



सत्यमेव जयते

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

**विषय:** उत्तर क्षेत्रीय विद्युत समिति की प्रचालन समन्वय उप-समिति की 235<sup>वीं</sup> बैठक का कार्यवृत्त ।

**Subject:** Minutes of the 235<sup>th</sup> OCC meeting of NRPC.

उत्तर क्षेत्रीय विद्युत समिति की प्रचालन समन्वय उप-समिति की 235<sup>वीं</sup> बैठक दिनांक 16.09.2025 को आयोजित की गयी थी। उक्त बैठक का कार्यवृत्त उत्तर क्षेत्रीय विद्युत समिति की वेबसाइट <http://164.100.60.165> पर उपलब्ध है। यदि कार्यवृत्त पर कोई टिप्पणी हो तो कार्यवृत्त जारी करने के एक सप्ताह के अन्दर इस कार्यालय को भेजें ।

The 235<sup>th</sup> meeting of the Operation Co-ordination Sub-Committee (OCC) of NRPC was held on 16.09.2025. 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।

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

सेवा में,

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

## List of addressee (via mail)

| OCC Members for FY 2025-26 |                       |                                               |                                                                                                                                                                                                                |
|----------------------------|-----------------------|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| S. No                      | OCC Member            | Category                                      | E-mail                                                                                                                                                                                                         |
| 1                          | NLDC                  | National Load Despatch Centre                 | <a href="mailto:nomination_awaited@susha@grid-india.in">nomination awaited (susha@grid-india.in)</a>                                                                                                           |
| 2                          | NRLDC                 | Northern Regional Load Despatch Centre        | <a href="mailto:somara.lakra@grid-india.in">somara.lakra@grid-india.in</a>                                                                                                                                     |
| 3                          | CTUIL                 | Central Transmission Utility                  | <a href="mailto:sandeepk@powergrid.in">sandeepk@powergrid.in</a>                                                                                                                                               |
| 4                          | PGCIL                 | Central Government owned Transmission Company | <a href="mailto:rtamc.nr1@powergrid.in">rtamc.nr1@powergrid.in</a><br><a href="mailto:rtamcjammu@powergrid.in">rtamcjammu@powergrid.in</a><br><a href="mailto:cpcc.nr3@powergrid.in">cpcc.nr3@powergrid.in</a> |
| 5                          | NTPC                  | Central Generating Company                    | <a href="mailto:RAMESHSINGH@NTPC.CO.IN">RAMESHSINGH@NTPC.CO.IN</a>                                                                                                                                             |
| 6                          | BBMB                  |                                               | <a href="mailto:powerc@bbmb.nic.in">powerc@bbmb.nic.in</a>                                                                                                                                                     |
| 7                          | THDC                  |                                               | <a href="mailto:ravindrasrana@thdc.co.in">ravindrasrana@thdc.co.in</a>                                                                                                                                         |
| 8                          | SJVN                  |                                               | <a href="mailto:sjvn.cso@sjvn.nic.in">sjvn.cso@sjvn.nic.in</a>                                                                                                                                                 |
| 9                          | NHPC                  |                                               | <a href="mailto:surendramishra@nhpc.nic.in">surendramishra@nhpc.nic.in</a>                                                                                                                                     |
| 10                         | NPCIL                 |                                               | <a href="mailto:df@npcil.co.in">df@npcil.co.in</a>                                                                                                                                                             |
| 11                         | Delhi SLDC            | State Load Despatch Centre                    | <a href="mailto:gmsldc@delhisldc.org">gmsldc@delhisldc.org</a>                                                                                                                                                 |
| 12                         | Haryana SLDC          |                                               | <a href="mailto:cesocomml@hvpn.org.in">cesocomml@hvpn.org.in</a>                                                                                                                                               |
| 13                         | Rajasthan SLDC        |                                               | <a href="mailto:ce.ld@rvpn.co.in">ce.ld@rvpn.co.in</a>                                                                                                                                                         |
| 14                         | Uttar Pradesh SLDC    |                                               | <a href="mailto:ceps@upslc.org">ceps@upslc.org</a>                                                                                                                                                             |
| 15                         | Uttarakhand SLDC      |                                               | <a href="mailto:se_sldc@ptcul.org">se_sldc@ptcul.org</a>                                                                                                                                                       |
| 16                         | Punjab SLDC           |                                               | <a href="mailto:ce-sldc@pstcl.org">ce-sldc@pstcl.org</a>                                                                                                                                                       |
| 17                         | Himachal Pradesh SLDC |                                               | <a href="mailto:cehpsldc@gmail.com">cehpsldc@gmail.com</a>                                                                                                                                                     |
| 18                         | DTL                   | State Transmission Utility                    | <a href="mailto:bl.gujar@dtl.gov.in">bl.gujar@dtl.gov.in</a>                                                                                                                                                   |
| 19                         | HVPNL                 |                                               | <a href="mailto:cetspkl@hvpn.org.in">cetspkl@hvpn.org.in</a>                                                                                                                                                   |
| 20                         | RRVNL                 |                                               | <a href="mailto:ce.ppm@rvpn.co.in">ce.ppm@rvpn.co.in</a>                                                                                                                                                       |
| 21                         | UPPTCL                |                                               | <a href="mailto:smart.saxena@gmail.com">smart.saxena@gmail.com</a>                                                                                                                                             |
| 22                         | PTCUL                 |                                               | <a href="mailto:ce_oandmk@ptcul.org">ce_oandmk@ptcul.org</a>                                                                                                                                                   |
| 23                         | PSTCL                 |                                               | <a href="mailto:ce-tl@pstcl.org">ce-tl@pstcl.org</a>                                                                                                                                                           |
| 24                         | HPPTCL                |                                               | <a href="mailto:gmprojects.tcl@hpmail.in">gmprojects.tcl@hpmail.in</a>                                                                                                                                         |
| 25                         | IPGCL                 | State Generating Company                      | <a href="mailto:ncsharma@ipgcl-ppcl.nic.in">ncsharma@ipgcl-ppcl.nic.in</a>                                                                                                                                     |
| 26                         | HPGCL                 |                                               | <a href="mailto:seom2.rgtp@hpgcl.org.in">seom2.rgtp@hpgcl.org.in</a>                                                                                                                                           |
| 27                         | RRVUNL                |                                               | <a href="mailto:ce.ppmcit@rrvunl.com">ce.ppmcit@rrvunl.com</a>                                                                                                                                                 |
| 28                         | UPRVUNL               |                                               | <a href="mailto:cgm.to@uprvunl.org">cgm.to@uprvunl.org</a>                                                                                                                                                     |
| 29                         | UJVNL                 |                                               | <a href="mailto:gm_engg_ujvn@yahoo.co.in">gm_engg_ujvn@yahoo.co.in</a>                                                                                                                                         |
| 30                         | HPPCL                 |                                               | <a href="mailto:gm_generation@hppcl.in">gm_generation@hppcl.in</a>                                                                                                                                             |
| 31                         | PSPCL                 | State Generating Company & State              | <a href="mailto:ce-ppr@pspcl.in">ce-ppr@pspcl.in</a>                                                                                                                                                           |

|    |                                               |                                                                                                                                                |                                                                                                             |
|----|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
|    |                                               | owned Distribution Company                                                                                                                     |                                                                                                             |
| 32 | DHBVN                                         | State owned Distribution Company (alphabetical rotational basis/nominated by state govt.)                                                      | <a href="mailto:(cecommercial@dhbvn.org.in)">(cecommercial@dhbvn.org.in)</a>                                |
| 33 | Ajmer Vidyut Vitran Nigam Ltd.                |                                                                                                                                                | <b>nomination awaited</b><br><a href="mailto:(md.avvnl@rajasthan.gov.in)">(md.avvnl@rajasthan.gov.in)</a>   |
| 34 | Purvanchal Vidyut Vitaran Nigam Ltd.          |                                                                                                                                                | <b>nomination awaited</b><br><a href="mailto:(mdpurvanchalvvn@gmail.com)">(mdpurvanchalvvn@gmail.com)</a>   |
| 35 | UPCL                                          |                                                                                                                                                | <a href="mailto:cgmupcl@yahoo.com">cgmupcl@yahoo.com</a>                                                    |
| 36 | HPSEB                                         |                                                                                                                                                | <a href="mailto:cesysophpsebl@gmail.com">cesysophpsebl@gmail.com</a>                                        |
| 37 | Prayagraj Power Generation Co. Ltd.           | IPP having more than 1000 MW installed capacity                                                                                                | <a href="mailto:sanjay.bhargava@tatapower.com">sanjay.bhargava@tatapower.com</a>                            |
| 38 | Aravali Power Company Pvt. Ltd                |                                                                                                                                                | <a href="mailto:amit.hooda01@apcpl.co.in">amit.hooda01@apcpl.co.in</a>                                      |
| 39 | Apraave Energy Ltd.,                          |                                                                                                                                                | <a href="mailto:rajneesh.setia@apraava.com">rajneesh.setia@apraava.com</a>                                  |
| 40 | Talwandi Sabo Power Ltd.                      |                                                                                                                                                | <a href="mailto:ravinder.thakur@vedanta.co.in">ravinder.thakur@vedanta.co.in</a>                            |
| 41 | Nabha Power Limited                           |                                                                                                                                                | <a href="mailto:Durvesh.Yadav@larsentoubro.com">Durvesh.Yadav@larsentoubro.com</a>                          |
| 42 | MEIL Anpara Energy Limited                    |                                                                                                                                                | <a href="mailto:arun.tholia@meilanparapower.com">arun.tholia@meilanparapower.com</a>                        |
| 43 | Rosa Power Supply Company Ltd                 |                                                                                                                                                | <a href="mailto:Suvendu.Dey@relianceada.com">Suvendu.Dey@relianceada.com</a>                                |
| 44 | Lalitpur Power Generation Company Ltd         |                                                                                                                                                | <a href="mailto:avinashkumar.ltp@lpgcl.com">avinashkumar.ltp@lpgcl.com</a>                                  |
| 45 | MEJA Urja Nigam Ltd.                          |                                                                                                                                                | <a href="mailto:rsjuneja@ntpc.co.in">rsjuneja@ntpc.co.in</a>                                                |
| 46 | Adani Power Rajasthan Limited                 |                                                                                                                                                | <a href="mailto:manoj.taunk@adani.com">manoj.taunk@adani.com</a>                                            |
| 47 | JSW Energy Ltd. (KWHEP)                       |                                                                                                                                                | <a href="mailto:roshan.zipta@jsw.in">roshan.zipta@jsw.in</a>                                                |
| 48 | Transition Cleantech Services Private Limited | IPP having less than 1000 MW installed capacity (alphabetical rotational basis)                                                                | <b>nomination awaited</b><br><a href="mailto:(kswamidoss@evrenenergy.com)">(kswamidoss@evrenenergy.com)</a> |
| 49 | UT of J&K                                     | From each of the Union Territories in the region, a representative nominated by the administration of the Union Territory concerned out of the | <a href="mailto:sojpdd@gmail.com">sojpdd@gmail.com</a>                                                      |
| 50 | UT of Ladakh                                  |                                                                                                                                                | <a href="mailto:cepdladakh@gmail.com">cepdladakh@gmail.com</a>                                              |
| 51 | UT of Chandigarh                              |                                                                                                                                                | <a href="mailto:seelo-chd@nic.in">seelo-chd@nic.in</a>                                                      |

|    |                                       |                                                                        |                                                                                                          |
|----|---------------------------------------|------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
|    |                                       | entities engaged in generation/ transmission/                          |                                                                                                          |
| 52 | Tata Power Delhi Distribution Limited | Private Distribution Company in region (alphabetical rotational basis) | nomination awaited<br>( <a href="mailto:sandeep.k@tatapower-ddl.com">sandeep.k@tatapower-ddl.com</a> )   |
| 53 | Gurgaon Palwal Transmission Limited   | Private transmission licensee (nominated by central govt.)             | nomination awaited<br>( <a href="mailto:samriddhi.gogoi@indigrid.com">samriddhi.gogoi@indigrid.com</a> ) |
| 54 | PTC India Limited                     | Electricity Trader (nominated by central govt.)                        | nomination awaited<br>( <a href="mailto:bibhuti.prakash@ptcindia.com">bibhuti.prakash@ptcindia.com</a> ) |

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## उत्तर क्षेत्रीय विद्युत समिति की प्रचालन समन्वय उप-समिति की 235<sup>वीं</sup> बैठक का कार्यवृत्त

The 235<sup>th</sup> OCC meeting of NRPC was held on 16.09.2025 through video conferencing. MS, NRPC welcomed all the participants connected through VC in the meeting from power utilities of Northern Region.

खण्ड-क:उ.क्षे.वि.स.

PART-A:NRPC

### A.1. Confirmation of Minutes

Minutes of the 234<sup>th</sup> OCC meeting was issued on 14.08.2025. OCC confirmed the minutes of the meeting.

#### **Decision of OCC Forum:**

*OCC confirmed the minutes of the meeting.*

### A.2. Status of action taken on decisions of 234<sup>th</sup> OCC meeting of NRPC

A.2.1. MS, NRPC conveyed that the agenda has been taken to track the status of action taken as per decision of last meeting. Accordingly, issues may be resolved at the earliest.

A.2.2. Concerned utilities submitted the status of action taken *and the same has been complied as Annexure-A.I.*

#### **Decision of OCC Forum:**

*The forum noted the status of action taken has been complied as Annexure-A.I.*

### A.3. Review of Grid operations of August 2025

#### **Anticipated vis-à-vis Actual Power Supply Position (Provisional) for August 2025**

Reasons submitted by States/UTs for significant deviation of actual demand from anticipated figures during the month of August 2025 are as under:

- **Delhi**

Delhi witnessed light to moderate rainfall throughout the month and overcast skies resulted in below-normal temperatures, resulting in subdued peak power demand an energy consumption, which remained lower than anticipated.

- **Haryana**

The actual demand for the month of August 2025 was lesser than anticipated demand due to excessive rainfall. The rural agricultural demand is 22% lesser than last year.

- **Himachal Pradesh**

The anticipated energy requirement in respect of Himachal Pradesh for the month of August 2025 was on the lower side due to bad weather (heavy rainfall) conditions.

- **Punjab**

The actual energy requirement and actual maximum demand are less as compared to anticipated energy requirement and anticipated maximum demand respectively because of widespread rainfall and floods in last week of August 2025 in the state of Punjab.

- **Rajasthan**

The actual peak demand and actual energy requirement w.r.t. Anticipated Peak Demand and Anticipated Energy requirement for the month of August 2025 increased by 17.4% and 15.7% respectively due to unexpected load demand growth w.r.t. same month of previous year during first fortnight of August 2025 due to less rains observed in Rajasthan state control area.

ED NRLDC pointed out that multiple letters and real-time communications from the control room have been sent to Rajasthan. Rajasthan needs to improve its portfolio management. There have been instances of significant under-drawl, during high-frequency periods coinciding with the implementation of TRAS down on ISGS solar plants to control frequency. He also urged all SLDCs to engage with their respective regulators and explore the possibility of introducing ancillary services regulations at the state level, like what is being implemented at the ISTS level.

The matter was deliberated in detail under Agenda item B.3.

- **Uttarakhand**

The reason for significant variation in Energy Requirement (decrease) and Peak Demand (Decrease) for month of August 2025 against anticipated figures) was due to unprecedented rainfall in this month resulting into normal ambient temperature.

#### **A.4. Maintenance Programme of Generating units and Transmission Lines**

The maintenance programme of generating units and transmission lines for the month of September 2025 was deliberated in the meeting on 15.09.2025.

#### **A.5. Anticipated Power Supply Position in Northern Region for October 2025**

The updated anticipated Power Supply Position for October 2025 is as below:

| State / UT       | Availability / Requirement | Revised Energy (MU) | Revised Peak (MW) | Date of revision      |
|------------------|----------------------------|---------------------|-------------------|-----------------------|
| CHANDIGARH       | Availability               | 130                 | 350               | No Revision submitted |
|                  | Requirement                | 145                 | 322               |                       |
|                  | Surplus / Shortfall        | -15                 | 28                |                       |
|                  | % Surplus / Shortfall      | -10.3%              | 8.7%              |                       |
| DELHI            | Availability               | 3830                | 6200              | 15-Sep-25             |
|                  | Requirement                | 3250                | 6200              |                       |
|                  | Surplus / Shortfall        | 580                 | 0                 |                       |
|                  | % Surplus / Shortfall      | 17.8%               | 0.0%              |                       |
| HARYANA          | Availability               | 7943                | 10677             | 09-Sep-25             |
|                  | Requirement                | 6446                | 11587             |                       |
|                  | Surplus / Shortfall        | 1497                | -910              |                       |
|                  | % Surplus / Shortfall      | 23.2%               | -7.9%             |                       |
| HIMACHAL PRADESH | Availability               | 1117                | 1939              | 10-Sep-25             |
|                  | Requirement                | 1149                | 2024              |                       |
|                  | Surplus / Shortfall        | -31                 | -85               |                       |
|                  | % Surplus / Shortfall      | -2.7%               | -4.2%             |                       |
| J&K and LADAKH   | Availability               | 1230                | 2490              | No Revision submitted |
|                  | Requirement                | 1947                | 3470              |                       |
|                  | Surplus / Shortfall        | -717                | -980              |                       |
|                  | % Surplus / Shortfall      | -36.8%              | -28.2%            |                       |
| PUNJAB           | Availability               | 6170                | 12620             | 15-Sep-25             |
|                  | Requirement                | 6210                | 13618             |                       |
|                  | Surplus / Shortfall        | -40                 | -998              |                       |
|                  | % Surplus / Shortfall      | -0.6%               | -7.3%             |                       |
| RAJASTHAN        | Availability               | 8840                | 19060             | 16-Sep-25             |

| State / UT      | Availability / Requirement | Revised Energy (MU) | Revised Peak (MW) | Date of revision |
|-----------------|----------------------------|---------------------|-------------------|------------------|
|                 | Requirement                | 10075               | 16589             |                  |
|                 | Surplus / Shortfall        | -1235               | 2471              |                  |
|                 | % Surplus / Shortfall      | -12.3%              | 14.9%             |                  |
| UTTAR PRADESH   | Availability               | 14415               | 27200             | 04-Sep-25        |
|                 | Requirement                | 14260               | 27200             |                  |
|                 | Surplus / Shortfall        | 155                 | 0                 |                  |
|                 | % Surplus / Shortfall      | 1.1%                | 0.0%              |                  |
| UTTARAKHAND     | Availability               | 1333                | 2370              | 12-Sep-25        |
|                 | Requirement                | 1348                | 2400              |                  |
|                 | Surplus / Shortfall        | -15                 | -30               |                  |
|                 | % Surplus / Shortfall      | -1.1%               | -1.3%             |                  |
| NORTHERN REGION | Availability               | 43950.0             | 80700             |                  |
|                 | Requirement                | 42928.0             | 75900             |                  |
|                 | Surplus / Shortfall        | 1022.0              | 4800              |                  |
|                 | % Surplus / Shortfall      | 2.4%                | 6.3%              |                  |

A.5.1. Representative of Haryana, SLDC, Punjab SLDC and J&K SLDC informed that the shortfall in J&K would be met through Real time exchanges.

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

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

A.6.2. SLDCs were requested again to coordinate with respective Transmission Utilities of states/UTs and submit details about the updated status of Down Stream network by State Utilities from ISTS Station (enclosed as **Annexure-A.II.I**) before every OCC meeting.

#### A.7. NR Islanding scheme

A.7.1. With regard to the Agra Islanding Scheme, the UPPTCL representative informed the forum that the proposal has been resubmitted to the PSDF Secretariat for funding under PSDF, following approval by the UPPTCL Board.

- A.7.2. Regarding Lucknow-Unchahar Islanding Scheme, UPPTCL representative apprised the forum that the data of 132 KV S/S Husainganj is available through GPRS. The work of laying of OPGW cable is under progress.
- A.7.3. RRVPNL representative informed the forum that the proposal for the Jodhpur–Barmer–Rajwest Islanding Scheme was submitted to the PSDF Secretariat on 16.01.2025 for PSDF funding. A meeting regarding the scheme was held on 07.03.2025, during which certain queries were raised. The representative further stated that responses to these queries were submitted on 30.05.2025. However, the final decision from the PSDF Secretariat is still awaited.
- A.7.4. RRVPNL representative mentioned that DPR for implementation of Suratgarh islanding scheme would be submitted after the confirmation of decision from PSDF Sectt. for PSDF funding for Jodhpur-Barmer-Rajwest islanding scheme.
- A.7.5. Punjab SLDC representative informed that two islanding schemes were approved by NRPC for Punjab Control area as mentioned below-
- NPL Rajpura islanding scheme
  - RSD islanding scheme (with only one machine)

These schemes were conceptualized and are based on PMUs and DPR (detailed project report) regarding PSDF funding for NPL Rajpura islanding scheme was submitted for PSDF funding about a year ago and DPR regarding PSDF funding for RSD islanding scheme was submitted for PSDF funding recently. The total estimated cost of scheme is around 20 crores based on re-evaluation done on the pattern of Raipur islanding scheme (similar to schemes proposed by PSTCL) as per directives of authorities sanctioning DPRs for PSDF funding. As discussed in 233<sup>rd</sup> OCC meeting, EE(O) asked PSTCL to get the designing aspect of both the islanding scheme vetted by Punjab SLDC and thereafter submit the proposal with the undertaking the earlier PSDF funding was not availed for these schemes.

- A.7.6. HPSLDC representative apprised that the Monitoring committee of State PSDF has provided approval for State PSDF funding for implementation of proposed UFR scheme for Kullu-Manali islanding scheme and Shimla-Solan Islanding scheme in the meeting held on 22<sup>nd</sup> April, 2025. He further stated that the procurement of UFRs will be undertaken by HPSEBL. HPSEBL had floated the tender with work completion period of 06 months. Techno-commercial bid was opened on 23<sup>rd</sup> August, 2025 and price bid is expected to be opened shortly.

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

- A.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 10<sup>th</sup> September 2025).

A.8.2. The coal stock position of generating stations in Northern Region, having critical stock, during first ten days of September 2025 is NIL.

#### **A.9. Periodic Testing of generators and FACTS/HVDC Devices (Agenda by NRPC Sectt.)**

A.9.1 NRPC representative stated that Regulation 40 (1) of CERC (IEGC) Regulations, 2023 stipulate that there shall be periodic tests, as required under clause (3) of this Regulation, carried out on power system elements for ascertaining the correctness of mathematical models used for simulation studies as well as ensuring desired performance during an event in the system.

A.9.2 The tests shall be performed once in every five (5) years or whenever major retrofitting is done. If any adverse performance is observed during any grid event, then the tests shall be carried out even earlier, if advised by SLDC or RLDC or NLDC or RPC, as the case may be.

A.9.3 Further, Regulation 40(1)(b) stipulate that "All equipment owners shall submit a testing plan for the next year to the concerned RPC by 31st October to ensure proper coordination during testing as per the schedule. In case of any change in the schedule, the owners shall inform the concerned RPC in advance."

A.9.4 Extract of IEGC 2023 clause 40,

##### ***"40. PERIODIC TESTING***

*(1) There shall be periodic tests, as required under clause (3) of this Regulation, carried out on power system elements for ascertaining the correctness of mathematical models used for simulation studies as well as ensuring desired performance during an event in the system.*

##### ***(2) General provisions***

*(a) The owner of the power system element shall be responsible for carrying out tests as specified in these regulations and for submitting reports to NLDC, RLDCs, CEA and CTU for all elements and to STUs and SLDCs for intra-State elements.*

***(b) All equipment owners shall submit a testing plan for the next year to the concerned RPC by 31st October to ensure proper coordination during testing as per the schedule. In case of any change in the schedule, the owners shall inform the concerned RPC in advance.***

*(c) The tests shall be performed once every five (5) years or whenever major retrofitting is done. If any adverse performance is observed during any grid event, then the tests shall be carried out even earlier, if so advised by SLDC or RLDC or NLDC or RPC, as the case may be.*

(d) The owners of the power system elements shall implement the recommendations, if any, suggested in the test reports in consultation with NLDC, RLDC, CEA, RPC and CTU.

### (3) Testing requirements

The following tests shall be carried out on the respective power system elements:

TABLE 9 : TESTS REQUIRED FOR POWER SYSTEM ELEMENTS

| Power System Elements                  | Tests                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Applicability                                                                                                         |
|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Synchronous Generator                  | (1) Real and Reactive Power Capability assessment.<br>(2) Assessment of Reactive Power Control Capability as per CEA Technical Standards for Connectivity<br>(3) Model Validation and verification test for the complete Generator and Excitation System model including PSS.<br>(4) Model Validation and verification of Turbine/Governor and Load Control or Active Power/ Frequency Control Functions.<br>(5) Testing of Governor performance and Automatic Generation Control. | Individual Unit of rating 100MW and above for Coal/lignite, 50MW and above gas turbine and 25 MW and above for Hydro. |
| Non synchronous Generator (Solar/Wind) | (1) Real and Reactive Power Capability for Generator<br>(2) Power Plant Controller Function Test<br>(3) Frequency Response Test<br>(4) Active Power Set Point change test.<br>(5) Reactive Power (Voltage / Power Factor / Q) Set Point change test                                                                                                                                                                                                                                | Applicable as per CEA Technical Standards for Connectivity.                                                           |
| HVDC/FACTS Devices                     | (1) Reactive Power Controller (RPC) Capability for HVDC/FACTS<br>(2) Filter bank adequacy assessment based on present grid condition, in consultation with NLDC.<br>(3) Validation of response by FACTS devices as per settings.                                                                                                                                                                                                                                                   | To all ISTS HVDC as well as Intra-State HVDC/FACTS, as applicable                                                     |

A.9.5 In accordance with above, Generators and HVDC/FACT owners were supposed to furnish the Testing schedule for the next five financial years.

A.9.6 The procedure for testing is available at the NLDC website at <https://posoco.in/wpcontent/uploads/2023/09/Final-Procedure-of-Periodic-Testing-for-Power-SystemElements-submitted-to-CERC.pdf>. This may be used for testing.

A.9.7 In view of this, a google sheet was prepared and it was requested that testing plan for next five financial years may be updated in the sheet at the earliest as per the requirement of IEGC 2023 and decision of 73rd NRPC meeting.

A.9.8 EE(O), NRPC informed the forum that a letter has been issued in this regard to all the state generators and NR ISTS renewables for submitting their testing schedule for the next five financial years. He asked all SLDCs to take up this with all the generators in their control area to expedite providing of information at the earliest.

A.9.9 He informed that till date, data has been received only from Powergrid, NHPC, SJVN, THDC JSW Hydro, Rosa Power Supply Co Ltd, NLC India Limited, ADHPL, Malana Power Company Limited and Clean Solar Power.

A.9.10 SE (O), NRPC asked Generators and HVDC/FACT owners to furnish Testing schedule in the format attached at **Annexure-A.III.** to [seo-nrpc@nic.in](mailto:seo-nrpc@nic.in).

**Decision of OCC Forum:**

OCC forum asked all Generators and HVDC/FACT owners to furnish Testing schedule for next five financial years in the format attached at **Annexure-A.III** to [seo-nrpc@nic.in](mailto:seo-nrpc@nic.in).

**A.10. Implementation on Automatic under Frequency Load Shedding (AUFLS) scheme in accordance with the report of Task Force on Automatic under Frequency Load Shedding (AUFLS) (Agenda by NRPC Secretariat)**

A.10.1. In line with the report of Task Force on Automatic under Frequency Load Shedding (AUFLS) and df/dt scheme, NPC Secretariat to communicate the Region wise relief quantum (based on Regional Peak Demand Met during the previous year) by 31st of May to RPCs for implementation in the next Financial Year (FY).

A.10.2. NPC Secretariat has communicated to RPC's that they have computed the quantum of load shedding in different stages of AUFLS based on the Peak Demand Met of the Region in the financial year (2024-25). The region wise Peak Demand Met considered by NPC Sectt. is as follows:

| Region               | NR     | SR     | WR     | ER     | NER   |
|----------------------|--------|--------|--------|--------|-------|
| Peak Demand Met (MW) | 80,548 | 68,094 | 72,556 | 29,299 | 3,678 |

A.10.3. The quantum of load shedding in different stages of AUFLS region-wise is as follows:

| Sr. No.                                           | Stage   | Frequency (Hz) | Demand Disconnection (%) | Quantum of Load shed in MW |        |        |        |       |                     |
|---------------------------------------------------|---------|----------------|--------------------------|----------------------------|--------|--------|--------|-------|---------------------|
| AUFLS Set Points and Percentage Quantum of Relief |         |                |                          | NR                         | SR     | WR     | ER     | NER   | All India Load shed |
| 1                                                 | Stage 1 | 49.4 Hz        | 5.00 %                   | 3801.7                     | 3213.9 | 3424.5 | 1382.8 | 173.5 | 11996.55            |
| 2                                                 | Stage   | 49.2           | 6.00                     | 4562.0                     | 3856.7 | 4109.4 | 1659.  | 208.3 | 14395.              |

|   |                      |         |        |                |                |                |               |              |                |
|---|----------------------|---------|--------|----------------|----------------|----------------|---------------|--------------|----------------|
|   | e 2                  | Hz      | %      | 4              |                |                | 4             |              | 86             |
| 3 | Stage 3              | 49.0 Hz | 7.00 % | 5322.4         | 4499.5         | 4794.3         | 1935.9        | 243.03       | 16795.17       |
| 4 | Stage 4              | 48.8 Hz | 7.00 % | 5322.4         | 4499.5         | 4794.3         | 1935.9        | 243.03       | 16795.17       |
|   | <b>Total (in MW)</b> |         |        | <b>19008.5</b> | <b>16069.5</b> | <b>17122.4</b> | <b>6914.3</b> | <b>867.9</b> | <b>59982.7</b> |

A.10.4. After the receipt of the allocated load shedding quantum of the Region from NPC, AUFLS relief quantum should be distributed among the State/UT in the region by the RPCs in consultation with the stakeholders.

A.10.5. NRPC Sectt. has computed each State/UT Stage-wise AUFLS quantum for NR based upon the task force report and quantum of load shedding in different stages of AUFLS region-wise finalized by NPC. The details of which are mentioned in the table below:-

| State/UT                       | Stage-1<br>49.4 Hz<br>(5%) | Stage-2<br>49.2 Hz<br>(6%) | Stage-3<br>49.0 Hz<br>(7%) | Stage-4<br>48.8 Hz<br>(7%) | Total        | Currently<br>implemented<br>relief as<br>per 231st<br>OCC |
|--------------------------------|----------------------------|----------------------------|----------------------------|----------------------------|--------------|-----------------------------------------------------------|
|                                | Stage-1<br>Relief          | Stage-2<br>Relief          | Stage-3<br>Relief          | Stage-4<br>Relief          |              |                                                           |
| <b>Chandigarh</b>              | 17                         | 21                         | 24                         | 24                         | <b>86</b>    | <b>Nil</b>                                                |
| <b>Delhi</b>                   | 334                        | 400                        | 467                        | 467                        | <b>1668</b>  | <b>1595</b>                                               |
| <b>Haryana</b>                 | 586                        | 704                        | 821                        | 821                        | <b>2931</b>  | <b>3177</b>                                               |
| <b>Himachal Pradesh</b>        | 101                        | 122                        | 142                        | 142                        | <b>507</b>   | <b>1076</b>                                               |
| <b>UT J&amp;K &amp; Ladhak</b> | 140                        | 168                        | 196                        | 196                        | <b>700</b>   | <b>777</b>                                                |
| <b>Punjab</b>                  | 645                        | 773                        | 902                        | 902                        | <b>3223</b>  | <b>3012</b>                                               |
| <b>Rajasthan</b>               | 853                        | 1024                       | 1194                       | 1194                       | <b>4266</b>  | <b>4066</b>                                               |
| <b>Uttar Pradesh</b>           | 1297                       | 1557                       | 1816                       | 1816                       | <b>6486</b>  | <b>8537</b>                                               |
| <b>Uttarakhand</b>             | 127                        | 152                        | 177                        | 177                        | <b>633</b>   | <b>865</b>                                                |
| <b>Total</b>                   | <b>4100</b>                | <b>4920</b>                | <b>5740</b>                | <b>5740</b>                | <b>20499</b> | <b>23105</b>                                              |

A.10.6. States/UT shall identify the load relief for each stage considering the Quantum of relief and their demand contribution considering the intra-day, seasonality etc. 10% additional relief would be finalised considering the demand growth of the year, planned and forced outages, UFR and breaker issues etc. SLDC would communicate feeder-wise, Stage-wise details etc. to RPC/RLDC.

A.10.7. EE(O), NROC stated that in 234th OCC meeting it was apprised that states like Chandigarh, Delhi, Punjab (In Stage 1&2), Rajasthan (In Stage 1& 2) need to plan load relief in comparison to actual load relief required (attached as **Annexure-A.IV**). Further, as per the recommendation of task force, the planned relief should be 10% more than the actual estimated relief.

- A.10.8. EE(O), NRPC requested States/UTs of NR to submit feeder-wise, Stage-wise AUFLS quantum to NRPC/NRLDC before next OCC meeting.
- A.10.9. MS, NRPC asked all states to plan the aforementioned load relief and submit feeder-wise, Stage-wise AUFLS quantum to NRPC/NRLDC before next OCC meeting.

**Decision of OCC Forum:**

*OCC forum asked all states to plan the requisite load relief as mentioned in the **Annexure-A.IV** and submit feeder-wise, Stage-wise AUFLS quantum to NRPC/NRLDC before next OCC meeting.*

**A.11. Electricity Generation Program for the year 2026-27 (Agenda by NRPC Secretariat)**

- A.11.1. EE(O), NRPC apprised the forum that Central Electricity Authority vide its letter dated 03.09.2025 has sought following information from generating utilities of the country for the preparation of electricity generation program for the year 2026-27:
- Unit-wise monthly generation proposed during 2026-27 taking into account likely fuel availability, the anticipated loss of generation on account of various factors such as grid constraint, low schedule/ Reserve shut down due to high cost, coal/lignite quality etc., if any.
- A.11.2. NRPC Secretariat vide letter dated 09.08.2025 (**Annexure-A.V**) had requested generating utilities to submit the above-mentioned data in the prescribed format (**Annexure-A.VI**) by 5<sup>th</sup> October 2025.
- A.11.3. SE (O), NRPC requested all generating utilities in the Northern Region to submit Unit-wise monthly generation proposed during 2026-27 in the prescribed format (**Annexure-A.VI**) via email to [seo-nrpc@nic.in](mailto:seo-nrpc@nic.in) by 05<sup>th</sup> October 2025.

**Decision of OCC Forum:**

*OCC Forum asked all generating stations of NR to submit Unit-wise monthly generation proposed during 2026-27 in the prescribed format (**Annexure-A.VI**) via email to [seo-nrpc@nic.in](mailto:seo-nrpc@nic.in) by 05<sup>th</sup> October 2025.*

**A.12. Surrendering/utilization of spare 2 No. bays at 400/220 kV Hamirpur Substation of PGCIL allotted to HPSEBL (Agenda by NRPC Secretariat)**

- A.12.1. EE(O), NRPC apprised the forum that in the 77th NRPC & 52nd TCC meeting under agenda item no. A.7 matter regarding surrendering/utilization of spare 2 No. bays at 400/220 kV Hamirpur Substation of PGCIL allotted to HPSEBL was discussed. Forum decided that Punjab, H.P. and CTUIL may explore the feasibilities of utilising the two bays till the next OCC meeting. Forum also suggested HP to approach CERC to get the matter resolved as per its accordance.

- A.12.2. HPPTCL vide letter attached at Annexure-A.IX of agenda has requested confirmation regarding requirement of usage of bays by Punjab and CTUIL.
- A.12.3. CTUIL representative stated that they have not received any request from Punjab or H.P. for utilization of spare bays at 400/220 kV Hamirpur Substation.
- A.12.4. NRLDC representative stated that Punjab may explore the feasibility of utilization of spare bays at 400/220 kV Hamirpur Substation.
- A.12.5. Punjab SLDC representative asked HPPTCL to take up the matter with PSTCL.
- A.12.6. MS, NRPC advised HPPTCL to take up with PSTCL for exploring the feasibility of utilization of spare bays at 400/220 kV Hamirpur Substation.

**Decision of OCC Forum:**

*OCC Forum advised HPPTCL to take up with PSTCL for exploring the feasibility of utilization of spare bays at 400/220 kV Hamirpur Substation.*

**A.13. Restoration of Transmission Lines under outage due to Tower damage (Agenda by NRPC Secretariat)**

- A.13.1. EE(O), NRPC apprised the forum that NRLDC vide letter dated 03.09.2025 (attached at Annexure-A.X of agenda) has intimated that multiple transmission lines (765kV, 400kV, 220kV) are under outage due to tower collapse/damage in the Northern Region.
- A.13.2. It is mentioned in the said letter that the outage of these transmission lines is causing generation evacuation constraints and impacting the grid security. Moreover, the concerned utilities have not been adhering to the timelines committed by them to restore these affected transmission lines.
- A.13.3. SE (O), NRPC asked concerned utilities to update the status of revival of these lines.
- A.13.4. Regarding 220kV Kishenpur – Mir Bazar line and Kishenpur - Ramban line, JKPTCL representative informed that tender has been floated for repair of the tower. Further, Kishenpur - Ramban line would be revived on ERS by October, 2025.
- A.13.5. Regarding 400kV Jalandhar – Samba Ckt-1 & 2, representative of IndiGrid informed that they are planning to revive Ckt-1 through ERS in the next 15 days and Ckt-2 would be revived thereafter.
- A.13.6. Regarding 400kV Jaisalmer – Barmer Ckt-1 & 2, representative of RRVPNL informed that tower erection work has been completed and stringing work is going on and it is expected to be completed by September 2025.
- A.13.7. Regarding 220kV AD Hydro – Nalagarh and 220kV Phozal – Nalagarh, representative of ADHPL informed that 220kV AD Hydro – Nalagarh would be

restored on ERS in the next 2-3 days and both circuits would be restored on normal towers within a month.

A.13.8. Representative of Powergrid NR-1 informed that 765kV Koteshwar – Meerut Ckt-1 has been restored on ERS.

A.13.9. Representative of Powergrid NR-2 informed that 400kV Chamera\_2 - Chamera\_1 Ckt-1 was revived on 08.09.2025 and 400kV Nalagarh – Rampur Ckt-1 & 2 were revived on 15.09.2025.

A.13.10. Representative of Powergrid NR-3 informed that 765kV Bareilly\_2 - Lucknow\_2(PG) Ckt-1

A.13.11. MS, NRPC stated asked concerned utilities to expeditiously restore the lines under outage due to tower collapse for safe, reliable and secure grid operation.

**Decision of OCC Forum:**

*OCC forum asked concerned utilities to expeditiously restore the lines under outage due to tower collapse for safe, reliable and secure grid operation.*

**A.14. Revision of RAPS Island (Agenda by NRPC Secretariat)**

A.14.1. EE(O), NRPC apprised the forum that On 05th January 2024, at 05:16hrs, cascade tripping of multiple elements occurred in RAPS, KTPS generation complex in Rajasthan control area leading to loss of total running generation of KTPS, RAPS (A, B & C) and other small hydro stations (Jawahar Sagar HEP & Rana Pratap Sagar HEP) in the complex. Again, on 29<sup>th</sup> March 2024, at 20:22 hrs a grid event (GD-1) of blackout of this complex occurred.

A.14.2. During the above two grid events i.e., 05<sup>th</sup> January 2024 and 29th March 2024, all the running units at RAPS A, B & C went under Xe-poisoning of reactors. Units were able to synchronized back to the grid only after 2-3 days of the grid events, as significant time period (56-72 hours) is required for complete poison out of Xe from the reactor.

A.14.3. Based on decision of 50th PSC meeting, NRPC constituted the Committee for detailed analysis of the events and give recommendations for strengthening the reliability and security of this complex.

A.14.4. Committee has submitted its report on 07.08.2025. Report of the Committee is attached as Annexure-A.XI of the agenda.

A.14.5. The Committee has recommended for revision of island. Accordingly, agenda has been discussed in 62nd PSC meeting held on 26.08.2025, wherein it was decided that agenda should be discussed in next OCC for approval of island revision.

A.14.6. EE(P), NRPC stated that committee has reviewed load generation balance in RAPS island scheme has been comprehensively. Necessary changes in network configuration and load profile of island scheme have been done to ensure the feasibility of island subsystem.

- A.14.7. SE (O), NRPC asked views of the members of the OCC forum on the revision of RAPS islanding recommended by the Committee.
- A.14.8. NRLDC representative stated that Committee has recommended revision based on the studied carried out by RRVPNL. The study may be reviewed by NRLDC.
- A.14.9. MS, NRPC asked RRVPNL to share the basecase of revised islanding scheme with NRLDC for review.

### ***Decision of OCC Forum:***

*OCC forum asked RRVPNL to share the basecase of revised islanding scheme with NRLDC for review.*

### **A.15. Action on measures suggested for Indian power system during discussion on the Spanish Peninsular blackout event (Agenda by NRPC Secretariat)**

- A.15.1. EE(O), NRPC apprised the forum that, a meeting was held under the chairmanship of the Secretary (Power), MoP on 27.08.2025 to discuss the Spanish Peninsular blackout event.
- A.15.1. Following action points emerged in the meeting:
- i. Enforcement of compliance of RE plants to specified standards/regulations both at intra-state and inter-state level.
  - ii. Periodic testing and tuning of controllers as well as model validation of all grid elements as per IEGC 2023
  - iii. Revision in CEA Construction, Connectivity and Grid Standards for inclusion of necessary technical provisions for RE, BESS, Data Centres, Electrolysers, Synchronous Condensers and other grid elements.
  - iv. Pilot project on Grid Forming Inverters under R&D.
  - v. Planning of dynamic reactive power compensation devices like SynCONs in RE complexes and near major load centres.
  - vi. Sharing the learnings from Spanish Peninsular Blackout Event with STUs/SLDCs/RE Developers and other stakeholders.
  - vii. Discussion to be done with Rajasthan regarding possibility of converting their old thermal units, if identified for retirement, into Synchronous Condensers.
- A.15.2. NRLDC representative stated that a presentation on the Spanish Peninsular blackout event was also delivered by NRLDC in the recent FOLD meeting.
- A.15.3. MS, NRPC requested NRLDC to brief the forum about the event.

A.15.4. The NRLDC representative gave a brief presentation (Attached at **Annexure-A.VII**) to the forum regarding the Spanish Peninsular blackout event.

A.15.5. MS, NRPC requested all STUs/SLDCs/RE developers and other stakeholders to take necessary action on the measures suggested in the aforementioned meeting.

***Decision of OCC Forum:***

*OCC forum asked all STUs/SLDCs/RE developers and other stakeholders to take necessary action on the measures suggested in the meeting held under the Chairmanship of the Secretary (Power) to discuss the Spanish Peninsular blackout event.*

**A.16. Provision for Grid-Forming (GFM) Functionality and Essential Reliability Services from Upcoming VRE and BESS Plants (Agenda by NRPC Secretariat)**

A.16.1. EE(O), NRPC apprised the forum that NLDC vide letter dated 22.08.2025 (attached as Annexure-A.XIII of agenda) has suggested some provision for Grid-Forming (GFM) Functionality and Essential Reliability Services from Upcoming VRE and BESS Plants.

A.16.1. Brief highlights from the letter are mentioned below:

**Background:**

- India targets 500 GW non-fossil capacity by 2030 and net-zero by 2070, requiring large-scale integration of inverter-based resources (IBRs: solar, wind, BESS).
- Several large VRE complexes face weak grid conditions, leading to stability issues and renewable generation loss events (as documented in GRID-INDIA's Nov 2023 report).
- Traditionally, synchronous machines provided inertia, frequency response, fault current, reactive support, and system restoration. With increasing IBR penetration, these essential reliability services (ERS) must be delivered by IBRs.

**Key Points:**

- Presently, most IBRs are Grid-Following (GFL) type, dependent on strong grid conditions.
- Grid-Forming (GFM) inverters can independently establish voltage/frequency, enhance transient stability, damp oscillations, support black start, and improve weak-grid performance.
- BESS is best suited for GFM functionality due to headroom for sustained frequency/voltage support. Global examples (e.g., Hornsdale, Australia) demonstrate success.
- As per CEA NEP (Generation), BESS capacity envisaged:

- ❖ 2026-27: 8,680 MW / 34,720 MWh
- ❖ 2031-32: 47,244 MW / 236,220 MWh
- Mandating GFM capability in large BESS will enhance grid stability and resilience.

#### Pilot Learnings:

##### 1. AGC Pilot with BESS (20 MW / 40 MWh, BRPL Kilokari-1, 2025)

- Successfully integrated into AGC framework.
- Limitations: fixed charging/discharging windows, mandatory cooling-off periods, restricted flexibility due to BMS/inverter constraints.
- Need: future specifications must ensure flexible operation, reduced cooling-off, enhanced BMS controls and telemetry.

##### 2. AGC Pilot with Solar Plant (Adani Devikot, 180 MW, 2024)

- Successfully operated under AGC.
- Limitation: MPPT not available at PPC; only empirical estimation possible, affecting performance evaluation.
- Need: mandate real-time MPPT availability at PPC for AGC/ancillary service operations.

#### Actions Requested:

1. Mandate GFM functionality (at least partial capacity) in all upcoming large-scale BESS and VRE projects to ensure grid stability in weak systems.
2. Revise technical specifications of BESS tenders to include:
  - ❖ Flexible charge–discharge operation
  - ❖ Reduced cooling-off constraints

Advanced BMS controls with real-time telemetry (grid, inverter, MPPT, SOC, etc.)

3. Amend solar plant construction standards to ensure real-time MPPT signals aggregated at PPC for AGC/ERS compliance.
4. Institutionalize AGC readiness for all new VRE and BESS projects to contribute towards ancillary services and essential reliability functions.

A.16.2. NLDC requested by their letter that above suggestions may be deliberated and suitably incorporated in the technical specifications of tender documents for BESS and solar plants for enabling the essential reliability services from these resources.

A.16.3. NRLDC representative stated that Grid-Forming (GFM) inverters can independently establish voltage/frequency, enhance transient stability, damp oscillations, support black start, and improve weak-grid performance. As several states are planning

BESS therefore, he requested to consider Grid-Forming (GFM) inverters in the future BESS and solar plants

- A.16.4. MS, NRPC requested that provisions regarding Grid-Forming (GFM) inverters suitably incorporated in the technical specifications of tender documents for BESS and solar plants for enabling the essential reliability services from these resources.

**Decision of OCC Forum:**

*OCC forum requested concerned stakeholders to incorporate provisions regarding Grid-Forming (GFM) inverters in the technical specifications of tender documents for BESS and solar plants for enabling the essential reliability services from these resources.*

**A.17. SOP for diversion of RPC approved spare Transformers/Reactors to constituents/state transmission utilities (Agenda by Powergrid NR-1)**

- A.17.1 EE (O), NRPC apprised the forum that in line with the discussion held in 55th TCC and 80th NRPC meeting, POWERGRID was asked to submit draft guidelines for diverting RPC-approved spare transformers and reactors to regional constituents.
- A.17.2 Further, in the above meeting it was agreed that guidelines should cover scope, cost implications, penalty provisions, responsibilities of borrowers, timeline for return, and other general aspects related to diversion.
- A.17.3 In compliance to the above, POWERGRID submitted draft SOP/Guidelines for diversion of RPC approved Spare Transformers to the constituents/state transmission utilities.
- A.17.4 Draft guidelines were deliberated in 234th OCC meeting wherein forum suggested certain modifications. Further, constituents were asked to review the draft SOP prepared by POWERGRID and submit their comments before the next OCC meeting.
- A.17.5 EE (O), NRPC presented revised draft SOP to the constituents (copy attached as **Annexure-A.VIII**).
- A.17.6 SE (O), NRPC asked the views of the members on the revised draft SOP.
- A.17.7 UPPTCL suggested that, for the sake of uniformity, POWERGRID should prepare a draft MoU to be signed between the borrower and POWERGRID, and share it with all stakeholders for their comments.
- A.17.8 The representative of DTL enquired whether the SoP would be applicable to ICTs that were diverted to their substations and have already been de-capped.
- A.17.9 MS, NRPC stated that POWERGRID and DTL may mutually address the matter regarding the return of ICTs that have already been de-capped.
- A.17.10 Cost implications and penalty provisions of the draft SOP will be deliberated further in Commercial Sub-Committee meeting of NRPC.

A.17.11 Further, MS, NRPC requested the constituents to submit their comments on the draft SOP within 15 days via email to [seo-nrpc@nic.in](mailto:seo-nrpc@nic.in), failing which it would be presumed that they have no remarks on the matter.

**Decision of OCC Forum:**

*OCC forum asked the constituents to submit their comments on the draft SOP within 15 days via email to [seo-nrpc@nic.in](mailto:seo-nrpc@nic.in), failing which it would be presumed that they have no remarks on the matter. Further, forum asked Powergrid to share a draft MoU to be signed between the borrower and POWERGRID with all stakeholders for their comments within 15 days.*

**A.18. Replacement of existing 2 x 500KVA DG sets at HVDC Dadri & Rihand with 2 x1010 kVA DG sets to meet essential auxiliary power of Rihand-Dadri HVDC Link (Agenda by Powergrid NR-1)**

- A.18.1. EE (O), NRPC apprised the forum that Powergrid NR-1 has submitted that Rihand-Dadri HVDC link of (+/-) 500 KV, 1500 MW Rihand is very critical link for supply of power from thermal generating stations of Eastern UP to Delhi NCR. The HVDC Link was commissioned in 1991 and retro fitment of HVDC Control & Protection, Valve cooling system has been carried out in 2021 under additional capitalisation.
- A.18.2. Powergrid has mentioned that at both HVDC terminals, 415V LT auxiliary supply is provided to critical HVDC loads through 2 nos. incomer feeders coming from 6.6KV feeders from NTPC Dadri & Rihand stations. The critical auxiliary supply load includes fans of transformers and reactors, valve cooling fans and fine water motors, battery chargers etc.
- A.18.3. Powergrid has further mentioned that as per original auxiliary load calculations, 01 no. 500 KVA DG set is provided in each pole at Rihand & Dadri ( total 04 DG set of 500 kVA capacity) to feed auxiliary power supply to critical auxiliary loads of HVDC station.
- A.18.4. Powergrid has further mentioned that as per detailed load calculation sheet attached (Annexure-A.XV of agenda) after retro-fitment of HVDC System, considering Control room C&P essential air conditioners requirement, the total essential load comes out to be approximately 650 KW. It is to mention here that in Refurbished Valve Cooling system 60 number of fans (having 3.6 KW each rating) in each pole have been added due to which auxiliary load requirement has increased. Further, it is pertinent to mention here that inrush current/starting current of these fans may draw 2-3 time of full load current which also impact the performance of DG set.
- A.18.5. Powergrid has further mentioned that on 21.05.2025, HVDC Dadri tripped on "Commutation Failure" due to persistent AC Voltage fluctuations and tripping of lines. The Auxiliary Supply to HVDC Dadri also tripped from NTPC Dadri due to tripping of NTPC Dadri Generating Units. The HVDC Dadri Pole#2 was attempted

to energize with available 500 kVA DG Set, but Pole#2 tripped due to tripping of DG Set on O/L or U/V protection within 30 minutes. On analysis, it was found that after upgradation of HVDC Rihand -Dadri, load of Valve Cooling System has increased from approx. 100 kW to approx. 284 kW per Pole and hence DG Set could not meet the overall aux. power requirement.

- A.18.6. Powergrid has further mentioned that it is very much evident from above incident that existing capacity of DG sets at Rihand & Dadri HVDC is not sufficient to take minimum auxiliary loading and needs to be replaced with 2 x1010 kVA DG sets to meet essential auxiliary power of Rihand-Dadri HVDC Link. Along with DG set, suitable power cables as per increased capacity is required to be laid from DG set to LT distribution room.
- A.18.7. Powergrid has further mentioned that the total cost estimate for supply, installation and retrofitting of 1000 KVA DG set (each for Pole-1&2) at both sites with financial implication of Rs. 11,36,28,525/- only (Eleven crore thirty-six lakhs twenty-eight thousand five hundred twenty-five only) including GST and freight and insurance charges
- A.18.8. Considering the reliability of Rihand-Dadri HVDC link for reliable power transmission to Delhi NCR, Powergrid has proposed replacement of existing 2 x 500KVA DG sets at HVDC Dadri & Rihand with 2 x1010 kVA DG sets to meet essential auxiliary power of Rihand-Dadri HVDC Link at cost estimate of Rs. 11,36,28,525/- (including GST) under additional capitalisation.
- A.18.9. The NRLDC representative enquired from Powergrid as to why the replacement of the DG sets was not carried out during the retro-fitment of the HVDC system.
- A.18.10. Powergrid representative clarified that the review and retro-fitment of the auxiliary supply were not included within the scope of work during the retro-fitment of the HVDC Control & Protection and Valve Cooling systems.
- A.18.11. The NRLDC representative further asked whether Powergrid had explored the possibility of enhancing the existing DG capacity by installing additional 250 kVA DG sets.
- A.18.12. Powergrid informed that they had consulted the OEMs of the existing DG sets regarding augmentation of capacity through the installation of additional DG sets; however, the OEMs indicated that synchronization of the existing DG sets with new DG sets would not be feasible.
- A.18.13. NRLDC also sought clarification on the residual life of the existing DG sets and the proposed plan for their utilization or disposal after replacement with new units.
- A.18.14. Powergrid responded that Pole-1 and Pole-2 DG sets were replaced in 2016 and 2020 respectively. He further added that the residual value of the existing DG sets would be adjusted against the cost of the new DG sets.

A.18.15.MS, NRPC, stated that based on Powergrid submissions, the requirement for new DG sets appears to be justified subject to the adjustment of the residual value of the existing DG sets against the cost of the new DG sets.

**Decision of OCC Forum:**

*OCC Forum approved the proposal of replacement of existing 2 x 500KVA DG sets at HVDC Dadri & Rihand with 2 x 1010 kVA DG sets to meet essential auxiliary power of Rihand-Dadri HVDC Link under additional capitalisation subject to the adjustment of the residual value of the existing DG sets against the cost of the new DG sets. Further, forum decided that the matter may be taken up in the upcoming NRPC meeting for approval.*

**A.19. Requirement of schedule during Mandatory Periodic Testing as per IEGC, 2023 regulations (Agenda by APCPL)**

A.19.1. EE(O), NRPC apprised the forum that APCPL has intimated that as per Regulation 40 of IEGC-2023 Regulations,

(1) there shall be periodic tests, as required under clause (3) of this Regulation, carried out on power system elements for ascertaining the correctness of mathematical models used for simulation studies as well as ensuring desired performance during an event in the system.

(2) General provisions

(a) The owner of the power system element shall be responsible for carrying out tests as specified in these regulations and for submitting reports to NLDC, RLDCs, CEA and CTU for all elements and to STUs and SLDCs for intra-State elements.

(b) **All equipment owners shall submit a testing plan for the next year to the concerned RPC by 31st October** to ensure proper coordination during testing as per the schedule. In case of any change in the schedule, the owners shall inform the concerned RPC in advance.

(c) **The tests shall be performed once every five (5) years or whenever major retrofitting is done. If any adverse performance is observed during any grid event, then the tests shall be carried out even earlier, if so advised by SLDC or RLDC or NLDC or RPC, as the case may be.**

(d) The owners of the power system elements shall implement the recommendations, if any, suggested in the test reports in consultation with NLDC, RLDC, CEA, RPC and CTU.

(3) Testing requirements

The following tests shall be carried out on the respective power system

elements:

Table 8: Tests required for power system elements

| Power System Elements | Tests                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Synchronous Generator | <p>(1) Real and Reactive Power Capability assessment.</p> <p>(2) Assessment of Reactive Power Control Capability as per CEA Technical Standards for Connectivity</p> <p>(3) Model Validation and verification test for the complete Generator and Excitation System model including PSS.</p> <p>(4) Model Validation and verification of Turbine/Governor and Load Control or Active Power/ Frequency Control Functions.</p> <p>(5) Testing of Governor performance and Automatic Generation Control.</p> |

A.19.2. APCPL has further mentioned that NLDC vide letter dated 25-09-2023 has issued guidelines for periodic testing of power system elements. As per the procedure, the various tests as mentioned above, have to be conducted at different MCR loading.

For example,

- **Real Power Assessment** must be conducted at three loading levels: 55%, 70%, and 100% of the Maximum Continuous Rating (MCR).
- **Model Validation and Verification of the complete Generator and Excitation System, including the Power System Stabilizer (PSS)**, is required at 55% and 80% MCR.
- **Automatic Generation Control (AGC) Testing** should be carried out at 55% and 100% MCR loading.

A.19.3. In light of the aforementioned requirements, APCPL has requested that all necessary scheduling support be extended to the generators to facilitate the execution of the mandated tests as per the Indian Electricity Grid Code (IEGC),

2023. These tests should be conducted in a manner that ensures grid stability and security are not compromised at any stage.

A.19.4. NRLDC representative stated that scheduling is done as per the relevant provisions of the relevant CERC regulations. He advised APCPL to coordinate with beneficiaries and schedule the test in such a way that requisite schedule for the testing is provided by the beneficiaries. Further, APCPL may approach CERC for necessary amendments in the in the relevant regulation in this regard.

A.19.5. MS, NRPC advised APCPL to coordinate with beneficiaries for providing requisite schedule for testing.

A.19.6. NRLDC representative stated that scheduling is carried out in accordance with the applicable provisions of the relevant CERC regulations. He advised APCPL to coordinate with the beneficiaries and plan the test in a manner that ensures they provide required schedule. Further, APCPL may approach CERC for any necessary amendments to the applicable regulations, if required.

A.19.7. MS, NRPC also advised APCPL to coordinate with the beneficiaries to ensure availability of the requisite schedule for testing.

A.19.8. APCPL representative requested that during this testing, schedule revision under the SCUC/SCED may not be done by NRLDC. NRLDC representative agreed for the same.

#### **Decision of OCC Forum:**

*OCC forum advised APCPL to coordinate with the beneficiaries to ensure availability of the requisite schedule for testing. Moreover, schedule revision under the SCUC/SCED may not be done by NRLDC.*

**खण्ड-ख: उ.क्षे.भा.प्रे.के.**

**Part-B: NRLDC**

### **B.1 NR Grid Highlights for July 2025 and demand forecasting related**

#### **Demand met details of NR**

| S.No | Constituents | Max Demand met (in MW) | Date & Time of Max Demand met | Max Consumption (in MUs) | Date of Max Consumption | Average Demand met (in Mus) |
|------|--------------|------------------------|-------------------------------|--------------------------|-------------------------|-----------------------------|
| 1    | Chandigarh   | 357                    | 22-08-2025<br>15:00           | 7.15                     | 22.08.25                | 6.330                       |
| 2    | Delhi        | 7050                   | 08-08-2025<br>15:14           | 142.7                    | 08.08.25                | 128.211                     |
| 3    | Haryana      | 12855                  | 08-08-2025                    | 270.03                   | 01.08.25                | 34.812                      |

|    |                 |       |                  |        |          |          |
|----|-----------------|-------|------------------|--------|----------|----------|
|    |                 |       | 14:00            |        |          |          |
| 4  | H.P.            | 1888  | 01-08-2025 10:00 | 39.18  | 08.08.25 | 228.765  |
| 5  | J&K             | 2731  | 22-08-2025 20:00 | 55.3   | 22.08.25 | 48.068   |
| 6  | Punjab          | 16310 | 08-08-2025 10:15 | 348.5  | 09.08.25 | 271.666  |
| 7  | Rajasthan       | 17607 | 13-08-2025 14:30 | 377.9  | 13.08.25 | 319.411  |
| 8  | UP              | 30292 | 20-08-2025 21:38 | 582.5  | 22.08.25 | 47.037   |
| 9  | Uttarakhand     | 2355  | 27-08-2025 20:00 | 52.9   | 20.08.25 | 519.851  |
| 10 | Northern Region | 80688 | 19-08-2025 21:00 | 1780.8 | 19.08.25 | 1604.151 |

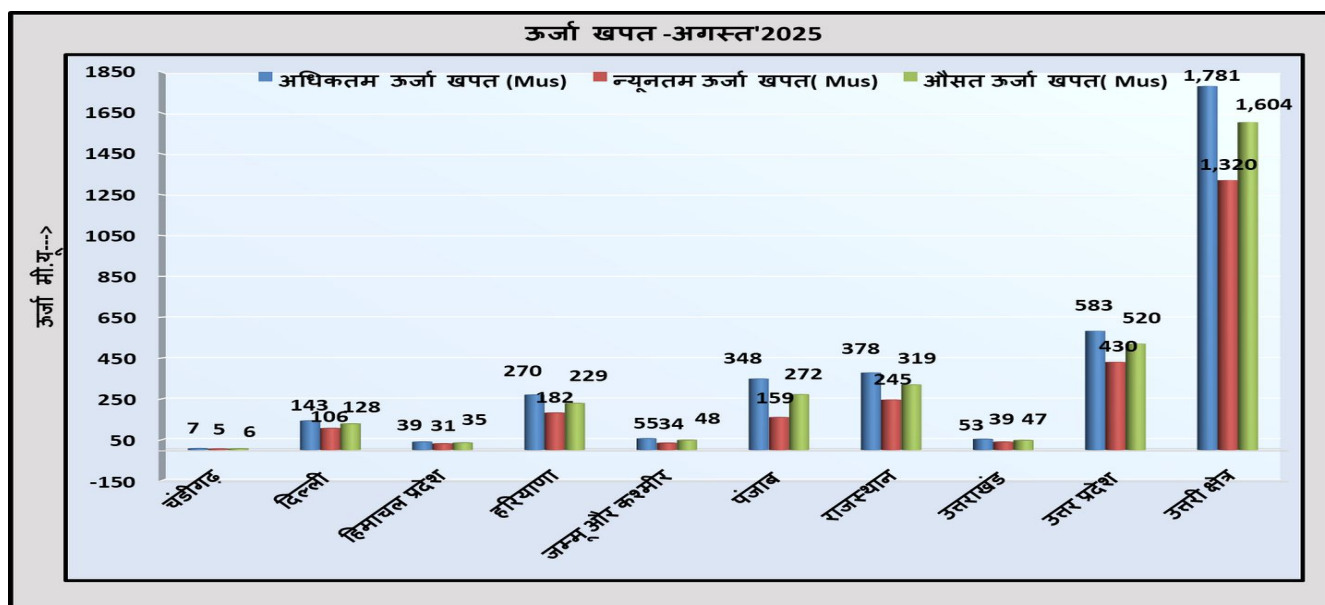
- In August'25, the Maximum energy consumption of Northern Region was **1780.8 MUs** on 19<sup>th</sup> August'25 and it was 5.1% higher than August'24 (1694.13 MU 06<sup>th</sup> August'24)
- In August'25, the Average energy consumption per day of Northern Region was **1609 MUs** and it was 1.59% higher than August'24 (1583 MUs/day)
- In August'25, the Maximum Demand met of Northern Region was **80688 MW** on 19<sup>th</sup> August'25 @21:00 hours as compared to **77380 MW** on 06<sup>th</sup> August'24 @22:00.

#### Comparison of Average Energy Consumption (MUs/Day) – August '24 vs August '25

| क्षेत्र/राज्य   | अगस्त- 2024 | अगस्त - 2025 | % अंतर |
|-----------------|-------------|--------------|--------|
| चंडीगढ़         | 6.9         | 6.3          | -0.6   |
| दिल्ली          | 127.5       | 128.2        | 0.7    |
| हरियाणा         | 232.7       | 228.8        | -3.9   |
| हिमाचल प्रदेश   | 34.6        | 34.8         | 0.2    |
| जम्मू और कश्मीर | 49.9        | 48.1         | -1.8   |
| पंजाब           | 299.7       | 271.7        | -28.0  |
| राजस्थान        | 251.3       | 319.4        | 68.1   |

|                |        |        |      |
|----------------|--------|--------|------|
| उत्तराखंड      | 53.8   | 47.0   | -6.8 |
| उत्तर प्रदेश   | 524.0  | 519.9  | -4.2 |
| उत्तरी क्षेत्र | 1583.4 | 1608.6 | 25.1 |

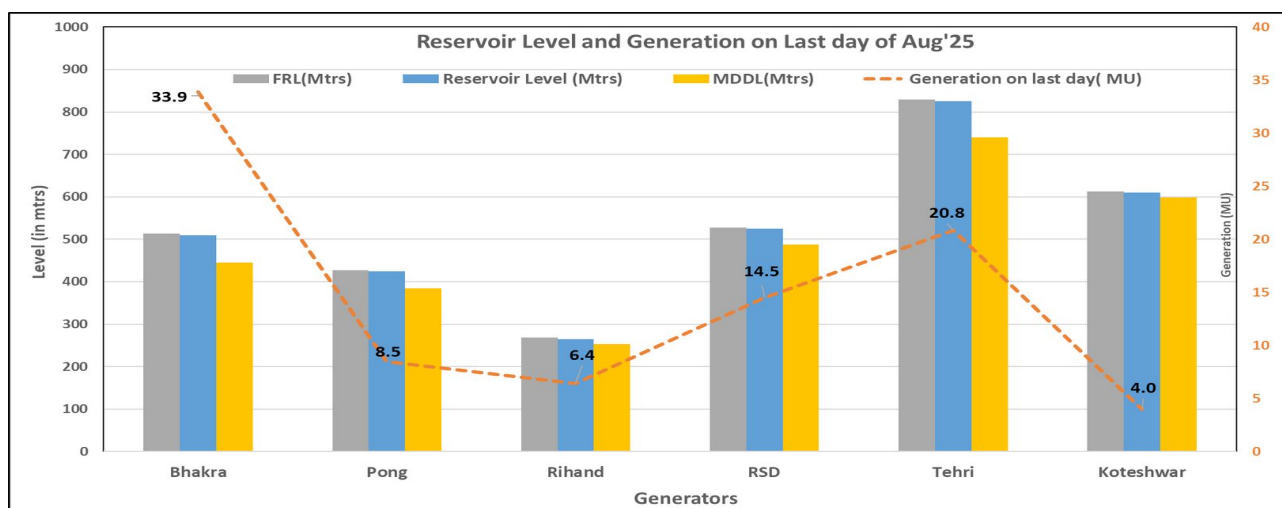
### Energy Consumption



### Frequency profile

| Month  | Avg. Freq. (Hz) | Max. Freq. (Hz)                      | Min. Freq. (Hz)                      | <49.90 (% time) | 49.90 – 50.05 (% time) | >50.05 (% time) |
|--------|-----------------|--------------------------------------|--------------------------------------|-----------------|------------------------|-----------------|
| Aug'25 | 49.999          | 50.352<br>(28.08.25 at 13:01:00 hrs) | 49.469<br>(21.08.25 at 19:13:00 hrs) | 6.63            | 76.22                  | 17.16           |
| Aug'24 | 50.00           | 50.45<br>(27.08.24 at 13:02:50 hrs)  | 49.55<br>(13.08.24 at 19:20:20 hrs)  | 4.7             | 75.0                   | 20.3            |

### Reservoir Level and Generation on Last Day of Month



### Reservoir Level on last day of August month

(Low: -ve)

(High: +ve)

| Year        | Bhakra | Pong | Rihand HPS | RSD  | Tehri | Koteswar | Chamera-1 |
|-------------|--------|------|------------|------|-------|----------|-----------|
| 2025        | 510    | 424  | 264        | 525  | 825   | 610      | 755.85    |
| 2024        | 490    | 403  | 260        | 491  | 794   | 611      | -         |
| Diff (in m) | 19.9   | 21.3 | 4.2        | 33.8 | 30.9  | -0.7     | -         |

Detailed presentation on grid highlights of August'2025 as shared by NRLDC in OCC meeting is attached as Annexure-B.I of MoM.

## B.2 Winter preparedness 2025-26

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. Accordingly, following measures need to be discussed and implemented for better grid operation during winter months:

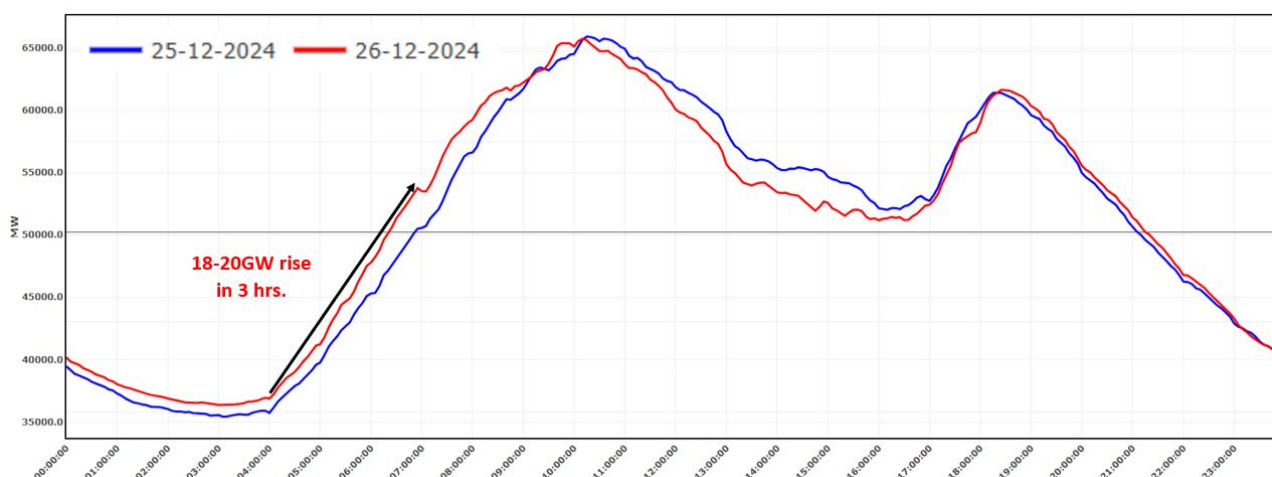
### (i) Load-generation balance (Action by SLDCs/ NRLDC)

- Hydro generation resource which becomes all the more important in winter months due to ramping requirement; it starts depleting due to limited inflow of water (most of the hydro stations of NR are snow fed). With increasing solar generation during the day-time, the ramping requirements during evening hours are rising and posing serious challenge to the system operators to maintain frequency within the band.
- Off-peak to peak demand ratio of NR falls to around 0.5 to 0.6 during winter, morning and evening load ramp is quite steep together with limited hydro

resources etc. This increases the importance of Portfolio management as per load forecast especially during high ramp up and ramp down periods.

- Generation planning becomes very important especially with the in-surge of renewable integration with the grid, generation resources should be optimally planned, taking care to maintain adequate reserves.

Typical regional demand pattern of NR for a winter day is shown below:



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

- Forecast of demand ramp has also become important especially with increasing penetration of solar generation, and so SLDCs are 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 forum asked all utilities to take necessary actions for portfolio management as well as ramp requirements as discussed above.***

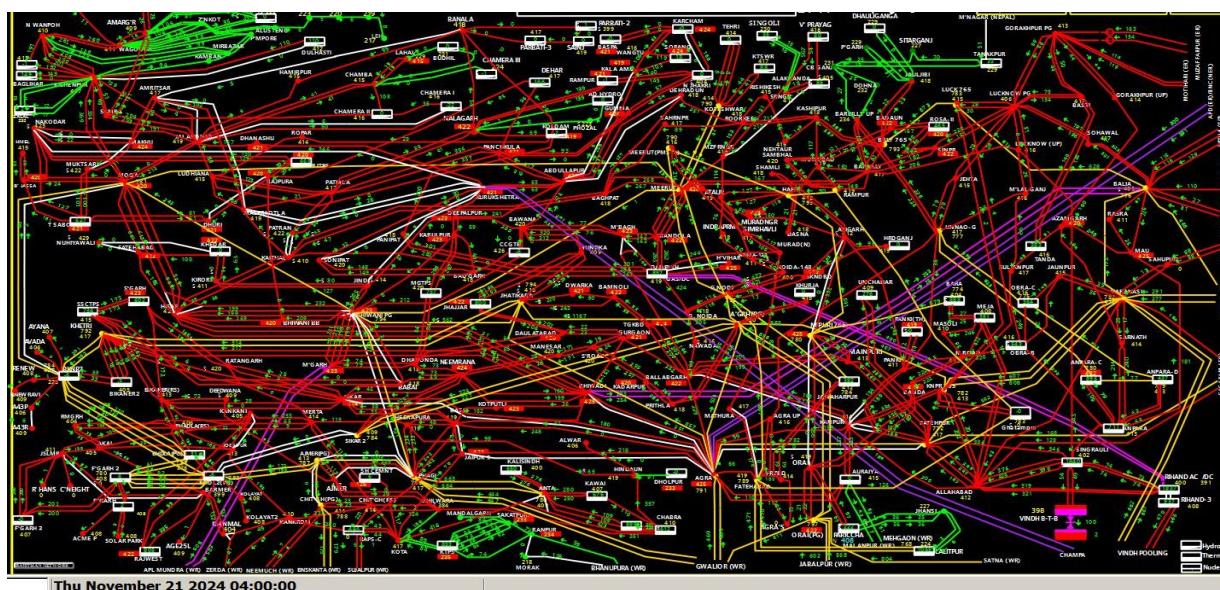
## **(ii) High voltages in grid (Action by all utilities)**

Another big challenge with decrease in demand, is the high voltages observed in the 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 improved minimizing any reactive power requirement from the grid.

To overcome this challenge following measures 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. NRLDC would present the reactive power performance of all thermal generators in next OCC meetings.
- Synchronous condenser operation especially of hydro units during night hours for dynamic voltage support. States/SLDCs were also advised to explore synchronous condenser operation of Hydro & Gas units in their state control area. It was requested that all other utilities may explore possibility of running units as synchronous condenser.
- ICT Tap Optimization at 400kV & above is carried out by NRLDC. Same exercise need to be carried out by SLDCs at 220kV & below levels. ICT tap optimisation will be done by NRLDC before winter based on SCADA data of Oct month.
- 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 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://nrlcdc.in/documents/Documents>. It was requested that all utilities go through document and share any anomaly/misrepresentation. 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.

During 235 OCC meeting, NRLDC representative stressed that as can be seen from the image shown below, even after taking all necessary measures for voltage control as available with NRLDC including opening of 40-50EHVAC lines to control high voltages, high voltage issues are observed in NR grid. Accordingly, it was requested that any planned commissioning of bus reactors may please be expedited before winter 2025.



NRLDC representative requested THDC, BBMB and Punjab SLDC to confirm the availability of their machines for synchronous condenser support.

THDC representative confirmed the availability of both Tehri Hydro Power Plant and Tehri Pumped Storage Plant generating units for synchronous condenser mode of operation. It was also confirmed that machines from both can be operated in synchronous condenser mode of operation simultaneously.

BBMB representative agreed to share confirmation through email after discussing with Pong Hydroplant.

Punjab SLDC confirmed availability of RSD Unit-3 for synchronous condenser mode of operation, as per grid requirement.

CGM NRLDC advised RSD to ensure availability of machine which runs as synchronous condenser during winter season. Further, it was mentioned that Punjab SLDC may ask RSD to operate other units also in synchronous condenser mode of operation with necessary modifications.

Punjab SLDC agreed to take up the same.

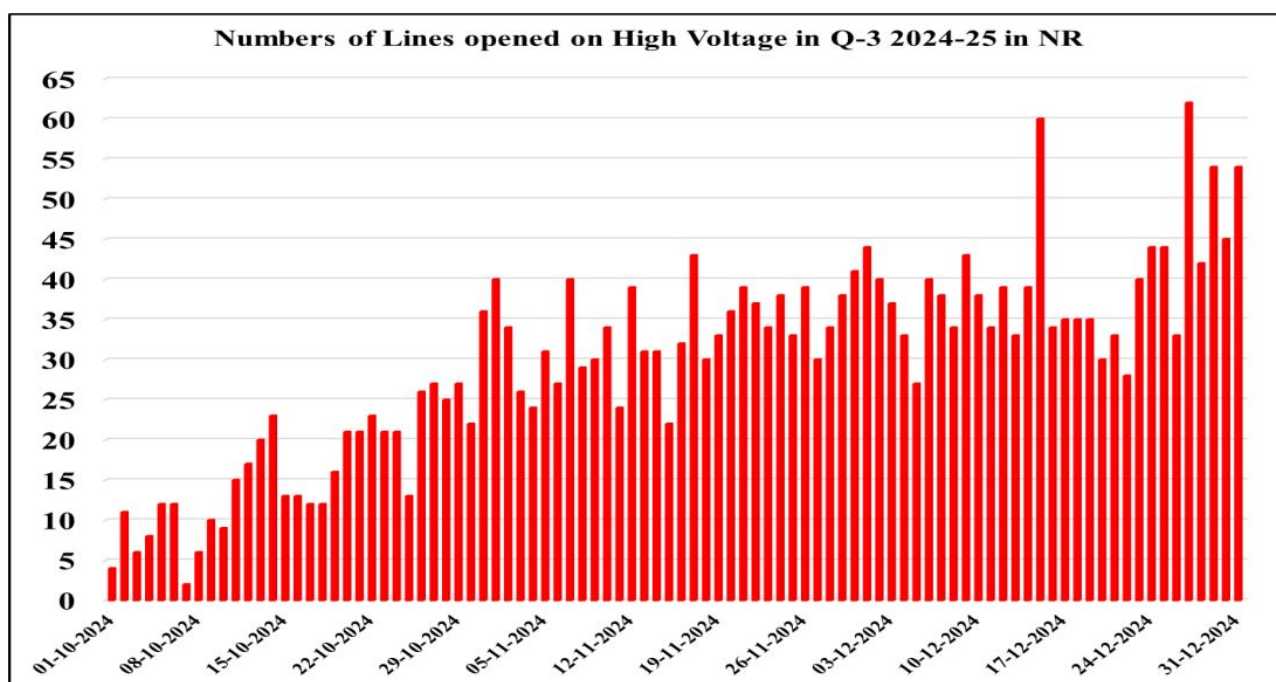
***OCC forum asked all utilities to take necessary actions for portfolio management as well as ramp requirements as discussed above. Further, it was discussed that if all utilities provide maximum support from their side in reactive power management, then operations of bus reactors/ opening of lines on high voltage can further be optimized. All utilities were also asked to explore possibility of running other units as synchronous condenser for grid support.***

### (iii) Plan for winter preparedness (Action by SLDCs)

To avoid frequent opening of lines, following instructions are given to avoid over voltages in the system.

- The bus reactors are switched in.
- The manually switchable capacitor banks are taken out.
- The switchable line/tertiary reactor are taken in.
- Optimizing the filter banks at HVDC terminal.
- All the generating units on bar are advised to absorb reactive power within the capability curve.
- Reduced power flow on HVDC terminals so that loading on parallel EHV network goes up resulting in drop in voltage.

After exhausting all the above stated resources, in the last resort, lightly loaded lines were opened and priority was given to the lines which have switchable line reactor, so that their line reactors(L/R) can be converted to bus reactors(B/R) to contain the overvoltage. As can be seen from the plot shown below, number of 400kV & above lines have to be opened on daily basis to control high voltages in the grid.



NRLDC representative highlighted that it has been observed that many transmission lines have switchable Line Reactors (with distinct Circuit Breaker for switching operations) but they are not used as Bus Reactors due to concerns raised by line owners owing to non-availability of NGR bypass scheme. Generally, the bypass scheme is required for Neutral Grounding Reactor (NGR) of the line reactor so as to utilize the line reactor as bus reactor. The NGR bypass scheme requires a bypass isolator or circuit breaker, the provision of which makes the conversion possible. In planning stage, instalment of NGR bypass schemes may also be considered in switchable Line Reactors to avoid multiple opening of parallel circuits on high voltage and to maintain system voltage within limits specified under Central Electricity Authority (Grid Standards) Regulations, 2010.

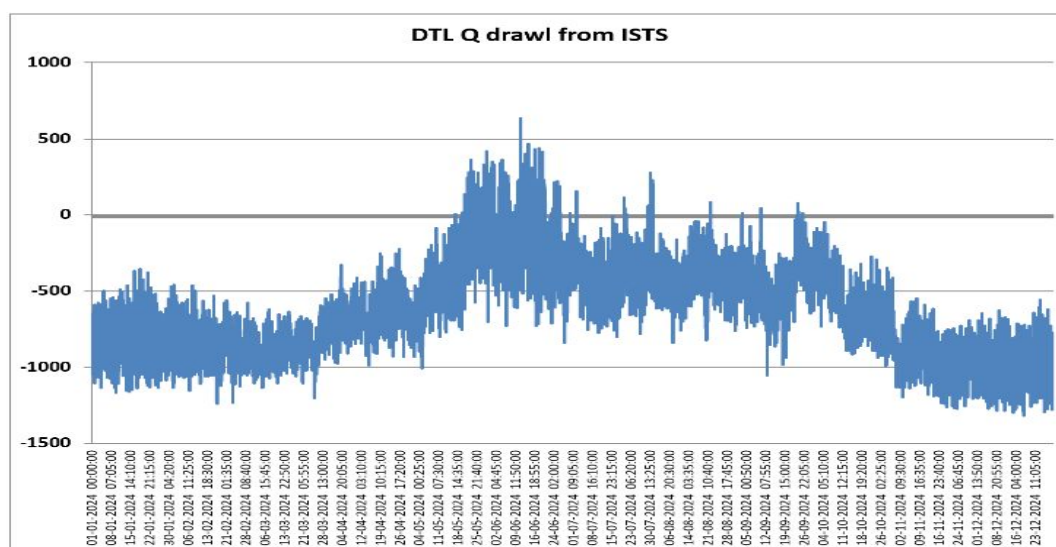
## Severe High voltage in Delhi, Punjab & Haryana area

NRLDC representative highlighted that issue of high voltage in Delhi, Punjab & Haryana state control area is well known. Since the demand of these states reduces drastically in the winter months compared to high demand months from Jun-Sep, the transmission lines and transformers are under-utilised. This leads to a situation wherein the low power flow through these transmission lines leads to high MVAR generation. This high MVAR generation along with less reactive load (highly inductive load during summer months due to agricultural and cooling requirement) leads to very high voltages in the grid. Further, due to less demand, these states are generally drawing power from the pithead plants and their internal generation is also less. This lower internal generation / less machines on bar aggravates the high voltage as no reactive power support is available from nearby machines.

Delhi has a transmission network and distribution network involving cable which are generating high reactive power. Further, when these cables are lightly loaded during the night hours of winter months, it leaves the operator no choice but to open the transmission lines. Thus, it is important that already planned and approved reactors be commissioned before the winter season to minimise the issues of high voltage in Delhi control area.

Similarly, for Punjab & Haryana apart from the above listed measures, it is critical that lightly loaded transmission lines are opened at lower voltage during night time also keeping in mind grid security so that unnecessary MVAR generation is avoided. Ready list of such 220kV lines may be furnished to NRLDC/NRPC for information.

Reactive power exchange by DTL network with ISTS network for year 2024 is shown below:



NRLDC and NRPC representatives stressed that there is around 1000-1200MVAR injection by DTL network into ISTS from Nov-Mar months. Thus, commissioning of bus

reactors in DTL network is urgently required. Status of reactors under commissioning in Delhi control area in Northern region as per 234 OCC MoM is shown below:

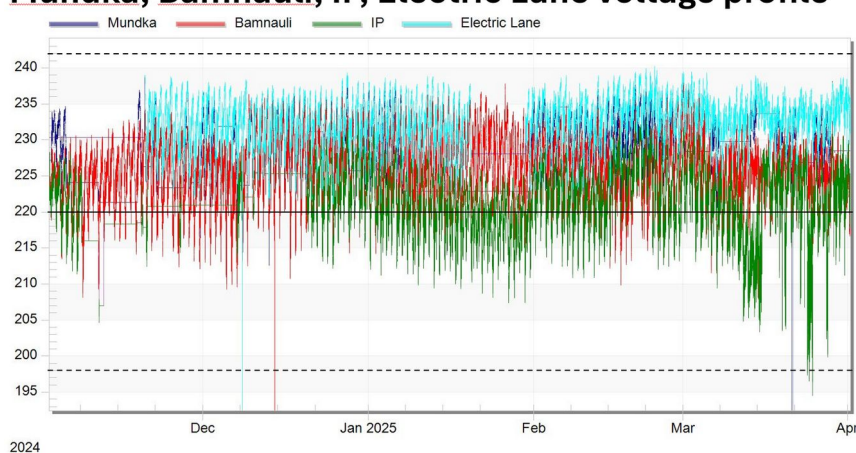
| Substation    | Reactor                                    | Status as per 234 OCC MoM                                                                               |
|---------------|--------------------------------------------|---------------------------------------------------------------------------------------------------------|
| Mundka        | 1x125 MVar at 400 kV & 1x25 MVar at 220 kV | Bay work completed on 25.03.2023. Reactor part tender is dropped and at present same is under revision. |
| Bamnauli      | 2x25 MVar at 220 kV                        | Bay work completed on 25.03.2023. Reactor part tender is dropped and at present same is under revision. |
| Electric Lane | 1x50 MVar at 220 kV                        | Under Re-tendering due to Single Bid                                                                    |
| Indraprastha  | 2x25 MVar at 220 kV                        | Bay work completed on 07.11.2023. Reactor part tender is dropped and at present same is under revision. |

During the meeting, DTL representative updated that bids have been received for 220kV bus reactors and single bid has been received for 400kV bus reactor. Management approval is being sought for awarding these bus reactors, but commissioning of reactors would further take at least 2 years.

NRPC representative highlighted that these bus reactors were approved 7-8 years back by CEA and still these reactors have not been commissioned.

NRLDC representative also presented the voltage profile of these DTL substations and highlighted high voltage at these substations:

**Mundka, Bamnauli, IP, Electric Lane voltage profile**



**OCC forum expressed concern on the delays in commissioning of bus reactors by DTL and asked DTL to commission the reactors on war footing basis. This would help in improving grid voltage and also minimize reactive energy charges payable by Delhi. It was also discussed that special actions are required by Punjab, Haryana & Delhi to avoid the high voltage issues during winter season**

**and it was suggested that these states may prepare action plan for voltage control for upcoming winter season.**

**(iv) EHV line trip during fog/Smog (Action by transmission line owners)**

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. Following lines tripped on two or more occasions during Dec-Jan months of last 2 winter seasons between 21:00hrs-11:00hrs

| Name of line                                           | Owner             | 2023-24 | 2024-25 |
|--------------------------------------------------------|-------------------|---------|---------|
| 220 KV RAPS_A(NP)-Sakatpura(RS) (RS) Ckt-2             | RRVPNL            | 12      | 7       |
| 400 KV Agra-Unnao (UP) Ckt-1                           | UPPTCL            | 8       | 2       |
| 220 KV RAPS_B(NP)-Sakatpura(RS) (RS) Ckt-1             | RRVPNL            | 10      | 4       |
| 220 KV Ratangarh(RS)-Sikar(PG) (PG) Ckt-1              | POWERGRID         | 5       | 2       |
| 220 KV Debari(RS)-RAPS_A(NP) (RS) Ckt-1                | RRVPNL            | 6       | 9       |
| 220 KV Agra(PG)-Bharatpur(RS) (PG) Ckt-1               | POWERGRID, RRVPNL | 2       | 8       |
| 220 KV RAPS_A(NP)-Sakatpura(RS) (RS) Ckt-1             | RRVPNL            | 9       | 14      |
| 400 KV Noida Sec 148-Noida Sec 123 (UP) Ckt-1          | UPPTCL            | 2       | 4       |
| 220 KV RAPS_B(NP)-Debari(RS) (PG) Ckt-1                | POWERGRID         | 2       | 2       |
| 400 KV Indirapuram-Noida Sec 123 (UP) Ckt-1            | WUPPTCL           | 2       | 2       |
| 220 KV Sahupuri(UP)-New Karamnasa (BS) (BSEB) Ckt-1    | BSEB              | 2       | 4       |
| 220 KV Duni(RS)-Kota(PG) (RS) Ckt-1                    | RRVPNL            | 2       | 2       |
| 132 KV Dehar(BB)-Kangoo(HP) (HPPTCL) Ckt-1             | HPPTCL            | 2       | 5       |
| 220 KV RSVPL_SL_FTHG3_PG-Fatehgarh_III(PG) Ckt-1       |                   | 2       | 4       |
| 220 KV Agra(PG)-Kirawali(UP) (PG) Ckt-1                | POWERGRID, UPPTCL | 2       | 2       |
| 220 KV Fatehgarh_II(PG)-ASEJOL_HB FTGH2 (ASEJOL) Ckt-1 |                   | 2       | 2       |
| 132 KV Khatima(UK)-Pilibhit(UP) (PTCUL) Ckt-1          | PTCUL             | 2       | 4       |

It is being seen that there is higher number of tripping in lines passing through UP and Rajasthan as compared to Punjab and Haryana. These tripping were also discussed in past OCC and protection subcommittee meetings, wherein actions being taken at utility end were also discussed. All concerned transmission licensees are requested to ensure:

- Priority wise cleaning & replacement is carried out. Priority to be given to the lines that have historical record of tripping during foggy weather.
- Progress on cleaning, replacement of porcelain insulator with polymer insulator to be monitored and latest status may be furnished to NRPC/NRLDC. NRLDC will also try and prioritize shutdowns for crucial lines having past instances of tripping during foggy weather.

***NRLDC representative highlighted frequent tripping of lines from RAPS station during winter months which risks the formation of island as well as complete outage of complex.***

***Rajasthan SLDC stated they would obtain present status of washing/cleaning and replacement of porcelain insulators with polymer insulators for lines from RAPS and share with NRLDC.***

***OCC asked all transmission licenses and utilities to ensure:***

- ***Priority wise cleaning & replacement is carried out. Priority to be given to the lines that have historical record of tripping during foggy weather.***
- ***Progress on cleaning replacement of porcelain insulator with polymer insulator to be monitored and latest plan/status to be furnished to NRPC/NRLDC by 30<sup>th</sup> Sep.***

**(v) Ensuring protection settings as approved by NRPC (Action by all transmission & generating stations)**

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 over flux 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.***

**Utilities were requested to plan for above listed measures for carrying out pre-winter maintenance activities.**

### B.3 Minimising deviation against scheduled drawl by Rajasthan state control area

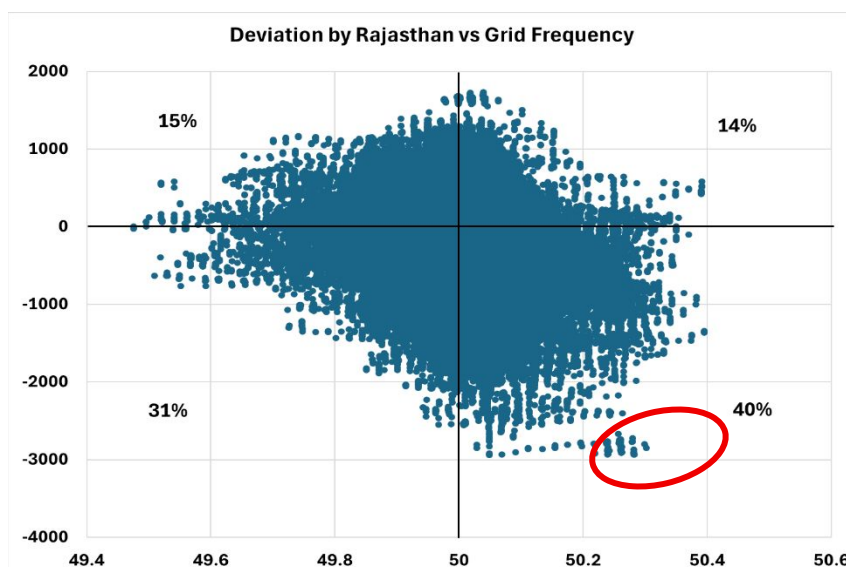
It has been observed that Rajasthan state has been under drawing from the grid in June-Sep 2025. The under drawl in Energy terms reached 10-20 MUs on daily basis as per the Daily Operation Report published by NRLDC. With inclement weather leading to load crash and lower demand, high frequency grid operation has been observed recently. NRLDC has been advising constituents to maintain load generation balance and messages are also regularly issued from Real time operators to the under-drawing constituents. Further, NRLDC has been pro-actively carrying out hydro moderation of ISGS plants in addition to TRAS down support from NLDC to arrest high frequency.

The details of day wise deviation i.r.o. Rajasthan state control area is given below:

#### Rajasthan Deviation in Jun-Aug

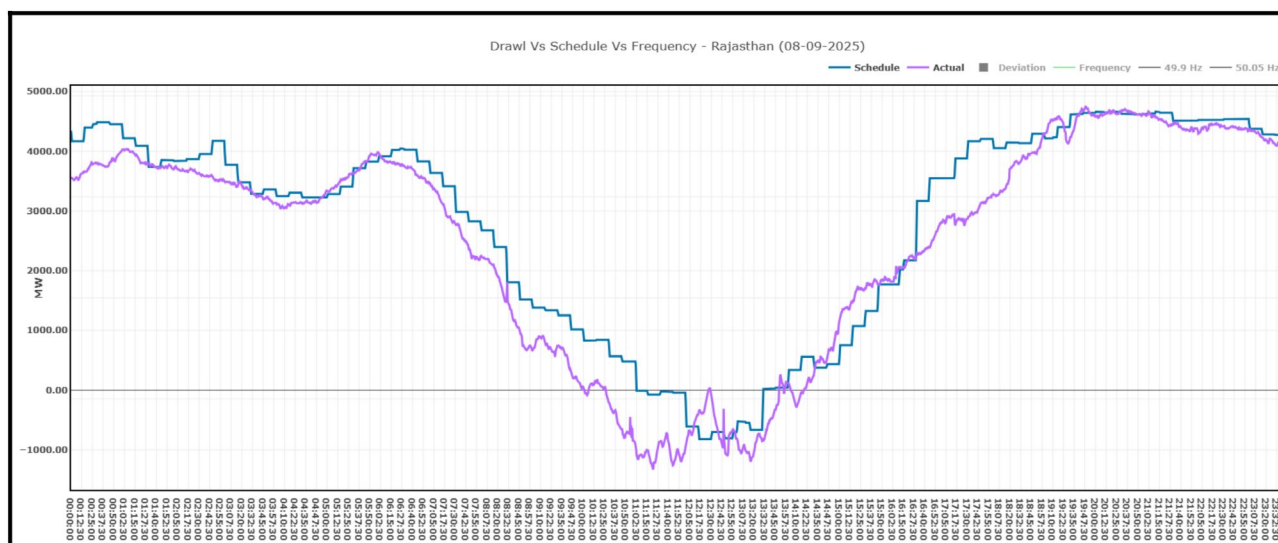
| Date       | Schedule | Actual | OD(+) UD(-) | Date       | Schedule | Actual | OD(+) UD(-) | Date       | Schedule | Actual | OD(+) UD(-) |
|------------|----------|--------|-------------|------------|----------|--------|-------------|------------|----------|--------|-------------|
| 01-06-2025 | 121.0    | 115.8  | -5.2        | 01-07-2025 | 108.0    | 95.8   | -12.2       | 01-08-2025 | 106.8    | 97.6   | -9.1        |
| 02-06-2025 | 112.2    | 104.4  | -7.8        | 02-07-2025 | 116.9    | 112.6  | -4.3        | 02-08-2025 | 90.9     | 78.3   | -12.6       |
| 03-06-2025 | 80.3     | 70.8   | -9.4        | 03-07-2025 | 114.6    | 112.1  | -2.5        | 03-08-2025 | 107.0    | 97.7   | -9.3        |
| 04-06-2025 | 86.1     | 78.8   | -7.3        | 04-07-2025 | 113.9    | 107.9  | -6.0        | 04-08-2025 | 119.1    | 111.2  | -7.8        |
| 05-06-2025 | 91.9     | 89.1   | -2.7        | 05-07-2025 | 108.4    | 99.0   | -9.3        | 05-08-2025 | 110.3    | 104.4  | -5.9        |
| 06-06-2025 | 111.6    | 111.3  | -0.3        | 06-07-2025 | 119.1    | 117.0  | -2.1        | 06-08-2025 | 121.2    | 124.0  | 2.8         |
| 07-06-2025 | 129.8    | 122.6  | -7.1        | 07-07-2025 | 127.9    | 120.9  | -7.0        | 07-08-2025 | 141.9    | 140.6  | -1.2        |
| 08-06-2025 | 125.8    | 121.3  | -4.6        | 08-07-2025 | 128.7    | 128.3  | -0.5        | 08-08-2025 | 140.2    | 138.7  | -1.5        |
| 09-06-2025 | 136.4    | 133.0  | -3.4        | 09-07-2025 | 126.0    | 122.9  | -3.1        | 09-08-2025 | 140.6    | 136.0  | -4.6        |
| 10-06-2025 | 143.3    | 138.9  | -4.4        | 10-07-2025 | 126.5    | 123.2  | -3.3        | 10-08-2025 | 130.6    | 126.0  | -4.7        |
| 11-06-2025 | 145.4    | 144.4  | -1.1        | 11-07-2025 | 110.2    | 103.5  | -6.7        | 11-08-2025 | 138.7    | 134.6  | -4.1        |
| 12-06-2025 | 153.4    | 154.1  | 0.7         | 12-07-2025 | 97.7     | 93.7   | -4.0        | 12-08-2025 | 147.4    | 146.2  | -1.2        |
| 13-06-2025 | 158.5    | 158.7  | 0.3         | 13-07-2025 | 90.5     | 81.6   | -8.9        | 13-08-2025 | 166.8    | 168.6  | 1.8         |
| 14-06-2025 | 160.1    | 164.0  | 3.9         | 14-07-2025 | 78.0     | 70.6   | -7.4        | 14-08-2025 | 178.7    | 179.2  | 0.5         |
| 15-06-2025 | 155.8    | 144.4  | -11.4       | 15-07-2025 | 74.1     | 69.1   | -4.9        | 15-08-2025 | 168.6    | 167.4  | -1.2        |
| 16-06-2025 | 137.0    | 130.2  | -6.8        | 16-07-2025 | 81.6     | 76.6   | -5.0        | 16-08-2025 | 167.6    | 165.6  | -2.0        |
| 17-06-2025 | 132.2    | 118.7  | -13.4       | 17-07-2025 | 91.0     | 89.2   | -1.9        | 17-08-2025 | 179.0    | 178.6  | -0.4        |
| 18-06-2025 | 132.9    | 125.3  | -7.6        | 18-07-2025 | 85.0     | 82.2   | -2.9        | 18-08-2025 | 175.0    | 173.0  | -2.0        |
| 19-06-2025 | 130.9    | 120.5  | -10.4       | 19-07-2025 | 73.9     | 70.7   | -3.1        | 19-08-2025 | 177.6    | 174.6  | -3.0        |
| 20-06-2025 | 112.2    | 101.1  | -11.1       | 20-07-2025 | 97.0     | 94.2   | -2.9        | 20-08-2025 | 171.5    | 171.1  | -0.4        |
| 21-06-2025 | 116.2    | 109.8  | -6.4        | 21-07-2025 | 96.0     | 95.2   | -0.8        | 21-08-2025 | 170.2    | 172.3  | 2.1         |
| 22-06-2025 | 116.4    | 105.7  | -8.7        | 22-07-2025 | 102.4    | 98.4   | -4.0        | 22-08-2025 | 158.1    | 151.5  | -6.6        |
| 23-06-2025 | 132.0    | 128.5  | -3.4        | 23-07-2025 | 83.6     | 77.3   | -6.3        | 23-08-2025 | 135.2    | 122.8  | -12.4       |
| 24-06-2025 | 137.1    | 130.8  | -6.3        | 24-07-2025 | 102.0    | 105.1  | -2.1        | 24-08-2025 | 130.4    | 123.9  | -6.5        |
| 25-06-2025 | 135.0    | 128.5  | -6.4        | 25-07-2025 | 129.2    | 128.1  | -1.1        | 25-08-2025 | 124.2    | 115.1  | -9.1        |
| 26-06-2025 | 132.8    | 132.5  | -0.3        | 26-07-2025 | 122.3    | 122.2  | -0.1        | 26-08-2025 | 107.4    | 99.9   | -7.6        |
| 27-06-2025 | 117.8    | 114.5  | -3.3        | 27-07-2025 | 128.8    | 126.3  | -2.5        | 27-08-2025 | 110.9    | 104.5  | -6.4        |
| 28-06-2025 | 130.8    | 124.8  | -6.0        | 28-07-2025 | 126.3    | 117.9  | -8.4        | 28-08-2025 | 122.0    | 116.2  | -5.8        |
| 29-06-2025 | 114.2    | 103.6  | -10.6       | 29-07-2025 | 120.8    | 92.0   | -28.8       | 29-08-2025 | 126.3    | 122.4  | -3.8        |
| 30-06-2025 | 111.7    | 107.2  | -4.5        | 30-07-2025 | 128.1    | 116.5  | -11.6       | 30-08-2025 | 122.7    | 115.8  | -6.9        |
| Total      | 3810.2   | 3643.2 | -167.0      | 31-07-2025 | 116.8    | 110.8  | -6.0        | 31-08-2025 | 101.8    | 84.9   | -16.8       |
|            |          |        |             | Total      | 3308.1   | 3156.3 | -151.9      | Total      | 4288.4   | 4142.8 | -145.7      |

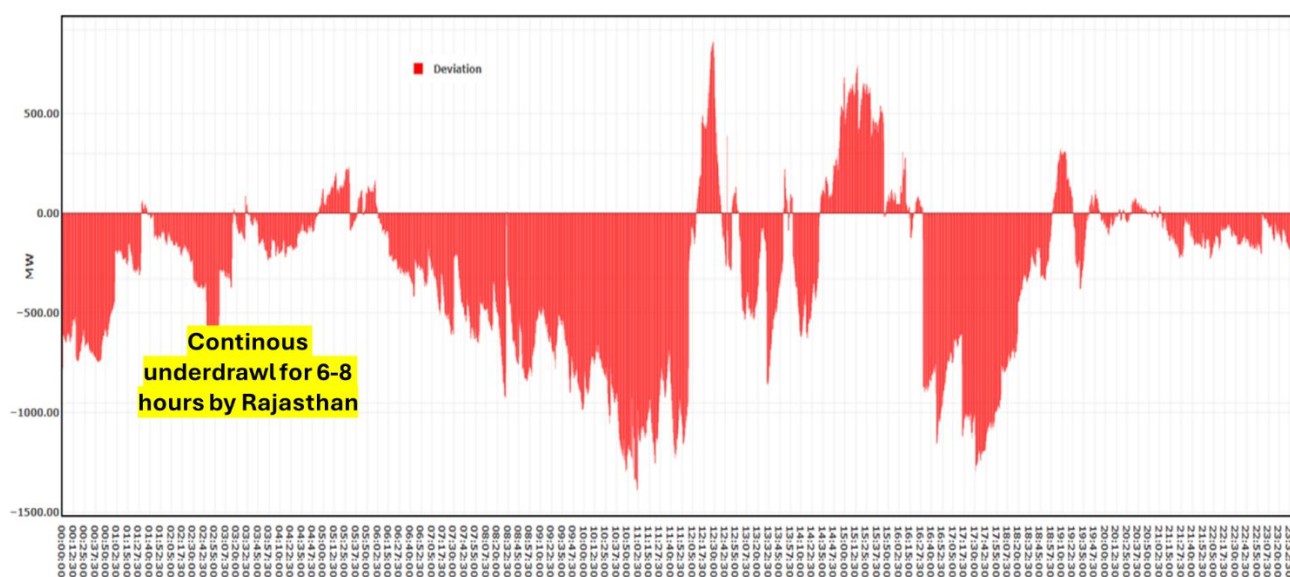
Further Scatter plot depicting deviation by Rajasthan and grid frequency for Jun-Aug 2025 period is shown below:



**During 235 OCC meeting, NRLDC representative stated that Rajasthan had underdrawl for around 71% of time in last 3 months of which around 40% of time frequency was beyond 50.0Hz and 30% of time frequency was below 50.0Hz. Also, there were instances when Rajasthan has under drawl of 3000MW, even when frequency was beyond 50.20Hz. Such large and continuous deviations from schedule are a threat to the system security.**

Without required MTL and ramp support from intrastate thermal generators, it will be very difficult to manage drawl by Rajasthan state control area. Further, recently on 08.09.2025, it was seen that Rajasthan state was injecting power into the ISTS due to surplus power during the day-time and drawing in the evening time. With increasing penetration of RE intrastate generation, adequate MTL and ramp support from intrastate thermal generators becomes very crucial.





To avoid continuous high frequency operation in the grid, following actions may be ensured during real-time grid operation and maintain their drawal close to schedule:

- Portfolio management through sale/purchase of power in T-GNA
- Lifting of planned load shedding, curtailments, if any
- Generation backing down in coal fired thermal stations to 55% of Maximum Continuous Rating (MCR) loading of the units on bar at the generating station after deducting the normative Auxiliary Energy Consumption plus Auxiliary Energy Consumption compensation as per the provisions of the Grid Code as per merit order based on variable charges
- Downward revision of requisitions from ISGS as per merit order on request of beneficiaries
- Expeditious planning and commissioning of energy storage resources
- Generation reduction at hydro stations having storage capability

**ED NRLDC pointed out that multiple letters and real-time communications from the control room have been sent to Rajasthan. Rajasthan needs to improve its portfolio management. There have been instances of significant under-drawl, during high-frequency periods coinciding with the implementation of TRAS down on ISGS solar plants to control frequency. He also urged all SLDCs to engage with their respective regulators and explore the possibility of introducing ancillary services regulations at the state level, like what is being implemented at the ISTS level.**

**Rajasthan SLDC representative stated that Intrastate Thermal generation is being backed down to technical minimum level and 55% schedule is being**

*given to all intrastate thermal generators although few generators are still not able to operate at 55%. Requisitions from ISGS are being revised to revise net schedule of state from ISTS. Rajasthan is selling excess power in market and as a last resort, RE curtailment has also been done on few occasions to maintain state drawl from the grid during high frequency period when no further backing down was possible. He further stated that with onset of winter season, demand of Rajasthan would increase and underdrawl scenarios during day time would not be there.*

*MS NRPC asked Rajasthan SLDC to plan for long term and take necessary actions so that diurnal variations in demand and generation are managed properly without any significant deviation by Rajasthan state control area.*

NRLDC representative further highlighted the MTL levels of different intrastate thermal stations:

| Name of State | Name of Intra-State Thermal Generator          | Installed Capacity (in MW) | MTL (in %) | Additional Flexibility margin in case all generators operate at MTL |
|---------------|------------------------------------------------|----------------------------|------------|---------------------------------------------------------------------|
| Rajasthan     | Kota                                           | 1240                       | 0.72       | 211                                                                 |
|               | Suratgarh                                      | 1500                       | 0.72       | 255                                                                 |
|               | Chhabra                                        | 1000                       | 0.72       | 170                                                                 |
|               | Dholpur                                        | 330                        | 0.72       | 56                                                                  |
|               | Ramgarh                                        | 270                        | 0.72       | 46                                                                  |
|               | Rajwest                                        | 1080                       | 0.72       | 184                                                                 |
|               | Total                                          |                            |            | 921                                                                 |
| Haryana       | Panipat Unit-6                                 | 210                        | 0.77       | 46                                                                  |
|               | Panipat Unit-7 & 8                             | 500                        | 0.70       | 75                                                                  |
|               | Total                                          |                            |            | 121                                                                 |
| Delhi         | IP Gas Turbine Power Station (in Closed Cycle) | 90                         | 0.80       | 23                                                                  |
|               | Pragati Power station -I                       | 330                        | 0.80       | 83                                                                  |
|               | Pragati Power station -III, Bawana             | 1371                       | 0.75       | 274                                                                 |
|               | Total                                          |                            |            | 379                                                                 |
| Uttarakhand   | GIPL                                           | 225                        | 0.85       | 68                                                                  |
|               | SEPL                                           | 450                        | 0.85       | 135                                                                 |
| Punjab        | Goindwal Sahib                                 | 540                        | 0.59       | 22                                                                  |
|               | Lehra Mohabbat U# 1                            | 210                        | 0.79       | 50                                                                  |
|               | Lehra Mohabbat U# 3 & 4                        | 500                        | 0.68       | 65                                                                  |
|               | Ropar                                          | 840                        | 0.75       | 168                                                                 |
|               | Total                                          |                            |            | 508                                                                 |
|               | Grand Total                                    |                            |            | 1929                                                                |

*It was highlighted from NRLDC side that maximum of 920MW additional flexibility can be obtained in the grid if Rajasthan intrastate thermal generators back down to MTL of 55%. It was also mentioned that maximum of 1920MW additional flexibility can be obtained if all NR intrastate thermal generators back down to MTL of 55%.*

*OCC forum discussed that Rajasthan grid is facing critical issues which have also been discussed at higher TCC/NRPC forum, but actions from Rajasthan side seem to be slow. It was also mentioned that SLDC being the nodal agency for secure grid operation of state network should strongly take up with their*

***SERC regarding challenges being faced in grid operation, so that concerned agencies take necessary actions swiftly.***

#### **B.4 State-wise transmission constraints in monsoon 2025 and SPS proposals**

During the high demand season, the transmission system in Northern region remains heavily loaded. Transmission constraints observed in the grid during high demand period are regularly being highlighted in OCC meetings. Same is also being submitted to CTUIL and CEA through quarterly operational feedback.

Even after several follow-ups, it is observed that progress of several transmission elements are not upto the mark and expeditious actions from transmission utilities are required so that minimal issues are observed at transmission level during the high demand season.

State-wise issues and measures required thereof are listed below. Concerned transmission utilities were requested to provide update and ensure that these transmission elements are possibly commissioned during this high demand season.

##### **Punjab:**

Punjab SLDC informed that study has been carried out and revised ATC/TTC limit has been recently submitted on 13.08.2025 which requires review from NRLDC. Tentative increase of 500MW in ATC/TTC limits has been proposed from Punjab SLDC side. Subsequently, NRLDC and Punjab SLDC exchanged several communications regarding issues with basecase.

Finally, NRLDC vide email dated 27.08.2025 communicated the import Limits as assessed by NRLDC:

Available Transfer Capability: 10900MW

Total Transfer Capability: 11400MW

(Which is similar to limits assessed and shared by Punjab SLDC)

Limiting Constraint observed:

1.N-1 contingency of 500MVA ICT at 400/220kV Rajpura will overload remaining ICTs (100%)

2.N-1 contingency of 500MVA ICT at 400/220kV Dhanansu will overload remaining ICTs (100%)

3.N-1 contingency of 500MVA ICT at 400/220kV Muktsar may overload remaining ICTs (on verge of N-1 non-compliance) (95%)

However, there will be a significant increase in ATC/TTC by 500MW based on simulation studies and low voltage issues & overloading of 220kV network may be observed with this increased ATC/TTC limits.

Accordingly, NRLDC proposed to increase ATC/TTC limits of Punjab state control area by 300MW presently and keeping it under observation and in case no issues are observed with ATC/TTC limits of 10700/11200MW, decision on further increase

of ATC/TTC by 200MW would be taken by NRLDC in consultation with Punjab SLDC.

***Punjab SLDC representative stated that they are awaiting management approval for the same. NRLDC proposal for enhancing ATC/TTC by 300MW and 200MW subsequently based on observation has been shared with higher officials and after their consent, same shall be communicated with NRLDC.***

#### **Haryana:**

As POWERGRID has confirmed via e-mail that SPS has been implemented at 765/400kV Bhiwani(PG), ATC/TTC of Haryana state control area has been revised to 10400/10700 MW w.e.f. 07<sup>th</sup> Aug 2025.

#### **SPS proposals in Haryana**

**For SPS at 400/220kV Hissar(PG) ICTs:** Haryana SLDC wanted to wire 220kV Hissar(BBMB)-220kV Sangrur D/C (supplying power to Punjab) and 220kV Hissar-Chirawa (supplying power to Rajasthan) lines in SPS. Punjab and Rajasthan SLDC have agreed for wiring 220kV Hissar-Chirawa line in SPS logic.

POWERGRID informed that PLCC channel is not available for transferring signal from 220kV Hissar(PG)--->220kV Hissar(IA-HVPNL)--->220kV Hissar(BBMB) and it would require procurement of DTPC coupler for implementation of SPS. It was discussed that new 500MVA ICT is approved at Hissar(PG) but it may not be commissioned before next paddy season. Further, there are also loading issues in 220kV Hissar(PG)---220kV Hissar(IA-HVPNL)---220kV Hissar(BBMB) for most part of the year. Accordingly, SPS for N-1 contingency of 400/220kV Hissar(PG) ICTs and 220kV Hissar(PG)---220kV Hissar(IA-HVPNL)---220kV Hissar(BBMB) ckts is required. HVPNL and BBMB were asked to check at their respective substations regarding space for DTPC panel and also confirm feasibility of SPS implementation.

As a short term measure (till implementation of SPS at Hissar-PG), in case loading of 400/220kV Hissar(PG) ICTs crosses 90% of rated capacity, then NRLDC in consultation with BBMB, Haryana SLDC, Punjab SLDC and Rajasthan SLDC may ask BBMB to open 220kV Hissar(BBMB)-220kV Sangrur D/C (supplying power to Punjab) and 220kV Hissar-Chirawa (supplying power to Rajasthan) lines. Punjab SLDC and Rajasthan SLDC to ensure supply of these stations from other stations before disconnection from Hissar(BBMB).

***During 235 OCC meeting, NRLDC representative stated that as HVPNL and BBMB had confirmed space for placing DTPC panel, POWERGRID was asked by OCC forum to expedite procurement of DTPC for implementation of SPS at Hissar(PG).***

***POWERGRID representative stated that the proposal has been initiated and DTPC panels would be procured at the earliest.***

***NRLDC representative asked POWERGRID to plan & implement SPS in such a manner that SPS is surely implemented by Apr 2026.***

**For SPS at 400/220kV Panipat ICTs:** Haryana SLDC to review the requirement of SPS as continuous N-1 violation is being observed. During 234 OCC meeting,

NRLDC representative stated that loading of 400/220kV Panipat is still beyond the N-1 limits even after LILO of 2<sup>nd</sup> ckt of 220kV Samalkha-Mohana at 400/220kV Sonapat(PG) and continuous N-1 violations were observed during June 2025. HVPNL is implementing new 400/22kV ICT at Panipat. It was requested to provide an update on shifting of some load from Panipat to Sonipat as an interim measure.

Haryana SLDC representative stated that around 40-50MW load has been shifted to Sonipat from Panipat. He further stated that in the coming time loading would reduce only and before the next season ICT might come, timeline for which once confirmed by BBMB and their TS wing will be shared with the forum.

***Haryana SLDC representative stated that they have communicated with HVPNL TS Wing for preparing proposal for SPS at 400/220kV Panipat.***

***It was further discussed that two new ICTs would be commissioned at 400/220kV Panipat. One would be implemented by HVPNL and another by BBMB.***

***NRLDC representative stated that HVPNL and BBMB may take necessary approval from CEA PSPA so that First Time Charging of ICTs is smoothly facilitated.***

#### **Rajasthan:**

| Constrained location                                      | Status as available with NRLDC                                              |
|-----------------------------------------------------------|-----------------------------------------------------------------------------|
| N-1 contingency of 3*315=945 MVA ICT at Bhiwadi(PG)       | Additional 500MVA ICT approved in 29 CMETS on 17.05.2024                    |
| N-1 contingency of 2*315+500=1130 MVA ICT at Bassi(PG)    | Additional 500MVA ICT has been approved. Same is anticipated by 14.12.2025. |
| N-1 contingency of 315+500=815 MVA ICT at Neemrana(PG)    | Additional 500MVA ICT has been approved in 36 NR CMETS held on 15.01.2025.  |
| N-1 contingency of 2*500=1000 MVA ICT at Jaipur South(PG) | Additional 500MVA ICT has been approved in 36 NR CMETS held on 15.01.2025.  |

|                                                                |                                                                                                                                                                                                                                                                                                                                                                                                               |
|----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| N-1 contingency of 2*315+500=1130 MVA ICT at Sikar(PG)         | Additional 500MVA ICT has been approved in 38 NR CMETS held on 28.05.2025..                                                                                                                                                                                                                                                                                                                                   |
| N-1 contingency of 3*315=945 MVA ICT at Kankroli(PG)           | ICT-4 has been approved and is expected to be commissioned by Oct 2025.                                                                                                                                                                                                                                                                                                                                       |
| N-1 contingency of 2*315=630 MVA ICT at Kotputli(PG)           | Augmentation by 400/220 kV 500 MVA (3rd) ICT at Kotputli (PG) is expected by 31.12.2025                                                                                                                                                                                                                                                                                                                       |
| N-1 contingency of 2*315=630 MVA ICT at Deedwana(RVPN)         | <p>As per latest status shared by Rajasthan SLDC order for 10 no. ICT has been placed recently. New 500MVA ICTs are expected to be commissioned at 400/220kV Merta, Ajmer and Bikaner by Sep 2025.</p> <p>SPS has been implemented as temporary measure for some of the stations such as Chittorgarh (RVPN), Ajmer (RVPN), Merta (RVPN), Bikaner (RVPN), Jodhpur (RVPN), Suratgarh(RVPN), Ratangarh(RVPN)</p> |
| N-1 contingency of 3*250+315=1065 MVA ICT at Heerapura(RVPN)   |                                                                                                                                                                                                                                                                                                                                                                                                               |
| N-1 contingency of 3*315 =945 MVA ICT at Chittorgarh (RVPN)    |                                                                                                                                                                                                                                                                                                                                                                                                               |
| N-1 contingency of 2*315 =630 MVA ICT at Ajmer (RVPN)          |                                                                                                                                                                                                                                                                                                                                                                                                               |
| N-1 contingency of 2*315 =630 MVA ICT at Merta (RVPN)          |                                                                                                                                                                                                                                                                                                                                                                                                               |
| N-1 contingency of 2*315 =630 MVA ICT at Bikaner (RVPN)        |                                                                                                                                                                                                                                                                                                                                                                                                               |
| N-1 contingency of 2*315 =630 MVA ICT at Jodhpur (RVPN)        |                                                                                                                                                                                                                                                                                                                                                                                                               |
| N-1 contingency of 2*315=630 MVA ICT at Suratgarh(RVPN)        |                                                                                                                                                                                                                                                                                                                                                                                                               |
| N-1 contingency of 3*315=945 MVA ICT at Ratangarh(RVPN)        |                                                                                                                                                                                                                                                                                                                                                                                                               |
| N-1 contingency of 1*500+1*315 =815 MVA ICT at Bhilwara (RVPN) |                                                                                                                                                                                                                                                                                                                                                                                                               |

RRVNL representative informed that:

- Work order has been placed for improvement of condition of 400kV Bhadla-Bikaner D/C and upgradation of terminal equipment, bid was opened on 25.05.2025 and PO was issued on 24.06.2025 approving L1 bidder and is scheduled to be completed by December 2025. Repair work will be carried

out along the entire line, with reconductoring at locations experiencing significant damage.

- After the work is completed, the full capacity of the 400kV Bhadla-Bikaner double circuit (D/C) line which is quad-moose will be available for utilization.
- Total of 151 no. total 5.43MVAR capacitors has been planned out of which 19 has already been commissioned and by December'2025 all the capacitors would be commissioned.
- Further, additional 1100MVAR is being considered and is in the planning phase as locations are being identified.
- Jaipur and Jodhpur DISCOMs have also been asked to expedite capacitor commissioning.
- 500MVA ICTs at Bikaner and Ajmer is expected to be commissioned by September 2025 and for 500MVA ICT at Merta, bay completion work is under progress, transformer has already reached at the site and is expected to be commissioned by end of this month i.e. August 2025.
- For  $\pm 300$ MVAR STATCOMs planned at 400kV Bhadla and 765kV Jaisalmer and  $\pm 100$ MVAR STATCOMs planned at 220kV Tinwari and 220kV Phalodi, Rajasthan is planning to move ahead with PSDF fund.
- New substations as approved by CEA are planned to come with STATCOM as per the scheme and one synchronous condenser is expected to commission at Bikaner.
- 3700MVAR of capacitors are planned at Discom level which has been sent for approval of PSDF fund.

***Rajasthan SLDC agreed to share updated status through email after discussing with RRVPNL-transmission team.***

***NRLDC representative reiterated that peak demand season of Rajasthan starts from mid Nov onwards which is hardly 2 months away, so accordingly any continuous shutdown requirement of 400kV Bhadla-Bikaner for condition improvement may be taken up timely and work may preferably be completed by mid Nov so that line remains available during peak demand and high MVAR drawl season of Rajasthan.***

***Regarding PSDF funding, the Member Secretary, NRPC stated that obtaining approval currently appears challenging due to the depletion of PSDF funds and works of emergency and urgent nature may be taken up by RRVPNL from their own funds.***

***Given the urgent and critical need for capacitors, and the potential delays associated with the PSDF approval process, OCC forum suggested that Rajasthan may consider self-financing and proceed accordingly atleast for critical substations.***

### **SPS proposals in Rajasthan**

Majority of 400/220kV ICTs in Rajasthan state (both interstate as well as intrastate) are N-1 non-compliant.

For intrastate substations, where SPS have not been planned and implemented, the same may be taken up. List of N-1 non-compliant substations is shown below:

| Constrained location                        | SPS Status as available with NRLDC |
|---------------------------------------------|------------------------------------|
| 3*315=945 MVA ICT at Bhiwadi(PG)            | Not planned                        |
| 2*315+500=1130 MVA ICT at Bassi(PG)         | Not planned                        |
| 315+500=815 MVA ICT at Neemrana(PG)         | Not planned                        |
| 2*500=1000 MVA ICT at Jaipur South(PG)      | Not planned                        |
| 2*315+500=1130 MVA ICT at Sikar(PG)         | Not planned                        |
| 3*315=945 MVA ICT at Kankroli(PG)           | Not planned                        |
| 2*315=630 MVA ICT at Kotputli(PG)           | Not planned                        |
| 2*315=630 MVA ICT at Deedwana(RVPN)         | Not planned                        |
| 3*250+315=1065 MVA ICT at Heerapura(RVPN)   | Not planned                        |
| 3*315 =945 MVA ICT at Chittorgarh (RVPN)    | Implemented                        |
| 2*315 =630 MVA ICT at Ajmer (RVPN)          | Implemented                        |
| 2*315 =630 MVA ICT at Merta (RVPN)          | Implemented                        |
| 2*315 =630 MVA ICT at Bikaner (RVPN)        | Implemented                        |
| 2*315 =630 MVA ICT at Jodhpur (RVPN)        | Implemented                        |
| 2*315=630 MVA ICT at Suratgarh(RVPN)        | Implemented                        |
| 3*315=945 MVA ICT at Ratangarh(RVPN)        | Implemented                        |
| 1*500+1*315 =815 MVA ICT at Bhilwara (RVPN) | Implemented                        |

Subsequently, NRLDC vide email dated 01.08.2025 had communicated to share simulation studies carried out at RRVN side for feeders identified for SPS at the earliest. Further, it was mentioned that NRLDC has also simulated feeders for SPS and need further discussion for feeders identified for Bassi SPS.

***Rajasthan SLDC stated that simulation studies are in progress and would be shared with NRLDC at the earliest.***

***NRLDC representative asked Rajasthan SLDC to submit the same at the earliest as it is desirable that SPS are commissioned before Nov 2025 when demand of Rajasthan starts increasing.***

**Uttar Pradesh:**

***POWERGRID representative stated that 500MVA ICT-4 at Allahabad is expected to be commissioned by Nov 2025 as the work got delayed due to some rains and flood like situation.***

***It was also informed that old 240MVA ICT at Obra is expected to be revived by Nov 2025 whereas 315MVA ICTs at Obra would be revived after some time due to requirement of procurement of ICTs.***

**SPS proposals in Uttar Pradesh**

**UP SLDC informed that work order for SPS logic of 400/220kV Bareilly S/s has been placed. SPS at both 400/220kV Panki and Bareilly substation are expected to be commissioned by Dec 2025.**

**OCC forum asked POWERGRID to implement SPS scheme at Agra(PG) at the earliest.**

Further, it may be noted that CERC vide their order dated 29.09.2023 has granted approval of “Detailed Procedure for Allocation of Transmission Corridor for Scheduling of General Network Access and Temporary General Network Access under Central Electricity Regulatory Commission (Connectivity and General Network Access to the inter-State Transmission System) Regulations, 2022” which requires SLDCs to submit network data as well as PSSE basecases on M-12, M-6, M-1 basis. The monitoring of submission of these data by SLDCs is being done in OCC meetings on monthly basis where response of some of the states needs improvement.

| April 2025 Mails     |                     |           |                     |           |                         |           |     |
|----------------------|---------------------|-----------|---------------------|-----------|-------------------------|-----------|-----|
|                      | ATC/TTC Declaration |           |                     |           | Interconnection Studies |           |     |
|                      | M-1 (May-25)        |           | M-12 (April-26)     |           | M-6 (October-25)        |           |     |
|                      | Data Values         | Basecases | Data Values         | Basecases | Data Values             | Basecases |     |
| Chandigarh           | No                  | No        | No                  | No        | No                      | No        | No  |
| Delhi                | No                  | No        | Yes                 | Yes       | No                      | No        | No  |
| Haryana              | Yes                 | Yes       | Yes                 | Yes       | Yes                     | Yes       | Yes |
| Himachal             | Yes                 | No        | Yes                 | No        | Yes                     | No        | Yes |
| J & K                | Yes                 | Yes       | Yes                 | Yes       | Yes                     | Yes       | Yes |
| Ladakh               | No                  | No        | No                  | No        | No                      | No        | No  |
| Punjab               | Yes                 | Yes       | Yes                 | Yes       | Yes                     | Yes       | Yes |
| Rajasthan            | Yes                 | Yes       | Yes                 | Yes       | Yes                     | Yes       | Yes |
| Uttar Pradesh        | Yes                 | Yes       | Yes                 | Yes       | Yes                     | Yes       | Yes |
| Uttarakhand          | No                  | No        | No                  | No        | No                      | No        | No  |
|                      |                     |           |                     |           |                         |           |     |
| May 2025 Mails       |                     |           |                     |           |                         |           |     |
|                      | ATC/TTC Declaration |           |                     |           | Interconnection Studies |           |     |
|                      | M-1 (June-25)       |           | M-12 (May-26)       |           | M-6 (November-25)       |           |     |
|                      | Data Values         | Basecases | Data Values         | Basecases | Data Values             | Basecases |     |
| Chandigarh           | No                  | No        | No                  | No        | No                      | No        | No  |
| Delhi                | No                  | No        | Yes                 | Yes       | No                      | No        | No  |
| Haryana              | No                  | No        | Yes                 | Yes       | Yes                     | Yes       | Yes |
| Himachal             | Yes                 | No        | Yes                 | No        | Yes                     | No        | Yes |
| J & K                | Yes                 | Yes       | Yes                 | Yes       | Yes                     | Yes       | Yes |
| Ladakh               | No                  | No        | No                  | No        | No                      | No        | No  |
| Punjab               | Yes                 | Yes       | Yes                 | Yes       | Yes                     | Yes       | Yes |
| Rajasthan            | No                  | No        | No                  | No        | No                      | No        | No  |
| Uttar Pradesh        | Yes                 | Yes       | Yes                 | Yes       | Yes                     | Yes       | Yes |
| Uttarakhand          | No                  | No        | No                  | No        | No                      | No        | No  |
|                      |                     |           |                     |           |                         |           |     |
| June 2025 Mails      |                     |           |                     |           |                         |           |     |
|                      | ATC/TTC Declaration |           |                     |           | Interconnection Studies |           |     |
|                      | M-1 (July-25)       |           | M-12 (June-26)      |           | M-6 (December-25)       |           |     |
|                      | Data Values         | Basecases | Data Values         | Basecases | Data Values             | Basecases |     |
| Chandigarh           | No                  | No        | No                  | No        | No                      | No        | No  |
| Delhi                | No                  | No        | Yes                 | Yes       | No                      | No        | No  |
| Haryana              | Yes                 | Yes       | Yes                 | Yes       | Yes                     | Yes       | Yes |
| Himachal             | Yes                 | Yes       | Yes                 | Yes       | Yes                     | Yes       | Yes |
| J & K                | Yes                 | Yes       | Yes                 | Yes       | Yes                     | Yes       | Yes |
| Ladakh               | No                  | No        | No                  | No        | No                      | No        | No  |
| Punjab               | Yes                 | Yes       | Yes                 | Yes       | Yes                     | Yes       | Yes |
| Rajasthan            | Yes                 | Yes       | Yes                 | Yes       | Yes                     | Yes       | Yes |
| Uttar Pradesh        | Yes                 | Yes       | Yes                 | Yes       | Yes                     | Yes       | Yes |
| Uttarakhand          | No                  | No        | No                  | No        | No                      | No        | No  |
|                      |                     |           |                     |           |                         |           |     |
| July 2025 Mails      |                     |           |                     |           |                         |           |     |
|                      | ATC/TTC Declaration |           |                     |           | Interconnection Studies |           |     |
|                      | M-1 (August-25)     |           | M-12 (July-26)      |           | M-6 (January-26)        |           |     |
|                      | Data Values         | Basecases | Data Values         | Basecases | Data Values             | Basecases |     |
| Chandigarh           | No                  | No        | No                  | No        | No                      | No        | No  |
| Delhi                | No                  | No        | Yes                 | Yes       | No                      | No        | No  |
| Haryana              | Yes                 | Yes       | Yes                 | Yes       | Yes                     | Yes       | Yes |
| Himachal             | Yes                 | Yes       | Yes                 | Yes       | Yes                     | Yes       | Yes |
| J & K                | Yes                 | Yes       | Yes                 | Yes       | Yes                     | Yes       | Yes |
| Ladakh               | No                  | No        | No                  | No        | No                      | No        | No  |
| Punjab               | Yes                 | Yes       | Yes                 | Yes       | Yes                     | Yes       | Yes |
| Rajasthan            | Yes                 | Yes       | Yes                 | Yes       | Yes                     | Yes       | Yes |
| Uttar Pradesh        | Yes                 | Yes       | Yes                 | Yes       | Yes                     | Yes       | Yes |
| Uttarakhand          | No                  | No        | No                  | No        | No                      | No        | No  |
|                      |                     |           |                     |           |                         |           |     |
| August 2025 Mails    |                     |           |                     |           |                         |           |     |
|                      | ATC/TTC Declaration |           |                     |           | Interconnection Studies |           |     |
|                      | M-1 (Sep-25)        |           | M-12 (August-26)    |           | M-6 (February-26)       |           |     |
|                      | Data Values         | Basecases | Data Values         | Basecases | Data Values             | Basecases |     |
| Chandigarh           | No                  | No        | No                  | No        | No                      | No        | No  |
| Delhi                | No                  | No        | Yes                 | Yes       | No                      | No        | No  |
| Haryana              | Yes                 | Yes       | Yes                 | Yes       | Yes                     | Yes       | Yes |
| Himachal             | Yes                 | Yes       | Yes                 | No        | Yes                     | No        | Yes |
| J & K                | Yes                 | Yes       | Yes                 | Yes       | Yes                     | Yes       | Yes |
| Ladakh               | No                  | No        | No                  | No        | No                      | No        | No  |
| Punjab               | Yes                 | Yes       | Yes                 | Yes       | Yes                     | Yes       | Yes |
| Rajasthan            | Yes                 | Yes       | Yes                 | Yes       | Yes                     | Yes       | Yes |
| Uttar Pradesh        | Yes                 | Yes       | Yes                 | Yes       | Yes                     | Yes       | Yes |
| Uttarakhand          | No                  | No        | No                  | No        | No                      | No        | No  |
|                      |                     |           |                     |           |                         |           |     |
| September 2025 Mails |                     |           |                     |           |                         |           |     |
|                      | ATC/TTC Declaration |           |                     |           | Interconnection Studies |           |     |
|                      | M-1 (Oct-25)        |           | M-12 (September-26) |           | M-6 (March-26)          |           |     |
|                      | Data Values         | Basecases | Data Values         | Basecases | Data Values             | Basecases |     |
| Chandigarh           |                     |           |                     |           |                         |           |     |
| Delhi                |                     | Yes       | Yes                 |           |                         |           |     |
| Haryana              |                     |           |                     |           |                         |           |     |
| Himachal             |                     |           |                     |           |                         |           |     |
| J & K                | Yes                 | Yes       | Yes                 | Yes       | Yes                     | Yes       | Yes |
| Ladakh               |                     |           |                     |           |                         |           |     |
| Punjab               | Yes                 | Yes       | Yes                 | Yes       | Yes                     | Yes       | Yes |
| Rajasthan            | Yes                 | Yes       | Yes                 | Yes       | Yes                     | Yes       | Yes |
| Uttar Pradesh        | Yes                 | Yes       | Yes                 | Yes       | Yes                     | Yes       | Yes |
| Uttarakhand          |                     |           |                     |           |                         |           |     |

**Uttarakhand, HP and Haryana SLDC were asked to regularly share basecase with NRLDC as per CERC approved procedure.**

**NRLDC asked Uttarakhand SLDC to dedicate manpower for PSSE related works and ensure that basecase are shared with NRLDC timely so that network changes in intrastate level also get reflected in All India PSSE file.**

**CGM NRLDC stressed that all SLDCs are regularly sharing basecases with NRLDC except Uttarakhand SLDC. It was also mentioned that if any assistance is required from NRLDC side, training sessions can be organized for officials of Uttarakhand SLDC by NRLDC.**

**Uttarakhand SLDC representative stated that they have assigned manpower for this job and agreed to share basecases with NRLDC on regular basis as per approved timelines.**

***ATC/TTC limits of states for the month of October 2025 are attached as Annexure-B.I of agenda. Utilities were requested to go through these limits and provide comments.***

## **B.5 SPS for Champa-Kurukshetra HVDC and SOP actions in case of tripping**

As discussed in recent OCC meetings, there have been concerns regarding reliability of Champa-Kurukshetra HVDC. There have been unplanned load loss that has taken place in two events related to simultaneous all poles outage of HVDC Champa-Kurukshetra namely,

1. 16.5GW load loss event on 17.06.2024 due to tripping of Champa-Kurukshetra all poles carrying 4000MW with NR total load as 89.4GW
2. 0.9GW load loss event on 09.06.2025 due to tripping of Champa-Kurukshetra all poles carrying 4300MW with NR total load as 82.6GW

NRLDC has been continuously pursuing with NR states to take measures for reactive power support at local level so that reactive power exchange from ISTS is minimal. However, as per discussions held in OCC meetings, no progress is being reported. There is huge MVAR drawl by NR states during May-Sep months.

Accordingly, in 233 OCC meeting it was agreed to implement a SPS scheme which can shed loads in case of simultaneous outage of all poles of HVDC Champa-Kurukshetra. Since, identification and wiring of new load groups may be difficult for implementation in short time frame and further utilities have also expressed concerns in identifying further new feeders for UFR or other load shedding schemes, it was suggested to utilise the wired loads of existing Agra-Gwalior or Rihand-Dadri SPS scheme. Signal of multiple HVDC pole outage can be extended from Kurukshetra station to Dadri/Agra SPS scheme and some load relief can be obtained. The automatic disconnection of wired loads post outage of multiple HVDC Poles at Kurukshetra may provide some relief and may help in containing the voltages till suitable static and dynamic compensation devices are commissioned.

During 234 OCC meeting, MS NRPC proposed holding a separate meeting between NRLDC, Powergrid and all states as inputs from states are not being received. It was requested all states provide their input on the feeders connected to the Agra-Gwalior or Rihand-Dadri SPS schemes and submit any proposals if there are changes from the initially planned scheme.

Accordingly a separate meeting was convened on 04.09.2025 by NRLDC with participation from SLDCs, POWERGRID and NRPC. During the meeting held on 04.09.2025,

- NRLDC representative further stated that the feeder list identified for different groups for Agra-Gwalior and Rihand-Dadri SPS were planned long back

when NR demand used to be in range of 40-45GW, whereas presently NR demand has crossed 90GW. Moreover, with progressive transmission upgradation, certain feeders may not be radial presently. Accordingly, inputs are required from states side so that these are duly considered while carrying out studies and proposing logics for Champa-Kurukshetra SPS.

- NRLDC representative further quoted IEGC Clause 29.13(d) w.r.t. ufr monitoring,  
*“SLDC shall ensure that telemetered data of feeders (MW power flow in real time and circuit breaker status) on which UFR and df/dt relays are installed is available at its control centre. SLDC shall monitor the combined load in MW of these feeders at all times. SLDC shall share the above data with the respective RLDC in real time and submit a monthly exception report to the respective RPC.”*
- It was mentioned that although above IEGC clause requires SLDCs to monitor UFR and df/dt relay feeders and submit monthly report to RPCs, similar practise may be adopted for feeders identified for SPS of major schemes such as Agra-Gwalior, Rihand-Dadri, Mundra-Mohindergarh etc.

Thereafter, State-wise feeder list was discussed based on SCADA data availability at NRLDC. List is attached as Annexure-B.II of agenda:

## Delhi

Delhi SLDC representative stated that loading in the month of Jun-Jul period remains on the higher side. Loading of Mandola-Gopalpur remains in range of 350MW during this time. However, Mandola-Gopalpur is not radial. Gopalpur is also connected to Sabzi Mandi via Timarpur/Kashmiri Gate.

It was also mentioned that in place of Mandola-Gopalpur D/C, Bamnauli-Najafgarh Ckts. May be planned.

Regarding Mandola-Narela ckts it was mentioned that 300MW load relief can be provided by 220kV Mandola-Narela D/C for most duration and can be included.

Regarding Bamnauli-Papankalan, it was mentioned that Papankalan is also being supplied from 220kV Dwarka(PG). Therefore, 220kV Dwarka-Papankalan D/C also need to be wired in SPS in case desired load relief is to be obtained.

POWERGRID was asked to check how signal can be transmitted to 400/220kV Dwarka, so that 220kV Dwarka-Papankalan D/C can also be included in feeder list to obtain desired relief.

## UP

UP SLDC representative stated that all feeders mentioned in the list are radial and wired under SPS scheme except 132kV Muradnagar Old-Morta line and 2\*63

transformers at Muradnagar Old. Average loading is higher than planned relief as per data received from site. However, substations have been asked to provide actual load on these feeders for Jun-Jul months during solar period as suggested by NRLDC in this meeting.

UPPTCL will take up for wiring of 2\*63 transformers at Muradnagar Old which is damaged and would be completed at the earliest in presence of PGCIL officials of nearby substation.

Further, wiring of 132kV Muradnagar old-Morta would also be taken up with site.

It was also informed that DTPC panels are installed at all these substations.

### **Rajasthan**

Rajasthan SLDC representative stated that number of 132kV feeders are now having alternate supply. But mostly, these are operating radially. Moreover, actual load remains significantly higher than planned relief.

NRLDC representative stated that individual feeder-wise details of actual loading during Jun-Jul solar period may be shared.

Rajasthan SLDC agreed to share the details as per format through mail.

### **Punjab**

Punjab SLDC representative stated that data has been collected for each feeder. Confirmation regarding radial/non-radial supply is awaited from some of the sites. Details will be shared with NRLDC in attached format at the earliest.

### **Haryana**

Haryana SLDC representative was not available for comments.

NRPC representative asked all states to submit the data to NRLDC within next week so that the agenda can be accordingly discussed in next OCC meeting.

NRLDC representative requested all states to submit the data for each feeders with following details:

- Loading each feeder wise for Jun-Jul months during 1200-1500 hrs period
- Whether feeders mentioned in list are operated radially during Jun-July months or not?
- SLDC/STU comments regarding usage of feeder in SPS logic i.e. if there are any preferences or they want to use other alternate feeders in SPS. In case no issues from their side, they may mention Consented.
- Medium of signal transfer to feeders (OPGW/PLCC).

***During 235 OCC meeting, NRLDC representative stated that details have been received from Delhi, Rajasthan, UP and Punjab SLDC. It was highlighted that inputs are yet to be received from Haryana SLDC.***

***MS NRPC expressed concern on the same and stated that Haryana SLDC has not participated in the meeting organized by NRLDC nor has submitted data to NRLDC. Haryana SLDC was asked to share the required data with NRLDC at the earliest.***

***Haryana SLDC agreed to share the data with NRLDC at the earliest.***

***OCC forum discussed that NRLDC may organize separate meeting with NR states before next OCC meeting for pending issues and discuss on how SPS signal would be transmitted from Kurukshetra to Agra/Dadri with POWERGRID.***

## **B.6 Mock testing of islanding scheme and simulation studies**

Following four islanding schemes are operational in the Northern Region: NAPP Islanding Scheme (Uttar Pradesh), RAPP Islanding Scheme (Rajasthan), Bawana Islanding Scheme (Delhi), and Unchahar Islanding Scheme (Uttar Pradesh).

During 235 OCC meeting, NRLDC representative presented the latest status of actions required on various islanding schemes.

| Scheme                          | UFR testing done | Basecase shared | SCADA display made |
|---------------------------------|------------------|-----------------|--------------------|
| NAPP Islanding scheme (UP)      | ☑ Yes            | ☑ Yes           | ☑ Yes              |
| RAPP Islanding scheme (Raj)     | ☑ Yes            | ☑ Yes           | ☑ Yes              |
| Bawana Islanding scheme (Delhi) | ✗ No             | ☑ Yes           | ☑ Yes              |
| Unchahar Islanding scheme(UP)   | ☑ Yes            | ✗ No            | ☑ Yes              |

***During 235 OCC meeting,***

***NRLDC and NRPC representatives expressed concern on the pending testing of Delhi islanding scheme at 400/220kV Maharanibagh substation.***

***It was highlighted from NRLDC side that although SCADA displays have been made for islanding schemes, telemetry of site data to NRLDC is poor and most of the time, some or other data is missing.***

***UFR testing report has been submitted by UP SLDC for Unchahar islanding scheme, however, basecase are yet to be received at NRLDC end.***

**POWERGRID representative stated that pending testing of UFR at POWERGRID will be carried out shortly.**

**NRLDC and NRPC representatives asked DTL and POWERGRID to coordinate and carry out testing at the earliest. Same has also been requested in previous OCC meetings.**

**UP SLDC representative stated that Unchahar islanding scheme is being reviewed in consultation with DISCOM and STU. After review of the same, basecase would be shared with NRLDC.**

**OCC forum expressed concern and asked POWERGRID and UP SLDC to complete the pending works at the earliest.**

## **B.7 Frequency response beyond 50.3Hz**

NRLDC representative stated that as per IEGC clause 30.10.g

*Quote*

*(j) All generating stations, including the WS seller mentioned in Table-4 (under subclause (g) of this clause) shall have the capability of reducing output at least by 5% or 10%, as applicable, of their operating level and up to 5% or 10% of their MCR, as applicable, limited to the minimum turndown level when the frequency rises above the reference frequency and thus providing primary response, whenever condition arise. Any generating station not complying with the above requirements shall be kept in operation (synchronized with the regional grid) only after obtaining permission from the concerned RLDC.*

*Unquote*

However, it is seen that in number of cases, even with high grid frequency, even exceeding 50.3Hz, number of generating stations are not reducing their response and continue to over inject in the grid. Two such sample events in the month of Aug 2025 were identified for further analysis. This includes event of day time as well as evening time as listed below.



***NRLDC representative highlighted that Unchahar Stage-1 and NPCIL machines at RAPS were still over-injecting and didn't reduce their generation even though there was continuous high frequency operation of the grid. Further, the response of number of thermal stations seems inadequate as per their droop settings of 3-5%.***

***NPCIL representative agreed to discuss with their management and suggested they would explore possibility of reducing their generation by around 10% in case of high frequency in grid.***

***OCC forum discussed that generators may compare the frequency response for high frequency events, with desired response as per present droop settings and take actions at their end, so that there is adequate frequency response during persistent high frequency events also.***

## **B.8 Demand forecasting and resource adequacy related**

Hon'ble CERC In the matter of Planning for safe, secure, and reliable integrated operation of the power system during critical periods arising on account of seasonal variations wherein the electricity demand increases rapidly by undertaking specific measures to mitigate the risks on the power system, under clause (h) of sub-section (1) of Section 79 of the Electricity Act, 2003 and the Regulation 31 of the Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2023 has issued suo-motto order 9/SM/2024 dated 07.10.2024.

Subsequently, a meeting was taken by Hon'ble CERC on 14.02.2025 with all NR SLDCs, NRLDC and NRPC to review the actions being taken at SLDC end on measures related to resource adequacy.

It is to be noted that CERC has also released "Report on Planning for safe, secure, and reliable integrated operation of the power system during critical periods arising on account of seasonal variations wherein the electricity demand increases rapidly by undertaking specific measures to mitigate the risks on the power system under Order dated 07.10.2024 in Suo-Moto Petition No. 9/SM/2024" on 29.04.2025.

With reference to the Clause 31(2) of Central Electricity Regulatory Commission-IEGC Regulations, 2023 and the Operating Procedure of NRLDC prepared in accordance with the same, each SLDC has to furnish the demand estimation for day ahead, week ahead, month ahead (with time block wise granularity) and demand estimation for year ahead (with hour granularity). The sub-clause 31(2) (h) of IEGC-2023 states the following timeline for the submission of demand estimate data to RLDC.

| Type of Demand Estimation | Timeline                           |
|---------------------------|------------------------------------|
| Daily                     | 10:00 hours of previous day        |
| Weekly                    | First working day of previous week |

|         |                                 |
|---------|---------------------------------|
| Monthly | Fifth day of previous month     |
| Yearly  | 30th September of previous year |

**Status of Day Ahead Forecasting, week ahead, month-ahead and year-ahead submission status for Sep-2025 as per Clause 31(4) (a) & (b) of IEGC-2023 is shown below:**

| State/Entity        | Day Ahead<br>(As on Sep-25)                         | Week Ahead                              | Month Ahead<br>(Oct 2025) | Year-Ahead(2026-27) |
|---------------------|-----------------------------------------------------|-----------------------------------------|---------------------------|---------------------|
| Punjab              | As per Format                                       | Demand and Resource not as per timeline | Not received              | Not received        |
| Haryana             | Demand and Resource not as per format               | Only demand & irregular                 | Not received              | Not received        |
| Delhi               | Demand and Resource not as per format               | As per Format                           | As per Format             | Not received        |
| Rajasthan           | As per Format but irregular                         | As per Format                           | Not received              | Not received        |
| Uttar Pradesh       | As per Format                                       | As per Format                           | As per Format             | Not received        |
| Uttarakhand         | Demand and Resource not as per format and irregular | As per Format                           | As per Format             | Not received        |
| Himachal Pradesh    | As per Format                                       | As per Format                           | As per Format             | Not received        |
| J&K and Ladakh (UT) | Demand and Resource not as per format & irregular   | Not received                            | Not received              | Not received        |
| Chandigarh (UT)     | As per Format                                       | Not received                            | Not received              | Not received        |

In accordance with above, all SLDCs were requested to timely furnish the demand estimation data along with generation adequacy data as per the formats available at [https://drive.google.com/drive/folders/1KWY4G9gTBLV5wTJkhGEleRptKP-QbhjL?usp=drive\\_link](https://drive.google.com/drive/folders/1KWY4G9gTBLV5wTJkhGEleRptKP-QbhjL?usp=drive_link) to NRLDC through mail (nrlcmis@grid-india.in) and FTP as per above timeline.

All SLDCs need to take actions at their end for timely submission of demand forecasting and resource adequacy data on day-ahead, week-ahead, month ahead and year ahead basis.

***It may be noted that timeline for submission of year ahead data of 2026-27 is 30<sup>th</sup> Sep 2025.***

***Portal has been prepared for submission of data by states. The user credentials have been provided to all states of Northern region.***

NLDC vide IOM dated 04.09.2025 has communicated that as per Clause 3.2 of Section-3 of the CEA Guidelines for Resource Adequacy, "NLDC shall annually publish a one-year look-ahead Short-term National Resource Adequacy Plan ....". Further as per the provisions of Regulation 5.3(d) of the Indian Electricity Grid Code (IEGC), the concerned agencies are required to furnish the requisite technical data to

NLDC through respective RLDCs every year, for carrying out a national level generation resource adequacy assessment. IOM is attached as Annexure-B.III of agenda.

Accordingly, timely furnishing of data by all concerned entities is essential for preparation of the national level adequacy plan.

As per the Procedure for Year Ahead Operational Planning (Annexure II of NLDC Operating Procedure), the following agencies shall submit the data through RLDCs:

1. State Transmission Utilities (STUs) / State Load Despatch Centres (SLDCs) or such other agency as may be designated by the State Commission.
2. Inter-State Transmission Licensees.
3. Regional Entity Generating Stations or ISTS Connected Bulk Consumers, as applicable.

Accordingly, it is requested to timely furnishing of the following data sets by 15<sup>th</sup> Sep 2025:

1. Electricity Demand Data (as per format RA-1)
2. Reserve Requirement (as per format RA-2)
3. Tie Line Details (as per format RA-3)
4. Transfer Capability (as per RA-4)
5. Generation Data (as per RA-5)

Data submission should be as per formats RA-1 to RA-5 of "Procedure for Year Ahead Operational Planning (Annexure II of NLDC Operating Procedure)".

Link: [https://webcdn.gridindia.in/files/grdw/2025/08/NLDC%20Operating%20Procedure 2025 134.pdf](https://webcdn.gridindia.in/files/grdw/2025/08/NLDC%20Operating%20Procedure%202025%20134.pdf)

The same has also been communicated from NRLDC side vide email dated 09.09.2025.

***OCC forum asked all utilities to ensure that the data is submitted by 19.09.2025.***

***Further, NRLDC has also carried out month ahead resource adequacy analysis on regional basis for Oct 2025 as per data available at NRLDC through PRAS software. The results are attached as Annexure-B.IV of agenda. The results suggest some shortfall in first week of October during 1800-2000 hrs period.***

NRLDC had also organized training program for NR SLDCs on 29.07.2025 regarding Demand Forecast, RA Planning & Reserve Assessment for SLDCs of Northern

Region. Subsequently a meeting was also convened on 11.08.2025 by CERC in Lucknow in which chairpersons of SERC, Head of STUs, DISCOMs and SLDCs were also invited.

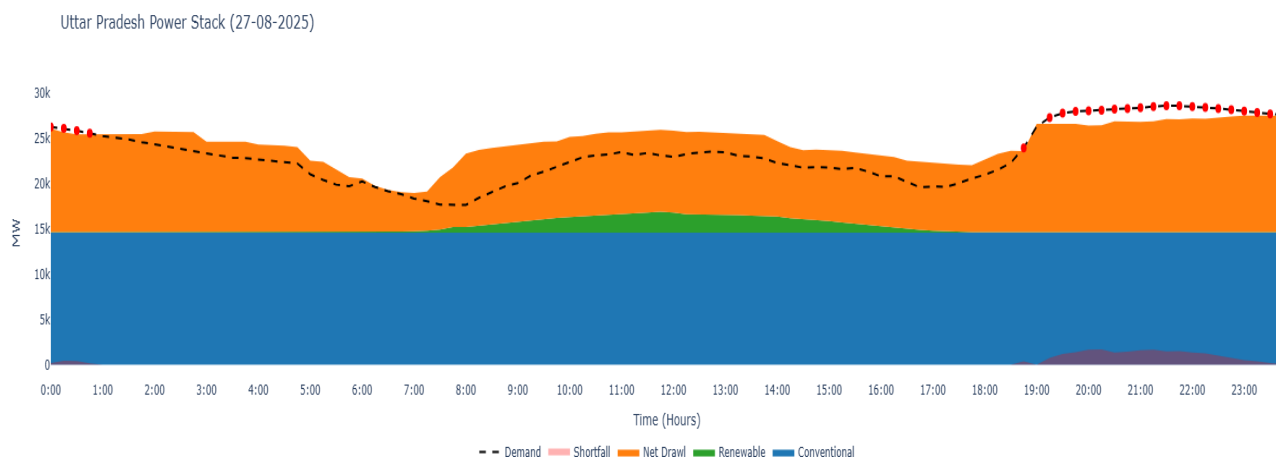
As per IEGC clause 31

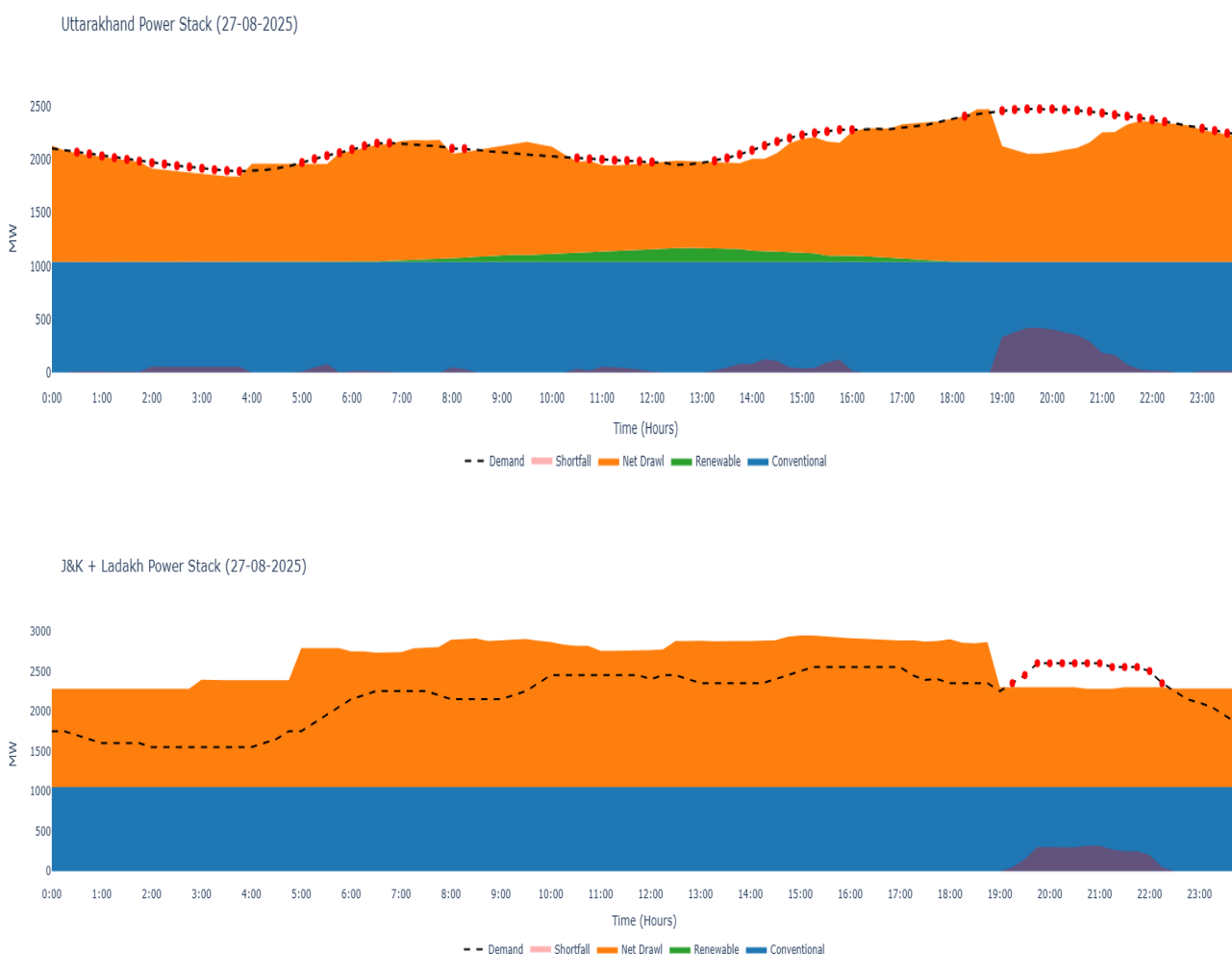
Quote

*(4) Adequacy of Resources (a) SLDCs shall estimate and ensure the adequacy of resources, identify generation reserves, demand response capacity and generation flexibility requirements with due regard to the resource adequacy framework as specified under Chapter 2 of these regulations.*

Unquote

Accordingly, **NRLDC is also regularly sending emails based on day ahead resource adequacy exercise being carried out at NRLDC end. In case of major shortfall seen for a state based on demand forecast and generation adequacy data submitted by state, NRLDC communicates the actions required from state side in real-time also.** Some sample snapshots emailed to respective states are shown below for reference:





***OCC forum suggested that as per IEGC clauses, SLDCs also carry out day ahead, week ahead and month ahead resource adequacy exercise and share their results with NRLDC.***

#### **Self-audit related:**

As per IEGC Clause 56.2(c), 'The self-audit reports by users, QCAs, and SNAs shall be submitted to the concerned RLDC or SLDC, as the case may be.' Failure to submit the self-audit report within the stipulated timeframe would be considered a non-compliance with IEGC regulations.

NRLDC representative stated that self-audit report has been received from NHPC and Koteswar THDC only for F.Y. 2023-24. As F.Y. 2024-25 has also completed recently, all utilities in Northern region are requested to carry out self-audit exercise and share report with NRLDC as per IEGC Clause 56.2(c). List of NRLDC users is attached as Annexure-B.V of agenda.

***OCC forum asked all concerned to carry out self-audit and submit reports as per IEGC Clause 56.2(c).***

***OCC asked all concerned to take necessary actions as discussed.***

## **B.9 Operation philosophy of Tehri PSP under spillage conditions**

NRLDC representative apprised the Tehri PSP schedule vs actual Generation/Pumping during Aug-Sep'25. NRLDC presentation is enclosed as Annex-II. It was informed that as reported by THDC, due to high water inflows and spillage conditions, Tehri PSP is generating without pumping intermittently from 26th august 2025.

NRLDC representative informed that scheduling of Tehri PSP is being done as per discussion and MoM of 3<sup>rd</sup> June 2025 meeting, and same is reproduced below:

1. Beneficiaries can give their requirements on D-1 to THDC.
2. THDC shall punch the schedule in WBES after incorporating the beneficiaries' requirement subject to the technical constraints.
3. NRLDC shall then moderate the schedules if required and issue the final schedules. Accordingly, Tehri shall generate and pump.

NRLDC apprised the forum that it is understand the operation of Tehri PSP during spillage conditions was undertaken with the consent of the beneficiary, and accordingly, scheduling was done.

In the above referred meeting, it was agreed that THDC shall develop a software solution to finalize the PSP schedule after collating the day-ahead Pumping and Turbine schedules from the beneficiaries and technical considerations of PSP and subsequently share the proposed schedule with NRLDC. THDC may apprise about the development of software.

THDC informed that Tehri PSP continuous generation was not envisaged in the already approved operation philosophy of Tehri PSP. THDC has brought this issue in 52nd Commercial Sub-Committee meeting, wherein the THDC representative informed that Regulation of Tehri reservoir level and plant operations is carried out in accordance with the prescribed guidelines detailed in the "Operation and Maintenance Manual of Tehri Dam Project" and that Beyond EL 815 m Tehri reservoir level (crest level of Chute and Left Bank Shaft Spillways), reservoir level regulation is undertaken through a combination of Tehri Powerhouse and spillways. The Operation and Maintenance Manual of Tehri Dam Project including the Reservoir Rule Curve have been designed in accordance with Dam Safety Act, 2021 and duly approved from CWC. During August 2025, high inflows raised the reservoir level beyond prescribed limit as per Reservoir rule curve in the 815 m-830m zone, necessitating continuous turbine operation without pumping in order to avoid spillage of water, in compliance with the Dam Safety Act, 2021 and CWC advisories. The operation philosophy as proposed by THDC is enclosed at Annexure-II.

NRPC emphasized that, given the 20+ years of operational experience of the Tehri Dam and the availability of weather forecasting tools with THDC, efforts should be made to improve inflow forecasting capability on a Day-Ahead (D-1) basis. Although it was apprised by THDC that the present tools provide good inflow forecasts over shorter horizons of 6-8 hours, their accuracy for D-1 prediction needs further enhancement. Reliable Day-Ahead inflow forecasting will enable timely assessment of potential spillage conditions and their consequent impact on Tehri PSP operations. This, in turn, will support better operational and commercial planning by beneficiary states as well as operational planning by the grid operator for grid security. Accordingly, it was agreed that a step-wise procedure shall be developed to incorporate such forecasting-based operations under exceptional conditions.

#### **B.10 Multiple element tripping events in Northern region in the month of August 2025:**

A total of 18 grid events occurred in the month of August 2025 of which 9 are of GD-1 category 08 are of GI-2 Category and 01 are of GI-1 Category. The tripping report of all the events have been issued from NRLDC. A list of all these events along with the status of DR/EL & tripping detail submission is attached at Annexure-B.VII of agenda.

Maximum delayed clearance of fault observed in event of tripping event at 400/220kV Gumma(HP) & 220kV Sawra Kuddu HEP at 07:04 hrs on 06<sup>th</sup> August 2025 (As per PMU at Gumma(HP), Y-B fault converted into R-Y-B fault with delayed clearance of approx. 4 sec 80 msec is observed).

Delayed clearance of fault (more than 100ms for 400kV and 160ms for 220kV system) observed in total 07 events out of 18 grid events occurred in the month. In 02 (no.) of grid event, there was no fault in the grid.

*NRLDC representative presented the reporting status of DR/EL & tripping reports w.r.t. grid events occurred in August 2025. It was highlighted that detailed reports of some of the tripping events have not been received. In some of the grid events, complete DR & EL have also been not received.*

*Members agreed to share the tripping details at the earliest and assured to submit the tripping details as per timeline specified in IEGC.*

*Regarding grid event at 400/220kV Gumma(HP) occurred on 06.08.2025, NRLDC requested HP to share the DR/EL & detailed analysis of the event and necessary remedial actions may be taken to avoid such event in future. SLDC-HP representative stated that detailed analysis of the grid event along with details of remedial action taken shall be shared.*

*NRLDC requested utilities to start preparing the detailed report of the tripping events as per timeline mentioned in IEGC 2023 and share the report with NRLDC, NRPC and PSC forum. Remedial actions taken by constituents to avoid such multiple elements tripping may also be included in the detailed report.*

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

***OCC forum requested members to 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.***

#### **B.11 Status of submission of DR/EL and tripping report of utilities for the month of August 2025:**

The status of receipt of DR/EL and tripping report of utilities for the month of **August 2025** is attached at Annexure-B.VIII of agenda. It is to be noted that as per the IEGC provision under clause 37.2 (c), the tripping report along with DR/EL has to be furnished within 24 hrs of the occurrence of the event.

*NRLDC representative stated that on the basis of status of July month it is evident that reporting status of some of the constituents i.e., RE stations, POWERGRID(NR-I), SLDC-HR, SLDC-PS, SLDC-J&K, BBMB, NTPC, NHPC and RAPS are not satisfactory and need improvement. Further, persistent unsatisfactory reporting status of Punjab & J&K was also highlighted.*

*NRLDC representative requested utilities to improve the status of submission of DR/EL & tripping reports. Timely submission of tripping details (DR, EL, tripping report etc.) helps in detailed analysis of the grid event and further remedial actions.*

*Members from SLDCs and transmission licensees stated that continuous follow-up are being done for timely submission of DR/EL of tripping events. Further efforts will be made to improve the DR/EL reporting status.*

***OCC forum emphasized the importance of DR/EL & tripping report data for analysis of the tripping. In addition, these data are also the base for the availability verification. The unavailability of these details delays the availability verification process also. Hence, timely submission of DR/EL & tripping report is very much necessary. Members were requested to comply***

***with IEGC 37.2(c) and submit the details in time. Members agreed to take necessary follow-up actions to improve the reporting status.***

***Members may please note and advise the concerned for timely submission of the information. It is requested that DR/EL of all the tripping shall be uploaded on Web Based Tripping Monitoring System (TMS) “<https://postda.nrlc.in/Default.aspx>” within 24 hours of the events as per IEGC clause 37.2(c) and clause 15.3 of CEA grid standard.***

## **B.12 Mock testing of System Protection Schemes (SPS) in Northern Region**

There are 57 numbers of System Protection Scheme (SPS) approved in Northern Region. These SPS are implemented at major generation complexes, important evacuating transmission lines and ICTs which are N-1 non-complaint. System Protection Scheme Document of Northern Region has been revised/updated on 31st January, 2025. Revised version of the document is available on the NRLDC website.

As per IEGC clause 16.2

*“For the operational SPS, RLDC or NLDC, as the case may be, in consultation with the concerned RPC(s) shall perform regular load flow and dynamic studies and mock testing for reviewing SPS parameters & functions, at least once in a year. RLDC or NLDC shall share the report of such studies and mock testing including any short comings to respective RPC(s). The data for such studies shall be provided by CTU to the concerned RPC, RLDC and NLDC.”*

As per IEGC clause 16.3

*“The users and SLDCs shall report about the operation of SPS immediately and detailed report shall be submitted within three days of operation to the concerned RPC and RLDC in the format specified by the respective RPCs.”*

NRLDC representative stated that in this regard, communication has already been sent to constituents through NRLDC letter dated 01.05.2024, 21.02.2025 & 05.03.2025 for conducting mock testing of SPS in their control area and continuous follow up is also being done in OCC & PSC meeting since May 2024.

Further it was stated that during 2024-25, mock testing of 14 SPS out of total 55 SPS were not conducted. In view of high demand scenario during summer 2025-26, NRLDC vide letter dated 04.04.2025 requested all the concerned utility to conduct the mock testing of pending SPS by the end of April 2025. However, as reported, mock testing of 03 SPS out of pending 14 SPS have been done. In this regard, discussion was also held in 60<sup>th</sup> & 61<sup>st</sup> PSC meeting. PSC forum requested all the members to conduct the mock testing of all the SPS in their respective control area at the earliest.

Status of mock testing of all the SPS in NR is attached as Annexure-B.IX of agenda.

*NRLDC requested POWERGRID(NR-3) to share the schedule of mock testing of 400kV Gorakhpur-Muzaffarpur D/C (NR-ER inter-regional link). POWERGRID(NR-3) representative agreed to share at the earliest.*

*NRLDC requested concerned members to conduct the mock testing SPS in their respective control area and share the mock test report if mock test exercise has been conducted.*

**NRLDC also highlighted the following points related to SPS schemes in NR:**

- i. **SPS of HVDC Rihand-Dadri:** During mock testing of SPS of HVDC Rihand-Dadri on 20.03.2025, issues i.e., faulty SPS hardware at Singrauli TPS (NTPC) and no receipt of SPS signal at 220/132kV Ratangarh(RS) were identified. Further, during recent operation of SPS on 21.05.2025 in incident of outage of both poles, desired SPS actions i.e., generation backdown at Singrauli TPS and load relief in UP, Delhi, Haryana & Punjab were not observed. Desired load / generation relief is important to ensure the security and reliability of grid during such contingency. As per details received, SPS signal was sent to all the mapped stations from POWERGRID end however either due to non receipt of signal or error in SPS system at load / generation, SPS action didn't occur. NRLDC vide letter dated 02.07.2025, requested POWERGRID and Singrauli NTPC to take necessary remedial measures and make complete SPS system healthy.

During 233 OCC meeting, POWERGRID representative stated that the equipment's at Singrauli TPS end is owned by NTPC and need to be revived by them. SPS system at Rihand(PG) is healthy and operational. NTPC representative stated that as per details received from site, NTPC Singrauli team have initiated necessary actions in coordination with the POWERGRID. SPS operation is crucial as it is planned for special contingencies, and its unavailability may lead to cascade tripping or major grid disturbance especially in case of high demand period.

*Representative from POWERGRID(NR-1) and NTPC were not available during the discussion of this agenda point.*

*NRLDC representative stated that NTPC Singrauli and POWERGRID(NR-1) need to take necessary corrective actions and ensure healthiness of SPS system at Singrauli TPS and load stations.*

- ii. **SPS of Anta, Kawai, Chhabra generation complex:** In one of the SPS cases i.e., N-1-1/ N-2 of 765kV Anta-Phagi 1 & 2, instantaneous generation backdown of ~2100 MW is designed as SPS action. In such scenario, to avoid overloading

of WR-NR corridor and over drawl by Rajasthan, it was agreed that RVPNL shall implement the automatic load shedding of ~750 MW by 28.02.2018. However, as per details available, implementation of automatic load shedding as per SPS hasn't been done yet. This matter has already been discussed in PSC as well as OCC meetings on regular basis. The concern of grid security and reliability was also raised during request of shutdown of 765kV Anta-Phagi line. is requested to expedite implementation of the automatic load shedding of ~750 MW as per SPS (N-1-1/ N-2 contingency of 765kV Anta-Phagi-1 & 2).

During 233 OCC meeting, SLDC-Rajasthan representative informed that study has been conducted in this regard and the case shall be put up in next OCC meeting for approval.

*NRLDC representative requested Rajasthan to apprise the forum about present status. No agenda has been put up in 234 or 235 OCC meeting.*

*RVPNL representative informed that automatic load shedding of ~750 MW has been implemented.*

*RVPNL was requested to share the details of load mapped under SPS for automatic load shedding.*

- iii. **SPS of N.Jharkri, Karcham, Rampur hydro generation complex:** Status of implementation of case-6(i) and corrective actions w.r.t case-6 (ii) need to be shared.

*NRLDC representative requested Karcham(JSW) and HPPTCL to apprise the forum about present status of actions taken.*

*HPPTCL representative informed that faulty communication card at Wangtoo S/s is to be replaced with new card. The case is at procurement stage, and it is estimated that work will be completed by the end of December 2025.*

*Representative from Karcham(JSW) were not available during the discussion of this agenda point.*

- iv. **SPS of HVDC Mundra-Mahendragarh:** Continuous follow up is being done since 51<sup>st</sup> PSC meeting. As informed by ADANI, word order has been placed and SPS will be made healthy by end of December 2025.

During 62<sup>nd</sup> PSC meeting, ADANI representative stated that work is going as per schedule. Further, they will ensure the completion of the work as per timeline.

*In view of high demand scenario and criticality of SPS of HVDC Mundra-Mahendragarh in case of any contingency, ADANI was requested to expedite the corrective actions and share the present status.*

*ADANI representative stated that Hardware expected to be received by the partner by end of this week (20-Sep-25). Further, FAT expected to be carried out within this month (by 31-Sep-25). The Dispatch and site activities shall be planned based on FAT punch point closures.*

*Further, they will ensure the completion of the work as per timeline.*

Further, Clause 16.2 of IEGC 2023 also mandates the mock testing of SPS for reviewing SPS parameters & functions, at least once a year. Mock testing of all the SPS needs to be conducted in 2025-26. In view of this NRLDC representative requested the following to the members:

- i. **Concerned constituents / utility are requested to conduct the mock testing of pending SPS (whose mock testing was not conducted in 2024-25) at the earliest.**
- ii. **Utilities are also requested to conduct the mock testing of SPS schemes in their respective control area w.r.t. year 2025-26.**
- iii. **In compliance with IEGC clause 16.2, users shall ensure that mock testing along with the review of SPS logic of all the SPS is conducted at least once in a year.**
- iv. **Further In compliance with IEGC clause 16.3, users shall also share the detailed report of SPS operation in their respective control area within 3 days of its operation. Presently, no such report is being received.**

Further, during 60<sup>th</sup> PSC meeting, forum also decided to not disable the SPS where ICTs are now N-1 compliant after augmentation. It was decided that SPS may be kept enabled with logic based on loading instead of ICT tripping. In view of this, NRLDC requested members to take necessary actions at their end and share the confirmation.

OCC forum requested members to conduct the mock testing of SPS in their respective control area, share the report of the mock testing conducted. Members were also requested to review the SPS scheme in their respective control area if there is any change in network configuration and load profile.

### **B.13 Mock trial run and testing of black start facilities at generating stations in Northern Region**

As per Indian Electricity Grid Code (IEGC) clause 34.3

“ Detailed procedures for restoration post partial and total blackout of each user system within a region shall be prepared by the concerned user in coordination with the concerned SLDC, RLDC or NLDC, as the case may be. The concerned user shall review the procedure every year and update the same. **The user shall carry out a mock trial run of the procedure for**

***different sub-systems including black-start of generating units along with grid forming capability of inverter based generating station and VSC based HVDC black-start support at least once a year under intimation to the concerned SLDC and RLDC. Diesel generator sets and other standalone auxiliary supply source to be used for black start shall be tested on a weekly basis and the user shall send the test reports to the concerned SLDC, RLDC and NLDC on a quarterly basis”.***

Hydro and gas-based plants are capable of self-black-start. Conducting periodic mock black start exercises are extremely important to ensure the healthiness of black start facilities and also to build awareness as well as confidence among the system operators.

In view of above, regional entity generating stations shall conduct the dead bus charging of their units on rotation basis as per availability of schedule under intimation to the NRLDC. Testing of Diesel generator sets and other standalone auxiliary supply source to be used for black start shall also be done on a weekly basis. SLDC shall also ensure the same in their respective control area. This will ensure the healthiness of blackstart facility at generating stations. Further, NRLDC shall coordinate with the ISGS and states to conduct the mock black start exercise of subsystems.

Therefore, regional entity generating stations and SLDCs are requested to share the annual schedule plan for conducting dead bus charging / mock black start exercise of generating stations / sub-systems during 2025-26. The present status of mock black start of generating units is attached as Annexure-B.X of agenda. Constituents are also requested to share the test report of diesel generators / auxiliary supply on a quarterly basis.

***NRLDC representative presented the status of mock black start exercises in NR and requested ISGS and SLDCs to take following actions:***

- ***share the report of testing of DG sets.***
- ***share the tentative schedule of mock black start exercise of generating stations in their respective control area.***
- ***SLDCs are requested to share the tentative schedule plan of mock black start exercise of generating stations in their respective control area.***
- ***conduct dead bus charging after self-starting the generating station if schedule with load is not available.***
- ***share the test report of mock black start exercise conducted along with weekly DG testing on monthly/quarterly basis.***

***OCC forum requested all the concerned generating stations and States to conduct the mock black start exercise of black start facilities in your respective control area. Members were also requested to share the report of mock black start exercises after conducting and testing of DG sets on quarterly basis.***

Status of action taken on decision of 235<sup>th</sup> OCC meeting of NRPC

| S.N. | Agenda                                                                                                                      | Decision of 234 <sup>th</sup> OCC meeting of NRPC                                                                                                                                                                                                     | Status of action taken                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------|-----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Agenda. Rectification of the breaker and charging of the 220kV Sunam (PS)-Patran (IndiGrid) Circuit (Agenda by Punjab SLDC) | The IndiGrid representative informed that the OEM has assured the cord would be made available within the next 15 days. MS, NRPC, urged IndiGrid to resolve the matter within a week, as the line has been under breakdown for a considerable period. | <p>The IndiGrid representative informed that the OEM has recently conveyed that the power cord cannot be repaired and must be replaced. The OEM has also requested 15 days to provide the replacement.</p> <p>MS, NRPC expressed serious concern over the line remaining under outage for more than a year and directed IndiGrid to ensure that the cord is replaced within 15 days. She further advised IndiGrid to examine the possibility of invoking the penalty provisions under the contract against the OEM.</p> |
| 2    | A.16 Installation of 315 MVA 400/220kV Synthetic Ester Oil based Transformer in Delhi-NCR (Agenda by Powergrid NR-1)        | OCC forum requested POWERGRID to explore the possibility of installing an additional 5th ICT at the Bhiwadi substation, considering the availability of space. Additionally, POWERGRID was asked to                                                   | <p>The Powergrid representative informed that space is available at the Bhiwadi substation.</p> <p>The forum agreed to the installation of a 315 MVA, 400/220 kV Synthetic Ester Oil-based</p>                                                                                                                                                                                                                                                                                                                          |

Status of action taken on decision of 235<sup>th</sup> OCC meeting of NRPC

|   |                                                                                                                   |                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                         |
|---|-------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   |                                                                                                                   | survey and examine the option of commissioning the ICT at other substations (including DTL) in the vicinity of the NCR                                                                                                                                                                 | transformer at the Bhiwadi (PG) substation without any cost implication to the constituents.                                                                                                                                                                                                                                                                            |
| 3 | A.22 Installation of STATCOM at 220/66 KV GIS Substation to improve Voltage Stability (Additional Agenda by LPDD) | OCC Forum asked CTU to conduct studies in consultation with LDPP and POWERGRID to identify suitable locations and the required STATCOM capacities for various POWERGRID substations. Regarding installation of capacitor banks, forum asked LPDD to submit the DPR vetted by J&K SLDC. | The CTU representative stated that a study is required considering the impact of the Synchronous Condensers recently approved by NCT under the transmission system for evacuation of 5 GW RE power from the Renewable Energy Parks in Leh. MS, NRPC requested CTU to undertake the study and present the findings for further deliberation in the upcoming OCC meeting. |

## Follow up issues from previous OCC meetings

Annexure-A. II

|                  |                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |               |         |          |           |          |      |          |                  |               |          |          |             |          |      |          |               |          |        |          |              |               |         |           |           |           |      |           |                  |           |          |           |             |           |      |           |               |           |        |           |
|------------------|--------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|---------------|---------|----------|-----------|----------|------|----------|------------------|---------------|----------|----------|-------------|----------|------|----------|---------------|----------|--------|----------|--------------|---------------|---------|-----------|-----------|-----------|------|-----------|------------------|-----------|----------|-----------|-------------|-----------|------|-----------|---------------|-----------|--------|-----------|
| 1                | Down Stream network by State utilities from ISTS Station                 | 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.                    | List of downstream networks is enclosed in Annexure-A. II. I.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |              |               |         |          |           |          |      |          |                  |               |          |          |             |          |      |          |               |          |        |          |              |               |         |           |           |           |      |           |                  |           |          |           |             |           |      |           |               |           |        |           |
| 2                | Progress of installing new capacitors and repair of defective capacitors | Information regarding installation of new capacitors and repair of defective capacitors is to be submitted to NRPC Secretariat.                                                                                                                                                                                                                                                                                                           | <div>Data upto following months, received from various states / UTs:</div> <table><tr><td>⊙ CHANDIGARH</td><td>Sep-2019</td></tr><tr><td>⊙ DELHI</td><td>Jul-2025</td></tr><tr><td>⊙ HARYANA</td><td>May-2025</td></tr><tr><td>⊙ HP</td><td>Mar-2025</td></tr><tr><td>⊙ J&amp;K and LADAKH</td><td>Not Available</td></tr><tr><td>⊙ PUNJAB</td><td>Jul-2025</td></tr><tr><td>⊙ RAJASTHAN</td><td>Aug-2025</td></tr><tr><td>⊙ UP</td><td>Aug-2025</td></tr><tr><td>⊙ UTTARAKHAND</td><td>Aug-2025</td></tr></table> <div>All States/UTs are requested to update status on monthly basis.</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | ⊙ CHANDIGARH | Sep-2019      | ⊙ DELHI | Jul-2025 | ⊙ HARYANA | May-2025 | ⊙ HP | Mar-2025 | ⊙ J&K and LADAKH | Not Available | ⊙ PUNJAB | Jul-2025 | ⊙ RAJASTHAN | Aug-2025 | ⊙ UP | Aug-2025 | ⊙ UTTARAKHAND | Aug-2025 |        |          |              |               |         |           |           |           |      |           |                  |           |          |           |             |           |      |           |               |           |        |           |
| ⊙ CHANDIGARH     | Sep-2019                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |               |         |          |           |          |      |          |                  |               |          |          |             |          |      |          |               |          |        |          |              |               |         |           |           |           |      |           |                  |           |          |           |             |           |      |           |               |           |        |           |
| ⊙ DELHI          | Jul-2025                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |               |         |          |           |          |      |          |                  |               |          |          |             |          |      |          |               |          |        |          |              |               |         |           |           |           |      |           |                  |           |          |           |             |           |      |           |               |           |        |           |
| ⊙ HARYANA        | May-2025                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |               |         |          |           |          |      |          |                  |               |          |          |             |          |      |          |               |          |        |          |              |               |         |           |           |           |      |           |                  |           |          |           |             |           |      |           |               |           |        |           |
| ⊙ HP             | Mar-2025                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |               |         |          |           |          |      |          |                  |               |          |          |             |          |      |          |               |          |        |          |              |               |         |           |           |           |      |           |                  |           |          |           |             |           |      |           |               |           |        |           |
| ⊙ J&K and LADAKH | Not Available                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |               |         |          |           |          |      |          |                  |               |          |          |             |          |      |          |               |          |        |          |              |               |         |           |           |           |      |           |                  |           |          |           |             |           |      |           |               |           |        |           |
| ⊙ PUNJAB         | Jul-2025                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |               |         |          |           |          |      |          |                  |               |          |          |             |          |      |          |               |          |        |          |              |               |         |           |           |           |      |           |                  |           |          |           |             |           |      |           |               |           |        |           |
| ⊙ RAJASTHAN      | Aug-2025                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |               |         |          |           |          |      |          |                  |               |          |          |             |          |      |          |               |          |        |          |              |               |         |           |           |           |      |           |                  |           |          |           |             |           |      |           |               |           |        |           |
| ⊙ UP             | Aug-2025                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |               |         |          |           |          |      |          |                  |               |          |          |             |          |      |          |               |          |        |          |              |               |         |           |           |           |      |           |                  |           |          |           |             |           |      |           |               |           |        |           |
| ⊙ UTTARAKHAND    | Aug-2025                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |               |         |          |           |          |      |          |                  |               |          |          |             |          |      |          |               |          |        |          |              |               |         |           |           |           |      |           |                  |           |          |           |             |           |      |           |               |           |        |           |
| 3                | Healthiness of defence mechanism: Self-certification                     | <div>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” .</div> <div>In compliance of NPC decision, NR states/constituents agreed to raise the AUFR settings by 0.2 Hz in 47th TCC/49th NRPC meetings.</div> | <div>Data upto following months, received from various states / UTs:</div> <table><tr><td>⊙ CHANDIGARH</td><td>Not Available</td></tr><tr><td>⊙ DELHI</td><td>Jul-2025</td></tr><tr><td>⊙ HARYANA</td><td>Jun-2025</td></tr><tr><td>⊙ HP</td><td>Jun-2025</td></tr><tr><td>⊙ J&amp;K and LADAKH</td><td>Not Available</td></tr><tr><td>⊙ PUNJAB</td><td>Jun-2025</td></tr><tr><td>⊙ RAJASTHAN</td><td>Jun-2025</td></tr><tr><td>⊙ UP</td><td>Aug-2025</td></tr><tr><td>⊙ UTTARAKHAND</td><td>Aug-2025</td></tr><tr><td>⊙ BBMB</td><td>Jun-2025</td></tr></table> <div>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.</div> <div>Status:</div> <table><tr><td>⊙ CHANDIGARH</td><td>Not Available</td></tr><tr><td>⊙ DELHI</td><td>Increased</td></tr><tr><td>⊙ HARYANA</td><td>Increased</td></tr><tr><td>⊙ HP</td><td>Increased</td></tr><tr><td>⊙ J&amp;K and LADAKH</td><td>Increased</td></tr><tr><td>⊙ PUNJAB</td><td>Increased</td></tr><tr><td>⊙ RAJASTHAN</td><td>Increased</td></tr><tr><td>⊙ UP</td><td>Increased</td></tr><tr><td>⊙ UTTARAKHAND</td><td>Increased</td></tr><tr><td>⊙ BBMB</td><td>Increased</td></tr></table> | ⊙ CHANDIGARH | Not Available | ⊙ DELHI | Jul-2025 | ⊙ HARYANA | Jun-2025 | ⊙ HP | Jun-2025 | ⊙ J&K and LADAKH | Not Available | ⊙ PUNJAB | Jun-2025 | ⊙ RAJASTHAN | Jun-2025 | ⊙ UP | Aug-2025 | ⊙ UTTARAKHAND | Aug-2025 | ⊙ BBMB | Jun-2025 | ⊙ CHANDIGARH | Not Available | ⊙ DELHI | Increased | ⊙ HARYANA | Increased | ⊙ HP | Increased | ⊙ J&K and LADAKH | Increased | ⊙ PUNJAB | Increased | ⊙ RAJASTHAN | Increased | ⊙ UP | Increased | ⊙ UTTARAKHAND | Increased | ⊙ BBMB | Increased |
| ⊙ CHANDIGARH     | Not Available                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |               |         |          |           |          |      |          |                  |               |          |          |             |          |      |          |               |          |        |          |              |               |         |           |           |           |      |           |                  |           |          |           |             |           |      |           |               |           |        |           |
| ⊙ DELHI          | Jul-2025                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |               |         |          |           |          |      |          |                  |               |          |          |             |          |      |          |               |          |        |          |              |               |         |           |           |           |      |           |                  |           |          |           |             |           |      |           |               |           |        |           |
| ⊙ HARYANA        | Jun-2025                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |               |         |          |           |          |      |          |                  |               |          |          |             |          |      |          |               |          |        |          |              |               |         |           |           |           |      |           |                  |           |          |           |             |           |      |           |               |           |        |           |
| ⊙ HP             | Jun-2025                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |               |         |          |           |          |      |          |                  |               |          |          |             |          |      |          |               |          |        |          |              |               |         |           |           |           |      |           |                  |           |          |           |             |           |      |           |               |           |        |           |
| ⊙ J&K and LADAKH | Not Available                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |               |         |          |           |          |      |          |                  |               |          |          |             |          |      |          |               |          |        |          |              |               |         |           |           |           |      |           |                  |           |          |           |             |           |      |           |               |           |        |           |
| ⊙ PUNJAB         | Jun-2025                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |               |         |          |           |          |      |          |                  |               |          |          |             |          |      |          |               |          |        |          |              |               |         |           |           |           |      |           |                  |           |          |           |             |           |      |           |               |           |        |           |
| ⊙ RAJASTHAN      | Jun-2025                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |               |         |          |           |          |      |          |                  |               |          |          |             |          |      |          |               |          |        |          |              |               |         |           |           |           |      |           |                  |           |          |           |             |           |      |           |               |           |        |           |
| ⊙ UP             | Aug-2025                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |               |         |          |           |          |      |          |                  |               |          |          |             |          |      |          |               |          |        |          |              |               |         |           |           |           |      |           |                  |           |          |           |             |           |      |           |               |           |        |           |
| ⊙ UTTARAKHAND    | Aug-2025                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |               |         |          |           |          |      |          |                  |               |          |          |             |          |      |          |               |          |        |          |              |               |         |           |           |           |      |           |                  |           |          |           |             |           |      |           |               |           |        |           |
| ⊙ BBMB           | Jun-2025                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |               |         |          |           |          |      |          |                  |               |          |          |             |          |      |          |               |          |        |          |              |               |         |           |           |           |      |           |                  |           |          |           |             |           |      |           |               |           |        |           |
| ⊙ CHANDIGARH     | Not Available                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |               |         |          |           |          |      |          |                  |               |          |          |             |          |      |          |               |          |        |          |              |               |         |           |           |           |      |           |                  |           |          |           |             |           |      |           |               |           |        |           |
| ⊙ DELHI          | Increased                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |               |         |          |           |          |      |          |                  |               |          |          |             |          |      |          |               |          |        |          |              |               |         |           |           |           |      |           |                  |           |          |           |             |           |      |           |               |           |        |           |
| ⊙ HARYANA        | Increased                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |               |         |          |           |          |      |          |                  |               |          |          |             |          |      |          |               |          |        |          |              |               |         |           |           |           |      |           |                  |           |          |           |             |           |      |           |               |           |        |           |
| ⊙ HP             | Increased                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |               |         |          |           |          |      |          |                  |               |          |          |             |          |      |          |               |          |        |          |              |               |         |           |           |           |      |           |                  |           |          |           |             |           |      |           |               |           |        |           |
| ⊙ J&K and LADAKH | Increased                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |               |         |          |           |          |      |          |                  |               |          |          |             |          |      |          |               |          |        |          |              |               |         |           |           |           |      |           |                  |           |          |           |             |           |      |           |               |           |        |           |
| ⊙ PUNJAB         | Increased                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |               |         |          |           |          |      |          |                  |               |          |          |             |          |      |          |               |          |        |          |              |               |         |           |           |           |      |           |                  |           |          |           |             |           |      |           |               |           |        |           |
| ⊙ RAJASTHAN      | Increased                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |               |         |          |           |          |      |          |                  |               |          |          |             |          |      |          |               |          |        |          |              |               |         |           |           |           |      |           |                  |           |          |           |             |           |      |           |               |           |        |           |
| ⊙ UP             | Increased                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |               |         |          |           |          |      |          |                  |               |          |          |             |          |      |          |               |          |        |          |              |               |         |           |           |           |      |           |                  |           |          |           |             |           |      |           |               |           |        |           |
| ⊙ UTTARAKHAND    | Increased                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |               |         |          |           |          |      |          |                  |               |          |          |             |          |      |          |               |          |        |          |              |               |         |           |           |           |      |           |                  |           |          |           |             |           |      |           |               |           |        |           |
| ⊙ BBMB           | Increased                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |               |         |          |           |          |      |          |                  |               |          |          |             |          |      |          |               |          |        |          |              |               |         |           |           |           |      |           |                  |           |          |           |             |           |      |           |               |           |        |           |

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|-----------|----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|---------------------------------|-----------------------------------|---------------------------------|----------------------|------------------------|---------|--|--|--|--|--|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|------------|------|---|------------|---------------|---|-------|--------|---|---------|--------|---|----|--------|---|----------------|----------------------------------------|---|--------|--------|---|-----------|--------|---|----|--------|---|-------------|--------|
| 4         | Status of Automatic Demand Management System in NR states/UT's | 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:                                                                                                                                                                                                                                                                                                                                           | The status of ADMS implementation in NR is enclosed in <b>Annexure-A.II.II.</b>                                                                                                    |                                                 |                                 |                                   |                                 |                      |                        |         |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |            |      |   |            |               |   |       |        |   |         |        |   |    |        |   |                |                                        |   |        |        |   |           |        |   |    |        |   |             |        |
|           |                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ⊙ DELHI                                                                                                                                                                            | Scheme Implemented but operated in manual mode. |                                 |                                   |                                 |                      |                        |         |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |            |      |   |            |               |   |       |        |   |         |        |   |    |        |   |                |                                        |   |        |        |   |           |        |   |    |        |   |             |        |
|           |                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ⊙ HARYANA                                                                                                                                                                          | Scheme not implemented                          |                                 |                                   |                                 |                      |                        |         |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |            |      |   |            |               |   |       |        |   |         |        |   |    |        |   |                |                                        |   |        |        |   |           |        |   |    |        |   |             |        |
|           |                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ⊙ HP                                                                                                                                                                               | Scheme not implemented                          |                                 |                                   |                                 |                      |                        |         |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |            |      |   |            |               |   |       |        |   |         |        |   |    |        |   |                |                                        |   |        |        |   |           |        |   |    |        |   |             |        |
|           |                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ⊙ PUNJAB                                                                                                                                                                           | Scheme not implemented                          |                                 |                                   |                                 |                      |                        |         |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |            |      |   |            |               |   |       |        |   |         |        |   |    |        |   |                |                                        |   |        |        |   |           |        |   |    |        |   |             |        |
|           |                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ⊙ RAJASTHAN                                                                                                                                                                        | Under implementation.                           |                                 |                                   |                                 |                      |                        |         |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |            |      |   |            |               |   |       |        |   |         |        |   |    |        |   |                |                                        |   |        |        |   |           |        |   |    |        |   |             |        |
|           |                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ⊙ UP                                                                                                                                                                               | Scheme implemented by NPCIL only                |                                 |                                   |                                 |                      |                        |         |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |            |      |   |            |               |   |       |        |   |         |        |   |    |        |   |                |                                        |   |        |        |   |           |        |   |    |        |   |             |        |
|           |                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ⊙ UTTARAKHAND                                                                                                                                                                      | Scheme not implemented                          |                                 |                                   |                                 |                      |                        |         |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |            |      |   |            |               |   |       |        |   |         |        |   |    |        |   |                |                                        |   |        |        |   |           |        |   |    |        |   |             |        |
| 5         | Status of availability of ERS towers in NR                     | As per the decesion of 68th NRPC and 211th OCC meeting, ERS availability monitoring is being taken as rolling/follow-up agenda in OCC meetings for regular monitoring of ERS under different utilities in Northern region.                                                                                                                                                                                                                                                                | As per the information received from different utilities in Northern region, updated status of availability of ERS towers in Northern Region attached as <b>Annexure-A.II.III.</b> |                                                 |                                 |                                   |                                 |                      |                        |         |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |            |      |   |            |               |   |       |        |   |         |        |   |    |        |   |                |                                        |   |        |        |   |           |        |   |    |        |   |             |        |
| 6         | Submission of breakup of Energy Consumption by the states      | All states/UTs are requested to submit the requisite data as per the billed data information in the format given as under:<br><table><tr><td>Category→</td><td>Consumption by Domestic Loads</td><td>Consumption by Commercial Loads</td><td>Consumption by Agricultural Loads</td><td>Consumption by Industrial Loads</td><td>Traction supply load</td><td>Miscellaneous / Others</td></tr><tr><td>&lt;Month&gt;</td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> | Category→                                                                                                                                                                          | Consumption by Domestic Loads                   | Consumption by Commercial Loads | Consumption by Agricultural Loads | Consumption by Industrial Loads | Traction supply load | Miscellaneous / Others | <Month> |  |  |  |  |  |  | Status of the information submission (month) from states / utilities is as under:<br><table><tr><td></td><td>State / UT</td><td>Upto</td></tr><tr><td>⊙</td><td>CHANDIGARH</td><td>Not Submitted</td></tr><tr><td>⊙</td><td>DELHI</td><td>Jun-25</td></tr><tr><td>⊙</td><td>HARYANA</td><td>Jul-25</td></tr><tr><td>⊙</td><td>HP</td><td>Jul-25</td></tr><tr><td>⊙</td><td>J&amp;K and LADAKH</td><td>JPDCL- Mar' 24<br/>KPDCL- Not Submitted</td></tr><tr><td>⊙</td><td>PUNJAB</td><td>Jul-25</td></tr><tr><td>⊙</td><td>RAJASTHAN</td><td>Jul-25</td></tr><tr><td>⊙</td><td>UP</td><td>Feb-25</td></tr><tr><td>⊙</td><td>UTTARAKHAND</td><td>Feb-25</td></tr></table><br>Chandigarh is requested to submit the requisite data w.e.f. April 2018 as per the billed data information in the given format |  |  | State / UT | Upto | ⊙ | CHANDIGARH | Not Submitted | ⊙ | DELHI | Jun-25 | ⊙ | HARYANA | Jul-25 | ⊙ | HP | Jul-25 | ⊙ | J&K and LADAKH | JPDCL- Mar' 24<br>KPDCL- Not Submitted | ⊙ | PUNJAB | Jul-25 | ⊙ | RAJASTHAN | Jul-25 | ⊙ | UP | Feb-25 | ⊙ | UTTARAKHAND | Feb-25 |
| Category→ | Consumption by Domestic Loads                                  | Consumption by Commercial Loads                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Consumption by Agricultural Loads                                                                                                                                                  | Consumption by Industrial Loads                 | Traction supply load            | Miscellaneous / Others            |                                 |                      |                        |         |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |            |      |   |            |               |   |       |        |   |         |        |   |    |        |   |                |                                        |   |        |        |   |           |        |   |    |        |   |             |        |
| <Month>   |                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                    |                                                 |                                 |                                   |                                 |                      |                        |         |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |            |      |   |            |               |   |       |        |   |         |        |   |    |        |   |                |                                        |   |        |        |   |           |        |   |    |        |   |             |        |
|           | State / UT                                                     | Upto                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                    |                                                 |                                 |                                   |                                 |                      |                        |         |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |            |      |   |            |               |   |       |        |   |         |        |   |    |        |   |                |                                        |   |        |        |   |           |        |   |    |        |   |             |        |
| ⊙         | CHANDIGARH                                                     | Not Submitted                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                    |                                                 |                                 |                                   |                                 |                      |                        |         |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |            |      |   |            |               |   |       |        |   |         |        |   |    |        |   |                |                                        |   |        |        |   |           |        |   |    |        |   |             |        |
| ⊙         | DELHI                                                          | Jun-25                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                    |                                                 |                                 |                                   |                                 |                      |                        |         |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |            |      |   |            |               |   |       |        |   |         |        |   |    |        |   |                |                                        |   |        |        |   |           |        |   |    |        |   |             |        |
| ⊙         | HARYANA                                                        | Jul-25                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                    |                                                 |                                 |                                   |                                 |                      |                        |         |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |            |      |   |            |               |   |       |        |   |         |        |   |    |        |   |                |                                        |   |        |        |   |           |        |   |    |        |   |             |        |
| ⊙         | HP                                                             | Jul-25                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                    |                                                 |                                 |                                   |                                 |                      |                        |         |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |            |      |   |            |               |   |       |        |   |         |        |   |    |        |   |                |                                        |   |        |        |   |           |        |   |    |        |   |             |        |
| ⊙         | J&K and LADAKH                                                 | JPDCL- Mar' 24<br>KPDCL- Not Submitted                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                    |                                                 |                                 |                                   |                                 |                      |                        |         |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |            |      |   |            |               |   |       |        |   |         |        |   |    |        |   |                |                                        |   |        |        |   |           |        |   |    |        |   |             |        |
| ⊙         | PUNJAB                                                         | Jul-25                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                    |                                                 |                                 |                                   |                                 |                      |                        |         |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |            |      |   |            |               |   |       |        |   |         |        |   |    |        |   |                |                                        |   |        |        |   |           |        |   |    |        |   |             |        |
| ⊙         | RAJASTHAN                                                      | Jul-25                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                    |                                                 |                                 |                                   |                                 |                      |                        |         |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |            |      |   |            |               |   |       |        |   |         |        |   |    |        |   |                |                                        |   |        |        |   |           |        |   |    |        |   |             |        |
| ⊙         | UP                                                             | Feb-25                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                    |                                                 |                                 |                                   |                                 |                      |                        |         |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |            |      |   |            |               |   |       |        |   |         |        |   |    |        |   |                |                                        |   |        |        |   |           |        |   |    |        |   |             |        |
| ⊙         | UTTARAKHAND                                                    | Feb-25                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                    |                                                 |                                 |                                   |                                 |                      |                        |         |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |            |      |   |            |               |   |       |        |   |         |        |   |    |        |   |                |                                        |   |        |        |   |           |        |   |    |        |   |             |        |

|     |                                                                |               |                                            |                                                                                                                                                                                                                                                                                                    |
|-----|----------------------------------------------------------------|---------------|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 9   | Reactive compensation at 220 kV/ 400 kV level at 7 substations |               |                                            |                                                                                                                                                                                                                                                                                                    |
|     | State / Utility                                                | Substation    | Reactor                                    | Status                                                                                                                                                                                                                                                                                             |
| i   | DTL                                                            | Peeragarhi    | 1x50 MVar at 220 kV                        | 1x50 MVar Reactor at Peeragarhi has been commissioned on dated 18.09.2023                                                                                                                                                                                                                          |
| ii  | DTL                                                            | Harsh Vihar   | 2x50 MVar at 220 kV                        | 2x50 MVAR Reactor at Harsh Vihar has been commissioned on dated 31th March 2023.                                                                                                                                                                                                                   |
| iii | DTL                                                            | Mundka        | 1x125 MVar at 400 kV & 1x25 MVar at 220 kV | Bay work completed on 25.03.2023. Reactor part tender is dropped and at present same is under revision.                                                                                                                                                                                            |
| iv  | DTL                                                            | Bamnauli      | 2x25 MVar at 220 kV                        | Bay work completed on 25.03.2023. Reactor part tender is dropped and at present same is under revision.                                                                                                                                                                                            |
| v   | DTL                                                            | Indraprastha  | 2x25 MVar at 220 kV                        | Bay work completed on 07.11.2023. Reactor part tender is dropped and at present same is under revision.                                                                                                                                                                                            |
| vi  | DTL                                                            | Electric Lane | 1x50 MVar at 220 kV                        | Under Re-tendering due to Single Bid                                                                                                                                                                                                                                                               |
| vii | PTCUL                                                          | Kashipur      | 1x125 MVAR at 400 kV                       | The Letter of Award for "Procurement of 125 MVAR Reactor, Online DGA, ODS, NIFPS along with its accessories at 400 KV Sub-station Kashipur" against Tender Specification no. PTCUL/E-Tender/C&P-II/SS-12/2024-25 has been issued to M/s Bharat Heavy Electricals Limited, New Delhi on 26.06.2025. |

|                                                              |                                        |                                                    |                              |                                                                                                                                         |                | Annexure-A-II.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.                                                                                                     | -              | 02 No. of bays shall be utilized for LILO-II of 220kV Jatwal-Bishnah Transmission Line, the work of which is expected to begin on 16th July 2025. Updated in 233rd OCC by JKPTCL.                                                                                                                                                                                                                                     |
| 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                                                                                                 | Mar'25         | 02 No. of bays are to be utilized for connecting 220kV New Wanpoh-Alusteng D/c Line. RoW issues persisting; At present new-wampoh-mirbazar 5km and harwan-alstung 16km have been completed, expected date of completion is Mar 2025 subject to availability of funds and resolving of RoW issues), Updated in 214th OCC by JKPTCL.                                                                                    |
|                                                              |                                        |                                                    |                              | • 220 kV New Wanpoh - Mattan D/c Line                                                                                                   | End of 2024    | 02 No. of bays are to be utilized for connecting 220kV New Wanpoh-Mattan D/c Line. The funding source for the project is being identified and the project is expected to be completed by ending 2024. Updated in 204th OCC by JKPTCL.                                                                                                                                                                                 |
| 3                                                            | 400/220kV, 2x315 MVA Amargarh          | Commissioned: 6<br>Total: 6                        | Utilized: 4<br>Unutilized: 2 | • 220kV D/C line from 400/220kV Kunzar - 220/33kV Sheeri                                                                                | End of 2024    | 02 No. of bays are proposed to be utilized for connecting 220/132 kV GSS Loolipora. The funding source for the project is being identified and the project is expected to be completed by ending 2024. Updated in 204th OCC by JKPTCL.                                                                                                                                                                                |
| 4                                                            | 400/220kV, 2x500 MVA Kurukshetra (GIS) | Commissioned: 8<br>Total: 8                        | Utilized: 6<br>Unutilized: 2 | • 220kV Bhadson (Kurukshetra) – Ramana Ramani D/c line                                                                                  | Commissioned   | Updated by HVPNL in 235th OCC.                                                                                                                                                                                                                                                                                                                                                                                        |
| 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 | Utilized: 7                  | • 220 kV D/C Shahjahanpur (PG) - Gola line                                                                                              | Commissioned   | Energization date: 26.10.2023 updated by UPPTCL in 215th OCC                                                                                                                                                                                                                                                                                                                                                          |
|                                                              |                                        |                                                    |                              | • LILO of Sitapur – Shahjahanpur 220 kV SC line at Shahjahanpur (PG)                                                                    | Commissioned   | Energization date: 25.02.2022 updated by UPPTCL in 196th OCC                                                                                                                                                                                                                                                                                                                                                          |
| 7                                                            | Hamirpur 400/220 kV Sub-station        | Commissioned: 8<br>Total: 8                        | Utilized: 4<br>Unutilized: 4 | • 220 kV Hamirpur-Dehan D/c line                                                                                                        | Commissioned   | HPPTCL has commissioned the Planned 220kV Dehan-Hamirpur TL utilizing 2 No. 220kV Bays.Commissioned 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: 2<br>Unutilized: 4 | • 220 kV D/C line Bhiwani (PG) – Bhiwani (HVPNL) line                                                                                   | Commissioned   | Updated in 202nd OCC by HVPNL                                                                                                                                                                                                                                                                                                                                                                                         |
|                                                              |                                        |                                                    |                              | • 220 kV Bhiwani (PG) - Isherwal (HVPNL) D/c line.                                                                                      | Dec'25         | Issue related to ROW as intimated in 228th OCC by HVPNL.<br><b>Status:</b><br>Work was stalled since 29.07.2021 due to ROW issues and farmers agitation and further restarted on 9.10.2023 with the help of district administration. Now, work was again stalled since 30.11.2023 due to severe ROW issues.<br>Expected to be completed by 31.03.2025.<br>Foundation 209/212. Erection 193/212. Stinging 37.8/50.3 km |
|                                                              |                                        |                                                    |                              | • 220 kV Bhiwani (PG) - Dadhibana (HVPNL) D/c line.                                                                                     | Mar'26         | Line work awarded to M/s R S Infra Projects Pvt. Ltd. Noida, Uttar Pradesh on dated 09.03.2024. Work of route plan and route alignment has been started by the firm as intimated in 234th OCC by HVPNL.                                                                                                                                                                                                               |
| 10                                                           | Jind 400/220kV S/s                     | Commissioned: 4<br>Approved:4<br>Total: 8          | Utilized: 4<br>Unutilized: 0 | • LILO of both circuits of 220 kV Jind HVPNL to PTPS D/C line at 400 kV substation PGCIL Khatkar (Jind) with 0.5 sq inch ACSR conductor | Sep'25         | Erection and stringing work completed.The signing of Connection agreement amongst the Utilities is pending. Updated in 234th OCC by HVPNL.                                                                                                                                                                                                                                                                            |
| 11                                                           | 400/220kV Tughlakabad GIS              | Commissioned: 6<br>Under Implementation: 4         | Utilized: 6<br>Unutilized: 0 | • RK Puram – Tughlakabad (UG Cable) 220kV D/c line – March 2023.                                                                        | Commissioned   | Updated in 216th OCC by DTL                                                                                                                                                                                                                                                                                                                                                                                           |
|                                                              |                                        |                                                    |                              | • Masjid Mor – Tughlakabad 220kV D/c line.                                                                                              | Commissioned   | Updated in 216th OCC by DTL                                                                                                                                                                                                                                                                                                                                                                                           |
| 12                                                           | 400/220kV Kala Amb GIS (TBCB)          | Commissioned: 6<br>Total: 6                        | Utilized: 2<br>Unutilized: 2 | • HPPTCL has planned one no. of 220kV D/c line from Kala Amb 400/220kV S/s to 220/132kV Kala Amb S/s                                    | Commissioned   | Energization date: 31.05.2024 updated by HPPTCL in 220th OCC                                                                                                                                                                                                                                                                                                                                                          |
|                                                              |                                        |                                                    |                              | • HPPTCL has planned one no. of 220kV D/c line from Kala Amb 400/220kV S/s to 220/132kV Giri S/s                                        | -              | Tendering process is yet to be started.Updated in 219th OCC by HPPTCL                                                                                                                                                                                                                                                                                                                                                 |
|                                                              |                                        |                                                    | Under Implementation:2       | • Network to be planned for 2 bays                                                                                                      | -              | HPPTCL to update the status.                                                                                                                                                                                                                                                                                                                                                                                          |
| 13                                                           | 400/220kV Kadarpur Sub-station         | Commissioned: 8<br>Total: 8                        | Utilized: 0<br>Unutilized: 8 | • D/C line Kadarpur - Pali D/C line Kadarpur - Sec-65                                                                                   | Commissioned   | Updated in 232nd OCC by HVPNL<br><b>Status:-</b><br>A-formats for FTC of line submitted on FTC portal of NRLDC on dated 09.04.25.                                                                                                                                                                                                                                                                                     |

| Sl. No. | Substation                       | Downstream network bays                                | Status of bays                                         | Planned 220 kV system and Implementation status                                                 | Revised Target | Remarks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------|----------------------------------|--------------------------------------------------------|--------------------------------------------------------|-------------------------------------------------------------------------------------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 14      | 400/220kV Sohna Road Sub-station | Commissioned: 8<br>Total: 8                            | Utilized: 4<br>Unutilized: 4                           | • LILO of both circuits of 220kV D/c Sohna-Rangla Rajpur at Roj Ka Meo line at 400kV Sohna Road | Oct'25         | Line work completed, but commissioning of 220kV substation Roj ka Meo is pending till now.. However, this arrangement will not lead to usage of additional bays i.e. no of utilised bays at Sohna road will remain same.Updated in 230th OCC by HVPNL                                                                                                                                                                                                                                               |
|         |                                  |                                                        |                                                        | • LILO of both circuits of 220kV D/c Badshahpur-Sec77 line at 400kV Sohna Road                  | -              | The matter is subjudice in Hon'ble Punjab & Haryana High court, Chandigarh Updated in 228th OCC by HVPNL.<br><b>Status:-</b><br>Earlier 02 nos 220 kV line bays were to be utilized for the 220 kV GIS S/Stn. Sec-77, Gurugram but due to denotification of land of the 220 kV GIS S/Stn. Sec-77 the said substation is now going to be dismantled and a new substation is proposed at Sec-75A, Gurugram. Now, these 02 no. 220 kV line bays may be utilized at 220 kV GIS S/Stn Sec-75A, Gurugram. |
| 15      | 400/220kV Prithla Sub-station    | Commissioned: 8<br>Approved: 2<br>Total: 10            | Utilized: 4<br>Unutilized: 4<br>Under Implementation:2 | • 220kV D/C line from Prithla to Harfali with LILO of one circuit at 220kV Meerpur Kurali       | Dec'25         | Contract awarded on 08.08.23 to M/s Skipper with completion in December 25.Updated in 230th OCC by HVPNL                                                                                                                                                                                                                                                                                                                                                                                            |
|         |                                  |                                                        |                                                        | • LILO of both ckt of 220kV D/c Ranga Rajpur – Palwal line                                      | Commissioned   | Energization date: 31.12.2021. Updated in 198th OCC by HVPNL                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|         |                                  |                                                        |                                                        | • 220kV D/C for Sector78, Faridabad                                                             | Dec'25         | Issue related to ROW and Pending crossing approval from Northern Railways and DFCCIL. as intimated in 228th OCC by HVPNL.                                                                                                                                                                                                                                                                                                                                                                           |
|         |                                  |                                                        |                                                        | • Prithla - Sector 89 Faridabad 220kV D/c line                                                  | Dec'25         | The work for construction of 220kV D/C Prithla-Sector-78 Faridabad line on multi circuit towers is delayed mainly due to severe resistance by local villagers & ROW problem at site during construction. Due to delay in construction of 220kV D/C Prithla-Sector-78 Faridabad line, the work for construction of 220kV D/C Prithla-Sector 89 Faridabad line might delay..Updated in 230th OCC by HVPNL                                                                                             |
| 16      | 400/220kV Sonapat Sub-station    | Commissioned: 6<br>Under Implementation:2<br>Total: 8  | Utilized: 2<br>Unutilized: 4<br>Under Implementation:2 | • LILO of both circuits of 220kV Samalkha - Mohana line at Sonapat                              | Commissioned   | Commissioned as updated by HVPNL in 233rd OCC                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|         |                                  |                                                        |                                                        | • Sonapat - HSIISC Rai 220kV D/c line                                                           | Commissioned   | Energization date: 31.05.2024 updated by HVPNL in 220th OCC                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|         |                                  |                                                        |                                                        | • Sonapat - Kharkhoda Pocket A 220kV D/c line                                                   | Nov'25         | Updated in 232nd OCC by HVPNL.<br><b>Status:</b><br>Work order has been issued to M/s R.S Infra on dated 09.08.2023 by O/o CE/PD&C, Panchkula for construction of line.<br>Both bays are under construction and erection of electrical equipment is under progress.                                                                                                                                                                                                                                 |
| 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)                                    | -              | Work is under progres. Stub Setting: 14/2017. Permission for Highway is awaited from concerned department as updated in 218th 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                                                            | -              | Date of bid opening has been extended up to 30.04.2024 as updated in 218th OCC by RVPNL.                                                                                                                                                                                                                                                                                                                                                                                                            |
| 19      | 400/220kV Jalandhar Sub-station  | Commissioned: 10<br>Total: 10                          | Utilized: 8<br>Unutilized: 2                           | • LILO of 220 kV BBMB Jalandhar - Butari line at 400 kV PGCIL Jalandhar                         | -              | LILO of 220 kV BBMB Jalandhar - Butari line at 400 kV PGCIL Jalandhar being planned. Route plan and estimate of work sanctioned, DNIT has been sent to float tender as updated by PSTCL in 227th OCC                                                                                                                                                                                                                                                                                                |
| 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 commissioned 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 2 bays                                                              | Commissioned   | • Lucknow -Kanduni, 220 kV D/C line work energized on 05.10.2023. Updated in 212th OCC by UPPTCL.<br>• No planning for 2 no. of bays upated by UPPTCL in 196th OCC. The same has been communicated to Powergrid.                                                                                                                                                                                                                                                                                    |
| 22      | 400/220kV Gorakhpur Sub-station  | Commissioned: 6<br>Total: 6                            | Utilized: 4<br>Unutilized: 2                           | • Network to be planned for 2 bays                                                              | Commissioned   | • Gorakhpur(PG)- Maharajganj, 220 kV D/C line energized on 27.09.2023 updated by UPPTCL in 212th OCC                                                                                                                                                                                                                                                                                                                                                                                                |
| 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 2 bays                                                              | -              | • UPPTCL intimated that 02 no. of bays under finalization stage. In 201st OCC, UPPTCL intimated that it is finalized that Khaga s/s will be connected (tentative time 1.5 years).<br>• No planning for 2 no. of bays updated by UPPTCL in 196th OCC. The same has been communicated to Powergrid.                                                                                                                                                                                                   |

| Sl. No. | Substation                       | Downstream network bays                                                      | Status of bays                                          | Planned 220 kV system and Implementation status                                                                                                                                                        | Revised Target | Remarks                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------|----------------------------------|------------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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                                                                                                                                                                | Commissioned   | Ckt-1 commissioned at 16:13hrs on dated 06.08.24 & Ckt-2 commissioned at 20:10 hrs on dated 05.08.24. Updated in 223rd OCC by HVPNL                                                                                                                                                                                                                                                                     |
| 25      | 400/220kV Pachkula Sub-station   | Commissioned: 8<br>Under tender:2<br>Total: 10<br>Out of these 10 nos. 220kV | Utilized: 2<br>Unutilized: 4<br>Under Implementation:2  | • Panchkula – Pinjore 220kV D/c line                                                                                                                                                                   | Commissioned   | Updated in 218th OCC by HVPNL                                                                                                                                                                                                                                                                                                                                                                           |
|         |                                  |                                                                              |                                                         | • Panchkula – Sector-32 220kV D/c line                                                                                                                                                                 | Commissioned   | Energization date: 24.05.2024 updated by HVPNL in 220th OCC                                                                                                                                                                                                                                                                                                                                             |
|         |                                  |                                                                              |                                                         | • Panchkula – Raiwali 220kV D/c line                                                                                                                                                                   | Commissioned   | Updated in 194th OCC by HVPNL                                                                                                                                                                                                                                                                                                                                                                           |
|         |                                  |                                                                              |                                                         | • Panchkula – Sadhaura 220kV D/c line: Sep'23                                                                                                                                                          | Nov'25         | Revised target date as confirmed by concerned XEN TS, Panchkula.Updated in 234th OCC by HVPNL                                                                                                                                                                                                                                                                                                           |
| 26      | 400/220kV Amritsar S/s           | Commissioned:7<br>Approved in 50th NRPC- 1 no.<br>Total: 8                   | Utilized: 6<br>Under Implementation:2                   | • Amritsar – Patti 220kV S/c line                                                                                                                                                                      | -              | Draft connectivity agreements for 220kV Rashiana-Amritsar has been received from CTU and the same under processing. Draft connectivity agreements for 220kV Patti-Amritsar line is under consideration by CTU. CTU is processing the agreement and PSTCL has provided with the requisite inputs/data to CTU. Updated in 232nd OCC by PSTCL.                                                             |
|         |                                  |                                                                              |                                                         | • Amritsar – Rashiana 220kV S/c line (2 bays shall be required for above lines. However, 1 unutilized bay shall be used for Patti and requirement of one additional bay approved for Rashiana by NRPC) | -              | Draft connectivity agreements for 220kV Rashiana-Amritsar & 220kV Patti-Amritsar lines are under consideration by CTU. CTU is processing the agreement and PSTCL has provided with the requisite inputs/data to CTU. Updated in 232nd OCC by PSTCL.                                                                                                                                                     |
| 27      | 400/220kV Bagpat S/s             | Commissioned: 8<br>Total: 8                                                  | Utilized:6<br>Unutilized: 2                             | • Bagpat - Modipuram 220kV D/c line                                                                                                                                                                    | Commissioned   | Updated in 201st OCC by UPPTCL                                                                                                                                                                                                                                                                                                                                                                          |
| 28      | 400/220kV Bahadurgarh S/s        | Commissioned: 4<br>Approved: 4<br>Total: 8                                   | Utilized:2<br>Unutilized: 2                             | • LILO of 220 kV Nunamajra- Daultabad S/c line at 400 kV Bahadurgarh PGCIL                                                                                                                             | -              | Proposal turned down by CEA.Updated in 230th OCC by HVPNL.                                                                                                                                                                                                                                                                                                                                              |
|         |                                  |                                                                              |                                                         | • Bahadurgarh - METL 220kV D/c line (Deposit work of M/s METL)                                                                                                                                         | 15.06.2026     | Updated in 230th OCC by HVPNL.<br><b>Status:</b><br>The work stands awarded to the M/s KRR and the execution work has been started at site. Partial route stands approved by the competent authority of the HVPNL. Further, 06 no. Foundation has been casted.                                                                                                                                          |
|         |                                  |                                                                              |                                                         | • Bahadurgarh - Kharkhoda Pocket B 220kV D/c line                                                                                                                                                      | 30.11.2025     | Updated in 234th OCC by HVPNL.<br><b>Status:</b><br>RoW issues which are being resolved with the help of Duty Magistrate.                                                                                                                                                                                                                                                                               |
| 29      | 400/220kV Jaipur (South) S/s     | Commissioned: 4<br>Total: 4                                                  | Utilized:2<br>Unutilized: 2                             | • LILO of 220 kV S/C Dausa – Sawai Madhopur line at 400 kV GSS Jaipur South (PG)                                                                                                                       | 06.10.2025     | Work order has been issued on 06.10.2023, work under progress as updated by RVPNL in 215th OCC                                                                                                                                                                                                                                                                                                          |
| 30      | 400/220kV Sohawal S/s            | Commissioned: 8<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>• Sohawal - Bahraich 220kV S/c line (Energization date: 15.02.2021) updated by UPPTCL in 196th OCC                                                                                                                                                                                                   |
| 31      | 400/220kV, Kankroli              | Commissioned: 6<br>Total: 6                                                  | Utilized: 4<br>Unutilized: 2                            | • 220 kV D/C Kankroli(PG) - Nathdwara line                                                                                                                                                             | -              | Standard bid document has been finalized on 13.08.2024 and bid is under preparation as updated by RVPN in 222nd OCC.                                                                                                                                                                                                                                                                                    |
| 32      | 400/220kV, Manesar               | Commissioned: 8<br>Total: 8                                                  | Utilized: 4<br>Unutilized: 4                            | • Network to be planned for 2 bays                                                                                                                                                                     | -              | Status:-<br>A proposal is being prepared for the creation of another 220kV D/C line from the 400kV substation Panchgaon (PG) to the 220kV substation Panchgaon (HVPNL), along with the LILO of one circuit of the 220kV D/C Panchgaon (PG) – Mau line at the 220kV substation Panchgaon to utilize two bays at the 400kV substation Panchgaon. The load flow study for this has already been completed. |
| 33      | 400/220kV, Saharanpur            | 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                                                                                                                                                                     | Commissioned   | Saharanpur(PG)-Devband D/c line (Energization date: 20.04.2023) updated by UPPTCL in 207th OCC                                                                                                                                                                                                                                                                                                          |
| 34      | 400/220kV, Wagoora               | Commissioned: 10<br>Total: 10                                                | Utilized: 6<br>Unutilized: 4                            | • Network to be planned for 4 bays                                                                                                                                                                     | -              | PDD, J&K to update the status.                                                                                                                                                                                                                                                                                                                                                                          |
| 35      | 400/220kV, Ludhiana              | Commissioned: 9<br>Total: 9                                                  | Utilized: 8<br>Unutilized: 1                            | • Network to be planned for 1 bay                                                                                                                                                                      | Commissioned   | Direct circuit from 220 kV Lalton Kalan to Dhandari Kalan to be diverted to 400 kV PGCIL Ludhiana. Work completed , final agrement is expected to be signed by May'24. Updated in 218th OCC by PSTCL.                                                                                                                                                                                                   |
| 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                                                                                                                                         | Commissioned   | Stringing of 2nd Circuit of Chamera Pool-Karian Tansmission line has been completed & terminal bay at 400/220 kV chamera pooling substation (PGCIL) is commissioned on 20.01.2024. Updated in 217th 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. Mainpuri S/s planned. Land is not finalized, therefore timeline not available as intimated by UPPTCL in 201st OCC.                                                                                                                                                                                                            |

| Sl. No. | Substation         | Downstream network bays     | Status of bays               | Planned 220 kV system and Implementation status | Revised Target | Remarks                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------|--------------------|-----------------------------|------------------------------|-------------------------------------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 38      | 400/220kV, Patiala | Commissioned: 8<br>Total: 8 | Utilized: 6<br>Unutilized: 2 | • 400 kV PGCIL Patiala - 220 kV Bhadson (D/C)   | -              | 2 Nos. bays for 400 kV PGCIL Patiala - 220 kV Bhadson (D/C) line being planned. Construction of boundary wall has started at 220 kv ss bhadson.yard work could not be started as approval for dismantaling existing 517 no tress is pending at district level committee which is competent for giving approval of dismantling of trees. Chairman of committee is DC pataiala.. as updated by PSTCL in 233th OCC meeting |

| Sl. No. | Substation | Downstream network bays | Status of bays | Planned 220 kV system and Implementation status | Revised Target | Remarks |
|---------|------------|-------------------------|----------------|-------------------------------------------------|----------------|---------|
|         |            |                         |                |                                                 |                |         |

## Status of ADMS implementation in NR:

| Sl. No. | State / UT | Status                                          | Remarks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------|------------|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1       | DELHI      | Scheme Implemented but operated in manual mode. | Revised Standard Operating Procedure (SOP) of Automatic Demand Management Scheme (ADMS) in NCT of Delhi has been approved in 51st TCC and 76th NRPC meeting. In OCC meeting, DTL intimated that TPPDL has informed that they have engaged SCADA OEM for the implementation of ADMS. However, OEM has confirmed that incorporation of ADMS logic into the current SCADA system is not feasible and it would require an upgrade or refresh of the system, necessitating additional expenditure for which DERC has been approached. The complete implementation cycle is expected to be within 2 years. However, in the meantime considering the criticality, their in-house team is working to develop a trigger notification/alarm system for manual operation of breaker triggering from the control room and thereafter exploring the possibility of automatically triggering the breaker using the trigger notification. TPPDL has stated that they expect to complete it by August 2025, if materialized. BRPL and BYPL have informed that their existing SCADA system is obsolete and it is in the up-gradation phase by OEM. After the up-gradation of SCADA system, the ADMS is expected to be implemented in BRPL & BYPL by Oct 25. |
| 2       | HARYANA    | Scheme not implemented                          | <p>Haryana SLDC intimated that as per Joint Roadmap of implementation of ADMS in Haryana supplied to NRPC vide memo dated 17.10.2023 (Annexure-II), the implementation plan was proposed to be carried out in two parts, as mentioned below:</p> <p>PART-I: Control with Transmission Utility</p> <p>PART-II: Control with Distribution Utility</p> <p>It is pertinent to mention that as part of upcoming SCADA-EMS system i.e. upgradation of SCADA-EMS system, a feature in the name of LSS (Load Shedding Software)/ ADMS is part of the Technical Specification of project to be delivered. Therefore, the functionalities of ADMS application will be covered under 'Part-I: Control with Transmission Utility' will already be covered using the RTUs available at select substations along with the ADMS software being delivered by M/s GE under SCADA upgradation project.</p> <p>Hence, there is no need to acquire a separate ADMS application &amp; associated hardware for data centre for implementation of PART-I.</p> <p>Further for Part -II a committee has been constituted for further finalization of the ADMS module with control with Discoms is under discussions for preparation of DPR.</p>                     |
| 3       | HP         | Scheme not implemented                          | HPSDLC has kept the provision of ADMS in upgradation/replacement of SCADA system under ULDC Phase-III scheme for operating the feeders automatically through ADMS functionality. HP SLDC mentioned that logic regarding implementation of Automatic Demand Management System in HP Control Area has been finalized and finalization of feeders to give this load relief is pending. HPSEB had intimated that initially 142 Nos. of feeders were identified for operation under ADMS functionality but most of these feeders were from same sub-station. Therefore, now they have increased the no. of sub-station and identified the non-critical feeders. Load relief to be given through these feeders is under finalization. The revised feeder list from HPSEBL is awaited as intimated by HPSLDC.                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 4       | PUNJAB     | Scheme not implemented                          | <p>i. A committee comprising of following officers of PSPCL &amp; PSTCL has been constituted to finalize the logic regarding implementation of Automatic Demand Management System in Punjab Control Area.</p> <p>A meeting in this regard was held on dated 26-02-2024 at PSLDC Complex, Patiala. The committee deliberated various loading scenarios and proposed the following logic for the management of demand:</p> <ol style="list-style-type: none"> <li>1. If the frequency sustains below 49.90 Hz for duration of 3 minutes, the Automatic Demand Management System will initiate a 50% reduction in the Over Drawl.</li> <li>2. In case the frequency falls further below 49.85 Hz, the Over Drawl will be reduced to zero.</li> <li>3. The software at the SLDC end for ADMS shall be available with ULDC phase –III SCADA system which is under implementation.</li> </ol> <p>ii. In 222nd OCC, MS NRPC asked Punjab to co-ordinate with Powergrid for integration of their proposed logic with the ULDC phase-III SCADA system for timely implementation.</p>                                                                                                                                                                |
| 5       | RAJASTHAN  | Under implementation                            | RVPN has pilot tested the logic of ADMS which is to be implemented for Rajasthan. In 232th OCC meeting, RVPN informed that 286 nos. of circuit breakers have been mapped to ADMS, all 286 circuit breakers tested upto yard individually. Total 650CBs are to be mapped in phased manner.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

|   |             |                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---|-------------|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6 | UP          | Scheme implemented by NPCIL only | <p>i. A meeting regarding ADMS was held on 15.01.2023 with the UPPCL under the chairmanship of MD UPPCL.</p> <p>ii. A committee formed for identification of load at 33 kV level under the chairmanship of Director (Distribution), UPPCL.</p> <p>iii. Another committee under the chairmanship of Director UPSLDC shall identify the technical and operational requirement for ADMS implementation.</p> <p>iv. The software at the SLDC end for ADMS shall be available with ULDC phase –III SCADA system which is under implementation and likely to be commissioned by March 2025.(it is delayed)</p> <p>v. In order to operate identified 33 kV feeders under ADMS scheme, integration of 132 kV substations with SCADA system is under implementation in the Reliable Communication Scheme.</p> <p>vi. MS, NRPC apprised forum that a letter has been written to Director, SLDC for co-ordinating with Director (Distribution), UPPCL for expediting the finalization of feeder list at 33kV for ADMS implementation.</p> <p>vii. Response from UPPCL regarding the finalization of feeder list at 33kV for ADMS implementation is awaited.</p> <p>ix. In 230th OCC meeting UP SLDC representative informed that feeder list at 33kV level for ADMS is awaited from UPPCL.</p>                                                                                                                                                                |
| 7 | UTTARAKHAND | Scheme not implemented           | <p>i. UPCL has prepared a system architecture in which all the non-monitored sub-stations have been selected and 11kV feeders have been considered for ADMS operation. For the scheme, discom has also done group-wise selection of feeders and quantum of MW relief to be given for automatic demand response at 11kV level has also been decided. UPCL has awarded the tender for implementation of the aforementioned scheme to M/s Metergy Pvt.Ltd.</p> <p>ii. As per the status report submitted by M/s Metergy Pvt.Ltd, the survey work of 30 nos. incomer sites have been completed and order has been placed by UPCL for hardware equipments.</p> <p>iii. Uttarakhand SLDC informed that feeder list at 11kV level has been finalized and logic of ADMS implementation is under finalization.</p> <p>iv. Uttarakhand has intimated that It is bring to your notice that installation MFT( Multi Function Transducers) at various interstate points at PTCUL Substations under ADMS Project of UPCL is in progress.</p> <p>v. First Phase- Data Acquisition of 32 interstate points completed.</p> <p>vi. Second Phase-95 distribution side Substation work is on progress.</p> <p>vii. In 230th OCC meeting Uttarakhand SLDC representative informed that Harbour installation and communication establishment has been done on 35 11kV feeders out of total 195 11kV feeders. The work is expected to be completed by December, 2025.</p> |

## Status of availability of ERS towers in NR

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

| Sl. No. | Transmission Utility                       | Voltage Level<br>(220kV/400kV/765kV/<br>500 kV HVDC etc.) | Length of the<br>transmission lines<br>owned by the Utility<br>(Ckt. Kms.) | Number of ERS Sets (towers)<br>available (Nos.) | ERS Set ( towers)<br>required as per the Govt. norms. | Location                   | Remarks                                                                                                                                                                                                                   |
|---------|--------------------------------------------|-----------------------------------------------------------|----------------------------------------------------------------------------|-------------------------------------------------|-------------------------------------------------------|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 13      | DTL                                        | 220kV                                                     | 915.498                                                                    | NIL                                             | 1                                                     | 400kV Bamnauli Sub station | ERS tower available for 400KV rating can also be used for lower voltage lines as well                                                                                                                                     |
|         |                                            | 400kV                                                     | 249.19                                                                     | 02 Sets (32 towers)                             | 1                                                     |                            |                                                                                                                                                                                                                           |
| 14      | JKPTCL                                     |                                                           |                                                                            |                                                 |                                                       |                            | JKPTCL, Jammu: being procured JKPTCL, Kashmir:10 tower procured (out of which 3 on loan to JKPTCL, Jammu)                                                                                                                 |
| 15      | HVPN                                       |                                                           |                                                                            |                                                 |                                                       |                            | HVPN has apprised that purchase order for procurement of 2 sets of Emergency Restoration System (ERS) in HVPNL has been issued to M/s Jost's Engineering Company Ltd., Mumbai                                             |
| 16      | PSTCL                                      | 400 kV                                                    | 1666.43                                                                    | 2                                               | 2                                                     |                            |                                                                                                                                                                                                                           |
|         |                                            | 220 kV                                                    | 7921.991                                                                   |                                                 |                                                       |                            |                                                                                                                                                                                                                           |
| 17      | UPPTCL 1- Meerut                           | 132KV                                                     | 27508.321                                                                  | 24 Nos(15 Running+9 Angle)                      |                                                       | 400 kV S/s Gr. Noida       | ERS will be also be used in other voltage level lines.                                                                                                                                                                    |
|         |                                            | 220KV                                                     | 14973.453                                                                  |                                                 |                                                       |                            |                                                                                                                                                                                                                           |
|         |                                            | 400KV                                                     | 6922.828                                                                   |                                                 |                                                       |                            |                                                                                                                                                                                                                           |
|         | UPPTCL 2-Prayagraj                         | 765KV                                                     | 839.37                                                                     | 24 Towers                                       |                                                       | 220 kv S/s phulpur         | ERS will also be used in other voltage lines.                                                                                                                                                                             |
|         |                                            | 400KV                                                     | 1804.257                                                                   |                                                 |                                                       |                            |                                                                                                                                                                                                                           |
|         |                                            | 220KV                                                     | 2578.932                                                                   |                                                 |                                                       |                            |                                                                                                                                                                                                                           |
|         |                                            | 132KV                                                     | 4714.768                                                                   |                                                 |                                                       |                            |                                                                                                                                                                                                                           |
| 18      | POWERLINK                                  |                                                           |                                                                            |                                                 |                                                       |                            |                                                                                                                                                                                                                           |
| 19      | POWERGRID HIMACHAL TRANSMISSION LTD        |                                                           |                                                                            |                                                 |                                                       |                            |                                                                                                                                                                                                                           |
| 20      | Powergrid Ajmer Phagi Transmission Limited |                                                           |                                                                            |                                                 |                                                       |                            |                                                                                                                                                                                                                           |
| 21      | Powergrid Fatehgarh Transmission Limited   |                                                           |                                                                            |                                                 |                                                       |                            |                                                                                                                                                                                                                           |
| 22      | POWERGRID KALA AMB TRANSMISSION LTD        |                                                           |                                                                            |                                                 |                                                       |                            |                                                                                                                                                                                                                           |
| 23      | Powergrid Unchahar Transmission Ltd        |                                                           |                                                                            |                                                 |                                                       |                            |                                                                                                                                                                                                                           |
| 24      | Powergrid Khetri Transmission Limited      |                                                           |                                                                            |                                                 |                                                       |                            |                                                                                                                                                                                                                           |
| 25      | POWERGRID VARANASI TRANSMISSION SYSTEM LTD |                                                           |                                                                            |                                                 |                                                       |                            |                                                                                                                                                                                                                           |
| 26      | ADANI TRANSMISSION INDIA LIMITED           |                                                           | 2090                                                                       | 1 Set (12 towers)                               | 1 set (12 towers)                                     | Sami (Gujarat)             | Make-Lindsey ERS set available for 400KV & 500KV rating can be used for lower as well as higher voltage Towers. In case used for 765KV Line, No of towers can reduce due to increase in Tower Height & nos of conductors. |
| 27      | BIKANER KHETRI TRANSMISSION LIMITED        |                                                           | 482                                                                        |                                                 |                                                       |                            |                                                                                                                                                                                                                           |
| 28      | FATEHGARH BHADLA TRANSMISSION LIMITED      | 500 kV HVDC<br>400 kV HVAC                                | 291                                                                        |                                                 |                                                       |                            |                                                                                                                                                                                                                           |
| 29      | NRSS-XXXI(B) TRANSMISSION LTD              | 400 kV                                                    | 577.74                                                                     | Not Available                                   | Not Available                                         |                            | Tied up with M/s INDIGRID for providing ERS on need basis.                                                                                                                                                                |
| 30      | ARAVALI POWER COMPANY PVT LTD              | 765 kv HVAC                                               |                                                                            |                                                 |                                                       |                            |                                                                                                                                                                                                                           |

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

| S. No. | Name of Plant | Unit | Installed Capacity | MVA Rating | Make of Units | COD | GT Details    |                 |                                          | Mode of Fuel Transport (Pit Head/No n Pit-head) | Name of Utility | Sector | Control Area | Type | Real and Reactive Power Capability assessment. |              |                         | Assessment of Reactive Power Control Capability as per CEA Technical Standards for connectivity |              |                         | Model Validation and verification test for the complete Generator and Excitation System model including PSS. |              |                         | Model Validation and verification of Turbine/Governor and Load Control or Active Power/frequency Control Functions. |              |                         | Testing of Governor performance and Automatic Generation Control |              |                         |
|--------|---------------|------|--------------------|------------|---------------|-----|---------------|-----------------|------------------------------------------|-------------------------------------------------|-----------------|--------|--------------|------|------------------------------------------------|--------------|-------------------------|-------------------------------------------------------------------------------------------------|--------------|-------------------------|--------------------------------------------------------------------------------------------------------------|--------------|-------------------------|---------------------------------------------------------------------------------------------------------------------|--------------|-------------------------|------------------------------------------------------------------|--------------|-------------------------|
|        |               |      |                    |            |               |     | Voltage Ratio | GT MVA Capacity | Tap Ratio of GT (Present Tap/Total Taps) |                                                 |                 |        |              |      | Last tested on (dd/mm/yyyy)                    | Whether due? | Tentative Schedule date | Last tested on (dd/mm/yyyy)                                                                     | Whether due? | Tentative Schedule date | Last tested on (dd/mm/yyyy)                                                                                  | Whether due? | Tentative Schedule date | Last tested on (dd/mm/yyyy)                                                                                         | Whether due? | Tentative Schedule date | Last tested on (dd/mm/yyyy)                                      | Whether due? | Tentative Schedule date |
| 1      |               |      |                    |            |               |     |               |                 |                                          |                                                 |                 |        |              |      |                                                |              |                         |                                                                                                 |              |                         |                                                                                                              |              |                         |                                                                                                                     |              |                         |                                                                  |              |                         |
| 2      |               |      |                    |            |               |     |               |                 |                                          |                                                 |                 |        |              |      |                                                |              |                         |                                                                                                 |              |                         |                                                                                                              |              |                         |                                                                                                                     |              |                         |                                                                  |              |                         |
| 3      |               |      |                    |            |               |     |               |                 |                                          |                                                 |                 |        |              |      |                                                |              |                         |                                                                                                 |              |                         |                                                                                                              |              |                         |                                                                                                                     |              |                         |                                                                  |              |                         |
| 4      |               |      |                    |            |               |     |               |                 |                                          |                                                 |                 |        |              |      |                                                |              |                         |                                                                                                 |              |                         |                                                                                                              |              |                         |                                                                                                                     |              |                         |                                                                  |              |                         |
| 5      |               |      |                    |            |               |     |               |                 |                                          |                                                 |                 |        |              |      |                                                |              |                         |                                                                                                 |              |                         |                                                                                                              |              |                         |                                                                                                                     |              |                         |                                                                  |              |                         |
| 6      |               |      |                    |            |               |     |               |                 |                                          |                                                 |                 |        |              |      |                                                |              |                         |                                                                                                 |              |                         |                                                                                                              |              |                         |                                                                                                                     |              |                         |                                                                  |              |                         |
| 7      |               |      |                    |            |               |     |               |                 |                                          |                                                 |                 |        |              |      |                                                |              |                         |                                                                                                 |              |                         |                                                                                                              |              |                         |                                                                                                                     |              |                         |                                                                  |              |                         |
| 8      |               |      |                    |            |               |     |               |                 |                                          |                                                 |                 |        |              |      |                                                |              |                         |                                                                                                 |              |                         |                                                                                                              |              |                         |                                                                                                                     |              |                         |                                                                  |              |                         |
| 9      |               |      |                    |            |               |     |               |                 |                                          |                                                 |                 |        |              |      |                                                |              |                         |                                                                                                 |              |                         |                                                                                                              |              |                         |                                                                                                                     |              |                         |                                                                  |              |                         |
| 10     |               |      |                    |            |               |     |               |                 |                                          |                                                 |                 |        |              |      |                                                |              |                         |                                                                                                 |              |                         |                                                                                                              |              |                         |                                                                                                                     |              |                         |                                                                  |              |                         |

Revised Simulation Models

Whether Revised Models Submitted?      Remarks

## Hydro Generators

[illegible]

## Revised Simulation Models

| Whether Revised Models Submitted? | Remarks |
|-----------------------------------|---------|
|-----------------------------------|---------|

As per guidelines the OEM representative must remain present at the time of Generator periodic testing hence looking to the age and present status of Units at Mahi PH-I, Letters Dated 12/07/2024 and 19/12/2024 have been sent to the OEM M/s BHEL, Bhopal, and accordingly the plan may be scheduled .

## Nuclear Generators

[illegible]

### Revised Simulation Models

| Whether Revised Models Submitted? | Remarks |
|-----------------------------------|---------|
|-----------------------------------|---------|

## Gas Based Generators

[illegible]

## Revised Simulation Models

| Whether Revised Models Submitted? | Remarks |
|-----------------------------------|---------|
|-----------------------------------|---------|

## Renewable Energy Plants

[illegible]

## Revised Simulation Models

| Whether Revised Models Submitted? | Remarks |
|-----------------------------------|---------|
|-----------------------------------|---------|

HVDC Links

| S. No | Name of Link | Type (LCC/VSC/Back-to-Back) | HVDC_Voltage (kV) | Converter-1  |        | Converter-2  |        | Master Converter Station | Pole_number | Length (km) | Capacity (MW) | Owner     | Forward Direction |                  |                        | Reverse Direction |                  |                        | Reactive Power Controller (RPC) Capability for HVDC/FACTS |              |                         | Filter bank adequacy assessment based on present grid condition, in consultation with NLDC. |              |                         |
|-------|--------------|-----------------------------|-------------------|--------------|--------|--------------|--------|--------------------------|-------------|-------------|---------------|-----------|-------------------|------------------|------------------------|-------------------|------------------|------------------------|-----------------------------------------------------------|--------------|-------------------------|---------------------------------------------------------------------------------------------|--------------|-------------------------|
|       |              |                             |                   | Station Name | Region | Station Name | Region |                          |             |             |               |           | Maximum Capacity  | Minimum Capacity | Ground_return_capacity | Maximum Capacity  | Minimum Capacity | Ground_return_capacity | Last tested on (dd/mm/yyyy)                               | Whether due? | Tentative Schedule date | Last tested on (dd/mm/yyyy)                                                                 | Whether due? | Tentative Schedule date |
| 1     |              |                             | 500               | APL-Mundra   | WR     | Mohindargarh | NR     |                          | 1           | 989         | 1,250         | ATIL      | 150               | 500              | 1250                   |                   |                  |                        |                                                           | Due          |                         |                                                                                             | Due          |                         |
| 2     |              |                             | 500               | APL-Mundra   |        | Mohindargarh |        |                          | 2           | 989         | 1,250         | ATIL      | 150               | 500              | 1250                   |                   |                  |                        |                                                           | Due          |                         |                                                                                             | Due          |                         |
| 3     |              | LCC                         | 800               | Champa_HVDC  | WR     | Kurukshetra  | NR     | Champa_HVDC              | 1           | 1,306       | 1,500         | POWERGRID | 150               | 1,500            | DMR path               | NA                | NA               | NA                     |                                                           | Due          | Apr-2025                |                                                                                             | Due          |                         |
| 4     |              | LCC                         | 800               | Champa_HVDC  | WR     | Kurukshetra  | NR     | Champa_HVDC              | 2           | 1,306       | 1,500         | POWERGRID | 150               | 1,500            | DMR path               | NA                | NA               | NA                     |                                                           | Due          | Apr-2025                |                                                                                             | Due          |                         |
| 5     |              | LCC                         | 800               | Champa_HVDC  | WR     | Kurukshetra  | NR     | Champa_HVDC              | 3           | 1,306       | 1,500         | POWERGRID | 150               | 1,500            | DMR path               | NA                | NA               | NA                     |                                                           | Due          | Apr-2025                |                                                                                             | Due          |                         |
| 6     |              | LCC                         | 800               | Champa_HVDC  | WR     | Kurukshetra  | NR     | Champa_HVDC              | 4           | 1,306       | 1,500         | POWERGRID | 150               | 1,500            | DMR path               | NA                | NA               | NA                     |                                                           | Due          | Apr-2025                |                                                                                             | Due          |                         |
|       |              |                             |                   |              |        |              |        |                          |             |             |               |           |                   |                  |                        |                   |                  |                        |                                                           |              |                         |                                                                                             |              |                         |
|       |              |                             |                   |              |        |              |        |                          |             |             |               |           |                   |                  |                        |                   |                  |                        |                                                           |              |                         |                                                                                             |              |                         |
|       |              |                             |                   |              |        |              |        |                          |             |             |               |           |                   |                  |                        |                   |                  |                        |                                                           |              |                         |                                                                                             |              |                         |
|       |              |                             |                   |              |        |              |        |                          |             |             |               |           |                   |                  |                        |                   |                  |                        |                                                           |              |                         |                                                                                             |              |                         |

Revised Simulation Models

Whether Revised Models Submitted? Remarks

STATCOMs/SVCs

| S.No | Station     | Statcom | Capacity (MVAR) | Owner     | Make           | Reactive Power Controller (RPC) Capability for HVDC/FACTS |              |                         | Filter bank adequacy assessment based on present grid condition, in consultation with NLDC |              |                         | Validation of response by FACTS devices as per settings. |              |                         |
|------|-------------|---------|-----------------|-----------|----------------|-----------------------------------------------------------|--------------|-------------------------|--------------------------------------------------------------------------------------------|--------------|-------------------------|----------------------------------------------------------|--------------|-------------------------|
|      |             |         |                 |           |                | Last tested on (dd/mm/yyyy)                               | Whether due? | Tentative Schedule date | Last tested on (dd/mm/yyyy)                                                                | Whether due? | Tentative Schedule date | Last tested on (dd/mm/yyyy)                              | Whether due? | Tentative Schedule date |
| 1    | Kurukshetra | TCR     | 500             | POWERGRID | GE Vernova T&D | NA                                                        |              | NA                      | NA                                                                                         |              | NA                      | Nov-2023                                                 | No           | Sep-2028                |
| 2    | Fatehgarh-2 | STATCOM | ±/-600          | POWERGRID | SIEMENS        | Oct-2023                                                  | No           | Sep-2028                | NA                                                                                         |              | NA                      | Oct-2023                                                 | No           | Sep-2028                |
| 3    | Bhadla-2    | STATCOM | ±/-600          | POWERGRID | SIEMENS        | Jun-2023                                                  | No           | May-2028                | NA                                                                                         |              | NA                      | Jun-2023                                                 | No           | May-2028                |
| 4    | Bikaner-2   | STATCOM | ±/-300          | POWERGRID | SIEMENS        | Jul-2023                                                  | No           | Jun-2028                | NA                                                                                         |              | NA                      | Jul-2023                                                 | No           | Jun-2028                |
|      |             |         |                 |           |                |                                                           |              |                         |                                                                                            |              |                         |                                                          |              |                         |
|      |             |         |                 |           |                |                                                           |              |                         |                                                                                            |              |                         |                                                          |              |                         |
|      |             |         |                 |           |                |                                                           |              |                         |                                                                                            |              |                         |                                                          |              |                         |
|      |             |         |                 |           |                |                                                           |              |                         |                                                                                            |              |                         |                                                          |              |                         |

Revised Simulation Models

Whether Revised Models Submitted?      Remarks

## FSCs/TCSCs

[illegible]

Series Reactor

| S.No | End 1 | End 2 | Line No. | End | Capacity | Make | Reactive Power Controller (RPC) Capability for HVDC/FACTS |              |                         | Filter bank adequacy assessment based on present grid condition, in consultation with NLDC |              |                         | Validation of response by FACTS devices as per settings. |              |                         |
|------|-------|-------|----------|-----|----------|------|-----------------------------------------------------------|--------------|-------------------------|--------------------------------------------------------------------------------------------|--------------|-------------------------|----------------------------------------------------------|--------------|-------------------------|
|      |       |       |          |     |          |      | Last tested on (dd/mm/yyyy)                               | Whether due? | Tentative Schedule date | Last tested on (dd/mm/yyyy)                                                                | Whether due? | Tentative Schedule date | Last tested on (dd/mm/yyyy)                              | Whether due? | Tentative Schedule date |
| 1    |       |       |          |     |          |      |                                                           |              |                         |                                                                                            |              |                         |                                                          |              |                         |

Revised Simulation Models

Whether Revised Models Submitted? Remarks

| State/UT         |                 | Stage-1<br>49.4 Hz<br>(5%) | Stage-2<br>49.2 Hz<br>(6%) | Stage-3<br>49.0 Hz<br>(7%) | Stage-4<br>48.8 Hz<br>(7%) | Total |
|------------------|-----------------|----------------------------|----------------------------|----------------------------|----------------------------|-------|
|                  |                 | Stage-1<br>Relief          | Stage-2<br>Relief          | Stage-3<br>Relief          | Stage-4<br>Relief          |       |
| Chandigarh       | Planned (MW)    | 17                         | 21                         | 24                         | 24                         | 86    |
|                  | Actual (MW)     | 0                          | 0                          | 0                          | 0                          | 0     |
|                  | Difference (MW) | -17                        | -21                        | -24                        | -24                        | -86   |
|                  | Difference (%)  | -100%                      | -100%                      | -100%                      | -100%                      | -100% |
| Delhi            | Planned (MW)    | 334                        | 400                        | 467                        | 467                        | 1668  |
|                  | Actual (MW)     | 322                        | 399                        | 442                        | 434                        | 1597  |
|                  | Difference (MW) | -11                        | -1                         | -25                        | -33                        | -71   |
|                  | Difference (%)  | -3%                        | 0%                         | -5%                        | -7%                        | -4%   |
| Haryana          | Planned (MW)    | 586                        | 704                        | 821                        | 821                        | 2931  |
|                  | Actual (MW)     | 735                        | 730                        | 815                        | 897                        | 3175  |
|                  | Difference (MW) | 148                        | 26                         | -6                         | 76                         | 244   |
|                  | Difference (%)  | 25%                        | 4%                         | -1%                        | 9%                         | 8%    |
| Himachal Pradesh | Planned (MW)    | 101                        | 122                        | 142                        | 142                        | 507   |
|                  | Actual (MW)     | 432                        | 365                        | 183                        | 97                         | 1077  |
|                  | Difference (MW) | 331                        | 244                        | 41                         | -45                        | 570   |
|                  | Difference (%)  | 326%                       | 200%                       | 29%                        | -32%                       | 112%  |
| UT J&K & Ladhak  | Planned (MW)    | 140                        | 168                        | 196                        | 196                        | 700   |
|                  | Actual (MW)     | 156                        | 204                        | 204                        | 214                        | 778   |
|                  | Difference (MW) | 16                         | 36                         | 8                          | 18                         | 78    |
|                  | Difference (%)  | 11%                        | 22%                        | 4%                         | 9%                         | 11%   |
| Punjab           | Planned (MW)    | 645                        | 773                        | 902                        | 902                        | 3223  |
|                  | Actual (MW)     | 584                        | 715                        | 855                        | 859                        | 3014  |
|                  | Difference (MW) | -61                        | -58                        | -47                        | -43                        | -209  |
|                  | Difference (%)  | -9%                        | -8%                        | -5%                        | -5%                        | -6%   |
| Rajasthan        | Planned (MW)    | 853                        | 1024                       | 1194                       | 1194                       | 4266  |
|                  | Actual (MW)     | 812                        | 974                        | 1138                       | 1142                       | 4066  |
|                  | Difference (MW) | -41                        | -50                        | -56                        | -52                        | -200  |
|                  | Difference (%)  | -5%                        | -5%                        | -5%                        | -4%                        | -5%   |
| Uttar Pradesh    | Planned (MW)    | 1297                       | 1557                       | 1816                       | 1816                       | 6486  |
|                  | Actual (MW)     | 2580                       | 2188                       | 2013                       | 1757                       | 8538  |
|                  | Difference (MW) | 1283                       | 631                        | 197                        | -59                        | 2052  |
|                  | Difference (%)  | 99%                        | 41%                        | 11%                        | -3%                        | 32%   |
| Uttarakhand      | Planned (MW)    | 127                        | 152                        | 177                        | 177                        | 633   |
|                  | Actual (MW)     | 319                        | 138                        | 167                        | 241                        | 865   |
|                  | Difference (MW) | 192                        | -14                        | -10                        | 64                         | 232   |
|                  | Difference (%)  | 152%                       | -9%                        | -6%                        | 36%                        | 37%   |
| Total            | Planned (MW)    | 4100                       | 4920                       | 5740                       | 5740                       | 20499 |
|                  | Actual (MW)     | 5940                       | 5713                       | 5816                       | 5642                       | 23111 |
|                  | Difference (MW) | 1840                       | 793                        | 76                         | -98                        | 2612  |
|                  | Difference (%)  | 45%                        | 16%                        | 1%                         | -2%                        | 13%   |



Annexure-A.V

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

**विषय: Electricity Generation Program for the year 2026-27-reg.**

Central Electricity Authority vide its letter dated 03.09.2025 (copy enclosed) has sought following information from generating utilities of the country for the preparation of electricity generation program for the year 2026-27. In this regard, please find enclosed herewith the data formats and the inputs desired:

1. Unit-wise monthly generation proposed during 2026-27 taking into account likely fuel availability, the anticipated loss of generation on account of various factors such as grid constraint, low schedule/ Reserve shut down due to high cost, coal/lignite quality etc., if any (**Annex**).

Generating utilities are requested to submit the above-mentioned data. The above information may kindly be submitted in the prescribed format by email to [seo-nrpc@nic.in](mailto:seo-nrpc@nic.in) by **05<sup>th</sup> October 2025**.

DHARMENDER  
KUMAR MEENA  
Digitally signed by  
DHARMENDER KUMAR  
MEENA  
Date: 2025.09.08 09:56:13  
+05'30'

(डी. के. मीना)

अधीक्षण अभियंता (प्रचालन)

सेवा में,

As per distribution list attached

Station name (As per Monthly Generation Report of CEA):-----

Organisation:-----

Unit wise Monthly Generation Program for the year 2026-27

1. Contact Details

| Sr. no | Name | Designation | email | Phone no. | Fax. no. |
|--------|------|-------------|-------|-----------|----------|
| 1      |      |             |       |           |          |
| 2      |      |             |       |           |          |

2. Units existing on 31.03.2025

| Month | Unit No. | Capacity (MW) | Date of commissioning | 2025-26 generation details (MU) |                                                   |                                        |                                    | 2026-27 generation details (MU)                |                             |                                              | Remarks |
|-------|----------|---------------|-----------------------|---------------------------------|---------------------------------------------------|----------------------------------------|------------------------------------|------------------------------------------------|-----------------------------|----------------------------------------------|---------|
|       |          |               |                       | Program for 2025-26             | Total Anticipated Gen for Sep 25 to March 26 (MU) | Total Anticipated Gen for 2025-26 (MU) | Reason for low generation (if any) | Anticipated maximum Generation capability (MU) | Anticipated Generation (MU) | Reason for variation from Maximum Capability |         |
|       |          |               |                       |                                 |                                                   |                                        |                                    |                                                |                             |                                              |         |
|       |          |               |                       |                                 |                                                   |                                        |                                    |                                                |                             |                                              |         |

3. Units Commissioned during 2025-26

| Month | Unit No. | Capacity (MW) | Date of commissioning | 2025-26 generation details (MU) |                                                   |                                        |                                    | 2026-27 generation details (MU)                |                             |                                              | Remarks |
|-------|----------|---------------|-----------------------|---------------------------------|---------------------------------------------------|----------------------------------------|------------------------------------|------------------------------------------------|-----------------------------|----------------------------------------------|---------|
|       |          |               |                       | Program for 2025-26             | Total Anticipated Gen for Sep 25 to March 26 (MU) | Total Anticipated Gen for 2025-26 (MU) | Reason for low generation (if any) | Anticipated maximum Generation capability (MU) | Anticipated Generation (MU) | Reason for variation from Maximum Capability |         |
|       |          |               |                       |                                 |                                                   |                                        |                                    |                                                |                             |                                              |         |
|       |          |               |                       |                                 |                                                   |                                        |                                    |                                                |                             |                                              |         |

4. Units likely to be commissioned during 2026-27

| Month | Unit No. | Capacity (MW) | Expected date of commissioning | Expected Generation 2026-27 (MU) | Remarks |
|-------|----------|---------------|--------------------------------|----------------------------------|---------|
|       |          |               |                                |                                  |         |
|       |          |               |                                |                                  |         |

## Planned maintenance Schedules including R&M activities

A) R&M of Units likely to be completed during 2025-26 & 2026-27

| Station name | Unit No. | Capacity (MW) | R&M Schedule |         |
|--------------|----------|---------------|--------------|---------|
|              |          |               | From date    | To date |
|              |          |               |              |         |
|              |          |               |              |         |

B) Annual Overhaul/ Boiler overhaul

| Station name | Unit No. | Capacity (MW) | AOH Schedule |         |
|--------------|----------|---------------|--------------|---------|
|              |          |               | From date    | To date |
|              |          |               |              |         |
|              |          |               |              |         |

C) Capital Overhaul

| Station name | Unit No. | Capacity (MW) | COH Schedule |         |
|--------------|----------|---------------|--------------|---------|
|              |          |               | From date    | To date |
|              |          |               |              |         |
|              |          |               |              |         |

D) Other maintenance if not included above such as PG tests (new units) and Boiler inspection

| Station name | Unit No. | Capacity (MW) | Schedule  |         | Reason |
|--------------|----------|---------------|-----------|---------|--------|
|              |          |               | From date | To date |        |
|              |          |               |           |         |        |
|              |          |               |           |         |        |

## Actual and Planned maintenance Schedules including R&M activities

### A) Actual Maintenance during Apr-2025 to Aug-2025

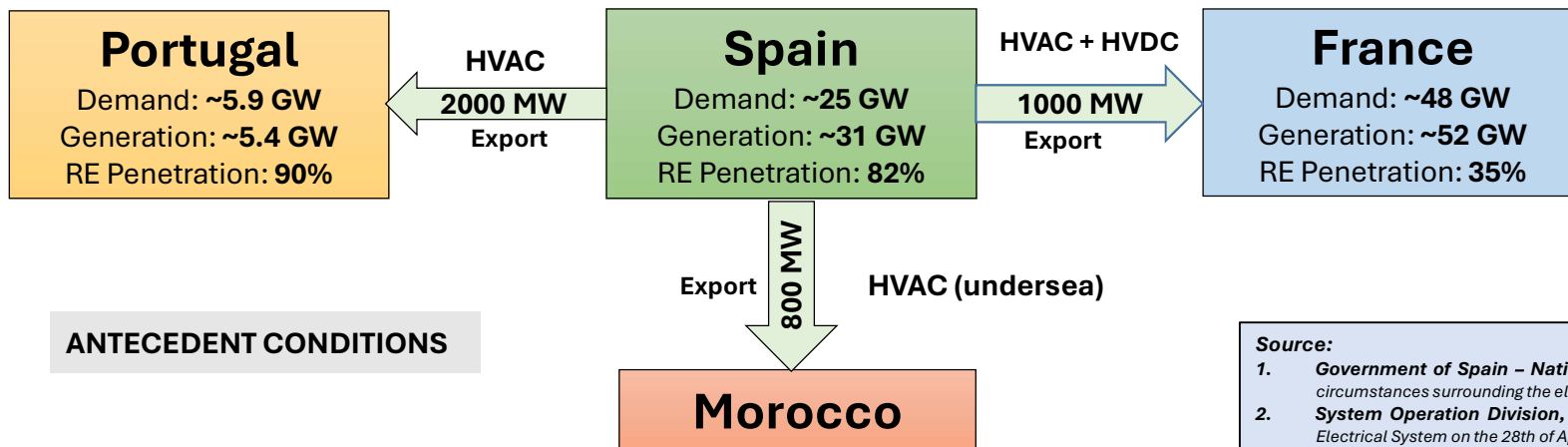
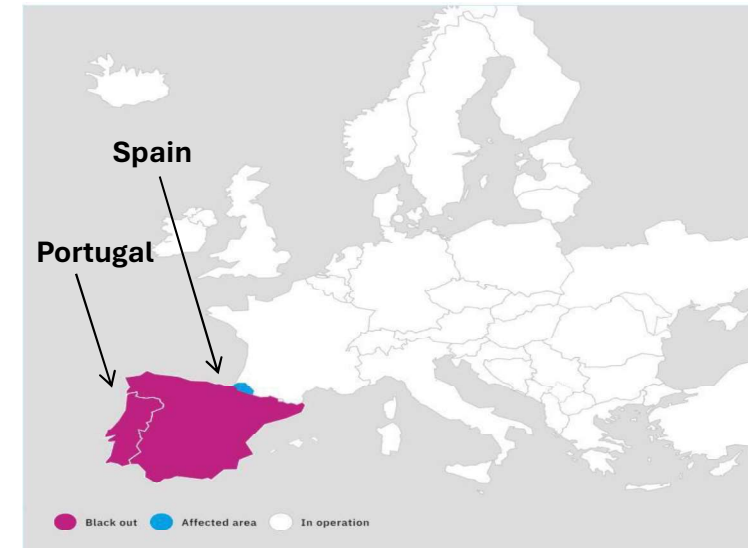
| Station name | Unit No. | Capacity (MW) | From date | To date | No. of Days | Outage reason |
|--------------|----------|---------------|-----------|---------|-------------|---------------|
|              |          |               |           |         |             |               |
|              |          |               |           |         |             |               |

### B) Planned Maintenance Schedule during remaining months of 2025-26

| Station name | Unit No. | Capacity (MW) | From date | To date | No. of Days | Outage reason |
|--------------|----------|---------------|-----------|---------|-------------|---------------|
|              |          |               |           |         |             |               |
|              |          |               |           |         |             |               |

# 1. Summary of Iberian Disturbance on 28 April 2025

- ❖ **Event Date:** April 28, 2025
- ❖ **Event Time – 12:33:30 hrs** (Local time)
- ❖ **Affected Power Systems:**
  - ❖ Spain (Complete Blackout)
  - ❖ Portugal (Complete Blackout)
  - ❖ France (small disruptions near the Spanish border)
- ❖ **Total Population Affected:** ~ 60 million (Spain + Portugal)
- ❖ **Time taken for complete restoration:** ~19 Hrs

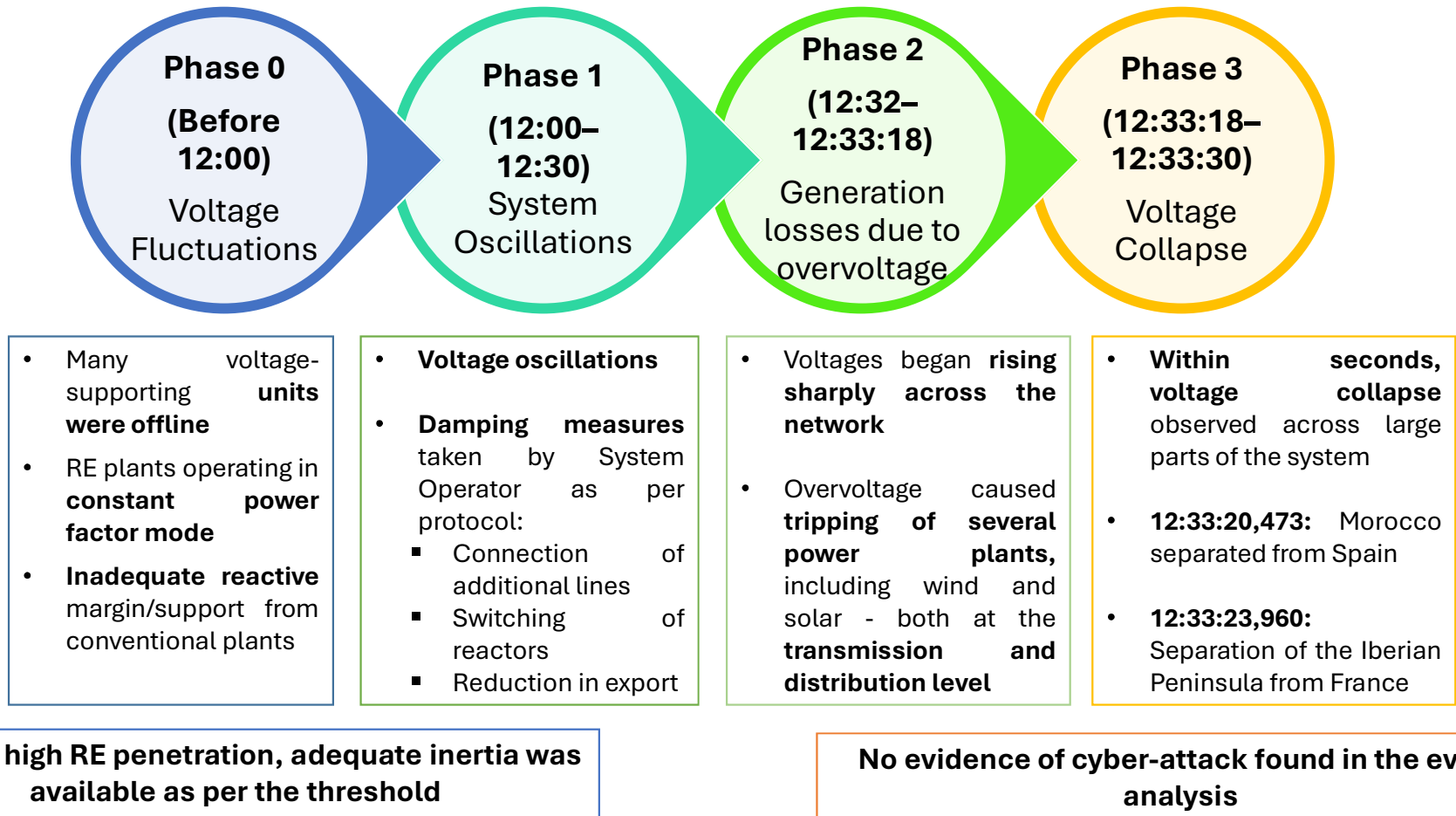


**Source:**

1. **Government of Spain – National Security Council:** “Committee for the analysis of the circumstances surrounding the electricity crisis of 28 April 2025”
2. **System Operation Division, Red Eléctrica (REE):** “Blackout in the Spanish Peninsular Electrical System on the 28th of April 2025”

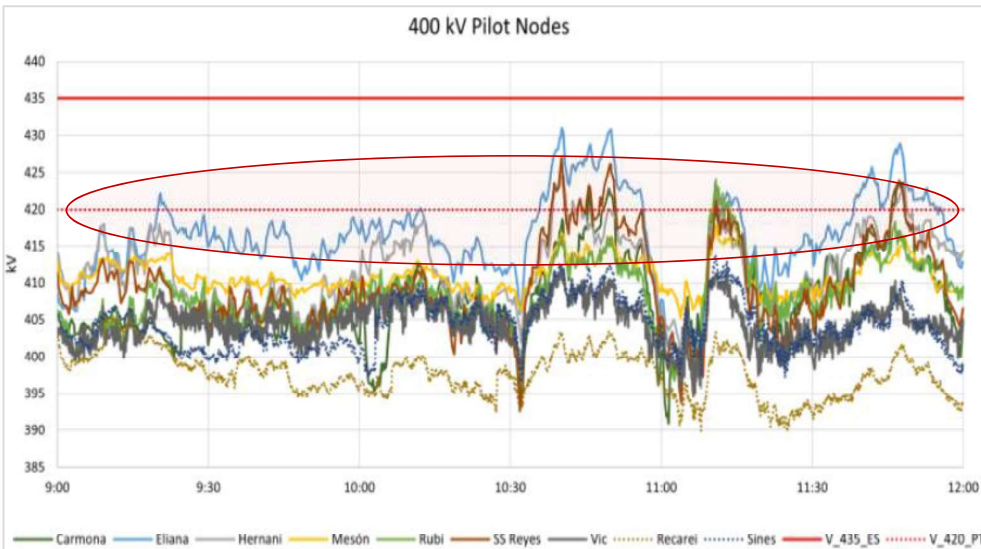
## 2. Analysis of the Sequence of Events

**Chain Reaction Overvoltage:** High voltages triggered generation trips → further rise in voltage → more tripping



### 3. Brief of Iberian Disturbance on 28 April 2025 (1/2)

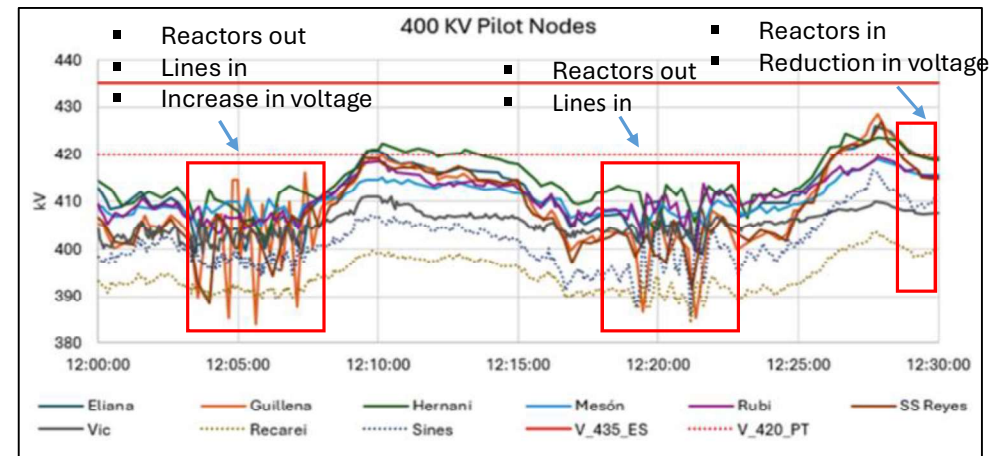
#### Phase 0: Voltage Fluctuations (Before 12:00 hrs)



*Evolution of the Voltage profile from 9:00 to 12:00 CEST in the main 400 kV in Spain and Portugal.*

- ❖ Many conventional power plants were offline due to planned and forced outages:
  - Gas – 7400 MW
  - Nuclear – 3000 MW
  - **Total outage – 12800 MW**
- ❖ High renewable energy penetration - **82%**
- ❖ Fluctuations in voltages observed from early morning hours

#### Phase 1: System Oscillations (12:00–12:30 hrs)



- ❖ Voltage oscillations of the tune of 32 kV peak to peak were detected in the Spanish system
- ❖ Actions taken by System Operator as per the **standard operating procedure**:
  - Connected more transmission lines
  - Reactor switching operations
  - HVDC switched to fixed power mode
  - Reduced electricity exports to stabilize the grid
- ❖ Despite efforts, large voltage swings observed at key substations

### 3. Brief of Iberian Disturbance on 28 April 2025 (2/2)

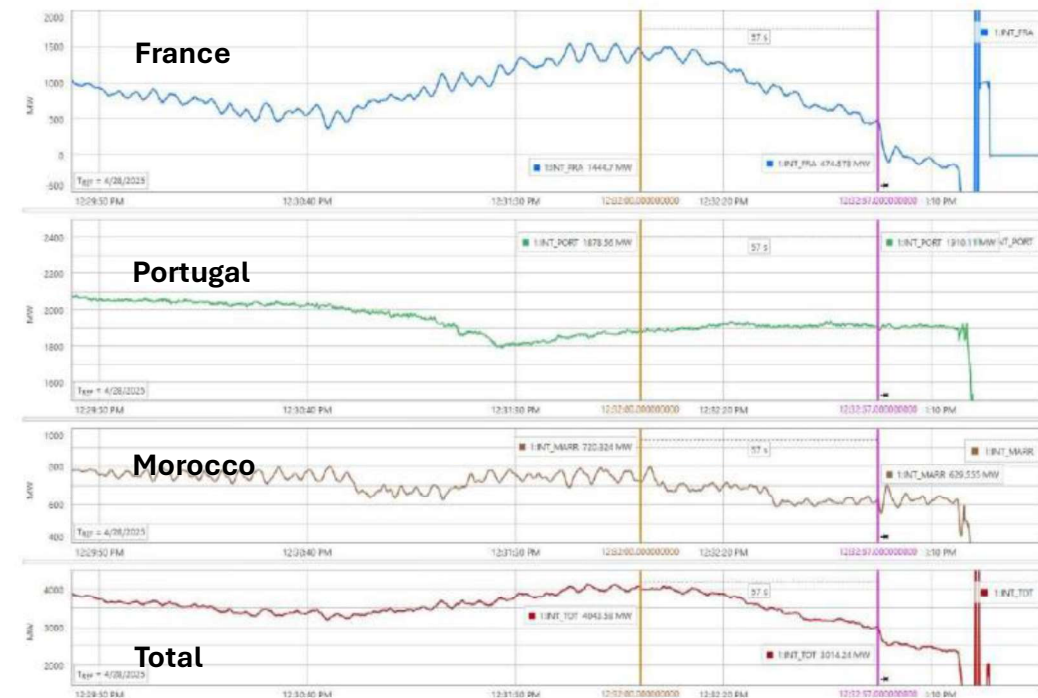
#### Phase 2: Generation losses due to overvoltage (12:32:00–12:33:18 hrs)

- ❖ Overvoltage caused tripping of several power plants, including wind and solar - both at the transmission and distribution level
- ❖ Within seconds, a large quantum of generation was lost

#### Phase 3: Voltage Collapse (12:33:18–12:33:30 hrs)

- ❖ Voltage collapse observed across large parts of the system
- ❖ Sharp decline in frequency leading to disconnection of more generators
- ❖ Interconnections with France and Morocco automatically cut off by protection systems to prevent the blackout from spreading:

Interconnector Flows



- ❖ By 07:00 hrs the next day (29<sup>th</sup> April 2025), 99.95% of demand was restored
- ❖ Hydro and Gas Plants were critical for the restoration of the supply
- ❖ All the technical work was completed by 14:36 hrs of 29<sup>th</sup> April 2025

## 4. Recommendations of the Committee on Iberian Disturbance

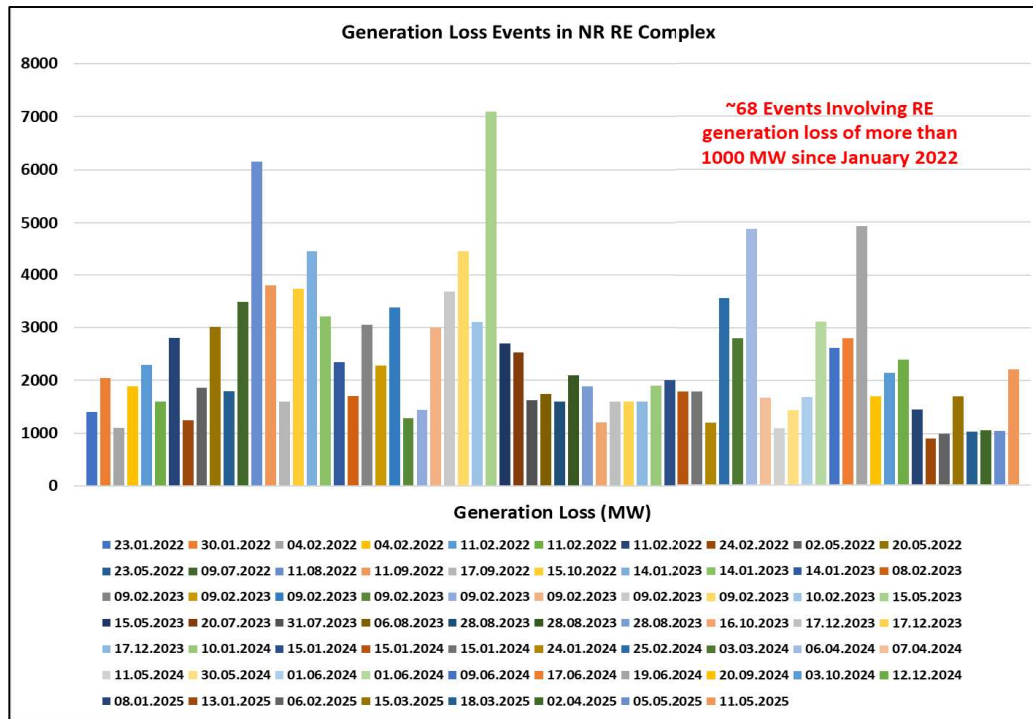
1. Reinforcement of the process of supervision and **verification of compliance** against specified regulations
2. Technical measures to reinforce the **capabilities for voltage control** and **protection against oscillations** in the system.
  - Approval and implementation of the new voltage control support services from both **conventional and RE plants**.
  - Incorporate **penalties for non-compliance of RE Plants against proposed** voltage control requirements.
  - Additional tools for voltage control and management of oscillations, viz. Planning of dynamic reactive power compensation devices such as **Synchronous Condensers, FACTS devices** (including power oscillation dampers), etc.
3. Promote the **interconnections** with the European system.
4. Enable the entry of new technologies (**grid forming**) to facilitate **autonomous start-up (black start)**.
5. Enhance robustness and flexibility of the electric power system via **boosting energy storage, promoting flexibility and capacity market regulations** etc.
6. **Repowering of renewable energy projects** - replacement of old renewable energy equipment with modern equipment to incorporate the latest control, management and system robustness requirements.

## 5. Major Grid Events in RE Complexes in India (1/2)

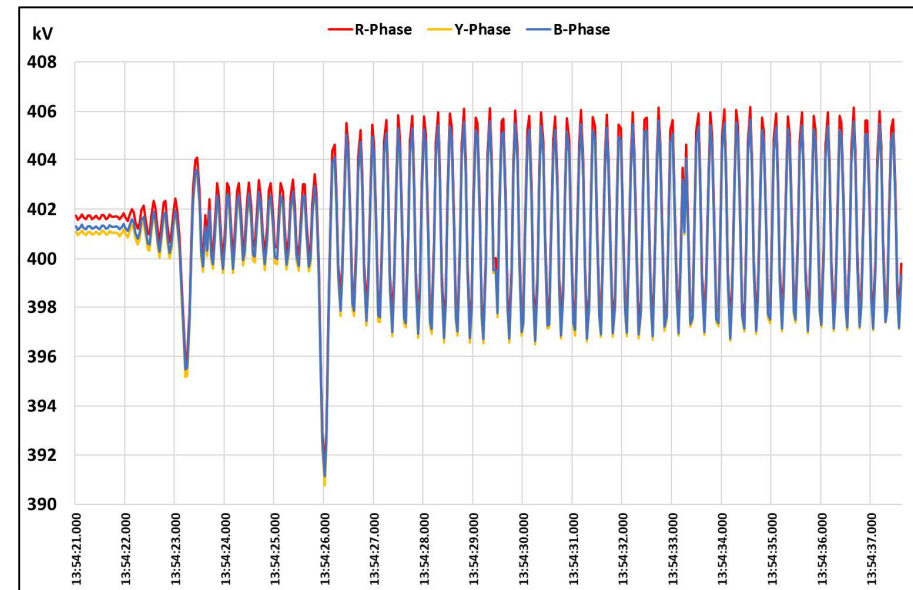
1. ~68 events involving RE generation loss of above 1000 MW between Jan'22 to Jun'25

### 2. Reasons for the above events:

- Non-compliance of the RE plants to specified CEA Standards
- Low system strength in remote RE pockets
- Tuning of controllers of RE plants and FACTS devices (STATCOMs etc.)

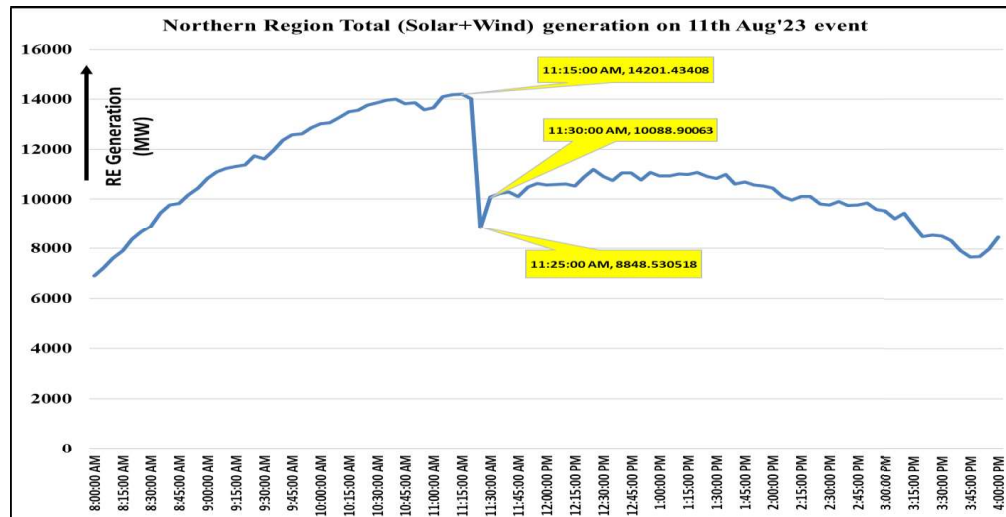
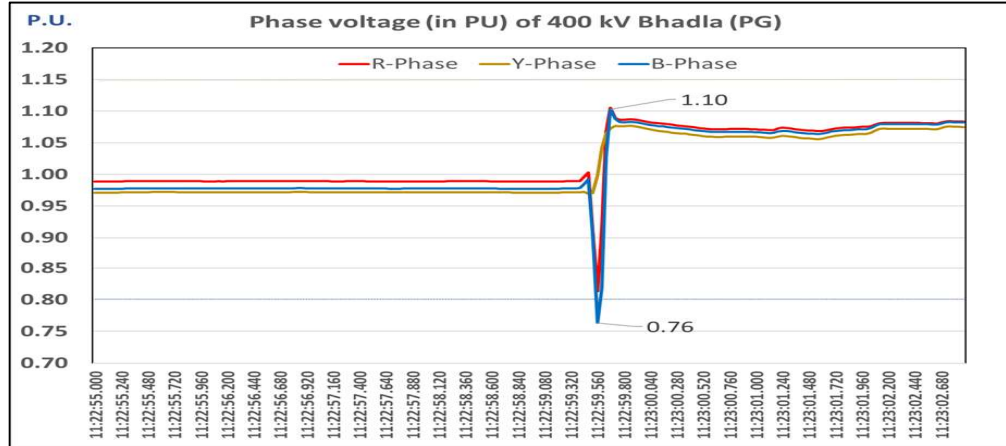


### Intermittent Low Frequency Oscillations during solar hours



## 5. Major Grid Events in the RE Complexes in India (2/2)

~6000 MW Generation Loss in Rajasthan RE Complex on 11<sup>th</sup> Aug 2022



### Event Description

Generation loss: **6157 MW** (Solar : 5807MW, Wind : 350 MW)

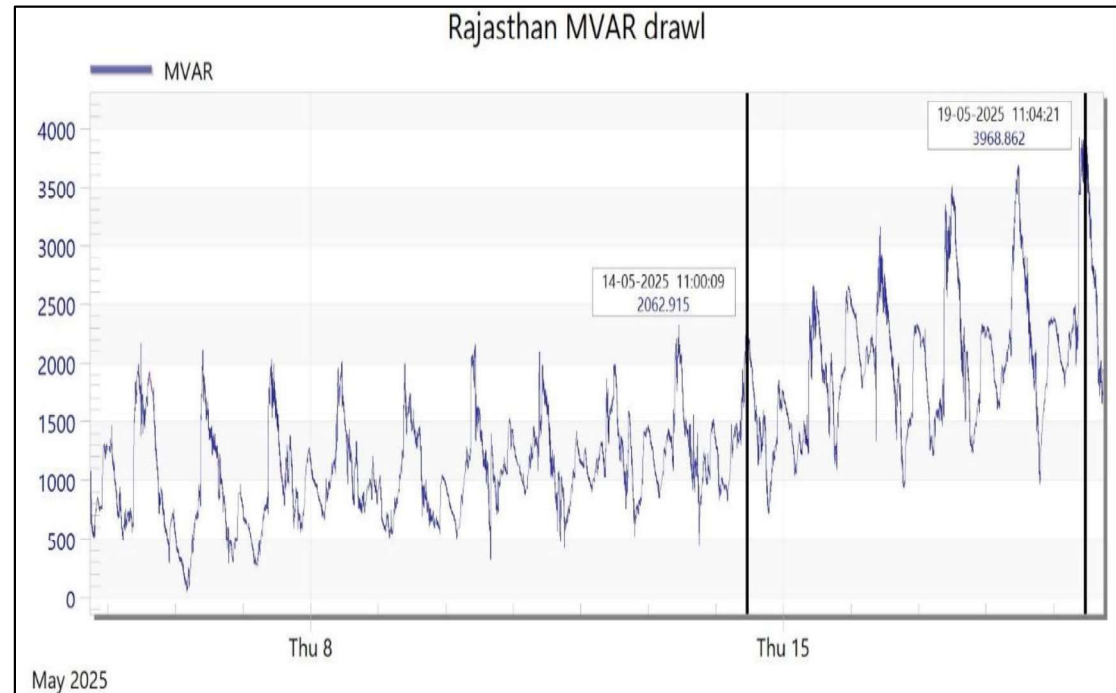
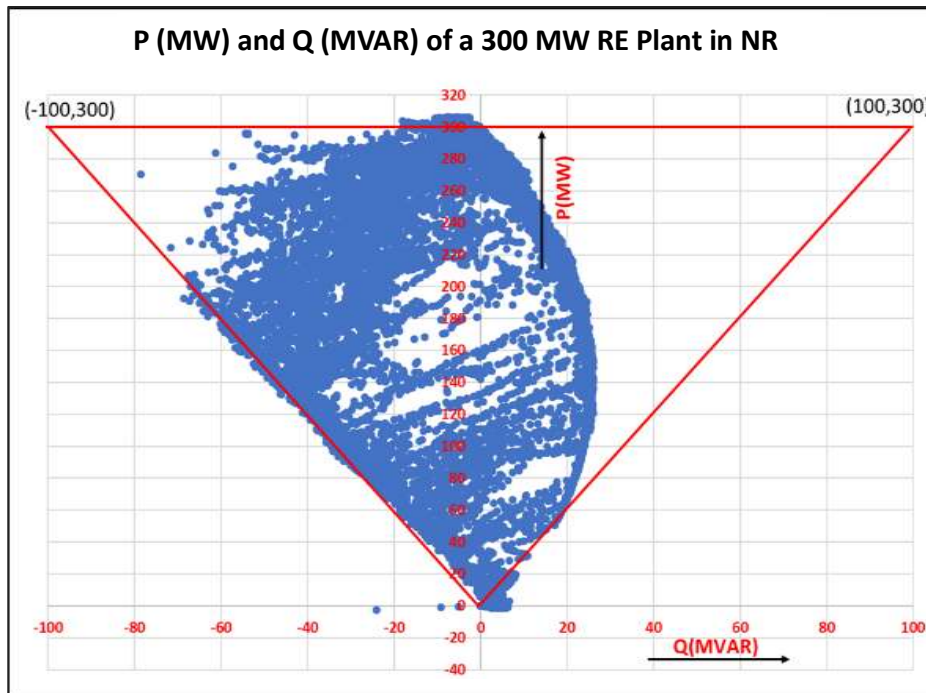
Frequency drop: **0.7 Hz** (50.16 Hz to 49.46)

### Chronology:

- ❖ R-B phase fault on 220 kV Bhadla (PG) - Clean Solar Power (Jodhpur) Pvt. Ltd. Line
- ❖ Voltage dip at 400 kV Bhadla (PG) - **0.77 pu**
- ❖ Most inverters **failed to recover MW output** within 1s **after fault clearance**
- ❖ Due to a reduction in generation, the **EHV network got offloaded**, causing a further rise in voltage
- ❖ Sustained overvoltage led to significant generation loss (HVRT) and tripping of multiple EHV lines on over voltage
- ❖ Triggering of under frequency load shedding (~750 MW)

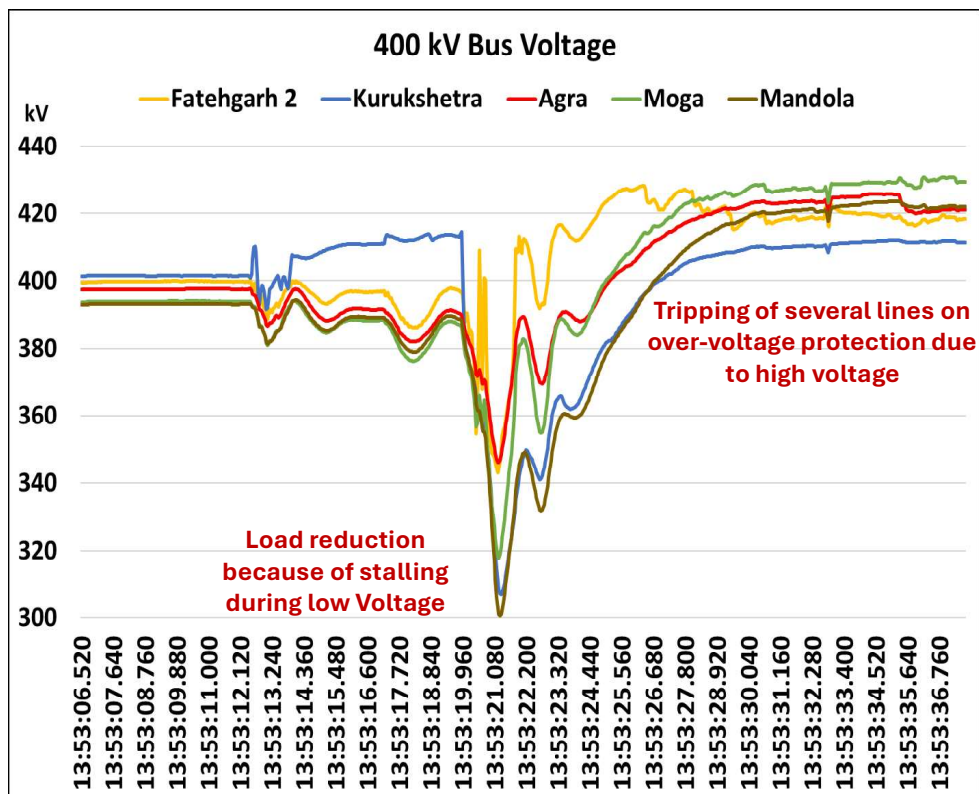
## 6. Voltage Stability and Reactive Power Support

### Reactive Power Reserve Shortfall due to non-compliance



Intra-state system drawing high MVAR from the grid, leading to poor power factor and persistent low-voltage issues at 400/220 kV stations

## 7. 17 June 2024 Northern Region Load Loss Event



1. Tripping of both bipoles of **+/-800 kV HVDC Champa (WR) – Kurukshetra (NR)** carrying **4,500 MW** from WR to NR
2. Sharp grid **voltage decline** and Northern Region **demand reduction** by around **16.5 GW**.
  - Reduction in **NR RE generation** of approx. **2870 MW**.
  - **12 conventional units tripped**, aggregating gen is **6775 MW**, majorly on over frequency.
3. High voltage scenario due to off loading of transmission network.
  - A **total of 23 (nos.) transmission lines** (765kV and 400kV) **tripped on OV**, causing a partial blackout at the 765/400kV Aligarh(PG) S/s.
4. Load that reduced during the **low voltage at 13:53 hrs** began to recover gradually, the grid experienced another **low voltage scenario at 14:05 hrs**.
5. Frequency rise from **50.03 Hz to 50.68 Hz**, recovered back to 50.00 Hz within **~ 6 minutes**
6. **Planning for dynamic reactive power sources near load centers**

## 8. Initiatives taken in Indian Power System

1. A comprehensive set of **regulations and standards** governing interconnection and operations of the renewable plants
2. **Proposed amendments** to standards /procedures are under various stages of preparation by CEA
3. Established procedures for **compliance verification**. Joint compliance verification by system planner & operator
4. Regular **monitoring and reporting** of non-compliance by RLDCs to developers, RPCs, CEA, CERC, MOP and MNRE
5. Robust **inter-regional transmission network**
6. **Perspective transmission planning** on a rolling basis to ensure timely availability of transmission
7. **Transmission resource adequacy plans** for states under development by CEA
8. NRPC committee report on installation of **Synchronous Condensers** published in Dec 2024
9. MOP Guidelines for **Resource Adequacy Planning Framework** for India, 2023.
10. Initiatives with IMD, ISRO, National Centre for Medium Range Weather Forecast (NCMRWF), IIT Bombay are already being taken up to improve the **forecast accuracy**.

**Checklist for First Time Energization and Integration of RE plants:** [https://webcdn.grid-india.in/files/grdw/2025/08/Checklist%20for%20FTE&I%20and%20Trial%20Run%20of%20PSPs\\_Aug%2025\\_534.pdf](https://webcdn.grid-india.in/files/grdw/2025/08/Checklist%20for%20FTE&I%20and%20Trial%20Run%20of%20PSPs_Aug%2025_534.pdf)

## 9. Suggested Measures for Indian Power System

### Compliance

- ➡ Enforcement of compliance to specified standards at both ISTS and **In-STS level**
- ➡ Periodic testing and tuning of controllers of all grid elements by respective asset owners

### Grid Planning

- ➡ Static and dynamic reactive power planning – SynCONs, STATCOMs etc.
- ➡ Timely commissioning of the associated transmission system for RE evacuation
- ➡ Augmentation of intra-state transmission system
- ➡ Generation Flexibility and Adequacy - Timely commissioning of Energy Storage Systems

### Resiliency

- ➡ Distributed RE capacity addition across the country from resiliency perspective
- ➡ Ensuring Black Start Capability / Fast System Restoration – Grid Forming, VSC HVDCs etc.

### Frequency Stability

- ➡ Participation by RE plants and BESS in Primary, Secondary and Fast Freq. Control
- ➡ Measures for addressing gradual decline in inertia – SynCONs at suitable locations

### Standards and Regulations

- ➡ Regular review and strengthening of standards, regulations and guidelines
- ➡ Inclusion of standards for new actors – Electrolyzers, Data Centers, Energy Storage etc.

## **SOP for diversion of RPC approved spare Transformers/Reactors to constituents/state transmission utilities**

### **1. General Conditions**

Regional spares are primarily sanctioned for use in Inter-State Transmission System (ISTS) substations. Diversion of such spares to a State Transmission Utility (STU) shall be permitted only under exceptional circumstances, based on the criticality of the requirement and subject to expeditious replenishment by the Borrower.

Inter-regional diversion of equipment to any constituent shall not be permitted.

### **2. Utilities eligible for diversion:**

- i. Transmission Service Providers (TSPs) operating Inter-State Transmission System (ISTS) stations: Eligible to request diversion of regional spares as per RPC approval.
- ii. State Transmission Utility: Diversion may be considered only in case of failure of existing in-use equipment and where diversion is essential for grid security and reliability. Under normal circumstances, regional spares shall not be diverted for commissioning of new assets.

### **3. Modalities for Diversion to State Transmission Utilities:**

#### **3.1 Submission of Request**

Any STU seeking diversion of a regional spare transformer/reactor ("Borrower") shall place its requirement before the respective RPC forum along with:

- Details of contingency necessitating diversion.
- An action plan with timelines for return/replenishment of the diverted equipment.

#### **3.2 Approval Process**

The RPC forum shall evaluate the request based on merit, availability of spares, and overall grid security considerations. Decision of the forum shall be final and binding.

#### **3.3 Basis of Diversion**

Upon approval, the spare transformer/reactor shall be diverted on replenishment basis. Sale of the spare equipment to the Borrower shall not be permitted under any circumstances.

### **4. Signing of agreement**

Following RPC approval, and before diversion, an agreement shall be executed between POWERGRID and the Borrower incorporating terms and conditions consistent with this SOP. The agreement shall broadly include the following:

**a) Time period:**

- The Borrower shall return/replenish the spare transformer/reactor within the period stipulated by the RPC forum, which shall not exceed **24 months** from the date of handover of regional spare/equipment by POWERGRID.
- A **Memorandum of Understanding (MoU)** shall be signed within 45 days of RPC approval. Diversion shall be effected within **45 days** of MoU execution.
- Failure to execute the MoU within the stipulated timeframe shall result in automatic revocation of RPC approval.
- POWERGRID shall maintain a record of all diverted equipment and monitor timely replenishment.

**b) Cost implications:**

- Diversion shall be on a **zero-cost / cost-neutral basis** to POWERGRID.
- POWERGRID shall remain revenue neutral, with no impact on CERC-approved tariff or sharing thereof.
- As per Sharing Regulations or RPC decision, tariff for the diverted asset may be borne by the Borrower for the usage period, with charges recovered bilaterally and adjusted to the pool.

**c) Responsibilities of Borrower:**

The Borrower shall:

- 1) Bear all costs related to dismantling, transportation (both ways), transit insurance, statutory charges, erection, testing, commissioning (including post-return at POWERGRID station), and any incidental expenditure or loss to POWERGRID.
- 2) Jointly verify the equipment condition at POWERGRID substation prior to MoU signing.
- 3) Before diversion, furnish a **Bank Guarantee (BG)** equivalent to the prevailing cost of the diverted equipment, valid until the equipment is returned in healthy condition.
- 4) Manage transportation, erection, commissioning, operation, and maintenance.
- 5) Maintain the equipment in accordance with POWERGRID's standard maintenance practices.
- 6) Ensure return of the equipment in healthy condition as per MoU timelines and commitments.

- 7) Bear full responsibility for any damage/failure until the equipment is returned in healthy condition.
- 8) In case of failure/breakdown during transportation, erection, commissioning, or operation, arrange for OEM-approved repair/refurbishment to POWERGRID specifications, or alternatively, provide new replacement equipment meeting POWERGRID standards. All costs shall be borne by the Borrower.
- 9) After returning of equipment, all pre-commissioning tests shall be jointly performed at POWERGRID station to ascertain healthiness. In case of any deviation, POWERGRID shall take up the repair of equipment and cost of the repair shall be borne by the Borrower.

**d) Return of equipment:**

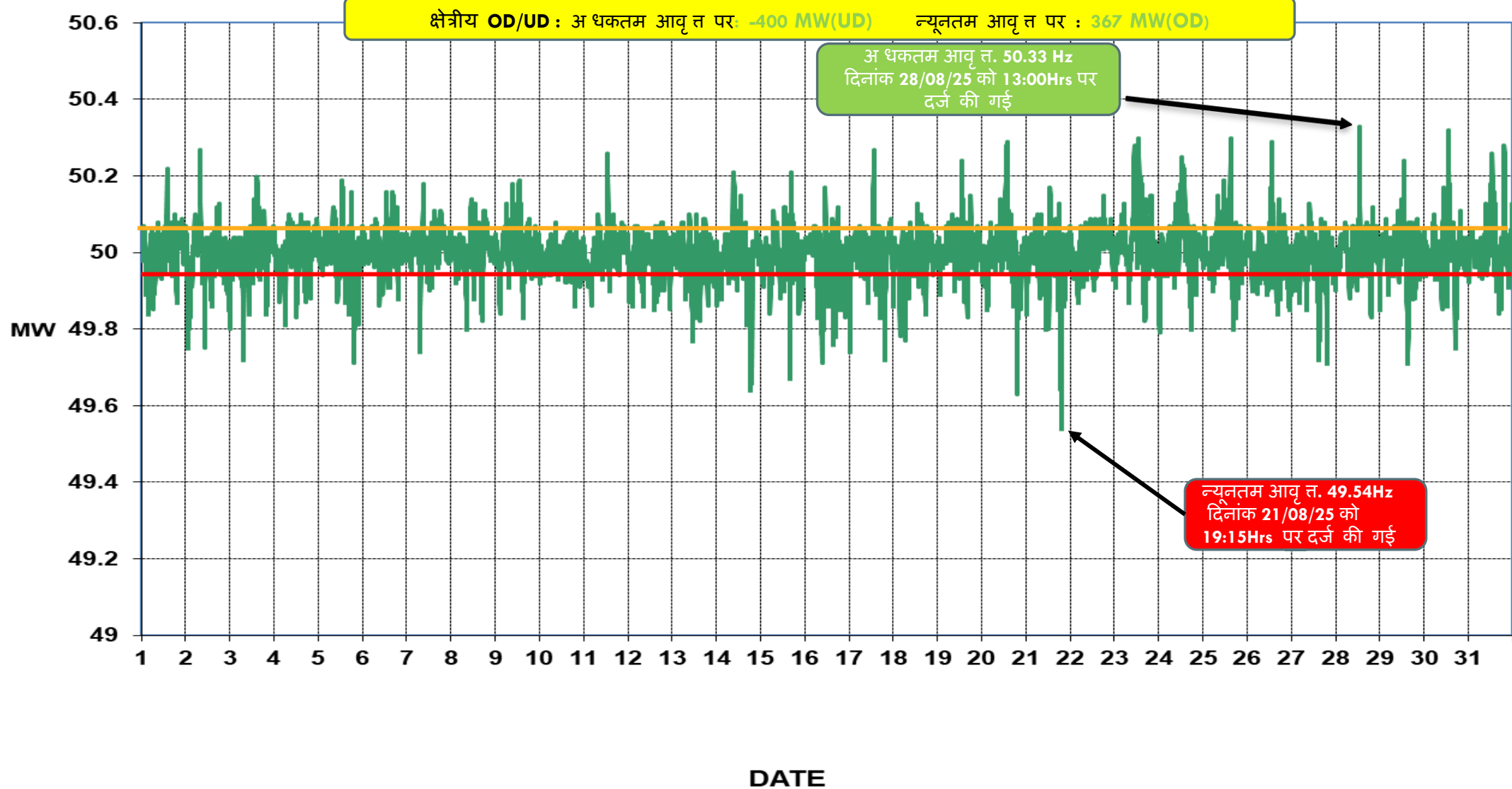
In the event of exigency or requirement in the interest of grid security, the RPC forum reserves the right to demand early return of the diverted spare prior to expiry of the agreed timeframe.

**e) Penalty clause:**

In case of delay in return/replenishment beyond the agreed period (maximum 24 months from diversion date), a penalty of 15% of the approved tariff of the diverted equipment shall be imposed on the Borrower as a one-time charge for the delayed period.

**प्रचालन समन्वय उपस मति की बैठक  
अगस्त - 2025**

# अगस्त-2025 के दौरान आवृत्ति की स्थिति (As per 5 Minute SCADA data)



## OD(+)/UD(-) at Max Freq

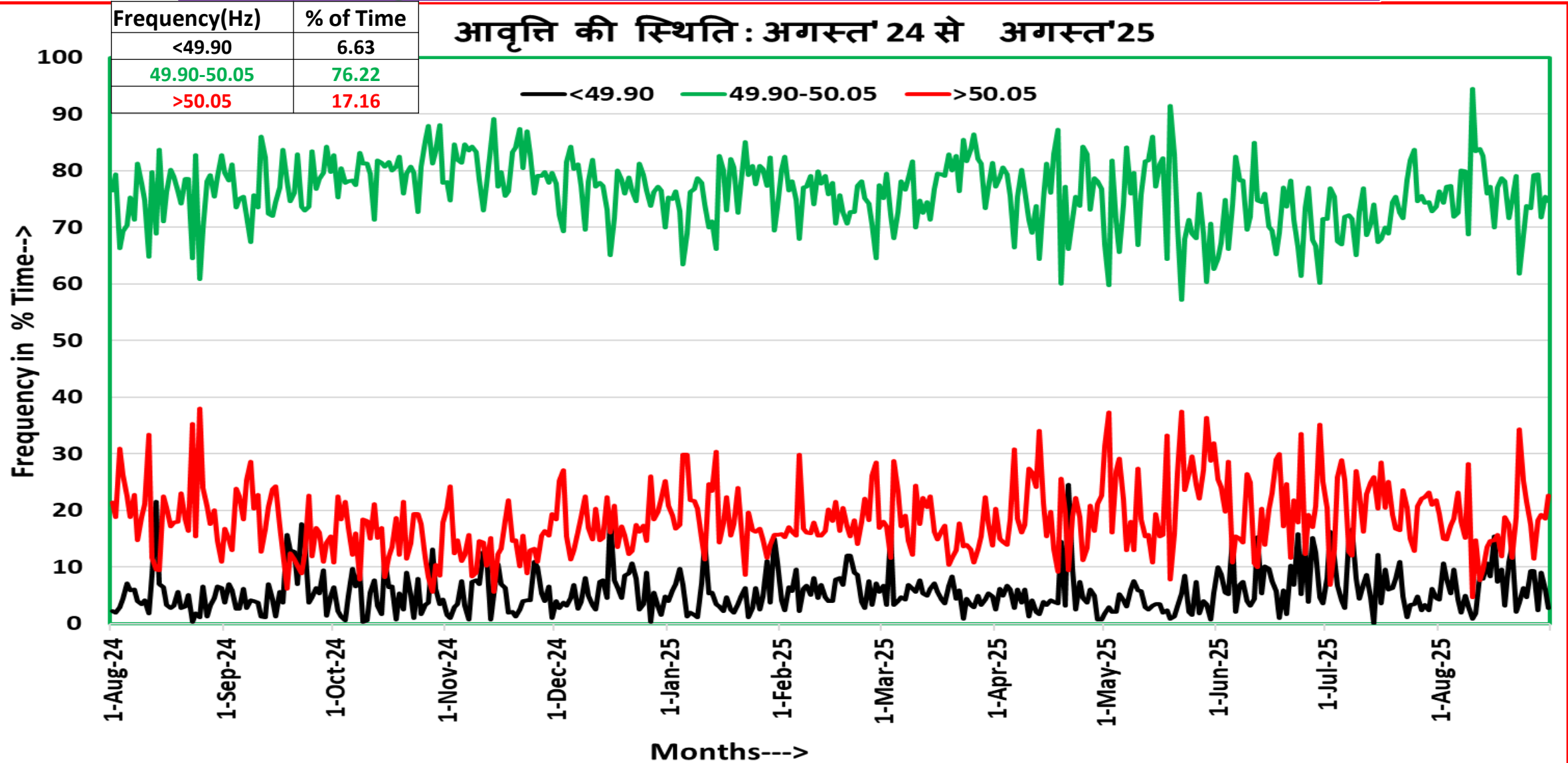
|     |        |
|-----|--------|
| UP  | + 336  |
| Pun | + 117  |
| Del | + 118  |
| Utt | + 33   |
| HP  | + 13   |
| Har | + 61   |
| Raj | - 1004 |
| JK  | - 66   |
| Chd | - 7    |

## OD(+)/UD(-) at Min Freq

|     |       |
|-----|-------|
| Utt | - 170 |
| HP  | - 245 |
| Har | - 48  |
| Raj | - 17  |
| Del | + 245 |
| JK  | + 20  |
| Chd | + 19  |
| UP  | + 70  |
| Pun | + 3   |

# आवृत्ति की स्थिति: अगस्त-2024 से 2025

## आवृत्ति की स्थिति: अगस्त'24 से अगस्त'25



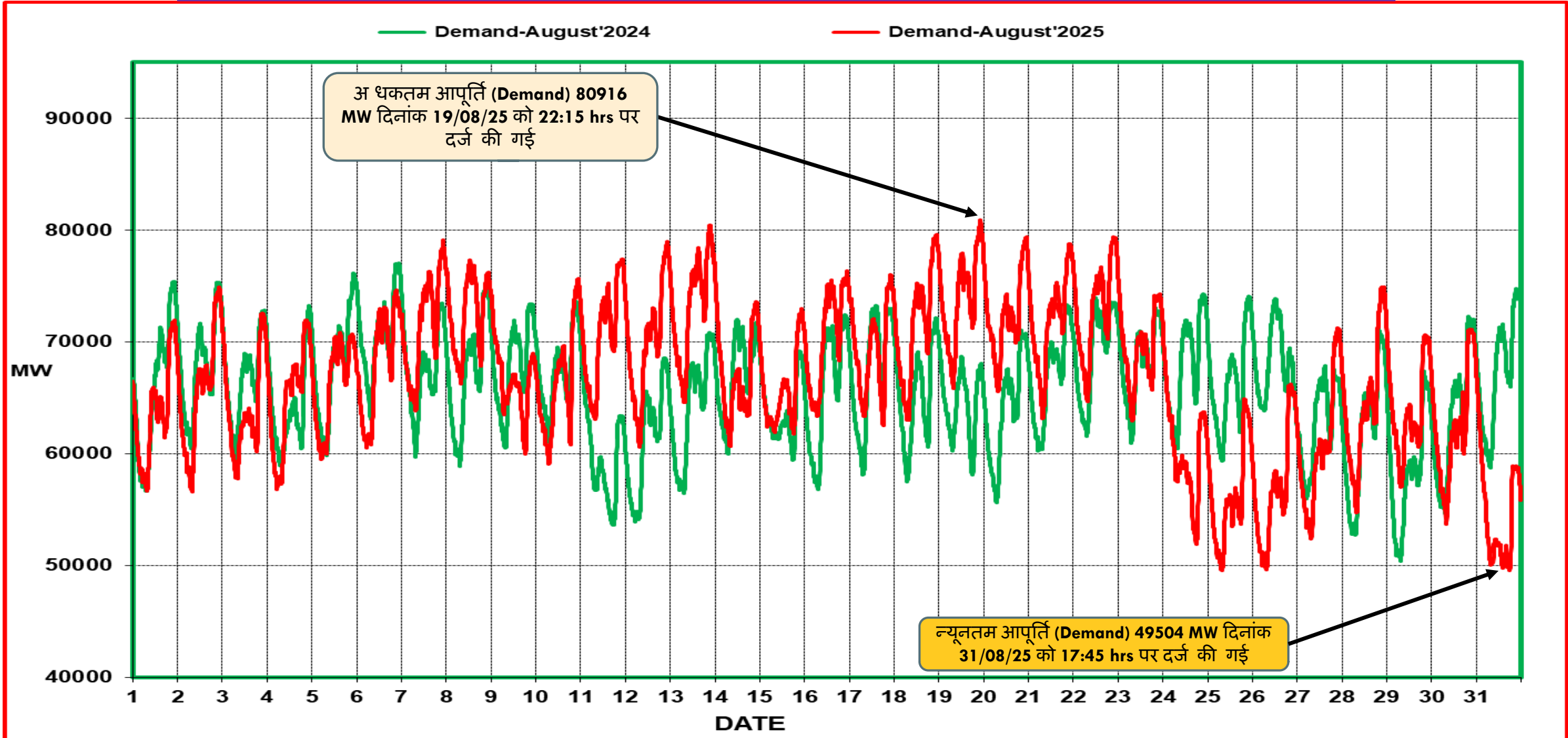
**अगस्त-2025 के दौरान अधिकतम मांग (Demand Met), अधिकतम ऊर्जा खपत (Energy consumption) और अब तक का कीर्तिमान (राज्यों द्वारा जमा आंकड़ों के अनुसार)**



| राज्य                                | अधिकतम मांग (MW)<br>(in Aug'25) | दिनांक / समय        | रिकॉर्ड अधिकतम मांग<br>(in MW)<br>(upto Jul'25) | दिनांक / समय      | अधिकतम ऊर्जा खपत (MU)<br>(in Aug'25) | दिनांक   | रिकॉर्ड अधिकतम ऊर्जा खपत (MU)<br>(Upto Jul'25) | दिनांक     |
|--------------------------------------|---------------------------------|---------------------|-------------------------------------------------|-------------------|--------------------------------------|----------|------------------------------------------------|------------|
| पंजाब                                | 16310                           | 08-08-2025<br>10:15 | 16754                                           | 28.06.25 at 15:00 | 348.5                                | 09.08.25 | 366.8                                          | 21.07.2024 |
| हरियाणा                              | 12855                           | 08-08-2025<br>14:00 | 14662                                           | 31.07.24 at 14:30 | 270.03                               | 01.08.25 | 293.4                                          | 30.07.2024 |
| राजस्थान                             | 17607                           | 13-08-2025<br>14:30 | 19165                                           | 12.02.25 at 11:00 | 377.9                                | 13.08.25 | 388.01                                         | 11.06.2025 |
| दिल्ली                               | 7050                            | 08-08-2025<br>15:14 | 8656                                            | 19.06.24 at 15:06 | 142.7                                | 08.08.25 | 177.7                                          | 18.06.2024 |
| उत्तर प्रदेश                         | 30292                           | 20-08-2025<br>21:38 | 31486                                           | 11.06.25 at 00:45 | 582.5                                | 22.08.25 | 658.7                                          | 17.06.2024 |
| उत्तराखंड                            | 2355                            | 27-08-2025<br>20:00 | 2910                                            | 11.06.25 at 22:00 | 52.9                                 | 20.08.25 | 62.1                                           | 14.06.2024 |
| हिमाचल प्रदेश                        | 1888                            | 01-08-2025<br>10:00 | 2273                                            | 17.01.25 at 09:00 | 39.18                                | 08.08.25 | 42.55                                          | 11.06.2025 |
| जम्मू और कश्मीर (UT) तथा लद्दाख (UT) | 2731                            | 22-08-2025<br>20:00 | 3200                                            | 07.01.25 at 10:00 | 55.3                                 | 22.08.25 | 70.3                                           | 04.02.2025 |
| चंडीगढ़                              | 357                             | 22-08-2025<br>15:00 | 482                                             | 18.06.24 at 15:28 | 7.15                                 | 22.08.25 | 9.28                                           | 12.06.2025 |
| उत्तरी क्षेत्र #                     | 80688                           | 19-08-2025<br>21:00 | 91234                                           | 19.06.24 at 14:37 | 1780.8                               | 19.08.25 | 2022.9                                         | 12.06.2025 |

# उत्तरी क्षेत्र अधिकतम मांग (Demand Met) as per 1 min SCADA Data

# क्षेत्रीय विद्युत आपूर्ति (Demand) अगस्त 2024 बनाम अगस्त 2025 (As per 5 Minute SCADA data)

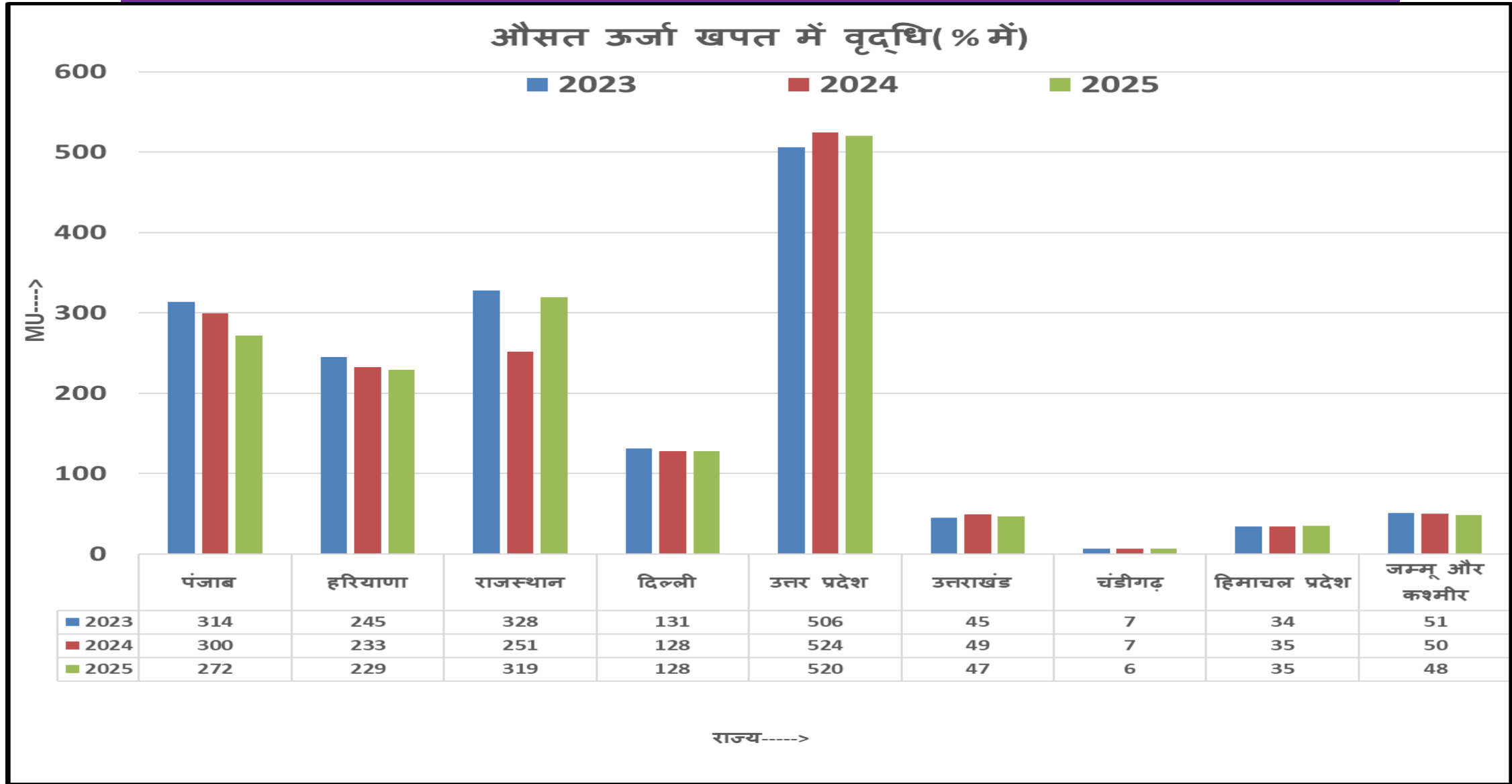


अगस्त -2024 की तुलना में अगस्त -2025 की औसत वद्युत आपूर्ति में 1029 MW वृद्ध हुई

## उत्तरी क्षेत्र की औसत ऊर्जा खपत में वृद्धि( % में) अगस्त-2025/ अगस्त-2024 / अगस्त-2023

| राज्य                                   | अगस्त-2023 | अगस्त-2024 | अगस्त-2025 | % वृद्धि<br>(अगस्त-2024 vs<br>अगस्त-2023) | % वृद्धि<br>(अगस्त-2025 vs<br>अगस्त-2024) |
|-----------------------------------------|------------|------------|------------|-------------------------------------------|-------------------------------------------|
| पंजाब                                   | 314        | 300        | 272        | -4.4%                                     | -9.4%                                     |
| हरियाणा                                 | 245        | 233        | 229        | -5.0%                                     | -1.7%                                     |
| राजस्थान                                | 328        | 251        | 319        | -23.4%                                    | 27.1%                                     |
| दिल्ली                                  | 131        | 128        | 128        | -3.0%                                     | 0.5%                                      |
| उत्तर प्रदेश                            | 506        | 524        | 520        | 3.7%                                      | -0.8%                                     |
| उत्तराखंड                               | 45         | 49         | 47         | 8.3%                                      | -3.8%                                     |
| चंडीगढ़                                 | 7          | 7          | 6          | 0.5%                                      | -8.4%                                     |
| हिमाचल प्रदेश                           | 34         | 35         | 35         | 1.6%                                      | 0.6%                                      |
| जम्मू और कश्मीर<br>(UT) तथा लद्दाख (UT) | 51         | 50         | 48         | -2.5%                                     | -3.6%                                     |
| उत्तरी क्षेत्र                          | 1664       | 1579       | 1608       | -5.1%                                     | 1.9%                                      |

# उत्तरी क्षेत्र की औसत ऊर्जा खपत में वृद्धि( % में) अगस्त-2025/ अगस्त-2024 / अगस्त-2023

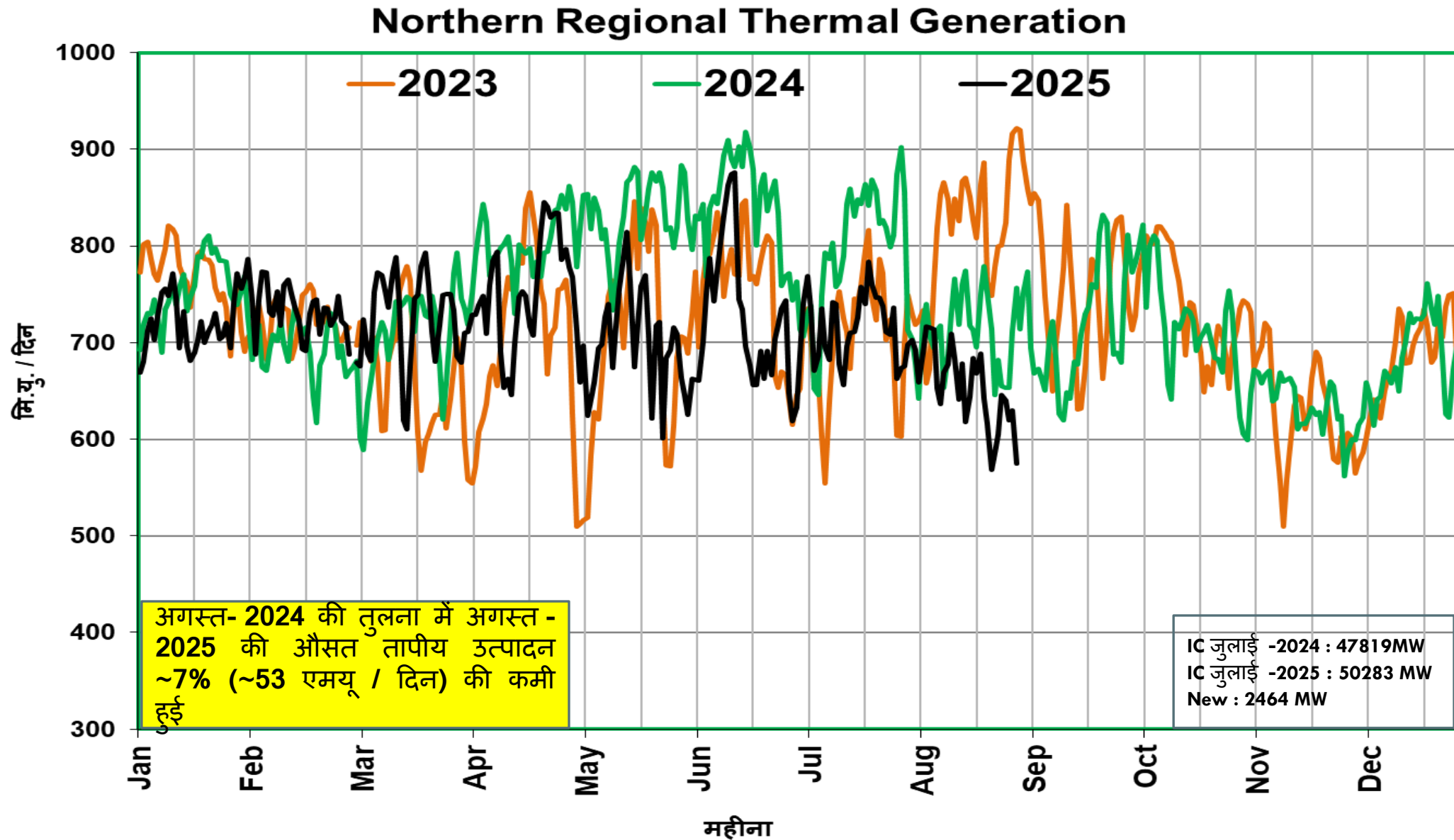


# उत्तरी क्षेत्र की ऊर्जा खपत(MUs)

## Northern Region Energy Consumption Pattern

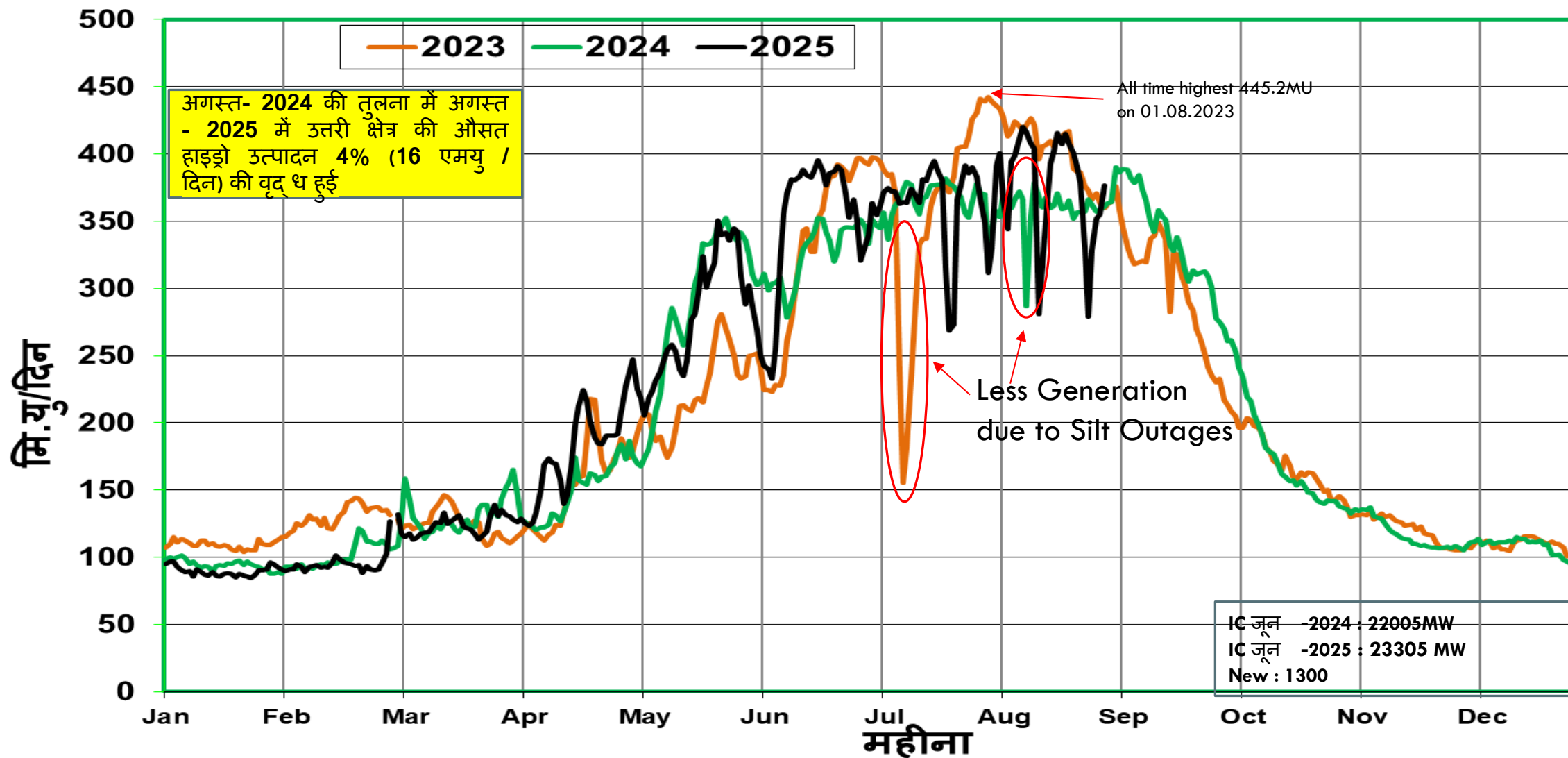


# उत्तरी क्षेत्र की तापीय (Thermal) उत्पादन की स्थिति (MUs/Day)

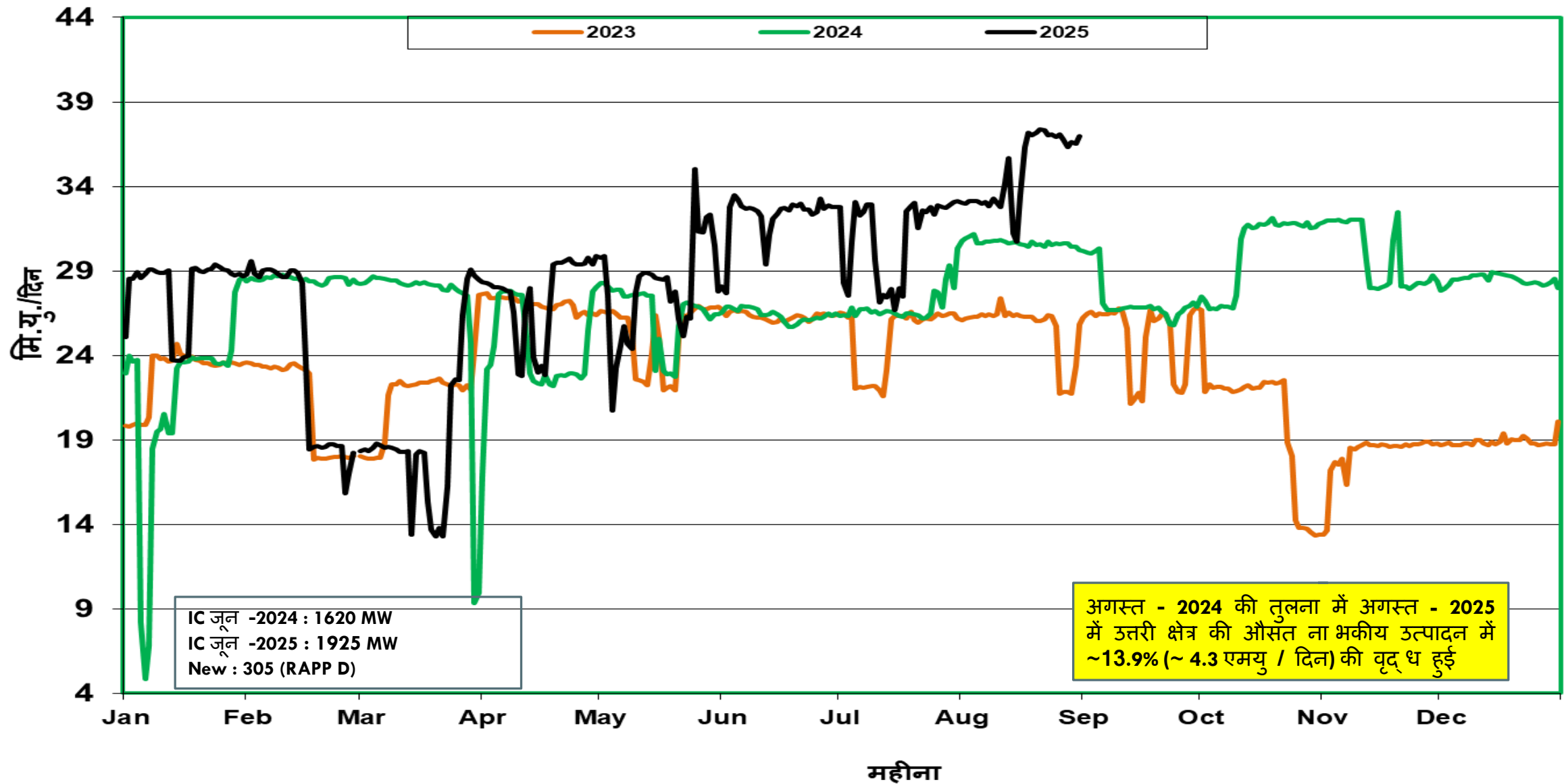


# उत्तरी क्षेत्र की जलीय (हाइड्रो) उत्पादन की स्थिति (MU<sub>s</sub>/Day)

## Northern Regional Hydro Generation

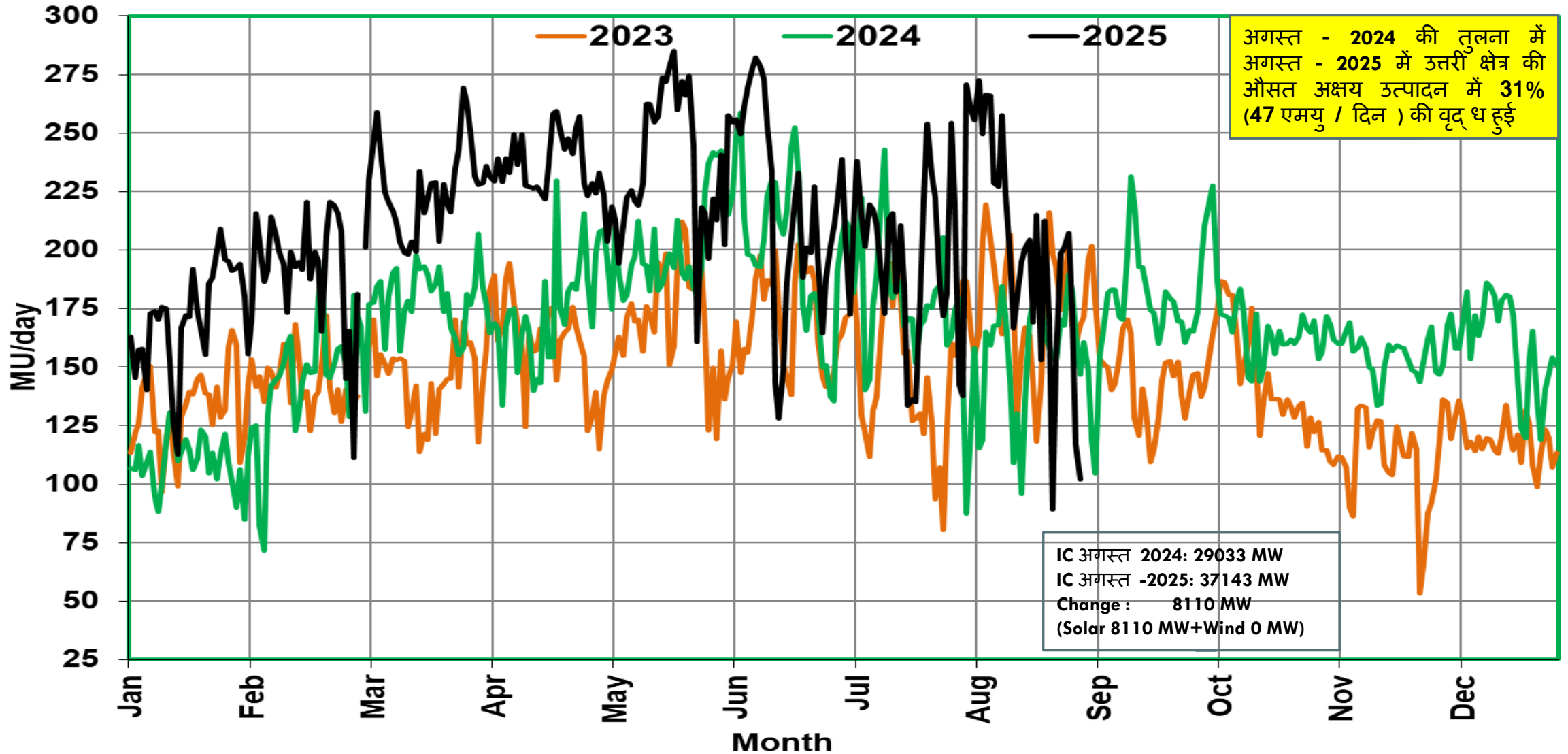


# उत्तरी क्षेत्र की नाभिकीय उत्पादन की स्थिति (MUs/Day)

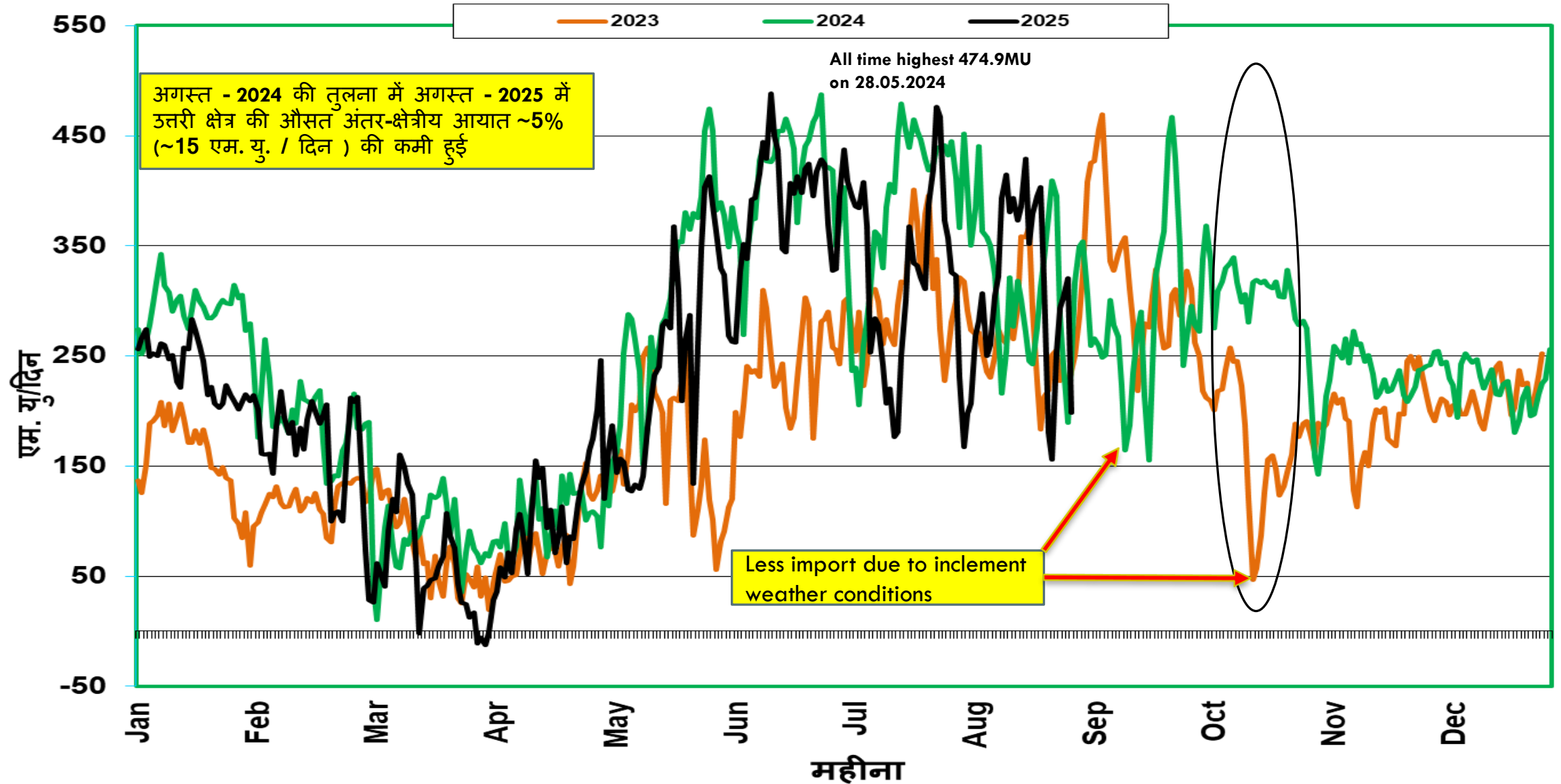


## उत्तरी क्षेत्र की अक्षय (Renewable) उत्पादन की स्थिति (MUs/Day)

### NR Renewable Generation



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



वास्तविक सारांश -  
अगस्त-2024 बनाम अगस्त-2025

|                                              | अगस्त-2024<br>( म.यु. /दिन) | अगस्त-2025<br>( म.यु. /दिन) | अगस्त माह में वृद्धि<br>( म.यु./दिन) |
|----------------------------------------------|-----------------------------|-----------------------------|--------------------------------------|
| तापीय (Thermal)<br>उत्पादन                   | 710                         | 657                         | -53                                  |
| जलीय (Hydro) उत्पादन                         | 358                         | 373                         | 16                                   |
| नाभकीय (Nuclear)<br>उत्पादन                  | 31                          | 27                          | -4                                   |
| अंतर-क्षेत्रीय (Inter-<br>Regional) कुल आयात | 319                         | 305                         | -15                                  |
| अक्षय (Renewable)<br>उत्पादन                 | 153                         | 201                         | 47                                   |

# नवीकरणीय ऊर्जा की क्षमता (VRE PENETRATION)

|                 | अ धकतम दैनिक (MU) क्षमता |            |                           |            |
|-----------------|--------------------------|------------|---------------------------|------------|
|                 | अगस्त '2025              |            | अगस्त '2025 तक का रिकॉर्ड |            |
|                 | अ धकतम % क्षमता          | दिनांक     | अ धकतम % क्षमता           | दिनांक     |
| पंजाब           | 3.16                     | 27-08-2025 | 12.28                     | 01-04-2020 |
| राजस्थान        | 29.44                    | 02-08-2025 | 36.47                     | 22-10-2021 |
| उत्तर प्रदेश    | 3.01                     | 27-08-2025 | 6.03                      | 05-03-2025 |
| उत्तर क्षेत्रीय | 17.11                    | 05-08-2025 | 23.00                     | 15-03-2025 |

| OUTAGE SUMMARY FOR AUG-2025 |             |                        |                          |              |                                |                                  |                        |                  |                     |
|-----------------------------|-------------|------------------------|--------------------------|--------------|--------------------------------|----------------------------------|------------------------|------------------|---------------------|
| CONSTITUENT S               | PLANNED (A) | FORCED OUTAGES (B=C+D) | EMERGENCY SHUT DOWNS (C) | TRIPPING (D) | PLANNED SHUT DOWNS (A/(A+C)) % | EMERGENCY SHUT DOWNS (C/(A+C)) % | ESD SHUT DOWNS (C/B) % | TRIPPING (D/B) % | TOTAL OUTAGES (A+B) |
| POWERGRID                   | 312         | 323                    | 184                      | 139          | 63%                            | 37%                              | 57%                    | 43%              | 635                 |
| UPPTCL                      | 72          | 197                    | 80                       | 117          | 47%                            | 53%                              | 41%                    | 59%              | 269                 |
| RRVPNL                      | 66          | 80                     | 37                       | 43           | 64%                            | 36%                              | 46%                    | 54%              | 146                 |
| HVPNL                       | 24          | 50                     | 16                       | 34           | 60%                            | 40%                              | 32%                    | 68%              | 74                  |
| BBMB                        | 11          | 66                     | 22                       | 44           | 33%                            | 67%                              | 33%                    | 67%              | 77                  |
| PSTCL                       | 14          | 39                     | 12                       | 27           | 54%                            | 46%                              | 31%                    | 69%              | 53                  |
| DTL                         | 17          | 16                     | 9                        | 7            | 65%                            | 35%                              | 56%                    | 44%              | 33                  |
| PTCUL                       | 4           | 32                     | 2                        | 30           | 67%                            | 33%                              | 6%                     | 94%              | 36                  |
| HPPTCL                      | 6           | 25                     | 5                        | 20           | 55%                            | 45%                              | 20%                    | 80%              | 31                  |
| NTPC                        | 17          | 8                      | 5                        | 3            | 77%                            | 23%                              | 63%                    | 38%              | 25                  |
| PDDJK                       | 6           | 5                      | 0                        | 5            | 100%                           | 0%                               | 0%                     | 100%             | 11                  |
| ESUCRL                      | 2           | 0                      | 0                        | 0            | 100%                           | 0%                               | 0%                     | 0%               | 2                   |
| Adani                       | 38          | 16                     | 10                       | 6            | 79%                            | 21%                              | 63%                    | 38%              | 54                  |
| NRSS XXIX                   | 3           | 17                     | 14                       | 3            | 18%                            | 82%                              | 82%                    | 18%              | 20                  |
| APCPL                       | 0           | 1                      | 1                        | 0            | 0%                             | 100%                             | 100%                   | 0%               | 1                   |
| Renew Power                 | 2           | 2                      | 0                        | 2            | 100%                           | 0%                               | 0%                     | 100%             | 4                   |
| PKTCL                       | 2           | 4                      | 3                        | 1            | 40%                            | 60%                              | 75%                    | 25%              | 6                   |
| TATA POWER                  | 6           | 4                      | 4                        | 0            | 60%                            | 40%                              | 100%                   | 0%               | 10                  |
| <b>Total</b>                | <b>602</b>  | <b>885</b>             | <b>404</b>               | <b>481</b>   | <b>60%</b>                     | <b>40%</b>                       | <b>46%</b>             | <b>54%</b>       | <b>1487</b>         |

| OUTAGE SUMMARY OF LAST FOUR 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-25                             | 729     | 1379           | 482                 | 897      | 60.2%                     | 39.8%                 | 2108                |
| June-25                            | 498     | 801            | 401                 | 400      | 55.39%                    | 44.60%                | 1299                |
| July-25                            | 634     | 860            | 412                 | 448      | 60.60%                    | 39.38%                | 1494                |
| Aug-25                             | 602     | 885            | 404                 | 481      | 59.88%                    | 40.15%                | 1487                |

| LILO/Re-arrangement/Re-conductoring of Existing Transmission Lines |              |                                                                                                                                                                        |                                                                           |                                            |                    |                                               |
|--------------------------------------------------------------------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|--------------------------------------------|--------------------|-----------------------------------------------|
| S.NO.                                                              | Agency/Owner | Transmission Line Name {LILO at/ Re-arrangement of/Reconductoring}                                                                                                     |                                                                           | Line Length (km) after LILO/Re-arrangement | Conductor Type     | Date of First Time Energization & Integration |
| 1                                                                  | HVPNL        | 220kV Gurgaon(PG)-Gurugram Sec-15 (GIS) (HVPNL)-1(After LILO of 220kV Sector-72 Gurugram (PG) - Sector-72 Gurugram (HVPNL) ckt-4 at Sector-15 II GIS Gurugram (HVPNL)) |                                                                           | 8                                          | MOOSE              | 05-Aug-2025                                   |
| 2                                                                  | HVPNL        | 220kV Jind(PG)-Jind(HR)-1(After LILO of 220kV PTPS - Jind D/C at 400kV PGCIL Jind)                                                                                     |                                                                           | 5.65                                       | MOOSE              | 26-Aug-2025                                   |
| 3                                                                  | HVPNL        | 220kV Jind(PG)-Jind(HR)-2(After LILO of 220kV PTPS - Jind D/C at 400kV PGCIL Jind)                                                                                     |                                                                           | 5.65                                       | MOOSE              | 26-Aug-2025                                   |
|                                                                    |              |                                                                                                                                                                        |                                                                           |                                            |                    |                                               |
|                                                                    |              |                                                                                                                                                                        |                                                                           |                                            |                    |                                               |
| Bus / Line Reactors                                                |              |                                                                                                                                                                        |                                                                           |                                            |                    |                                               |
| S.NO.                                                              | Agency/Owner | Element Name                                                                                                                                                           |                                                                           | Voltage Level (kV)                         | Rating (MVar)      | Date of First Time Energization & Integration |
| 1                                                                  | UPPTCL       | 50 Non-Switchable Convertable LINE_REACTOR of 400 KV AZAMGARH-MAU LINE at Azamgarh(UP)                                                                                 |                                                                           | 400kV                                      | 50                 | 03-Aug-2025                                   |
|                                                                    |              |                                                                                                                                                                        |                                                                           | Total (MVar)                               | 50                 |                                               |
| HVDC /AC Filter bank / FACTS DEVICE associated System              |              |                                                                                                                                                                        |                                                                           |                                            |                    |                                               |
| S.NO.                                                              | Agency/Owner | Element Name                                                                                                                                                           |                                                                           | SUB-STATION                                | Voltage Level (kV) | Date of First Time Energization & Integration |
| 1                                                                  | XL_XPPL      | 33kV, Harmonic Filter bank, No-1 at XL_XPPL_SL_Ftg3(PG)                                                                                                                | 5 MVar per Phase with the Quality factor of 3 and Tuned Frequency 395 Hz. | XL_XPPL_SL_Ftg3(PG)                        | 33kV               | 04-Aug-2025                                   |

| Generating Units                               |                           |                                     |                                 |                     |                               |                                               |
|------------------------------------------------|---------------------------|-------------------------------------|---------------------------------|---------------------|-------------------------------|-----------------------------------------------|
| S. NO.                                         | Location/ Pooling Station | Owner/Unit Name                     | Unit No/Source                  | Capacity added (MW) | Total/Installed Capacity (MW) | Date of First Time Energization & Integration |
| 1                                              | Bhadla_2                  | Nokh Solar Power Plant NTPC Limited | Solar                           | 33.4                | 735                           | 29-Aug-2025                                   |
|                                                |                           |                                     | Total Solar Generation addition | 33.4                |                               |                                               |
|                                                |                           |                                     | Total Wind Generation addition  |                     |                               |                                               |
| Interconnecting/Generator/Station Transformers |                           |                                     |                                 |                     |                               |                                               |
| S.NO.                                          | Agency/Owner              | Sub-Station                         | ICT/GT/ST No.                   | Voltage Rating (kV) | Capacity (MVA)                | Date of First Time Energization & Integration |
| 1                                              | PRTL                      | Fatehgarh_III(PG)                   | 7                               | 400/220/33kV        | 500                           | 11-Aug-2025                                   |
| 2                                              | POWERGRID                 | Bikaner(PG)                         | 4                               | 765/400/33kV        | 1500                          | 30-Aug-2025                                   |

## DEMAND FORECAST STATUS OF SLDC

- With reference to the Clause 31(2) of Central Electricity Regulatory Commission-IEGC Regulations, 2023 and the Operating Procedure of NRLDC prepared in accordance with the same, each SLDC has to furnish the demand estimation for day ahead, week ahead, month ahead (with time block wise granularity) and demand estimation for year ahead (with hour granularity). The sub-clause 31(2) (h) of IEGC-2023 states the following timeline for the submission of demand estimate data to RLDC.

| Type of Demand Estimation | Timeline                           |
|---------------------------|------------------------------------|
| Daily                     | 10:00 hours of previous day        |
| Weekly                    | First working day of previous week |
| Monthly                   | Fifth day of previous month        |
| Yearly                    | 30th September of previous year    |

- The following is the status regarding forecast data submission.

| State/Entity        | Day Ahead<br>(As on Sep-25)                         | Week Ahead                              | Month Ahead<br>(Oct 2025) | Year-Ahead(2026-27) |
|---------------------|-----------------------------------------------------|-----------------------------------------|---------------------------|---------------------|
| Punjab              | As per Format                                       | Demand and Resource not as per timeline | As per Format             | Not received        |
| Haryana             | Demand and Resource not as per format               | Only demand & irregular                 | Not received              | Not received        |
| Delhi               | Demand and Resource not as per format               | As per Format                           | As per Format             | Not received        |
| Rajasthan           | As per Format but irregular                         | As per Format                           | As per Format             | Not received        |
| Uttar Pradesh       | As per Format                                       | As per Format                           | As per Format             | Not received        |
| Uttarakhand         | Demand and Resource not as per format and irregular | As per Format                           | As per Format             | Not received        |
| Himachal Pradesh    | As per Format                                       | As per Format                           | As per Format             | Not received        |
| J&K and Ladakh (UT) | Demand and Resource not as per format & irregular   | Not received                            | Not received              | Not received        |
| Chandigarh (UT)     | As per Format                                       | Not received                            | Not received              | Not received        |

- All are requested to strictly follow the standard format provided along with the submission timeline.



धन्यवाद

# Extract from MoM of 03<sup>rd</sup> June 2025

15. Keeping in view the above, NRLDC representative has proposed the following:

- Beneficiaries can give their requirements on D-1 to THDC.
- THDC shall punch the schedule in WBES after incorporating the beneficiaries' requirement subject to the technical constraints.
- NRLDC shall then moderate the schedules if required and issue the final schedules. Accordingly, Tehri shall generate and pump.

16. MS NRPC agreed to the methodology proposed by NRLDC.

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18-ए, शहीद जीत सिंह मार्ग, कटवरिया सराय, नई दिल्ली दूरभाष: 011-26513265 ई-मेल: [seo-nrpc@nic.in](mailto:seo-nrpc@nic.in) वेबसाइट: [www.nrpc.gov.in](http://www.nrpc.gov.in)  
18-A, Shaheed Jeet Singh Marg, Katwaria Sarai, New Delhi-110016 Phone: 011-26513265 e-mail: [seo-nrpc@nic.in](mailto:seo-nrpc@nic.in) Website: [www.nrpc.gov.in](http://www.nrpc.gov.in)

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17. NRLDC representative also stated that the above proposal is made keeping in view the fact that THDC is in a better position to assess the technical constraints and propose the schedules accordingly. It was also stressed that the beneficiaries' requirements may or may not be fulfilled in the above-mentioned process.

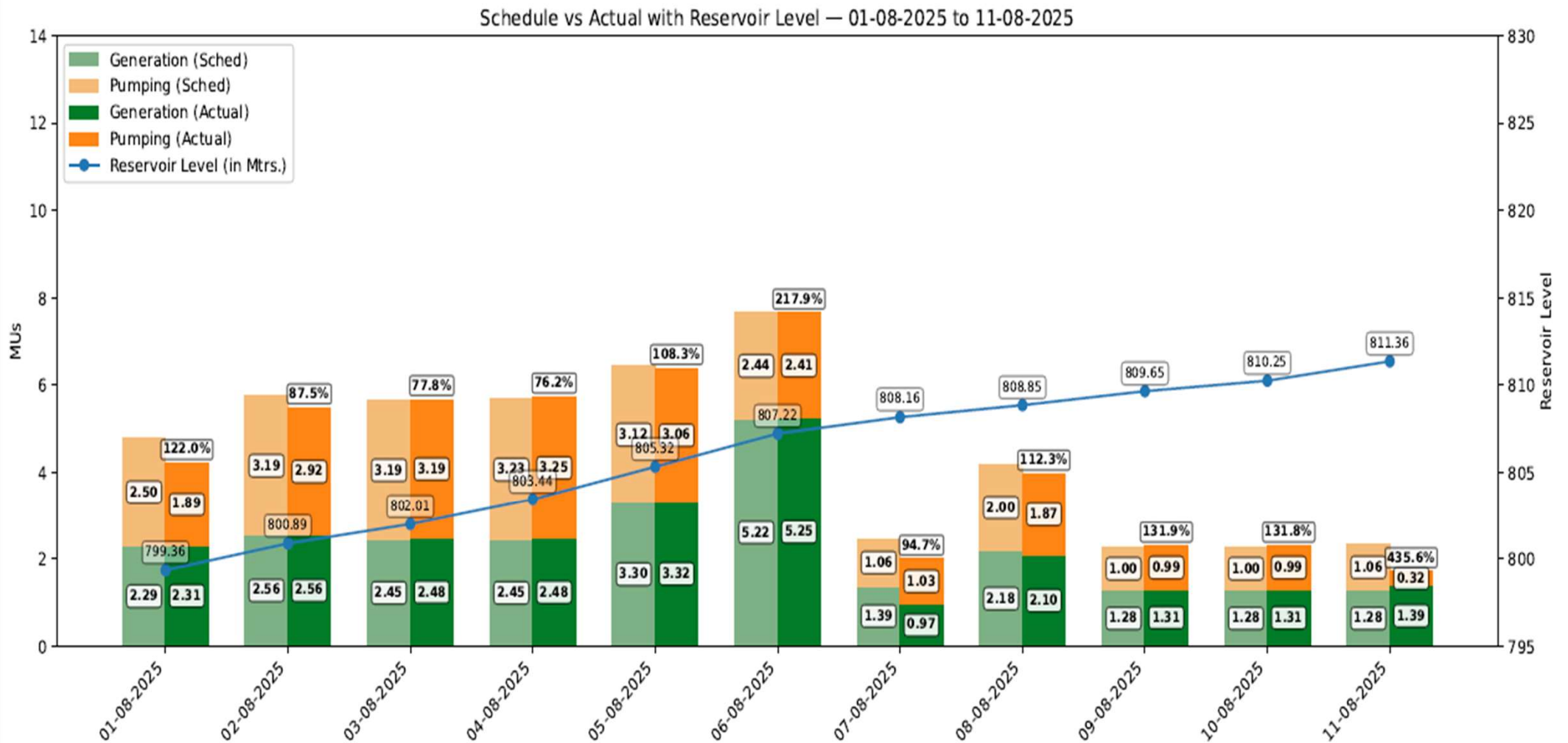
18. MS, NRPC has also stated that the since multiple constraints need to be honoured while operating the PSP, it would be prudent that beneficiaries give their requirements to THDC and then a schedule is prepared accordingly.

**Decision of the forum:** Agreeing to the proposed methodology of NRLDC, forum advised THDC to develop a software solution to finalize the PSP schedule after collating the day-ahead Pumping and Turbining schedules from the beneficiaries and technical considerations of PSP and subsequently share the proposed schedule with NRLDC. The proposed schedules shall be moderated by NRLDC if required and NRLDC shall issue the final schedules. Accordingly, PSP shall generate and Pump.

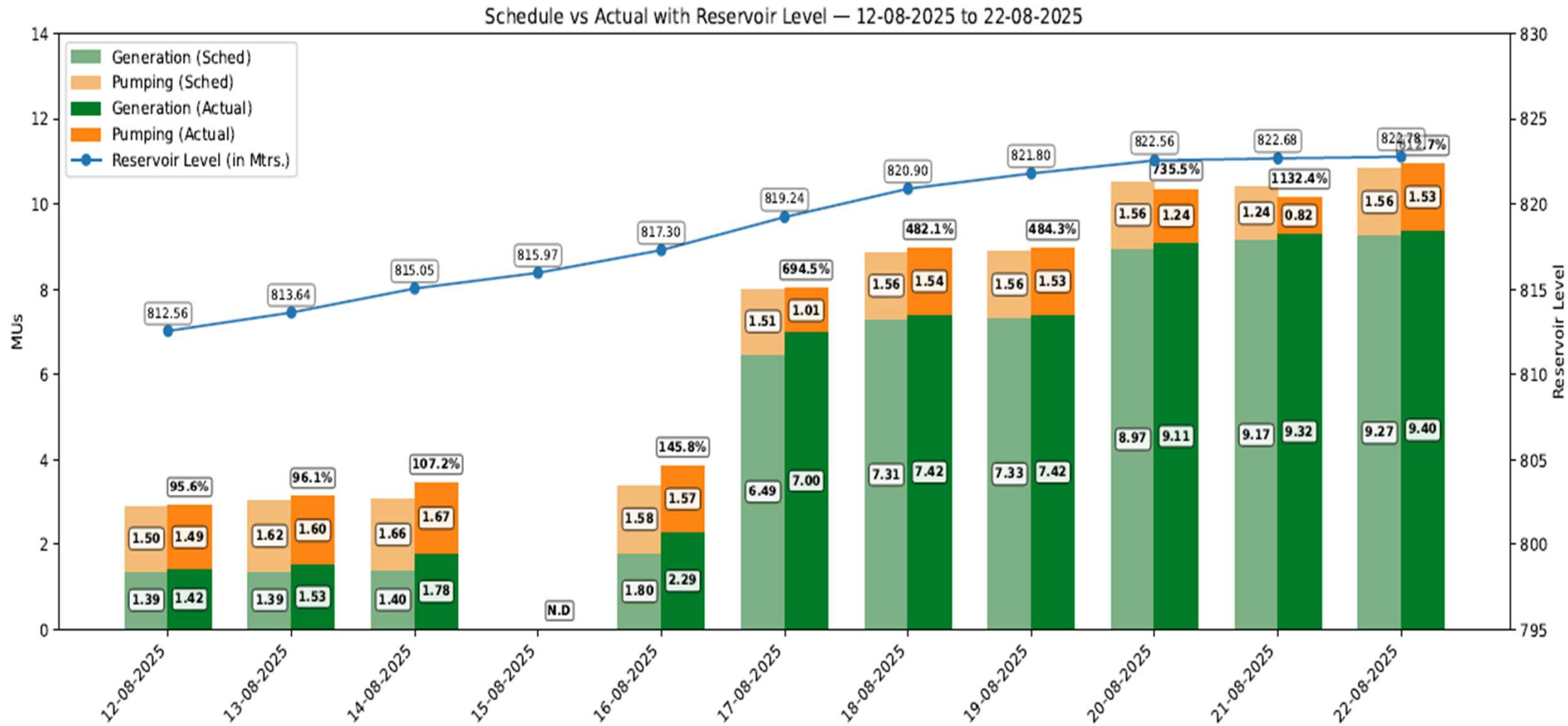
# Tehri PSP

- THDC update the status of software for scheduling.
- Any change in approved operational philosophy get approved from NRPC forum.
- Schedule share by THDC/Tehri PSP shall be deemed considered (in consultation with beneficiaries), NRLDC shall schedule after moderation based on regional demand as discussed in 3<sup>rd</sup> June 2025 meeting.

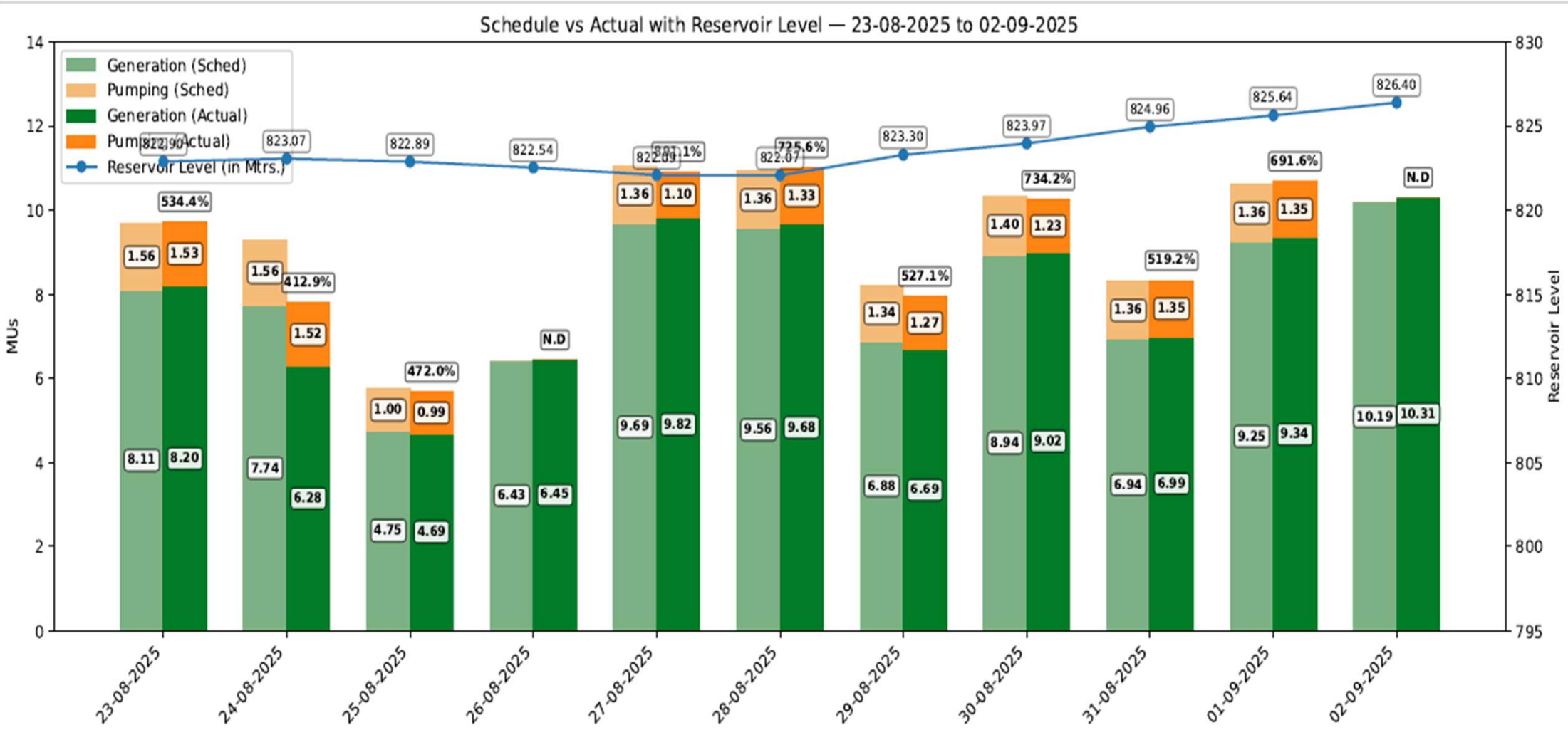
# Tehri PSP: Generation & Pumping vis-a vis Reservoir level



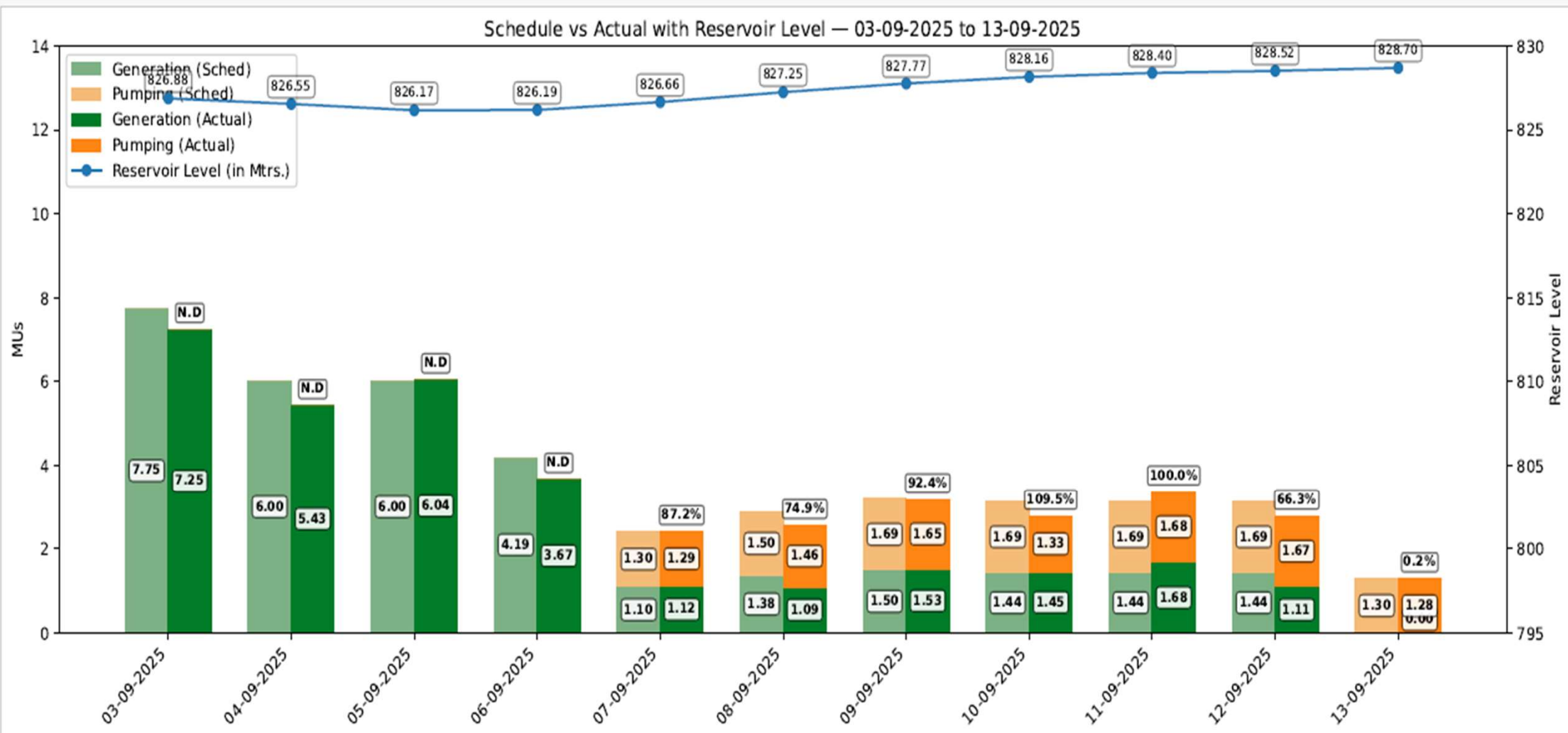
# Tehri PSP: Generation & Pumping vis-a vis Reservoir level



# Tehri PSP: Generation & Pumping vis-a vis Reservoir level



# Tehri PSP: Generation & Pumping vis-a vis Reservoir level



## OPERATION OF TEHRI PSP DURING ACTIVE MONSOON AND SPILLAGE CONDITIONS

### 1. Background

Tehri Pumped Storage Plant (PSP) is an integral part of the Tehri Power Complex, which consists of:

- a) Tehri HPP – 4 × 250 MW
- b) Koteshwar HEP – 4 × 100 MW
- c) Tehri PSP – 4 × 250 MW

Tehri HPP and PSP share common infrastructure, including upper, lower reservoirs and the power evacuation system, hence operational requirements of these plants interdependent and aligned with management of reservoirs.

Operation of Tehri PSP is being done as per as per **“Operational Philosophy of Tehri PSP with Integrated Operation of the 2400 MW Tehri Power Complex” (Annexure-A)**, which is prepared as per operational requirements of plants, reservoir, multipurpose commitment of the Tehri Power Complex. Scheduling of plant formulated based on peaking requirements of beneficiaries, seasonal variation in plant capacity as per availability of reservoir level and downstream requirements of water for drinking & irrigation.

### 2. Existing provision pertains to operation in monsoon period:

As per philosophy followings are key operating conditions mentioned for operation of PSP and relevant during monsoon:

- i. Upstream Reservoir (Sl. No 3.2): *“Tehri reservoir shall act as upstream reservoir for Tehri PSP and operation/management of Tehri reservoir shall be done as per reservoir rule curve and approved methodology of operation of the reservoir”*
- ii. Operation of Tehri PSP and HPP is interdependent owing to common infrastructures shared by projects, and simultaneous opposite mode operation i.e. pumping mode of PSP with operation of HPP is avoided from the economic perspective of the power system(Sl. 4.1.3).
- iii. All hydrological inflow shall be used for generation through Tehri HPP and except spillage of water. (Sl.4.1.3)
- iv. During monsoon period, cycle operation of Tehri PSP may be suspended during round the clock operation of Tehri HPP owing to unanticipated excess hydrology, .

During monsoon and spillage condition, PSP units are available to operate as conventional Hydro plant. Hence in order to avoid wastage of water through spillage, generation mode operation of Tehri PSP is opted, this is also in line with Reservoir operation framework of Tehri.

### 3. Reservoir Operation and Plants Operation:

- i. Reservoir Management Framework is given in **“Operation and Maintenance Manual of Tehri Dam Project” (Annexure-B)**, which was prepared and issued in 2020 in line

with Dam Safety Bill 2019 and guidelines issued by the Central Water Commission (CWC) for dam operation and safety. Dam Safety Bill subsequently enacted as Dam Safety Act 2021.

It is also worth to mention that Dam and downstream safety is the first priority while formulating the operational framework of Dam and plants. In monsoon period, plant operation followed the operation requirement of Dam. In this line, **the Reservoir Rule Curve, detailed under Clause 2.2.4 of the O&M Manual, prescribes the guiding limits for reservoir operation. The relevant operating zones of the Tehri Reservoir are summarized below:**

| Zone of Reservoir         | RL in m (from-to)       | Remark                                                                      |
|---------------------------|-------------------------|-----------------------------------------------------------------------------|
| Dead Storage Zone         | Up to 700 (ILO Intake)  | –                                                                           |
| Buffer Zone               | 700 – 740 (MDDL)        | Water can be drawn from the reservoir in draught like situation through ILO |
| Conservation Zone         | 740 – 815 (Crest Level) | Regulation can be done through powerhouse only                              |
| <b>Flood Control Zone</b> | <b>815 – 830 (FRL)</b>  | Regulation can be done through spillways (gated) & powerhouse only          |
| <b>Surcharge Zone</b>     | <b>830 – 835 (MWL)</b>  | Regulation of PMF with all three (gated & un-gated) spillways               |

At Sl 2.2.5 Flood peak of different return periods are given, it is highlighted that as per historical data/observations that floods having peak discharge of the order 3500 cumecs or having peak discharge of around 10 years return period flood are common. It is therefore proposed that a provision for regulation of such a flood should always be kept in mind till the active monsoon period is over. Such a flood may be treated as normal flood in Tehri dam catchment area.

**ii. Reservoir Operation for Normal Period:**

As mentioned above, the floods having discharge up to 10 year return period flood will be considered normal. An inflow forecasting system has been established for Tehri dam reservoir which gives flood forecasts with 6 hrs. lead time and 24 hrs. lead time based on observed hydrometeorological data and IMD forecasts respectively. The following factors will decide the

- i. Reservoir level w.r.t. rule curve,
- ii. Rate of rise in the reservoir level in a particular 10-daily period / anticipated reservoir level at the end of a particular 10-daily period w.r.t. rule curve,

- iii. Cushion available in the reservoir to absorb incoming flood volume based on flood forecasted by the inflow forecasting system
- iv. Prevailing flood situation in the d/s of dam at Rishikesh and Haridwar.

There may be the following different scenarios of reservoir management when inflow exceeding powerhouse capacity but not exceeding peak flow of 10 year return period flood:

| Anticipated res. Level at the end of 10-Daily wrt rule curve | Cushion available for incoming flood | Flood situation in the d/s of dam | Regulation to be done through                      |
|--------------------------------------------------------------|--------------------------------------|-----------------------------------|----------------------------------------------------|
| < or =                                                       | Not Relevant                         | Not Relevant                      | PH Only                                            |
| >                                                            | Y                                    | Not Relevant                      | PH Only                                            |
|                                                              | Partly                               | Relevant                          | PH & Spillway (In Co-ordination with Distt Admin.) |
|                                                              | N                                    | Not Relevant                      |                                                    |

Similarly, reservoir operation for higher floods are given at 2.2.7 in manual.

#### 4. Operation of Tehri PSP in active monsoon and spillage conditions:

- i. Regulation of water and plant operations done in accordance with the prescribed guidelines detailed in the ***“Operation and Maintenance Manual of Tehri Dam Project”***
- ii. Water/Flood regulation carried out through spillways only after the reservoir level exceeds EL 815 m (crest level of Chute and Left Bank Shaft Spillways). Below EL 815 m, regulation done through Tehri Powerhouse in line with target 10-daily reservoir levels.
- iii. Reservoir level exceeds EL 815.00 m and spillage condition arises. Normally, under such scenario round the clock operation of Tehri HPP expected to release maximum water, hence, during this period Cycle operation of Tehri PSP is avoided in pumping mode and excess water shall be utilized in generation mode operation of Tehri PSP to avoid the spillage upto extent possible.

Operational philosophy of Tehri PSP has been framed with multi-objective optimization (Energy Generation, Energy Storage, Flood Control, Dam safety, Drinking & Irrigation requirements, Peaking Requirements of beneficiaries etc.) and provide flexibility in managing during active monsoon and spillage conditions through integrated operation of the Tehri Power Complex. By effectively utilizing the reservoir zones, adhering to the Rule Curve, and coordinating releases through power houses and spillways, the O&M practices of Tehri Power Complex adhere to regulatory and Safety norms to ensure both upstream and downstream safety while maximizing generation potential. At the same time, it is recognized that reservoir management and PSP operation is a dynamic process influenced by hydrological variability, system conditions, and stakeholder requirements. Accordingly, there remains continuous scope to refine and strengthen this operational framework through learning,

experience, technological advancements in forecasting, and close coordination with all stakeholders.