availability of AUFLS and df/dt load shedding.
8. In case of inadequate margins in intrastate generators, measures for emergency load regulation measures may be taken in interest of grid security.
9. Pursue generators to expedite revival of thermal units under forced outage wherever feasible.

***All states were advised to strictly take actions and avoid over/ under drawal from Grid for safe & secure operation of the Grid. OCC members agreed to take above actions for better frequency control. Detailed presentation as delivered by NRLDC representative is attached as*** **Annexure-B.I.**

**16. Winter preparedness**

NRLDC representative stated that winter in Northern region is likely to start from mid of October till February end, and the challenges faced during these months are well known to all the utilities. During winter, demand of NR states except Rajasthan and hilly states starts reducing. With decreasing temperatures and festivals, winter also brings some severe challenges to NR grid operators:

**(i) Load-generation balance**

Measures to be taken by utilities to manage load generation balance during winter months were discussed as mentioned below:

- With increasing complexity, users may develop in house or use third party Software tools for precision of load forecasting & generation planning for daily basis, which can further go for sub-hourly basis also.
- Forecast of demand ramp has become all the more important and so SLDCs were advised to forecast load ramping so that commensurate ramping of generation can also be planned.
- Minimize generation to technical minimum as per IEGC guidelines /CERC directions during low demand.
- **Co-ordination of ramping of generation during morning & evening peak ramping**
- Optimum utilization of Hydro resources for meeting peak hour demand.

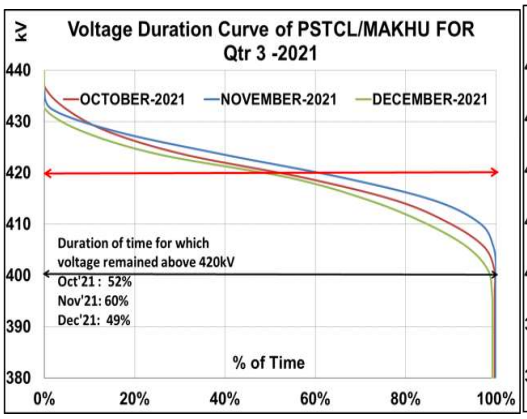
***OCC members agreed to take above actions for better frequency control.***

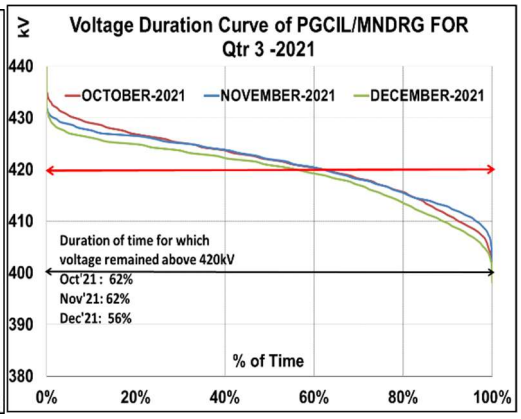
**(ii) High voltages in grid**

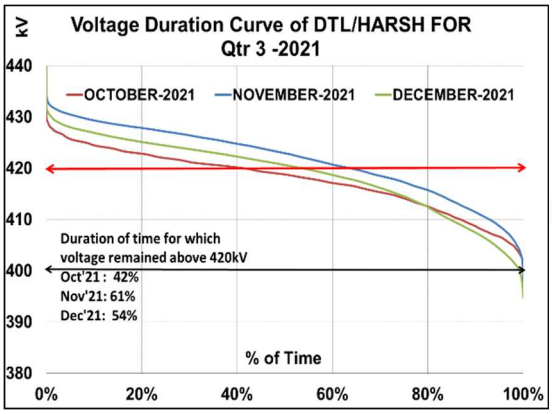
With NR load reducing significantly, the lines become lightly loaded and are generating MVAR most of the time leading to high voltages in grid. Moreover, with heating loads across most of the NR states the power factor also is improved minimizing any reactive power requirement from the grid. To overcome this challenge number of measures have been discussed earlier and were reiterated for OCC members:

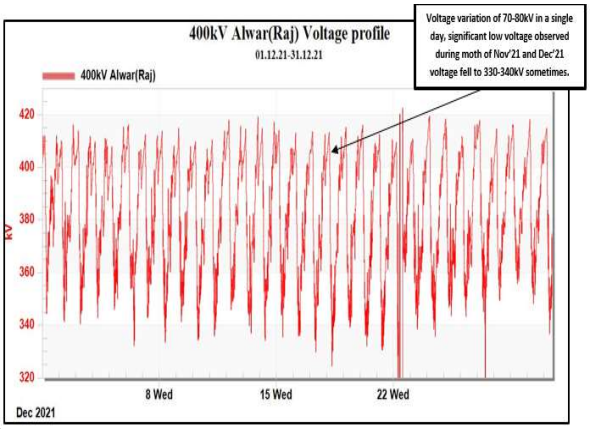
- Ensuring to switch off capacitors & switch on reactors.
- Ensuring healthiness of all commissioned reactors in the system
- Monitoring of reactive power through SCADA displays.
- Reactive power support (absorption) by generating stations as per the capability curve.
- Synchronous condenser operation especially of hydro units during night hours for dynamic voltage support. Some of the generators have already been tested (Tehri, Chamera, Pong, RSD etc.) and shall be available for condenser mode of operation as and when required.
- **Punjab SLDC representative informed that RSD has been tested for synchronous condenser mode of operation with MVAr generation (60MVAr generation with 3MW consumption). During this winter season, MVAr absorption by RSD units would also be tested. HP SLDC agreed to take up the matter with Larji and communicate with NRLDC/ NRPC.**
- States/SLDCs were also advised to explore synchronous condenser operation of Hydro & Gas units in their state control area. It was requested that all utilities may explore possibility of running units as synchronous condenser and provide update on the status attached as **Annexure-B.I of agenda**. No new update was received from any hydro/gas station or SLDC.
- ICT Tap Optimization at 400kV & above is carried out by NRLDC. Same exercise need to be carried out by SLDCs at 220kV & below levels.
- Opening of EHV lines based on expected voltage reduction and also considering security & reliability of system
- To ensure that line reactors available after opening of lines are optimally utilized it is necessary that details of all the stations where the provision of using line reactors as bus reactors is available at all control centres. The Reactive power document being compiled by NRLDC has the details of all such line reactors. Last updated document is available at NRLDC website under documents section: *https://nrldc.in/download/nr-reactive-power-management-2022/?wpdmdl=9908*. It was requested that all utilities go through document and share any anomaly/mis-representation. The document is being utilized in real-time operation by control room operators at NRLDC, thus it is necessary that list of all reactors where such provision is available are updated in the document.

NRLDC representative presented some of the plots showing high/ low voltage nodes from last year:




All utilities were asked to expedite commissioning of reactors in their respective control area. It was requested that the healthiness of all reactors, SVC, STATCOM may be ensured at all substations especially before winter.

***The persistent issue of low voltages at 400/220kV Hindaun and Alwar substations were discussed. It was discussed that even after utilizing margin of ICT taps at these substations, continuous low voltages are being observed. The issue has been persisting for last 3-4 years and still no concrete action has been taken from RVPN end. OCC expressed concern on the low voltage issue at Hindaun and Alwar and RVPN was asked to expedite measures to remove low voltages in this area at the earliest. MS NRPC stated that letter may be written from NRPC to CMD RVPN regarding expediting connectivity to Hindaun/ Alwar as still the matter is pending at RVPN end since long time.***

(iii) **EHV line trip during fog/Smog**

One more challenge during winter months is tripping of EHV lines due to fog. With low temperature across Northern region and sometimes with high humidity in the air, fog starts to appear across Northern region. This problem is generally most severe from 15Dec- 15Feb period. During this time additional care need to be taken by system operator as many multiple element tripping events have been reported in the past especially in Punjab and Eastern UP. Such tripping are more severe if the lines are tripping from generation complex such as Singrauli-Anpara-Rihand complex. Therefore, utilities were requested to ensure:

- Priority wise cleaning & replacement is carried out.

- Progress on cleaning replacement of porcelain insulator with polymer insulator to be monitored and latest status to be furnished to NRPC/NRLDC.

***All members were asked to provide updated status of points listed above.***

**(iv) Load crash due to inclement weather**

During winter months, the demand of Northern region is much lower compared to summer months for which the transmission system is designed. When operating at reduced demand, the internal generation of most of the states is low based on merit order. Several EHV lines are also opened to ensure voltages within IEGC limits. In such a scenario, in case of rainfall/snowfall, it is seen that demand of Northern region falls sharply. With several lines out due to high voltage and more tripping due to bad weather, ensuring safe and secure grid operation becomes a big challenge for system operators. To overcome this challenge, it is important that:

- All system operators and transmission utilities regularly monitor weather forecast site ( Weather portal for power sector)
- ERS is available in case of emergency.
- Ensure additional trained manpower especially during night hours at all major control centres/ substations

***All members agreed to take above actions.***

**(v) Ensuring protection settings as approved by NRPC**

Apart from above, it needs to be made sure that defense mechanism is healthy i.e. ensuring all SPS healthy, protection system intact, monitoring of df/dt& UFR etc; and telemetry especially of MVAr of Generator, temperature & humidity etc. is available and reliable.

During winter months, it has been observed that there is **frequent tripping of ICTs on overflux and lines on overvoltage** especially in Punjab and Haryana areas. On number of occasions, it is seen that utilities are correcting their protection settings after tripping events. It is important all the protection settings are as approved by NRPC. Utilities were requested to confirm the same from field and ensure that protection settings are only as approved by NRPC.

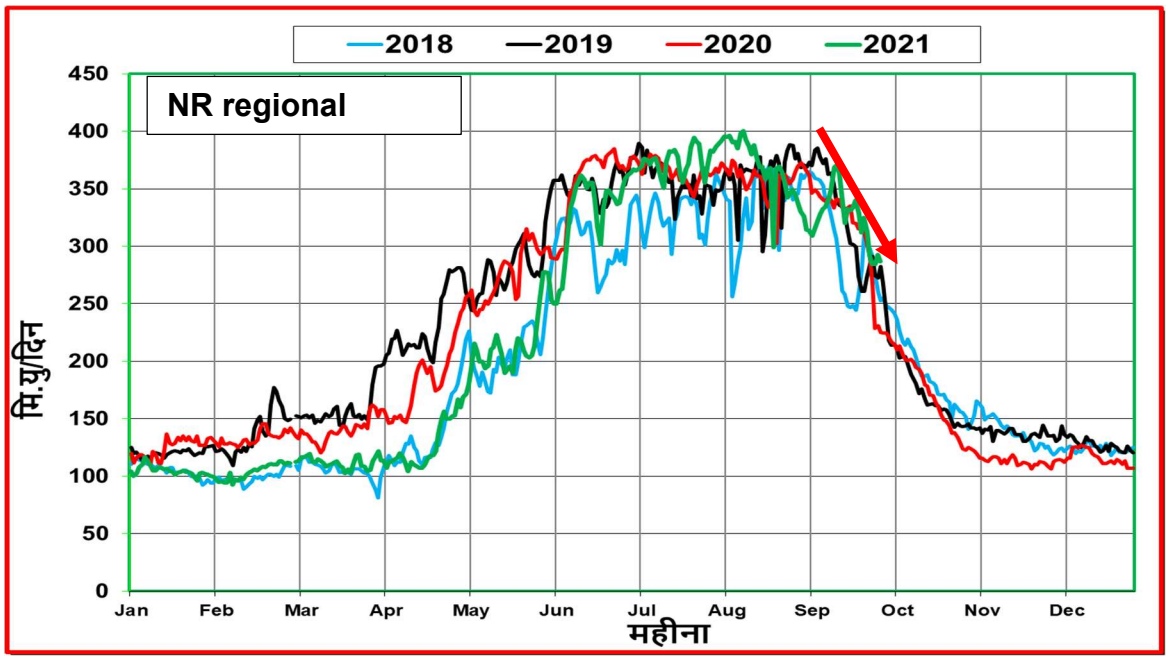
In case, rating of terminal equipment is lower than thermal rating of the line, same may also be intimated to NRLDC, so that feedback regarding same is submitted to CEA/CTU.

***Utilities were requested to prepare plan for measures to be taken by them for carrying out pre-winter maintenance activities. Same may be shared by utilities via mail with NRPC/NRLDC before next OCC meeting. All members agreed to take above actions.***

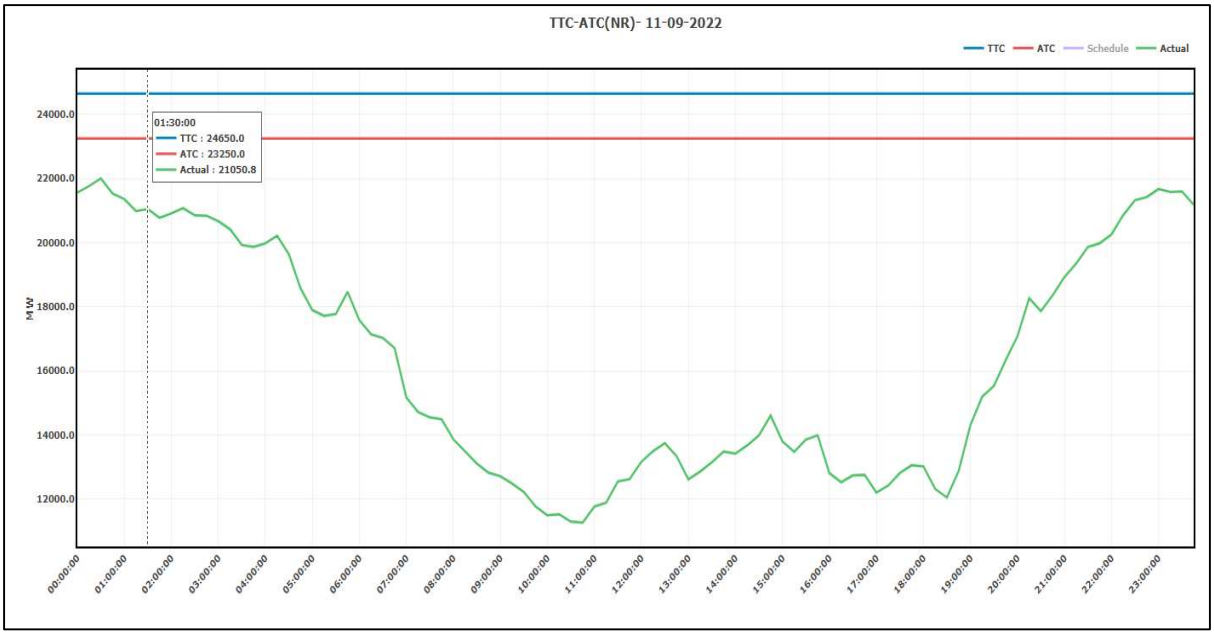
**17. Maximizing generation within Northern Region during September month:**

In the meeting, it was discussed that since start of September due to dry spell of monsoon, demand of Northern Region has remained high considerably in past years.

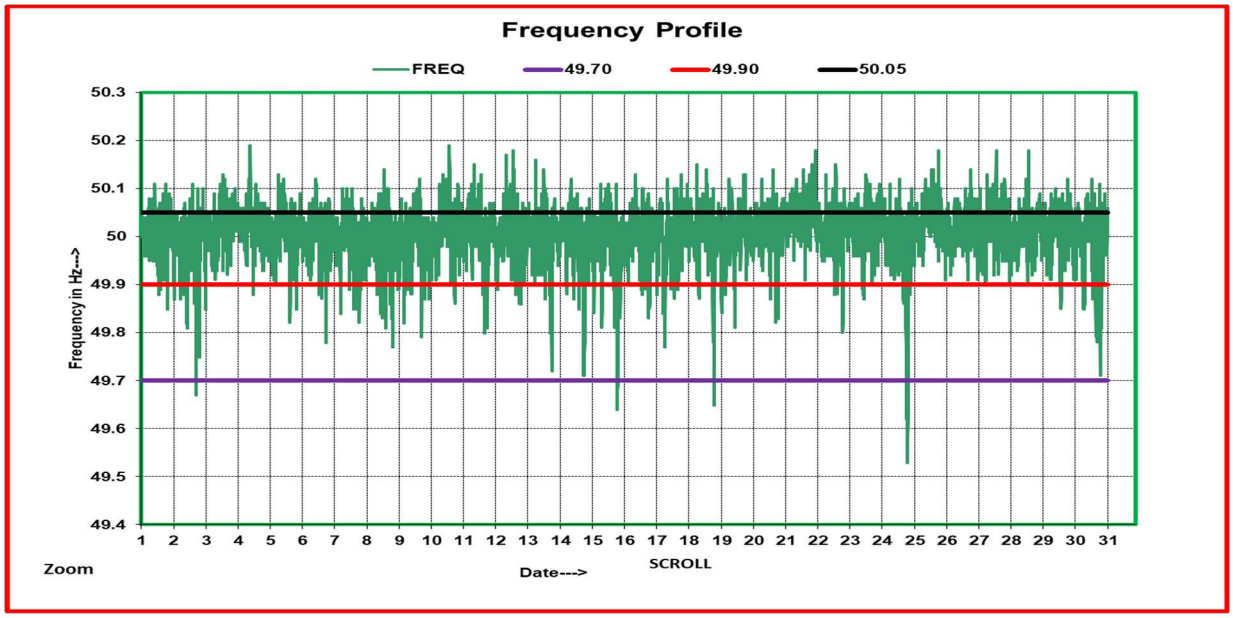
With hydro generation starting to decline, there is need for maximising other generation available in Northern Region.




In past years, during this high demand period some thermal stations had reduced their DC due to coal shortage/ wet coal issues. During this high demand period also some of the units in state control area remain off bar, as a result, import from other regions increases and there is possibility of violation in Inter-regional exchange and WR-NR corridor exchange (ATC violation) at times. **With the forced outage of 765kV Gwalior-Agra Ckt1 due to tower collapse, the inter-regional import capability limits have also been reduced slightly**. **POWERGRID representative informed that the line is expected to be revived by 30 Sep 2022.**




As can be seen from the plot below, that during last September, frequency profile was also poor. On number of occasions, the grid operated with low frequency. Appropriate measures as mentioned in previous agenda may be taken so that such situation is avoided this year.




September month every year being high demand period with more reliance on thermal generation, due importance needs to be given to the fuel availability during this period and a minimum number of days coal stock shall be ensured and DC shall be given accordingly ensuring adequate number of state generating units on bar.

***Members agreed to take actions in this regard.***

## 18. Issues related to Power System Operation of J&K/Ladakh

Major issues related to Power system operation in J&K and Ladakh were discussed in detail in 47th TCC and 49th NRPC meetings and special meeting held on 28.07.2020 to deliberate on the issues related to UT of J&K and Ladakh. These issues were also discussed in 57th NRPC meeting and 198 OCC meeting recently:

NRLDC representative stated that following issues still persist in J&K and Ladakh control areas:

i. Most of the 220 kV voltage level Substations of PDD-J&K, are being operated with only one Main and transfer bus scheme instead of double main transfer (DMT) bus as per CEA planning criteria and therefore bus shutdown requires shutdown of entire station which affects reliability of power supply.

On 29.05.2022, complete shutdown of 220/132kV Hiranagar substation was taken by JKPTCL as there is only single bus and transfer scheme. This led to loss of generation at Sewa-II and load loss in Kathua area which could have been avoided if there were double main and transfer scheme available at 220/132kV Hiranagar substation. Same was also communicated vide NRLDC letter dated 28.06.2022. Moreover, there have also been number of other such events previously. It was also observed that when island was created to allow some generation evacuation, the island didn't survive. Telemetry is not available from most of the substations at NRLDC which is making decision making (including for island survival) difficult. Moreover, all efforts need to be made from NHPC and J&K in future to make island survive.

In 198 OCC meeting, CE, JKPTCL Kashmir informed that in Kashmir area around 90% of substations have double main transfer scheme layout in substations.

CE, JKPTCL Jammu informed in the meeting as well as vide email dated 18.08.2022 (Annexure-B.II of agenda) that all of the 220/132 kV voltage level Sub Stations of PDD-JK are being operated with only one Main and Transfer bus scheme instead of double main transfer (DMT) bus as per CEA planning criteria. Also due to constraints of load shifting and space, the Bus arrangement of these GSS's at present cannot be changed. However, 02 No.s 220/66KV GSS recently Commissioned at Ghatti (Kathua) and IGC Samba and under Construction GSS's coming up at Nagrota (220/33 kV Level) and Chowadhi {220/132 KV Level) have double main and transfer scheme.

***J&K was asked to explore the possibility of providing double main scheme at single main and transfer substations where it is possible to enhance reliability. Current rating of transfer bus also to be checked for double main operation. J&K representative agreed to check for the same.***

ii. As per the agreed quantum relief for NR, total target in respect of J&K for UFR and df/dt are 336 MW and 270 MW respectively. Confirmation on relief quantum is yet to be received from J&K. Moreover, in compliance of NPC decision, NR states/constituents agreed to raise the AUFR settings by 0.2 Hz in 47th TCC/49th NRPC meetings. Status is still pending from J&K end. ***J&K representative agreed to update the status, however it was informed that possibly no ufr and df/dt relay settings are enabled.***

iii. Two stages (450 MW each) of Baglihar HEP (900 MW) operate on two different buses and are being evacuated through two 400 kV lines on each side connected to two different buses operating in disconnected manner. UT-J&K to expedite the coupling of two buses of Baghlihar stage-1 & 2 to minimize the probability of generation loss.

***It was discussed that the matter may be taken up with generation wing by JKPTCL and update to be provided to NRLDC/ NRPC.***

iv. Availability of automatic DR (disturbance recorder) and station event logger needs to be ensured for all the 220 kV and above stations. DR/EL and preliminary report needs to be submitted within the stipulated timelines as per IEGC. Same is also being requested regularly in OCC/ PSC meetings.

***v.*** In order to make connectivity more reliable and for secure power supply to the valley, restoration of 220kV Kishenpur-Mirbazar and commissioning of underlying network at 400/220kV New Wanpoh to be expedited. ***J&K informed that 220kV Kishenpur-Mirbazar line is likely to be revived by end of Dec'2022.***

***vi.*** Mock black start exercise of URI-I & URI-II HEP, Lower Jhelum HEP is yet to be conducted. ***In 198 OCC meeting, JKPTCL representative agreed that the issue is well known and important and the same would be taken up with SLDC. No new update was received.***

vii. Planned and under implementation reactive compensation i.e. reactor & capacitors details to be shared.

viii. Data for monthly PoC case to calculate transmission losses and charges to be shared with NRLDC/NLDC.

***In 198 OCC meeting, representative from JKPTCL agreed to provide update on these issues in the upcoming 57$^{th}$ NRPC meeting in last week of August 2022, however no information was received in 57$^{th}$ NRPC meeting. No major update was received in 199$^{th}$ OCC meeting also.***

**19. TTC/ATC of state control areas for winter 2022**

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

Based on feedbacks received till date, SLDCs were requested to go through the tentative ATC/TTC limits for October 2022 as per joint studies by NRLDC/ SLDC (**Annexure-B.III of agenda**) and provide comments. If no comments are received, these limits will be assumed confirmed and uploaded on NLDC website. SLDCs were also requested to upload these limits in their respective websites. States were also requested to regularly provide update regarding the upcoming transmission elements which would improve import capability of respective state control area.

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

Following was discussed in 199 OCC meeting:

**Punjab**

During last 30 days, loading was close to N-1 contingency limits of 400/220kV ICTs at Patiala, Ludhiana, Nakodar, Moga and Patran when import of Punjab was close to their ATC limits.

**UP**

During last 30 days, loading was above N-1 contingency limits of 400/220kV ICTs at Gorakhpur(UP), Azamgarh, Sarnath, Allahabad(PG), Lucknow(PG), and Sohawal(PG) when import of UP was close to their ATC limits. UPPTCL was asked to expedite implementation of SPS at 400/220kV Sohawal and Obra ICTs.

**Rajasthan**

During last 30 days, loading was above N-1 contingency limits of 400/220kV ICTs at Ajmer(RJ), Jodhpur(RJ), Merta(RJ) and Bikaner(RJ) when import of Rajasthan was close to their ATC limits. Details shared by Rajasthan SLDC regarding approval of 400/220kV ICTs is attached as Annexure-B.II.

Rajasthan SLDC was requested to share revised ATC/TTC limits of Rajasthan state control area for winter 2022-23. NRLDC had shared few observations on the ATC/TTC limits assessed by Rajasthan state control area.

Revised SPS for 400/220kV Bhadla and Bikaner ICTs would be shared shortly.

**Delhi**

During last 30 days, loading was close to N-1 contingency limits of 400/220kV ICTs at Mundka and Bawana (2 ICTs) when import of Delhi was close to their ATC limits.

**Haryana**

In 198 OCC meeting, no update was received from SLDC Haryana.

In 199 OCC meeting, Haryana SLDC representative informed that some load of Deepalpur was shifted to Panipat due to issue at underlying network.

NRLDC asked Haryana to resolve the issues of high loading (severe N-1 violations) at 400/220kV Deepalpur and Panipat(BBMB) ICTs at the earliest.

**Uttarakhand**
During last 30 days, loading was above N-1 contingency limits of 400/220kV ICTs at Kashipur when import of Uttarakhand was close to their ATC limits.

Uttarakhand SLDC representative was asked to visit NRLDC/ convene online meeting to finalise SPS for 400/220kV Kashipur and 220kV CBGanj-Pantnagar line as there were some issues regarding SPS scheme which needed to be discussed.

**HP** have shared their ATC/TTC assessment for monsoon 2022. Loading was observed beyond N-1 compliant limit for 400/220kV Nallagarh ICTs. High loading of 220kV Nallagarh-Upernangal D/C was also observed. Same has also been shared with CTU/CEA in quarterly operational feedback

**J&K**
Not assessing its ATC. J&K representatives had intimated during 47$^{th}$ TCC and 49$^{th}$ NRPC meeting that they would be sharing ATC/TTC assessment with NRLDC from October 2021, however the same is still awaited. J&K and Ladakh U/Ts 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.
It was again requested that SLDCs may ensure that loading of ICTs and lines are below their N-1 contingency limits. While requisitioning power from various sources, states should take care to limit their scheduled drawl as well as actual drawl in real time within the Available Transfer Capability (ATC) limits assessed by SLDC and NRLDC. NRLDC is continuously sending emails in real-time for ensuring N-1 compliances as well as restricting schedule till ATC limit and maximizing internal generation. SLDCs need to ensure this during real-time operation.

***Members agreed to take actions in this regard.***

## 20. Grid operation related issues

### (i) RE related issues in Northern region

In 198 OCC meeting, it was discussed that along with developers the matter also needs to be taken up with plant manufacturers and OEM as even after pursuing the matter with solar generators no/ improper response is received. LVRT/HVRT compliance test at Point of Interconnection is not being done during pre-commissioning field tests and same is only being checked based on real-time events where most of the plants are observed to be LVRT/ HVRT non-compliant.

***Discussions for three days with participation from RE developers/Inverter OEM and Power Park controller team were organized at NRLDC from 06-08 Sep 2022. Number of RE developers and OEM attended the discussions as per details shown below:***

| Solar plant developers |
|---|
| ReNew Power |
| Eden Renewables Cite Pvt Ltd. |
| Clean Solar Power Jodhpur Pvt. Ltd. (CSP(J)PL) (Hero Solar). |
| Adani Green Energy Ltd. (AGEL). |
| Mahindra Solar |
| ACME Solar |
| Tata Power |
| Azure Power |
| NTPC Renewable |
| ABC Renewable |
| Ayana Power |
| Thar Surya Pvt. Ltd. did not attend the meeting citing reason of flood at Banglore |

| OEM |
|---|
| Sungrow |
| Huawei |
| TBEA |
| CLP India |
| Adaptive (PPC OEM) |
| SINENG |
| KEHUA |
| ARMAX (PPC) |
| Emerson (PPC) |
| SEIMENs |
| ABB |
| TMEIC |

Following points were noted which require improvement at almost all the plants:

1. RE plant developer do not have the access rights to download the implemented settings in inverters, this activity is carried out by inverter OEM. In some cases, facility to view the settings has been provided to RE plant developers. It was also informed by few developers that inverter OEM have the facility to remotely download/access the settings. Few RE plants informed that inverters are providing onsite service during the warranty period wherein one person on behalf of inverter OEM is providing services in radius of 50 km.

2. The event logger of inverters at all the plants have a minimum resolution of one minute to capture the events. In some inverters LVRT/HVRT has been defined as event

for logger purposes. The event logger shared by inverter OEM had a time drift ranging from few to several minutes.

3. There is no facility for RE developers to record the analog value of current/Voltage or any other parameters in millisecond resolution. Neither plants nor inverter manufacturers could share any relevant data for the event. This way PMU reporting at NRLDC/NLDC become the only source to validate the performance.

4. There appeared a lack of understanding for CEA regulations by RE developers. The teams from RE developers were totally dependent on inverter OEM for compliance of regulations.

5. Inverter OEM have implemented the LVRT/HVRT settings or nearby values on the basis of voltage at inverter terminals, since there is small difference between voltage at POI and inverter terminal, the adopted settings caused unwanted operation of HVRT trigger even when voltage at POI was below threshold (1.1 PU).

6. The performance of inverter controls and PPC depend upon handshake of signals. In most cases it was seen that there is non-adequate coordination between PPC OEM and inverter OEM.

7. There were some inadvertent wrong settings like overvoltage at 220/33 kV level/ anti-islanding protection/ PPC in constant reactive power mode etc. which were rectified by RE developers before coming for meeting.

The suggestions which were broadly shared with RE developers:

1. Establishing high resolution event logger for inverters where events can be captured with millisecond accuracy.

2. Configuring low/high voltage (<0.9 PU and >1.1 PU) as DR trigger in relays at 33 kV and lower level in collector system wherever possible. This would help in observing waveform at lower levels. PMU placement within RE plant was also suggested.

3. RE developers to study the difference in voltage between inverter terminal and POI and provide sufficient margin in the settings of inverters to display the behavior required at POI.

4. LVRT/HVRT to be added as an event in event logger of inverter, sufficient storage for handling logs to be explored by inverters.

5. RE developers shall take up with inverter OEM to download/modify settings as and when required.

6. PPC OEM were informed to enhance the resolution of set-point change and improve it to 100 msec or lower.

7. PPC OEM were informed to explore the possibility to improve the coordination of PPC set-point with inverter when inverter either enters or leave LVRT/HVRT mode of operation.

Solar developers agreed to take actions agreed in the three-day discussion.

***NRLDC representative once again presented sample plots of some solar developers for which LVRT/HVRT clause non-compliance were observed in recent tripping event.***

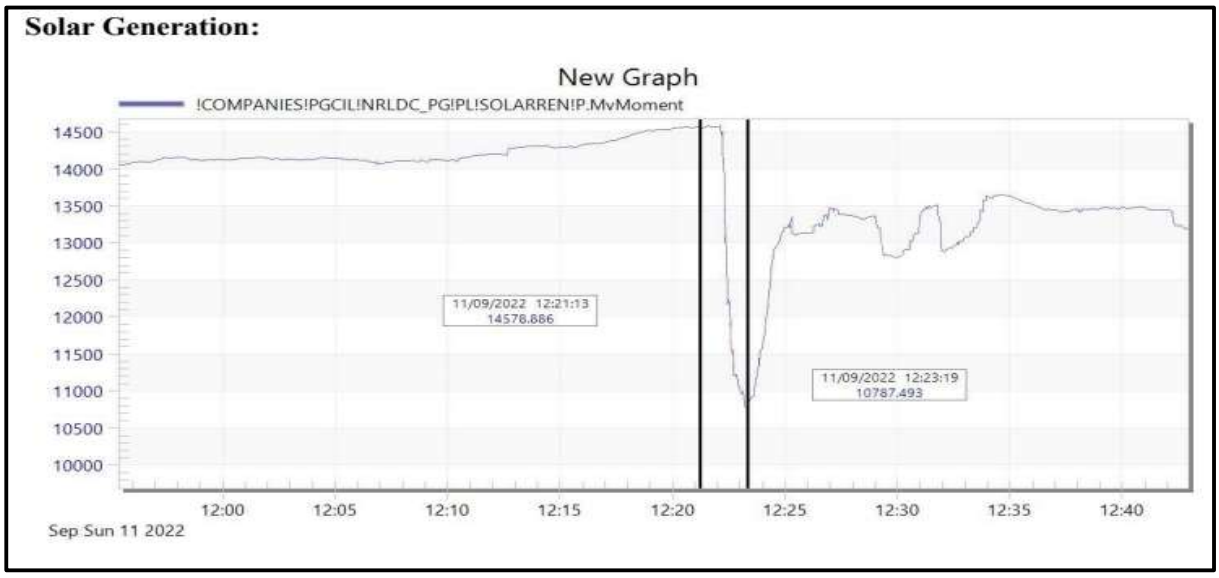
***OCC noted the same and agreed that the matter needs to be taken up on priority by all RE developers as such LVRT/ HVRT non-compliance always pose serious challenge to safe and secure operation of grid. It was also discussed that protection audits may also be carried out by team formation at NRPC level to check anomalies at different solar developer end.***

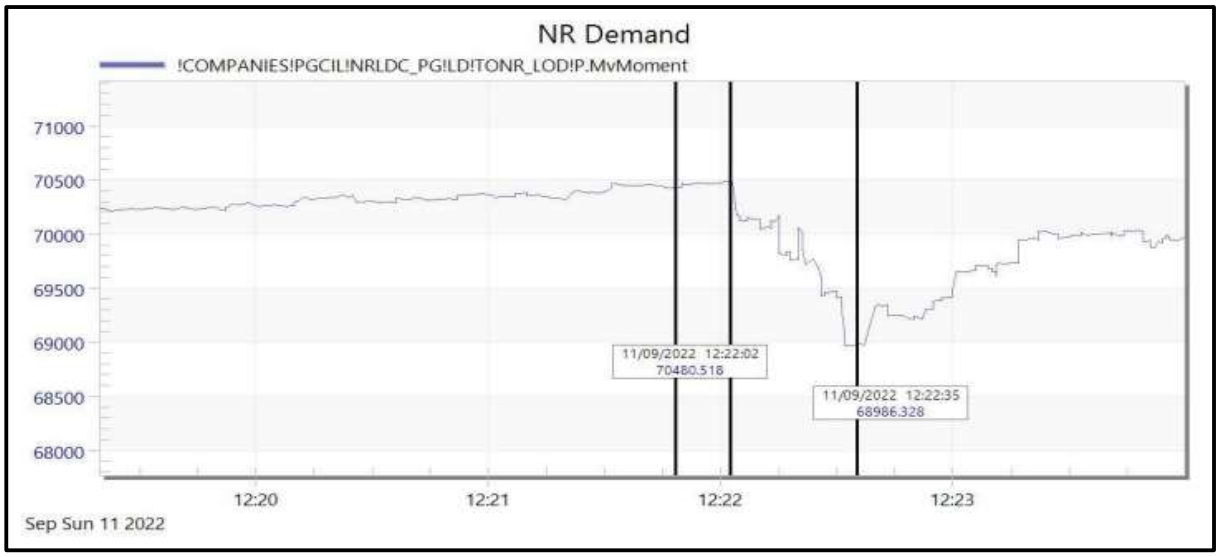
**(ii) Generation loss event in ISTS RE complex**

Similar to previous many events, another generation loss event was observed in ISTS RE complex on 11.09.2022. In this event, at 12:22 hrs 220kV Bhadla –CSP Jodhpur tripped due to Y-B fault resulting in approximate 3500 MW of solar generation reduction connected to 765 kV Fatehg'h-2, 765 kV Bhadla & 765 kV Bhadla_2 reduced due to Low Bus Voltage during fault and high voltage after fault clearance as reported by Solar Stations. This reduction in generation caused tripping of four number of 765kV lines emanating from solar complex namely,

- 765 KV FATEHGARH_II(PG)-BHADLA(PG) (FBTL) CKT-1,
- 765 KV BIKANER-BHADLA_2 (PG) CKT-1
- 765 KV BHADLA_2 (PG)-FATEHGARH_II(PG) (PFTL) CKT-2
- 765 KV AJMER-BHADLA_2 (PG) CKT-1

Frequency had fallen to 49.61 Hz from a level of 50.04 Hz narrowly missing the first stage of UFR shedding. If the frequency had been slightly on the lower side i.e. below 50 Hz there would have been a major event including UFR load shedding.




NRLDC organized separate meeting with CSP Bhadla and the plant was asked to carry out thorough maintenance activity in the line so as to minimise tripping of this line on fault in future.

Following points need further analysis and discussion:

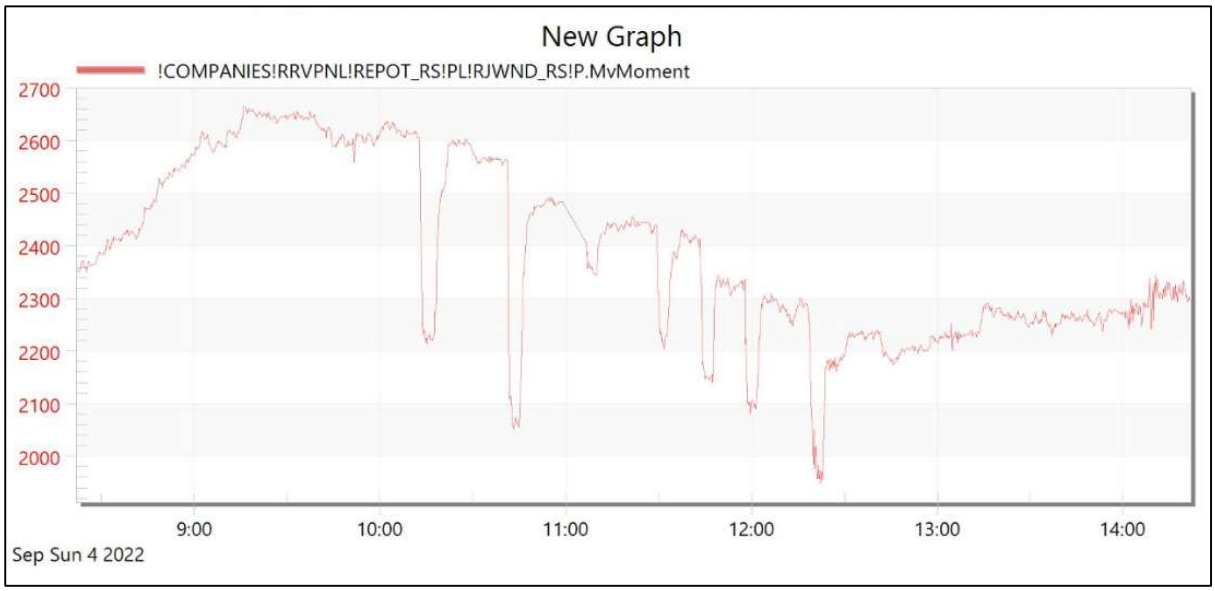
- Behaviour of MW & MVAR of different solar developers as per LVRT operation (as per CEA standard for connectivity).
- Operation of PPC during LVRT operation needs to be reviewed.
- DR, EL & tripping report needs to be shared by all RE stations.
- Load shedding quantum in each state control area to be reported to NRLDC

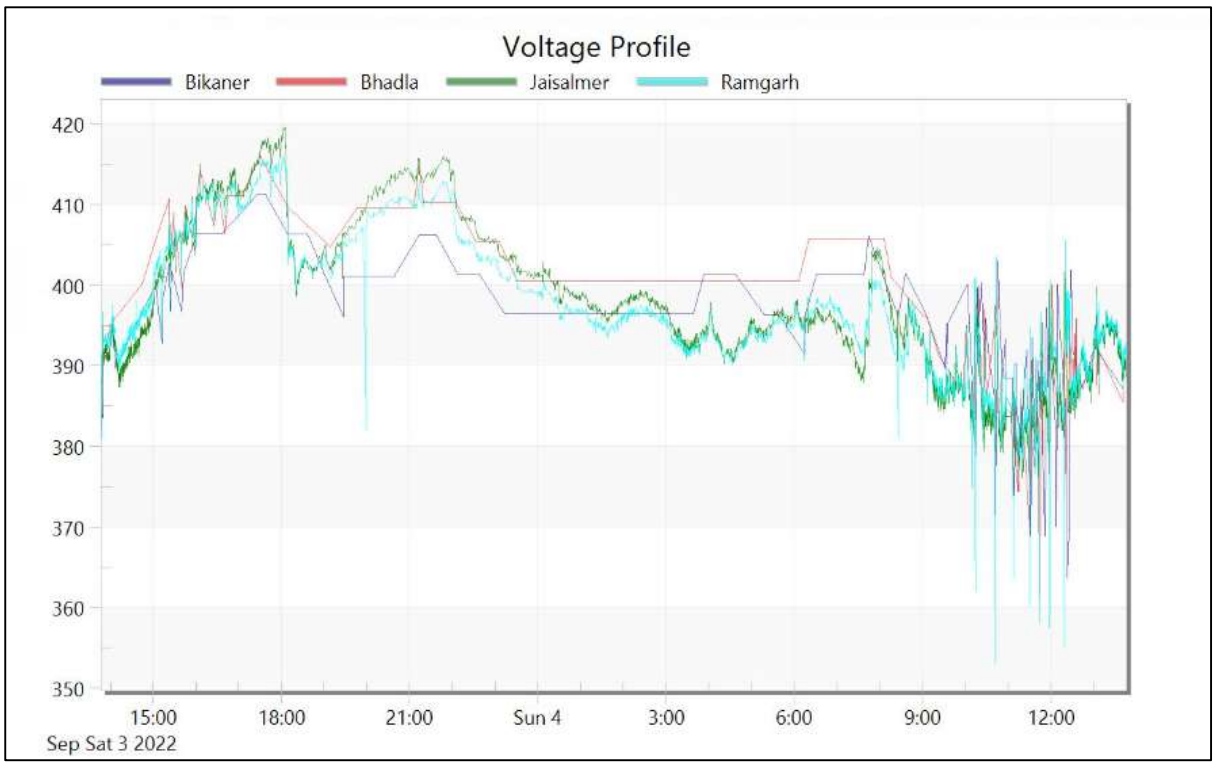
***All present members agreed to share the requested data along with their findings. POWERGRID was also requested to make sure that over voltage***

***settings including drop-off ratio of all evacuating lines from ISTS Solar RE complex are reviewed in coordination with NRLDC/ NLDC.***

**(iii) Wind generation fluctuation in Rajasthan control area**

NRLDC representative stated that various dips were observed in Rajasthan wind generation between 10:10 hrs to 12:30 hrs in the tune of 200 MW to 500MW on 4th September 2022. During this time huge variations in voltage were also observed in RE pooling substations of Rajasthan state control area such as Jaisalmer, Ramgarh, Bikaner and Bhadla.



Rajasthan SLDC was asked to provide reason for dip in Rajasthan wind generation along with detailed analysis of the event.

Rajasthan SLDC representative stated that wind generators are keeping setting that when voltages are beyond the IEGC band of 198-242kV, wind generators are manually disconnected from the grid and only when grid voltage is within the range they can synchronise with the grid.

***Rajasthan SLDC was asked to gather wind speed, voltage profile, MVAR drawl and action taken from RE developers and RE pooling stations. Cut-in & cut-out speed for wind turbines may also be gathered along with actual wind speed data. It was also requested that wind generators may be asked to provide reasons for manually tripping wind turbines as soon as voltages fall below 0.9 p.u. what issue would be there if machine is made to operate at slightly lower voltage say 0.88 p.u. Rajasthan SLDC agreed to provide update on the above issues.***

**(iv) Long outage of transmission elements/ generating units**

***All utilities are 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.***

***Latest available status is attached as* Annexure-B.III*.***

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

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

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

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

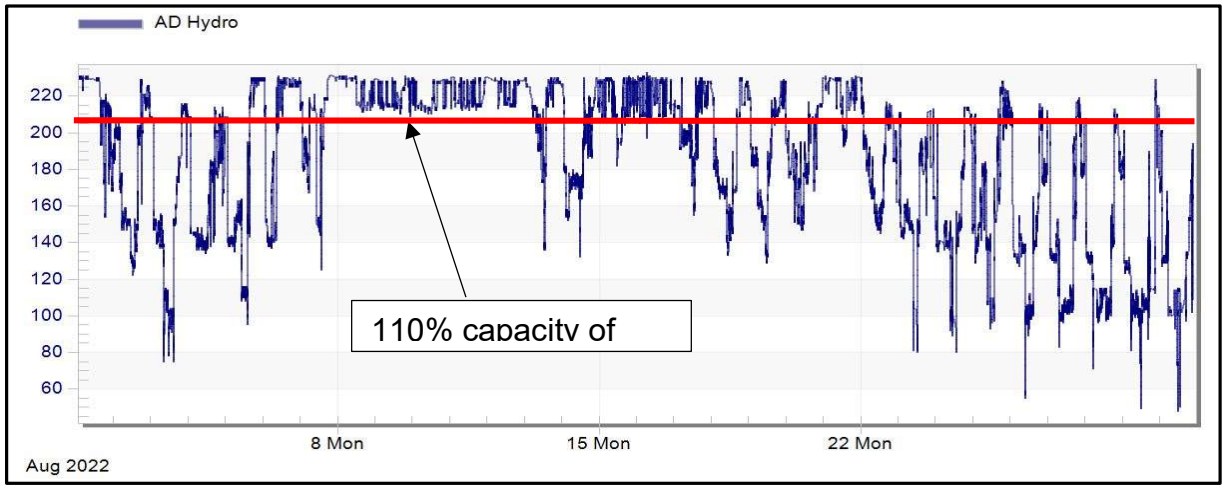
(v) **Maximising hydro generation during peak hydro season**

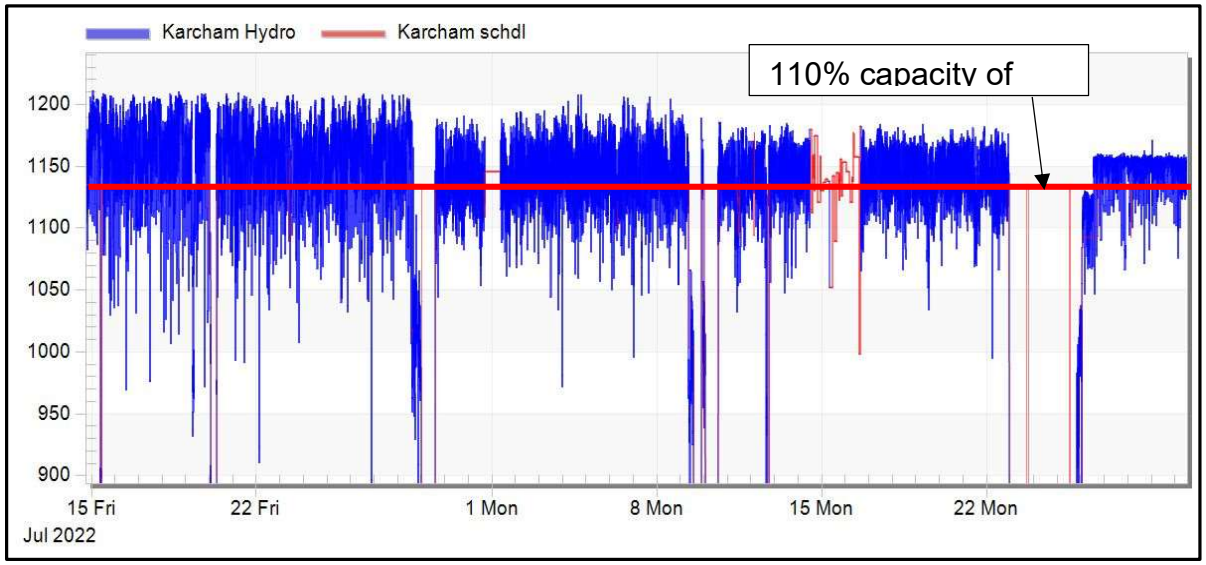
Jun-Sep months are generally associated with high hydro generation period and high demand season in Northern region. During this high demand season, it is always desired

that the available generation resources are maximised However, it is being observed that some of the generators such as Bairasuil, Chamera-1, Chamera-2, Chamera-3, Dhauliganga, Dulhasti, Kishenganga, Parbati-3, Salal, Sewa-II, Uri and Uri-II have been generating less than 110%.

NRLDC communication in this regard is attached as Annexure-B.VI of agenda.

It is also being observed that some of the hydro generators such as Karcham Wangtoo HEP, AD Hydro are generating beyond 110% their capacity.




**ADHydro representative stated that generally the actual generation is being restricted upto maximum schedule provided and when frequency is lower there is over injection. Manufacturer has certified that plant can also operate safely upto 120% and requested forum to allow higher generation.**

**NRLDC representative stated that as is clear from the data, ADhydro and Karcham both are over injecting most of the time irrespective of grid frequency. It was mentioned that till the time, plant capacity is upgraded by CEA, over injection is not desirable. Moreover, there is no mandate available with NRLDC to schedule higher than 110% therefore such hydro plants need to restrict their generation upto 110% of capacity.**

**NHPC representative informed that some of the hydro stations such as Bairasuil, Chamera-1, Chamera-2 and Dhauliganga are not designed for continuous 110% operation. Dulhasti and Kishenganga are operating at 103-104%. SOP is followed during monsoon that dam level is kept at MDDL level which is also restricting continuous 110% operation.**

**(vi) Calculation of Drawal points based on SLDC end data**

In 197 OCC meeting, Haryana SLDC representative informed that SCADA team is working on the issue and trying to determine additional RTUs required for the work. Haryana SLDC was asked to share the details so that same can be incorporated in OCC minutes. However, reply was not received.

Uttarakhand SLDC representative informed that data calculation was already done from SLDC end data and there is difference between the values from NRLDC end and Uttarakhand SLDC end drawl data; few data points are suspected. There are shortages of Multi-Functional Meters, and issues of faulty PLCC links. It was informed by SCADA wing of PTCUL that SCADA had initiated tenders of procurement of MFM and for re-locations of Digital PLCC Panels and expected to be completed by Aug'2022.

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

Haryana representative stated that the issue is arising due to non-availability of redundant points at BBMB stations, the matter is still pending. For these stations 22 points from BBMB s/s are available, if redundant data is required, nearly 70 downstream points need to be added in the list which may take more time for implementation as DISCOM is also involved.

OCC advised Haryana that meanwhile available data from BBMB stations may be used till integration of other end 70 downstream points is completed. It was also discussed that Haryana may mail detailed issues observed with NRLDC SCADA team for further resolution of issue.

Uttarakhand SLDC representative informed that tender is to be awarded within next two weeks.

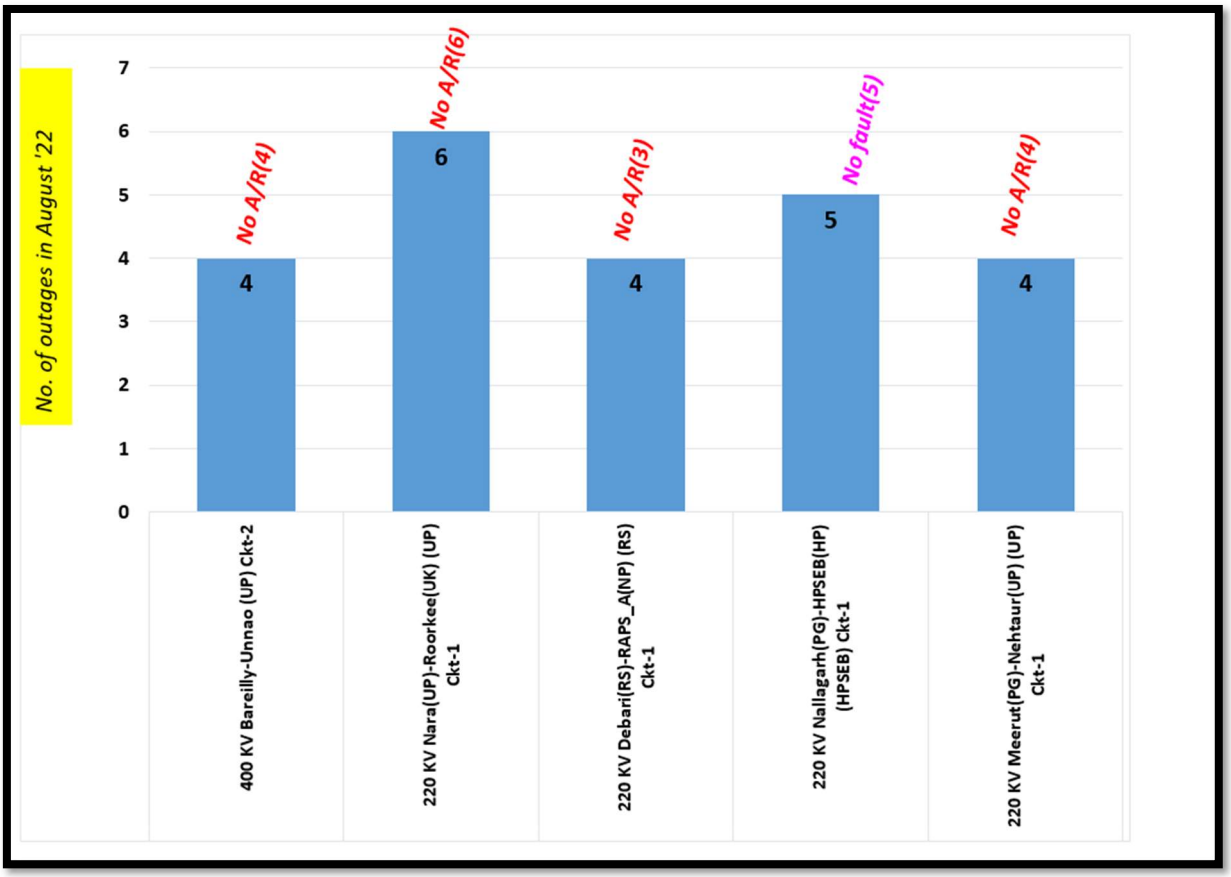
Haryana and Uttarakhand SLDCs were requested to provide update on the agenda point.

***Haryana SLDC representative agreed to provide update on the agenda through email.***

## 21. Frequent forced outages of transmission elements in the month of August'22:

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

| S. NO. | Element Name | No. of forced outages | Utility/SLDC |
|---|---|---|---|
| 1 | 400 KV Bareilly-Unnao (UP) Ckt-2 | 4 | UP |
| 2 | 220 KV Nara(UP)-Roorkee(UK) (UP) Ckt-1 | 6 | UP/UK |
| 3 | 220 KV Debari(RS)-RAPS_A(NP) (RS) Ckt-1 | 4 | Raj/RAPS-A |
| 4 | 220 KV Nallagarh(PG)-HPSEB(HP) (HPSEB) Ckt-1 | 5 | HP/POWERGRID |
| 5 | 220 KV Meerut(PG)-Nehtaur(UP) (UP) Ckt-1 | 4 | UP/POWERGRID |




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

**Discussion during the meeting:**

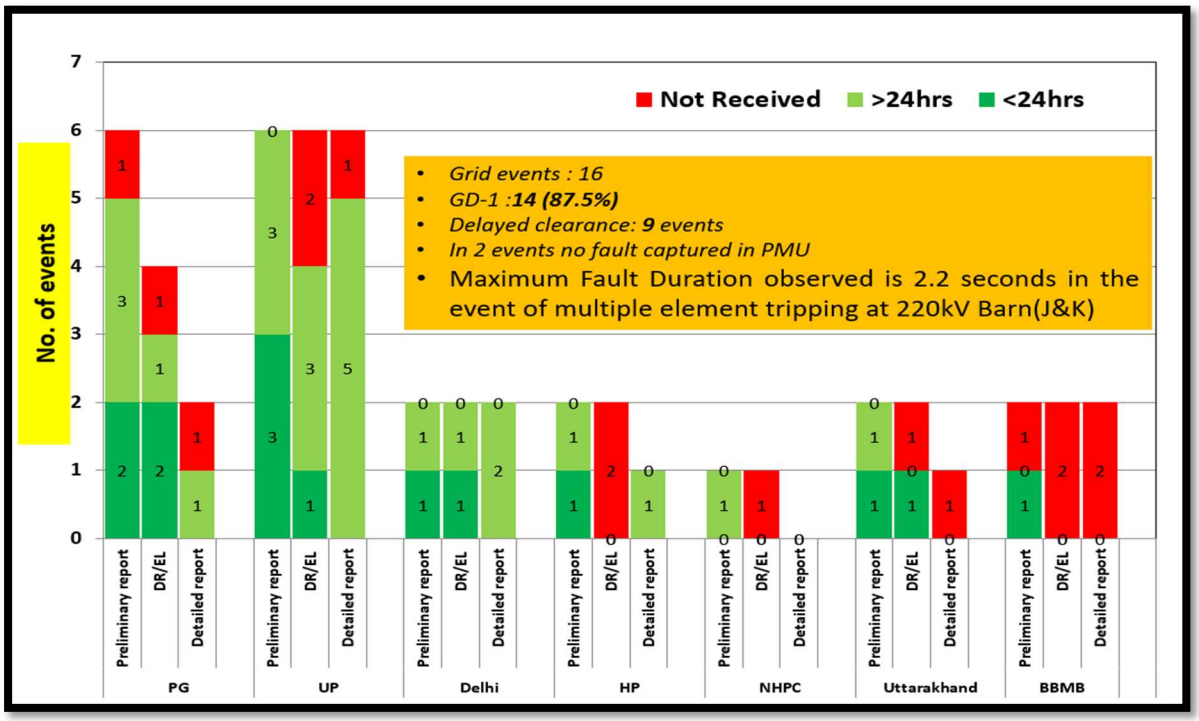
- **400 kV Brailey-Unnao (UP) Ckt-2-**: *UPPTCL representative stated that their protection team could not find any problem regarding failure of A/R (signal is being generated).Their conclusion was that problem is with circuit breaker.*
- **220 kV Nara (UP)-Roorkee(UK) (UP) Ckt-1:** *UPPTCL representative informed that Nara end has observed some problem and relay is under observation, problem is being communicated with relay engineer.*
- **220 kV Meerut (PG)-Nehtaur (UP) (UP) Ckt-1:** *UPPTCL representative stated that in first two cases A/R was observed, A/R signal was generated at Nehtaur end in other cases.*
- **220 kV RAPPs_A(NP)-Debari (RS) (RS) Ckt-1:** *Rajasthan representative stated that A/R is disabled at RAPPs_A end .*

- **220 kV Nallagarh (PG)-HPSEB (HP) (HPEB) Ckt-1:** HP representative stated that PNC switch was malfunctioning and PNC switch was replaced on 06-09-2022.

***NRLDC representative emphasized that A/R (auto recloser) 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 Standards. 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 thus and reducing the reliability of the grid. All the utilities shall endeavour to keep auto recloser 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 were 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 August'22:




A total of 16 grid events occurred in the month of August '22 of which **14** are of GD-1 category. The preliminary report of all the events have been issued from NRLDC. A list of all these events is attached at **Annexure-B.IX.**

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

Maximum Fault Duration observed is 2.2 seconds in the event of multiple element tripping at 220kV Barn(J&K). As reported at 05:49hrs, main bus isolator to reserve bus isolator dropper of 132 side of 220/132kV 160 MVA ICT-3 at Barn(JK) damaged. Delayed clearance of fault (more than 100ms for 400kV and 160ms for 220kV system) observed in total **9** events out of **16** grid events occurred in the month. In 2 number of events, fault signature couldn't be captured from PMU data.

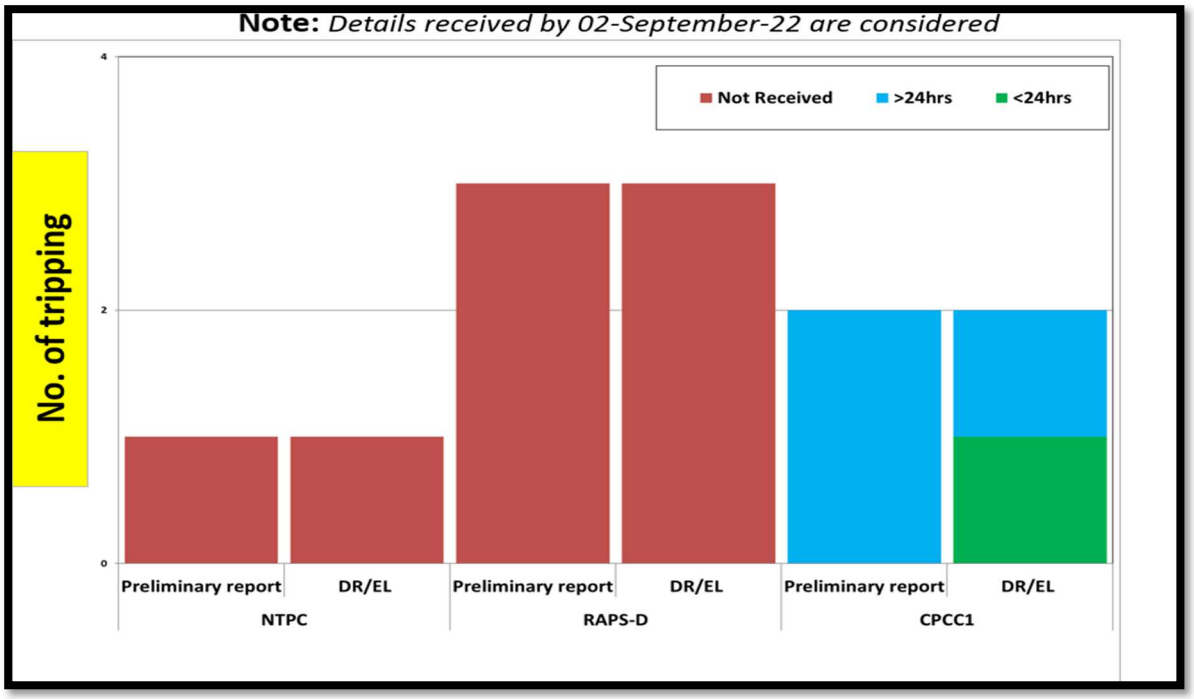
Members may take necessary preventive measures to avoid such grid incidents / disturbances in future and report actions taken by respective utilities in OCC & PSC forum. Moreover, utilities may impress upon all concerned for providing the Preliminary Report, DR/EL & Detailed Report of the events to RLDC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

***NRLDC representative raised concern about poor status of report updation by POWERGRID, MAHINDRA, BBMB, Rajasthan& J&K 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, Moreover, utilities may impress upon all concerned for providing the Preliminary Report, DR/EL & Detailed Report of the events 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 August'22:**




A total of 4 inter-regional lines tripping occurred in the month of August'22. The list is attached at **Annexure-X.** The status of receipt of preliminary reports, DR/EL within 24hrs of the event and fault clearing time as per PMU data has also been mentioned in the table. The non-receipt of DR/EL & preliminary report within 24hrs of the event from SLDCs / ISTS licensees / ISGSs is in violation of regulation 5.2(r) of IEGC and regulation 15(3) of CEA Grid Standards. As per regulations, all the utilities shall furnish the DR/EL, flag details & preliminary report to RLDC/RPC within 24hrs of the event. They shall also furnish the detailed investigation report within 7 days of the event if fault clearance time is higher than thatmandated by CEA (Grid Standard) Regulations.

***NRLDC representative raised concern about poor status of report updation by POWERGRID RAPS-D and NTPC 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.***

***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 August'22.

NRLDC representative informed the current status (as on 05thSeptember 2022) of DR/EL and tripping report of utilities for the month of August 2022. Consolidated information is tabulated below:

| S. No. | Utility | Total No. of elements tripped | First Information Report (Not Received) | | Disturbance Recorder (Not Received) | Disturbance Recorder (NA) as informed by utility | Disturbance Recorder (Not Received) | Event Logger (Not Received) | Event Logger (NA) as informed by utility | Event Logger (Not Received) | Tripping Report (Not Received) | Tripping Report (NA) as informed by utility | Tripping Report (Not Received) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Value | % | Value | | % | Value | | % | Value | | % | |
| 1 | ABC RENEWABLE_RJ01 | 1 | 1 | 100 | 1 | 0 | 100 | 1 | 0 | 100 | 1 | 0 | 100 | DR/EL & Tripping report needs to be submitted |
| 2 | ADANI | 2 | 2 | 100 | 2 | 0 | 100 | 2 | 0 | 100 | 2 | 0 | 100 | |
| 3 | AHEJ2L | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 4 | AHEJ3L | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 5 | AHEJOL | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 100 | DR/EL & Tripping report needs to be submitted |
| 6 | ANTA-NT | 5 | 2 | 40 | 3 | 0 | 60 | 3 | 0 | 60 | 2 | 0 | 40 | |
| 7 | APFOL | 2 | 2 | 100 | 2 | 0 | 100 | 2 | 0 | 100 | 2 | 0 | 100 | |
| 8 | AURAIYA-NT | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 9 | BBMB | 40 | 14 | 35 | 17 | 13 | 63 | 16 | 17 | 70 | 17 | 8 | 53 | DR/EL & Tripping report needs to be submitted |
| 10 | BUDHIL | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 11 | CHAMERA-III-NH | 1 | 1 | 100 | 1 | 0 | 100 | 1 | 0 | 100 | 1 | 0 | 100 | DR/EL & Tripping report needs to be submitted |
| 12 | CLEANSOLAR_JODHPUR | 3 | 2 | 67 | 3 | 0 | 100 | 3 | 0 | 100 | 2 | 0 | 67 | |
| 13 | CPCC1 | 93 | 51 | 55 | 50 | 4 | 56 | 51 | 3 | 57 | 57 | 2 | 63 | |
| 14 | CPCC2 | 37 | 0 | 0 | 0 | 13 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | |
| 15 | CPCC3 | 34 | 2 | 6 | 2 | 5 | 7 | 2 | 5 | 7 | 2 | 0 | 6 | DR/EL & Tripping report needs to be submitted |
| 16 | DADRI-NT | 1 | 1 | 100 | 1 | 0 | 100 | 1 | 0 | 100 | 1 | 0 | 100 | |
| 17 | EDEN (ERCPL) | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 100 | |
| 18 | FARIDABAD-NT | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 19 | FBTL | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 20 | JHAJJAR | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 21 | KOLDAM-NT | 1 | 1 | 100 | 1 | 0 | 100 | 1 | 0 | 100 | 1 | 0 | 100 | DR/EL & Tripping report needs to be submitted |
| 22 | Mega_SuryaUrja | 1 | 1 | 100 | 1 | 0 | 100 | 1 | 0 | 100 | 1 | 0 | 100 | |
| 23 | NAPP | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 24 | RAPPA | 7 | 2 | 29 | 7 | 0 | 100 | 7 | 0 | 100 | 7 | 0 | 100 | DR/EL & Tripping report needs to be submitted |
| 25 | RAPPB | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 26 | RAPPC | 5 | 3 | 60 | 4 | 0 | 80 | 4 | 0 | 80 | 3 | 1 | 75 | DR/EL & Tripping report needs to be submitted |
| 27 | RENEW SOLARURJA (RSUPL) | 1 | 1 | 100 | 1 | 0 | 100 | 1 | 0 | 100 | 1 | 0 | 100 | |
| 28 | RENEW SUN WAVES(RSWPL) | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 29 | RIHAND-NT | 1 | 1 | 100 | 1 | 0 | 100 | 1 | 0 | 100 | 1 | 0 | 100 | DR/EL & Tripping report needs to be submitted |
| 30 | RSEJ3PL | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 31 | SALAL-NH | 1 | 1 | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 100 | DR/EL & Tripping report needs to be submitted |
| 32 | SEWA-2-NH | 3 | 0 | 0 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | |
| 33 | SINGOLI | 9 | 9 | 100 | 9 | 0 | 100 | 8 | 1 | 100 | 9 | 0 | 100 | DR/EL & Tripping report needs to be submitted |
| 34 | SINGRAULI-NT | 2 | 0 | 0 | 1 | 0 | 50 | 1 | 0 | 50 | 1 | 0 | 50 | |
| 35 | SLDC-CHD | 4 | 4 | 100 | 4 | 0 | 100 | 4 | 0 | 100 | 4 | 0 | 100 | |
| 36 | SLDC-DV | 30 | 0 | 0 | 6 | 2 | 21 | 6 | 2 | 21 | 6 | 0 | 20 | |
| 37 | SLDC-HP | 8 | 0 | 0 | 0 | 6 | 0 | 0 | 6 | 0 | 0 | 1 | 0 | |
| 38 | SLDC-HR | 14 | 1 | 7 | 1 | 0 | 7 | 1 | 0 | 7 | 1 | 0 | 7 | DR/EL & Tripping report needs to be submitted |
| 39 | SLDC-JK | 12 | 0 | 0 | 12 | 0 | 100 | 12 | 0 | 100 | 12 | 0 | 100 | |
| 40 | SLDC-PS | 17 | 6 | 35 | 11 | 4 | 85 | 11 | 4 | 85 | 16 | 1 | 100 | |
| 41 | SLDC-RS | 58 | 3 | 5 | 13 | 0 | 22 | 13 | 0 | 22 | 16 | 0 | 28 | |
| 42 | SLDC-UK | 22 | 0 | 0 | 0 | 11 | 0 | 0 | 12 | 0 | 1 | 0 | 5 | |
| 43 | SLDC-UP | 124 | 16 | 13 | 16 | 14 | 15 | 24 | 24 | 24 | 22 | 1 | 18 | |
| 44 | STERLITE | 4 | 1 | 25 | 1 | 0 | 25 | 1 | 0 | 25 | 1 | 2 | 50 | |
| 45 | TANAKPUR-NH | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | |
| 46 | TATAPOWER | 1 | 1 | 100 | 1 | 0 | 100 | 1 | 0 | 100 | 1 | 0 | 100 | DR/EL & Tripping report needs to be submitted |
| 47 | UNCHAHAR-NT | 2 | 1 | 50 | 1 | 0 | 50 | 1 | 0 | 50 | 1 | 0 | 50 | |
| 48 | UNCHAHAR-NT | 2 | 1 | 50 | 1 | 0 | 50 | 1 | 0 | 50 | 1 | 0 | 50 | |

It is to be noted that as per the IEGC provision under clause 5.2 (r), detailed tripping report along with DR & EL has to be furnished within 24 hrs of the occurrence of the event. However, it is evident from the submitted data that reporting status is not satisfactory and needs improvement. Also, it is observed that reporting status has been improved from POWERGRID, Haryana, Uttar Pradesh and Himachal Pradesh in Aug, 2022 compared to the previous month.

***NRLDC representative raised concern about poor status of report updation by Rajasthan, Punjab, BBMB, J&K, CPCC1and RE developers on the tripping portal. Haryana representative mentioned about their good performance regarding submission of DR/EL.***

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

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

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

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

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

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

***NRLDC representative informed that all the units who have done Step response test before 2018 were requested to plan the exciter step-response test as soon as possible and submit the tentative schedule of step-response test on the units with NRPC/ NRLDC. He further informed that till date Schedule has been received from Rajasthan and UP Control area. He further requested that members may kindly Accord due priority in this regard and update about their future plan for PSS tuning as there is little progress despite including this agenda in every OCC meeting.***

***Members agreed for the same.***

**26. Frequency response characteristic:**

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

Table:

| S. No. | Event Date | Time (In hrs.) | Event Description | Starting Frequency (in Hz) | End Frequency (in Hz) | *Δf* |
|---|---|---|---|---|---|---|
| 1 | 11-August-22 | 11:22hrs | On 11th Aug'22 at 11:22 hrs, Y-B phase to phase fault occurred on 220kV Bhadla-Clean Solar Jodhpur Ckt. On this fault, almost all the RE stations connected at Bhadla (PG), Bhadla2 (PG), Fatehgarh2 (PG) & Bikaner (PG) dropped their generation. However, generation didn't recover in desired time as per LVRT. Due to sudden generation drop, over voltage in transmission network at Rajasthan RE complex also observed. Many 765kV lines and 220kV lines to RE stations tripped due to over voltage. Total RE generation drop of approx. 6157MW (5807MW Solar & 350MW Wind) observed (as per SCADA). At the same time, load shedding of approx. 400MW in UP, 200MW in Punjab & 150MW in Haryana control area is also observed on df/dt protection operation. Hence, net 5407MW generation loss figure has been considered for FRC calculation. | 50.16 | 49.63 | -0.53 |

Status of Data received till date:

| Status of Field Data received of FRC of Grid event occurred at Rajasthan RE complex at 11:22 Hrs on 11.08.2022 | | | |
|---|---|---|---|
| Data Received from | | Data Not Received from | |
| Koteshwar HEP | NJPC | Uttarakhand | APCPL Jhajjar |
| NHPC | UP | Haryana | Rampur HEP |
| Rajasthan | Dadri NTPC | HP | Unchhahar NTPC |
| Singrauli NTPC | Tehri HEP | BBMB | Karcham HEP |
| Koldam NTPC | Delhi | | AD Hydro HEP |
| Rosa Reliance | Punjab | | |
| Tanda NTPC | Rihand NTPC | | |
| | | | |

Primary Frequency Response by Generators during Grid Event occurred at Rajasthan RE complex at 11:22 Hrs on 11.08.2022

| Sr. No | Generating stations | FRC as per NRLDC SCADA data (in %) | FRC as per generator data (in %) |
|---|---|---|---|
| 1 | Dadri TPS Stage-1 Unit-1 | 22% | 25% |
| 2 | Dadri TPS Stage-1 Unit-3 | | 29% |
| 3 | Dadri TPS Stage-1 Unit-4 | | 15% |
| 4 | Dadri TPS Stage-2 Unit-1 | 24% | 32% |
| 5 | Dadri TPS Stage-2 Unit-2 | | 20% |
| 6 | Koteshwar HEP | 5% | 18% |
| 7 | Singrauli Unit-6 | 10% | 29% |
| 8 | Singrauli Unit-7 | | 24% |
| 9 | Chamera-I | 2% | 15% |
| 10 | Anpara C Unit-1 | 30% | 25% |
| 11 | Anpara C Unit-2 | | 40% |
| 12 | Nabha Power TPS Unit-1 | -4% | 24% |
| 13 | Nabha Power TPS Unit-2 | | 26% |
| 14 | KTPS Unit-1 | -1% | 29% |
| 15 | KTPS Unit-2 | | 0% |
| 16 | CTPP Unit-1 | 3% | 9% |
| 17 | CTPP Unit-1 | | -6% |
| 18 | Tehri Unit-1 | 19% | 35% |
| 19 | Tehri Unit-2 | | 28% |

| Sr. No | Generating stations | FRC as per NRLDC SCADA data (in %) | FRC as per generator data (in %) |
|---|---|---|---|
| 20 | Sewa-II HEP | 12% | 16% |
| 21 | Nathpa Jhakri Unit-1 | 18% | 18% |
| 22 | Nathpa Jhakri Unit-2 | | 22% |
| 23 | Nathpa Jhakri Unit-3 | | 22% |
| 24 | Nathpa Jhakri Unit-4 | | 24% |
| 25 | Nathpa Jhakri Unit-5 | | 24% |
| 26 | Nathpa Jhakri Unit-6 | | 17% |
| 27 | Rihand TPS Unit-1 | 4% | -12% |
| 28 | Rihand TPS Unit-2 | | 2% |
| 29 | Rihand TPS Unit-3 | | 1% |
| 30 | Rihand TPS Unit-4 | | 5% |
| 31 | Rihand TPS Unit-5 | | 3% |
| 32 | Rihand TPS Unit-6 | | 4% |
| 33 | Kalisindh Unit-1 | | 2% |
| 34 | Kalisindh Unit-2 | | 0% |
| 35 | Rosa TPS Unit-1 | -4% | 28% |
| 36 | Rosa TPS Unit-2 | | 28% |
| 37 | Rosa TPS Unit-3 | | 24% |
| 38 | Rosa TPS Unit-4 | | 24% |

***All the concerned utilities were asked to 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.***

**27. Mock black start exercises in NR:**

As per Indian Electricity Grid Code (IEGC) clause 5.8(b)
"*Detailed plans and procedures for restoration after partial/total blackout of each user's/STU/CTU system within a Region, will be finalized by the concerned user's/STU/CTU in coordination with the RLDC. The procedure will be reviewed, confirmed and/or revised once every subsequent year. Mock trial runs of the procedure for different subsystems shall be carried out by the users/CTU/STU at least once every six months under intimation to the RLDC*".

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

**The summary of last conducted mock black start exercise of ISGS hydro & gas stations during 2020-21 & 2021-22 is tabulated below:**

**Hydro Power Stations:**

| Name of stations | Last conducted exercise date | Remark |
|---|---|---|

| | | |
|---|---|---|
| Uri-I, II HEP, Lower Jhelum HEP, Upper Sindh and Kishenganga | – | |
| Dhauliganga | 28th Dec 2021 | Exercise carried out successfully |
| Bairasiul | 04th Dec 2020 | |
| Sewa-2 | 29th May 2022 | |
| N. Jhakri and Rampur | 17th Dec 2019 | |
| Karcham and Baspa | 29th Dec 2021 | Exercise was partially successful |
| Budhil | – | |
| Parbati-3 and Sainj | 22nd Dec 2020 | Black start of only Parbati-3 was carried out successfully. Sainjto explore blackstart capability. |
| Salal | - | |
| Chamera-3 | - | |
| Kishenganga | - | |
| Koteshwar | 19th Jan 2022 | Exercise carried out successfully |
| Chamera-1 and Chamera-2 | 08th Dec 2020 | |
| Malana-2, AD Hydro and Phozal | 08th Jan 2021 | |
| Tehri | 12th Jan 2022 | |
| Koldam | 22nd Jan 2021 | Partially successful. |

**Gas Power Stations:**

| Name of stations | Last conducted exercise date | Remark |
|---|---|---|
| Anta GPS | 09th Feb 2021 (with load)<br><br>01st Feb 2022 (without load) | Exercise carried out successfully |
| Auraiya GPS | - | |
| Dadri GPS | 28th Jan 2022 (without load) | Exercise carried out successfully |

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

confirm and inform to all the concerned persons of control centre/ substations to facilitate the exercise.

**Hydro Power Stations:**

| Name of stations | Tentative Date for Mock Black start exercise (to be proposed by power plants) |
|---|---|
| *Uri-I, II HEP, Lower Jhelum HEP, Upper Sindh and Kishenganga | |
| Dhauliganga | |
| *Bairasiul | |
| Sewa-2 | |
| *N. Jhakri and Rampur | |
| Karcham and Baspa | |
| *Budhil | |
| *Parbati-3 and Sainj | |
| *Salal | |
| *Chamera-3 | |
| *Kishenganga | |
| Koteshwar | |
| *Chamera-1 and Chamera-2 | |
| *Malana-2, AD Hydro and Phozal | |
| Tehri | |
| *Koldam | |

Mock Black start exercise not carried out during Year 2021-22

- **NHPC** representative stated that Parbati 3 last black start was performed on 22 December 2021. For this year mock Black start exercise, they will submit schedule with in a week.

**Gas Power Stations:**

| Name of stations | Tentative Date for Mock Black start exercise (to be proposed by power plants) |
|---|---|
| Anta GPS | |
| *Auraiya GPS | |
| Dadri GPS | |

Mock Black start exercise not carried out during Year 2021-22

SLDC's may also carryout mock black-start of station in their respective control area & inform the tentative dates to the OCC as well as outcome of these exercises. The proposed Hydro Power Stations to undergo the exercise are as follows:

| S. NO. | Utility | Hydro Power Station | Installed Capacity(MW) |
|---|---|---|---|
| 1 | J&K | Baglihar | 3x150 |
| 2 | | Baglihar stage-2 | 3x150 |
| 3 | | Lower Jhelum | 3x35 |
| 4 | | Upper Sindh | 2x11+3x35 |
| 5 | | Larji | 3x42 |
| 6 | | Bhabha | 3x40 |
| 7 | | Malana -I | 2x43 |
| 8 | | Baspa | 3x100 |
| 9 | Punjab | Anandpur Sahib | 4x33.5 |
| 10 | | RanjitSagar | 4x150 |
| 11 | Rajasthan | Mahi-I&II | 2x25+2x45 |
| 12 | | Rana PratapSagar | 4x43 |
| 13 | | JawaharSagar | 3x33 |
| 14 | | Gandhi Sagar | 5x23 |
| 15 | | Dholpur GPS | 3x110 |
| 16 | | Ramgarh GPS | 1x35.5+2x37.5+1x110 |
| 17 | UP | Rihand | 6x50 |
| 18 | | Obra | 3x33 |
| 19 | | Vishnuprayag | 4x100 |
| 20<br>21 | | Srinagar (Alaknanda) | 4x82.5 |
| | Uttarakhand | Gamma Infra | 2x76+1x73 |
| 22 | | Shravanti | 6x75 |
| 23 | | Ramganga | 3x66 |
| 24 | | Chibro | 4x60 |
| 25 | | Khodri | 4x30 |
| 26 | | Chilla | 4x36 |
| 27 | | ManeriBhali-I&II | 3x30+4x76 |
| 28 | Delhi | IP Extn GTs | 6x30+3x30 |
| 29 | | Pragati GPS | 2x104.6+1x121.2 |
| 30 | | Rithala | 3x36 |
| 31 | Haryana | Faridabad GPS | 2x137.75+1x156.07 |

***SLDCs shall submit the reports of black start exercise in their respective control area. SLDCs may also identify further generating stations/unit for black start exercise.***

## Follow up issues from previous OCC meetings

Annexure-A.I

<table>
<tr><td>1</td><td>Down Stream network by State utilities from ISTS Station</td><td>Augmentation of transformation capacity in various existing substations, addition of new substations along with line bays as well as requirement of line bays by STUs for downstream network are under implementation at various locations in Northern Region. Further, 220kV bays have already been commissioned at various substations in NR. For its utilization, downstream 220kV system needs to be commissioned.</td><td>List of downstream networks is enclosed in Annexure-A.I.I.</td></tr>
<tr><td>2</td><td>Progress of installing new capacitors and repair of defective capacitors</td><td>Information regarding installation of new capacitors and repair of defective capacitors is to be submitted to NRPC Secretariat.</td><td>Data upto following months, received from various states / UTs:<br>◎ CHANDIGARH — Sep-2019<br>◎ DELHI — Aug-2022<br>◎ HARYANA — May-2022<br>◎ HP — Jan-2022<br>◎ J&K and LADAKH — Not Available<br>◎ PUNJAB — Jul-2022<br>◎ RAJASTHAN — Aug-2022<br>◎ UP — Sep-2022<br>◎ UTTARAKHAND — Aug-2022<br>All States/UTs are requested to update status on monthly basis.</td></tr>
<tr><td>3</td><td>Healthiness of defence mechanism: Self-certification</td><td>Report of mock exercise for healthiness of UFRs carried out by utilities themselves on quarterly basis is to be submitted to NRPC Secretariat and NRLDC. All utilities were advised to certify specifically, in the report that “All the UFRs are checked and found functional”.</td><td>Data upto following months, received from various states / UTs:<br>◎ CHANDIGARH — Not Available<br>◎ DELHI — Jun-2022<br>◎ HARYANA — Jun-2022<br>◎ HP — Aug-2022<br>◎ J&K and LADAKH — Not Available<br>◎ PUNJAB — Jun-2022<br>◎ RAJASTHAN — Jun-2022<br>◎ UP — Jun-2022<br>◎ UTTARAKHAND — Jun-2022<br>◎ BBMB — Jun-2022<br>All States/UTs are requested to update status for healthiness of UFRs on monthly basis for islanding schemes and on quartely basis for the rest .</td></tr>
<tr><td></td><td></td><td>In compliance of NPC decision, NR states/constituents agreed to raise the AUFR settings by 0.2 Hz in 47th TCC/49th NRPC meetings.</td><td>Status:<br>◎ CHANDIGARH — Not Available<br>◎ DELHI — Increased<br>◎ HARYANA — Increased<br>◎ HP — Increased<br>◎ J&K and LADAKH — Not increased<br>◎ PUNJAB — Increased<br>◎ RAJASTHAN — Increased<br>◎ UP — Increased<br>◎ UTTARAKHAND — Increased<br>◎ BBMB — Increased</td></tr>
</table>

<table>
<tr><td></td><td></td><td></td><td colspan="3">BBMB was requested to submit the updated self certification report indicating increase of 0.2 Hz in AUFR settings, within one week. J&K and LADAKH were requested to update status for increasing settings of UFRs.</td></tr>
<tr><td>4</td><td>Status of FGD installation vis-à-vis installation plan at identified TPS</td><td>List of FGDs to be installed in NR was finalized in the 36th TCC (special) meeting dt. 14.09.2017. All SLDCs were regularly requested since 144th OCC meeting to take up with the concerned generators where FGD was required to be installed.<br>Further, progress of FGD installation work on monthly basis is monitored in OCC meetings.</td><td colspan="3">Status of the information submission (month) from states / utilities is as under:<br>◎ HARYANA — Sep-2022<br>◎ PUNJAB — Sep-2022<br>◎ RAJASTHAN — Sep-2022<br>◎ UP — Sep-2022<br>◎ NTPC — Feb-2022<br>FGD status details are enclosed as Annexure-A.I.II.<br>All States/utilities are requested to update status of FGD installation progress on monthly basis.</td></tr>
<tr><td>5</td><td>Information about variable charges of all generating units in the Region</td><td>The variable charges detail for different generating units are available on the MERIT Order Portal.</td><td colspan="3">All states/UTs are requested to submit daily data on MERIT Order Portal timely.</td></tr>
<tr><td>6</td><td>Status of Automatic Demand Management Sysytem in NR states/UT's</td><td>The status of ADMS implementation in NR, which is mandated in clause 5.4.2 (d) of IEGC by SLDC/SEB/DISCOMs is presented in the following table:</td><td colspan="3">Status:<br>◎ DELHI — Fully implemented<br>◎ HARYANA — Scheme not implemented<br>◎ HP — Scheme not implemented<br>◎ PUNJAB — Scheme not implemented<br>◎ RAJASTHAN — Under implementation. Likely completion schedule is 31.12.2022.<br>◎ UP — Scheme implemented by NPCIL only</td></tr>
</table>

| 7 | Reactive compensation at 220 kV/ 400 kV level at 15 substations | | | |
|---|---|---|---|---|
| | State / Utility | Substation | Reactor | Status |
| i | POWERGRID | Kurukshetra | 500 MVAr TCR | Anticipated commissioning: Nov'22 2022 |
| ii | DTL | Peeragarhi | 1x50 MVAr at 220 kV | PO awarded to M/s Kanohar Electricals Ltd. Drawings approved and under final stage inspection. GIS Bay is already available. |
| iii | DTL | Harsh Vihar | 2x50 MVAr at 220 kV | PO awarded to M/s Kanohar Electricals Ltd. Drawings approved and under final stage inspection. GIS Bay is already available. |
| iv | DTL | Mundka | 1x125 MVAr at 400 kV & 1x25 MVAr at 220 kV | Bay work awarded to M/s. Ethos. Bay work is expected to be completed by Dec.21. Reactor part tender is dropped and at present same is under revision. |
| v | DTL | Bamnauli | 2x25 MVAr at 220 kV | Bay work awarded to M/s. Ethos. Bay work is expected to be completed by Dec.21. Reactor part tender is dropped and at present same is under revision. |
| vi | DTL | Indraprastha | 2x25 MVAr at 220 kV | Bay work awarded to M/s. Ethos. Bay work is expected to be completed by Dec.21. Reactor part tender is dropped and at present same is under revision. |
| vii | DTL | Electric Lane | 1x50 MVAr at 220 kV | Under Re-tendering due to Single Bid |
| viii | PUNJAB | Dhuri | 1x125 MVAr at 400 kV & 1x25 MVAr at 220 kV | 400kV Reactors - LOA issued on dated. 17.08.2021 and date of completion of project is 18 months from the date of LOA. 220kV Reactors - LOA issued on dated 19.07.2021 and date of completion of project is 18 months from the date of LOA. |
| ix | PUNJAB | Nakodar | 1x25 MVAr at 220 kV | 220kV Reactors - LOA issued on dated 19.07.2021 and date of completion of project is 18 months from the date of LOA. |
| x | PTCUL | Kashipur | 1x125 MVAR at 400 kV | Price bid has been opened and is under evaluation |
| xi | RAJASTHAN | Akal | 1x25 MVAr | 1x25 MVAR Reactor at Akal has been commissioned on dated 25th July' 2022. |

| | | | | |
|---|---|---|---|---|
| xii | RAJASTHAN | Bikaner | 1x25 MVAr | Erection work of 1x25 MVAR Reactors at Bikaner and Suratgarh completed and testing work is pending. The same are likely to be commissioned in Aug / Sept 2022. |
| xiii | RAJASTHAN | Suratgarh | 1x25 MVAr | Erection work of 1x25 MVAR Reactors at Bikaner and Suratgarh completed and testing work is pending. The same are likely to be commissioned in Aug / Sept 2022. |
| xiv | RAJASTHAN | Barmer & others | 13x25 MVAr | Agreement signed on dt. 22.06.2020. Grant of Ist Instalment received on dt.19.02.21 &work order placed on dt. 7.04.2022 to M/s Kanohar Electricals Ltd. |
| xv | RAJASTHAN | Jodhpur | 1x125 MVAr | Agreement signed on dt. 22.06.2020. Grant of Ist Instalment received on dt.19.02.21 &work order placed on dt. 7.04.2022 to M/s Kanohar Electricals Ltd. |

Annexure-A-I.I

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

| Sl. No. | Substation | Downstream network bays | Status of bays | Planned 220 kV system and Implementation status | Revised Target | Remarks |
|---|---|---|---|---|---|---|
| 1 | 400/220kV, 3x315 MVA Samba | Commissioned: 8<br>Total: 8 | Utilized: 6<br>Unutilized: 2 | • Network to be planned for 2 bays. | - | PDD, J&K to update the status. |
| 2 | 400/220kV, 2x315 MVA New Wanpoh | Commissioned: 6<br>Total: 6 | Utilized: 2<br>Unutilized: 4 | • 220 kV New Wanpoh - Alusteng D/c Line | - | PDD, J&K to update the status. |
| | | | | • 220 kV New Wanpoh - Mattan D/c Line | - | PDD, J&K to update the status. |
| 3 | 400/220kV, 2x315 MVA Amargarh | Commissioned: 6<br>Total: 6 | Utilized: 6<br>Unutilized: 2 | • 220kV D/C line from 400/220kV Kunzar - 220/33kV Sheeri | - | PDD, J&K to update the status. |
| 4 | 400/220kV, 2x500 MVA Kurukshetra (GIS) | Commissioned: 8<br>Total: 8 | Utilized: 6<br>Unutilized: 2 | • 220kV Bhadson (Kurukshetra) – Ramana Ramani D/c line | - | HVPNL to update the status. |
| 5 | 400/220 kV, 2x315 MVA Dehradun | Commissioned: 6<br>Total: 6 | Utilized: 2<br>Unutilized: 4 | • Network to be planned for 4 bays | - | PTCUL to update the status. |
| 6 | Shahjahanpur, 2x315 MVA 400/220 kV | Commissioned: 6<br>Approved/Under Implementation:1<br>Total: 7 | Utilized: 5<br>Unutilized: 1<br>(1 bays to be utilized shortly)<br>Approved/Under Implementation:1 | • 220 kV D/C Shahajahanpur (PG) - Gola line | Oct'22 | Updated in 196th OCC by UPPTCL |
| | | | | • LILO of Sitapur – Shahjahanpur 220 kV SC line at Shahjahanpur (PG) | Commissioned | Energization date: 25.02.2022 updated by UPPTCL in 196th OCC |
| 7 | Hamirpur 400/220 kV Sub-station | Commissioned: 8<br>Total: 8 | Utilized: 4<br>Unutilized: 4<br>(2 bays to be utilized shortly) | • 220 kV Hamirpur-Dehan D/c line | Commissioned | Commisioned date: 09.06.2022. Updated in 198th OCC by HPPTCL |
| | | | | • Network to be planned for 4 bays | - | HPPTCL to update the status. |
| 8 | Sikar 400/220kV, 1x 315 MVA S/s | Commissioned: 8<br>Total: 8 | Utilized: 6<br>Unutilized: 2 | • LILO of 220 kV Sikar (220 kV GSS)-Dhod S/c line at Sikar (PG) | Commissioned | LILO of 220 kV S/C Sikar-Dhod line at 400 kV GSS PGCIL, Sikar has been charged on dt. 31.03.2022 |
| | | | | • Network to be planned for 2 bays. | - | Against the 3rd ICT at 400 kV GSS Sikar, only 2 bays were constructed and same has been utilized by RVPN by constructing LILO of 220 kV S/C Sikar – Dhod line as updated by RVPNL in 195th OCC |
| 9 | Bhiwani 400/220kV S/s | Commissioned: 6<br>Total: 6 | Utilized: 0<br>Unutilized: 6 | • 220 kV D/C line Bhiwani (PG) – Bhiwani (HVPNL) line | Dec'22 | Updated in 197th OCC by HVPNL |
| | | | | • 220 kV Bhiwani (PG) - Isherwal (HVPNL) D/c line. | Dec'22 | Issue related to ROW as intimated in 192nd OCC.HVPNL to update the status. |
| | | | | • 220 kV Bhiwani (PG) - Dadhibana (HVPNL) D/c line. | Apr'24 | Issue related to ROW as intimated in 192nd OCC.HVPNL to update the status. |
| 10 | Jind 400/220kV S/s | Commissioned: 4<br>Approved:4<br>Total: 8 | Utilized: 4<br>Unutilized: 0<br>Approved:4 | • LILO of both circuits of 220 kV Jind HVPNL to PTPS D/C line at 400 kV substation PGCIL Khatkar (Jind) with 0.5 sq inch ACSR conductor | May'24 | Updated in 197th OCC by HVPNL |
| 11 | 400/220kV Tughlakabad GIS | Commissioned: 6<br>Under Implementation: 4<br>Total: 10 | Utilized: 6<br>Unutilized: 0<br>Under Implementation:4 | • RK Puram – Tughlakabad (UG Cable) 220kV D/c line – March 2023. | - | DTL to update the status. |
| | | | | • Masjid Mor – Tughlakabad 220kV D/c line. | - | DTL to update the status. |
| 12 | 400/220kV Kala Amb GIS (TBCB) | Commissioned: 6<br>Total: 6 | Utilized: 0<br>Unutilized: 6 | • HPPTCL has planned one no. of 220kV D/c line from Kala Amb 400/220kV S/s to 220/132kV Kala Amb S/s | Mar'23 | Updated in 198th OCC by HPPTCL |
| | | | | • Network to be planned for 4 bays | - | HPPTCL to update the status. |
| 13 | 400/220kV Kadarpur | Commissioned: 8 | Utilized: 0 | • LILO of both circuits of 220 KV Pali - Sector 56 D/C line at Kadarpur along with augmentation of existing conductor from 220 KV Sector-56 to LILO point with 0.4 sq inch AL-59 conductor. | Mar'23 | Updated in 197th OCC by HVPNL |

| Sl. No. | Substation | Downstream network bays | Status of bays | Planned 220 kV system and Implementation status | Revised Target | Remarks |
|---|---|---|---|---|---|---|
| 13 | Sub-station | Total: 8 | Unutilized: 8 | • LILO of both circuits of 220KV Sector 65 - Pali D/C line at Kadarpur along with augmentation of balance 0.4 sq. inch ACSR conductor of 220 kV Kadarpur - Sector 65 D/C line with 0.4sq inch AL-59 conductor | May'23 | Updated in 197th OCC by HVPNL |
| 14 | 400/220kV Sohna Road Sub-station | Commissioned: 8<br>Total: 8 | Utilized: 2<br>Unutilized: 4 | • LILO of both circuits of 220kV D/c Sector-69 - Roj Ka Meo line at 400kV Sohna Road | Jun'23 | Updated in 197th OCC by HVPNL |
| | | | | • LILO of both circuits of 220kV D/c Badshahpur-Sec77 line at 400kV Sohna Road | Jun'23 | Updated in 197th OCC by HVPNL |
| 15 | 400/220kV Prithla Sub-station | Commissioned: 8<br>Total: 8 | Utilized: 2<br>Unutilized: 4<br>Under Implementation:2 | • Prithla - Harfali 220kV D/c line with LILO of one ckt at Meerpur Kurali | Commissioned | Commisioned date: 31.12.2021. Updated in 198th OCC by HVPNL |
| | | | | • LILO of both ckt of 220kV D/c Ranga Rajpur – Palwal line | - | HVPNL to update the status |
| | | | | • 220kV D/C for Sector78, Faridabad | 02.03.2023 | Updated in 198th OCC by HVPNL |
| | | | | • Prithla - Sector 89 Faridabad 220kV D/c line | 31.03.2024 | Under Implementation (Mar'24). Updated in 198th OCC by HVPNL |
| 16 | 400/220kV Sonepat Sub-station | Commissioned: 6<br>Under Implementation:2<br>Total: 8 | Utilized: 2<br>Unutilized: 2<br>Under Implementation:2 | • LILO of both circuits of 220kV Samalkha - Mohana line at Sonepat | - | HVPNL to update the status. |
| | | | | • Sonepat - HSIISC Rai 220kV D/c line | Nov'22 | Updated in 196th OCC by HVPNL |
| 17 | 400/220kV Neemrana Sub-station | Commissioned: 6<br>Total: 6 | Utilized: 4<br>Unutilized: 2 | • LILO of Bhiwadi - Neemrana 220kV S/c line at Neemrana (PG) | Oct'22 | In Tendering stage as updated in 192nd OCC by RVPNL. |
| 18 | 400/220kV Kotputli Sub-station | Commissioned: 6<br>Total: 6 | Utilized: 4<br>Unutilized: 2 | • Kotputli - Pathreda 220kV D/c line | - | Bid documents under approval as updated in 195th OCC by RVPNL. |
| 19 | 400/220kV Jallandhar Sub-station | Commissioned: 10<br>Total: 10 | Utilized: 8<br>Unutilized: 2 | • Network to be planned for 2 bays | May'24 | LILO of 220 kV BBMB Jalandhar - Butari line at 400 kV PGCIL Jalandhar being planned. Work expected to be completed by May 2024. Updated in 198th OCC by PSTCL. |
| 20 | 400/220kV Roorkee Sub-station | Commissioned: 6<br>Total: 6 | Utilized: 4<br>Unutilized: 2 | • Roorkee (PG)-Pirankaliyar 220kV D/c line | Commissioned | Roorkee (PG)-Pirankaliyar 220kV D/c line comiisioned in 2020 as intimated by PTCUL in 197th OCC |
| 21 | 400/220kV Lucknow Sub-station | Commissioned: 8<br>Total: 8 | Utilized: 4<br>Unutilized: 4 | • Network to be planned for 4 bays | Oct'22 | • Lucknow -Kaurasa (Sitapur), 220 kV D/C line expected energization date Oct'22 updated by UPPTCL in 196th OCC<br>_____<br>• No planning for 2 no. of bays upated by UPPTCL in 196th OCC |
| 22 | 400/220kV Gorakhpur Sub-station | Commissioned: 6<br>Total: 6 | Utilized: 4<br>Unutilized: 2 | • Network to be planned for 2 bays | Dec'22 | • Gorakhpur(PG)- Maharajganj, 220 kV D/C line expected energization date Dec'22 updated by UPPCL in 196th OCC |
| 23 | 400/220kV Fatehpur Sub-station | Commissioned: 8<br>Under Implementation:2<br>Total: 10 | Utilized: 6<br>Unutilized: 2<br>Under Implementation:2 | • Network to be planned for 4 bays | - | • UPPTCL intimated that 02 no. of bays under finalization stage<br>_____<br>• No planning for 2 no. of bays updated by UPPTCL in 196th OCC |
| 24 | 400/220kV Abdullapur Sub-station | Commissioned: 10<br>Under Implementation:2<br>Total: 12 | Utilized: 10<br>Unutilized: 0<br>Under Implementation:2 | • Abdullapur – Rajokheri 220kV D/c line | Oct'22 | Updated in 198th OCC by HVPNL |
| | | Commissioned: 8<br>Under tender:2 | Utilized: 2 | • Panchkula – Pinjore 220kV D/c line | 31.12.2022 | Updated in 194th OCC by HVPNL |
| | | | | • Panchkula – Sector-32 220kV D/c line | 31.12.2022 | Updated in 194th OCC by HVPNL |
| | | | | • Panchkula – Raiwali 220kV D/c line | Commissioned | Updated in 194th OCC by HVPNL |

| Sl. No. | Substation | Downstream network bays | Status of bays | Planned 220 kV system and Implementation status | Revised Target | Remarks |
|---|---|---|---|---|---|---|
| 25 | 400/220kV Pachkula Sub-station | Total: 10<br><br>Out of these 10 nos. 220kV Line Bays, 2 bays would be used by the lines being constructed by POWERGRID (Chandigarh-2) and balance 8 nos. bays would be used by HVPNL | Unutilized: 4<br><br>Under Implementation:2 | • Panchkula – Sadhaura 220kV D/c line: Sep'23 | Sept'23 | Updated in 194th OCC by HVPNL |
| 26 | 400/220kV Amritsar S/s | Commissioned:7<br><br>Approved in 50th NRPC- 1 no.<br><br>Total: 8 | Utilized: 6<br><br>Unutilized: 1<br><br>Approved in 50th NRPC- 1 no. | • Amritsar – Patti 220kV S/c line | May'23 | Route survey/tender under process. Work expected to be completed by May 2023. Updated in 198th OCC by PSTCL. |
| | | | | • Amritsar – Rashiana 220kV S/c line<br>(2 bays shall be required for above lines. However, 1 unutilized bay shall be used for Patti and requirement of one additional bay approved for Rashiana by NRPC) | May'23 | Route survey/tender under process. Work expected to be completed by May 2023. Updated in 198th OCC by PSTCL. |
| 27 | 400/220kV Bagpat S/s | Commissioned: 8<br><br>Total: 8 | Utilized:6<br><br>Unutilized: 2 | • Bagpat - Modipuram 220kV D/c line | Aug'22 | Updated in 196th OCC by UPPTCL, within 10 day tentative charging updated in 198th OCC by UPPTCL. |
| 28 | 400/220kV Bahardurgarh S/s | Commissioned: 4<br><br>Total: 4 | Utilized:2<br><br>Unutilized: 2 | • Network to be planned for 2 bays. | Mar'24 and July'24 | Updated in 198th OCC by HVPNL |
| 29 | 400/220kV Jaipur (South) S/s | Commissioned: 4<br><br>Total: 4 | Utilized:2<br><br>Unutilized: 2 | • Network to be planned for 2 bays. | - | LILO case of 220 kV Dausa – Sawai Madhopur line at 400 kV GSS Jaipur South (PG) is under WTD approval as updated by RVPNL in 195th OCC |
| 30 | 400/220kV Sohawal S/s | Commissioned: 8<br><br>Total: 8 | Utilized: 8 | • Sohawal - Barabanki 220kV D/c line | Commissioned | Energization date: 14.04.2018 updated by UPPTCL in 196th OCC |
| | | | | • Sohawal - New Tanda 220kV D/c line | Commissioned | Energization date: 28.05.2019 updated by UPPTCL in 196th OCC |
| | | | | • Network to be planned for 2 bays | Commissioned | • Sohawal - Gonda 220kV S/c line (Energization date: 27.04.2020) updated by UPPTCL in 196th OCC<br>_____<br>• Sohawal - Bahraich 220kV S/c line (Energization date: 15.02.2021) updated by UPPTCL in 196th OCC |
| 31 | 400/220kV, Kankroli | Commissioned: 6<br><br>Total: 6 | Utilized: 4<br><br>Unutilized: 2 | • Network to be planned for 2 bays | - | RVPNL to update the status |
| 32 | 400/220kV, Manesar | Commissioned: 8<br><br>Total: 8 | Utilized: 4<br><br>Unutilized: 4 | • Network to be planned for 4 bays | - | One bay 220 kV Manesar (PG)-Panchgaon ckt commissioned on 05.09.2022 |
| 33 | 400/220kV, Saharanpur | Commissioned: 6<br><br>Under Implementation:2<br><br>Total: 8 | Utilized: 6<br><br>Unutilized: 0<br><br>Under Implementation:2 | • Network to be planned for 2 bays | Oct'22 | Saharanpur(PG)-Devband D/c line expected energization date Oct'22 updated by UPPTCL in 199th OCC |
| 34 | 400/220kV, Wagoora | Commissioned: 10<br><br>Total: 10 | Utilized: 6<br><br>Unutilized: 4 | • Network to be planned for 4 bays | - | PDD, J&K to update the status. |
| 35 | 400/220kV, Ludhiana | Commissioned: 9<br><br>Total: 9 | Utilized: 8<br><br>Unutilized: 1 | • Network to be planned for 1 bay | Mar'23 | Direct circuit from 220 kV Lalton Kalan to Dhandari Kalan to be diverted to 400 kV PGCIL Ludhiana. Work expected to be completed by March 2023.Updated in 198th OCC by PSTCL. |

| Sl. No. | Substation | Downstream network bays | Status of bays | Planned 220 kV system and Implementation status | Revised Target | Remarks |
|---|---|---|---|---|---|---|
| 36 | 400/220kV, Chamba (Chamera Pool) | Commissioned: 3<br>Under tender:1<br>Total: 4 | Utilized:3<br>Unutilized: 0<br>Under tender:1 | • Stringing of 2nd ckt of Chamera Pool – Karian 220kV D/c line | - | Stringing of 2nd Circuit of Chamera Pool-Karian Tansmission line has been completed & terminal bay at 400/220 kV chamera pooling substation (PGCIL) is not ready.Updated in 198th OCC by HPPTCL |
| 37 | 400/220kV, Mainpuri | Commissioned: 6<br>Under Implementation:2<br>Total: 8 | Utilized: 6<br>Unutilized: 0<br>Under Implementation:2 | • Network to be planned for 2 bays | - | • 02 no. of bays under finalization stage updated by UPPTCL in 196th OCC |
| 38 | 400/220kV, Patiala | Commissioned: 8<br>Total: 8 | Utilized: 6<br>Unutilized: 2 | • Network to be planned for 2 bays | May'24 | 2 Nos. bays for 400 kV PGCIL Patiala - 220 kV Bhadson (D/C) line being planned. Work expected to be completed by May 2024. Updated in 198th OCC by PSTCL. |

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

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

# FGD Status

# Updated status of FGD related data submission

| **NTPC (25.02.2022)** |
| --- |
| MEJA Stage-I (Updated by UP on 18.06.2022) |
| RIHAND STPS |
| SINGRAULI STPS |
| TANDA Stage-I |
| TANDA Stage-II |
| UNCHAHAR TPS |
| **UPRVUNL (18.06.2022)** |
| ANPARA TPS |
| HARDUAGANJ TPS |
| OBRA TPS |
| PARICHHA TPS |

| **PSPCL (16.08.2022)** |
| --- |
| GGSSTP, Ropar |
| GH TPS (LEH.MOH.) |
| **RRVUNL (08.08.2022)** |
| CHHABRA SCPP |
| CHHABRA TPP |
| KALISINDH TPS |
| KOTA TPS |
| SURATGARH SCTPS |
| SURATGARH TPS |

# Updated status of FGD related data submission

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

| |
|---|
| **HGPCL (21.03.2022)** |
| PANIPAT TPS |
| RAJIV GANDHI TPS |
| YAMUNA NAGAR TPS |

| |
|---|
| **Adani Power Ltd. (18.02.2022)** |
| KAWAI TPS |

| |
|---|
| **Rosa Power Supply Company (18.06.2022)** |
| Rosa TPP Phase-I |
| **Prayagraj Power Generation Company Ltd. (18.06.2022)** |
| Prayagraj TPP |
| **APCPL (25.02.2022)** |
| INDIRA GANDHI STPP |

# Pending submissions

| **GVK Power Ltd.** |
| --- |
| GOINDWAL SAHIB |

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

# Target Dates for FGD Commissioning (Utility-wise)

| | |
|---|---|
| **Adani Power Ltd.** | KAWAI TPS U#1 (Target: 31-12-2024), KAWAI TPS U#2 (Target: 31-12-2024) |
| **APCPL** | INDIRA GANDHI STPP U#1 (Target: 30-09-2022), INDIRA GANDHI STPP U#2 (Target: 30-09-2022), INDIRA GANDHI STPP U#3 (Target: 30-09-2022) |
| **GVK Power Ltd.** | GOINDWAL SAHIB U#1 (Target: 30-04-2020), GOINDWAL SAHIB U#2 (Target: 29-02-2020) |
| **HGPCL** | PANIPAT TPS U#6 (Target: 30-04-2021), PANIPAT TPS U#7 (Target: 28-02-2021), PANIPAT TPS U#8 (Target: 31-12-2020), RAJIV GANDHI TPS U#1 (Target: 30-04-2022), RAJIV GANDHI TPS U#2 (Target: 28-02-2022), YAMUNA NAGAR TPS U#1 (Target: 31-12-2021), YAMUNA NAGAR TPS U#2 (Target: 31-10-2021) |

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

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

| | |
|---|---|
| **Rosa Power Supply Company** | ROSA TPP Ph-I U#1 (Target: 31-12-2024), ROSA TPP Ph-I U#2 (Target: 31-12-2024), ROSA TPP Ph-I U#3 (Target: 31-12-2024), ROSA TPP Ph-I U#4 (Target: 31-12-2024) |
| **RRVUNL** | KOTA TPS U#5 (Target: 31-08-2024), KOTA TPS U#6 (Target: 31-08-2024), KOTA TPS U#7 (Target: 31-08-2024), SURATGARH TPS U#1 (Target: 31-12-2024), SURATGARH TPS U#2 (Target: 31-12-2024), SURATGARH TPS U#3 (Target: 31-12-2024), SURATGARH TPS U#4 (Target: 31-12-2024), SURATGARH TPS U#5 (Target: 31-12-2024), SURATGARH TPS U#6 (Target: 31-12-2024), SURATGARH SCTPS U#7 (Target: 31-12-2024), SURATGARH SCTPS U#8 (Target: 31-12-2024), CHHABRA TPP U#1 (Target: 31-12-2024), CHHABRA TPP U#2 (Target: 31-12-2024), CHHABRA TPP U#3 (Target: 31-12-2024), CHHABRA TPP U#4 (Target: 31-12-2024), CHHABRA SCPP U#5 (Target: 31-12-2024), CHHABRA SCPP U#6 (Target: 31-12-2024), KALISINDH TPS U#1 (Target: 31-12-2024), KALISINDH TPS U#2 (Target: 31-12-2024) |
| **Talwandi Sabo Power Ltd.** | TALWANDI SABO TPP U#1 (Target: 28-02-2021), TALWANDI SABO TPP U#2 (Target: 31-12-2020), TALWANDI SABO TPP U#3 (Target: 31-10-2020) |
| **UPRVUNL** | ANPARA TPS U#1 (Target: 31-12-2023), ANPARA TPS U#2 (Target: 31-12-2023), ANPARA TPS U#3 (Target: 31-12-2023), ANPARA TPS U#4 (Target: 31-12-2023), ANPARA TPS U#5 (Target: 31-12-2023), ANPARA TPS U#6 (Target: 31-12-2023), ANPARA TPS U#7 (Target: 31-12-2023), HARDUAGANJ TPS U#8 (Target: 31-12-2024), HARDUAGANJ TPS U#9 (Target: 31-12-2024), OBRA TPS U#9 (Target: 31-12-2024), OBRA TPS U#10 (Target: 31-12-2024), OBRA TPS U#11 (Target: 31-12-2024), OBRA TPS U#12 (Target: 31-12-2024), OBRA TPS U#13 (Target: 31-12-2024), PARICHHA TPS U#3 (Target: 30-04-2022), PARICHHA TPS U#4 (Target: 31-12-2024), PARICHHA TPS U#5 (Target: 31-12-2024), PARICHHA TPS U#6 (Target: 31-12-2024) |

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

सं.:उ.क्षे.वि.स./प्रचालन/106/02/2022/ 8951-8952 दिनांक: 19.09.2022

**विषय**: Minutes of the meeting held on 14.09.2022 for discussing Implementation of Islanding Schemes in Himachal Pradesh - reg

Please find attached minutes of the meeting held on 14.09.2022 at 11:00 AM (through VC) for discussing Implementation of Islanding Schemes in Himachal Pradesh.

**संलग्नक:**यथोपरि

19/09/2022.

(सौमित्र मजूमदार)
अधीक्षण अभियंता (प्रचालन)

सेवा में,

1. मुख्य अभियंता, हिमाचल प्रदेश राज्य भार प्रेषण केंद्र, शिमला (cehpsldc@gmail.com)
2. सी.जी.एम इन-चार्ज, उत्तर क्षेत्रीय भार प्रेषण केंद्र, नई दिल्ली (rk.porwal@posoco.in)

**Minutes of the meeting held on 14.09.2022 for discussing Implementation of Islanding Schemes in Himachal Pradesh**

After welcoming the participants from HP SLDC, HPPTCL, HPSEBL and NRLDC, EE(O), NRPC apprised that HP has submitted some data as discussed in meeting held on 15.07.2022 and the same needs to be analysed in this meeting.

## A. Shimla - Solan Islanding scheme

1. EE(O), NRPC presented the graphical details of average generation and load considered by HP in the proposed island. It was observed that during May-October (high hydro season), load-generation scenario in last two years was as below:

| FY | Average generation (Bhabha HEP and other IPPs) (MW) | Average Load (With Barotiwala) | Average Load (Without Barotiwala) |
|---|---|---|---|
| 2020-21 | 150* | - | - |
| 2021-22 | 200 | 130 | 80 |

* *Due to Outage of 1 unit of Bhabha*

2. EE(O), NRPC highlighted that as per details submitted by HP, there are UFRs at 132 kV Barotiwala (Ckt-I & II) and 132 kV Solan (33 kV Lower/Upper Yard) that give load relief of 100 MW. Therefore, there is need to remove UFRs from these locations so that sufficient load may be ensured in the proposed island.
3. HP was requested to remove UFRs from above locations and provide equivalent load relief quantum at suitable locations out of the Shimla-Solan Island.
4. NRLDC suggested that PFR testing may be carried out for generators. It was also suggested that use of pondage at Bhabha may be explored.
5. HPSLDC informed that Bhabha HEP has designed 3 hrs pondage; however, practical condition may be different. HP SLDC stated that issue will be taken up with HPSEB.

## B. Kullu - Manali Islanding Scheme

1. EE(O), NRPC presented the graphical details of average generation and load under island. It was observed that during May-October (high hydro season), load-generation scenario in last two years was as below:

| FY | Average generation (Larji and Malana HEP) (MW) | Average Load |
|---|---|---|
| 2020-21 | 150 | - |
| 2021-22 | 130 | 60 |

2. It was observed that load is very less compared to generation. Accordingly, HP SLDC was suggested that only Malana-I HEP (84.6 MW) may be considered in Islanding scheme.
3. HP apprised that there are no UFRs within the proposed Kullu-Manali Islanding Scheme.
4. HP was suggested that PFR testing may also be carried out for Malana-I.
5. HP SLDC was requested to submit governor data (pertaining to generators of both islands) as per format/requirement to be intimated by NRLDC.
6. HP SLDC was requested to submit above mentioned data / information along with updated schemes within a weeks' time.

Meeting ended with vote of thanks.

*****

सत्यमेव जयते

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

सं.: उ.क्षे.वि.स./प्रचालन/106/02/2022/8953-8956 दिनांक: 20.09.2022

**विषय: Minutes of the meeting held on 14.09.2022 for discussing implementation of Islanding Schemes in UP – reg.**

Please find attached minutes of the meeting held on 14.09.2022 at 03:00 PM (through VC) for discussing Implementation of Islanding Schemes in UP.

**संलग्नक:**यथोपरि

सौमित्र 20/09/2022.

(सौमित्र मजूमदार)
अधीक्षण अभियंता (प्रचालन)

सेवा में,

1. मुख्य अभियंता, उत्तर प्रदेश राज्य भार प्रेषण केंद्र, गोमती नगर, लखनऊ, उत्तर प्रदेश (cecs@upsldc.org)
2. AGM,(.डी.एम.ई) .एनपीटीसी ऊंचाहार (vishnumurthy@ntpc.co.in)
3. सी.जी.एम इन-चार्ज, उत्तर क्षेत्रीय भार प्रेषण केंद्र, नई दिल्ली (rk.porwal@posoco.in)
4. जी.एम, राष्ट्रीय भार प्रेषण केंद्र, नई दिल्ली (ashokkr@posoco.in)

**Minutes of the meeting held on 14.09.2022 for discussing Implementation of Islanding Schemes in UP**

MS, NRPC welcomed the participants from UP SLDC, UPPTCL, NTPC, NLDC and NRLDC.

2. EE (O), NRPC apprised that UP SLDC has submitted revised proposed Unchahar Islanding scheme and comments have been received thereon from NRLDC and NTPC.

3. It was mentioned that NTPC has stated that average generation at Unchahar considered for stage-1 islanding is 800 MW; however, average load estimated is around 640MW. Hence, it was highlighted by NTPC that there is an excess generation of 160MW, which is significant.

4. UP SLDC stated that generation has been kept 20% excess as per general practice and as discussed in NRPC meeting. It was highlighted that low voltages of large number of buses and overloading of lines were observed when higher load was considered.

5. MS, NRPC enquired about logic of considering 20% excess generation as it can lead to tripping of unit(s) in the eventuality of on over-frequency of the island.

6. NRLDC highlighted that as per current practice generation is being kept 10 – 20% excess compared to load. It was further stated that technical literature in this regard may be explored. Further, philosophy being followed in other regions may also be explored.

7. NTPC confirmed that units are capable of operating in RGMO/FGMO as per requirement; however, response is very much slow for the case of islanding.

8. He further requested for exploring possibility of AGC in islanding scheme.

9. NLDC stated that Area Control Error (ACE) in AGC is calculated considering whole NR as region and commands are issued to generators in region on the basis of grid condition. Therefore, AGC is not expected to operate for a single machine. Moreover, it takes around 4 seconds to get data from machine. Hence, AGC can't be used in islanding schemes.

10. It was deliberated that automatic backdown of such large MW quantum may not be possible in such a short duration. Hence, it was decided that Generation-load difference may be decreased.

11. UP SLDC stated that generation back down may be slow compared to tripping of unit, hence quickest way to achieve stability in island is tripping of the unit.

12. NTPC stated that there may be delay in getting inputs for the comparator/controller logic proposed by UP. Hence, it may not be practical in island scenario.

13. Accordingly, it was decided that comparator/controller may not be useful in islanding schemes and it may be avoided. Islanding scheme shall be planned on basis of frequency setting.

14. Further, UP SLDC also raised issue of delay in two stages of islanding schemes which is currently kept as 3.5 sec. It was advised that currently setting may not be changed. The same may be reviewed later, if required.

15. MS, NRPC suggested UP SLDC to plot graphs of average generation of Unchahar and corresponding load for 2 years. Using these graphs, average generation and load may be obtained.

16. It was suggested that generation may be kept approx. 10% excess to load. Accordingly, no. of units to be considered in the islanding may be considered.

17. UP SLDC was requested to submit the data in the OCC meeting on 16.09.2022 if possible but not later than 20.09.2022.

Meeting ended with vote of thanks.

*****

पावरग्रिड
POWERGRID

पावर ग्रिड कॉर्पोरेशन ऑफ इंडिया लिमिटेड
(भारत सरकार का उद्यम)
POWER GRID CORPORATION OF INDIA LIMITED
(A Government of India Enterprise)

Annexure-A.IV

Ref: - N1/AM/

Date:- 14th September'2022

To,

**The Member Secretary,**
Northern Regional Power Committee,
18-A, Qutab Institutional Area,
Katwaria Sarai, New Delhi-110 016

Subject: **Proposed agenda point for 199th OCC meeting of Northern Region.**

Dear Sir,

Enclosed herewith please find the preliminary report on grid event occurred in Rajasthan Region at 12:22HRS on 11/09/2022 for kind information and further deliberation in 199th OCC meeting of Northern Region in order to avoid reoccurrence of such incidents.

Thanking you with regards,

Yours sincerely,

14/09/22

**(A. K. Behera)**
**Chief GM (AM), NR-1**

Copy :-

i) Chief GM(I/C), NRLDC, POSOCO
18-A, Qutab Institutional Area,
Katwaria Sarai, New Delhi-110 016

ii) ED, NR1 for kind information please.
iii) ED(AM), CC --- do--

पावर ग्रिड कॉर्पोरेशन ऑफ इंडिया लिमिटेड
(भारत सरकार का उद्यम)
POWER GRID CORPORATION OF INDIA LIMITED
(A Government of India Enterprise)

# Preliminary Report on Grid event in Rajasthan Region on 11.09.2022 at 12:22:02 hrs

**Date & Time of Tripping/Event:** **11.09.2022 12:22:02 hrs**

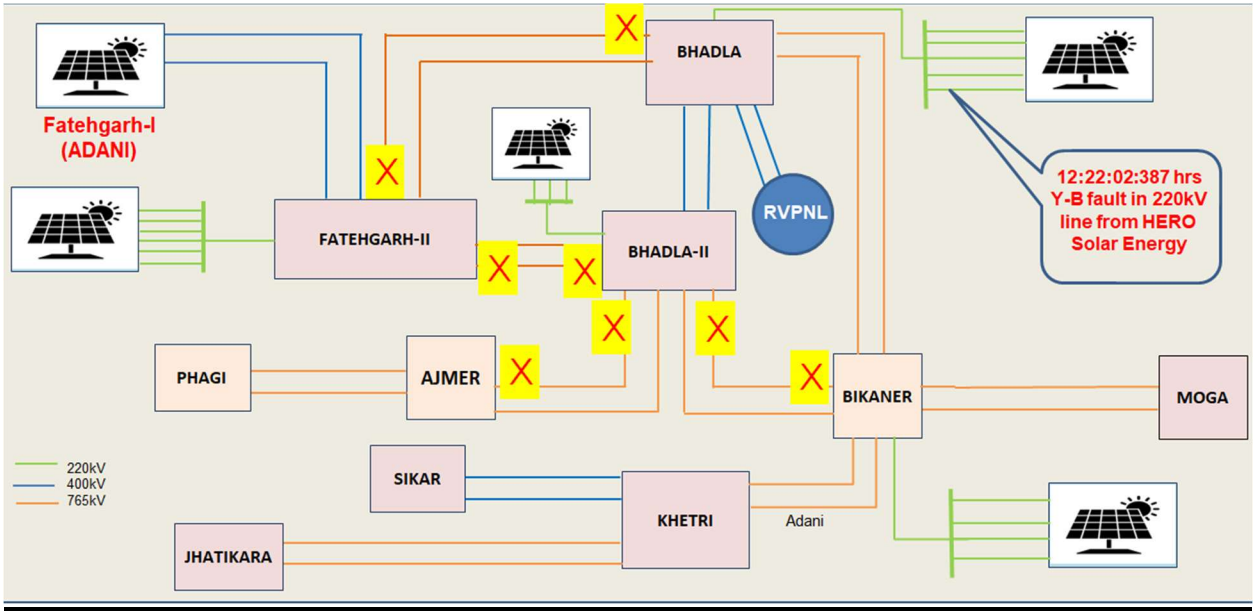
**Description of Tripping/Event:**

***At 12:22:02 hrs on 11.09.2022, the 220kV Bhadla-Hero Solar energy line (length 10.5km, owned by M/s Hero Solar energy with Installed capacity: 250MW) tripped on Y-B fault (15 kA, fault location- 5.8km).*** The line was evacuating generation of approx. 240 MW at the time of tripping. As evident from disturbance records, the above event caused generation backdown from several solar/wind generators in the region, which in turn led to high temporary overvoltages (~820+ kV) in the nearby substations. This load-generation imbalance led to overvoltage condition and cascaded tripping of following elements at Fatehgarh-1, Bhadla-2 and Bhadla substations after certain intervals on overvoltage protection(Stage-I):

| Sl. | Transmission element | Date/time | Events | Remarks |
|---|---|---|---|---|
| | **12:22:02:287 hrs : Trigger Event** | | **Tripping of 220kV Bhadla-Hero Solar energy line** | **00:00:00** |
| 1 | **12:22:17:940** | 765kV Bhadla Fatehgarh-2 Ckt-I | Tripped on Stage-I overvoltage protection (108%, 5 sec time delay) | Tripped after **15 seconds** of Tripping of Hero line (Trigger event |
| 2 | **12:22:19:081** | 765kV Bhadla-2 Bikaner Ckt-I | Tripped on Stage-I overvoltage protection (108%, 6 sec time delay) | Tripped on OV after 16 seconds |
| 3 | **12:22:18:253** | 765kV Bhadla-2 Ajmer Ckt-I | Tripped on Stage-I overvoltage protection (108%, 5 sec time delay) | Tripped on OV after 16 seconds |
| 4 | **12:22:24:995** | 765kV Bhadla-2 Fatehgarh-2 Ckt-I | Tripped on Stage-I overvoltage protection (109%, 7 sec time delay) | Tripped on OV after 22 seconds |

No other 220kV line connected to Renewable generators was reported to be tripped at the time of fault (except the faulty line i.e. 220kV Bhadla-Solar).

**SLD depicting outage of 765kV lines owned by POWERGRID:**




## Antecedent Conditions:

| Pre-Disturbance Scenario | Trigger event | Post-disturbance scenario |
|---|---|---|
| Pre-disturbance voltage at Fatehgarh-2: **753kV** | 12:22:02:387 hrs: Y-B fault in 220kV Line connected to Hero Power Solar Generator | Post-disturbance voltage at Fatehgarh-2: **827kV**<br><br>Lines tripped on Overvoltage:<br>765kV Fatehgarh-2 Bhadla Ckt-I<br>765kV Fatehgarh-2 Bhadla-II Ckt-II<br>765kV Bhadla-2 Ajmer Ckt-I<br>765kV Bhadla-2 Bikaner Ckt-I |

## Status of Shunt Reactors:

| Substation | Status | Status** | Opening Time |
|---|---|---|---|
| **Fatehgarh-2** | 765kV 240MVAr Bus Reactor-1 | Out of service | 08-09-2022 08:58 |
| | 765kV 240MVAr Bus Reactor-2 | Out of service | 11-09-2022 08:56 |
| | 400kV 125MVAr Bus Reactor | Out of service | 11-09-2022 09:36 |
| **Bhadla-2** | 765kV 240MVAr Bus Reactor-1 | Out of service | 11-09-2022 10:19 |
| | 765kV 240MVAr Bus Reactor-2 | Out of service | 11-09-2022 10:42 |
| | 240MVAr Bikane-2 Line Reactor | Out of service | 11-09-2022 11:47 |
| | 400kV 125MVAr Bus Reactor | Out of service | 11-09-2022 09:52 |
| **Bhadla** | 765kV 240MVAr Bus Reactor-1 | Out of service | 11-09-2022 09:53 |
| | 240MVAr Bikane-2 Line Reactor | Out of service | 11-09-2022 11:46 |
| | 400kV 125MVAr Bus Reactor | Out of service | 11-09-2022 09:44 |

**All remaining Line Reactors were in service at above mentioned substations.*
*** Out of service on voltage regulation as per instructions of NRLDC*

The details of change in generation of connected RE generators at different substations in the Rajasthan RE complex is as follows:

| | **Fatehgarh-II** | | |
|---|---|---|---|
| **Sl.No.** | **Element Name** | **Pre-Tripping Load (MW) - 12:22HRS** | **Post-Tripping Load (MW) - 12:30HRS** |
| 1 | 400KV FATEHGARH_2-FATEHGARH(AD) Ckt-I | 444 | 418 |
| 2 | 400KV FATEHGARH_2-FATEHGARH(AD) Ckt-II | 449 | 421 |
| 3 | 220KV FATEHGARH_2-RENEW SUNWAVE CKT-I | 306 | 122 |
| 4 | 220KV FATEHGARH_2-RENEW SUN BRIGHT CKT-I | 299 | 282 |
| 5 | 220KV FATEHGARH_2-RENEW SOLAR URJA CKT-I | 288 | 218 |
| 6 | 220KV FATEHGARH_2-AHEJ3L CKT-I | 292 | 276 |
| 7 | 220KV FATEHGARH_2-AHEJ2L CKT-I | 274 | 275 |
| 8 | 220KV FATEHGARH_2-AHEJOL CKT-I | 189 | 180 |
| 9 | 220KV FATEHGARH_2-AHEJOL CKT-II | 192 | 187 |
| 10 | 220KV FATEHGARH_2-EDEN CKT-I | 294 | 8 |
| 11 | 220KV FATEHGARH_2-RENEW (Jharkhad-3) CKT | 297 | 267 |
| | **Total (MW)** | **3324** | **2654** |

| | **Bhadla** | | |
|---|---|---|---|
| **Sl.No.** | **Element Name** | **Pre-Tripping Load (MW) - 12:22HRS** | **Post-Tripping Load (MW) - 12:30HRS** |
| 1 | 400KV BHADLA-BHADLA(RVPN) LINE-1 | 475 | 467 |
| 2 | 400KV BHADLA-BHADLA(RVPN) LINE-2 | 473 | 465 |
| 3 | 220KV BHADA-SAURYA URJA LINE-1 | 242 | 145 |
| 4 | 220KV BHADA-SAURYA URJA LINE-2 | 242 | 153 |
| 5 | 220KV BHADA-ADANI LINE-1 | 112 | 110 |
| 6 | 220KV BHADA-ADANI LINE-2 | 112 | 111 |
| 7 | 220KV BHADA-TATA LINE | 282 | 289 |
| 8 | 220KV BHADA-HERO CLEAN SOLAR LINE | 240 | 0 |
| 9 | 220KV BHADA-ACME LINE | 232 | 231 |
| 10 | 220KV BHADA-MAHOBA LINE | 287 | 288 |
| 11 | 220KV BHADA-ESSEL LINE | 287 | 268 |
| 12 | 220KV BHADA-MAHINDRA SUSTAIN LINE | 236 | 236 |
| 13 | 220KV BHADA-AZURE (300) LINE | 256 | 260 |
| 14 | 220KV BHADA-AZURE (250) LINE | 150 | 152 |
| 15 | 220KV BHADA-AZURE (130) LINE | 130 | 130 |
| | **Total (MW)** | **3756** | **3305** |

| | Bhadla-II | | |
|---|---|---|---|
| **Sl.No.** | **Element Name** | **Pre-Tripping Load (MW) - 12:22HRS** | **Post-Tripping Load (MW) - 12:30HRS** |
| 1 | 400KV BHADA_2-NTPC LINE | 229 | 228 |
| 2 | 220KV BHADA_2-ABC LINE | 303 | 300 |
| 3 | 220KV BHADA_2-MAHENDRA LINE | 230 | 227 |
| 4 | 220KV BHADA_2-ACME LINE | 220 | 220 |
| 5 | 220KV BHADA_2-AVAADA LINE | 10 | 10 |
| | **Total (MW)** | **992** | **985** |

**Analysis:**

The 220kV Bhadla-Hero Solar energy was carrying around 240 MW load prior to the fault. The phase-phase fault created a voltage drop in the nearby area, leading to active power backdown from RE generators. This sudden loss of generation causes high temporary over voltages (~820kV) in nearby substations (Fatehgarh-2, Bhadla-2 & Bhadla). The sustained overvoltages at Fatehgarh-2 and Bhadla-2 S/s led to sequential tripping of 765kV lines on over-voltage protection (stage-I) after certain intervals.

The system was restored to normalcy one by one as per instructions of NRLDC, keeping in view the prevailing overvoltage conditions in Rajasthan due to generation throw off. The last element i.e. 765kV Bhadla-2 Bikaner-1 line was restored at 13:46 hrs.

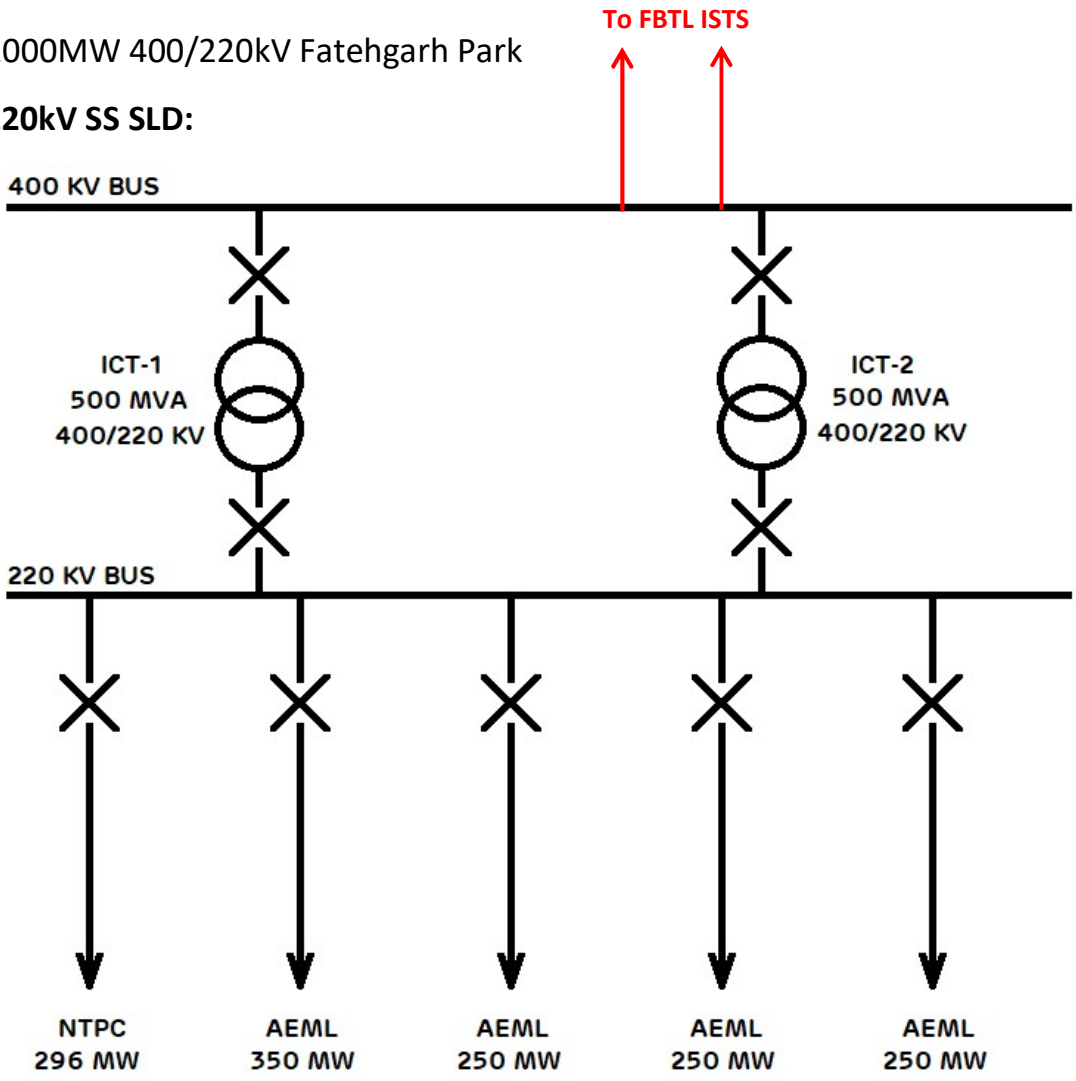
**Further, 220kV Hero Solar energy line at Bhadla substation has been revived by Solar Generator (M/s Hero) at 16:34 hrs.**

----------x----------x----------x----------x----------x----------x----------

# Special Protection Scheme

**PSS:** 1000MW 400/220kV Fatehgarh Park

**400/220kV SS SLD:**




## Pre-Condition:

- In 400/220kV Fatehgarh Solar Park, Following generating plants are connected with grid connectivity of 1000MW.
  1. 296MW NTPC Solar Project
  2. 250MW AEML Solar PSS-1
  3. 350MW AEML Solar PSS-2
  4. 250MW AEML Wind PSS-3
  5. 260MW AEML Wind PSS-4

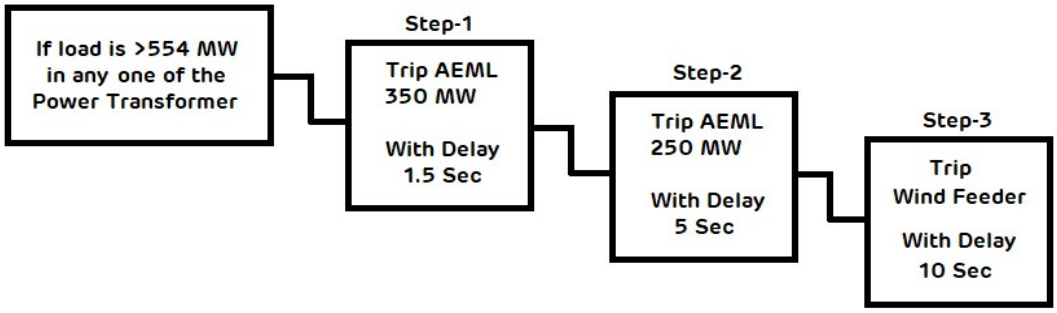
→ **700MW AEML Hybrid Project**

- Total connected generation capacity in 700MW AEML Hybrid project is 1110MW i.e., 600MW Solar & 510MW Wind.
- During normal operating condition Master PPC shall control AEML generation to 700MW at 220kV bus of Fatehgarh Park by curtailing solar generation if total connected generation exceeds > 700MW.
- Normally, both ICTs shall run in parallel condition with maximum generation transfer capacity is **1000MW.**
- Full generation scenario shall be observed during daytime when solar generation is at peak.
- Considering pro-rata generation case of AEML hybrid project. During peak generation, its Solar & Wind component would be generating 380MW & 320MW respectively.

## Need of Special Protection Scheme (SPS)

- During peak or full generation period when cumulative generation on both the ICTs exceeds > 500MW up to 1000MW, if any of one ICT trips then entire load shall be transferred to other ICT leading to overload condition and subsequent tripping.
- To avoid such blackout, total generation should be restricted up to 500MW in above condition by means of shedding generation at 220kV level. Response time of Master PPC to control generation at Inverter or WTG level is not very quick so that tripping of ICT on IDMT O/C protection can be avoided.
- Hence, SPS scheme is required to be developed by using Definite Time (DT) O/C protection in 400kV side numerical relay (RET670) of ICT with multiple O/C stages which would trip multiple feeders with different time delays.
- Three DT O/C stages shall be configured with PS corresponding to 550MVA loading of ICT (considering 10% continuous overload capacity of ICT) with three different time delays which would trip three different 220kV feeders as per the selected priority.
- Time delay setting for DT stages shall be set in coordination with IDMT O/C protection operation time for ICT at different loading conditions and ensured that DT stage shall trip first and overload condition of ICT is avoided.

**SPECIAL PROTECTION SCHEME (SPS) STEPS WITH TIME DELAY:**



+AB

-D12.01
LINE DIST.PROTN.MAIN-1(REL670)

+B.13-XX1.2:2 /39.E3 K102

K101 /39.E5 +B.29-X04:2

-X51

| | | | |
|---|---|---|---|
| DC-2 SUPPLY MCB TRIP | | + 1 | K137 |
| EVENT | | | |
| P5#BI.01 | 220-250VDC | /45.B6 - 2 | -XX1.2 3 |
| SPARE | | + 3 | K139 |
| | | | |
| P5#BI.02 | 220-250VDC | /45.B6 - 4 | |
| MAIN CB R PH.CLOSE | | + 5 | K141 |
| FOR DR PURPOSE | | | |
| P5#BI.03 | 220-250VDC | /45.B6 - 6 | |
| MAIN CB Y PH. CLOSE | | + 7 | K143 |
| FOR DR PURPOSE | | | |
| P5#BI.04 | 220-250VDC | /45.C6 - 8 | |
| MAIN CB B PH.CLOSE | | + 9 | K145 |
| FOR DR PURPOSE | | | |
| P5#BI.05 | 220-250VDC | /45.C6 - 10 | |
| SPARE | | + 11 | K147 |
| | | | |
| P5#BI.06 | 220-250VDC | /45.C6 - 12 | |
| SPARE | | + 13 | K149 |
| | | | |
| P5#BI.07 | 220-250VDC | /45.D6 - 14 | |
| SPARE | | + 15 | K151 |
| | | | |
| P5#BI.08 | 220-250VDC | /45.D6 - 16 | |

K102 /41.A3 +B.13-XX1.2:4

K101 /41.A4 +B.29-X04:11

+AA

-ABX14
16
17

-2MCB01 14 11 12 /32.D3 — I/C DC-2 MCB
-2MCB04 14 11 12 /34.C3 — MAIN-2 RLY MCB
-2MCB07 14 11 12 /34.D3 — ETHERNET SWITCH MCB
-2MCB03 14 11 12 /34.B4 — GR-B TRIP RELAY MCB
-2MCB02 14 11 12 /34.B3 — CB TC-2 MCB

-X04
6
7
8
9
10

-ABX14
12
13
14
15

+52

-52X04
54
55
56
57

-X3A 4 3 — CB OPEN RPH
-X3B 4 3 — CB OPEN YPH
-X3C 4 3 — CB OPEN BPH

REF DRG NO CB: 1HYB907794-0003, SH:8

+CB 400KV ICT-1 (-D12.01)
RET670-1
-X04 14 — SPARE P4#B0.07 — -X04 15

+CB 400KV ICT-2 (-D12.01)
RET670-1
-X04 14 — SPARE P4#B0.07 — -X04 15

| Rev. | Revision note | Date | Name |
|---|---|---|---|
| 01 | AS PER CUSTOMER COMMENTS | 10-07-2020 | HV |

Based on 3100063452

1MYN691003-102(A3)REV01

| | | |
|---|---|---|
| Prepared | 05-03-2020 | DEENADAYALAN A |
| Approved | 06-03-2020 | THIRUVENKADAM N |
| Project | ADANI RENEWABLE ENERGY PARK<br>400/220kV POOLING STATION AT FATEHGARH<br>3100108143 | |

Title: 220kV CONTROL & RELAY PANEL
220kV LINE CRP
MAIN-1 PROTN. CKTS- BIM

ABB INDIA LTD

| | | | |
|---|---|---|---|
| Doc. kind. | Circuit diagram | Ref.Des. | =2R |
| DCC | EFS | | |
| Resp. dept. | PG-GAS | Rev. ind. | 01 |
| Doc. no. | 1MNS500329-CADC | Language | en |
| | | Sheet | 40 |
| | | n. sheet | 41 |

+CB 400KV ICT-1

-D12.01
RET670-1-87T-67/67HV-99 IV-50/51LV

| | | | | | |
|---|---|---|---|---|---|
| TAP POSITION RAISE / P4#BO.03 | /56,B2 | -X41 5 | K167 | -X04 11 | -RX2 37 COMMON |
| | | 4 | K169 | 12 | 38 TAP POSITION RAISE |
| TAP POSITION LOWER / P4#BO.04 | /56,C2 | -X41 6 | K171 | 13 | 39 TAP POSITION LOWER |
| O/C STAGE-1 TIME DELAY 1.5Sec<br>SPARE / P4#BO.07 | /56,C2 | -X41 11 | K173 | 14 | |
| | | 10 | K175 | 15 | |
| GENERAL TRIP / P4#BO.08 | /56,D2 | -X41 12 | K177 | 16 | |
| O/C STAGE-2 TIME DELAY 5Sec<br>SPARE / P4#BO.09 | /56,D2 | -X41 14 | K179 | 17 | |
| | | 13 | K181 | 18 | |
| SPARE / P4#BO.10 | /56,D2 | -X41 15 | K183 | 19 | |
| O/C STAGE-3 TIME DELAY 10Sec<br>SPARE / P4#BO.11 | /56,E2 | -X41 17 | K185 | 20 | |
| | | 16 | K187 | 21 | |
| SPARE / P4#BO.12 | /56,E2 | -X41 18 | K189 | 22 | |

+RTCC
REF. ABB DRG NO. 2XYN464035C2114
SH No. 2

400KV ICT-2 O/C STAGE-1 (T= 1.5Sec)
SPARE / P4#BO.07 /56,C2

+AB 220KV LINE FEEDER-1
K101 -X04 6
-X04 7
-XX1:2 3 K102
SPS O/C STAGE-1 OPTD
SPARE (~~SPS O/C STAGE-1~~)
BINARY INPUT-2
P5#BI.02 220-250VDC /45,B6 (+ / -)

400KV ICT-2 O/C STAGE-2 (T= 5Sec)
SPARE / P4#BO.07 /56,C2

+AB 220KV LINE FEEDER-2
K101 -X04 6
-X04 7
-XX1:2 3 K102
SPS O/C STAGE-2 OPTD
SPARE
BINARY INPUT-2
P5#BI.02 220-250VDC /45,B6 (+ / -)

400KV ICT-2 O/C STAGE-3 (T= 10Sec)
SPARE / P4#BO.07 /56,C2

+AB 220KV LINE FEEDER-3
K101 -X04 6
-X04 7
-XX1:2 3 K102
SPS O/C STAGE-3 OPTD
SPARE
BINARY INPUT-2
P5#BI.02 220-250VDC /45,B6 (+ / -)

| | | | |
|---|---|---|---|
| Based on 3100101730 | | | |
| 01 | AS PER CUSTOMER COMMENTS | 16.06.2020 | RPV |
| Rev. | Revision note | Date | Name |

1MYN691003-102(A3)REV01

| | |
|---|---|
| Prepared | 10.12.2019 DEENADAYALAN A |
| Approved | 10.12.2019 THIRUVENKADAM N |
| Project | ADANI RENEWABLE ENERGY PARK<br>400/220kV SUBSTATION AT FATEHGARH<br>3100108143 |

Title: 400KV ICT CONTROL & RELAY PANEL
400/220/33kV ICT BAY
TRAFO. DIFF. RLY. O/P CKT.

ABB INDIA LTD

| | | | |
|---|---|---|---|
| Doc. kind. | Circuit diagram | Ref.Des. | =4R |
| DCC | EFS | | |
| Resp. dept. | PG-GAS | Rev. ind. 01 | Language en |
| Doc. no. | 1MNS500329-CDCA | Sheet | 53 |
| | | n. sheet | 54 |

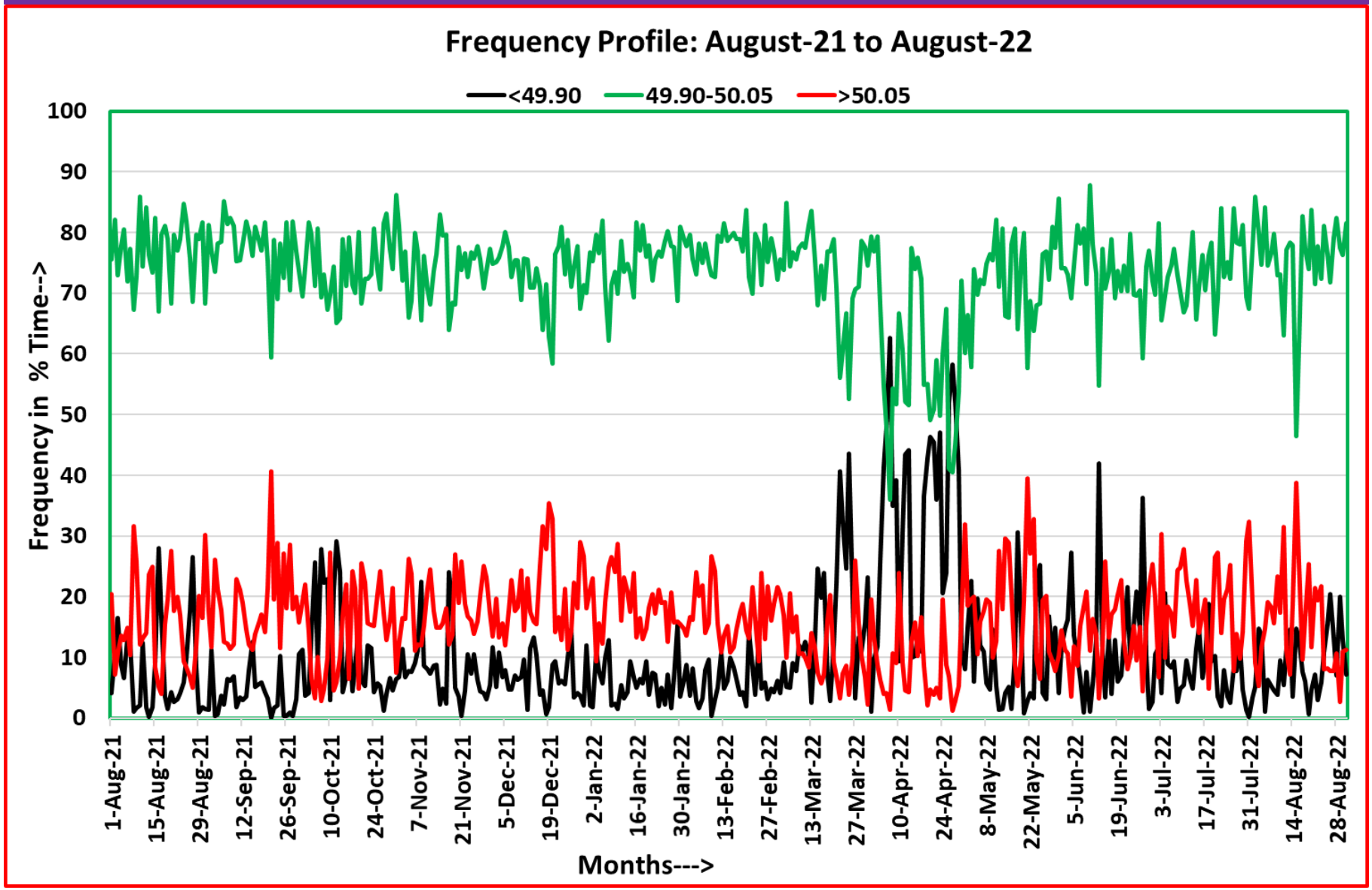
Annexure-B.I

# प्रचालन समन्वय उपसमिति की बैठक
# अगस्त - 2022

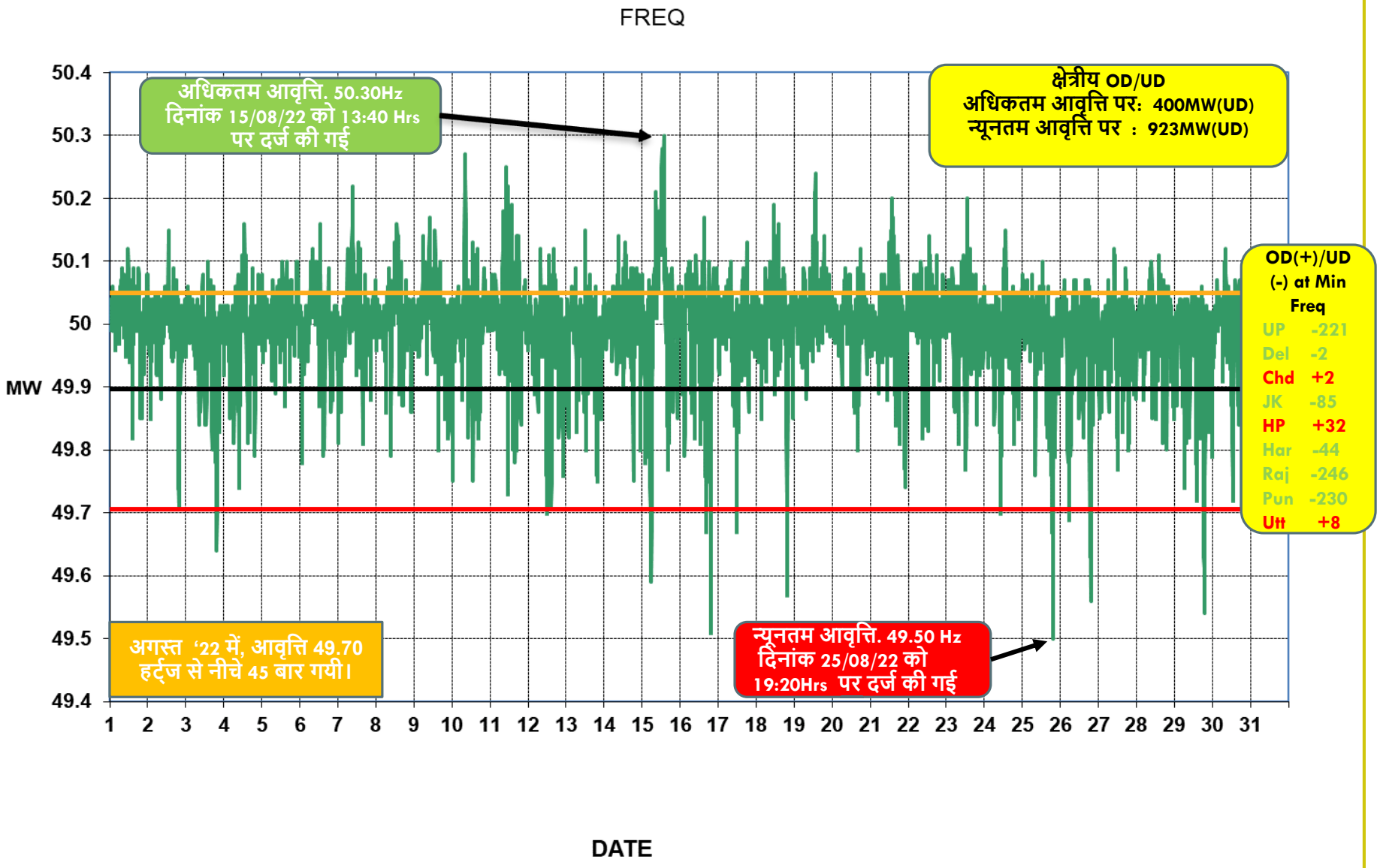
# पिछले एक साल मे आवृत्ति की स्थिति

| आवृत्ति बैंड | अगस्त 2021 | सितम्बर 2021 | अक्टूबर 2021 | नवम्बर 2021 | दिसम्बर 2021 | जनवरी 2022 | फ़रवरी 2022 | मार्च 2022 | अप्रैल 2022 | मई 2022 | जून 2022 | जुलाई 2022 | अगस्त 2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| < 49.7 Hz(%) | 0.17 | 0.21 | 0.31 | 0.09 | 0.03 | 0.02 | 0.08 | 0.46 | 4.94 | 0.27 | 0.42 | 0.42 | 0.49 |
| <49.8 Hz(%) | 1.3 | 0.69 | 2.43 | 1.17 | 0.71 | 0.53 | 0.55 | 2.92 | 13.60 | 1.94 | 2.41 | 1.78 | 2.02 |
| <49.9 Hz(%) | 7.67 | 4.18 | 11.10 | 8.02 | 6.92 | 5.84 | 5.99 | 14.50 | 31.98 | 9.83 | 12.45 | 7.82 | 8.77 |
| 49.90-50.05 Hz(%) | **76.93** | **77.01** | **74.38** | **74.10** | **73.14** | **75.66** | **77.06** | **73.42** | **59.30** | **72.23** | **73.38** | **73.45** | **75.77** |
| 50.05-50.10 Hz(%) | 14.14 | 15.83 | 12.70 | 14.77 | 15.09 | 15.17 | 14.36 | 10.28 | 7.35 | 12.95 | 11.46 | 14.84 | 11.99 |
| >50.10 Hz(%) | 1.25 | 2.26 | 1.81 | 3.05 | 3.89 | 3.21 | 2.51 | 1.72 | 1.35 | 4.11 | 2.43 | 3.58 | 3.00 |
| >50.20 Hz(%) | 0.01 | 0.03 | 0.06 | 0.07 | 0.25 | 0.11 | 0.08 | 0.08 | 0.08 | 0.88 | 0.28 | 0.31 | 0.47 |
| औसत आवृत्ति | 50.00 | 50.00 | 49.99 | 50.00 | 50.00 | 50.00 | 50.00 | 49.98 | 49.93 | 50.00 | 49.99 | 50.00 | 50.00 |

# आवृत्ति की स्थिति: अगस्त -2021 से 2022



# अगस्त -2022 के दौरान आवृत्ति की स्थिति
## (As per 5 Minute SCADA data)

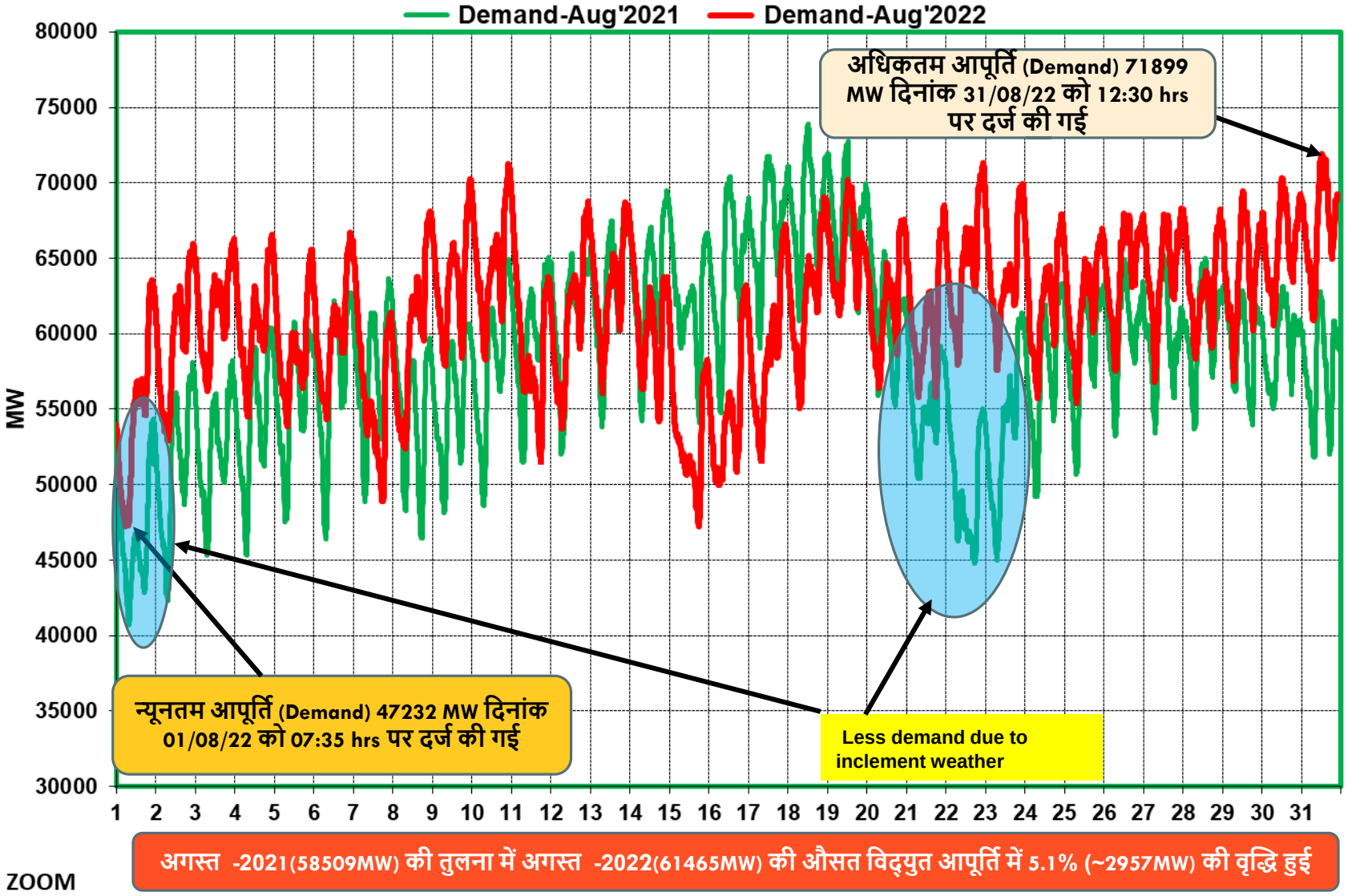


# अगस्त -2022 के दौरान अधिकतम मांग (Demand Met), अधिकतम ऊर्जा खपत (Energy consumption) और अब तक का कीर्तिमान (राज्यों द्वारा जमा आंकड़ों के अनुसार)

| राज्य | अधिकतम मांग (MW) (in July'22) | दिनांक / समय | रिकॉर्ड अधिकतम मांग (in MW) (upto June'22) | दिनांक / समय | अधिकतम ऊर्जा खपत (MU) (in July'22) | दिनांक | रिकॉर्ड अधिकतम ऊर्जा खपत (MU) (Upto June'22) | दिनांक |
|---|---|---|---|---|---|---|---|---|
| पंजाब | 14295 | 22.08.22 at 14:45 | 14207 | 29.06.22 को 12:30 बजे | 322.28 | 23.08.22 | 334.45 | 29.06.22 |
| हरियाणा | 12015 | 30.08.22 at 12:30 | 12768 | 28.06.22 को 11:56 बजे | 247.16 | 31.08.22 | 266.15 | 07.07.21 |
| राजस्थान | 13808 | 31.08.22 at 11:00 | 16012 | 28.06.22 को 14:00 बजे | 279.52 | 31.08.22 | 323.84 | 09.06.22 |
| दिल्ली | 6388 | 10.08.22 at 24:00 | 7695 | 29.06.22 को 15:10 बजे | 131.35 | 10.08.22 | 153.52 | 28.06.22 |
| उत्तर प्रदेश | 25437 | 18.08.22 at 23:00 | 25951 | 15.07.22 को 23:00 बजे | 547.360 | 19.08.22 | 541.77 | 08.07.22 |
| उत्तराखंड | 2339 | 26.08.22 at 21:00 | 2594 | 14.06.22 को 21:00 बजे | 50.28 | 26.08.22 | 54.27 | 15.06.22 |
| हिमाचल प्रदेश | 1711 | 08.08.22 at 09:30 | 2030 | 07.01.22 को 10:00 बजे | 34.91 | 10.08.22 | 36.91 | 28.06.22 |
| जम्मू और कश्मीर (UT) तथा लद्दाख़ (UT) | 2783 | 23.08.22 at 08:00 | 2826 | 03.02.22 को 19:00 बजे | 54.41 | 19.08.22 | 59.95 | 17.01.22 |
| चंडीगढ़ | 381 | 23.08.22 at 15:00 | 426 | 08.07.21 को 15:00 बजे | 7.34 | 23.08.22 | 8.41 | 08.07.21 |
| उत्तरी क्षेत्र # | 71899 | 31.08.22 at 12:30 | 77006 | 28.06.22 को 11:50 बजे | 1618.68 | 31.08.22 | 1737.09 | 28.06.22 |

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

# क्षेत्रीय विद्युत आपूर्ति (Demand) अगस्त 2021 बनाम अगस्त 2022 (As per 5 Minute SCADA data)

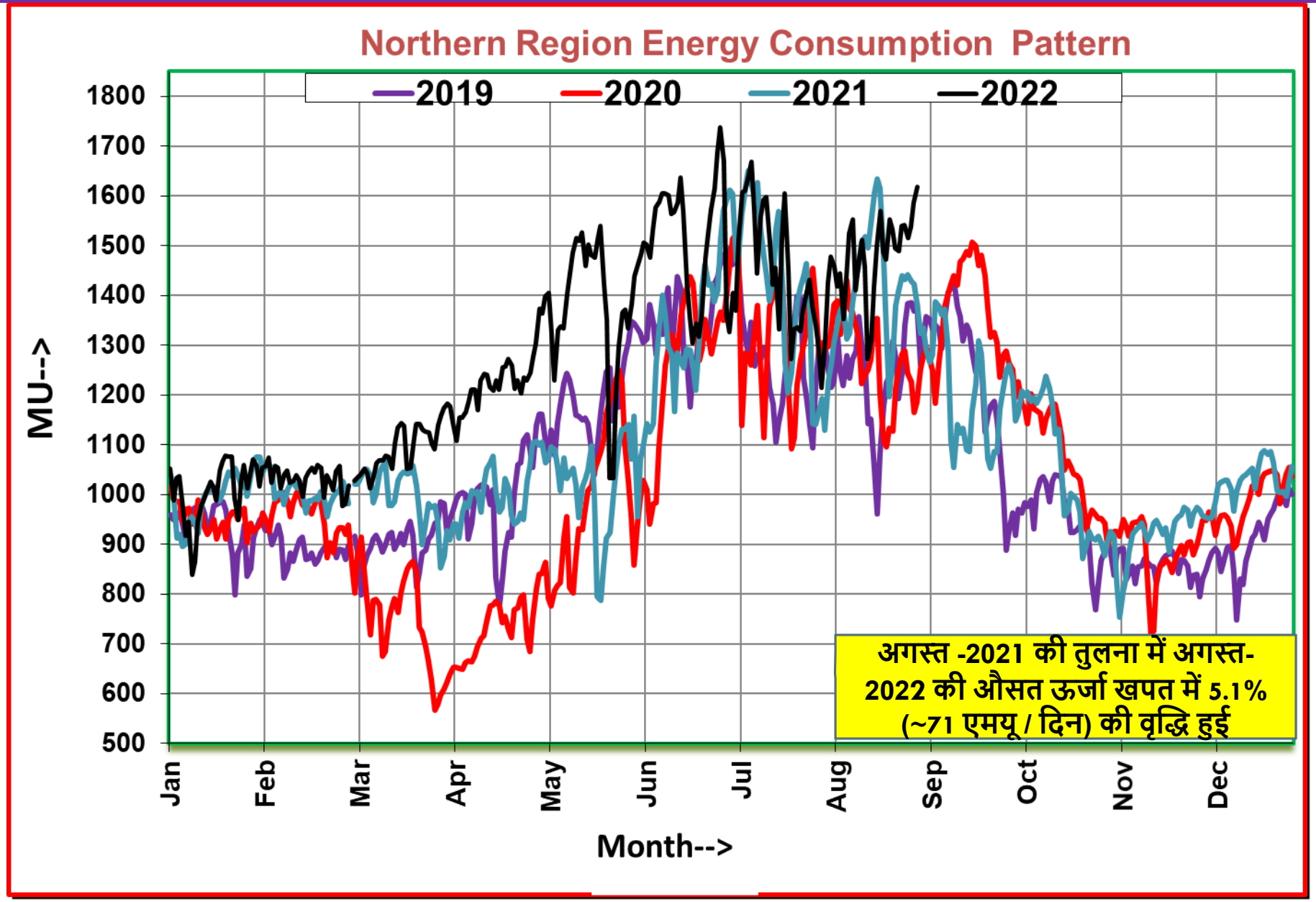



अगस्त -2021(58509MW) की तुलना में अगस्त -2022(61465MW) की औसत विद्युत आपूर्ति में 5.1% (~2957MW) की वृद्धि हुई

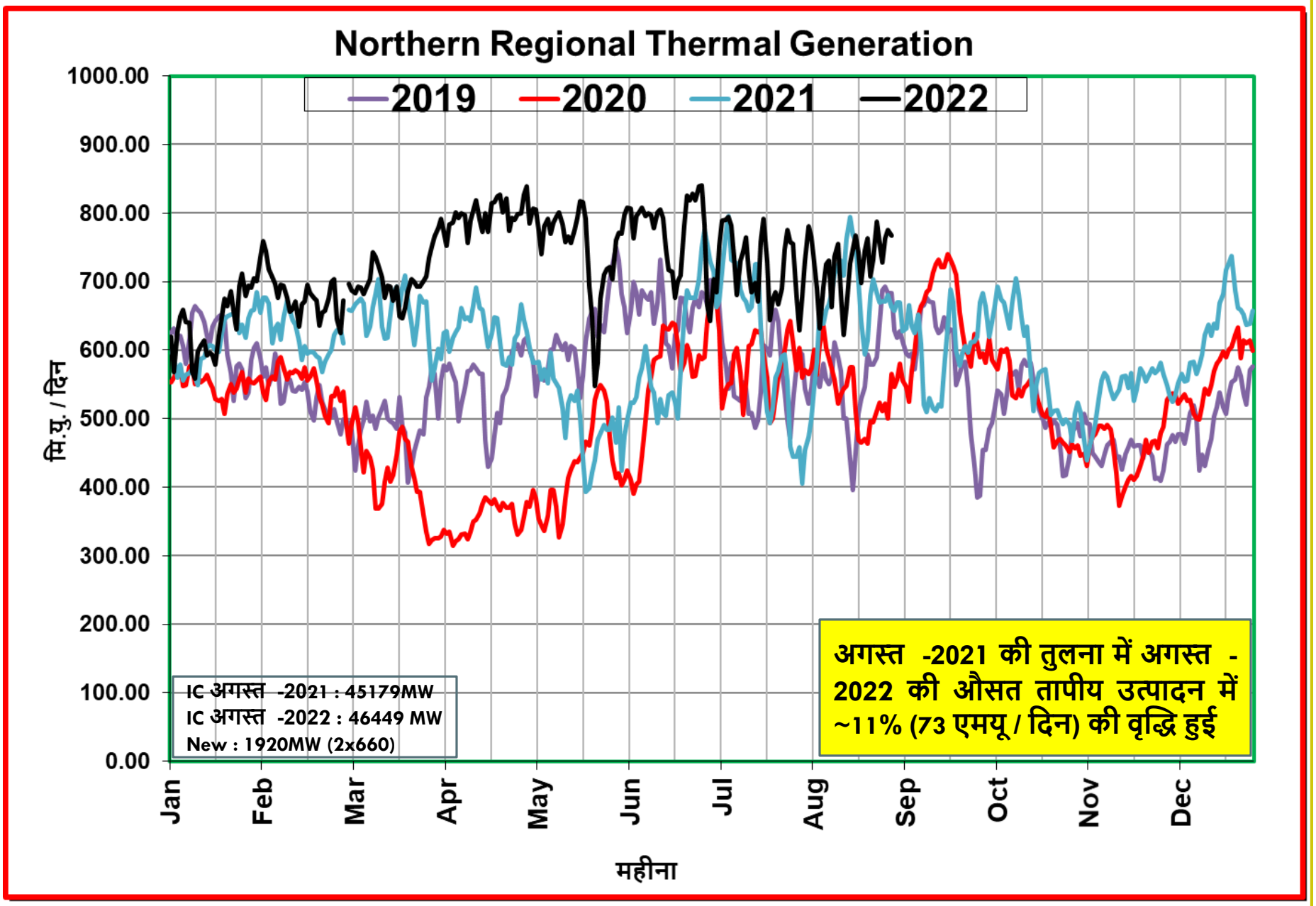
# उत्तरी क्षेत्र की औसत ऊर्जा खपत में वृद्धि( % में) अगस्त -2022/ अगस्त -2021 / अगस्त -2020

| राज्य | अगस्त -2020 | अगस्त -2021 | अगस्त -2022 | % वृद्धि (अगस्त -2021 vs अगस्त -2020 ) | % वृद्धि (अगस्त -2022 vs अगस्त -2021 ) |
|---|---|---|---|---|---|
| पंजाब | 243.79 | 267.27 | 290.80 | 9.63% | **8.80%** |
| हरियाणा | 185.43 | 207.16 | 216.66 | 11.72% | **4.59%** |
| राजस्थान | 219.78 | 264.51 | 236.49 | 20.35% | **-10.59%** |
| दिल्ली | 101.74 | 113.68 | 119.08 | 11.74% | **4.74%** |
| उत्तर प्रदेश | 402.59 | 423.85 | 474.99 | 5.28% | **12.07%** |
| उत्तराखंड | 39.08 | 42.47 | 46.17 | 8.65% | **8.73%** |
| चंडीगढ़ | 5.57 | 6.02 | 6.59 | 8.12% | **9.43%** |
| हिमाचल प्रदेश | 29.92 | 31.37 | 31.62 | 4.83% | **0.80%** |
| जम्मू और कश्मीर (UT) तथा लद्दाख़ (UT) | 44.08 | 45.75 | 51.22 | 3.80% | **11.96%** |
| उत्तरी क्षेत्र | 1271.98 | 1402.08 | 1473.63 | 10.23% | **5.10%** |

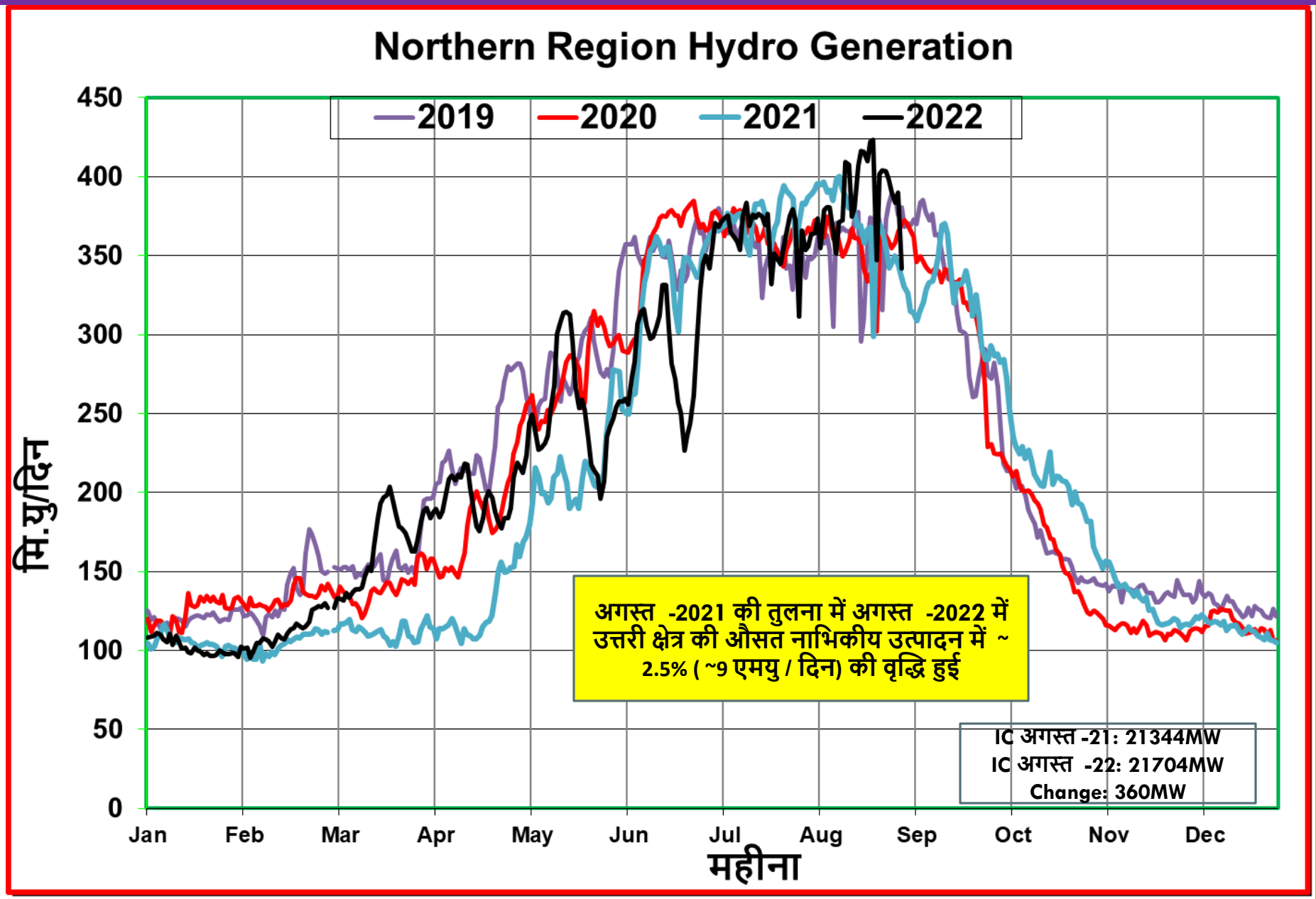
# उत्तरी क्षेत्र की ऊर्जा खपत(MUs)



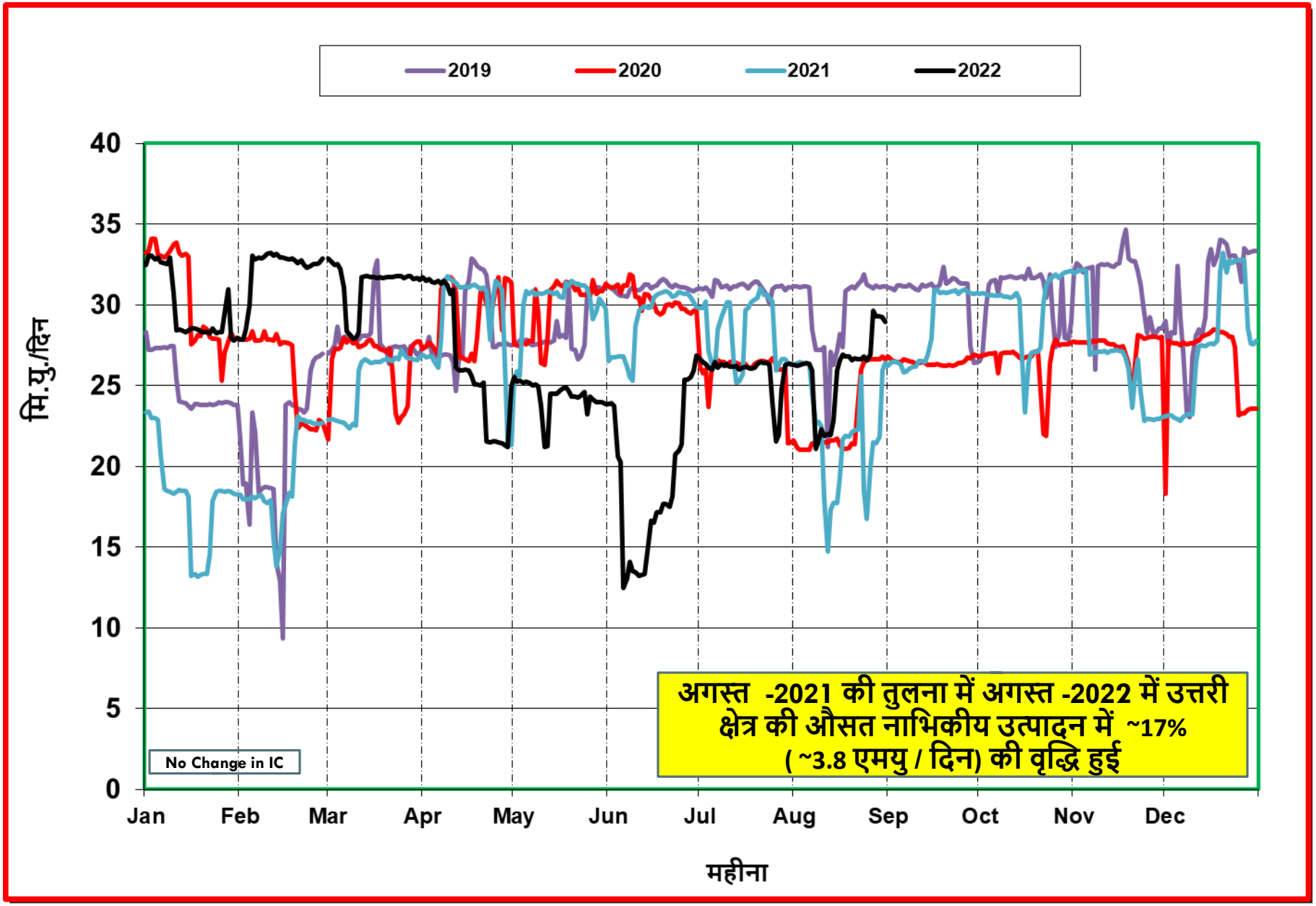
# उत्तरी क्षेत्र की तापीय (Thermal) उत्पादन की स्थिति(Mus/Day)



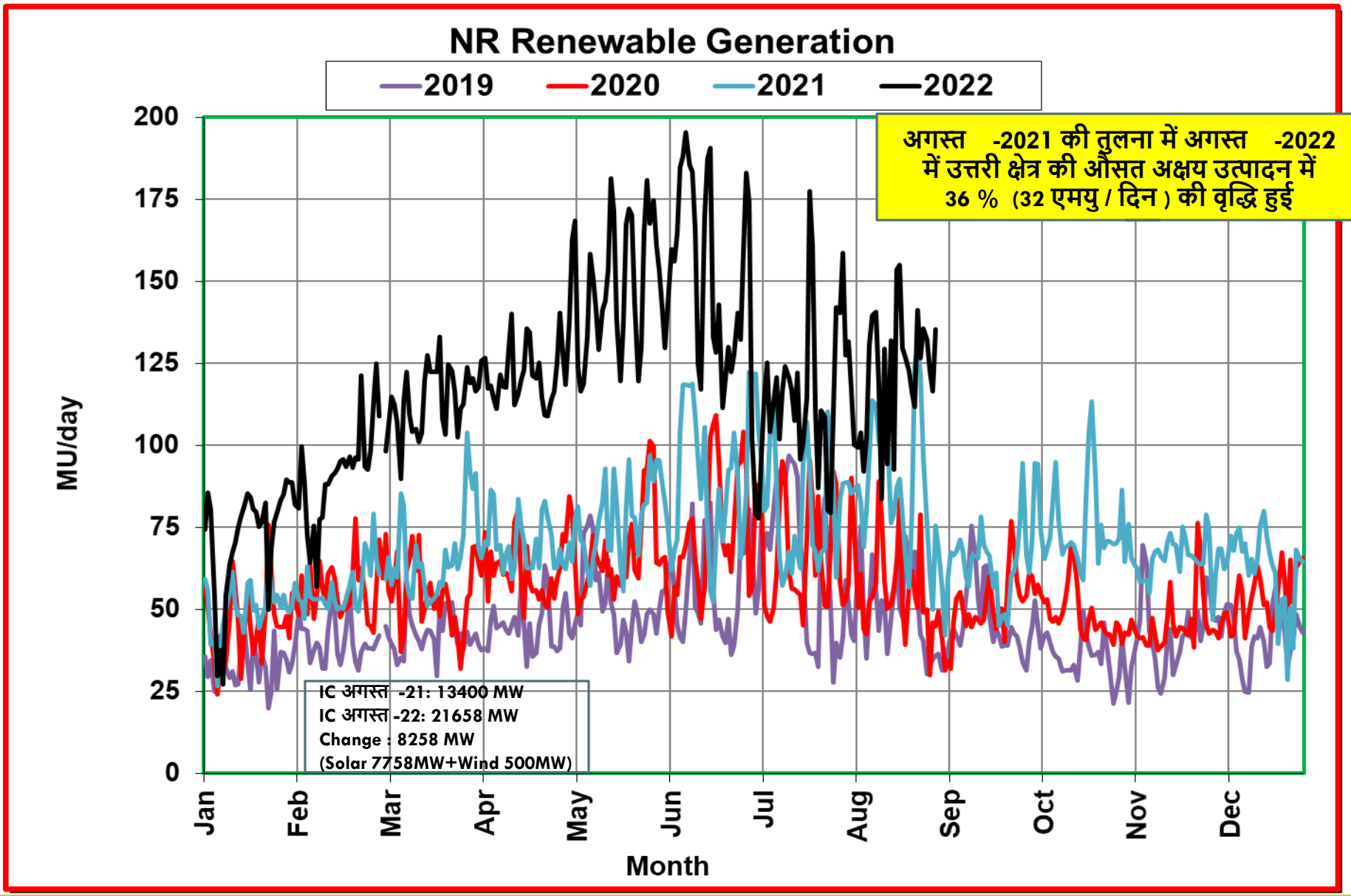
# उत्तरी क्षेत्र की जलीय (हाइड्रो) उत्पादन की स्थिति(Mus/Day)



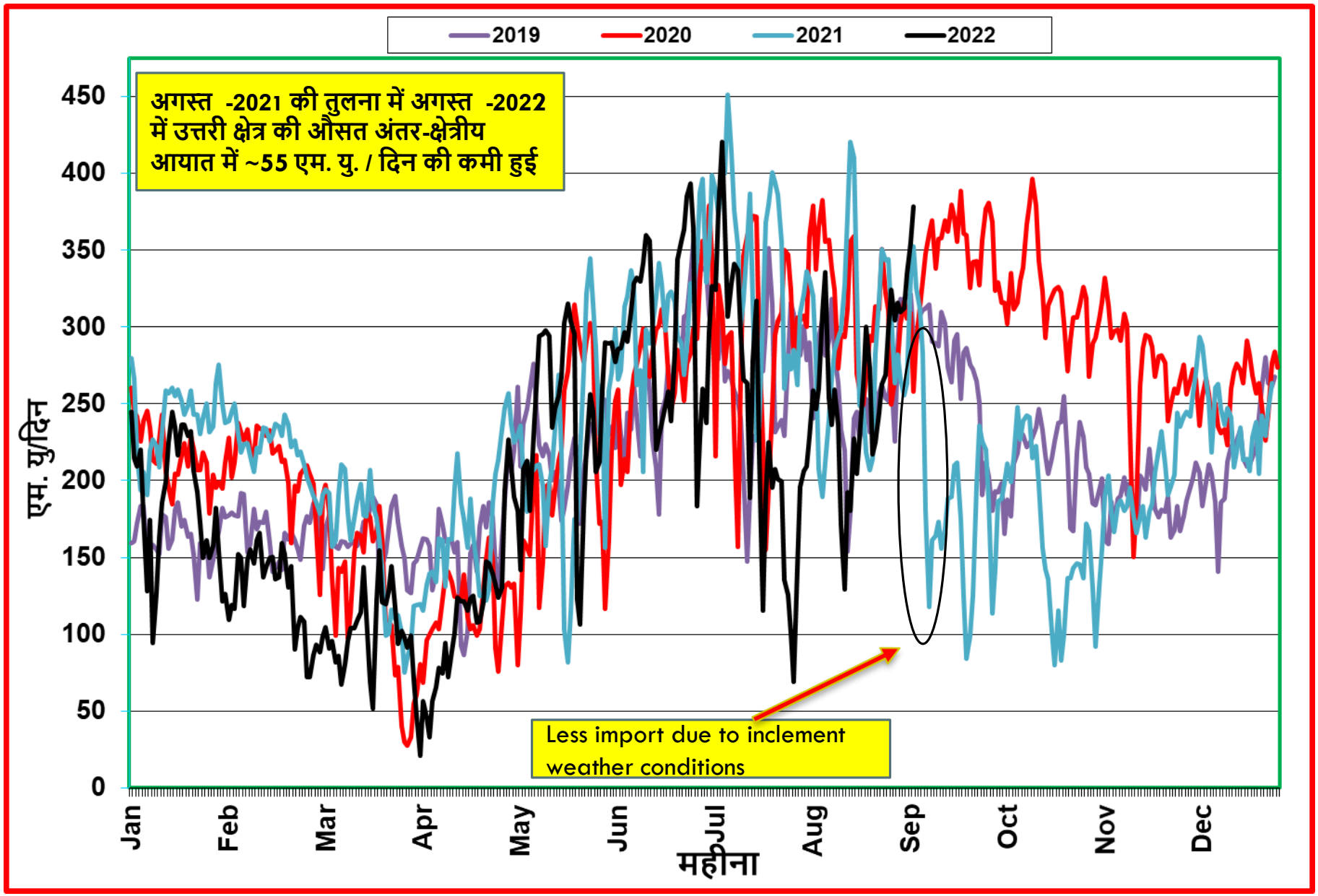
# उत्तरी क्षेत्र की नाभिकीय उत्पादन की स्थिति (Mus/Day)



# उत्तरी क्षेत्र की अक्षय (Renewable) उत्पादन की स्थिति (Mus/Day)



# अंतर-क्षेत्रीय आयात(Mus/Day) की स्थिति



# RE Penetration

| | Maximum Daily MU Penetration | | | |
|---|---|---|---|---|
| | August '2022 | | Record upto July'2022 | |
| | Max % Penetration | Date | Max % Penetration | Date |
| Punjab | 3.85 | 01-08-2022 | 12.28 | 01-04-2020 |
| Rajasthan | 35.81 | 18-08-2022 | 36.47 | 22-10-2021 |
| UP | 2.14 | 09-08-2022 | 4.07 | 30-10-2021 |
| NR | 10.25 | 18-08-2022 | 13.91 | 21-05-2022 |

| | Maximum Instantaneous Penetration in MW | | | |
|---|---|---|---|---|
| | August '2022 | | Record upto July'2022 | |
| | Max % Penetration | Date | Max % Penetration | Date |
| Punjab | 4.64 | 01-08-2022 | 26.87 | 22-04-2020 |
| Rajasthan | 56.00 | 18-08-2022 | 68.38 | 31-03-2020 |
| UP | 8.03 | 16-08-2022 | 15.13 | 01-04-2021 |
| NR | 25.50 | 16.08-2022 | 32.84 | 22-02-2022 |

# वास्तविक सारांश -
# अगस्त -2021 वनाम अगस्त -2022

| | अगस्त -2021 (मि.यु. /दिन) | अगस्त -2022 (मि.यु. /दिन) | अगस्त माह में वृद्धि (मि.यु./दिन) |
|---|---|---|---|
| तापीय (Thermal) उत्पादन | 651.56 | 725.22 | 73.66 |
| जलीय (Hydro) उत्पादन | 372.53 | 381.81 | 9.27 |
| नाभिकीय (Nuclear) उत्पादन | 22.12 | 25.93 | 3.81 |
| अंतर-क्षेत्रीय (Inter-Regional) कुल आयात | 293.18 | 238.35 | -54.84 |
| अक्षय (Renewable) उत्पादन | 89.52 | 121.32 | 31.80 |
| **कुल उपलब्धता** | **1428.91** | **1492.63** | **63.7** |

B.20

| Outage Summary For August 2022 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| CONSTITUENTS | PLANNED (A) | FORCED OUTAGES (B=C+D) | EMERGENCY SHUTDOWNS (C) | TRIPPING (D) | % PLANNED SHUTDOWNS (A/(A+C)) | % EMERGENCY SHUTDOWNS(C/(A+C)) | % ESD SHUTDOWNS(C/B) | % TRIPPING (D/B) | TOTAL OUTAGES (A+B) |
| POWERGRID | 201 | 158 | 93 | 65 | 68.4% | 31.6% | 58.9% | 41.1% | 359 |
| UPPTCL | 77 | 160 | 65 | 95 | 54.2% | 45.8% | 40.6% | 59.4% | 237 |
| RRVPNL | 42 | 71 | 34 | 37 | 55.3% | 44.7% | 47.9% | 52.1% | 113 |
| HVPNL | 35 | 34 | 21 | 13 | 62.5% | 37.5% | 61.8% | 38.2% | 69 |
| BBMB | 16 | 38 | 7 | 31 | 69.6% | 30.4% | 18.4% | 81.6% | 54 |
| DTL | 1 | 30 | 9 | 21 | 10.0% | 90.0% | 30.0% | 70.0% | 31 |
| PTCUL | 7 | 17 | 4 | 13 | 63.6% | 36.4% | 23.5% | 76.5% | 24 |
| Adani Solar | 7 | 16 | 5 | 11 | 58.3% | 41.7% | 31.3% | 68.8% | 23 |
| PSTCL | 5 | 18 | 6 | 12 | 45.5% | 54.5% | 33.3% | 66.7% | 23 |
| PKTSL | 16 | 1 | 1 | 0 | 94.1% | 5.9% | 100.0% | 0.0% | 17 |
| AEPL | 8 | 6 | 6 | 0 | 57.1% | 42.9% | 100.0% | 0.0% | 14 |
| PDD JK | 3 | 11 | 2 | 9 | 60.0% | 40.0% | 18.2% | 81.8% | 14 |
| Renew Solar | 6 | 8 | 5 | 3 | 54.5% | 45.5% | 62.5% | 37.5% | 14 |
| NTPC | 6 | 5 | 3 | 2 | 66.7% | 33.3% | 60.0% | 40.0% | 11 |
| HPPTCL | 0 | 10 | 0 | 10 | 0.0% | 0.0% | 0.0% | 100.0% | 10 |
| NRSS XXIX | 8 | 0 | 0 | 0 | 100.0% | 0.0% | 0.0% | 0.0% | 8 |
| ATIL | 0 | 7 | 7 | 0 | 0.0% | 100.0% | 100.0% | 0.0% | 7 |
| Cleansolar_Jodhpur | 2 | 4 | 1 | 3 | 66.7% | 33.3% | 25.0% | 75.0% | 6 |
| FBTL | 1 | 5 | 0 | 5 | 100.0% | 0.0% | 0.0% | 100.0% | 6 |
| ACME | 2 | 2 | 2 | 0 | 50.0% | 50.0% | 100.0% | 0.0% | 4 |
| Azure | 1 | 3 | 0 | 3 | 100.0% | 0.0% | 0.0% | 100.0% | 4 |
| Tata Power | 2 | 2 | 1 | 1 | 66.7% | 33.3% | 50.0% | 50.0% | 4 |
| Chandigarh SEB | 0 | 4 | 0 | 4 | 0.0% | 0.0% | 0.0% | 100.0% | 4 |
| ABC RJ01 | 1 | 2 | 1 | 1 | 50.0% | 50.0% | 50.0% | 50.0% | 3 |
| Saurya Urja | 2 | 1 | 0 | 1 | 100.0% | 0.0% | 0.0% | 100.0% | 3 |
| SBSRPC-11 | 3 | 0 | 0 | 0 | 100.0% | 0.0% | 0.0% | 0.0% | 3 |
| ARP1PL | 2 | 0 | 0 | 0 | 100.0% | 0.0% | 0.0% | 0.0% | 2 |
| GPTL | 0 | 2 | 2 | 0 | 0.0% | 100.0% | 100.0% | 0.0% | 2 |
| NPCIL | 0 | 2 | 2 | 0 | 0.0% | 100.0% | 100.0% | 0.0% | 2 |
| PFTL | 0 | 2 | 0 | 2 | 0.0% | 0.0% | 0.0% | 100.0% | 2 |
| ESUCRL | 1 | 0 | 0 | 0 | 100.0% | 0.0% | 0.0% | 0.0% | 1 |
| NHPC | 1 | 0 | 0 | 0 | 100.0% | 0.0% | 0.0% | 0.0% | 1 |
| PUTL | 1 | 0 | 0 | 0 | 100.0% | 0.0% | 0.0% | 0.0% | 1 |
| RAILWAYS | 1 | 0 | 0 | 0 | 100.0% | 0.0% | 0.0% | 0.0% | 1 |
| MAHINDRA | 0 | 1 | 1 | 0 | 0.0% | 100.0% | 100.0% | 0.0% | 1 |
| ADHPL | 0 | 1 | 0 | 1 | 0.0% | 0.0% | 0.0% | 100.0% | 1 |
| EDEN (ERCPL) | 0 | 1 | 0 | 1 | 0.0% | 0.0% | 0.0% | 100.0% | 1 |
| Greenko Budhil | 0 | 1 | 0 | 1 | 0.0% | 0.0% | 0.0% | 100.0% | 1 |
| Mega_SuryaUrja | 0 | 1 | 0 | 1 | 0.0% | 0.0% | 0.0% | 100.0% | 1 |
| NHPC | 0 | 1 | 0 | 1 | 0.0% | 0.0% | 0.0% | 100.0% | 1 |
| PKTCL | 0 | 1 | 0 | 1 | 0.0% | 0.0% | 0.0% | 100.0% | 1 |
| TOTAL | 458 | 626 | 278 | 348 | 62.2% | 37.8% | 44.4% | 55.6% | 1084 |

B.20

## OUTAGE SUMMARY OF LAST THREE MONTHS

| MONTH | PLANNED | FORCED OUTAGES | EMERGENCY SHUTDOWNS | TRIPPING | % PLANNED as of TOTAL S/D | % EMERGENCY SHUTDOWNS | TOTAL OUTAGES (A+B) |
|---|---|---|---|---|---|---|---|
| | (A) | (B=C+D) | (C) | (D) | (A/(A+C)) | (C/(A+C)) | |
| May-22 | 666 | 1060 | 366 | 694 | 64.5% | 35.5% | 1726 |
| June-22 | 640 | 766 | 363 | 403 | 63.8% | 36.2% | 1406 |
| July-22 | 453 | 720 | 303 | 417 | 59.9% | 40.1% | 1173 |
| **August-22** | **458** | **626** | **278** | **348** | **62.2%** | **37.8%** | **1084** |

B.20

# New Elements First Time Charged During July 2022

| S. No. | Type of transmission element | Total No |
|---|---|---|
| 1 | 220kV lines modification | 01 |
| 2 | 220kV lines | 02 |
| 3 | 400kV, 220 kV Bays & Buses | 03 |
| Total New Elements charged | | 6 |

**B.20**

| TRANSMISSION LINES MODIFICATION | | | | | | |
|---|---|---|---|---|---|---|
| **S.NO.** | **Agency/Owner** | **LINE NAME** | **Length (KM)** | **Conductor Type** | **DATE** | **Remarks** |
| 1 | PSTCL | 220kV Kartarpur(PS)-Jalandhar(PG)-2 | 5.82 | HTLS | 03-Aug-22 | Replacement of ACSR conductor with HTLS conductor |

| LILO OF TRANSMISSION LINES | | | | | | |
|---|---|---|---|---|---|---|
| **S.NO.** | **Agency/Owner** | **LINE NAME** | **Length (KM)** | **Conductor Type** | **DATE** | **Remarks** |
| 1 | UPPTCL | 220kV Mainpuri(PG)-Farrukhabad (UP)-1 | 42.875 (LILO Length-7.975 Kms) | ZEBRA | 03-Aug-22 | After LILO of 220 KV MAINPURI(PG)-NEEBKARORI CKT-I at 220 KV FARRUKHABAD |
| 2 | UPPTCL | 220kV Mallawan (UP)-Shahjahanpur(PG)-1 | 101.818 (LILO Length-43.146 Kms) | ZEBRA | 03-Aug-22 | After LILO of 220 KV SHAHJAHANPUR(PG)- HARDOI LINE at 220 KV MALLAWAN |

**B.20**

| GENERATING UNITS | | | | | | |
|---|---|---|---|---|---|---|
| **SL. NO.** | **Location** | **OWNER/UNIT NAME** | **Unit No/Source** | **Capacity added (MW)** | **Total/Installed Capacity (MW)** | **DATE** |
| 1 | Rajasthan | Thar Surya1_Bikaner (PG) | Solar | 9 | 300 | 01.08.2022 |
| 2 | Rajasthan | Thar Surya1_Bikaner (PG) | Solar | 27 | 225 | 05.08.2022 |
| 3 | Rajasthan | AHEJ4L PSS3(Adani)_Fatehgarh I(Adani) | Wind | 32 | 250 | 30.08.2022 |
| 4 | Rajasthan | AHEJ4L PSS4(Adani)_Fatehgarh I(Adani) | Wind | 19.2 | 260 | 22.08.2022 |
| 5 | Rajasthan | AHEJ4L PSS4(Adani)_Fatehgarh I(Adani) | Wind | 16.8 | 260 | 30.08.2022 |
| | | **Total Solar Generation addition** | | **36** | | |
| | | **Total Wind Generation addition** | | **68** | | |


धन्यवाद

An ISO 9001:2000
Certified Company

**RAJASTHAN RAJYA VIDYUT PRASARAN NIGAM LIMITED.**
[Corporate Identity Number (CIN):U40109RJ2000SGC016485]
(Regd. Office: Vidyut Bhawan, Jan Path, Jyoti Nagar, Jaipur - 302 005)
**OFFICE OF THE SUPERINTENDING ENGINEER (P&P)**
Room No. 336, Vidyut Bhawan, Jyoti Nagar, Jaipur Tel. No 0141-2740623
e-mail:se.pp @rvpn.co.in WEBSITE :https://energy.rajasthan.gov.in/rvpnl

*No. RVPN/CE (PP&D)/SE (P&P)/XEN-I/AE-I/ F. /D 971 Jaipur, Dt 08.08.2022*

## Revised Administrative & Financial Sanction

**Ref:** - The letter no. RVPN/CE(PP&D)/SE(Automation)/XEN-1/F. /D. 821 dated 16.10.2019

The Board of Directors of RVPN in its 303rd meeting held on dated 26.7.2022 has accorded its revised adminstrative and financial sanction for "**RVPN transmission system uprating, upgrade and strengthening scheme for renewable energy evacuation in Western Rajasthan**"; at an aggregated estimated cost of **Rs. 8029.3069 crore** (excluding IDC) **Rs. 8776.2946 crore** (including IDC) as per the Detailed Project Report (DPR) enclosed herewith. The brief abstract of the scheme is given hereunder:

**PART-A: RVPN transmission system uprating, upgrade and strengthening scheme for renewable energy evacuation in western Rajasthan**

| S. No. | Scheme/ Project Description | Cost Estimate (in Rs. Cr) | |
|---|---|---|---|
| | | Without IDC | With IDC |
| **I** | **765/400 kV Substation Jodhpur (Kankani) (Upg.) alongwith associated Lines** | | |
| i | 2x 1500 MVA, 765/400 kV Substation by Upgrading 400 kV GSS Kankani to 765 kV GSS, 1 x 330 MVAR 765 kV Bus Reactor, 4 Nos. Terminal 765 kV Bays with Switchable 4 x 330 MVAR Line Reactor, 2 Nos. of 400 kV Diameter, 2 Nos. of 765/400 kV Transformer Incomers | 746.8120 | 820.3730 |
| ii | 2 Nos. of 765 kV Terminal Bays at existing 765 kV GSS Phagi with Switchable 2 x 240 MVAR Line Reactors | 172.6960 | 189.7066 |
| iii | 300 km 765 kv D/C Line with Hex Zebra Conductor in each phase between 765 kV GSS Phagi and Proposed 765/400 kV GSS Jodhpur (Kankani) | 1893.3608 | 2079.8569 |
| | **Total(I)** | **2812.8688** | **3089.9365** |
| II | **765/400 kV Substation Jaisalmer (New Location) alongwith associated Lines** | | |
| i | 3 x 1500 MVA, 765/400 kV Substation Jaisalmer (New Location) | **829.5089** | **911.2155** |
| ii | 70 kM D/C Twin HTLS Line between 400 kV Jasialmer-2 to 765 kV Jaisalmer | **198.2157** | **217.7399** |
| iii | 2x25 kM LILO of 400 kV D/C Twin Moose Ramgarh-Akal Line at 765 kV Jaisalmer | **124.5562** | **136.8250** |
| iv | 225 km 765 kv D/C Line with Hex Zebra/ Al 59 (Zebra Eq.) Conductor in each phase between proposed 765 kV GSS Jodhpur (Kankani) and Proposed 765/400 kV GSS Jaisalmer | **1420.0206** | **1559.8927** |
| v | 1 No.+/- 300 MVAR, 400 kV STATCOM at 765 kV GSS Jaisalmer | **214.1257** | **235.2171** |
| | **Total(II)** | **2786.4272** | **3060.8902** |
| | **GRAND TOTAL (I+II)** | **5599.2960** | **6150.8267** |

**PART-B: RVPN transmission system uprating, upgrade and strengthening scheme for renewable energy evacuation in western Rajasthan**

| S. No. | Scheme/ Project Description | Cost Estimate (in Rs. Cr) | |
|---|---|---|---|
| | | Without IDC | With IDC |
| I | **Network Expansion and Strengthening** | | |
| A | **400 kV Transmission System** | | |
| 1 | 3 x 500 MVA Transformers with 3 nos. transformer bays and 4 nos. line bays. ( 2 nos. for D/C line from 765 kV Jaisalmer and 2 nos. for RE developers) | 172.6421 | 189.6473 |
| 2 | **400/220 kV Transformer Additions** | | |
| a | 1 x 500 MVA at 400 kV GSS Bhadala | 39.6236 | 43.5265 |
| b | 1 x 500 MVA at 400 kV GSS Ramgarh | 39.6236 | 43.5265 |
| c | 3 x 500 MVA at 400 kV GSS Jaisalmer-II | Cost estimates are included in Item-A(1) | |
| B | **220 kV Transmission System** | | |
| 1 | **Construction of 220 kV GSS Sawa** | | |
| a | 220 kV GSS Sawa with 1 x160 MVA 220/132 kV, 1 x 31.5 MVA 132/33 kV Transformer, 25 MVAR Bus Reactor | 67.4449 | 72.3145 |
| b | 2x 220 kV Bays at 400 kV GSS Barmer | 5.6506 | 6.0586 |
| c | 100 km 220 kV D/C Line between 400 kV GSS Barmer-220 kv GSS Sawa | 71.4758 | 76.6363 |
| d | 50 kM LILO of 220 kV S/C Dhorimanna-Sanchore Line at 220 kV GSS Sawa | 35.7379 | 38.3182 |
| e | 5 kM LILO of 132 kV S/C Sawa-Chohatan Lin at 220 kV GSS Sawa | 2.5432 | 2.7268 |
| f | 5 kM LILO of 132 kV S/C Sawa-Ranasar Line at 220 kV GSS Sawa | 2.5432 | 2.7268 |
| | **Total(1)** | **185.3956** | **198.7812** |
| 2 | **Construction of 220 kV GSS Lohawat** | | |
| a | 220 kV GSS Lohawat with 1 x160 MVA 220/132 kV, 1 x 40/50 MVA 132/33 kV Transformer, 25 MVAR Bus Reactor | 68.6052 | 73.5585 |
| b | 2x 220 kV Bays at 220 kV GSS Badi Sid | 5.6506 | 6.0586 |
| c | 2 x 132 kV Bays at 132 kV GSS Lohawat | 2.4920 | 2.6719 |
| d | 2x 132 kV Bays at 132 kV GSS Matora | 2.4920 | 2.6719 |
| e | 70 km 220 kV D/C Line between 220 kV GSS Badi Sid-220 kv GSS Lohawat (HTLS) Line | 129.2774 | 138.6113 |
| f | 10 kM LILO of 220 kV S/C Tinwari-Phalodi Line at 220 kV GSS Lohawat | 7.1476 | 7.6636 |
| g | 10 kM 132 kV D/C Lohawat (220 kV GSS)-Lohawat (132 kV GSS) Line | 5.0864 | 5.4537 |
| h | 35 kM 132 kV D/C Lohawat (220 kV GSS)-132 kV GSS Matora Line | 17.7350 | 19.0154 |
| | **Total(2)** | **238.4862** | **255.7049** |
| 3 | **Construction of 220 kV GSS Panchu** | | |
| a | 220 kV GSS Panchu with 1 x160 MVA 220/132 kV, 1 x 20/25 MVA 132/33 kV Transformer, 25 MVAR Bus Reactor | 65.1620 | 69.8666 |
| b | 2x 132 kV Bays at 132 kV GSS Bhamatsar | 2.4920 | 2.6719 |
| c | 2x 132 kV Bays at 132 kV GSS Panchu | 2.4920 | 2.6719 |
| d | 3 kM LILO of 220 kV S/C BLTPS-Khinvsar Line at 220 kV GSS Panchu | 2.1443 | 2.2991 |
| e | 28 km 132 kV D/C Panchu (220 kv GSS) -Bhamatsar Line | 14.2420 | 15.2702 |
| f | 1.1 kM 132 kV D/C Panchu(220 kV GSS)-Panchu (132 kV GSS) Line | 0.5595 | 0.5999 |
| | **Total(3)** | **87.0918** | **93.3796** |

| | | | |
|---|---|---|---|
| **5** | **Construction of 220 kV Dechu-Tinwari Line** | | |
| a | 72 km 220 kV S/C Dechu-Tinwari Line | **29.6248** | **31.7637** |
| b | 1x 220 kV Bay at 220 kV GSS Dechu | **2.8253** | **3.0293** |
| c | 1 x 220 kV Bay at 220 kV GSS Tinwari | **2.8253** | **3.0293** |
| | **Total(5)** | **35.2754** | **37.8223** |
| **C** | **132 kV Transmission System** | | |
| 2 | 28 km Stringing second Circuit on existing 132 kV S/C Bhadala-Khetusar Line on D/C Towers | 2.8784 | 3.0862 |
| 3 | 1 x 132 kV Bay at 132 kV GSS Khetusar | 1.2460 | 1.3360 |
| | **Total(C)** | **4.1244** | **4.4222** |
| **II** | **Uprating of Existing Transmission Corridors** | | |
| 1 | 220 kV Line Uprating alongwith strengthening at terminal substations | 459.1430 | 492.2931 |
| 2 | 132 kV Line Uprating alongwith strengthening at terminal substations | 208.3791 | 223.4241 |
| | **Total(II)** | **667.5221** | **715.7172** |
| **III** | **Reactive Power Compensation** | | |
| 1 | **Bus Reactors (Static Compensation)** | | |
| a | 240 MVAR 765 kV Bus Reactor with Terminal Bay at 765 kV GSS Anta (Baran) | 53.2720 | 58.5193 |
| b | 125 MVAR 400 kV Bus Reactor with Terminal Bay at 765 kV GSS Anta (Baran) | 24.1596 | 26.5393 |
| c | 125 MVAR 400 kV Bus Reactor with Terminal Bay at 400 kV GSS Heerapura | 23.9073 | 26.2622 |
| d | 125 MVAR 400 kV Bus Reactor with Terminal Bay at 400 kV GSS Ajmer | 23.9073 | 26.2622 |
| e | 125 MVAR 400 kV Bus Reactor with Terminal Bay at 400 kV GSS Bhilwara | 29.8612 | 32.8026 |
| f | 125 MVAR 400 kV Bus Reactor with Terminal Bay at 400 kV GSS Babai | 23.9073 | 26.2622 |
| g | 125 MVAR 400 kV Bus Reactor with Terminal Bay at 400 kV GSS Chittorgarh | 23.9073 | 26.2622 |
| h | 125 MVAR 400 kV Bus Reactor with Terminal Bay at proposed 765/400 kV Jodhpur (Kankani) | 21.1640 | 23.2487 |
| i | 125 MVAR 400 kV Bus Reactor with Terminal Bay at 400 kV GSS Barmer | 23.9073 | 26.2622 |
| | **Total(III-1)** | **247.9933** | **272.4209** |
| **2** | **STATCOM (Dynamic Compensation)** | | |
| a | (+/-) 300 MVAR STATCOM with 400 kV Terminal Bay at 400 kV GSS Bhadla | **260.9637** | **286.6686** |
| b | (+/-) 100 MVAR STATCOM with 220 kV Terminal Bay at 220 kV GSS Phalodi | **195.5486** | **209.6672** |
| c | (+/-) 100 MVAR STATCOM with 220 kV Terminal Bay at 220 kV GSS Tinwari | **195.5486** | **209.6672** |
| | **Total(III-2)** | **652.0609** | **706.0030** |
| **IV** | **Power Flow Control Devices/ Solution** | | |
| 1 | Power Flow Control Devices/ Solution on 220 kV Line between 400 kV GSS Bhadala-Badi Sid | **30.0859** | **32.2582** |
| 2 | Power Flow Control Devices/ Solution on 220 kV Line between 400 kV GSS Bhadala-Bap | **30.0859** | **32.2582** |
| | **Total(IV)** | **60.1718** | **64.5164** |
| | **GRAND TOTAL(I to IV)** | **2430.0109** | **2625.4679** |

*SAP WBS elements for the projects involved in above scheme shall be intimated separately.* You are requested to kindly endorse the above Detailed Project Report to all concerned field officers, who will supervise/under take the execution of the above scheme.

**Encl.: As Above.**

8/8/22
(V. A. Kale)
**SuperintendingEngineer (P&P)**

Copy to the following for information:-

1. The Managing Director, Jaipur/Jodhpur/Ajmer DISCOM .
2. The Director (Finance), RVPN, Jaipur.
3. The Chief Controller of Accounts-I/II, RVPN, Jaipur
4. The Secretary (Admn.), RVPN, Jaipur
5. The TA/PA to the CMD, RVPN, Jaipur
6. The Chief Accounts Officer (A/c-W&M), RVPN, Jaipur.
7. The Company Secretary, RVPN, Jaipur in compliance to the decision against the item no – 303.19 of the BoD meeting held on dated 26.07.2022.
8. The Superintending Engineer (QC., Insp. & Montg./ MIS / NPP&RA), RVPN, Jaipur.
9. The Land Acquisition Officer, RVPN, Jaipur .
10. The TA to Director (Technical/Operation), RVPN, Jaipur
11. The Executive Engineer-1 & 2 (P&P)/ PTCC, RVPN, Jaipur
12. The Asst. Accounts Officer (Admn.), RVPN, Jaipur.
13. The JEN(P&P), RVPN, Jaipur for creation/updation of WBS element in SAP.

Copy alongwith DPR to the following for information and necessary action :-

1. The Chief Engineer (T&C/MPT&S/Civil), RVPN, Jodhpur/Jaipur/Ajmer
2. The Chief Engineer (Procurement/Contracts/NPP&RA/LD/IT/ Communication), RVPN, Jaipur.
3. The Additional Chief Engineer (Civil), RVPN, Jodhpur/Jaipur/Ajmer
4. The Superintending Engineer (Design/Automation), RVPN, Jaipur
5. The Superintending Engineer (T&C), RVPN, Jaisalmer/Jaisalmer-2/ Jodhpur/Barmer/Bikaner/Kankani/Bhilwara/Chhitorgarh/Ajmer/Merta City/Babai/Jaipur City
6. The Superintending Engineer (765 kV GSS), RVPN, Phagi/Anta.
7. The Superintending Engineer (Communication), RVPN, Jodhpur/;Jaipur/Ajmer
8. The Superintending Engineer (Contracts-I/II), RVPN, Jaipur
9. The Superintending Engineer (Civil), RVPN, Jodhpur/Jaipur/Kota/Udaipur/Bikaner
10. The Superintending Engineer (Plan), Jodhpur Discom, Jodhpur.
11. The Sr. Accounts officer (B&R/W&M), RVPN, Jaipur
12. The Assistant Engineer-IV(P&P), RVPN, Jaipur

**SuperintendingEngineer (P&P)**

# RAJASTHAN RAJYA VIDYUT PRASARAN NIGAM LIMITED.

[Corporate Identity Number (CIN):U40109RJ2000SGC016485]
(Regd. Office: Vidyut Bhawan, Jan Path, Jyoti Nagar, Jaipur - 302 005)

## OFFICE OF THE SUPERINTENDING ENGINEER (P&P)

Room No. 336, Vidyut Bhawan, Jaipur ☎ +91-141-2740623
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No. RVPN/CE (PP&D)/SE (P&P)/XEN-I/AE-I/F D 938 Jaipur, Dt. 27/4/22

The Chief Engineer (T&C/Civil/Procurement/Contracts/LD/Communication/IT),
Rajasthan Rajya Vidyut Prasaran Nigam Ltd.,
JAIPUR/ AJMER/ JODHPUR

**Sub: Administrative & financial sanction for installation of 500 MVA, 400/220kV transformer each at 400kV GSS Jodhpur(Surpura), Ajmer, Bikaner & Merta.**

The Whole Time Directors of RVPN on dated 26.04.2022 have accorded admistrative and financial sanction for installation of 500 MVA, 400/220kV transformer each at 400kV GSS Jodhpur(Surpura), Ajmer, Bikaner & Merta as augmentation works as per the details given hereunder:

| S. No. | Name of work | Estimated cost (in Lacs) | |
|---|---|---|---|
| | | Without IDC | With IDC |
| 1 | Installation of 3rd 1x500 MVA, 400/220 kV transformer alongwith associated 400 kV & 220 kV bays at 400 kV GSS Jodhpur (Surpura) | 4704.01 | 5043.64 |
| 2 | Installation of 3rd 1x500 MVA, 400/220 kV transformer alongwith associated 400 kV & 220 kV bays at 400 kV GSS Ajmer | 4664.86 | 4980.21 |
| 3 | Installation of 3rd 1x500 MVA, 400/220 kV transformer alongwith associated 400 kV & 220 kV bays at 400 kV GSS Bikaner (Revsied A&FS approval) | 4683.47 | 5021.62 |
| 4 | Installation of 3rd 1x500 MVA, 400/220 kV transformer alongwith associated 400 kV & 220 kV bays at 400 kV GSS Merta | 4681.42 | 5019.42 |

It is also intimate that Revised administrative and financial sanction for installation of 3rd 1x500MVA, 400/220kV transformer at 400kV GSS Bikaner is in place of already approved cost of Rs 2051.005 lacs for installation of 1x315MVA transformer conveyed vide this office letter no. 1807 dated 4.1.2022.

Abstract of cost estimate and and detailed estimates are enclosed herewith. The expenditure of these schemes shall be made from provision made under the head "Augmentation" in Annual plan 2022-23(proposed). Additional funds required (if any) under this head would be provided in Annual Plan 2022-23 at the time of revision. In view of the above, the execution of the aforesaid works may kindly be taken up accordingly.

27/4/22
(V.A. KALE)
Superintending Engineer (P&P)

Encl.: Estimates.

Copy to the following for information & necessary action:-

1. The Chief Controller of Accounts-I/II, RVPN, Jaipur.
2. The Superintending Engineer (Design), RVPN, Jaipur.
3. The Superintending Engineer (T&C), RVPN, Jodhpur/Ajmer/Bikaner/Merta.
4. The Superintending Engineer (Communication), RVPN, Jaipur/ Jodhpur.
5. The Superintending Engineer (QC., Insp. & Montg./ MIS), RVPN, Jaipur.
6. The Superintending Engineer (Procurment-I/ Procurement-II/ Contract-I/ Contract-II), RVPN, Jaipur.
7. The TA to Director (Technical/Operation), RVPN, Jaipur.
8. The Executive Engineer-1 & 2 (P&P), RVPN, Jaipur.
9. The Assistant Engineer-IV (Plan), O/o Executive Engineer-1 (P&P), RVPN, Jaipur.

Encl.: Estimates.

Superintending Engineer (P&P)

D/AE-I/BoD Approvals

## A. Details of Long Duration Transmission elements Outage as on 12.09.2022:-

| S.No | Element Name | Type | Owner | Outage | | | Reason / Remarks | Status updated during last OCC |
|---|---|---|---|---|---|---|---|---|
| 1 | 80 MVAR Bus Reactor No 1 at 400KV Nathpa Jhakri(SJ) | BR | SJVNL | 17-10-2019 | 12:58 | 1054 | Flashover/Fault in 80MVAR Bus Reactor cleared by Bus Bar Protection. | 30.09.2022 |
| 2 | 50 MVAR LR on Akal-Jodhpur (RS) Ckt-1 @Akal(RS) | LR | RRVPNL | 17-08-2021 | 23:47 | | Akal: DT Receive Jodhpur: DT Send, 400 kV Reactor Manually Trip at 400 kV GSS, Jodhpur due to low voltage(before tripping reactor was charged as a bus reactor) | 30.11.2022 |
| 3 | 400/220 kV 315 MVA ICT 1 at Muradnagar_1(UP) | ICT | UPPTCL | 13-03-2020 | 02:46 | 907 | Buccholz relay alarm and Local Breaker Backup protection operated. Tripped along with Hapur-Muradnagar line. Flags are not reset because of cable flashover. | TWC approved on 09.12.2021 for replacement with 500MVA new ICT .<br>30 Dec 2022 |
| 4 | 400/220 kV 500 MVA ICT 2 at Noida Sec 148(UP) | ICT | UPPTCL | 19-08-2020 | 08:12 | 748 | ICT tripped on REF protection. Transformer caught fire and got damaged. | 30.09.2022 |
| 5 | 50 MVAR Non-Switchable LR on Agra-Unnao (UP) Ckt-1 @Agra(UP) | LR | UPPTCL | 28-10-2021 | 22:27 | 312 | R and Y phase bushing damaged at Agra(UP). Concerned written to OEM for inspection of reactor. Order placed for testing by manufacturer | Testing done by OEM, Report awaited. |
| 6 | 400KV Bus 1 at Vishnuprayag(JP) | BUS | JPVL | 02-12-2021 | 14:42 | 277 | Bus bar protection operated at Vishnuprayag. Sparking in Bus Coupler CB. | 30 Sep 2022 |
| 7 | 50 MVAR Bus Reactor No 1 at 400KV Moradabad(UP) | BR | UPPTCL | 03-12-2021 | 22:22 | 266 | R-phase bushing damaged. | 30 Dec 2022 |
| 8 | 400/220 kV 240 MVA ICT 3 at Moradabad(UP) | ICT | UPPTCL | 13-12-2021 | 22:38 | 256 | Due to high DGA values, Hydrogen gas is above permissible limit. | 30 Dec 2022 |
| 9 | 50 MVAR BUS REACTOR NO 1 AT 400KV PANKI(UP) | BR | UPPTCL | 29-01-2022 | 08:56 | 220 | Replacement of 50 MVAR Bus reactor by new 125 MVAR Bus Reactor. | 30.08.2022 |
| 10 | 765 KV ANPARA_D-UNNAO (UP) CKT-1 | Line | UPPCL | 08-02-2022 | 10:06 | 210 | Shifting of Line Reactor from Anpara-D to Obra-C S/S (OCC 190) | LILO of the line at Obra C under processing. Annexure-B documents awaited. |
| 11 | 220 KV Kishenpur(PG)-Mir Bazar(PDD) (PDD) Ckt-1 | Line | PDD JK | 19-02-2022 | 21:45 | 198 | Tower no. 170 collapsed. | |
| 12 | 400 KV Parbati_3(NH)-Sainj(HP) (PKTCL) Ckt-1 | Line | PKTCL | 11-03-2022 | 03:21 | 179 | Phase to earth fault R-N , Zone-1 from Parbati_3(NH). R-phase XLPE cable has been punctured between GIS and Pothead yard of Parbati-III PS. | |
| 13 | 400/21 kV 776 MVA GT 7 at Suratgarh SCTPS(RVUN) | ICT | RRVPNL | 15-03-2022 | 01:32 | 175 | Due to failure of R-phase bushing of GT-7A. | 15.09.2022 |
| 14 | 125 MVAR Bus Reactor No 1 at 400KV Barmer(RS) | BR | RRVPNL | 16-07-2022 | 18:49 | 42 | Reactor Back-up Impedance protection operated. | |
| 15 | 401A MAIN BAY - 400/66 KV 250 MVA ICT 1 AT HMEL (PS) (PSTCL) AND 400 KV HMEL (PS) - BUS 1 AT 400 KV HMEL (PS) (PSTCL) | BAY | PSTCL | 12-05-2022 | 14:05 | 116 | Transformer Differential protection operated. | |
| 16 | 400/66 kV 250 MVA ICT 1 at HMEL (PS) | ICT | PSTCL | 12-05-2022 | 14:05 | 116 | Differential relay operated. | |
| 17 | 201 MAIN BAY - 220KV BUS 1 AT PATRAN(PATR) (STERLITE) AND FUTURE AT 220 KV PATRAN(PATR) (STERLITE) | BAY | Sterlite | 10-06-2022 | 20:01 | 87 | 201 main Bay Y-ph hydraulic pump Is running continuously and the Spring is not getting charged, which may lead to CB Lockout. | |
| 18 | 203 MAIN BAY - 220 KV BIKANER(PG) - BUS 2 (POWERGRID) AND FUTURE AT 220 KV BIKANER(PG) (POWERGRID) | BAY | POWERGRID | 09-07-2022 | 15:44 | 32 | due to heavy sparking observed in the contact of isolator (203-89C). | |
| 19 | FSC of 400 KV Koteshwar-Meerut (PG) Ckt-1 at Meerut(PG) | FSC | POWERGRID | 20.02.2020 | 10:02 | | FSC out for upgradation work at 765kV. Upgraded to 765kV. Expected revival status awaited from PG-NR1.Waiting for CEA clearance. | FTC under processing |
| 20 | FSC of 400 KV Koteshwar-Meerut (PG) Ckt-2 at Meerut(PG) | FSC | POWERGRID | 15.05.2020 | 17:45 | | FSC out for upgradation work at 765kV. Upgraded to 765kV. Expected revival status awaited from PG-NR1.Waiting for CEA clearance. | |
| 21 | FSC of 400 KV Fatehpur-Mainpuri (PG) Ckt-1 at Mainpuri(PG) | FSC | POWERGRID | 24.10.2021 | 21:07 | 290 | BHEL breaker hydraulic pressure could not be developed in B phase and (loss of N2 pressure) doesn't allow the FSC-1 taken into service as reported by CPCC3. | |
| 22 | FSC of 400 KV Fatehpur-Mainpuri (PG) Ckt-2 at Mainpuri(PG) | FSC | POWERGRID | 29.01.2022 | 08:25 | 194 | VME protection system was blocking the FSC back in service as reported by CPCC3. | |
| 23 | 50 MVAR Non-Switchable LR on Akal-Jodhpur (RS) Ckt-1 @Jodhpur(RS) | LR | RRVPNL | 07-07-2022 | 21:10 | 60 | To take-out Line Reactor out of service due to high DGA violation; for internal inspection by OEM. | |
| 24 | 407 MAIN BAY - 80 MVAR BUS REACTOR NO 1 AT 400KV AGRA SOUTH(UP) AND SELECT | BAY | UPPTCL | 21-07-2022 | 00:00 | 47 | Due To Problem In Reactor Side Isolator While Shut Down Return Of 80 MVAR Bus Reactor. Opened At 15:58 Of 07/04/22 | |
| 25 | 400/220 kV 500 MVA ICT 1 at Bhiwani(BB) | ICT | BBMB | 31-07-2022 | 04:42 | 37 | Tripped due to tripping of 220 KV Bhiwani-Hissar ckt-2.ICT under inspection. | |
| 26 | 220/33 kV 125 MVA ICT 4 at Saurya Urja Solar(SU) | ICT | Saurya Urja | 31-07-2022 | 16:28 | 36 | Differential, PRD, HV REF and Buchholz tripping | |
| 27 | 125 MVAR Bus Reactor No 1 at 400KV Chamera_1(NH) | BR | NHPC | 14-08-2022 | 11:31 | 23 | High Acetylene content found during DGA of Y-Phase Bus Reactor. | |

## B. Details of Long Duration Generating Units Outage :-

| S.No | Element Name | Type | Owner | Outage | | | Reason / Remarks | Status updated during last OCC |
|---|---|---|---|---|---|---|---|---|
| 1 | 250 MW Chhabra TPS - UNIT 4 | | RRVPNL | 09-09-2021 | 00:47 | 362 | Due to Electrostatic precipitators (ESP) structure damage | |
| 2 | 100 MW Koteshwar HPS - UNIT 1 | | THDC | 04-11-2021 | 22:58 | 305 | Due to fault in GT | |
| 3 | 108 MW Bhakra HPS - UNIT 1 | | BBMB | 15-12-2021 | 12:05 | 264 | Renovation Modernization and upgradation of capacity to 126MW | 02-10-2022 |
| 4 | 34 MW Delhi Gas Turbines - UNIT 9 | | DTL | 12-02-2022 | 20:00 | 205 | STG Governor oil leakage | |
| 5 | 30 MW Delhi Gas Turbines - UNIT 5 | | DTL | 12-02-2022 | 21:04 | 205 | Due to tripping of associated STG at 20:00 hrs | |
| 6 | 660 MW Suratgarh SCTPS - UNIT 7 | | RRVPNL | 15-03-2022 | 01:32 | 175 | FAILURE OF R PHASE BUSHING OF GT-7A. | 15.09.2022 |
| 7 | 210 MW Guru Hargobind Singh TPS (Lehra Mohabbat) - UNIT 2 | | PSPCL | 13-05-2022 | 21:36 | 115 | ESP breakdown. Rectification works under progress as confirmed by SLDC-PS. | 15.09.2022 |
| 8 | 253 MW Bawana GPS - UNIT 5 | | DTL/Pragati CCGT | 03-06-2022 | 22:04 | 94 | C&I problem | |
| 9 | 250 MW Suratgarh TPS - UNIT 1 | | RRVPNL | 30-06-2022 | 18:24 | 67 | Stator earth fault | |
| 10 | 200 MW Singrauli STPS - UNIT 1 | | NTPC | 23-07-2022 | 02:39 | 45 | Over hauling | |
| 11 | 200 MW Obra TPS - UNIT 13 | | UPPTCL | 24-07-2022 | 22:49 | 43 | Electrical fault in transformer. | |
| 12 | 130.19 MW Dadri GPS - UNIT 4 | | NTPC | 29-07-2022 | 02:29 | 39 | Initially out on reserve shutdown. Out on forced outage due to fire in 6.6kV switchgear since 19:40hrs of 29.07.22 | |