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

दिनांक: 22.03.2025

सेवा में
As per attached list of Members and Other invitees

विषय: संरक्षण उप-समिति की 58 वीं बैठक की कार्यसूची |
Subject: Agenda for 58th Protection Sub-Committee Meeting.

संरक्षण उप-समिति की **58 वीं बैठक, दिनांक 26.03.2025 को 10:30 बजे** से एनआरपीसी सचिवालय, कटवारिया सराय, नई दिल्ली में आयोजित की जाएगी | उक्त बैठक की कार्यसूची संलग्न है । यह उत्तर क्षेत्रीय विद्युत् समिति की वेबसाइट (http://164.100.60.165/) पर भी उपलब्ध है | 56 वीं पीएससी बैठक के निर्णयों के अनुसार, आईईजीसी 2023 के सुरक्षा कोड का अनुपालन सुनिश्चित करने के लिए एनआरपीसी सदस्य के अलावा अन्य विद्युत उपयोगिताओं को भी बैठक के लिए आमंत्रित किया गया है। **कृपया बैठक मे उपस्थिति सुनिश्चित करें ।**

The **58th meeting** of Protection Sub-Committee is scheduled to be held on **26.03.2025** at **10:30 Hrs** at NRPC Secretariat, Katwaria Sarai, New Delhi. The agenda for the meeting is attached herewith. The same is also available on NRPC website (http://164.100.60.165/). As per decisions of 56th PSC meeting, utilities other than NRPC member have also been invited for meeting for ensuring compliance of protection code of IEGC 2023. Kindly make it convenient to attend the same.

Signed by Dharmendra Kumar Meena
Date: 23-03-2025 09:52:20

डी. के. मीणा
निदेशक (संरक्षण)

Contents

Part-A: Agenda by NRPC Secretariat.....3

Agenda of 58th Protection Sub-Committee Meeting (26th March, 2025)

A.1. Confirmation of minutes of 57th meeting of Protection Sub-Committee....3

A.2. Status of action taken on decisions of 57th Protection Sub-Committee meeting (agenda by NRPC Secretariat)....3

A.3. Submission of protection performance indices along with reason and corrective action taken for indices less than unity to NRPC Secretariat for month of Feb-2025 (agenda by NRPC Secretariat). 3

A.4. Annual protection audit plan for FY 2024-25 (agenda by NRPC Secretariat)....5

A.5. Annual protection audit plan for FY 2025-26 (agenda by NRPC Secretariat)....5

A.6. Third-party protection audit plan (agenda by NRPC Secretariat)....6

A.7. Discussion on audit reports submitted by utilities and compliance of recommendations of protection audit (agenda by NRPC Secretariat)....6

A.8. Tripping of Type-3 filters (5/27) on overload protections at HVDC Rihand & Dadri terminals due to elevated 5th order harmonics from external AC sources (agenda by POWERGRID, NR-3)....9

A.9. Study for implementation of 3ph-auto RECLOSING in 400 kV Bareilly PG - Moradabad transmission line (In case of L-L and L-L-G Fault) (agenda by POWERGRID NR-3)....10

A.10. Suggestion on remedial measures to prevent power swings in the Grid causing unwanted tripping (agenda by RVUNL)....11

A.11. Revised SPS for 2x315 MVA, 400/220 kV ICTs at 400 kV GSS Merta & 2x315 MVA, 400/220 kV ICTs at 400 kV GSS Ajmer (agenda by RVPN)....12

A.12. Provisions of line differential relays at BBMB substations (agenda by BBMB)....13

A.13. Expedited Completion of Temporary Arrangement for 400kV STPS(O&M) – Ratangarh Line and 400kV Suratgarh Supercritical-Babai D/C line and Provide Status Update (agenda by RVUNL)....14

A.14. Proposed settings of 765 kv lines in Northern Region by committee constituted to review the Overvoltage Protection settings of 400kV and 765kV transmission lines in Northern Region (agenda by NRPC Secretariat)....15

A.15. Un-necessary Trippings on 220KV ANTA-LALSOT Line (agenda by RVPN)....16

Part-B: Agenda by NRLDC....17

B.1 Status of remedial actions recommended during previous PSC meeting (agenda by NRLDC). 17

B.2 Multiple elements tripping events in Northern region in the month of February 2025 (agenda by NRLDC)....18

B.3 Analysis of the tripping events occurred during February-2025 and status of remedial action taken (agenda by NRLDC)....18

B.4 Details of tripping of Inter-Regional lines from Northern Region for Feb'25 (agenda by NRLDC) 19

B.5 Mock testing of System Protection Schemes (SPS) in Northern Region (agenda by NRLDC)...20

B.6 Implementation of Automatic load shedding scheme in SPS related to Safe evacuation of generation at Chhabra/ Chhabra Super Critical/ Kawai/ Kalisindh Complex (agenda by NRLDC)....21

B.7 Corrective action for healthiness of 500kV Mundra-Mahindergarh SPS (agenda by NRLDC). .22

Part-C: Agenda for final approval of protection settings by PSC Forum for FTCs which have been provisionally allowed by NRLDC/SLDCs....25

C.1. First Time Charging of transmission lines/Bays/Transformer/Reactor etc. by NRLDC in month of Feb-2025.....25

Agenda for 58th Meeting of Protection Sub-Committee (PSC) of Northern Regional Power Committee

Date and time of meeting	***:***	***26.03.2025 10.30 Hrs.***
Venue	***:***	***NRPC Secretariat, Katwaria Sarai, New Delhi***

Part-A: Agenda by NRPC Secretariat

A.1. Confirmation of minutes of the 57th meeting of Protection Sub-Committee

A.1.1 57th PSC meeting was held on 20.02.2025. Minutes of the meeting were issued vide letter dt. 21.03.2025. No comment has been received till date.

Decision required from Forum:

Forum may approve the minutes of meeting.

A.2. Status of action taken on decisions of 57th Protection Sub-Committee meeting (agenda by NRPC Secretariat)

A.2.1 Status of action taken on the decisions of the 57th PSC meeting is attached as **Annexure-A.I.**

***Decision* required from Forum**

Status may be deliberated for timely action on issues.

A.3. Submission of protection performance indices along with reason and corrective action taken for indices less than unity to NRPC Secretariat for month of Feb-2025 (agenda by NRPC Secretariat)

A.3.1 *As per clause 15 (6) of IEGC 2023;*

- *Users shall submit the following protection performance indices of previous month to their respective RPC and RLDC on monthly basis for 220 kV and*

above (132 kV and above in NER) system, which shall be reviewed by the RPC:

*a) The **Dependability Index** defined as* $D = Nc/Nc+Nf$

*b) The **Security Index** defined as* $S = Nc/Nc+Nu$

*c) The **Reliability Index** defined as* $R = Nc/Nc+Ni$

where,

Nc is the number of correct operations at internal power system faults,

Nf is the number of failures to operate at internal power system faults,

Nu is the number of unwanted operations,

Ni is the number of incorrect operations and is the sum of Nf and Nu

- *Each user shall also submit the reasons for performance indices less than unity of individual element wise protection system to the respective RPC and action plan for corrective measures. The action plan will be followed up regularly in the respective RPC.*

A.3.2 In earlier PSC meeting, it was decided that each utility shall submit the performance **indices of previous month by 7th day of next month.**

A.3.3 Accordingly, the status of the indices reported for the month of **Feb-2025** is attached as **Annexure-A.II.**

A.3.4 Further, based on submitted data by the utilities as on date, the summary of events that caused indices less than unity is also attached as **Annexure-A.III.**

A.3.5 **Submitted data has following issues:**

Some Utilities have not submitted data for Feb-2025	As mention in Annexure-A.II.
Utilities have submitted data for some plants but not all.	**PGCIL (NR-2)** **NTPC (Anta. Auriya, Koldam, Rihand, Unchahar, Singrauli)** **THDC-Koteshwar** **NPCIL (RAPS-C)** **UPRVUNL (Obra-C)**
Some utilities have sent data after cut-off date of	As mention in Annexure-A.II.

7th	

Decision required from Forum:

i. Forum may discuss cases where indices are less than 1.

ii. Forum may direct utilities to submit the performance indices of previous month by 7th day of next month element wise along with the reason for indices less than unity and corrective action taken.

A.4. Annual protection audit plan for FY 2024-25 (agenda by NRPC Secretariat)

A.4.1 As per clause 15 of IEGC 2023;

- *Annual audit plan for the next financial year shall be submitted by the users to their respective **RPC by 31st October**. The users shall adhere to the annual audit plan and report compliance of the same to their respective RPC.*

A.4.2 Starting from 48th PSC and in every PSC meeting, all utilities were requested to submit the annual protection audit plan.

A.4.3 In view of above, annual audit plans submitted by utilities have been compiled (enclosed as **Annexure- A.IV**).

Decision required from Forum:

Utilities may submit annual audit plans and reports of audit in FY 2024-25. Compliance reports for the audited substation may be submitted.

A.5. Annual protection audit plan for FY 2025-26 (agenda by NRPC Secretariat)

A.5.1 As per clause 15 of IEGC 2023;

- *Annual audit plan for the next financial year shall be submitted by the users to their respective RPC by 31st October. The users shall adhere to the annual audit plan and report compliance of the same to their respective RPC.*

A.5.2 In view of above, all utilities were requested to submit the annual protection audit plan for FY-2025-26 latest by 31st October 2024 in the 53rd PSC meeting. Further, concerned utilities were requested to submit the same at the earliest in every PSC meeting since then.

A.5.3 Accordingly, annual audit plans submitted by utilities have been compiled (enclosed as **Annexure- A.V**).

Decision required from Forum:

Forum may direct utilities who have not submitted audit plans for FY 2025-26 as the deadline of 31st October 2024 has already passed.

A.6. Third-party protection audit plan (agenda by NRPC Secretariat)

A.6.1 As per clause 15 of IEGC 2023:

All users shall also conduct third party protection audit of each sub-station at 220 kV and above (132 kV and above in NER) once in five years or earlier as advised by the respective RPC.

A.6.2 In view of above, third party audit plans submitted by utilities have been compiled (enclosed as **Annexure-A.VI)**.

Decision required from Forum:

Forum may direct utilities to update the status of 3rd party protection audit as per the submitted audit plans. Subsequently, the audit reports along with compliance status may be submitted to NRPC Secretariat regularly.

A.7. Discussion on audit reports submitted by utilities and compliance of recommendations of protection audit (agenda by NRPC Secretariat)

A.7.1 As per clause 15 (1) of IEGC 2023*;*

- *All users shall conduct internal audit of their protection systems annually,* ***and any shortcomings identified shall be rectified and informed to their respective RPC****. The audit report along with action plan for rectification of deficiencies detected, if any, shall be shared with respective RPC for users connected at 220 kV and above (132 kV and above in NER).*

A.7.2 As per clause 15 (4) of IEGC 2023*;*

The third-party protection audit report shall contain information sought in the format enclosed as Annexure–1 (IEGC). The protection audit reports, along with **action plan**

for rectification of deficiencies detected, if any, shall be submitted to the respective RPC and RLDC or SLDC, as the case may be, within a month of submission of third-party audit report. The necessary compliance to such protection audit report shall be followed up regularly in the respective RPC.

A.7.3 Following utilities have submitted the internal audit report (FY 2024-25) based on the audit done at their substations:

S.N.	Utility	Stations
1	RVPN	220kV Substations - Ratangarh, Badnu, Bikaner, Chhatargarh, Gajner, Halasar, Nokha, Goner, NPH, Sanganer, SEZ, VKIA, Shri Dungarhgarh, Sujangarh, Tehendesar 400kV substations- Chittorgarh, Akal
2	THDC	Tehri
3	Tata Power	300MW Bhanipura, 225MW, NOORSAR 150MW MSEDCL
4	RVUN	400kV CSCTPP, Chhabra, 220kV DCCPP, Dholpur, Suratgarh Super Thermal Power Station, Suratgarh
5	UPRVUNL	Parichha-BTPS, CTPS
6	UJVNL	220kV Dharasu
7	HPGCL	RGTPP, Khedar
8	HVPNL	220kV S/s Mohana
9	Others	ADHPL

A.7.4 Following utilities have submitted reports of 3rd Party audit:

S.N.	Utility	Stations
1	UJVNL	220kV Dharasu

A.7.5 Compliance/ action plan on recommendation of audit has been submitted by following:

S.N.	Utility	Stations
1	HVPNL	220kV S/s Mohana (internal audit)
2	UJVN	220kV Dharasu (external audit)
3	LPGCL	Updated action taken for Internal audit done in Nov'24
4	LPGCL	Updated action taken for External audit done in Oct'24

A.7.6 **The above submitted reports and action plan are available at NRPC website: http://164.100.60.165/meetings/prsub.html**

Decision required from Forum:

Forum may discuss audit report as well as action taken by utilities on recommendations of audit. Further, other utilities may be directed to submit the protection audit report (for audited S/s as per submitted plan) to NRPC Secretariat and may update the compliance status regularly.

A.8. Tripping of Type-3 filters (5/27) on overload protections at HVDC Rihand & Dadri terminals due to elevated 5th order harmonics from external AC sources (agenda by POWERGRID, NR-3)

A.8.1 HVDC Rihand and Dadri are experiencing tripping of Type-3 filters (Z13, Z23, & Z33) due to overload protections. There are three Type-3 Filter Banks, named Z13, Z23, and Z33, installed at each terminal to prevent the 5th and 27th order harmonics.

A.8.2 It has been observed that whenever any of the Type-3 Filter Banks (5/27) are charged either from RPC or manually, they trip on resistive or reactive overload protections, all three Type-3 filter banks (Z13, Z23, and Z33) are currently isolated at both HVDC Rihand and Dadri terminals.

A.8.3 The analysis concluded that the converter-generated harmonics are within the design limits, but external 5th harmonics present in the Grid are causing the Type-3 Filters to trip on Resistor and Reactor Overload Protection.

A.8.4 The same agenda was discussed in the 57th PSC meeting wherein POWERGRID proposed to review the 5th harmonics in the Grid and resolve the issue. *Forum decided that the agenda may be discussed with detailed analysis and study report in the next PSC meeting. POWERGRID may approach to OEM and may also take expert opinion from expert or third-party audit vendor to analyse and find out the root cause.*

A.8.5 Accordingly, POWERGRID has submitted the agenda with detailed report on analysis of the issue, including harmonic measurements, findings attached as **Annexure-A.VII.**

A.8.6 The analysis of the harmonic measurements revealed the following key observations:

A. **Elevated 5th Order Harmonics**: The 5th order harmonic levels were significantly higher than the harmonic data recorded at the time of commissioning. At the time of commissioning 5th harmonic Current was in the range of 1.25 amps, which elevated up to 3.021 amps at the Power flow of 1000 MW.

B. **External Source:** The elevated 5th order harmonics may be attributed from external sources within the grid, which exceed the limit of harmonic settings of the Type-3 filter banks (Z13, Z23, and Z33) and finally trips the filter banks (Z13, Z23, and Z33).

A.8.7 In view of above, POWERGRID has requested Forum that matter of the 5th harmonics infusion in the Grid may be reviewed and provide needful solution to resolve the issue.

Decision required from Forum:

Members may deliberate on issue and suggest solution to resolve the issue.

A.9. Study for implementation of 3ph-auto RECLOSING in 400 kV Bareilly PG - Moradabad transmission line (In case of L-L and L-L-G Fault) (agenda by POWERGRID NR-3)

A.9.1 During 51st PSC (agenda point A.13), POWERGRID has raised the concern for 3-Phase A/R of Transmission lines due to intermittent L-L fault under the Bareilly-PG jurisdiction due to kite threads and majorly in 400kV Bareilly- Moradabad Transmission line.

A.9.2 In 51st PSC meeting, Forum requested POWERGRID to perform protection simulation studies and then put up the matter again in upcoming meetings. POWERGRID may perform simulation study itself or may approach/engage any expert/consultant for same.

A.9.3 Accordingly, POWERGRID has done a Study (attached as **Annexure-A.VIII**) for implementation of 3ph-Auto Reclosing in 400 kV Bareilly PG - Moradabad Transmission Line. A simulation was conducted using PSS-E software to analyse the system's behaviour, focusing on bus voltages and the angle response during three-phase auto-reclosing due to a phase-to-phase fault.

A.9.4 Simulation study has been examined for the following scenarios:

- Three Phase Auto reclosing for temporary line to line fault
- Three Phase Auto reclosing for permanent line to line fault
- Three Phase Auto reclosing for temporary line to line fault under line contingencies
- Three Phase Auto reclosing for permanent line to line fault under line contingencies

A.9.5 Simulation study has been submitted to NRLDC vide mail dated-14th feb'2025 for review and further clearance for implementation. POWERGRID has plan to implement adaptive 3-Phase A/R in this line **firstly A/R close from Moradabad end** (due to lower fault level) and if **succeeded then attempted from Bareilly PG end**.

A.9.6 This study invites that transient nature fault type L-L and L-L-G due to kite threads, and another foreign material will be mitigating, and consequently reliability of Grid is increased.

Decision required from Forum:

Forum may discuss and consider to approve the proposal of POWERGRID.

A.10. Suggestion on remedial measures to prevent power swings in the Grid causing unwanted tripping (agenda by RVUNL)

A.10.1 RVUNL has submitted that the load/power swings in the range of 65-80 MW are being observed in 2x660MW Unit-7 & 8 of SSCTPS, RVUN, Suratgarh. These swings are normally observed during the time of RE injection i.e 10:30 AM to 11:30 AM. Sometimes when the swings are higher, it results in operation of Load Shedding logic, on which Turbine control valves closes (HPCV & IPCV) and unit trips on Low forward power. On this phenomenon, Unit-8 of SSCTPS, Suratgarh (660 MW) tripped 5 times in past 3 months.

A.10.2 Tripping details of Unit#8 are as detailed below:-

Sr. No.	Date	Time
1	29/11/2024	10:48 Hrs
2	05/12/2024	10:31 Hrs
3	08/12/2024	10:59 Hrs
4	29/01/2025	10:37 Hrs
5	19/02/2025	10:39 Hrs

A.10.3 The RVUNL has requested to look into the matter and suggest some remedial measures to prevent power swings in the power grid so that such unwanted trippings may be avoided.

Decision required from Forum:

Forum may discuss and suggest remedial measures to prevent power swings in the power grid.

A.11. Revised SPS for 2x315 MVA, 400/220 kV ICTs at 400 kV GSS Merta & 2x315 MVA, 400/220 kV ICTs at 400 kV GSS Ajmer (agenda by RVPN)

A.11.1 RVPN vide letter dated 18.03.2025 has submitted that SPS for the 2x315 MVA, 400/220 kV ICTs at 400 kV GSS Merta and SPS for the 2x315 MVA, 400/220 kV ICTs at 400 kV GSS Ajmer approved in the 194th OCC meeting (held on 20.04.2022)

was based on taking the trip command from the 86 relay installed on 220kV side of both the 2x315 MVA, 400/220 kV ICTs at 400 kV GSS Merta and 400 kV GSS Ajmer.

A.11.2 Hence, the existing SPS gives the relief in the event of tripping of the transformers and it does not take care of the ICT overloading. Hence, a generalized SPS was required which can take care of the tripping of the ICTs and overloading of the ICTs.

A.11.3 In this regard, revised SPS for the 2x315 MVA, 400/220 kV ICTs at 400 kV GSS Merta was discussed in the 229th OCC meeting held on dated 12.03.2025 and OCC Forum has directed to discuss the revised SPS in 58th Meeting of Protection Sub-Committee.

A.11.4 The revised SPS of 2x315MVA, 400/220 kV ICTs at 400 kV GSS Merta & revised SPS of the 2x315 MVA, 400/220 kV ICTs at 400 kV GSS Ajmer alongwith revised logics have been submitted by RVPN for approval. (Proposed revised SPS schemes are attached as **Annexure-A.IX.**

Decision required from Forum:

Forum may discuss and accord approval for revision in the SPS scheme or suggest modification if any.

A.12. Provisions of line differential relays at BBMB substations (agenda by BBMB)

A.12.1 BBMB has submitted that the following lines belonging to state utilities i.e. PSTCL, HVPNL, provision of line differential relays may be considered on account of the fact that problem is faced for clearance of faults on such lines by Distance protection schemes.

Sr. no.	Name of Line	Line length	Ownership	Remarks
1	220kV Jamalpur-Dhandari Ckt. I & II at 220kV BBMB Jamalpur S/s	3.75 kms (for both ckts)	PSTCL	• Line differential relay provided on 220kV Jamalpur-Dhandari Ckt. II. But not commissioned. • Due to proposed

				LILO of 220kV Jamalpur Dhandari Ckt-I at PSTCL SherpurS/s, Line differential relay to be provided (new line length approx. 2kms.)
2	220kV Hisar IA Ckt. I & II at 220kV 220kV BBMB Hisar S/s	3.2 & 3.7 kms.	HVPNL	Line differential relays required to be provided on such circuits as DPRs are not able to discriminate zones during faults.
3	66kV Railway Ckt. I & II and 66kV Hyderabad feeders at 220kV BBMB Ballabgarh S/s	2.0 kms. (Railway Ckt. I & II) and 1.1 kms. (Hyderabad feeder)	HVPNL	Provisions of line differential relay required as faults on these circuits are cleaned by upstream transformers and not cleared by respective DPRs.

A.12.2 BBMB has requested that concerned Power Utilities may be impressed upon for expeditions action in the matter.

Decision required from Forum:

Forum may deliberate and direct the concerned accordingly.

A.13. Expedited Completion of Temporary Arrangement for 400kV STPS(O&M) – Ratangarh Line and 400kV Suratgarh Supercritical-Babai D/C line and Provide Status Update (agenda by RVUNL)

A.13.1 RVUNL has invited the reference to the discussions held in the meeting regarding bilateral issues between state power utilities of Rajasthan held on 19.10.2024, it was

decided that RRVPNL will conduct a field survey by 15.11.2024 for the feasibility of a temporary arrangement to connect one circuit of the 400kV Suratgarh Thermal-Ratangarh line to one circuit of the 400kV Suratgarh Supercritical-Babai D/C line. This work includes the erection of two new towers to facilitate the rearrangement, ensuring the reduction of high loading on the 400kV Switchyard STPS, Suratgarh and 400kV STPS-Ratangarh lines.

A.13.2 During the meeting, RRVPNL had assured that the said work would be completed by December 2024. However, considering the anticipated high load conditions at the 400kV Switchyard of STPS Suratgarh during the upcoming summer season due to increased solar power generation, it is crucial to complete this work at the earliest to avoid any operational challenges and overloading issues.

A.13.3 Regarding expedite the execution of the proposed arrangement and provide the latest status of work progress a letter (attached as **Annexure-A.X**) was also written on dated 07/02/2025 by Chief Engineer (O&M), STPS, RVUN, Suratgarh to The Zonal Chief Engineer (T&C), RVPN, Jodhpur but no update provided till now.

A.13.4 Accordingly, RVUNL has requested Forum to arrange the expeditious execution of the proposed arrangement and latest status of work progress

Decision required from Forum:

Forum may deliberate and direct the concerned accordingly.

A.14. Proposed settings of 765 kv lines in Northern Region by the committee constituted to review the Overvoltage Protection settings of 400kV and 765kV transmission lines in Northern Region (agenda by NRPC Secretariat)

A.14.1 In 52nd Protection Sub-Committee (PSC) meeting, held on 20.09.2024, it was decided to constitute a committee to review the Overvoltage Protection settings of 400kV and 765kV transmission lines in Northern Region.

A.14.2 The committee has discussed the settings in 4 meetings held virtually. Settings has been finalized for 400 kv and 765 kv level. Settings of 400 kv may be found at below link:

https://docs.google.com/spreadsheets/d/1j5uY4m2W26X-1mJ9IQRxQyQU1Y7yr09uQHt6Nr5JZ1Y/edit?usp=sharing

A.14.3 Settings of 765 kV may be found at **Annexure-A.XI.**

A.14.4 The agenda was discussed in the 57th PSC meeting wherein it was highlighted that the above committee has no members from some states, therefore, settings may be examined for any issue.

A.14.5 Subsequently, Forum decided that the settings, finalized by the Committee may be shared with all states of NR and concerned transmission utilities. Forum referred the agenda to the next PSC meeting for final approval.

A.14.6 Accordingly, agenda has been taken for final approval.

Decision required from Forum:

Forum may deliberate and approve the recommended settings of Committee.

A.15. Un-necessary Trippings on 220KV ANTA-LALSOT Line (agenda by RVPN)

A.15.1 The agenda was discussed in the 57th PSC meeting wherein RVPN submitted that 220 kV GSS Lalsot has two sources of supply, (i) 220 kV Anta line (NTPC) and (ii) 220kV Dausa line (RVPN), out of which, CB of 220 kV Dausa line normally remains open at Dausa end. Practically, 220 kV Anta line is generally the only source of supply to 220 kV Lalsot GSS.

A.15.2 Abnormal trippings have occurred in recent past on 220 kV Anta- Lalsot line at Anta end. Some of these interruptions are detailed below:-

(i) On dated 09.08.2024 a fault occurred on 132 kV Main Bus at 220 kV GSS Lalsot and 220 kV Anta- Lalsot line tripped from Anta end. Although, both 220 kV transformers tripped at 220 kV GSS Lalsot and the fault was cleared, there should be no tripping on 220 kV Anta Lalsot line.

(ii) On dated 23.08.2024 and 05.09.2024 Auto reclose operated at Lalsot end but 220 kV Anta- Lalsot line remained tripped from Anta end.

(iii) On dated 10.10.2024 a CT of 132 kV feeder burst at 220 kV GSS Lalsot and Bus Bar protection operated at Anta end.

(iv) On dated 01.11.2024 and 14.01.2025 a fault occurred on 220 kV Dausa line, which is charged from 220 kV Lalsot and CB open at Dausa end. The CB at 220kV GSS Lalsot cleared the fault in Z1 time but simultaneously 220 kV Lalsot- Anta line also tripped from Anta end.

(v) On dated 17.01.2025 a fault occurred on 132kV feeder and 220 kV Lalsot- Anta line also tripped from Anta end with this fault.

A.15.3 RVPN engineers are regularly contacting the engineers at Anta (NTPC) and it was appraised by Anta (NTPC) engineers that Bus Bar protection PU of 220 kV Anta-Lalsot line is defective and the supply to 220 kV GSS is given through transfer bus. This defective PU causes the operation of Bus Bar protection with external faults of low intensity.

A.15.4 Even after pursuance several times **NTPC is neither blocking the defective PU nor revising the settings to avoid such unnecessary interruptions.**

A.15.5 In 57th PSC meeting, RVPN representative suggested that the reflected fault current on 220 kV Anta NTPC - Lalsot line due to fault on 132 kV side comes around 4 kA. He also proposed that the setting of Bus Bar Differential current shall be 4kA instead of 1.8 kA to stop such unwanted tripping as the PU is lying defective since long.

A.15.6 During 57th PSC meeting, Forum decided to deliberate the agenda in the next PSC meeting. NTPC was requested to submit comment on proposal of RVPN in writing before next PSC.

A.15.7 Accordingly, agenda has been taken again and NTPC may submit the comment on the proposal of RVPN.

Decision required from Forum:

Based on comments of NTPC on the proposal of RVPN, members may deliberate and suggest solution.

Part-B: Agenda by NRLDC

B.1 Status of remedial actions recommended during previous PSC meeting (agenda by NRLDC)

B.1.1 As per the discussion in previous PSC meetings, necessary remedial actions were recommended based on the analysis and discussion of the grid events. It is expected that necessary actions would have taken place. In view of the same, constituents are requested to share the status of remedial actions taken. List of points to be discussed in the 58th PSC meeting is attached as **Annexure-B.I**. Constituents can email the details via mail to NRLDC and NRPC.

Decision required from Forum:

Members may like to discuss.

B.2 Multiple elements tripping events in Northern region in the month of February 2025 (agenda by NRLDC)

B.2.1 A total of **16** grid events occurred in the month of **February 2025** of which **06** are of GD-1 category, **05** are of GI-2 Category and **05** are of GI-1 Category. The tripping report of all the events has been issued from NRLDC. A list of all these events is attached at **Annexure-B.II.**

B.2.2 Maximum delayed clearance of fault observed in the event of multiple elements tripping at 400/220kV Daulatabad(HS) at 08:11 hrs on 27th February, 2025 (As per PMU at Gurgaon(PG), B-N phase to earth fault with delayed fault clearing time of ~1080 msec is observed).

B.2.3 Delayed clearance of fault (more than 100ms for 400kV and 160ms for 220kV system) observed in total 04 events out of 16 grid events occurred in the month. In 04 (no.) of grid events, there was no fault in the grid.

B.2.4 Remedial actions taken by constituents to avoid such multiple elements tripping may be shared.

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 the event to RLDC and RPC.

B.2.5 Members may take necessary preventive measures to avoid such grid incidents / disturbances in future and report actions taken by respective utilities in OCC & PSC forum. Moreover, utilities may impress upon all concerned for providing the Preliminary Report, DR/EL & Detailed Report of the events to RLDC in line with the regulations.

Decision required from Forum:

Members may like to discuss.

B.3 Analysis of the tripping events that occurred during February-2025 and the status of remedial action taken (agenda by NRLDC)

a) Frequent elements tripping during February 2025:

B.3.1 The following transmission elements were frequently tripping during the month of **Feb'25**:

S. NO.	Element Name	No. of forced outages	Utility/ SLDC
1	220 KV RAPS_A(NP)-Sakatpura(RS) (RS) Ckt-1	8	NPCIL/Raj
2	220 KV Debari(RS)-RAPS_A(NP) (RS) Ckt-1	3	NPCIL/Raj
3	220 KV Panipat(BB)-Narela(DV) (BBMB) Ckt-3	3	BBMB/Delhi

List of tripping is attached as **Annexure-B.III**.

B.3.2 It may be noted that frequent tripping of such elements affects the reliability and security of the grid. Hence, utilities are requested to analyse the root cause of the tripping and share the remedial measures taken/being taken in this respect.

b) Protection related issues in multiple elements tripping, detailed analysis of the events and status of remedial measures:

B.3.3 The list of major tripping events that occurred during February 2025 is attached as **Annexure-B.IV.** Concerned constituents/utilities are requested to share the detailed analysis of the tripping elements along with the status of remedial action taken/to be taken.

Decision required from Forum:

Utilities are requested to prepare a detailed analysis report and present the event details during 58th PSC meeting. Events involving more than one utility may be jointly prepared and presented in Forum.

.

B.4 Details of tripping of Inter-Regional lines from Northern Region for Feb'25 (agenda by NRLDC)

B.4.1 A total of 4 inter-regional lines tripping occurred in the month of February 2025. The list is attached at **Annexure-B.V.** The status of receipt of preliminary reports, DR/EL within 24hrs of the event and fault clearing time as per PMU data has also been mentioned in the table. The non-receipt of DR/EL & preliminary report within 24hrs of the event from SLDCs / ISTS licensees / ISGSs is in violation of regulation 37.2(c) of IEGC and regulation 15(3) of CEA Grid Standards. As per regulations, all the utilities shall furnish the DR/EL, flag details & preliminary report to RLDC/RPC within 24hrs of the event. They shall also furnish the detailed investigation report within 7 days of the event if fault clearance time is higher than that mandated by CEA (Grid Standard) Regulations.

Decision required from Forum:

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

B.5 Mock testing of System Protection Schemes (SPS) in Northern Region (agenda by NRLDC)

B.5.1 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.''

B.5.2 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.''

B.5.3 There are 56 numbers of System Protection Scheme (SPS) approved in the Northern

Region. These SPS are implemented at major generation complexes, important evacuating transmission lines and ICTs which are N-1 non-compliant. The System Protection Scheme Document of Northern Region has been revised/updated on 28th February, 2025. Revised version of the document is available on the NRLDC website in the Document section and can be accessed at the below link: https://newnr.nrldc.in/documents/Documents.

B.5.4 SPS is designed to detect abnormal system conditions and take predetermined, corrective action to preserve system integrity and provide acceptable system performance. Therefore, correct operation of SPS as per designed logic is important to serve its purpose. To ensure this, mock testing of SPS needs to be conducted at a regular period. Clause 16.2 of IEGC 2023 also mandates the mock testing of SPS for reviewing SPS parameters & functions, at least once a year.

B.5.5 In view of the above, concerned constituents/utilities were requested to share the tentative schedule plan for conducting mock testing of SPS in their respective control area during 2024-25 in the format attached as **Annexure-B.VI**. In this regard, communication has already been sent to constituents through NRLDC letter dated 01.05.2024 and continuous follow-up is being done in OCC & PSC meetings since May 2024.

B.5.6 Update in this regard received from Uttarakhand, Rajasthan & UP only.

B.5.7 Members are requested to conduct the mock testing of SPS in their respective control area, share the tentative schedule of mock testing of SPS and share the report of the same.

Decision required from Forum:

Members may like to discuss.

B.6 Implementation of Automatic load shedding scheme in SPS related to Safe evacuation of generation at Chhabra/ Chhabra Super Critical/ Kawai/ Kalisindh Complex (agenda by NRLDC)

B.6.1 As per "SPS related to Safe evacuation of generation at Chhabra/ Chhabra Super Critical/ Kawai/ Kalisindh Complex" as mentioned in **System Protection Schemes Document of Northern Region 2025** (attached as **Annexure-B.VII**), with the loss of generation of about 2100 MW in the complex in case-3 (N-1-1/ N-2 of Anta-Phagi 1 & 2), equivalent load shedding needs to take place in Rajasthan state control area to avoid overloading of WR-NR corridor as well as to avoid over drawl by Rajasthan. However, considering logistics etc, approx 750 MW automatic load shedding in Rajasthan Control area would be required and rest could be manual (almost similar or slightly higher impact as tripping of one unit of 660 MW).

B.6.2 RRVPNL was requested to identify the feeders for 750 MW and dovetail the Automatic Load shedding with logic of the SPS given above. For implementation of Automatic load shedding scheme target date provided by Rajasthan was 28.02.2018. Confirmation in this regard was sought from Rajasthan during request for shutdown of 765 kV Anta-Phagi Ckt-1. As intimated by Rajasthan, Automatic load shedding scheme is yet not implemented.

B.6.3 Rajasthan is requested to share the reason for not implementing the Automatic load shedding scheme till now and also expedite implementation of Automatic load shedding scheme with logic of the SPS given above.

Decision required from Forum:

Members may like to discuss.

B.7 Corrective action for healthiness of 500kV Mundra-Mahindergarh SPS (agenda by NRLDC)

B.7.1 On 17th May 2024 on outage of both pole (carrying total ~1500MW), SPS of 500kV HVDC Mundra-Mahindergarh inter regional link didn't operate. This issue was discussed during 51st PSC meeting and ADANI was requested to share the details w.r.t. SPS operation during the meeting.

B.7.2 Further, NRLDC in coordination with NLDC conducted an online discussion meeting

with concerned stakeholders (SLDCs, ADANI, POWERGRID) on 12th August 2024, for further remedial actions required to make this SPS healthy.

B.7.3 Following actions were decided during the meeting:

i. POWERGRID, ADANI and concerned states were requested to identify the issue in communication links and take expeditious actions to make all the communication links healthy. POWERGRID & ADANI shall review the healthiness of SPS system at different load centres and the communication path between them in coordination with the SLDCs.

ii. States were requested to go through the details of load feeders mentioned in SPS document and share the changes/modifications as per present scenario and share the inputs w.r.t. unavailability in identified load feeders and load shedding. SLDCs shall share the revised updated feeder details (radial) along with expected average/peak load relief through respective feeders.

iii. SLDCs in coordination with their transmission and protection team shall share the status and healthiness of existing SPS system along with details of availability of communication path for incorporation of proposed revised/additional feeders.

B.7.4 Load end details have been received from UP, Haryana, Punjab Rajasthan & Delhi. Details and communications are attached as **Annexure-B.VIII.**

B.7.5 ADANI via mail dated 29.08.2024 has submitted the status of healthiness of communication network and hardware system at different locations on the basis of preliminary inspection. As per details submitted, counter status was found OFF at Alwar, Ratangarh, Gobindgarh, Malerkotla, Bamnauli, Shamli and Dhanonda.

B.7.6 Details of nodal officer of different substation involved in SPS scheme has already been shared with ADANI team for coordination and further remedial actions.

B.7.7 During 53rd PSC meeting, ADANI was requested to coordinate with the respective states to rectify the issues in the SPS system and share the status of remedial action taken/planned to be taken. Desired remedial actions need to be expedited.

B.7.8 ADANI agreed for the same and stated that update would be given within 01 week. However, no detail received yet from ADANI.

B.7.9 During discussion in 55th PSC meeting it was decided that ADANI shall take lead in rectification work as this SPS scheme was commissioned by them. Protection nodal officers from States will provide possible necessary assistance from their end. Further, states were also requested to ensure the incorporation of revised decided feeders during work at their stations. State representatives assured to provide all necessary coordination from their end.

B.7.10 During 56th PSC meeting, ADANI was requested to apprise the forum about the present status of remedial actions. ADANI representative stated that they have raised a service order to COMTEL (OEM) for approval. After approval of this service order, COMTEL engineers will visit all the sites in coordination with nodal officers from respective stations. It is expected that identification of issues and estimate hardware requirement will be completed by the end February 2025. Thereafter, after financial approval, rectification of issues will be done. ADANI was requested to ensure completion of whole work before summer 2025. State representatives were also requested to coordinate with the ADANI team and ensure incorporation of identified revised feeders for load relief in SPS.

B.7.11 Further, through mail dated 3rd February 2025, ADANI has informed that they awarded the rectification work service to M/s COMTEL for survey and restoration of possible elements installed at the locations and engineers from M/s COMTEL shall be visiting respective stations as per the schedule.

B.7.12 During 57th PSC meeting, ADANI representative informed that visit by COMTEL engineers at all the sites is completed and COMTEL will submit the report within 10 days.

B.7.13 ADANI was requested to share the report at the earliest and make Action Plan accordingly to ensure completion of whole work before summer 2025.

B.7.14 ADANI agreed to take expeditious actions and to share the action plan at the earliest.

B.7.15 ADANI is requested to apprise the Forum about identified issues at various stations, action plan and progress in rectification work.

B.7.16 It is again emphasized that as 500kV Mundra-Mahindergarh is an import inter-regional link between NR-WR corridor, ADANI is requested to ensure completion of whole work before summer 2025 in view of high demand envisaged during Summer

2025.

Decision required from Forum:

Members may like to discuss.

Part-C: Agenda for final approval of protection settings by PSC Forum for FTCs which have been provisionally allowed by NRLDC/SLDCs

C.1. First Time Charging of transmission lines/Bays/Transformer/Reactor etc. by NRLDC in month of Feb-2025

C.1.1 NRLDC has submitted the FTCs allowed in month of Feb-2025. The same may be found on NRPC website: http://164.100.60.165/meetings/prsub.html

C.1.2 As per approved procedure of NRPC, utilities have to put up agenda in PSC forum for final approval of settings.

C.1.3 Following utilities have submitted agenda for approval of settings:

i. POWERGRID
ii. PBTSL

C.1.4 However, none of the settings have been put up by following utilities:

i. UPRVUNL
ii. RSDCL
iii. RRVPNL
iv. Sh. Cement
v. Juniper Nirjara Energy Private Limited
vi. THDC

C.1.5 It is to highlight that as per decisions of 54th PSC meeting:

Quote

NRLDC shall give provisional protection clearance during FTC on conditional basis subject to submission of agenda in next Protection Sub-Committee meetings (not later than 2nd next PSC meeting). If utility does not put up the agenda within time, further FTC clearance would not be granted to the concerned.

Unquote

Agenda of 58th Protection Sub-Committee Meeting (26th March, 2025)

Decision required from Forum:

Members may refer settings put up by utilities for any correction required. Accordingly, settings may be approved by forum. Concerned members may be directed to submit the agenda for final approval of protection settings.

*****

Members of Protection Sub-Committee (FY 24-25)

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* *Organizations from where nominations are not received for PSC, memebers of NRPC have been mentioned. Nomination for PSC forum may be sent at the earliest.*

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16	Adani Hybrid Energy Jaisalmer Three Ltd.	
17	Adani Hybrid Energy Jaisalmer Four Ltd.	
18	Adani Renewable Energy (RJ) limited Rawara	
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27	Adani Solar Energy RJ Two Pvt. Ltd. (Devikot)	
28	Adani Solar Energy RJ Two Pvt. Ltd. (Phalodi)	
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36	Avaada Sunrays Pvt. Ltd.	
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53	SINGRAULI SOLAR	
54	Anta Solar	
55	Unchahar Solar	
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57	NTPC Kolayat_400kV	
58	Nedan Solar NTPC	
59	NTPC Nokhra_300MW	
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63	ReNew Solar Urja Private Limited	
64	Renew Sun Bright Pvt. Ltd. (RSBPL)	
65	Renew Sun Waves Private Limited (RSEJ4L)	
66	Renew Surya Partap Pvt. Ltd.	
67	Renew Surya Ravi Pvt. Ltd.	
68	Renew Surya Roshni Pvt. Ltd.	
69	Renew Surya Vihan Pvt. Ltd.	
70	Renew Surya Ayaan Pvt. Ltd.	
71	RENEW SOLAR POWER Pvt. Ltd. Bikaner	

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2	NRSS-XXIX Transmission Ltd		
3	Parbati Koldam Transmission Company Limited		
4	Patran Transmission Company Ltd		
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6	NRSS XXXVI Transmission Ltd	TATA POWER	rajnishmehrotra@tatapower.com
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11	Bikaner Khetri Transmission Limited		

Annexure-A.I

Status of action taken on decisions of 57th PSC

S.N.	Agenda No.	Agenda	Decision of 57th PSC	Status of action Taken
1	A.3	Submission of protection performance indices along with reason and corrective action taken for indices less than unity to NRPC Secretariat on monthly basis (agenda by NRPC Secretariat)	i.Non-compliant utilities were asked to submit the Protection performance indices timely by 7th day of month element wise along with corrective action taken for indices less than unity. ii. A formal letter may be issued to all RE plants to seek nomination of nodal officer for compliance of protection related data as per IEGC.	i. Status of reporting of indices has been taken as an agenda.
2	A.4	Annual protection audit plan for FY 2024-25 (agenda by NRPC Secretariat)	Managing Director of J&K, Ladakh may be added in the addressee list of PSC members.	MD, JKPTCL has been added in the addressee list.

3	A.5	Annual protection audit plan for FY 2025-26 (agenda by NRPC Secretariat)	Non-compliant utilities were asked to submit annual audit plan 2025-26 without any further delay. Other utilities were asked to submit report and compliance status within one month of completion of audit.	Some utilities have submitted audit report. Same has been taken as agenda.
4	A.6	Third-party protection audit plan (agenda by NRPC Secretariat)	Forum directed utilities to submit the third-party protection audit plan. Subsequently, the audit reports along with compliance status may be submitted to NRPC Secretariat within one month of completion of audit.	Some utilities have submitted audit report. Same has been taken as agenda.
5	A.8	Tripping of Type-3 filters (5/27) on overload protections at HVDC Rihand & Dadri terminals (agenda by POWERGRID, NR-3)	Forum decided that the agenda may be discussed with detailed analysis and study report in the next PSC meeting. POWERGRID may approach to OEM and may also take expert	Agenda has been taken. POWERGRID has submitted the report.

			opinion from expert or third-party audit vendor to analyse and find out the root cause.	
6	A.9	Un-necessary Trippings on 220KV ANTA-LALSOT Line (agenda by RVPN)	Forum decided to deliberate the agenda in the next PSC meeting. NTPC was requested to submit comment on proposal of RVPN in writing before next PSC.	Agenda has been taken.
7	A.11	Review of Distance Protection requirement Philosophy for Renewable plants having one evacuation line (agenda by Adani Green Energy Limited)	It was decided that protection philosophy may be prepared for RE plants based on deliberation. Accordingly, settings may be implemented after RE protection philosophy	
8	A.12	Review of protection setting of Thermal, Hydro, IBR based generations/HVDC and FACTS (agenda by NLDC)	Forum decided to constitute a committee under the chairmanship of SE (Protection), NRPC having members from NRLDC, NLDC, POWERGRID, Adani to prepare protection philosophy for the HVDC system.	

9	A.13	RE complex black start (agenda by NLDC)	Forum directed that a SOP may be prepared by NRPC Secretariat, NRLDC, NLDC, Rajasthan SLDC & Adani Green Energy Limited after having the studies.	
10	A.14	Proposed settings of 765 kv lines in Northern Region by committee constituted to review the Overvoltage Protection settings of 400kV and 765kV transmission lines in Northern Region (agenda by NRPC Secretariat)	The settings, finalized by the Committee may be shared with all states of NR and concerned transmission utilities. Forum referred the agenda to the next PSC meeting for final approval.	Agenda has been taken.
11	A.15.	Training on Electrical Protection of Power System for officials of NRPC Constituents (agenda by NRPC Secretariat)	Forum approved the proposal of training on Electrical Protection of Power System for approx. 135 officials of NRPC Constituent members with decided course curriculum. Forum recommended the same for approval of NRPC Forum.	The agenda was discussed in the 53rd TCC and 78th NRPC meeting (held on 16-17 march, 2025) wherein Forum approved the proposal.
12	B.6	Corrective action for healthiness of 500kV	Forum emphasized the importance of 500kV	Visit by COMTEL engineers at all the

		Mundra-Mahindergarh SPS (agenda by NRLDC)	Mundra-Mahindergarh SPS and its healthiness is important to ensure rectification of issue sin SPS system before summer 2025. ADANI is requested to share the report submitted by COMTEL at the earliest. State representatives were also requested to coordinate with the ADANI team and also ensure incorporation of identified revised feeders for load relief in SPS. Desired remedial actions need to be expedited.	sites is completed and COMTEL will submit the report within 10 days. Adani may update.

Status of perfomance indices report of Feb 2025 (Last date of submission 07.03.2025)							
S. No.	**Member Utility**		**Received Status (Yes/No)**	**Vide mail dated**	**Remarks**	**Indices less than 1 (Yes/No)**	**Reason submitted and corrective action taken**
1	PGCIL	Central Government owned Transmission Company	Yes	06.03.2025	NR-1	No	NA
					NR-2		
			Yes	07.03.2025	NR-3	No	NA
2	NTPC	Central Generating Company			Anta		
					Auriya		
			Yes	08.03.2025	Dadri	No	NA
					Koldam		
					Rihand		
					Singrauli		
					Unchahar		
			Yes	03.03.2025	Tanda	No	NA
3	BBMB		Yes	20.03.2025		No	NA
4	THDC		Yes	06.03.2025	Tehri	No	NA
					Koteshwar		
5	SJVN		Yes	04.03.2025	RHPS	No	NA
			Yes	07.03.2025	NJHPS	No	NA
6	NHPC		Yes	06.03.2025		Yes	Yes
7	NPCIL		Yes	11.03.2025	RAPS-A	NO	NA
			Yes	13.03.2025	RAPS-B	NO	NA
					RAPS-C(5&6)	NO	NA
			Yes	06.03.2025	NAPS-1&2	NO	NA
8	DTL	State Transmission Utility	Yes	07.03.2025		Yes	Yes
9	HVPNL		Yes	04.03.2025		Yes	NO
10	RRVPNL		Yes	07.03.2025		Yes	Yes
11	UPPTCL		Yes	03.03.2025	Meerut Circle	No	NA
			Yes	07.03.2025	Agra Circle	Yes	Yes
			Yes	04.03.2025	Jhansi Circle	No	NA
			Yes	07.03.2025	Prayagraj Circle	No	NA
			Yes	07.03.2025	Gorakhpur Circle	No	NA
			Yes	07.03.2025	Lucknow Circle	Yes	Yes
12	PTCUL		Yes	06.03.2025		No	NA
13	PSTCL						
14	HPPTCL		Yes	06.03.2025		Yes	Yes
15	IPGCL	State Generating Company	Yes	04.03.2025	PPS-I	No	NA
			Yes	04.03.2025	PPS-III, Bawana	No	NA
16	HPGCL						
17	RRVUNL		Yes	04.03.2025	KTPS	No	NA
			Yes	03.03.2025	CSCTPP Chhabra	No	NA
			Yes	03.03.2025	RGTPP, Ramgarh	No	NA
			Yes	01.03.2025	Ctpp,Chhabra	No	NA
			Yes	05.03.2025	DCCPP, Dholpur	No	NA
			Yes	07.03.2025	kATPP, Jhalawar	No	NA
			Yes	07.03.2025	STPS Suratgarh	No	NA
			Yes	07.03.2025	SSCTPS Suratgarh	No	NA
18	UPRVUNL		Yes	07.03.2025	Parichha B (220 kV)	No	NA
			Yes	03.03.2025	Parichha C (400 kV)	Yes	Yes
			Yes	04.03.2025	DTPS Anpara	No	NA
			Yes	07.03.2025	Obra B	No	NA
					Obra C		
			Yes	07.03.2025	Harduaganj 400 kV	No	NA
			Yes	07.03.2025	Ghatampur 765 kV	No	NA
			Yes	07.03.2025	Anpara-A&B	No	NA
			Yes	07.03.2025	Panki TPS	No	NA
			Yes	07.03.2025	Jawaharpur	No	NA
19	UJVNL		YES	03.03.2025	Dharasu	No	NA
			YES	03.03.2025	Tiloth	No	NA
			YES	05.03.2025	Khodri	No	NA
			YES	05.03.2025	Chibro	No	NA
			YES	05.03.2025	Vyasi	No	NA
20	HPPCL		YES	07.03.2025	Kashang HEP	No	NA
			YES	05.03.2025	Sawara Kuddu	No	NA
			YES	07.03.2025	Sainj	Yes	No
21	PSPCL	State Generating Company & State owned Distribution Company	Yes	03.03.2025	RSD	No	NA
			Yes	19.03.2025	GGSTPS, Rupnagar	No	NA
			Yes	04.03.2025	GVK Power Goindwal Shahib Ltd.	No	NA
			Yes	06.03.2025	GHSTPS, Lehra Mohabbat	No	NA
22	HPSEBL	Distribution company having Transmission	Yes	05.03.2025	Hamirpur Circle	No	NA

Status of perfomance indices report of Feb 2025 (Last date of submission 07.03.2025)							
S. No.	**Member Utility**		**Received Status (Yes/No)**	**Vide mail dated**	**Remarks**	**Indices less than 1 (Yes/No)**	**Reason submitted and corrective action taken**
		connectivity ownership	Yes	18.03.2025	Shimla Circle	No	NA
23	Prayagraj Power Generation Co. Ltd.	IPP having more than 1000 MW installed capacity	Yes	01.03.2025		No	NA
24	Aravali Power Company Pvt. Ltd		Yes	05.03.2025		No	NA
25	Apraava Energy Private Limited		Yes	13.03.2025		No	NA
26	Talwandi Sabo Power Ltd.		YES	07.03.2025		No	NA
27	Nabha Power Limited		YES	03.03.2025		No	NA
28	MEIL Anpara Energy Ltd (Anpara-C)		YES	03.03.2025		No	NA
29	Rosa Power Supply Company Ltd		YES	07.03.2025		No	NA
30	Lalitpur Power Generation Company Ltd		YES	06.03.2025		No	NA
31	MEJA Urja Nigam Ltd.		YES	06.03.2025		No	NA
32	Adani Power Rajasthan Limited						
33	JSW Energy Ltd. (KWHEP)						
34	RENEW Power Pvt Ltd	RE Generating Company having more than 1000 MW installed capacity					
35	NTPC Green Energy Limited						
36	Azure Power India Pvt. Ltd.						
37	Avaada Energy Private Limited						
38	Adani Green Energy Limited						
39	Tata Power Renewable Energy Ltd.	IPP having less than 1000 MW installed capacity (alphabetical rotaional basis)	Yes	04.03.2025		No	NA
40	UT of J&K	UT of Northern Region					
41	UT of Ladakh						
42	UT of Chandigarh						
	ISTS Transmission Utilities						
43	INDIGRID						
44	POWERLINK						
45	ADHPL		Yes	06.03.2025		No	NA
46	NRSSXXXI(B)'s Northern Region Transmission System	Sekura Energy Limited					
47	NRSSXXXVI's Northern Region Transmission System	Tata Power					
48	Adani Transmission Limited	AESL	Yes	04.02.2025		No	NA
49	Bikaner Khetri Transmission Limited		Yes	07.03.2025		No	NA
50	Fatehgarh Bhadla Transmission Limited		Yes	07.03.2025		No	NA
51	Powergrid Sikar Transmission Limited	POWERGRID, NR-1	Yes	06.03.2025		No	NA
52	Powergrid Aligarh Sikar Transmission Limited		Yes	06.03.2025		No	NA
53	Powergrid Ajmer Phagi Transmission Limited		Yes	06.03.2025		No	NA
54	Powergrid Bikaner Transmission System Limited		Yes	06.03.2025		No	NA
55	Powergrid Khetri Transmission System Limited		Yes	06.03.2025		No	NA
56	Powergrid Ramgarh Transmission Limited		Yes	06.03.2025		No	NA
57	Powergrid Fatehgarh Transmission Limited		Yes	06.03.2025		No	NA
58	Powergrid Bhadla Transmission Limited		Yes	06.03.2025		No	NA
59	Powergrid Meerut Simbhavli Transmission Limited		Yes	06.03.2025		No	NA
	State Utilities						
	Uttar Pradesh						
60	Vishnuprayag Hydro Electric Plant (J.P.)		YES	01.03.2025		No	NA
61	Alaknanda Hydro Electric Plant (GVK)		YES	05.03.2025		No	NA
62	Khara Power House (Khara)		YES	03.03.2025		No	NA
63	WUPPTCL		YES	03.03.2025		No	NA
64	SEUPPTCL		YES	07.03.2025		No	NA
65	ATSCL	**ADANI**	Yes	07.03.2025		No	NA
66	GTL	**ADANI**	Yes	03.03.2025		No	NA
67	HPTSL	**ADANI**	Yes	07.03.2025		No	NA
68	MTSCL	**ADANI**	Yes	07.03.2025		No	NA
69	OCBTL	**ADANI**	Yes	07.03.2025		No	NA
	Rajasthan						
70	220 KV Dhorimanna-Rajwest Line	**JSW**					
71	400 KV ANTA - CHABRA II	**ADANI**					
72	Barsingsar Plant	**NLC**					
	RE Utilities						
73	ABC Renewable Pvt. Ltd						
74	ACME Heeragarh powertech Pvt. Ltd						
75	ACME Chittorgarh Solar Energy Pvt Ltd						
76	Adani Hybrid Energy Jaisalmer One Ltd.						
77	Adani Hybrid Energy Jaisalmer Two Ltd.						
78	Adani Hybrid Energy Jaisalmer Three Ltd.						
79	Adani Hybrid Energy Jaisalmer Four Ltd.						

Status of perfomance indices report of Feb 2025 (Last date of submission 07.03.2025)							
S. No.	Member Utility		Received Status (Yes/No)	Vide mail dated	Remarks	Indices less than 1 (Yes/No)	Reason submitted and corrective action taken
80	Adani Renewable Energy (RJ) limited Rawara						
81	Adani Solar Energy Jaisalmer One Pvt. Ltd._450MW (Solar)						
82	Adani Solar Enegry Four Private Limited						
83	Adani Solar Energy Jaisalmer Two Private Limited						
84	Project Two						
85	SB ENERGY FOUR PRIVATE LIMTED, Bhadla						
86	SB Energy Six Private Limited, Bhadla						
87	Adani Solar Enegry Jodhpur Two Limited, Rawara						
88	Adept Renewable Technologies Pvt. Ltd.						
89	Adani Solar Energy RJ Two Pvt. Ltd. (Devikot)						
90	Adani Solar Energy RJ Two Pvt. Ltd. (Phalodi)						
91	Adani Green Energy 19 Limited						
92	Altra Xergi Pvt. Ltd.						
93	AMP Energy Green Five Pvt. Ltd.						
94	AMP Energy Green Six Pvt. Ltd.						
95	Amplus Ages Private Limited						
96	Avaada RJHN_240MW	Avaada	yes	07.03.2025		No	NA
97	Avaada sunce energy Pvt limited		yes	07.03.2025		No	NA
98	Avaada Sunrays Pvt. Ltd.		yes	07.03.2025		No	NA
99	Avaada Sustainable RJ Pvt. Ltd.		yes	07.03.2025		No	NA
100	Ayana Renewable Power Three Private Limited						
101	Ayaana Renewable Power One Pvt. Ltd.						
102	Azure Power Forty One Pvt limited						
103	Azure Power Forty Three Pvt. Ltd._RSS						
104	Azure Maple Pvt. Ltd.						
105	AZURE POWER INDIA Pvt. Ltd., Bhadla						
106	Azure Power Thirty Four Pvt. Ltd.						
107	Clean Solar Power (Jodhpur) Pvt. Ltd.						
108	Clean Solar Power (Bhadla) Pvt. Ltd						
109	Eden Renewable Cite Private Limited						
110	Grian Energy private limited						
111	Mahindra Renewable Private Limited						
112	Mega Surya Urja Pvt. Ltd. (MSUPL)						
113	AURAIYA Solar						
114	DADRI SOLAR						
115	SINGRAULI SOLAR						
116	Anta Solar						
117	Unchahar Solar						
118	NTPC Devikot Solar plant_240MW						
119	NTPC Kolayat_400kV						
120	Nedan Solar NTPC						
121	NTPC Nokhra_300MW						
122	One Volt energy Pvt. Ltd.						
123	ReNew Solar Energy (Jharkhand Three) Private Limited						
124	RENEW SOLAR POWER Pvt. Ltd. Bhadla						
125	ReNew Solar Urja Private Limited						
126	Renew Sun Bright Pvt. Ltd. (RSBPL)						
127	Renew Sun Waves Private Limited (RSEJ4L)						
128	Renew Surya Partap Pvt. Ltd.						
129	Renew Surya Ravi Pvt. Ltd.						
130	Renew Surya Roshni Pvt. Ltd.						
131	Renew Surya Vihan Pvt. Ltd.						
132	Renew Surya Ayaan Pvt. Ltd.						
133	RENEW SOLAR POWER Pvt. Ltd. Bikaner						
134	Rising Sun Energy-K Pvt. Ltd.						
135	Serentica Renewables India 4 Private Limited						
136	Tata Power Green Energy Ltd. (TPGEL)						
137	Tata Power Renewable Energy Ltd. (TPREL)						
138	Thar Surya Pvt. Ltd.						
139	TP Surya Pvt. Ltd.						
140	Banderwala Solar Plant TP Surya Ltd.						
141	TRANSITION ENERGY SERVICES PRIVATE LIMITED						
142	Transition Green Energy Private Limited						
143	Transition Sustainable Energy Services Private Limited						

Annexure-A.III

Format No.-PI-01
Reporting of performance indices for protection system
(for elements connected at 220 kV and above
Name of Utility: Delhi Transco Ltd
Month: February 2025

S. No.	Substation	Unit (SPS/Line/ICT/GT etc)	Nc	Nf	Nu	Ni	Dependability Index (D=Nc/(Nc+Nf))	Security Index (S=Nc/(Nc+Nu))	Reliability Index (R=Nc/(Nc+Ni))	Remedial Action Taken (if applicable)
1	400kV Mundka	160MVA Transformer-II (220/66kV)	1	0	0	0	1	1	1	
2	220kV Rohini-II	160MVA Transformer-II (220/66kV)	0	0	1	1	0	0	0	Tripping occurred on differential protection. While analysing the fault, insulation resistance value of CT control cable was found poor. So, CT control cable was replaced and fault was rectified.
		220kV Bawana-2 Ckt-2	1	0	0	0	1	1	1	
3	220kV Sarita Vihar	220kV BTPS Ckt-1	1	0	0	0	1	1	1	
4	220kV Okhla	100MVA Transformer-III (220/33kV)	1	0	0	0	1	1	1	
		100MVA Transformer-IV (220/33kV)	1	0	0	0	1	1	1	
		100MVA Transformer-V (220/33kV)	1	0	0	0	1	1	1	
		220kV Tuglakabad Ckt-1	1	0	0	0	1	1	1	
		220kV Tuglakabad Ckt-2	1	0	0	0	1	1	1	
5	220kV Narela	100MVA Transformer-I (220/66kV)	1	0	0	0	1	1	1	
		100MVA Transformer-II (220/66kV)	1	0	0	0	1	1	1	
		100MVA Transformer-III (220/66kV)	1	0	0	0	1	1	1	
		220kV DSIDC Ckt-1	1	0	0	0	1	1	1	
		220kV DSIDC Ckt-2	1	0	0	0	1	1	1	
		220kV Mandola Ckt-1	1	0	0	0	1	1	1	
		220kV Mandola Ckt-2	1	0	0	0	1	1	1	
		220kV Panipat Ckt-1	1	0	0	0	1	1	1	
		220kV Panipat Ckt-2	1	0	0	0	1	1	1	
		220kV Panipat Ckt-3	3	0	0	0	1	1	1	
		220kV Rohtak Road Ckt-1	1	0	0	0	1	1	1	
		220kV Rohtak Road Ckt-2	1	0	0	0	1	1	1	
6	400kV Harsh Vihar	315MVA ICT-1	1	0	0	0	1	1	1	
7	400kV Bawana	220kV Rohini-II Ckt-2	1	0	0	0	1	1	1	

S. No.	Substation	Unit (SPS/Line/ICT/GT etc)	Nc	Nf	Nu	Ni	Dependability Index (D=Nc/(Nc+Nf))	Security Index (S=Nc/(Nc+Nu))	Reliability Index (R=Nc/(Nc+Ni))	Remedial Action Taken (if applicable)
8	220kV Patparganj	220kV Geeta Colony Ckt-1	1	0	0	0	1	1	1	
		220kV Geeta Colony Ckt-2	1	0	0	0	1	1	1	
9	220kV Geeta Colony	220kV Patparganj Ckt-2	1	0	0	0	1	1	1	
10	220kV BTPS	220kV Sarita Vihar Ckt-1	1	0	0	0	1	1	1	
		220kV Ballabgarh Ckt-2	1	0	0	0	1	1	1	
11	220kV Gopalpur	220kV Mandola Ckt-2	1	0	0	0	1	1	1	
12	220kV South of Wazirabad	220kV Geeta Colony Ckt-II	1	0	0	0	1	1	1	
13	220kV Rajghat	100MVA Transformer-I (220/33kV)	1	0	0	0	1	1	1	

Justification for less than one index may be attached separately.
Nc is the number of correct operations at internal power system faults
Nf is the number of failures to operate at internal power system faults
Nu is the number of unwanted operations
Ni is the number of incorrect operations and is the sum of Nf and Nu

H P POWER TRANSMISSION CORPORATION LIMITED.
(A State Government Undertaking)
DGM (Protection & Communication), Chowki-Jamwalan, Hamirpur (HP).
Email. dgmprot.tcl@hpmail.in

No: HPPTCL/DGM (P&C)/NRPC/2024-25- 786-88 **Dated:-** 06-03-2025

To

The Superintending Engineer (Operation),
Northern Regional Power Committee,
18-A, Shaheed Jeet Singh Marg,
Katwaria Sarai, New Delhi-110016.
Email: sco-nrpc@nic.in

Subject: **Performance indices for protection system of HPPTCL Substations and Lines for the month of February, 2025.**

Sir,

With reference to the subject cited above, as per 48th protection sub-committee meeting, performance indices for protection system of HPPTCL for elements connected at 220 kV and above voltage level for the month of February, 2025 is enclosed herewith for your reference please.

Yours faithfully,

Sr. Manager (E)
O/o DGM (Prot. &Comm.),
HPPTCL, Chowki Jamwalan,
Hamirpur (HP).

DA: As above

Copy to:

1. The General Manager (Projects), HPPTCL, Himfed Bhawan, Shimla-05.
2. The Superintending Engineer, HPSLDC, Totu, Shimla-04.

Sr. Manager (E)
O/o DGM (Prot. &Comm.),
HPPTCL, Chowki Jamwalan,
Hamirpur (HP).

Report of performance indices for protection System for Feb, 2025
(for elements connected at 220 kV and above)

Sr. No.	Name of Sub-Station	Unit (SPS/Line/ICT/GT/ etc.)	Nc	Nf	Nu	Ni	Dependability Index (D) D= Nc/Nc+Nf	Security Index (S) S=Nc/Nc+Nu	Realiability Index (R) R=Nc/Nc+Ni	Brief Description of Tripping
1	400/220/66 KV Wangtoo Substation	400 kV Wangtoo - karcham Ckt I	0	0	0	0	0	0	0	Nil
		400 kV Wangtoo - karcham Ckt II	0	0	0	0	0	0	0	
		400 kV Wangtoo - kala Amb Ckt	2	0	0	0	1	1	1	1) Dated :14.02.2025 Tripped due to Phase to Ground fault 2) Dated :18.02.2025 Trpping on wangtoo-Kala Amb ckt ocurred due to transient fault on Wangtoo-shorang ckt (which autoreclosed itself as fault was of transient category) Wangtoo Kala Amb main breaker is faulty and is out of service since long.This ckt is enrgised by bus -2 through tie breaker and main breaker of wangtoo-Shorang ckt.
		400 kV Wangtoo - Sorang Ckt	0	0	0	0	0	0	0	Nil
		ICT I (315 MVA, 400/220/33 kV)	0	0	0	0	0	0	0	
		ICT II (315 MVA, 400/220/33 kV)	0	0	0	0	0	0	0	
		220 kV Wangtoo - Bhaba - Kunihar Ckt	1	0	0	0	1	1	1	Triped due to Phase to Ground Fault
		220 kV Wangtoo - Kashang Ckt	0	0	0	0	0	0	0	Nil
		220 kV Wangtoo-Bhoktoo	0	0	0	0	0	0	0	
		Trafo I (80/100 MVA, 220/66/33 kV)	0	0	0	0	0	0	0	
		Trafo II (80/100 MVA, 220/66/33 kV)	0	0	0	0	0	0	0	
2	400/220/33kV GIS Lahal, Distt Chamba	400 kV Lahal Rajera ckt. 1	0	0	0	0	0	0	0	Nil
		400 kV Lahal Rajera ckt. II	0	0	0	0	0	0	0	
		ICT -I (315 MVA, 400/220/33 kV)	0	0	0	0	0	0	0	
		ICT -2(315 MVA, 400/220/33 kV)	0	0	0	0	0	0	0	
		105 MVA Spare Transformer (400/220/33 kV)	0	0	0	0	0	0	0	
		220 kV Lahal -Budhil Ckt. 1	0	0	0	0	0	0	0	
		220 kV Lahal Bajoli Holi Ckt. 1	0	0	0	0	0	0	0	
		220 kV Lahal Bajoli Holi Ckt. 2	0	0	0	0	0	0	0	
		220/33 kV Transformer	0	0	0	0	0	0	0	
3	400/220/66kV GIS S/Stn GUMMA	ICT-I (315 MVA, 400/220/33 kV)	0	0	0	0	0	0	0	Nil
		ICT-2 (315 MVA, 400/220/33 kV)	0	0	0	0	0	0	0	
		400kV Bus-I	0	0	0	0	0	0	0	
		400kV Bus-2	0	0	0	0	0	0	0	
		400kV Gumma-Panchkula Ckt-I	0	0	0	0	0	0	0	
		400kV Gumma-Panchkula Ckt-II	0	0	0	0	0	0	0	
		400kV Gumma-Jhakri Ckt-I	0	0	0	0	0	0	0	
		400kV Gumma-Jhakri Ckt-II	0	0	0	0	0	0	0	
		220kV Gumma-Hatkoti Ckt-I	0	0	0	0	0	0	0	
		220kV Gumma-Hatkoti Ckt-II	0	0	0	0	0	0	0	

Assistant Manager (E)
O/o DGM (Prot. & Comm.)
HPPTCL, Hamirpur (H.P.)

4	220kV Switching S/Stn Hatkoti	220kV Hatkoti-Gumma Ckt-I	0	0	0	0	0	0	0	Nil
		220kV Hatkoti-Gumma Ckt-II	0	0	0	0	0	0	0	
		220kV Hatkoti-Natwar Mori Ckt-I	0	0	0	0	0	0	0	
		220kV Hatkoti-Snail Ckt	0	0	0	0	0	0	0	
		220kV Hatkoti-Sunda Ckt-I	0	0	0	0	0	0	0	
		220kV Hatkoti-Sunda Ckt-II	0	0	0	0	0	0	0	
5	220/132/66 kV, GIS Substation Sunda	220 kV Sunda-Hatkoti Ckt-1	0	0	0	0	0	0	0	Nil
		220 kV Sunda-Hatkoti Ckt-2	0	0	0	0	0	0	0	
		220/132 kV, ICT-1	0	0	0	0	0	0	0	
		220/132 kV, ICT-2	0	0	0	0	0	0	0	
		220/66 kV Transformer.	0	0	0	0	0	0	0	
6	220/33 kV GIS S/Stn. Phozal	220 kV Phojal to Nalagarh(Bay 205)	2	0	0	0	1	1	1	1. Tripped due to Phase to Phase Fault(Y-B Phase) 2. Tripped due to Three Phase Fault
		220 kV Phojal to ADHPL(Bay 201)	0	0	0	0	0	0	0	Nil
		220/33kV, 80/100 MVA Transformer Bank	0	0	0	0	0	0	0	Nil
7	220/132/33kV Charor Substation	ICT - 220/192 kV Transformer	0	0	0	0	0	0	0	Nil
		220/33 kV Power Transformer	0	0	0	0	0	0	0	
		220 kV Charor-Banala Ckt-1	0	0	0	0	0	0	0	
		220 kV Charor-Banala Ckt-2	0	0	0	0	0	0	0	
8	220/33 kV GIS S/Stn. Karian	220 KV Karian - Rajera Transmission Line	1	0	0	0	1	1	1	Tripped due to Ph-Ph fault (Y-B)
		220 kV Karian-Mazra Ckt.	0	0	0	0	0	0	0	Nil
		220/33 kV Power Transformer	0	0	0	0	0	0	0	
9	220/132 kV GIS S/Stn. Mazra	220/132/33 kV, 80/100 MVA ICT-1	0	0	1	1	0	0	0	There was a Single line to ground fault (Y-N) on 220KV Majra-Rajera Line& initiated tripping to Y-ph only and LBB initiation signal to LBB relay (REB670). AR cycle started in BCU. In the meantime, fault loop got changed from Y-N fault to YB-N Fault. The fault current of B-phase and LBB initiation from Y-phase lead to operation of LBB relay.
		220/132/33 kV, 80/100 MVA ICT-2	0	0	1	1	0	0	0	
		220 kV Mazra - Rajera Ckt.	1	0	0	0	1	1	1	
		220 kV Mazra-Karian Ckt.	0	0	1	1	0	0	0	
10	220/132 kV GIS S/stn. Dehan	220 kV Dehan-Tikkar Ckt. 1	1	0	0	0	1	1	1	Tripped due to Overvoltage. Overvoltage tripping was enabled in Main 2 Relay. As a corrective action, the same is disabled now.
		220 kV Dehan- Tikkar Ckt. 2	0	0	0	0	0	0	0	Nil
		220/132/33 kV, 60/80/100 MVA ICT-1	0	0	0	0	0	0	0	Nil
		220/132/33 kV, 60/80/100 MVA ICT-2	0	0	0	0	0	0	0	Nil

Assistant Engineer (E)
O/o DGM (Prot. & Comm.)
HPPTCL, Hamirpur (H.P.)

11	220/66/22 kV GIS S/stn. Bhoktoo	220/66 kV, 25/31.5 MVA Transformer	0	0	0	0	0	0	0	Nil
		220 kV Bhoktoo-Kashang-Ckt.	1	0	0	0	1	1	1	Line Tripped due to Three Phase fault
		220 kV Bhoktoo-Wangtoo Ckt.	0	0	0	0	0	0	0	Nil
12	220/132/33 kV AIS S/stn. Kala Amb	220 kV Andheri-PKATL Ckt.1	0	0	0	0	0	0	0	Nil
		220 kV Andheri-PKATL Ckt.2	0	0	0	0	0	0	0	
		3x53.33/66.66 MVA (223/132/33 kV Auto Transformer	0	0	0	0	0	0	0	
13	220/66 kV GIS S/stn. Heiling	220/66 kV, 80/100 MVA Transformer	0	0	0	0	0	0	0	Nil
		220kV Heiling-Lahal Ckt.	1	0	0	0	1	1	1	220kV Heiling-Lahal transmission line (Bay-203) tripped due to CVT fuse failure of Y-phase at 4:37 hrs and supply restored at 14:30 hrs
		220 kV Heiling-Holi Ckt.	0	0	0	0	0	0	0	Nil

Assistant Manager (E)
O/o DGM (Prot. & Comm.)
HPPTCL, Hamirpur (H.P.)

Annexure-X

Format No.-PI-01

Reporting of performance indices for protection system
(for elements connected at 220 kV and above)

Name of Utility: HVPNL

Month: February 2025

S.N.	Substation	Unit (SPS/Line/ICT/GT/ etc)	Nc	Nf	Nu	Ni	Dependability Index (D=Nc/Nc+Nf)	Security Index (S=Nc/Nc+Nu)	Reliability Index (R=Nc/Nc+Ni)
M&P Division, HVPNL, Hisar									
1	220 KV S/Stn. IA Hisar	220 KV IA Hisar – PGCIL Ckt. 01	**1**	**0**	**0**	**0**	**1**	**1**	**1**
2	220 KV S/Stn. IA Hisar	220 KV IA Hisar – PGCIL Ckt. 02	**1**	**0**	**0**	**0**	**1**	**1**	**1**
3	220 KV S/Stn. IA Hisar	220 KV IA Hisar – BBMB Ckt. 01	**1**	**0**	**0**	**0**	**1**	**1**	**1**
4	220 KV S/Stn. IA Hisar	220 KV IA Hisar – BBMB Ckt. 02	**1**	**0**	**0**	**0**	**1**	**1**	**1**
M&P Division, HVPNL, Gurugram									
1	220 KV B/Pur	220 KV B/Pur-Palli Ckt-1	**1**	**0**	**0**	**0**	**1**	**1**	**1**
2	220KV Sector-107 Gurugram	220/33KV 100MVA T-1	**1**	**0**	**0**	**0**	**1**	**1**	**1**
3	220KV Sector-107 Gurugram	220/33KV 100MVA T-2	**1**	**0**	**0**	**0**	**1**	**1**	**1**
4	400KV Daultabad	400KV Daultabad-Sector-72 Gurugram PG Ckt-1	**0**	**1**	**0**	**1**	**0**	**1**	**0**
5	400KV Daultabad	400KV Daultabad-Sec-72 Gurugram PG Ckt-1	**1**	**0**	**0**	**0**	**1**	**1**	**1**
6	400KV Daultabad	400KV Daultabad-Sec-72 Gurugram_PG Ckt-2	**1**	**0**	**0**	**0**	**1**	**1**	**1**
7	400KV Daultabad	400KV Daultabad- Jhajjar (APCL) Ckt-1	**1**	**0**	**0**	**0**	**1**	**1**	**1**
8	400KV Daultabad	400KV Daultabad- Jhajjar (APCL) Ckt-2	**1**	**0**	**0**	**0**	**1**	**1**	**1**
9	400KV Daultabad	400/220KV 315MVA ICT-1	**1**	**0**	**0**	**0**	**1**	**1**	**1**
10	400KV Daultabad	400/220KV 315MVA ICT-2	**1**	**0**	**0**	**0**	**1**	**1**	**1**
11	400KV Daultabad	400/220KV 315MVA ICT-3	**1**	**0**	**0**	**0**	**1**	**1**	**1**

12	400KV Daultabad	400/220KV 315MVA ICT-4	**1**	**0**	**0**	**0**	**1**	**1**	**1**
M&P Division, HVPNL, Dhulkote									
1	220 KV Sector-32 Panchkula	220 KV Sector-32 Panchkula-PKL_PG Ckt-2	**1**	**0**	**0**	**0**	**1**	**1**	**1**
2	220 KV Pinjore	220 KV Panchkula_ PG- Pinjore Ckt-2 (23.02.2025 & 25.02.2025)	**0**	**0**	**2**	**0**	**0**	**0**	**0**
M&P Division, HVPNL, Rohtak									
1	220KV GIS Rai. XEN TS Panipat	220kV Sonepat_PG - GIS Rai Ckt.-2	**1**	**0**	**0**	**0**	**1**	**1**	**1**
2	220KV PTPS Panipat XEN TS Panipat	220kV BBMB Sewah Panipat - Panipat Ckt.-2	**1**	**0**	**0**	**0**	**1**	**1**	**1**
3	220kV PTPS XEN TS Panipat	220kV BBMB Sewah - PTPS Ckt.-3	**1**	**0**	**0**	**0**	**1**	**1**	**1**

Note: Justification for less than one index may be attached separately.

Nc is the number of correct operations at internal power system faults

Nf is the number of failures to operate at internal power system faults

Nu is the number of unwanted operations

Ni is the number of incorrect operations and is the sum of Nf and Nu.

Sr. No.	**Dated**	**Divn.**	**Name of sub/ station**	**Tripping /Breakdown element**	**Length of line**	**Duration of Tripping /Break down**			**Relays Operated along with Relay Data**		**Reasons of Tripping /break-down**	**Area Affected if any**	**Analysis of Tripping/Breakdown by designated committee.**	**Remarks if any.**
						From (Hrs.)	**To (Hrs.)**	**Total (Hrs.)**	**This end (Reporting Substation)**	**Other end (in case of line)**				
1	21.02.25	XEN 400KV Daultabad	400KV Daultabad	400KV Daultabad-Sector-72 Gurugram _PG Ckt-1	20.2Km	21:32	22:52	01:20	DPR, Z-1, D=8.191 Km, Y-ph, Master 86 relay	Not tripped	Transient fault	NIL	A fault was reported on 400kV Daultabad-Sec 72 PG Gurugram ckt 1 line (Kite thread & flag cloth were wrapped on conductor during bad weather condition between TL 54 & 55)	

													A line tripped from Sector-72 Gurugram _PG end in Zone 1 C phase and AR operated successfully after 1 sec. But CB at Daultabad end didn't trip due to contractor burnt & all sources tripped from remote end including ICTs.	
2	23.02.25	XEN TS Madanpur	220kV Pinjore	220kV Panchkula _PG - Pinjore Ckt.-2	40.70 KM	19:19	20:13	00:54	DT received	Not tripped	PLCC mal operation	Nil	1. The PLCC cabinet was checked found healthy. Checked the event logs and observed many noise alarms indicating noise signals in the frequency band which might be the reason for the generation of false DT command. 2. Carrier team advised the PGCIL 400 KV Barwala staff to change the frequency band for this circuit and for the time being the links of DT command were made out of circuit to avoid un-necessary tripping.	
3	25.02.25	XEN TS Madanpur	220kV Pinjore	220kV Panchkula _PG - Pinjore Ckt.-2	40.70 KM	11:33	12:10	00:37	DT received	Not tripped	PLCC mal operation	Nil	1. The PLCC cabinet was checked found healthy. Checked the event logs and observed many noise alarms indicating noise signals in the frequency band which might be the reason for the generation of false DT command. 2. Carrier team advised the PGCIL 400 KV Barwala staff to change the frequency band for this circuit and for the time being the links of DT command were made out of circuit to avoid un-necessary tripping.	

OFFICE OF THE SUPERINTENDING ENGINEER
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कार्यालय अधीक्षणअभियन्ता
विद्युत परीक्षण एव परिचालन मण्डल,
उ0प्र0 पावर ट्रॉसमिशन कारपोरेशन लिमिटेड,
तृतीय तल, पारेषण भवन,विभूति
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पत्रांक / No. : T- 54 वि0परी0 एवं परि0 मं0(ल0) / ETCC(L)/PPI / दिनांक / Dated: 01.03.2025

Subject: - Protection Performance Index FMO Feb '2025 Under Transmission Central .

Director (Operation) , UPPTCL,
Shakti Bhawan Extension ,
Lucknow.

Kindly find enclosed herewith the Protection Performances Indices Index for the month of February '2025 & Annexure for Index less than one under Transmission Central for your kind information and necessary action.

Encl: -As above.

(Amrendra Kumar)
o/c SUPERINTENDING ENGINEER

NO: T-54 ET&CC (L)/PPI of date: 01.03.25

Copy forwarded along with enclosure to the following for information and necessary action: -

1- Chief Engineer,PSO, SLDC , Lucknow.
2- Chief Engineer (TC), UPPTCL ,Pareshan Bhawan, Gomti Nagar, Lucknow.
3- Superintending Engineer, SERA, SLDC, Lucknow.

Encl: -As above.

(Amrendra Kumar)
o/c SUPERINTENDING ENGINEER

Reporting of performance indices for protection system
(for elements connected at 220 KV and above)
Name of Utility : ET&CC, UPPTCL LUCKNOW
Month : Feb-2025

ET&CD- SULTANPUR

S.No.	Substation	Unit (SPS/Line/ICT/GT etc	Nc	Nf	Nu	Ni	Dependability Index (D)	Security Index(S)	Reliability Index(R)	Remarks
01	NIL	NIL	NA	NA	NA	NA	NA	NA	NA	

ET&CD- SAROJINI NAGAR

S.No.	Substation	Unit (SPS/Line/ICT/GT etc	Nc	Nf	Nu	Ni	Dependability Index (D)	Security Index(S)	Reliability Index(R)	Remarks
1	765kV S/s Unnao	765kV Unnao-Anpara C line	1	0	0	0	1	1	1	
2	400kV /s Unnao	400kV Unnao-Agra line	3	0	0	0	1	1	1	
3	400kV /s Unnao	400kV Unnao-Bareilly-I line	9	0	0	0	1	1	1	
4	400kV /s Unnao	400kV Unnao-Bareilly-2 line	4	0	0	0	1	1	1	
5	400kV /s Unnao	220kV Unnao-Phoolbagh-I line	2	0	0	0	1	1	1	
6	400kV S/s Sarojini Nagar, Lucknow	400kV Sarojini Nagar- Singrauli line	1	0	0	0	1	1	1	
7	220kV S/s Sarojini Nagar, Lucknow	220kV Sarojini Nagar- Gomti Nagar line	1	0	0	0	1	1	1	
8	220/33kV S/s Dahi Chauki, Unnao	60MVA Transformer-1	1	0	0	0	1	1	1	
9	220/33kV S/s Dahi Chauki, Unnao	60MVA Transformer-2	1	0	0	0	1	1	1	

ET&CD- SHAHJAHANPUR

S.No.	Substation	Unit (SPS/Line/ICT/GT etc	Nc	Nf	Nu	Ni	Dependability Index (D)	Security Index(S)	Reliability Index(R)	Remarks
01	220KV S/S Shahjahanpur	220KV Shahjahanpur to Faridpur Line	1	0	0	0	1.00	1.00	1.00	

ET&CD- LUCKNOW

S.No.	Substation	Unit (SPS/Line/ICT/GT etc	Nc	Nf	Nu	Ni	Dependability Index (D)	Security Index(S)	Reliability Index(R)	Remarks
1	220 KV S/S Gomti nagar, Lucknow	220 KV Gomti nagar-Sarojinin nagar line	1	0	0	0	1	1	1	
2	220 KV S/S Kanpur road, Lucknow	220/33 KV 60MVA T/F-1	1	0	0	0	1	1	1	
3		220/33 KV 60MVA T/F-2	1	0	0	0	1	1	1	

ET&CD- BAREILLY

S.N.	Sub station	Unit (SPS/LINE/ICT/GT etc)	Nc	Nf	Nu	Ni	Dependibility index D	Security index S	Reliabilty index R	Remarks
1	400 KV Bareilly	400 KV Unnao Ckt-1	6	0	1	1	1	0.86	0.86	
		400 KV PGCIL Ckt-2	0	0	1	1	0	0	0	
		315 MVA ICT-1	0	0	1	1	0	0	0	
		400 KV Bus coupler	0	0	1	1	0	0	0	
		400 KV Unnao Ckt-2	4	0	0	0	1	1	1	
		220 KV CB Ganj-1	4	0	0	0	1	1	1	
		220 KV Pantnagar	2	0	0	0	1	1	1	
		220 KV Faridpur	1	0	0	0	1	1	1	
		220 KV Amariya-2	1	0	0	0	1	1	1	
		220 KV CB Ganj-2	2	0	0	0	1	1	1	
2	220 KV Amariya	220 KV Bareilly-2	1	0	0	0	1	1	1	
3	220KV C.B.GANJ	220KV BAREILLY I	3	0	0	0	1	1	1	
4	220KV C.B.GANJ	220KV BAREILLY II	1	0	0	0	1	1	1	
5	220KV Faridpur	220KV SHAJHANPUR	1	0	0	0	1	1	1	
6	220KV Faridpur	220KV BAREILLY	1	0	0	0	1	1	1	
7	220KV GIS BADAUN ROAD BLY	220 KV OCBTL	2	0	0	0	1	1	1	
8	220KV DATAGANJ	OCBTL II	1	0	0	0	1	1	1	

ET&CD- GONDA

S.No.	Substation	Unit (SPS/Line/ICT/GT etc	Nc	Nf	Nu	Ni	Dependability Index (D)	Security Index(S)	Reliability Index(R)	Remarks
01	NIL	NIL	NA	NA	NA	NA	NA	NA	NA	
		GRAND TOTAL	57	0	4	4				

PERFORMANCE INDICES FORM TC ZONE UPPTCL	Dependability Index (D) D=Nc/(Nc+Nf)	1
	Security Index (S) S+Nc/(Nc+Nu)	0.93
	Reliability Index R=Nc/(Nc+Ni)	0.93

Nc is the number of correct operation at internal power system faults.

Nf is the number of failures of operation at internal power system faults.

Nu is the number of unwanted operations.

Ni is the number of incorrect operations and is the sum of Nf and Nu

(Amrendra Kumar)

Superintending Engineer

S.No.	Substation	Element name	Date & Time of the tripping	Categorization (F/U) F = Failures to operate at internal power system faults U = Unwanted operations	Reason for failures/Unwanted operation	Corrective action taken/ to be taken
1	400 KV Bareilly	400 KV Bus coupler	19.02.2025 15:24	U	1) At 15:24 hrs LBB function of 315 MVA ICT-3 operated during testing of Backup relay and elements connected to Bus-1 tripped. 2) ICT-3 400 KV Bus-1 Isolator was closed. It could not be open during shutdown as it was stucked due to mechanical fault.	In future during testing Bus isolator open condition and LBB/ Bus Bar protection should be in disabled condition will be ensured.
	400 KV Bareilly	315 MVA ICT-1	19.02.2025 15:24	U		
	400 KV Bareilly	400 KV Unnao-1	19.02.2025 15:24	U		
	400 KV Bareilly	400 KV PGCIL-2	19.02.2025 15:24	U		

Reporting of Performance Indices for NHPC Power Stations In NR-Region
Month-FEB'25

Sl No	Name of Utility	Name of PS	Elements (Line/ Unit)	From		To		Total Outage	Outage Reason	Nc	Nf	Nu	Ni	Dependability Index (D=Nc/(Nc+Nf))	Security Index (S=Nc/(Nc+Nu))	Reliability Index (R=Nc/(Nc+Ni))	Reason for wrong operation	Action Taken
1	NHPC Ltd	SALAL	220 KV Salal-Jammu Line#2	3-Feb-25	02:51	3-Feb-25	04:57	2:06	Distance protection operated in Z2 at R-Phase fault	1	0	0	0	1	1	1		
2	NHPC Ltd	PARBATI-III	400 KV Parbati-III-Banala Line#1	3-Feb-25	19:35	3-Feb-25	23:24	3:49	Direct Trip Receive from Banala End	1	0	0	0	1	1	1		
3	NHPC Ltd	CHAMERA-I	400 KV Chamera-I-Jalandhar Line#1	7-Feb-25	16:20	7-Feb-25	18:19	1:59	Oil Level Low in Shunt reactor	1	0	1	1	1	0.5	0.5	The two core of control cable assigned for low oil level trip found damaged (shorted) which lead to extend the positive DC supply and activate the master trip relay of the shunt reactor.	The damaged core has been replaced to available healthy spare cores.
4	NHPC Ltd	CHAMERA-I	400 KV Chamera-I-Jalandhar Line#1	8-Feb-25	17:48	8-Feb-25	19:36	1:48	High Vibration in Shunt reactor	1	0	1	1	1	0.5	0.5	Thetwo core of control cable assigned for high vibration relay was damaged which lead to extend the positive DC supply and activate the master trip relay of the shunt reactor.	The damaged core has been replaced to available healthy spare cores.
5	NHPC Ltd	URI	400 KV Uri-Amargarh Line#2	28-Feb-25	00:20	28-Feb-25	13:19	12:59	DPR operated in Z1 at B-N Phase fault	1	0	0	0	1	1	1		
6	NHPC Ltd	URI	400 KV Uri-Amargarh Line#2	28-Feb-25	19:01	28-Feb-25	21:22	2:21	DPR operated in Z1 at B-N Phase fault	1	0	0	0	1	1	1		
No Line tripping has been observed from other Power Stations of NHPC of NR region for Month of February'2025																		

S.No.	Substation	Element name	Date & Time of the tripping	Categorization (F/U) F = Failures to operate at internal power system faults U = Unwanted operations	Reason for failures/Unwanted operation	Corrective action taken/ to be taken
1	400KV PARICHHA	400KV PARICHHA-ORAI CIRCUIT 1	2/26/2025 2:35	U	During a single-phase transient fault, Auto reclose lockout shot recorded at Parichha end because of continuously persisting COS (carrier out of service) alarm.	**1.**Transmission T&C wing has checked carrier signal after emergency shutdown on 28/02/2025 & made healthy but COS alarm persisting at parichha end. **2**.ETD orai has consulted OEM for resolution of teleprotection panel issue & planned to check and rectify the issue in their panel in co-ordination with microwave wing.

Reason for Performance Indices less than Unity- February 2025 (RVPN)

Case-1 440/ 220 kV, 315 MVA ICT-I at 400KV GSS Jodhpur on 05.02.2025
No. of Unwanted operation – 1

Reason of unwanted operation –

Wrong operation of differential relay.

Corrective Action taken – Partial

Differential relay defective and kept out of service, shall be replaced soon.

Case-2 400 KV 252B C.B. - Bikaner line & 50 MVAR Reactor III at 400 KV GSS Merta on 22.02.2025
No. of Unwanted operation – 1

Reason of unwanted operation –

400KV Merta- Bikaner line & 50 MVAR Reactor III tripped during DC leakage detection of same dia of 400KV Main C.B. 252A relay panel. 400KV Bikaner line tripped only from Merta end, Line remained Charged from Bikaner end

Corrective Action taken – YES

Employees were asked to work carefully.

Case-3 400/220KV, 500MVA ICT-I Main CB Bay No. 415, 400/220KV, 500MVA ICT-III Main CB Bay No. 424, 400KV Renew-I line TIE CB Bay No. 432, 400KV Renew-II line TIE CB Bay No. 435, 400KV Jaisalmer-Barmer line TIE CB at 400 KV GSS Jaisalmer-2 (Bhensara) on 22.02.2025
No. of Unwanted operation – 5

Reason of unwanted operation –

LBB operated during Testing & wiring work in C&R panel, command of LBB trip issued.

Corrective Action taken – YES

Employees were asked to work carefully.

Case- 40652A MAIN BAY - 125 MVAR BUS REACTOR NO 1 at 400KV MERTA on 26.02.2025
No. of Unwanted operation – 1

Reason of unwanted operation –

Y- Phase pole of CB stuck.

Corrective Action taken – YES

CB problem rectified.

Case-5 220KV Chhonkarwara -Mandawar Line at 220 KV GSS Chhonkarwara on 14.02.2025
No. of Unwanted operation – 1

Reason of unwanted operation –

Dist. Protection Operated while revising setting of M1 and M2 Relays.

Corrective Action taken – YES

Employees were asked to work carefully.

Case-6 220 KV Lalsot-ANTA LINE from ANTA (NTPC) on 19.02.2025
No. of Unwanted operation – 1

Reason of unwanted operation –

Due to defective PU of Bus Bar protection scheme at ANTA (NTPC).

Corrective Action taken – NO

ANTA (NTPC) has been asked to replace the defective PU or revise the pickup setting according to fault MVA of Bus to prevent unwanted trippings.

Case-7 220/132 KV, 100 MVA BHEL-II TR at 220 KV GSS NAGAUR on 07.02.2025
No. of Unwanted operation – 1

Reason of unwanted operation –

REF relay defective.

Corrective Action taken – YES

Numerical REF relay replaced.

Case-8 220/132 KV, 100 MVA, IMP Make X-mer No.1 at 220 KV DHOD on 19.02.2025
No. of Unwanted operation – 1

Reason of unwanted operation –

LBB operation due to defective contact in 86 relay.

Corrective Action taken –YES

86 relay contact problem rectified.

Case-9 220/132 KV, 160 MVA BHEL TRF- 01 at 220 KV GSS, BHADLA on 27 & 28.02.2025
No. of Unwanted operation – 2

Reason of unwanted operation –

Defective relay setting, proper grading was not available.

Corrective Action taken –YES

Relay setting revised.

Annexure-X

Format No.PI-01
Reporting of performance indices for protection system
(for elements connected at 220 kV and above)
Name of Utility: Sainj HEP
Month: February' 2025

S. N.	Sub-station	Unit (SPS/Line/ICT/GT/etc)	Nc	Nf	Nu	Ni	Dependability Index(D)	Security Index (S)	Reliability Index R
1	Sainj HEP	unit	4	0	1	0	1	0.8	1

Justification for less than one index may be attached separately.

Nc is the number of correct operations at internal power system faults.

Nf is the number of failures to operate at internal power system faults.

Nu is the number of unwanted operations.

Ni is the number of incorrect operations and is the sum of Nf and Nu.

Sr. Manager (O&M)
Sainj HEP

Status of Internal Protection Audit Plan for FY 2024 -25									
S. No.	NRPC Member	Category	Status	Schedule submitted as per utililty	Present Status Comlpleted (yes/no)	Audit Completed Date	Report Submission Date by audit party	Discussion held in PSC meeting number	Compliance status
1	PGCIL	Central Government owned Transmission Company	Received						
2	NTPC	Central Generating Company	Received						
3	BBMB		Received						
4	THDC		Received						
5	SJVN		Received						
6	NHPC		Received						
7	NPCIL								
8	Delhi SLDC	SLDC							
9	Haryana SLDC								
10	Rajasthan SLDC								
11	Uttar Pradesh SLDC		Vishnuprayag, WUPPTCL		Vishnuprayag, WUPPTCL (Greater Noida)			57	Pending
12	Uttarakhand SLDC								
13	Punjab SLDC								
14	Himachal Pradesh SLDC								
15	DTL	State Transmission Utility	Received						
16	HVPNL		Received						
17	RRVPNL		Received		BARLI, NPH, TINWARI, ALWAR, BANSUR, BEHROR, BHARATPUR, BHIWADI, CHHONKARWADA, DHOLPUR, KG BAS, KHUSKHERA, KOTPUTALI, MANDAWAR, MANOHARPUR, NADBAI, NEEMRANA, PHAGI, AJMER, DOONI, GGC, SIKRAI, HINDAUN, SWM, BHENSARA, ANTA, BHILWARA, RAMGARH, RATANGARH, LALSOT			57	Pending
					220 kV Chaksu 220 kV Mansarovar 765 kV Anta 220 kv Mandalgarh 220 kV Pratapgarh			56	Pending
18	UPPTCL		Received for Jhansi, Lucknow, Meerut, Gorakhpur, Prayagraj, Agra zone)						
19	PTCUL		Received						
20	PSTCL		Received						
21	HPPTCL		Received		Gumma, Lahal, Phozal			56	Pending
22	IPGCL	State Generating Company	Received (PPCL-I,III)						
23	HPGCL		Received						
24	RRVUNL		Received		Ramgarh Gas Sutargarh Supercritical			56	Pending
25	UPRVUNL		Received (obra -B, Anpara-B,D switch yard, Harduganj-C,D,E))		Harduaganj, Anpara-B, C, D			57	Pending
26	UJVNL		Received (Khodri, Chibro, Vyasi, Dharasu , Tiloth)						
27	HPPCL								
28	PSPCL	State Generating Company & State owned Distribution Company	Received (Ranjet sagar dam, GHTP, GGSSTP, GATP)						
29	HPSEBL	Distribution company having Transmission connectivity ownership	Received						
30	Prayagraj Power Generation Co. Ltd.	IPP having more than 1000 MW installed capacity	Received		Yes			56	Pending
31	Aravali Power Company Pvt. Ltd		Received						
32	Apraava Energy Private Limited		Received						
33	Talwandi Sabo Power Ltd.		Completed	-	Nov'24		Pending		
34	Nabha Power Limited		Received		400 kV NPL Sub-station			56	Pending
35	MEIL Anpara Energy Ltd		Received						
36	Rosa Power Supply Company Ltd		Received						
37	Lalitpur Power Generation Company Ltd		Received		Yes			57	Pending
38	MEJA Urja Nigam Ltd.								
39	Adani Power Rajasthan Limited		Received						
40	JSW Energy Ltd. (KWHEP)		Received						
41	AESL	Other transmission licensee	Received (ATIL -400kV Mohindergarh S/s, OBTL, FBTL, MTSCL, ATSCL, HPTSL, BKTL, GTL)						
42	Tata Power Renewable Energy Ltd.		Recevied (TPGEL, BTPSL)						
43	UT of J&K	UT of Northern Region							
44	UT of Ladakh								
45	UT of Chandigarh								
46	INDIGRID		Received						
47	ADHPL		Received						
48	Sekura Energy Limited								

Status of Internal Protection Audit Plan for FY 2025 -26								
S. No.	**NRPC Member**	**Category**	**Status**	**Schedule submitted as per utililty**	**Present Status Comlpleted (yes/no)**	**Report Submission Date by audit party**	**Discussion held in PSC meeting number**	**Compliance status**
1	PGCIL	Central Government owned Transmission Company	Received (NR-1,2					
2	NTPC	Central Generating Company	Received					
3	BBMB							
4	THDC		Received (Tehri)					
5	SJVN		Received (NJHPS, RHPS)					
6	NHPC		Received					
7	NPCIL							
8	Delhi SLDC	SLDC						
9	Haryana SLDC							
10	Rajasthan SLDC							
11	Uttar Pradesh SLDC		Received (Jaypee Vishnuprayag, WUPPTCL, SEUPPTCL)					
12	Uttarakhand SLDC							
13	Punjab SLDC							
14	Himachal Pradesh SLDC							
15	DTL	State Transmission Utility	Received					
16	HVPNL		Received					
17	RRVPNL		Received					
18	UPPTCL		Received (All zones)					
19	PTCUL							
20	PSTCL							
21	HPPTCL		Received					
22	IPGCL	State Generating Company	Received (PPS-III, I)					
23	HPGCL							
24	RRVUNL		Received					
25	UPRVUNL		Received (Obra- A, B) BTPS Parichha					
26	UJVNL		Received (Dharashu, Tiloth)					
27	HPPCL		Received (Kasheng HEP, Sawara Kuddu, Saini)	Nov'25-Mar'26				
28	PSPCL	State Generating Company & State owned Distribution Company	Received (GHTP, GGSSTP, GATP, RSD)					
29	HPSEBL	Distribution company having Transmission connectivity ownership	Received					
30	Prayagraj Power Generation Co. Ltd.	IPP having more than 1000 MW installed capacity	Received					
31	Aravali Power Company Pvt. Ltd							
32	Apraava Energy Private Limited		Received	May'25				
33	Talwandi Sabo Power Ltd.			May'25				
34	Nabha Power Limited		Received					
35	MEIL Anpara Energy Ltd							
36	Rosa Power Supply Company Ltd		Received					
37	Lalitpur Power Generation Company Ltd		Received					
38	MEJA Urja Nigam Ltd.							
39	Adani Power Rajasthan Limited							
40	JSW Energy Ltd. (KWHEP)							
41	AESL	Other transmission licensee						
42	Tata Power Renewable Energy Ltd.							
43	UT of J&K	UT of Northern Region						
44	UT of Ladakh							
45	UT of Chandigarh							
46	INDIGRID		Received	Aug-25 to March-26				
47	ADHPL							
48	Sekura Energy Limited							

Status of 3rd Party Protection Audit Plan								
S. No.	NRPC Member	Category	Status	Schedule submitted as per utililty	Present Status Comlpleted (yes/no)	Report Submission Date by audit party	Discussion held in PSC meeting number	Compliance status
1	PGCIL	Central Government owned Transmission Company	Received (7 S/s of NR-1, 1 S/s of NR-2, 4 S/s of Nr-3)	By Jan 2025				
2	NTPC	Central Generating Company	Received (Singrauli, Rihand, Unchahar, Dadri, Dadri Gas, Auraiya Gas, Faridabad Gas, Anta Gas Power Station)	By Oct 2028				
			Received (Tanda)	By 17.07.2025				
3	BBMB		Received	Feb-27				
4	THDC		Received	March 2026-Tehri, F.Y. 2025-26- Koteshwar				
5	SJVN		Received	Nov-Dec 2025 for RHPS, Nov 24- March 25 for NJHPS				
6	NHPC		Received	FY-2025-26				
7	NPCIL		Completed (220kV) (NAPS)	Jan'25	Completed	18.01.2025	57	
8	Delhi SLDC	SLDC						
9	Haryana SLDC							
10	Rajasthan SLDC							
11	Uttar Pradesh SLDC		Alaknanda	March 2025				
			Received (Tanda extension)	17.07.2025				
			Received (Tanda)	17.07.2025				
			SEUPPTCL	Conducted (Oct 2024)				
12	Uttarakhand SLDC							
13	Punjab SLDC							
14	Himachal Pradesh SLDC							
15	DTL	State Transmission Utility	Received					
16	HVPNL							
17	RRVPNL							
18	UPPTCL		Received	2025	Under tendering			
19	PTCUL		Received	By Jan 2025				
20	PSTCL							
21	HPPTCL		Received	FY 25-26				
22	IPGCL	State Generating Company	Received (PPS-III)	FY 25-26				
23	HPGCL							
24	RRVUNL		Received					
25	UPRVUNL		Received (Obra-B)	2026-27				
			Anpara D	2025	Under tendering			
			Anpara B	2025	Under tendering			
			Harduaganj	2025	Under tendering			
			Harduaganj D	2025	Under tendering			
			Parichha	2025	Under tendering			
			Parichha Ext	2025	Under tendering			
			Jawaharpur	2025	Under tendering			
			Paricha BTPS	2026				
26	UJVNL				Dharasu		56	Pending
27	HPPCL		Kashang HEP	FY 2025-26				
28	PSPCL	State Generating Company & State owned Distribution Company	Reeceived (GHTP)	Dec. 2025				
			Received (GATP)	May 2025				
			GGSSTP	2026				
			RSD/ Sahapur Kandi					
29	HPSEBL	Distribution company having Transmission connectivity ownership						
30	Prayagraj Power Generation Co. Ltd.	IPP having more than 1000 MW installed capacity	Received	Dec-24				
31	Aravali Power Company Pvt. Ltd							
32	Apraava Energy Private Limited		Received	By May, 2025				
33	Talwandi Sabo Power Ltd.		Conducted	Dec'22		Pending		
34	Nabha Power Limited		Received	By December, 2025				
35	MEIL Anpara Energy Ltd		Received	* Feb 2025				
36	Rosa Power Supply Company Ltd		Conducted	By 30.09.2024	08.08.2024	13.01.2025	57	
37	Lalitpur Power Generation Company Ltd		Conducted	26.03.2024				
38	MEJA Urja Nigam Ltd.							
39	Adani Power Rajasthan Limited		Conducted	November, 2024	Kawai		56	Pending
40	JSW Energy Ltd. (KWHEP)		Received	December 2024 to March 2025	Completed		57	Pending
41	AESL	Other Transmission Licensee	Received (ATIL -400kV Mohindergarh S/s.)	400kV Mohindergarh SS- Q2 , FY 2025-26				
			Received (OBTL)	OBTL-Q1 , FY 2025-26				
			Received (FBTL)	FBTL-Q3 , FY 2025-26				
			Received (MTSCL)	MTSCL-Q4 , FY 2025-26				
			Received (ATSCL)	ATSCL-Q1 , FY 2026-27				
			Received (HPTSL)	HPTSL- Q2 , FY 2026-27				
			Received (BKTL)	BKTL-Q3 , FY 2026-27				
			Received (GTL)	GTL- Q3 & Q4, FY 2026-27				
42	Tata Power Renewable Energy Ltd.	IPP having less than 1000 MW installed capacity (alphabetical rotaional basis)						
43	UT of J&K	UT of Northern Region						
44	UT of Ladakh							
45	UT of Chandigarh							
46	INDIGRID		Received (NRSS 29)	FY 24-25				
			Received (PTCL)	FY 25-26				
47	ADHPL		Received	* September 2026				
48	Sekura Energy Limited							
* Revised Schedule								
	State Utilities							
	Uttar Pradesh							
	Vishnuprayag		Not received					
	Alaknanda		Received	Mar-25				
	WUPPTCL		No schedule provided					
	SEUPPTCL		Completed on Oct 2024					
	OCBTL		Q1 , FY 2025-26					
	GTL		Q3 & Q4 , FY 2026-27					

DETAILED REPORT ON ANALYSIS OF 5TH ORDER HARMONICS IN REFERENCE TO SUBSEQUENT TRIPPING OF TYPE 3 FILTERS (5/27) AT HVDC RIHAND & DADRI TERMINALS

Date of Report: March 17, 2025

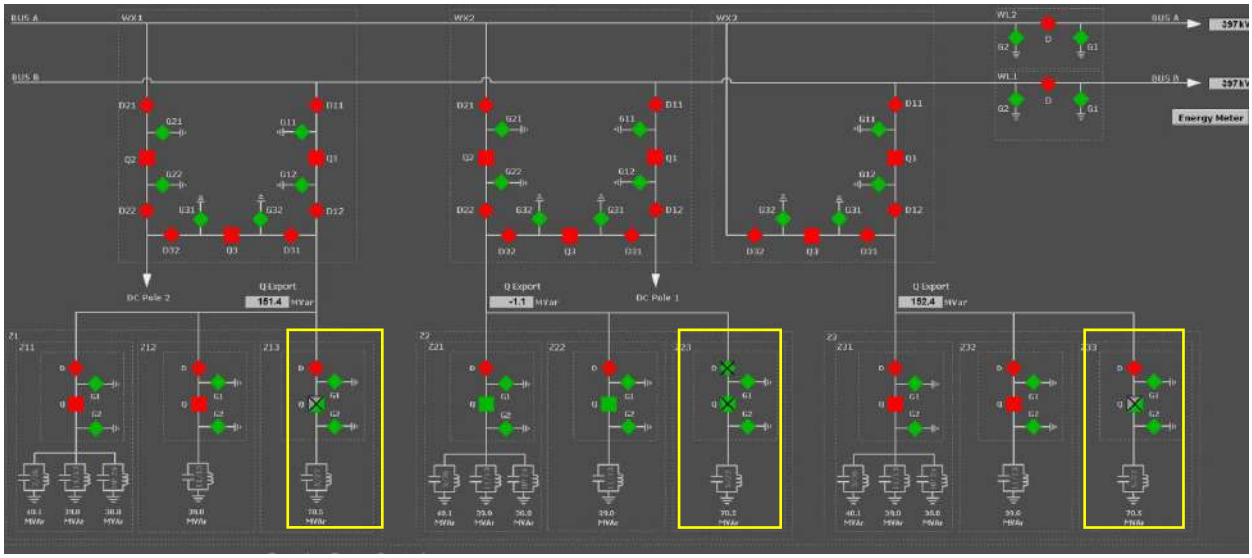
1. Introduction

The ± 500kV, 1500 MW HVDC terminals at Rihand and Dadri have been experiencing a recurring issue involving the tripping of Type-3 filter banks (Z13, Z23, and Z33) on harmonic overload protections. These filter banks are designed to mitigate the 5th and 27th order harmonics generated by the converters at the terminals. This report presents a detailed analysis of the issue, including harmonic measurements, findings, and proposed actions to address the problem.

Each terminal is equipped with three Type-3 filter banks—namely Z13, Z23, and Z33—intended to ensure 5th and 27th level harmonic suppression within acceptable limits. However, due to higher side of 5th level harmonic in the system, Harmonic Overload protection have led to all three filter banks being in an isolated state at both Rihand and Dadri terminals leading to loss of 211.5 MVAR out of 685.2 MVAR as of the current date.

2. Agenda Point

It has been observed that whenever any of the Type-3 filter banks (5/27) are charged—either through Reactive Power Control (RPC) or manually—they trip on harmonic overload protections. This issue persists despite the converter-generated harmonics being within the design limits of the system. Preliminary analysis suggests the presence of external 5th order harmonics in the grid as the primary cause of the overload and subsequent tripping.



Filter Configuration at HVDC Rihand and Dadri terminals

3. Study

A detailed study of harmonic levels was conducted using the **Megger MPQ2000 Power Quality Analyzer Kit**. Harmonic Measurements were taken under two distinct operational conditions to assess the harmonic profile and its impact on the Type-3 filters:

Note:

- *All the Readings are in Amps.*
- *Measurement data backup files shared separately with this report.*

Case 1: Harmonic measurement with both poles of Rihand-Dadri in service condition.

To measure the **net current harmonic levels (net of harmonics generated in HVDC and harmonics available in grid) available in the system**, measurement done in case of both poles in service.

Measurement 1: *18.11.2023*

- **Measurement Details:** Harmonic levels were recorded with both poles of the Rihand-Dadri HVDC link were in loaded condition.
- **Bipole Power Flow during measurement** = 1000 MW (500 MW each pole)

Results:

Date	Time	Harm 1	Harm 3	Harm 5	Harm 7	Harm 11	Harm 13	Harm 15	Harm 23	Harm 25	Harm 27
18-11-2023	8:20:54 PM	838.377	4.532	1.511	1.511	46.828	30.212	1.511	6.042	4.532	1.511
18-11-2023	8:30:54 PM	839.888	4.532	1.511	1.511	46.828	30.212	1.511	6.042	4.532	1.511
18-11-2023	8:40:54 PM	842.909	4.532	1.511	1.511	46.828	30.212	1.511	4.532	4.532	1.511
18-11-2023	8:50:54 PM	842.909	3.021	1.511	1.511	46.828	31.722	1.511	4.532	4.532	1.511
18-11-2023	9:00:54 PM	836.866	3.021	1.511	1.511	45.318	30.212	1.511	6.042	4.532	1.511
18-11-2023	9:10:54 PM	830.824	4.532	1.511	1.511	43.807	28.701	1.511	6.042	4.532	1.511
18-11-2023	9:20:54 PM	832.335	3.021	3.021	1.511	43.807	28.701	1.511	6.042	4.532	1.511
18-11-2023	9:30:54 PM	832.335	3.021	1.511	1.511	43.807	28.701	1.511	6.042	4.532	1.511
18-11-2023	9:40:54 PM	832.335	4.532	3.021	1.511	43.807	28.701	1.511	6.042	4.532	1.511
18-11-2023	9:50:54 PM	830.824	4.532	3.021	1.511	43.807	28.701	1.511	6.042	4.532	1.511
18-11-2023	10:00:54 PM	829.313	3.021	3.021	1.511	43.807	28.701	1.511	6.042	4.532	1.511
18-11-2023	10:10:54 PM	830.824	3.021	3.021	1.511	43.807	28.701	1.511	6.042	4.532	1.511
18-11-2023	10:20:54 PM	830.824	4.532	3.021	1.511	43.807	28.701	1.511	6.042	4.532	1.511
18-11-2023	10:30:54 PM	829.313	4.532	3.021	1.511	43.807	28.701	1.511	6.042	4.532	1.511
18-11-2023	10:40:54 PM	829.313	4.532	3.021	1.511	42.296	28.701	1.511	6.042	4.532	1.511
18-11-2023	10:50:54 PM	826.292	3.021	3.021	1.511	42.296	27.191	1.511	6.042	6.042	1.511
18-11-2023	11:00:54 PM	824.782	3.021	3.021	1.511	42.296	27.191	1.511	6.042	6.042	1.511
18-11-2023	11:10:54 PM	823.271	3.021	3.021	1.511	42.296	27.191	1.511	6.042	6.042	1.511
18-11-2023	11:20:54 PM	823.271	3.021	3.021	1.511	40.786	27.191	1.511	6.042	6.042	1.511
18-11-2023	11:30:54 PM	823.271	4.532	3.021	1.511	42.296	27.191	1.511	6.042	6.042	1.511
18-11-2023	11:40:54 PM	824.782	4.532	3.021	1.511	42.296	27.191	1.511	6.042	6.042	1.511
18-11-2023	11:50:54 PM	824.782	4.532	3.021	1.511	42.296	27.191	1.511	6.042	6.042	1.511
19-11-2023	12:00:54 AM	823.271	4.532	3.021	1.511	42.296	27.191	1.511	6.042	6.042	1.511
19-11-2023	12:10:54 AM	823.271	4.532	3.021	1.511	42.296	27.191	1.511	6.042	6.042	1.511
19-11-2023	12:20:54 AM	823.271	4.532	3.021	1.511	42.296	27.191	1.511	6.042	6.042	1.511
19-11-2023	12:30:54 AM	821.76	4.532	3.021	1.511	42.296	27.191	1.511	6.042	6.042	1.511
19-11-2023	12:40:54 AM	824.782	4.532	1.511	1.511	43.807	28.701	1.511	6.042	4.532	1.511
19-11-2023	12:50:54 AM	823.271	4.532	1.511	1.511	43.807	28.701	1.511	6.042	4.532	1.511
19-11-2023	1:00:54 AM	823.271	4.532	1.511	1.511	43.807	28.701	1.511	6.042	4.532	1.511
19-11-2023	1:10:54 AM	827.803	4.532	1.511	1.511	43.807	28.701	1.511	6.042	4.532	1.511
19-11-2023	1:20:54 AM	827.803	4.532	1.511	1.511	43.807	28.701	1.511	6.042	4.532	1.511
19-11-2023	1:30:54 AM	827.803	4.532	1.511	1.511	43.807	28.701	1.511	6.042	4.532	1.511
19-11-2023	1:40:54 AM	827.803	4.532	1.511	1.511	43.807	28.701	1.511	6.042	4.532	1.511
19-11-2023	1:50:54 AM	827.803	4.532	1.511	1.511	43.807	28.701	1.511	6.042	4.532	1.511

Measurement 2: 12.02.2024

- **Measurement Details:** Harmonic levels were recorded with both poles of the Rihand-Dadri HVDC link were in loaded condition.
- **Bipole Power Flow during measurement** = 1200 MW (600 MW each pole)

Results:

Date	Time	Harm 1	Harm 3	Harm 5	Harm 7	Harm 11	Harm 13	Harm 15	Harm 23	Harm 25	Harm 26	Harm 27
12-02-2024	12:29:11 PM	1000.01	3.021	1.511	1.511	42.296	30.212	1.511	9.064	9.064	0	1.511
12-02-2024	12:39:11 PM	1007.563	3.021	1.511	1.511	43.807	31.722	1.511	9.064	7.553	0	1.511
12-02-2024	12:49:11 PM	1007.563	3.021	1.511	1.511	43.807	30.212	1.511	9.064	7.553	0	1.511
12-02-2024	12:59:11 PM	1007.563	3.021	1.511	1.511	43.807	30.212	1.511	9.064	9.064	0	1.511
12-02-2024	1:09:11 PM	1006.052	3.021	1.511	1.511	42.296	30.212	1.511	9.064	9.064	0	1.511
12-02-2024	1:19:11 PM	1007.563	3.021	1.511	1.511	43.807	30.212	1.511	9.064	7.553	0	1.511
12-02-2024	1:29:11 PM	1003.031	3.021	1.511	1.511	42.296	30.212	1.511	9.064	9.064	0	1.511
12-02-2024	1:39:11 PM	1001.521	3.021	1.511	1.511	42.296	30.212	1.511	9.064	9.064	0	1.511
12-02-2024	1:49:11 PM	1000.01	3.021	1.511	1.511	42.296	28.701	1.511	9.064	9.064	0	1.511
12-02-2024	1:59:11 PM	998.499	3.021	1.511	1.511	42.296	28.701	1.511	9.064	9.064	0	1.511
12-02-2024	2:09:11 PM	993.968	3.021	1.511	1.511	40.786	28.701	1.511	9.064	9.064	0	1.511
12-02-2024	2:19:11 PM	993.968	3.021	1.511	1.511	40.786	28.701	1.511	9.064	9.064	0	1.511
12-02-2024	2:29:11 PM	993.968	3.021	1.511	1.511	40.786	28.701	1.511	9.064	9.064	0	1.511
12-02-2024	2:39:11 PM	996.989	3.021	1.511	1.511	42.296	28.701	1.511	9.064	7.553	0	1.511
12-02-2024	2:49:11 PM	998.499	3.021	1.511	1.511	42.296	28.701	1.511	9.064	7.553	0	1.511
12-02-2024	2:59:11 PM	998.499	3.021	1.511	1.511	42.296	28.701	1.511	9.064	7.553	0	1.511
12-02-2024	3:09:11 PM	992.457	3.021	1.511	1.511	40.786	27.191	1.511	9.064	7.553	0	1.511
12-02-2024	3:19:11 PM	996.989	3.021	1.511	1.511	43.807	31.722	1.511	9.064	7.553	0	1.511
12-02-2024	3:29:11 PM	998.499	3.021	1.511	1.511	43.807	31.722	1.511	9.064	7.553	0	1.511
12-02-2024	3:39:11 PM	998.499	3.021	1.511	1.511	43.807	31.722	1.511	9.064	7.553	0	1.511
12-02-2024	3:49:11 PM	1001.521	3.021	1.511	1.511	45.318	31.722	1.511	9.064	7.553	0	1.511
12-02-2024	3:59:11 PM	1001.521	3.021	1.511	1.511	45.318	31.722	1.511	9.064	7.553	0	1.511
12-02-2024	4:09:11 PM	998.499	3.021	1.511	1.511	43.807	30.212	1.511	9.064	7.553	0	1.511
12-02-2024	4:19:11 PM	1001.521	3.021	1.511	1.511	43.807	31.722	1.511	9.064	7.553	0	1.511
12-02-2024	4:29:11 PM	1003.031	3.021	1.511	1.511	45.318	31.722	1.511	9.064	7.553	0	1.511

Case 2: Harmonic measurement with both poles of Rihand-Dadri in shutdown condition:

To measure the current harmonic levels available in the **Grid**, measurement done in case of both poles in service.

- **Date of Measurement:** 20.11.2023
- **Measurement Details:** Harmonic levels were recorded with both poles of the Rihand-Dadri HVDC link in a shutdown state.
- **Power Flow = Nil**
- **Measurement Location :** Type 3 filter sub-bank Bay CT

Results:

Date	Time	Harm 1	Harm 3	Harm 5	Harm 7	Harm 11	Harm 13	Harm 15	Harm 23	Harm 25	Harm 27
20-11-2023	9:39:58 AM	104.231	0	7.553	0	3.021	0	0	1.511	0	0
20-11-2023	9:49:58 AM	104.231	0	7.553	0	3.021	0	0	1.511	0	0
20-11-2023	9:59:58 AM	104.231	0	7.553	0	3.021	0	0	1.511	0	0
20-11-2023	10:09:58 AM	104.231	0	7.553	0	3.021	1.511	0	1.511	0	0
20-11-2023	10:19:58 AM	104.231	0	7.553	0	3.021	0	0	1.511	0	0
20-11-2023	10:29:58 AM	104.231	0	7.553	0	3.021	1.511	0	1.511	0	0
20-11-2023	10:39:58 AM	104.231	0	7.553	0	3.021	1.511	0	1.511	0	0
20-11-2023	10:49:58 AM	104.231	0	7.553	0	3.021	0	0	1.511	0	0
20-11-2023	10:59:58 AM	104.231	0	6.042	0	3.021	0	0	1.511	0	0
20-11-2023	11:09:58 AM	104.231	0	7.553	0	3.021	1.511	0	1.511	0	0
20-11-2023	11:19:58 AM	104.231	0	7.553	0	3.021	1.511	0	1.511	0	0

Maximum harmonic currents (A) data with both poles of Rihand-Dadri in service condition during commissioning

Table attached below contains the data of net harmonic levels measured as per performance calculation at the time of commissioning of HVDC Rihand – Dadri link-

Calculated maximum harmonic currents (A) generated by the Rihand converters at bipolar operation, normal d.c. voltage

n / Id(pu) / Pdc MW / har order	0.10 (150)	0.67 (1000)	1.00 (1500)	1.10 (1650)	n / Id(pu) / Pdc MW / har order	0.10 (150)	0.67 (1000)	1.00 (1500)	1.10 (1650)
2	0.06	0.33	0.46	0.50	32	0.06	0.08	0.05	0.06
3	0.24	4.62	8.20	9.43	33	0.19	0.92	1.15	1.30
4	0.07	0.37	0.50	0.54	34	0.05	0.07	0.04	0.06
5	0.10	1.25	2.29	2.65	#35	5.57	9.77	9.03	10.66
6	0.08	0.42	0.54	0.56	36	0.04	0.05	0.05	0.05
7	0.09	1.18	2.07	2.36	#37	5.17	8.08	8.97	9.66
8	0.07	0.31	0.37	0.38	38	0.05	0.05	0.06	0.06
9	0.24	3.44	5.15	5.60	39	0.17	0.73	1.07	1.18
10	0.06	0.23	0.24	0.24	40	0.06	0.05	0.07	0.08
#11	20.54	102.18	110.77	108.92	41	0.06	0.24	0.37	0.40
12	0.06	0.21	0.18	0.16	42	0.07	0.05	0.08	0.08
#13	17.27	71.79	63.74	57.89	43	0.06	0.22	0.34	0.39
14	0.06	0.16	0.09	0.07	44	0.05	0.04	0.06	0.04
15	0.23	2.31	2.87	2.99	45	0.16	0.63	0.87	0.95
16	0.07	0.14	0.06	0.09	46	0.04	0.03	0.04	0.03
17	0.07	0.63	0.83	0.88	#47	3.61	4.49	4.93	5.35
18	0.08	0.11	0.11	0.13	48	0.05	0.04	0.03	0.04
19	0.07	0.54	0.67	0.77	#49	3.37	4.43	4.38	5.32
20	0.06	0.05	0.10	0.12	50	0.04	0.04	0.03	0.05
21	0.22	1.25	1.88	2.12	51	0.14	0.59	0.79	0.89
22	0.06	0.05	0.10	0.11	52	0.05	0.05	0.05	0.05
#23	9.31	14.99	24.34	27.18	53	0.05	0.19	0.29	0.32
24	0.06	0.06	0.11	0.12	54	0.06	0.06	0.06	0.06
#25	8.46	14.40	22.33	22.96	55	0.05	0.18	0.28	0.30
26	0.05	0.06	0.10	0.09	56	0.04	0.05	0.04	0.05
27	0.20	1.05	1.60	1.68	57	0.13	0.50	0.72	0.75
28	0.06	0.08	0.10	0.07	58	0.04	0.04	0.04	0.04
29	0.06	0.31	0.51	0.57	#59	2.37	3.24	4.01	3.39
30	0.07	0.10	0.08	0.07	60	0.04	0.04	0.04	0.03
31	0.07	0.32	0.48	0.51	#61	2.21	2.63	3.61	3.21

CHARACTERISTIC HARMONIC CURRENTS

5. Findings

The results of measurements carried out are compared against harmonic data recorded at the time of commissioning to identify deviations.

The analysis of the harmonic measurements revealed the following key observations:

1. **Elevated 5th Order Harmonics:** The 5th order harmonic levels were significantly higher than the harmonic data recorded at the time of commissioning.

   At the time of commissioning 5^{th} harmonic Current was in the range of 1.25 amps, which elevated up to 3.021 amps at the Power flow of 1000 MW.

2. **External Source:** The elevated 5th order harmonics may be attributed from external sources within the grid, which exceed the limit of harmonic settings of the Type-3 filter banks (Z13, Z23, and Z33) and finally trips the filter banks (Z13, Z23, and Z33).

STUDY FOR IMPLEMENETATION OF 3PH-AUTO RECLOSING IN 400 KV BAREILLY PG - MORADABAD TRANSMISSION LINES

Technology Development
Power Grid Corporation of India Ltd

Table of Contents

1. Introduction 2

2. Simulation Study 2

2.1 Three phase auto-reclosing for temporary line to line fault 4

2.2 Three phase auto-reclosing for permanent line to line fault 7

2.3 Three phase auto-reclosing for temporary line to line fault under line contingencies 11

2.4 Three phase auto-reclosing for permanent line to line fault under contingencies 15

Conclusion 19

List of Tables 21

List of figures 21

1. Introduction

A total of 76 numbers of phase-to-phase tripping incidents have been recorded on transmission lines in the NR-III Region over the past three years from May'21 to April'24 due to kite threads. Further, lines were successfully charged within a short duration of 1–2 hours during charging attempts, minimizing downtime.

Among these, the 400 kV Bareilly PG-Moradabad-I Line accounted for 16 of the 76 recorded incidents, highlighting it as a vulnerable section within the NR-III region. Given the frequency of such events in this line, implementation of three-phase auto-reclosing is being explored for this transmission line for line-to-line fault scenarios. Simulation study is undertaken to investigate the implications of the scheme to ensure the successful deployment of the three-phase auto-reclosing during line-to-line fault.

2. Simulation Study

The study examines the implementation of three-phase auto-reclosing in the 400kV Bareilly PG-Moradabad transmission line. A simulation was conducted using PSS-E software to analyse the system's behaviour, focusing on bus voltages and the angle response during three-phase auto-reclosing due to a phase-to-phase fault. A schematic diagram of the nearby network connected to the 400kV Bareilly PG and Moradabad bus systems is presented in Figure 1. The schematic diagram also includes above generators situated one or two buses away. NTPC Singrauli Super Thermal Power Station (SSTPS) has an installed capacity of 2,000 megawatts (MW) along with 15MW solar plant connected at 174923 Singral bus. Further, it is connected to 400kV Bareilly PG through 400kV Lucknow UPPPCL substation. The plant has five units of 200 MW each and two units of 500 MW each. Rosa Thermal Power Plant has installed capacity of 1200MW connected at 174471 ROSA-TP2 Bus & 172022 ROSA -TP1 Bus. The plant has four units of 300 MW each. ROSA TP plant is connected to 400kV Bareilly PG through 400kV Shahjahanpur substation. The Dhauliganga Hydroelectric Power Station (DHPS) has a capacity of 280 megawatts (MW) connected at 192237 Dhauli2 Bus. The plant has four units of 70 MW each. DHPS plant is connected to 400kV Bareilly PG through 400kV Jauljivi & 765kV Bareilly substation.

The network connectivity has been verified using the Single Line Diagram (SLD) of the 400kV Bareilly PG and 400kV Moradabad substations, with the SLDs provided in Appendix-I. The details of the 400kV Bareilly PG – Moradabad transmission line is as follows:

Table 1: 400kV Bareilly PG -Moradabad Line Details

Line length	93 km
Conductor configuration	S/C Twin Moose
Line Reactors	Not available

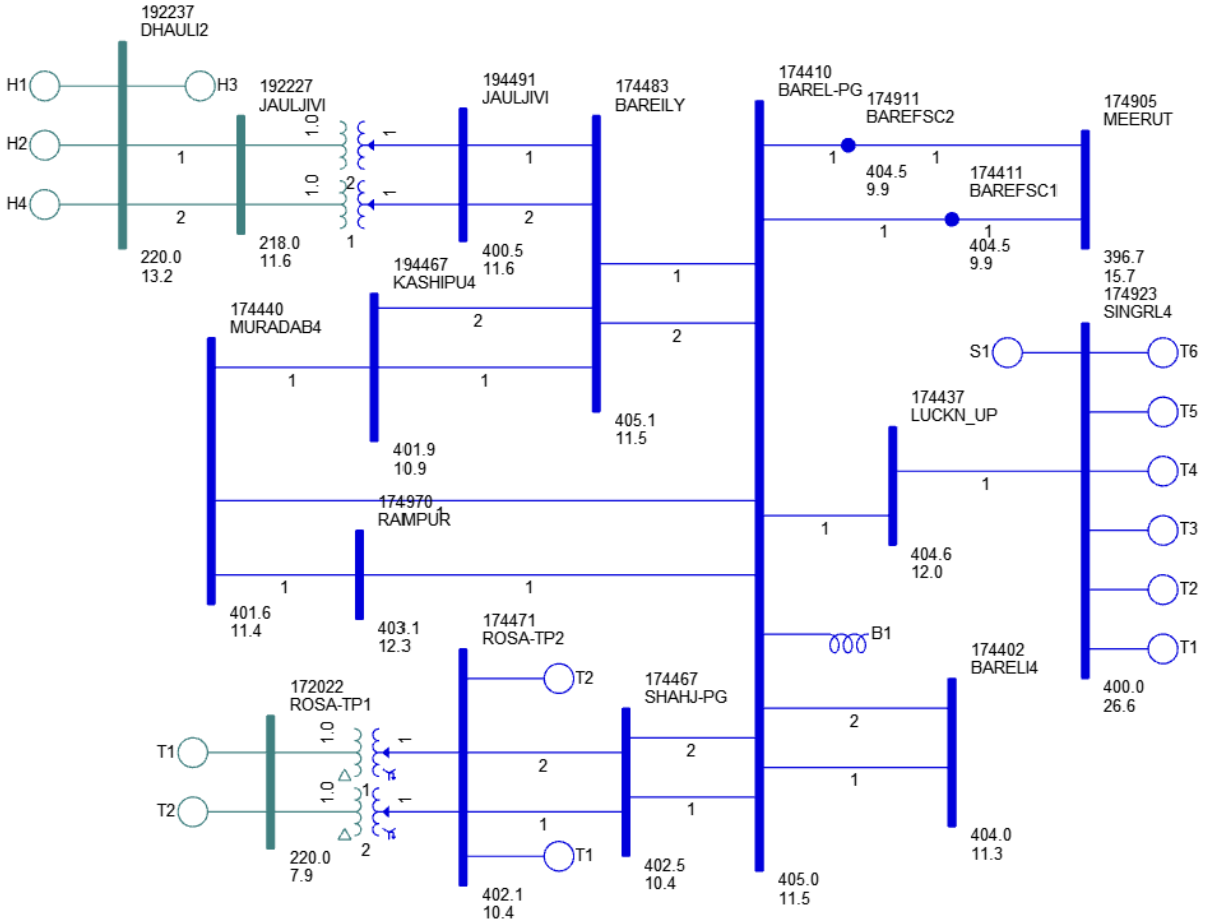


Figure 1: Schematic diagram of simulation Model

Short-circuit calculations have been performed for the 400kV Bareilly PG and 400kV Moradabad buses, as detailed below. The 400kV Bareilly PG is comparatively a stronger bus than the 400kV Moradabad. Therefore, it is suggested to perform synchronization at the 400kV Bareilly PG end.

Table 2: Short Circuit MVA details

Substation (400kV)		Short Circuit MVA	Short Circuit Current(kA)	Thevenin Impedance
Bareilly PG	3ph	29978.79	43.27	5.337/85.489
Moradabad	3ph	18260	26.35	8.360/85.229

In the simulation, a line-to-line fault was simulated, followed by three-phase auto-reclosing under both successful and unsuccessful scenarios. It was observed that the 400kV Bareilly PG-Rampur and 400kV Rampur-Moradabad lines provide a parallel path to the 400kV Bareilly PG-Moradabad line. Therefore, the above scenarios were also analysed for assessing the over loading of parallel lines with the 400kV Rampur-Moradabad line out of service.

The dynamic study focused on the voltage and angle deviations of the buses during AR event. Absolute bus voltages and angles with respect to the slack bus are plotted and figures are depicted in the respective scenarios section. Additionally, measurements

were recorded for remote end buses and generator connected buses. The following cases have been analysed in the simulation.

2.1 Three phase auto-reclosing for temporary line to line fault

In this case, a line-to-line fault is simulated on the 400kV Bareilly PG-Moradabad line, followed by three-phase auto-reclosing. The sequence of events used in the simulation study for successful three-phase auto-reclosing is detailed below in Figure 2.

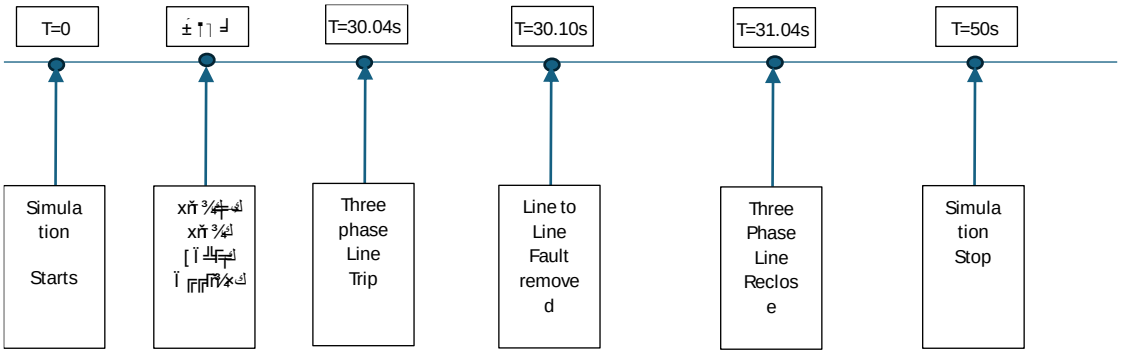


Figure 2: Sequence of the events for three-phase auto-reclosing for temporary fault

Absolute bus voltages and angles with respect to the slack bus of 400kV Bareilly PG and 400kV Moradabad buses are plotted in the Figure 3, Figure 4, Figure 5 and Figure 6. Other remote buses and generator connected buses voltage & angles with respect to the slack bus are depicted Figure 7 and Figure 8.

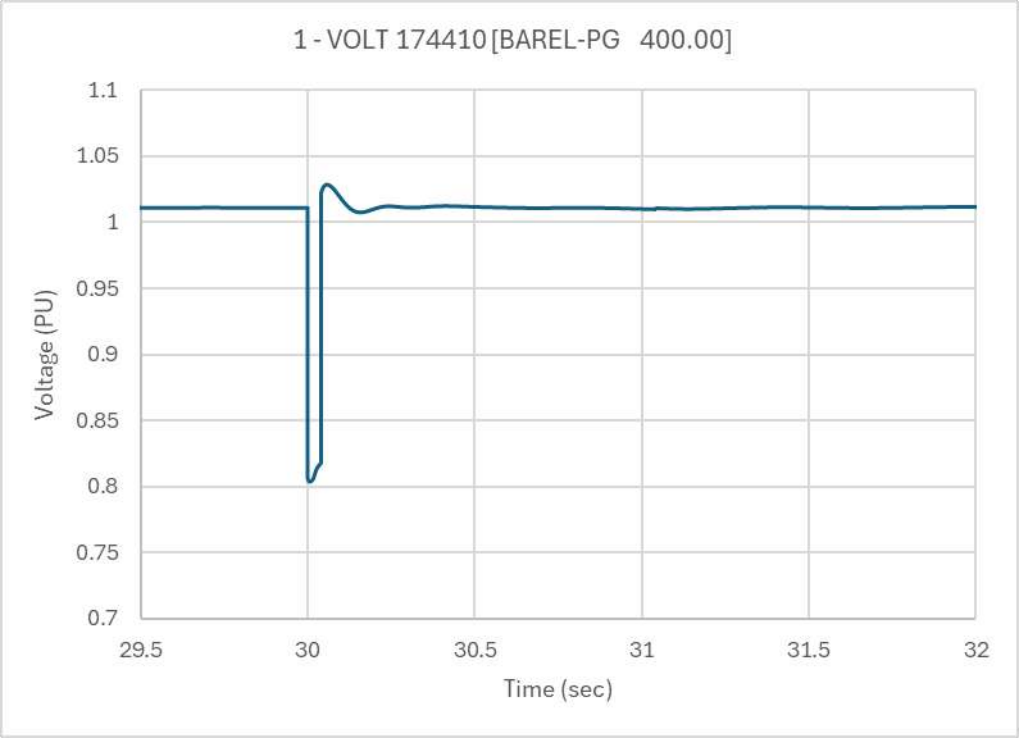


Figure 3: 400kV Bareilly PG Bus Voltage

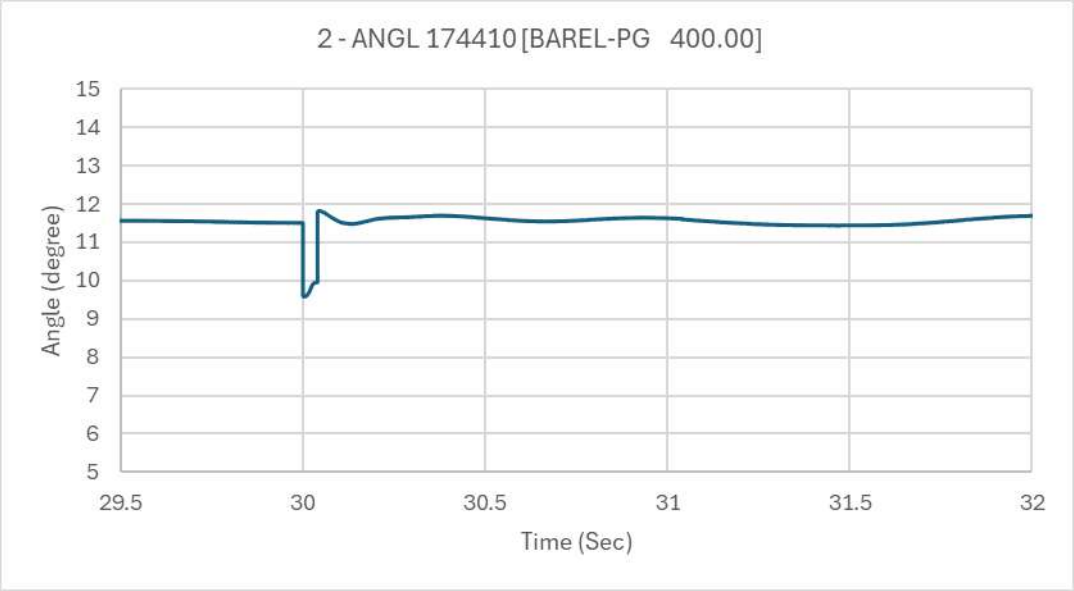


Figure 4: 400kV Bareilly PG Bus Angle

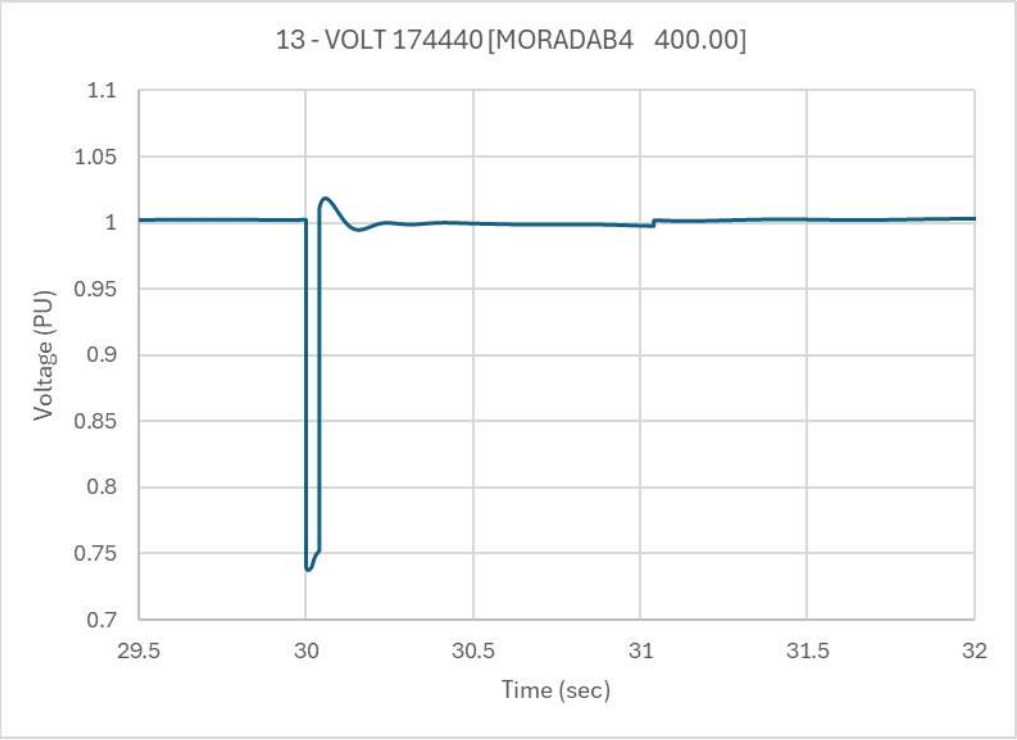


Figure 5: 400kV Moradabad Bus Voltage

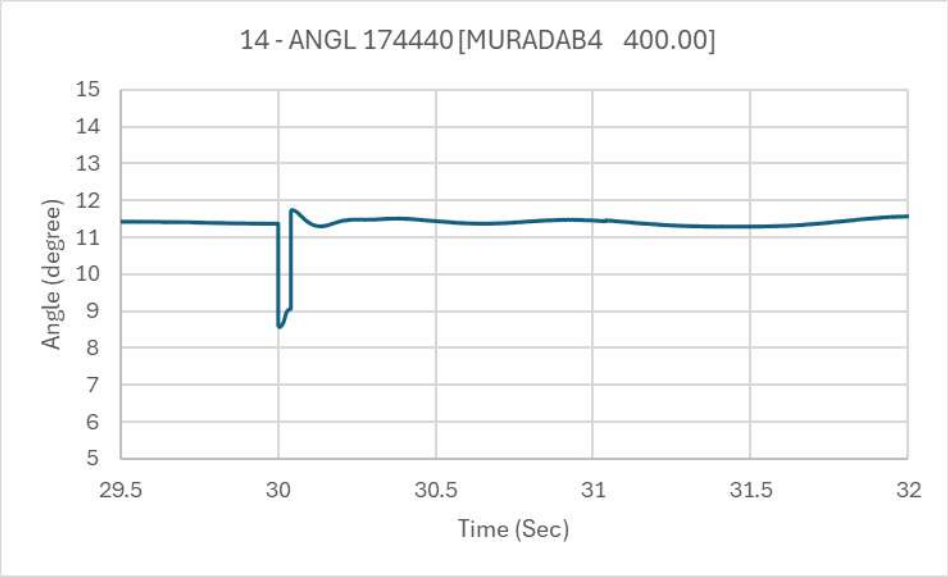


Figure 6: 400kV Moradabad Bus Angle

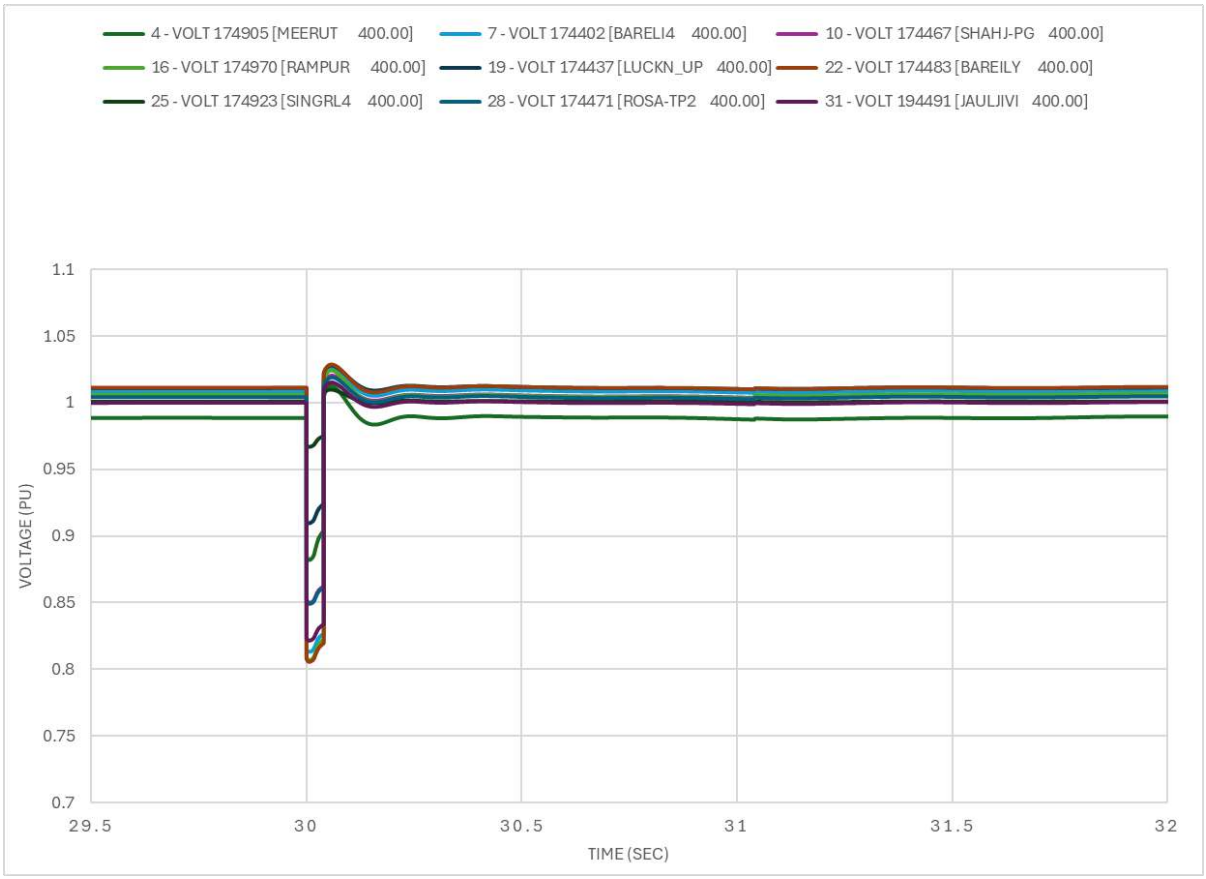


Figure 7: 400kV Remote end & Generator connected Buses Voltages

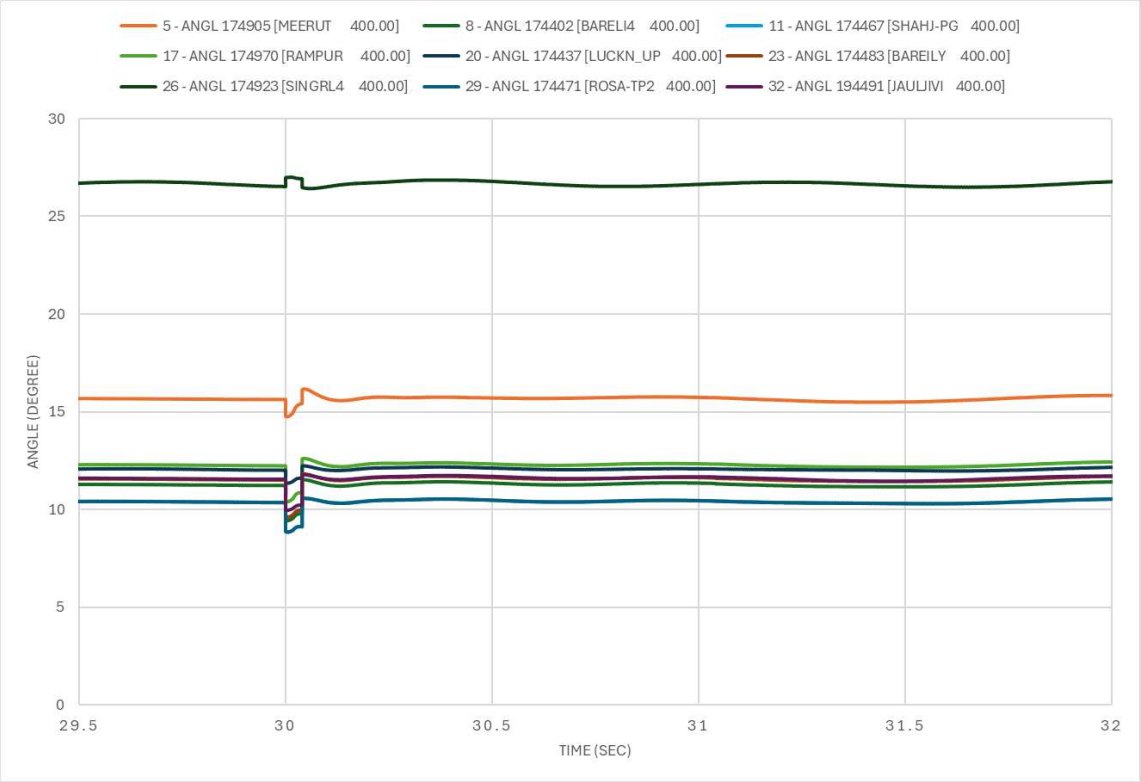


Figure 8: 400kV Remote end & Generator connected Buses Angles

From the figures above, the voltage at the 400kV Bareilly PG bus drops to 0.8 PU approximately but quickly recovers, rising by approximately 3–4% and stabilizing at its pre-fault value of around 1 PU after fault isolation. Similarly, the load angle at the 400kV Bareilly PG bus decreases by approximately 8.5 degrees but recovers quickly, rising by 3–4% and stabilizing at its pre-fault value of about 11.5 degrees after fault isolation. Other remote end and generator connected buses exhibited similar behaviour as shown in the Figure 7 and Figure 8. This demonstrates that the system remains stable when implementing three-phase auto-reclosing in response to a line-to-line fault.

2.2 Three phase auto-reclosing for permanent line to line fault

In this case, a line-to-line fault is simulated on the 400kV Bareilly PG-Moradabad line, followed by three-phase auto-reclosing. The sequence of events used in the simulation study for three-phase auto-reclosing under permanent line to line fault is detailed below.

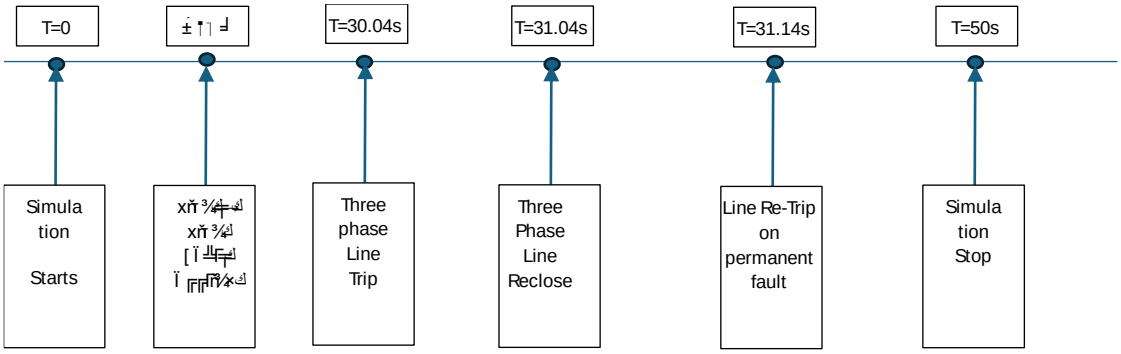


Figure 9: Sequence of the events-three phase auto-reclosing for permanent fault

Absolute bus voltages and angles with respect to the slack bus of 400kV Bareilly PG and 400kV Moradabad buses are plotted in the Figure 10, Figure 11, Figure 12 and Figure 13 . Other remote buses and generator connected buses voltage & angles with respect to the slack bus are depicted Figure 14 and Figure 15.

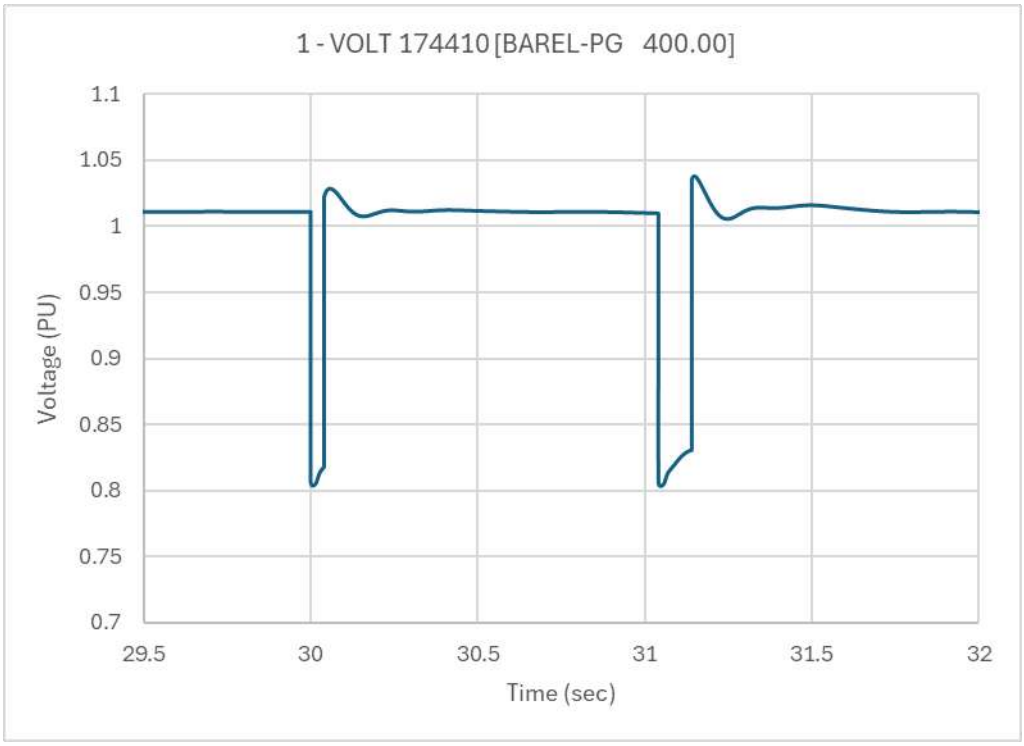


Figure 10: 400kV Bareilly PG Bus Voltage

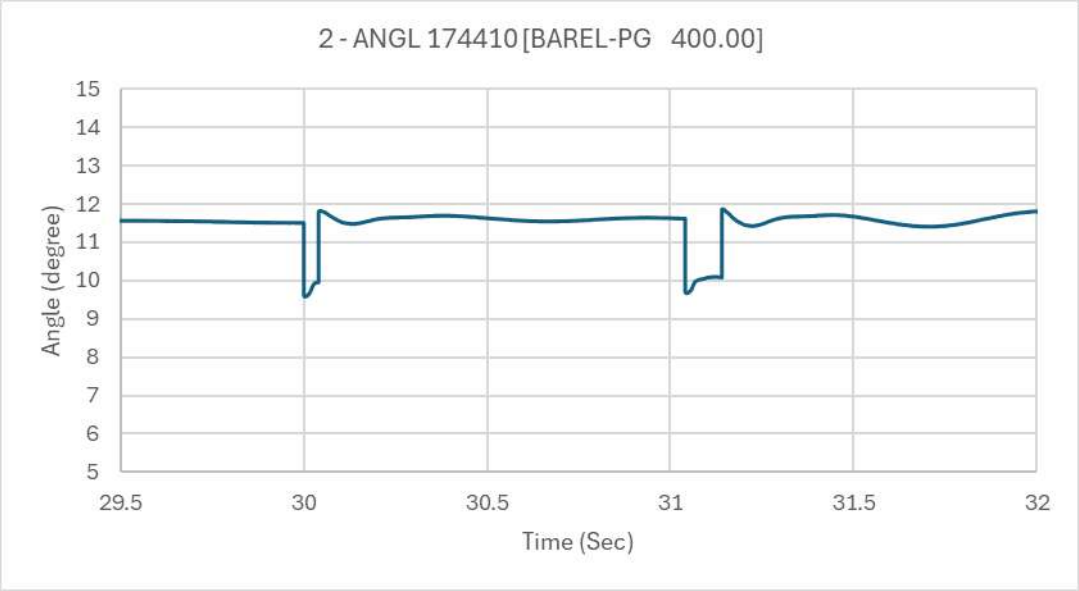


Figure 11: 400kV Bareilly PG Bus Angle

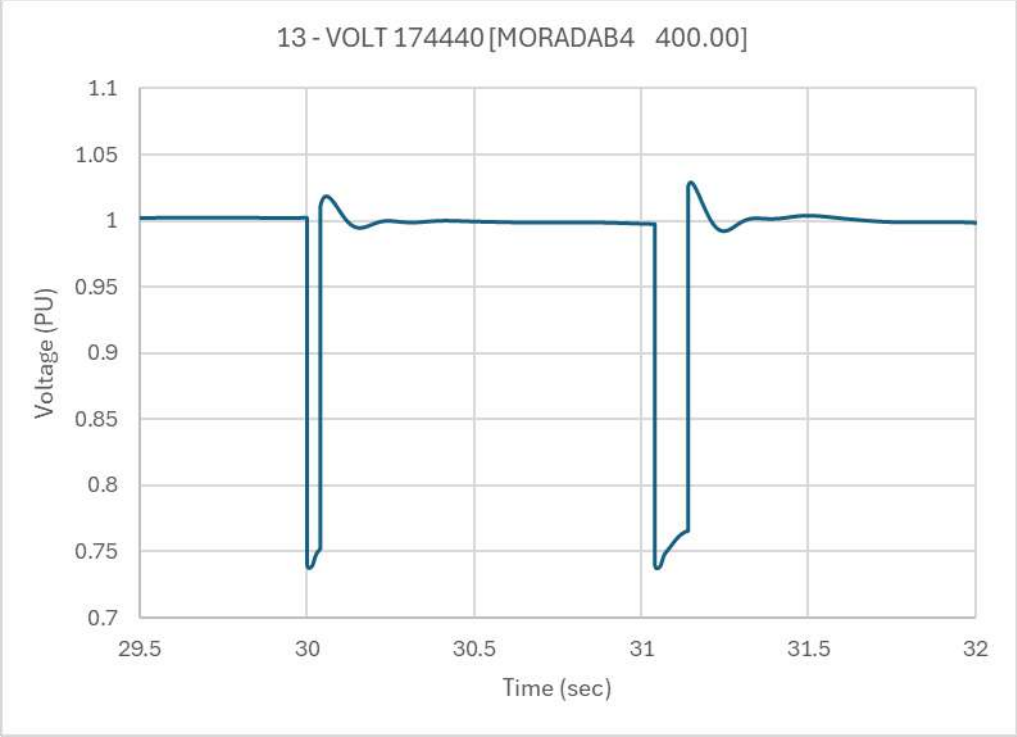


Figure 12: 400kV Moradabad Bus Voltage

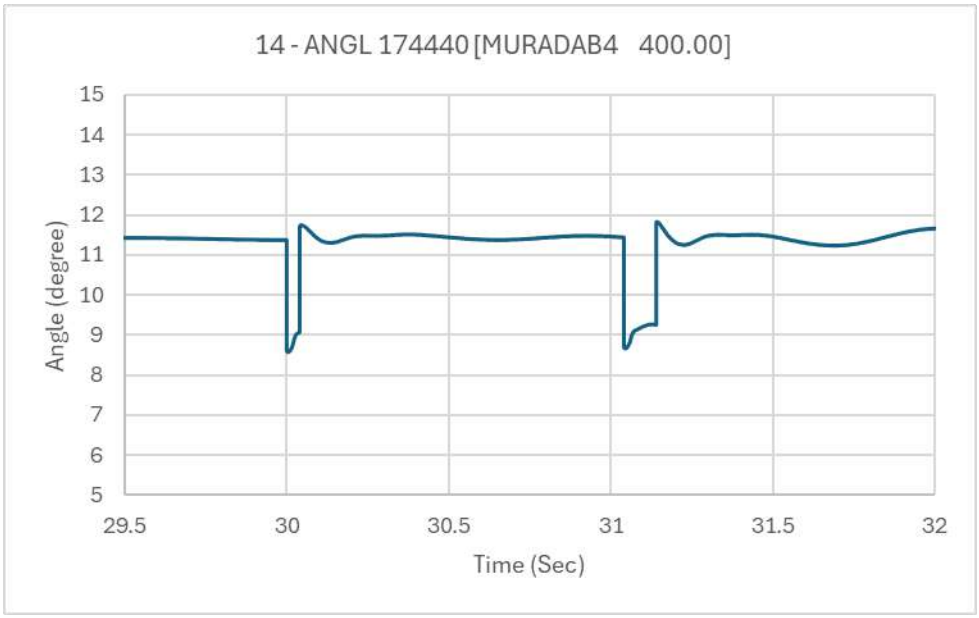


Figure 13: 400kV Moradabad Bus Angle

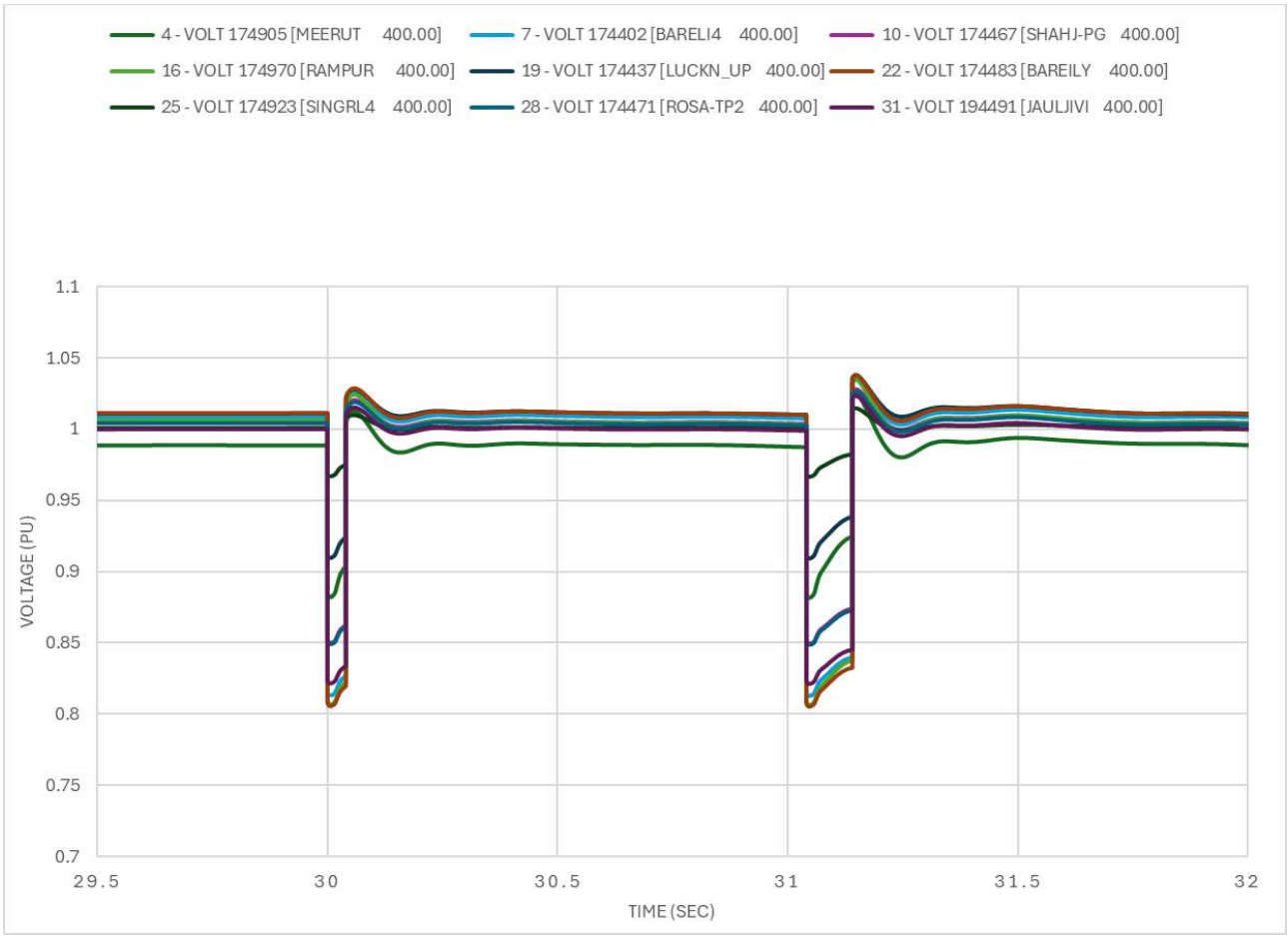


Figure 14: 400kV Remote End & Generator connected Buses Voltages

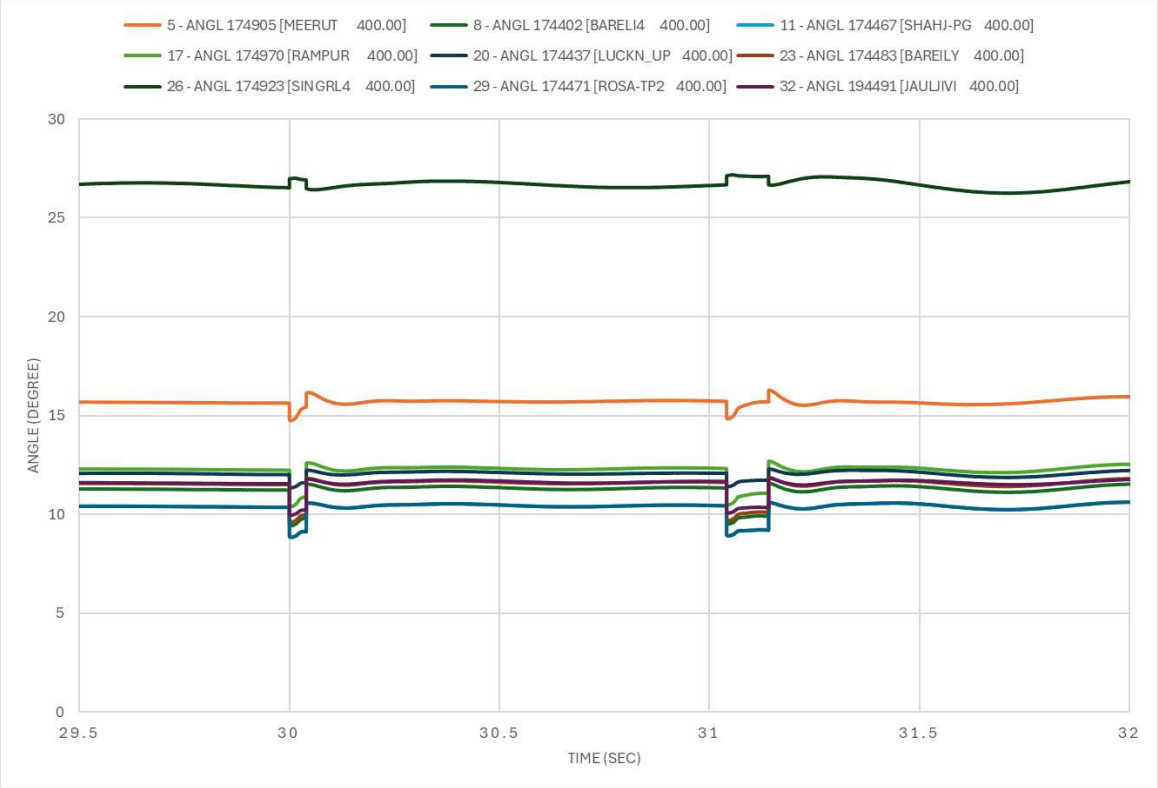


Figure 15: 400kV Remote end & Generator connected Buses Angles

Based on the figures above, the voltage at the 400kV Bareilly PG bus initially drops to approximately 0.8 PU but quickly recovers, rising by about 3–4% and stabilizing at its pre-fault value of around 1 PU during the dead time of the auto-reclosing process. Subsequently, the voltage drops by approximately 0.75 PU during the reclosing attempt of the line, which results in a re-trip due to a permanent fault. After isolating the fault with the line re-trip, the voltage rises by approximately 4% and stabilizes back to its pre-fault value of around 1 PU.

Angle at the 400kV Bareilly PG bus initially drops to approximately 8.5 degrees but quickly recovers, rising by about 3–4% and stabilizing at its pre-fault value of around 11.5 degrees during the dead time of the auto-reclosing process. Subsequently, the angle drops to approximately 8.5 degrees during the reclosing attempt of the line, which results in a re-trip due to a permanent fault. After isolating the fault with the line re-trip, angle rises by approximately 4% and stabilizes back to its pre-fault value of around 11.5 degrees.

This demonstrates that the system remains stable when implementing three-phase auto-reclosing in response to a permanent line-to-line fault as well.

2.3 Three phase auto-reclosing for temporary line to line fault under line contingencies

400kV Bareilly PG -Rampur and 400kV Rampur-Moradabad lines provide a parallel path to the 400kV Bareilly PG -Moradabad line. Therefore, dynamic study is also performed

with 400kV Rampur- Moradabad in out of service. In this case, a line-to-line fault is simulated on the 400kV Bareilly PG -Moradabad line, followed by three-phase auto-reclosing. Fault applied in the scenario is temporary with fault duration of 100ms. The sequence of events used in the simulation study is detailed below in Figure 16.

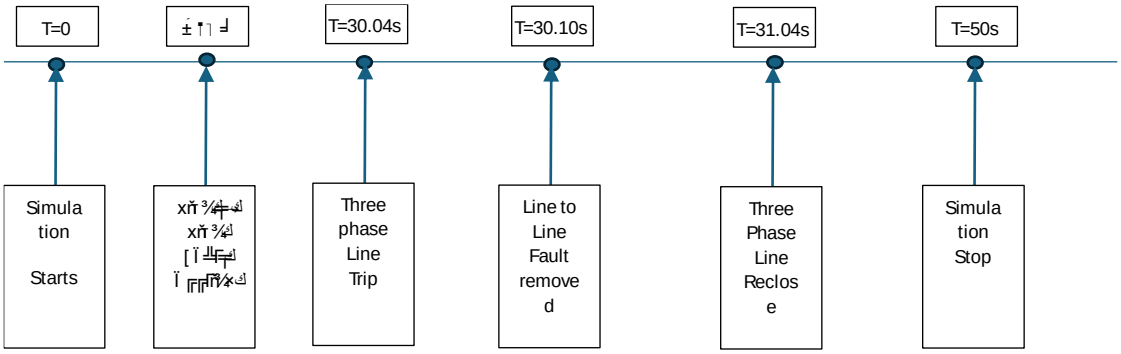


Figure 16: Sequence of the events for three phase Auto reclosing for temporary fault under line contingency

Absolute bus voltages and angles with respect to the slack bus of 400kV Bareilly PG and 400kV Moradabad buses are plotted in the Figure 17,Figure 18,Figure 19 and Figure 20. Other remote buses and generator connected buses voltage & angles with respect to the slack bus are depicted Figure 26 and Figure 27.

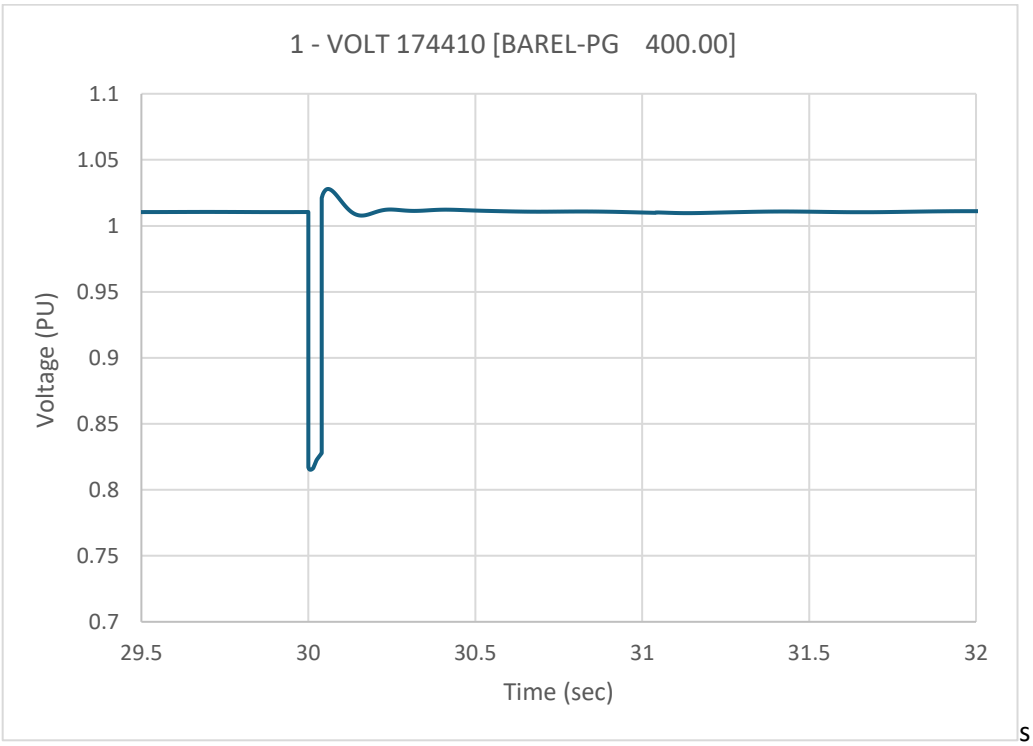


Figure 17: 400kV Bareilly PG Bus Voltage

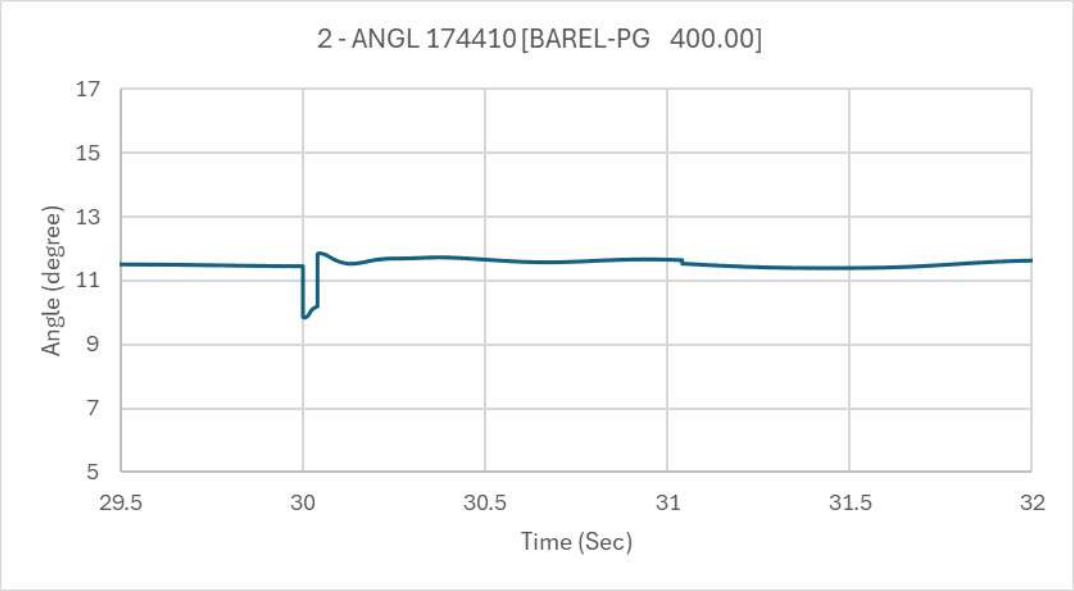


Figure 18: 400kV Bareilly PG Bus Angle

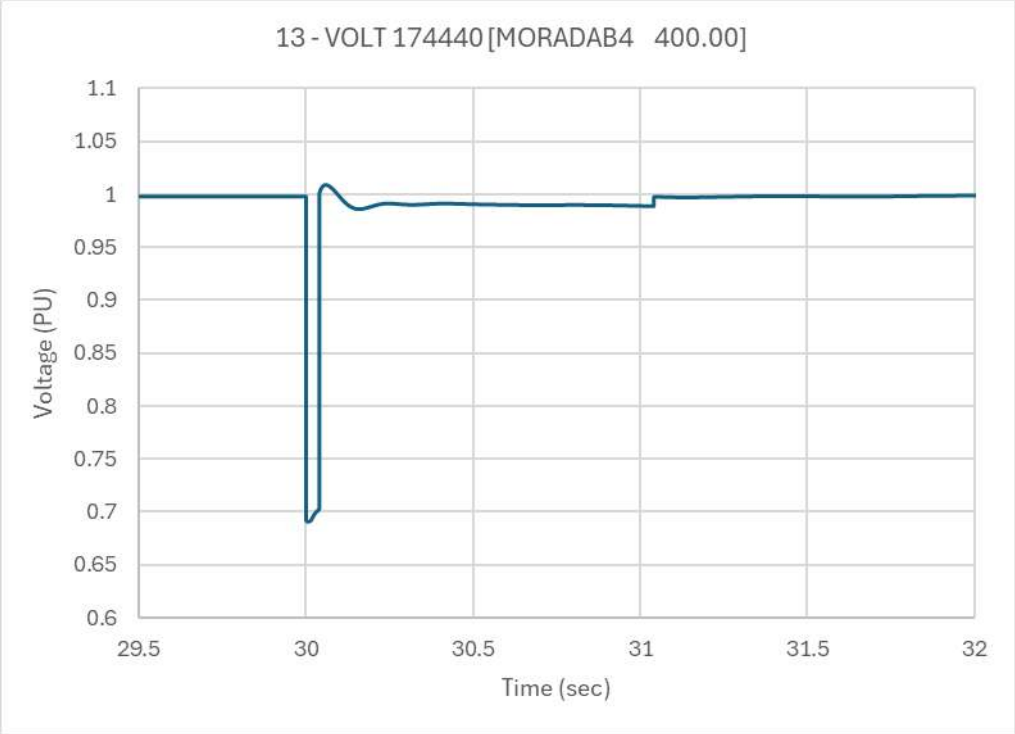


Figure 19: 400kV Moradabad Bus Voltage

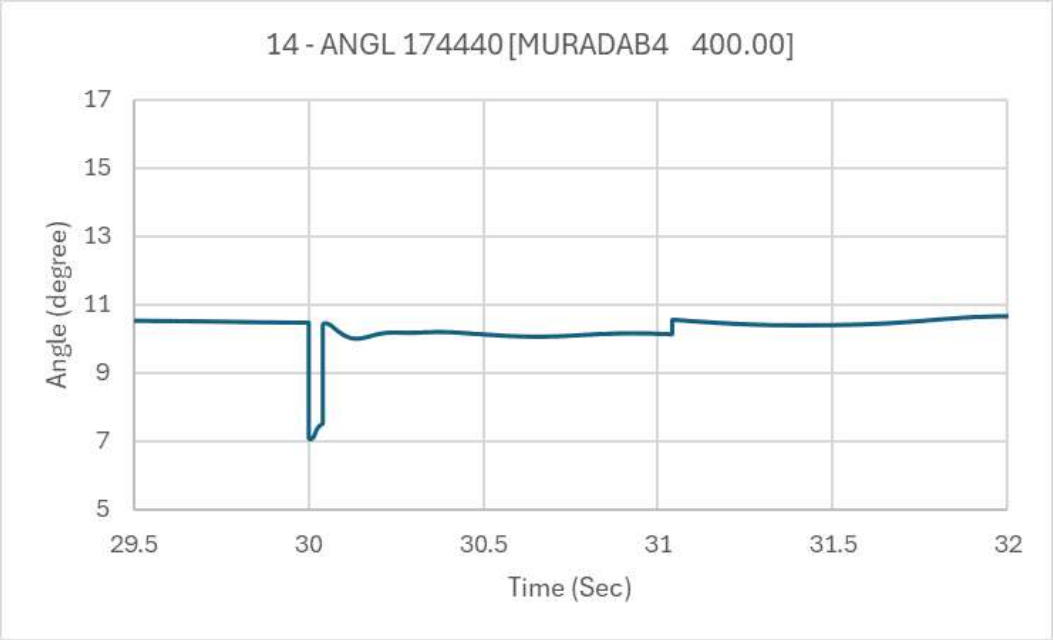


Figure 20: 400kV Moradabad Bus Angle

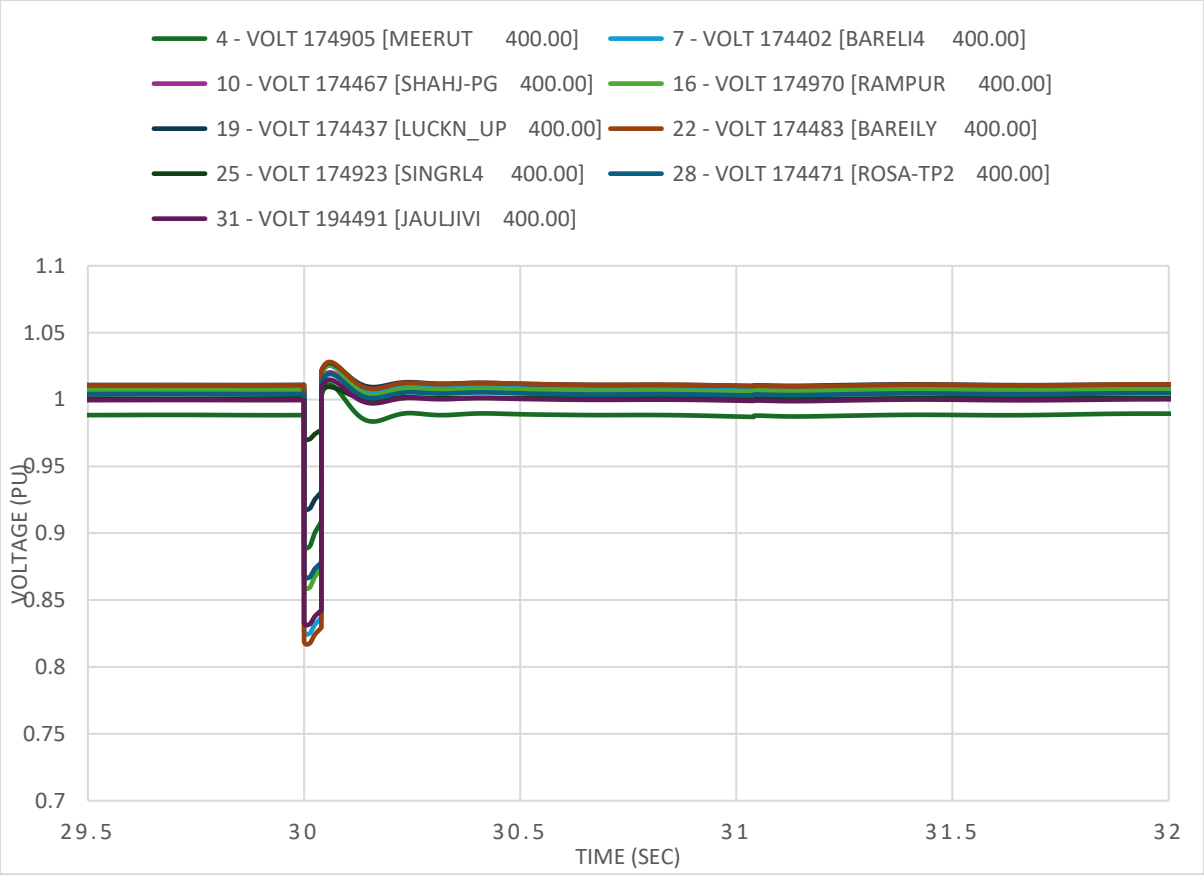


Figure 21: 400kV Remote end & Generator connected Buses Voltages

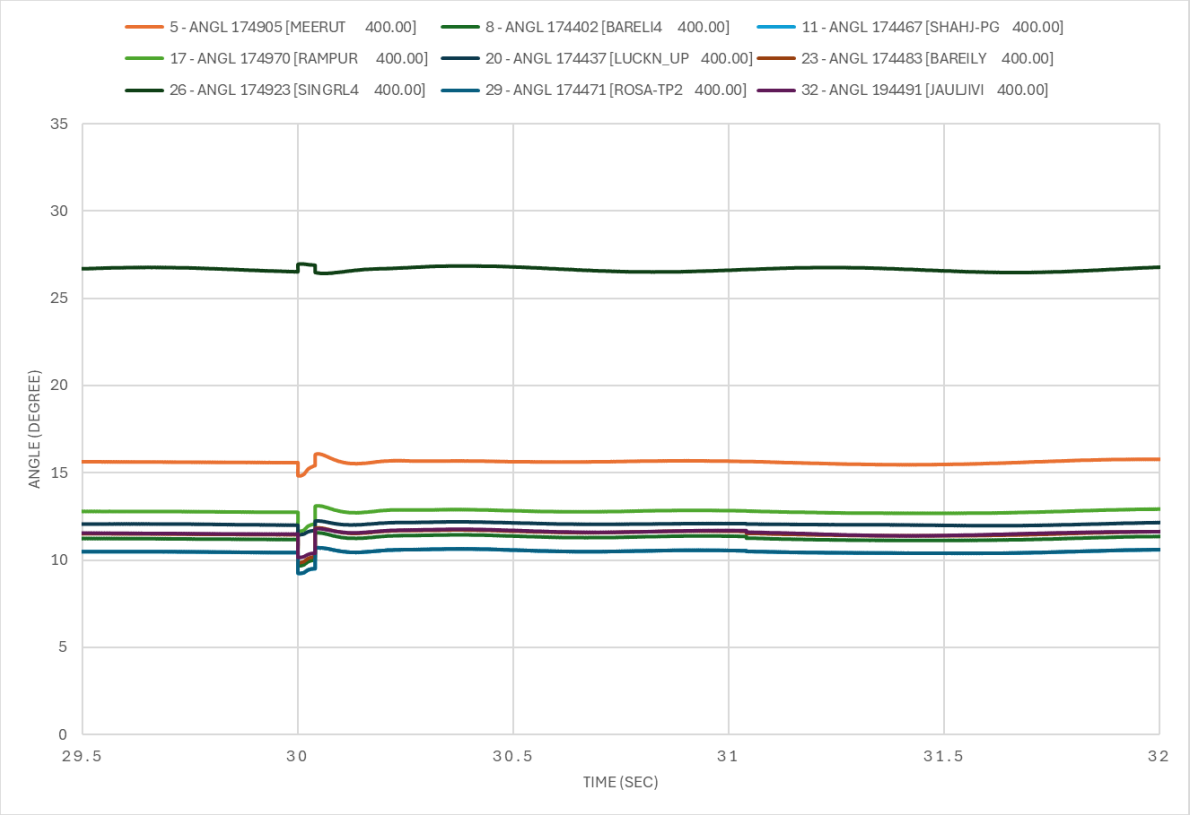


Figure 22: 400kV Remote end & Generator connected Buses Angles

From the figures above, the voltage at the 400kV Bareilly PG bus drops to 0.8 PU approximately but quickly recovers, rising by approximately 3–4% and stabilizing at its pre-fault value of around 1 PU after fault isolation. Similarly, the load angle at the 400kV Bareilly PG bus decreases by approximately 10 degrees but recovers quickly, rising by 3–4% and stabilizing at its pre-fault value of about 11.5 degrees after fault isolation. Other remote end and generator connected buses exhibited similar behaviour as shown in the Figure 21 and Figure 22. This demonstrates that the system remains stable when implementing three-phase auto-reclosing in response to a temporary line-to-line fault with contingency.

2.4 Three phase auto-reclosing for permanent line to line fault under contingencies

400kV Bareilly PG -Rampur and 400kV Rampur-Moradabad lines provide a parallel path to the 400kV Bareilly PG -Moradabad line. Therefore, dynamic study is also performed with 400kV Rampur- Moradabad in out of service. In this case, a line-to-line fault is simulated on the 400kV Bareilly PG -Moradabad line, followed by three-phase auto-reclosing. Fault applied in the scenario is permanent. The sequence of events used in the simulation study is detailed below.

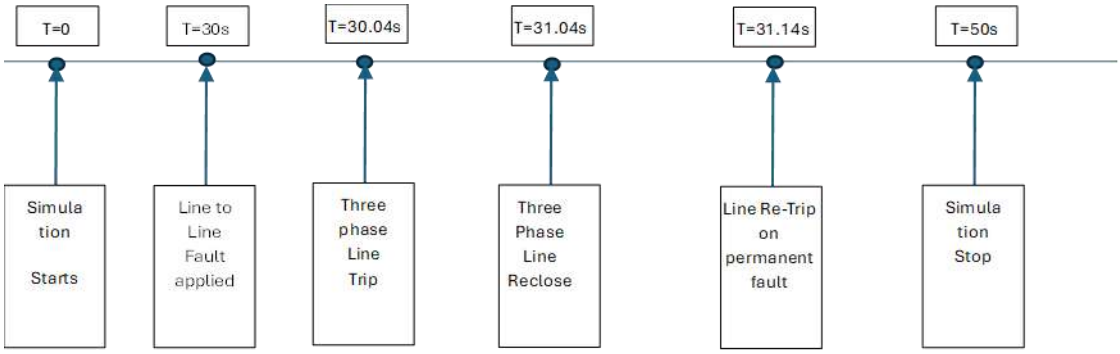


Figure 23: Sequence of the events-three phase Auto reclosing for permanent fault

Absolute bus voltages and angles with respect to the slack bus of 400kV Bareilly PG and 400kV Moradabad buses are plotted in the Figure 24, Figure 25,Figure 26, and Figure 27. Other remote end buses and generator connected buses voltage & angles with respect to the slack bus are depicted in Figure 28 and Figure 29.

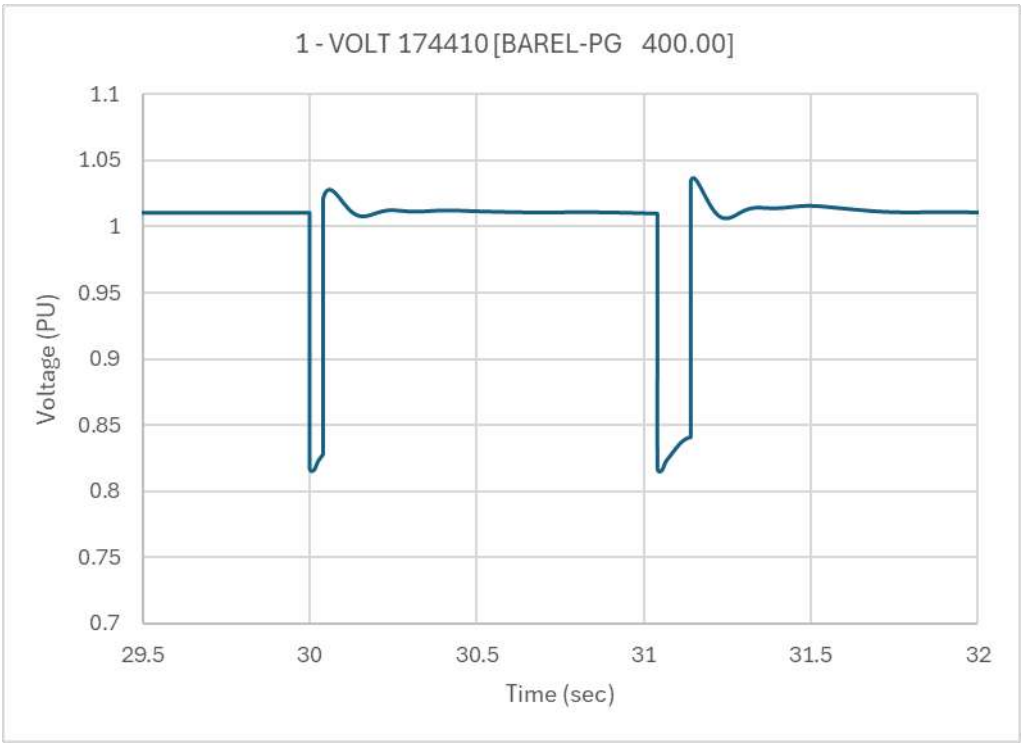


Figure 24: 400kV Bareilly PG Bus Voltage

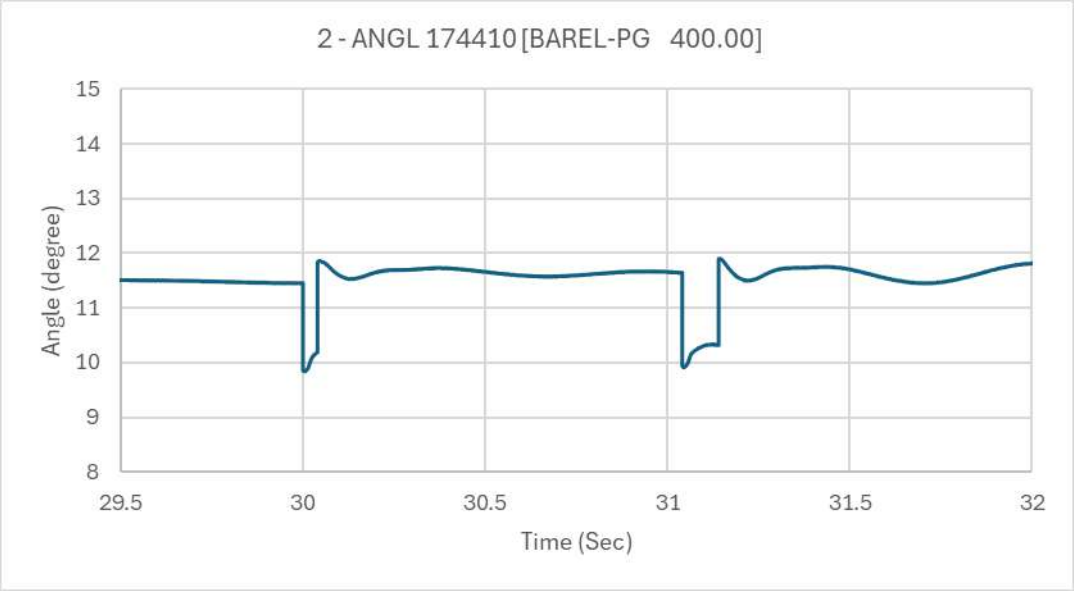


Figure 25: 400kV Bareilly PG Bus Angle

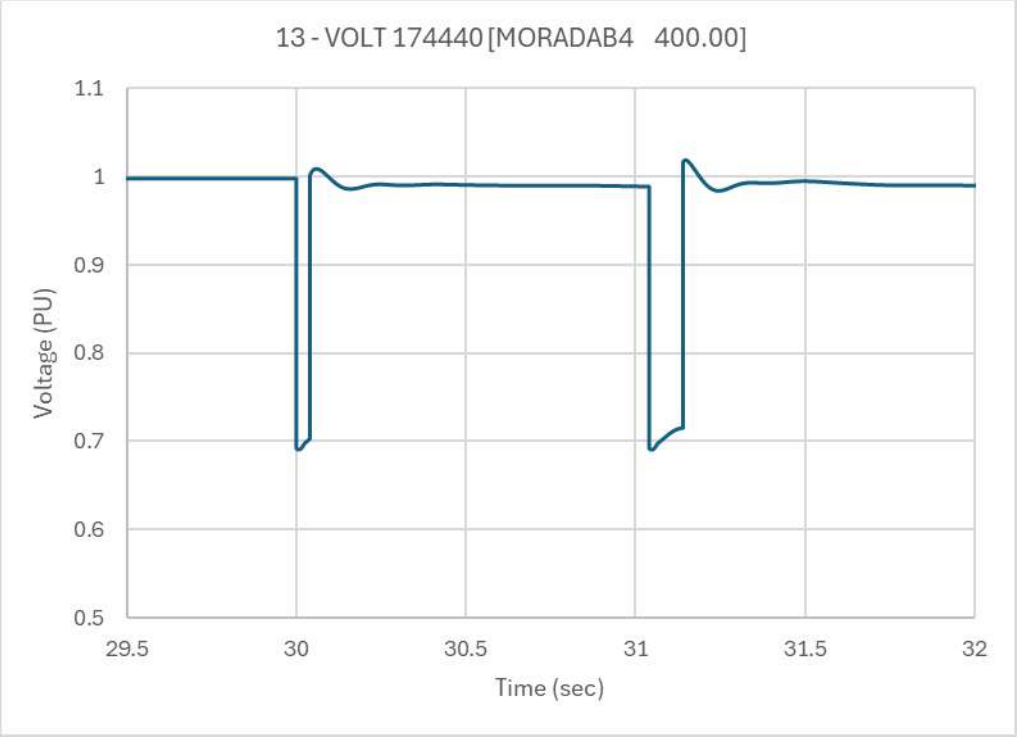


Figure 26: 400kV Moradabad Bus Voltage

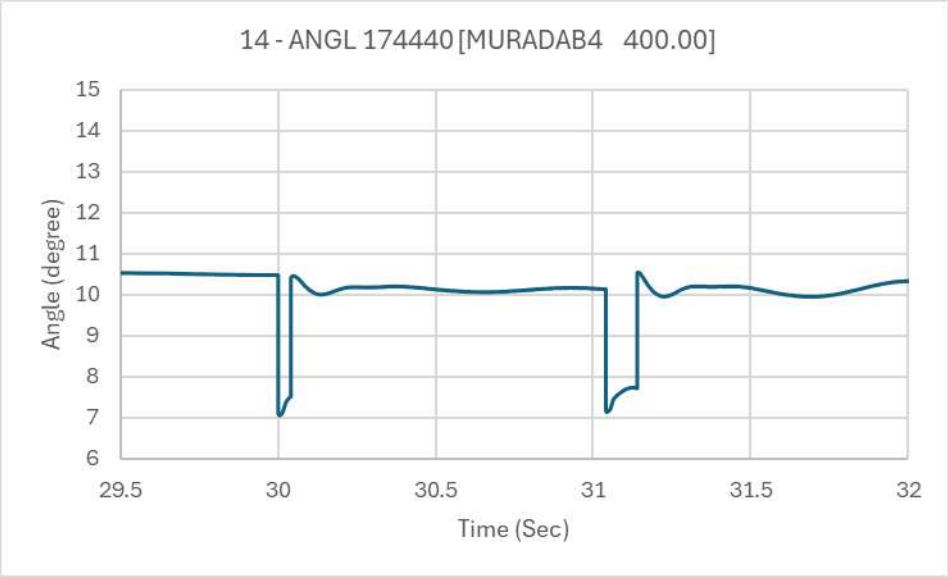


Figure 27: 400kV Moradabad Bus Angle

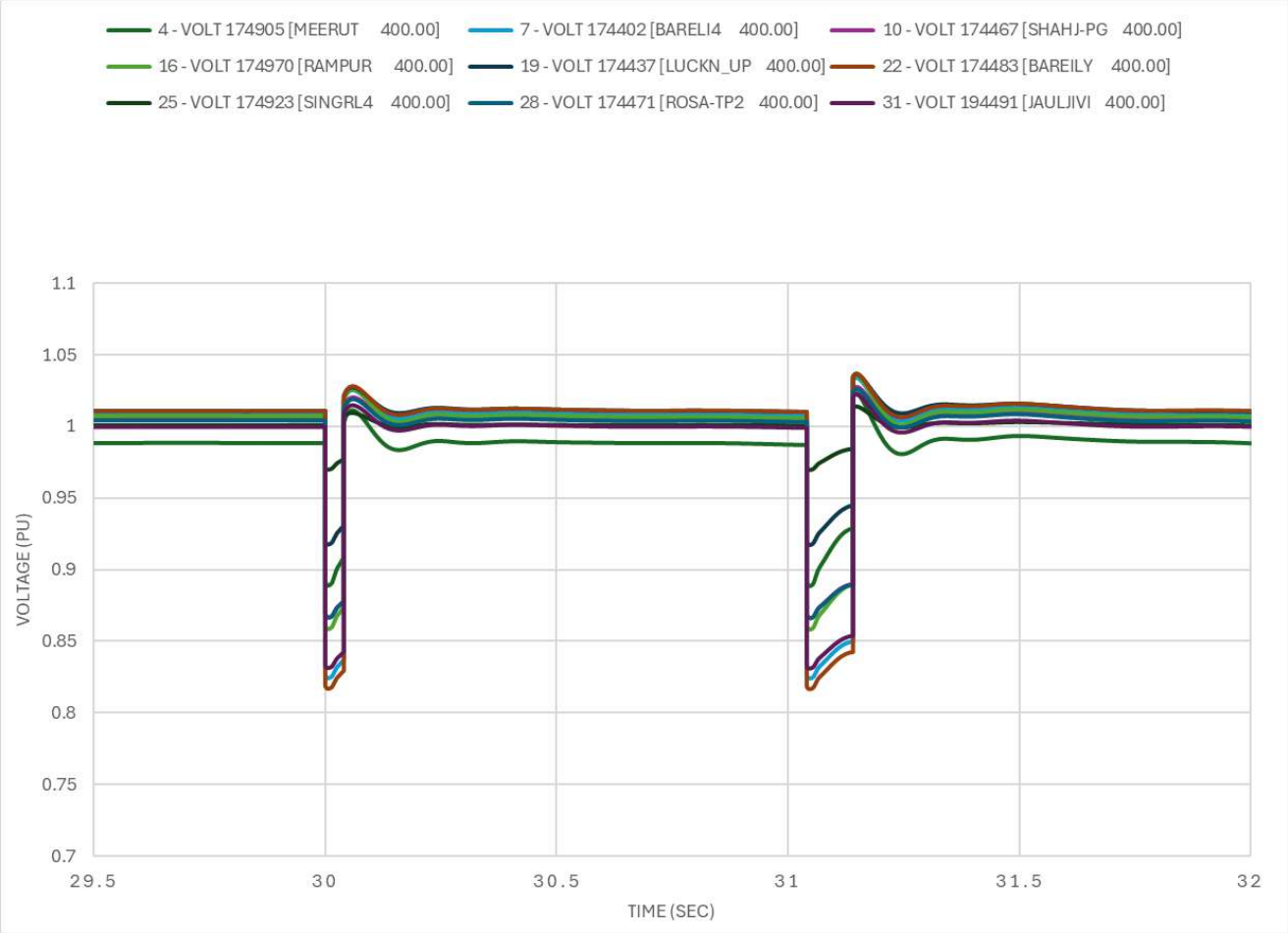


Figure 28: 400kV Remote end & Generator connected Buses Voltages

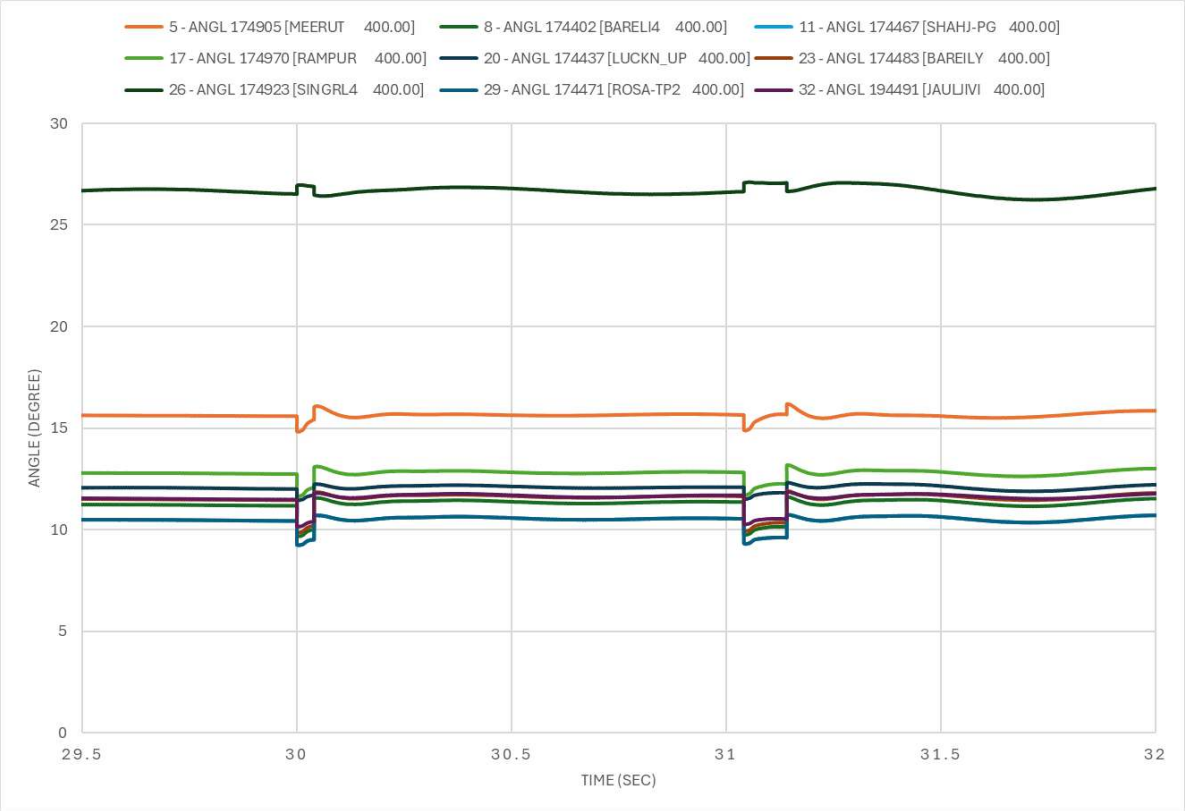


Figure 29: 400kV Remote end & Generator connected Buses Angles

Based on the figures above, the voltage at the 400kV Bareilly PG bus initially drops to approximately 0.8 PU but quickly recovers, rising by about 3–4% and stabilizing at its pre-fault value of around 1 PU during the dead time of the auto-reclosing process. Subsequently, the voltage drops by approximately 0.8 PU during the reclosing attempt of the line, which results in a re-trip due to a permanent fault. After isolating the fault with the line re-trip, the voltage rises by approximately 4% and stabilizes back to its pre-fault value of around 1 PU.

Angle at the 400kV Bareilly PG bus initially drops to approximately 10 degrees but quickly recovers, rising by about 3–4% and stabilizing at its pre-fault value of around 11.5 degrees during the dead time of the auto-reclosing process. Subsequently, the angle drops by approximately 10 degrees during the reclosing attempt of the line, which results in a re-trip due to a permanent fault. After isolating the fault with the line re-trip, angle rises by approximately 4% and stabilizes back to its pre-fault value of around 11.5 degrees.

This demonstrates that the system remains stable when implementing three-phase auto-reclosing in response to a permanent line-to-line faults under contingency conditions as well.

Conclusion

The dynamic study conducted to assess the feasibility of three-phase auto-reclosing on the 400kV Bareilly PG - Moradabad line.

Simulation findings indicate that voltage and angle deviations at both 400 kV Bareilly PG and Moradabad buses and at other remote buses & generator buses are within safe limits for 3 phases auto-reclosing. It showcases the system's robustness and feasibility of three phase auto-reclosing under temporary & permanent line to line fault conditions. Similar behaviour was observed during simulations with contingency conditions, such as the 400kV Moradabad-Rampur line being out of service.

Based on these observations, it is recommended to implement three-phase auto-reclosing for line-to-line faults on the 400kV Bareilly PG - Moradabad line to enhance system reliability and stability. It is to be noted that the line shall be tripped for any three phase faults on the line and auto reclose shall not be attempted for 3 phase faults.

List of Tables

Table 1: 400kV Bareilly PG -Moradabad Line Details 2
Table 2: Short Circuit MVA details 3

List of figures

Figure 1: Schematic diagram of simulation Model 3
Figure 2: Sequence of the events for three-phase auto-reclosing for temporary fault 4
Figure 3: 400kV Bareilly PG Bus Voltage 4
Figure 4: 400kV Bareilly PG Bus Angle 5
Figure 5: 400kV Moradabad Bus Voltage 5
Figure 6: 400kV Moradabad Bus Angle 6
Figure 7: 400kV Remote end & Generator connected Buses Voltages 6
Figure 8: 400kV Remote end & Generator connected Buses Angles 7
Figure 9: Sequence of the events-three phase auto-reclosing for permanent fault 8
Figure 10: 400kV Bareilly PG Bus Voltage 8
Figure 11: 400kV Bareilly PG Bus Angle 9
Figure 12: 400kV Moradabad Bus Voltage 9
Figure 13: 400kV Moradabad Bus Angle 10
Figure 14: 400kV Remote End & Generator connected Buses Voltages 11
Figure 15: 400kV Remote end & Generator connected Buses Angles 11
Figure 16: Sequence of the events for three phase Auto reclosing for temporary fault under line contingency 12
Figure 17: 400kV Bareilly PG Bus Voltage 12
Figure 18: 400kV Bareilly PG Bus Angle 13
Figure 19: 400kV Moradabad Bus Voltage 13
Figure 20: 400kV Moradabad Bus Angle 14
Figure 21: 400kV Remote end & Generator connected Buses Voltages 14
Figure 22: 400kV Remote end & Generator connected Buses Angles 15
Figure 23: Sequence of the events-three phase Auto reclosing for permanent fault 16
Figure 24: 400kV Bareilly PG Bus Voltage 16
Figure 25: 400kV Bareilly PG Bus Angle 17
Figure 26: 400kV Moradabad Bus Voltage 17
Figure 27: 400kV Moradabad Bus Angle 18
Figure 28: 400kV Remote end & Generator connected Buses Voltages 18
Figure 29: 400kV Remote end & Generator connected Buses Angles 19

……End of the Report ……

Proposed Revised SPS for 2x315 MVA, 400/220 kV ICTs at 400 kV GSS Merta

A. Transmission Network Associated with 400 kV GSS Merta

- There are two 400/220 kV ICTs at 400 kV GSS Merta each having capacity of 315 MVA.
- Percentage impedance of 315 MVA, 400/220 kV ICT-I is 11.82% (HV-LV) & 40.22% (HV-IV) & 20.08% (IV-LV) and Percentage impedance of 315 MVA, 400/220 kV ICT-II is 13.03% (HV-LV) & 40.50% (HV-IV) & 25.79% (IV-LV). Load sharing on both ICTs will be almost equal.
- 400 kV GSS Merta is connected to 400 kV GSS Jodhpur (Surpura), 400 kV GSS Bhadla, 400 kV GSS Bikaner, 400 kV GSS Kankani, 400 kV GSS Ratangarh, 400 kV GSS Kota (PGCIL) and 400 kV GSS Heerapura. There are following 220 kV and 132 kV lines emanating from 400 kV GSS Merta:-
  - 220 kV S/C Merta-Bhopalgarh line
  - 220 kV S/C Merta-Kuchera line
  - 220 kV S/C Merta-Jethana line
  - 220 kV S/C Merta-Makrana line
  - 3x100MVA, 220/132 kV Transformers at Merta
  - 132 kV Merta (400 kV GSS)-Merta (132 kV GSS) line
  - 132 kV Merta (400 kV GSS)-Roon line.
  - 132 kV Merta (400 kV GSS)-Merta Road line
  - 132 kV Merta (400 kV GSS)-Lamba Jatan line
  - 132 kV Merta (400 kV GSS)-Dhawa line
- 220 kV GSS Bhopalgarh is connected to the 220 kV GSS Bhawad through 220 kV D/C line and to 220 kV GSS Khinvsar through 220 kV S/C line. 220 kV GSS Bhawad is further connected to the 220 kV GSS Aau and 400 kV GSS Jodhpur through 220 kV D/C lines.
- 220 kV GSS Kuchera is connected to the 220 kV GSS Nagaur which is further connected to the 220 kV GSS Nokha and BLTPS through 220 kV S/C lines.
- 220 kV GSS Jethana is connected to the 400 kV GSS Ajmer through 220 kV D/C line and to the RAS LTPS through 220 kV S/C line.
- 220 kV GSS Makrana is connected to the 220 kV GSS Kuchaman and 220 kV GSS Phulera through 220 kV S/C lines.
- 132 kV S/C Merta (400 kV GSS)-Merta (132 kV GSS)-Riyabari-Jethana line is generally kept in ring system.
- 132 kV GSS Merta Road is connected radially to 400 kV GSS Merta and Biomass Generation of capacity 10 MW and solar power plant of 4 MW are connected to this GSS. Railway TSS is also connected to the 132 kV GSS Merta Road.
- 132 kV S/C Merta (400 kV GSS)-Lambajatan-Gotan line supplies power to 03 Nos. EHT consumers of continuous process cement plants.
- Power Map of Transmission System at 400kV GSS Merta is shown in Fig. 1.

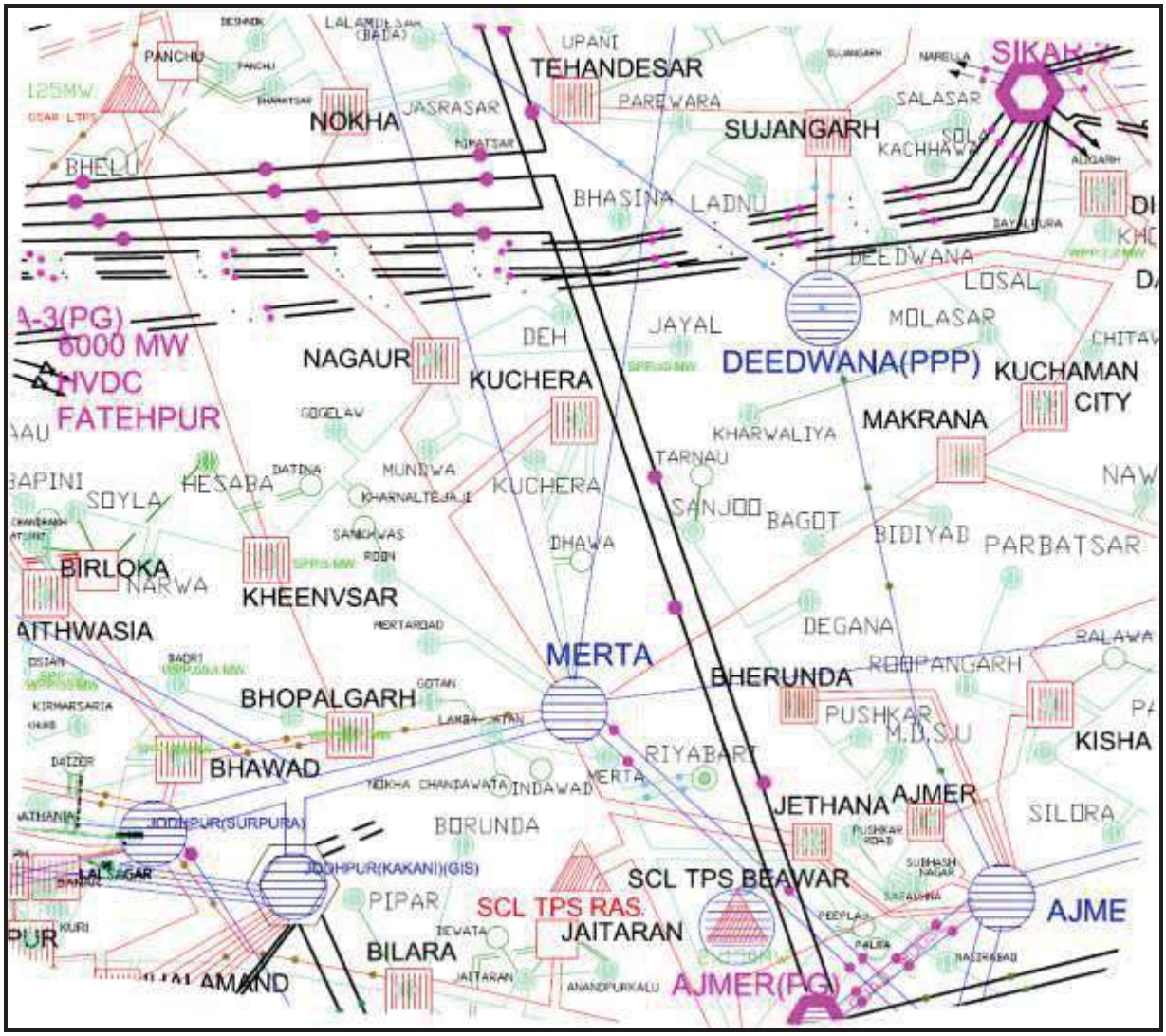


Fig. 1 Power map of merta region

B. <u>Recorded Loads on the Transmission Elements</u>

Recorded peak loads on the transmission lines and transformers are included in Table 1. Critical remarks are also included in the Table 1. 400 kV Bus-A and 400 kV Bus-B are kept integrated.

Table 1: Load Details of Peak and Average Loads on Transformers and Transmission Lines Associated with 400 kV GSS Merta

S. No.	Name of 220 kV line/ICTs	Peak Load	Average Load	Bus to Which connected	SPS Group/Remark
1	315 MVA, 400/220 kV ILT-I	348MVA	290 MVA	Bus-A	
2	315 MVA, 400/220 kV ILT-II	327 MVA	280 MVA	Bus-B	
3	220 kV Merta-Kuchera line	298 MVA	220 MVA	Bus-A	SPS Group-3
4	220 kV Merta-Jethana line	322 MVA	220 MVA	Bus-A	SPS Group-2
5	220 kV Merta-Makrana line	243 MVA	200 MVA	Bus-B	SPS Group-1
6	100MVA, 220/132 kV Transformer-I	85	75	Bus-A	Not included in SPS to ensure the uninterrupted supply in the Merta city, nearby area, and railway TSS connected at 132 kV
7	100MVA, 220/132 kV Transformer-II	85	75	Bus-A	
8	100MVA, 220/132 kV Transformer-III	86	80	Bus-B	

					GSS Merta Road
9	220 kV Merta-Bhopalgarh line	293	250	Bus-B	This line evacuates the RE power during solar generation hours to 400 kV GSS Merta from the Western Rajasthan. Hence, it is not considered for SPS.

C. Approved SPS

The SPS for 2x315MVA, 400/220 kV ICTs at 400 kV GSS Merta was approved in the 194th OCC meeting held on dated 20.04.2022. Approved SPS is placed at **Annexure-A**.

D. Installation of 3rd 500MVA, 400/220 kV ICT at 400 kV GSS Merta

Installation of 3rd 500MVA, 400/220 kV ICT at 400 kV GSS Merta was approved by RVPN and A&FS was issued on dated 27.04.2022 (**Annexure-B**). Work order for installation of this ICT was issued on dated 07.03.2024. Drawings/documents are under approval. Scheduled date of commissioning is September 2025.

E. Need of Revision in the Approved SPS

- The SPS for the 2x315MVA, 400/220 kV ICTs at 400 kV GSS Merta approved in the 194th OCC meeting held on dated 20.04.2022 was based on taking the trip command from the 86 relay installed on 220kV side of both the 2x315MVA, 400/220 kV ICTs at Merta. Hence, the existing SPS give the relief in the event of tripping of the transformers and it does not take care of the ICT overloading. Hence, a generalized SPS is required which can take care of the tripping of the ICTs and overloading of the ICTs.
- Generalized SPS can be considered by taking reference from the overcurrent relays of both 315MVA, 400/220 kV ICTs at 400 kV GSS Merta. This has been considered in the revised SPS.

F. Revised SPS for 2x315MVA, 400/220 kV ILTs at 400 kV GSS Merta

- Tripping of 220 kV transmission lines has been considered from the 400 kV GSS Merta end.
- 220 kV S/C Merta-Bhopalgarh line has not been considered for the SPS as this line evacuates RE power from the western Rajasthan.
- 3x100MVA, 220/132 kV Transformers have not been considered for the SPS to ensure uninterrupted power supply in the Merta city and Railway TSS.
- 132 kV lines associated with the 400 kV GSS Merta have not been considered for the SPS to ensure the uninterrupted power supply in the Merta region.
- After detailed analysis of loading conditions, power injection, RE evacuation & grid interconnection issues, following universal logics are proposed for the 2x315MVA, 400/220 kV ICTs at 400 kV GSS Merta which will work for all the operating scenarios:-

1. **SPS Group-1:** Trip commands are generated at time delay of 1.1 second to trip the following transmission line when 105% loading [105% current in all the three phases] on any one of the 2x315MVA, 400/220 kV Transformers at 400 kV GSS Merta is reached due to tripping of one of the transformer or any of the 220 kV lines associated with 400 kV GSS Merta or the overloading of transformers:-
   - 220 kV Merta-Makrana line

Implementation of SPS Logic-1: This logic will be implemented by taking reference from overcurrent relays of both 315MVA, 400/220 kV ICTs at 400 kV GSS Merta. Trip command will be initiated at time delay of 1.1 second when current reached the 105% loading of the ICTs [105% current in all three phases]. This trip command will be used to trip the 220 kV S/C Merta-Makrana line from 400 kV GSS Merta.

2. **SPS Group-2:** Trip commands are generated at time delay of 1.30 second to trip the following transmission line when 105% loading [105% current in all the three phases] on any one of the 2x315MVA, 400/220 kV Transformers at 400 kV GSS Merta is reached due to tripping of one of the transformer or any of the 220 kV lines associated with 400 kV GSS Merta or the overloading of transformers:-
   - 220 kV Merta- Jethana line

   Implementation of SPS Logic-2: This logic will be implemented by taking reference from overcurrent relays of both 315MVA, 400/220 kV ICTs at 400 kV GSS Merta. Trip command will be initiated at time delay of 1.30 second when current reached the 105% loading of the ICTs [105% current in all three phases]. This trip command will be used to trip the 220 kV S/C Merta- Jethana line from 400 kV GSS Merta.

3. **SPS Group-3:** Trip commands are generated at time delay of 1.50 second to trip the following transmission line when 105% loading [105% current in all the three phases] on any one of the 2x315MVA, 400/220 kV Transformers at 400 kV GSS Merta is reached due to tripping of one of the transformer or any of the 220 kV lines associated with 400 kV GSS Merta or the overloading of transformers:-
   - 220 kV Merta-Kuchera line

   Implementation of SPS Logic-3: This logic will be implemented by taking reference from overcurrent relays of both 315MVA, 400/220 kV ICTs at 400 kV GSS Merta. Trip command will be initiated at time delay of 1.50 second when current reached the 105% loading of the ICTs [105% current in all three phases]. This trip command will be used to trip the 220 kV S/C Merta- Kuchera line from 400 kV GSS Merta.

- Schematic diagram of proposed SPS is shown in Fig. 2.

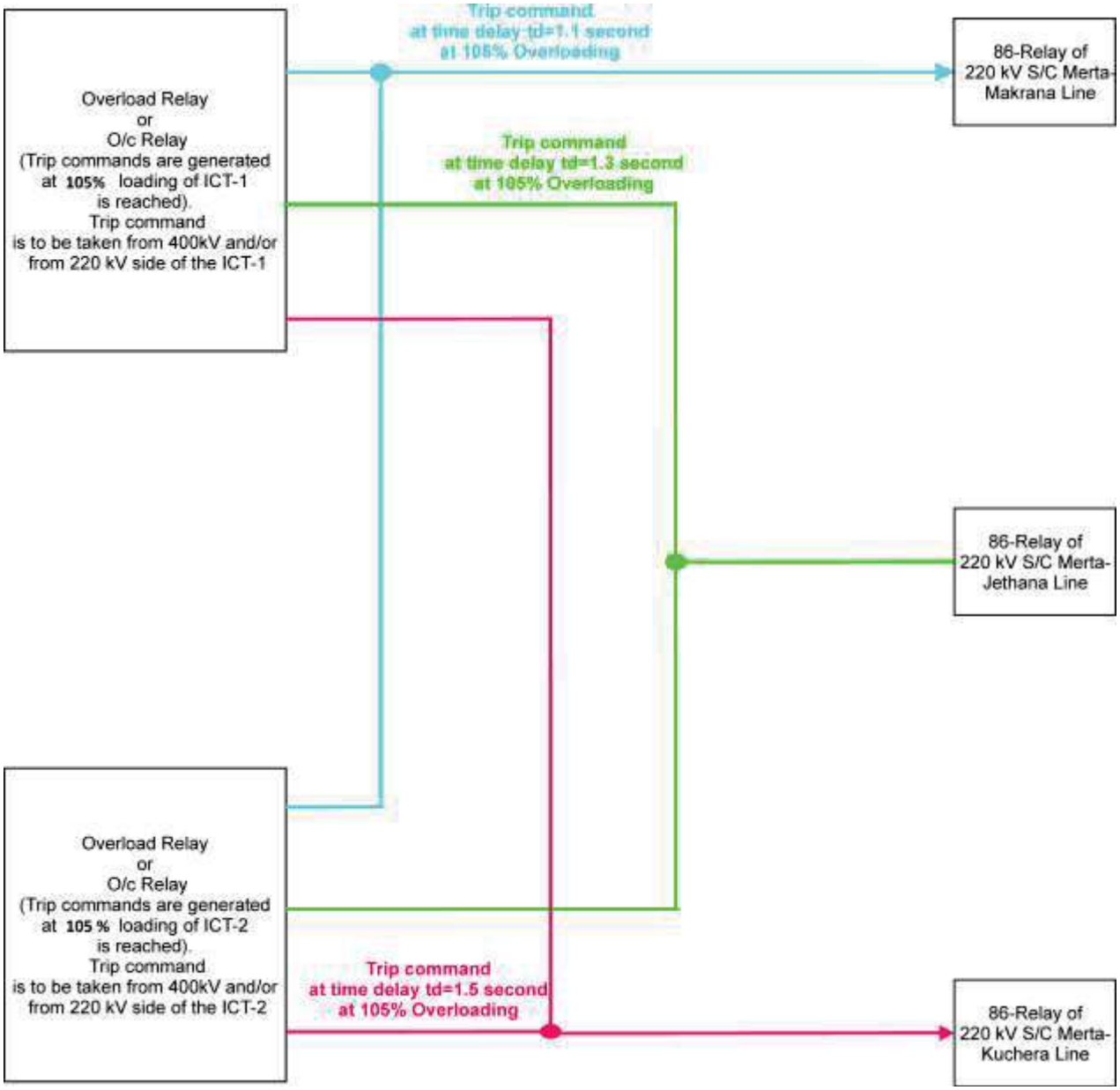


Fig. 2 Schematic diagram for implementation of proposed SPS Logics

- To maintain supply of critical loads connected to all the GSS in the region, tripped transformers and lines may be re-connected after applying load shedding on all the GSS in the region in such a quantum to maintain loadings on both the 315MVA, 400/220 kV ICTs or the healthy 315MVA, 400/220 kV ICT at 400 kV GSS Merta within permissible limits.

G. Requirement of Healthiness of the SPS

This SPS will function only if the present configuration of the transmission lines and transformers remain intact. Any change in configuration of lines and transformers will lead to mal-operation of the SPS. Further, LD Control room and SE (T&C), RVPN, Merta may ensure to take prior approval of NRLDC if any change is required in the configuration for which SPS is designed. Any change in configuration may be restored after the loading conditions are normalized.

सत्यमेव जयते

भारत सरकार

Government of India

विद्युत मंत्रालय

Ministry of Power

उत्तर क्षेत्रीय विद्युत समिति

Northern Regional Power Committee

संख्या: उ.क्षे.वि.स./ प्रचालन/106/01/2022/ दिनांक: 06.05.2022

विषय: उत्तर क्षेत्रीय विद्युत समिति की प्रचालन समन्वय उप-समिति की 194वीं बैठक का कार्यवृत |

Subject: Minutes of 194th OCC meeting of NRPC.

उत्तर क्षेत्रीय विद्युत समिति की प्रचालन समन्वय उप-समिति की 194वीं बैठक दिनांक 20.04.2022 को आयोजित की गयी थी। उक्त बैठक का कार्यवृत्त उत्तर क्षेत्रीय विद्युत समिति की वेबसाइट http://164.100.60.165 पर उपलब्ध है। यदि कार्यवृत पर कोई टिप्पणी हो तो कार्यवृत जारी करने के एक सप्ताह के अन्दर इस कार्यालय को भेजें |

194th meeting of the Operation Co-ordination Sub-Committee of NRPC was held on 20.04.2022. The Minutes of this meeting has been uploaded on the NRPC website http://164.100.60.165. Any comments on the minutes may kindly be submitted within a week of issuance of the minutes.

संलग्नक: यथोपरि

सौमित्र 06/05/2022

(सौमित्र मजूमदार)

अधीक्षण अभियंता (प्रचालन)

सेवा में,

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

UP SLDC had shared their assessment with NRLDC vide letter dated 31-03-2022.

Intra–State Generation(w/o Solar and Co-Gen)	TTC	RM	ATC
10000	15100	600	14500
11000	14400	600	13800
12000	13800	600	13200
13000	13300	600	12700

In 194 OCC meeting, it was discussed that:

- As per assessment done by NRLDC, the TTC computation pertaining to UP state control area seems to be in order. However, local load management would be required at Mau, Azamgarh, Nehtaur, Obra, Sarnath, Moradabad & Gorakhpur (UP) to arrive at these figures. Azamgarh ICTs should also be mentioned in the limiting constraints. Also, the actual load-generation scenario can change the TTC quantum based on the assumed local load distribution.
- UP SLDC was asked to share plan for load management at constained ICTs and also update on progress of underlying network at new stations such as 400/220kV Sambhal, Rasra, Sahupuri, Rampur, Jaunpur etc.

UP SLDC representative stated that 400/220kV Rasra substation is expected to be commissioned shortly. Many constrained ICTs are likely to be relieved with commissioning of Rasra sub-station. Moreover, revised ATC/TTC assessments along with load management plan would be shared shortly. It was also agreed that mock testing of SPS may be carried out before summer season as most of the constrained ICTs have SPS. SPS for 400/220kV Obra and Nehtaur substation would also be planned and commissioned before summer season.

Rajasthan

Rajasthan had shared ATC/TTC calculations with NRLDC on 22.10.2021. On 28.10.2021, NRLDC has shared their observations on basecase as well as simulation studies carried out by Rajasthan.

In 193 OCC meeting, Rajasthan SLDC representative informed there were some changes yet to be incorporated in basecase shared by NRLDC. NRLDC representative stated same may be carried out by Rajasthan before assessment of ATC in basecase shared. It was also informed by Rajasthan that proposal for SPS at constrained locations is under approval and would be brought for discussion in next OCC meeting. ICT Loadings observed above N-1 contingency limits were also discussed in the meeting.

Accordingly, Rajasthan SLDC has proposed SPS at 400/220kV Ajmer, Merta and Chittorgarh (Annexure-B.III of agenda).

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

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

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

Delhi

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

Delhi representative was not present in 192 OCC meeting for comments.

In 193 OCC meeting, Delhi SLDC was asked to implement SPS at Mundka and Bamnoli to save supercritical loads under N-1 contingency of one ICT. Delhi representative stated SPS at Mundka would be implemented before summer season. However, same is yet to be confirmed by DTL. NRLDC asked DTL and Delhi SLDC to coordinate and expedite shifting of ICT from Bamnauli to Mundka and implementation of SPS at 400/220kV Mundka. Delhi SLDC was asked to share the revised ATC/TTC limits for summer/monsoon 2022 along with anticipated generation scenario, basecase and reports with NRLDC at the earliest.

In 194 OCC meeting, it was informed that works for Mundka ICT are in place and ICT is expected before 30th April 2022. It was informed that SPS has been implemented at 400/220kV Mundka ICTs. NRLDC representative stated that SPS logic needs to be shared with NRLDC/ NRPC beforehand so that same can be discussed and approved in OCC/TCC/NRPC meeting before implementation. DTL was asked to share the logic and mock-testing exercise & ATC/TTC assessment with NRLDC/ NRPC at the earliest. Moreover, Delhi SLDC should immediately start uploading their ATC/TTC limits on their website.

Haryana

In 194 OCC meeting, Haryana SLDC was once again asked to expedite implementation of SPS and ICT capacity augmentation at 400/220kV Deepalpur and Kurukshetra (PG) to enhance their ATC/TTC limits at the earliest. Haryana SLDC informed SPS works are in process and would be implemented at Deepalpur by May'2022. For Kurukshetra, they have taken up the matter with STU to further take up with POWERGRID.

Haryana SLDC was asked to share the revised ATC/TTC limits for summer/monsoon 2022 along with anticipated generation scenario, basecase and reports with NRLDC at the earliest. Network arrangement for managing loading at Kurukshetra also needs to be shared. Haryana was also asked to expedite utilisation of underlying network at Bhiwani.

Annexure-B

RAJASTHAN RAJYA VIDYUT PRASARAN NIGAM LIMITED.

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

OFFICE OF THE SUPERINTENDING ENGINEER (P&P)

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No. RVPN/CE (PP&D)/SE (P&P)/XEN-IAE-I/F D 238 Jaipur. Dt. 27/4/22

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

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

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

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

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

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

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

Encl.: Estimates.

Copy to the following for information & necessary action:-

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

Encl.: Estimates.

Superintending Engineer (P&P)

D:\AE-I\BoD Approvals

Proposed Revised SPS for 2x315 MVA, 400/220 kV ICTs at 400 kV GSS Ajmer

A. Transmission Network Associated with 400 kV GSS Ajmer

- There are two 400/220 kV ICTs at 400 kV GSS Ajmer each having capacity of 315 MVA.
- Percentage impedance of 315 MVA, 400/220 kV ICT-I is 12.498% (HV-LV) & 39.27% (HV-IV) & 26.05% (IV-LV) and Percentage impedance of 315 MVA, 400/220 kV ICT-II is 12.02% (HV-LV) & 41.41% (HV-IV) & 27.66% (IV-LV). Load sharing on both ICTs will be almost equal.
- 400 kV GSS Ajmer is connected to 400 kV GSS Deedwana, 400 kV GSS Bhilwara, 765 kV GSS Phagi, and 765 kV GSS Ajmer (PGCIL). There are following 220 kV lines emanating from 400 kV GSS Ajmer:-
  - 220 kV S/C Ajmer-Kishangarh line
  - 220 kV D/C Ajmer-Bherunda line
  - 220 kV D/C Ajmer-Jethana line
  - 220 kV S/C Ajmer-Beawer line
  - 220 kV S/C Ajmer (400 kV GSS)-Aimer (220 kV GSS) line Ckt-I
  - 220 kV S/C Ajmer (400 kV GSS)-Aimer (220 kV GSS) line Ckt-II
- 220 kV D/C Ajmer-Jethana line has not been considered because tripping of this line will increase loading on ICTs at 400 kV GSS Merta.
- 220 kV 2xS/C Ajmer (400 kV GSS)-Aimer (220 kV GSS) lines have not been considered for the SPS because these lines feed power to Ajmer city.
- Power Map of Transmission System at 400kV GSS Ajmer is shown in Fig. 1.

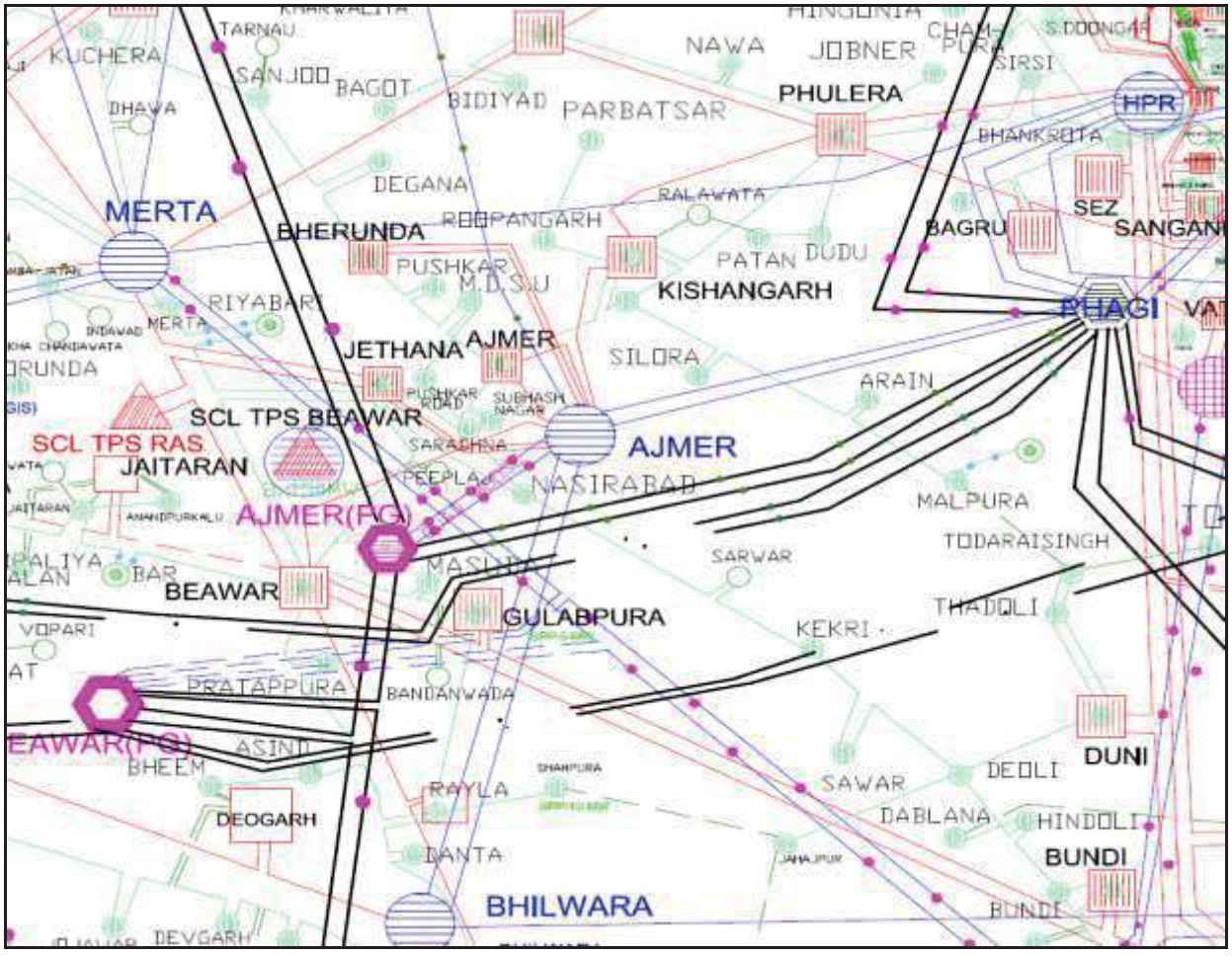

Fig. 1 Power map of Ajmer region

B. Recorded Loads on the Transmission Elements

Recorded peak loads on the transmission lines and transformers are included in Table 1. Critical remarks are also included in the Table 1.

Table 1: Load Details of Peak and Average Loads on Transformers and Transmission Lines Associated with 400 kV GSS Ajmer

S.No.	Particular of Lines/Transformer	Voltage Level (kV)	Import/ Export	Peak Load (MW)	Average Load (MW)	SPS Group/ Remark
1	400/220/33kV, 315 MVA Transformer (ALSTOM)	400	Export	292	270.11	
2	400/220/33kV, 315 MVA Transformer (KANOHAR)	400	Export	304	281.11	
3	400kV Ajmer-Bhilwara-I	400	Export	265	212.77	
4	400kV Ajmer-Bhilwara-II	400	Import	284	229	
5	400kV Ajmer-Deedwana	400	Export	380	324.88	
6	400kV Ajmer-Phagi-I	400	Export	428	295.66	
7	400kV Ajmer-Phagi-II	400	Export	313	273.55	
8	400kV Ajmer-Ajmer (PGCIL)-I	400	Import	467	408.66	
9	400kV Ajmer-Ajmer (PGCIL)-II	400	Import	467	407.33	
10	220KV Jethana-I Line	220	Import	215	107.67	
11	220KV Jethana-II Line	220	Import	180	107.44	
12	220KV Beawar Line	220	Import	193	110.22	SPS Group-I
13	220KV Ajmer-I Line	220	Export	170	117.44	
14	220KV Ajmer-II Line	220	Export	149	121.44	
15	220KV Kishangarh Line	220	Export	227	178.00	SPS Group-III
16	220KV Bherunda-I Line	220	Export	90	62.33	SPS Group-II
17	220KV Bherunda-II Line	220	Export	91	59.89	SPS Group-II
18	220KV NWR Line	220	Export	20	16.44	

C. Approved SPS

The SPS for 2x315MVA, 400/220 kV ICTs at 400 kV GSS Ajmer was approved in the 194th OCC meeting held on dated 20.04.2022. Approved SPS is placed at **Annexure-A**.

D. Installation of 3rd 500MVA, 400/220 kV ICT at 400 kV GSS Ajmer

Installation of 3rd 500MVA, 400/220 kV ICT at 400 kV GSS Ajmer was approved by RVPN and A&FS was issued on dated 27.04.2022 (**Annexure-B**). Work order for installation of this ICT was issued on dated 07.03.2024. Drawings/documents are under approval. Scheduled date of commissioning is September 2025.

E. Need of Revision in the Approved SPS

- The SPS for the 2x315MVA, 400/220 kV ICTs at 400 kV GSS Ajmer approved in the 194th OCC meeting held on dated 20.04.2022 was based on taking the trip command from the 86 relay installed on 220kV side of both the 2x315MVA, 400/220 kV ICTs at Ajmer. Hence, the existing SPS give the relief in the event of tripping of the transformers and it does not take care of the ICT overloading. Hence, a generalized SPS is required which can take care of the tripping of the ICTs and overloading of the ICTs.
- Generalized SPS can be considered by taking reference from the overcurrent relays of both 315MVA, 400/220 kV ICTs at 400 kV GSS Ajmer. This has been considered in the revised SPS.

F. Revised SPS for 2x315MVA, 400/220 kV ICTs at 400 kV GSS Ajmer

- Tripping of 220 kV transmission lines has been considered from the 400 kV GSS Ajmer end.

- 220 kV D/C Ajmer-Jethana line has not been considered because tripping of this line will increase loading on ICTs at 400 kV GSS Merta.
- 220 kV 2xS/C Ajmer (400 kV GSS)-Aimer (220 kV GSS) lines have not been considered for the SPS because these lines feed power to Ajmer city.
- After detailed analysis of loading conditions, power injection, RE evacuation & grid interconnection issues, following universal logics are proposed for the 2x315MVA, 400/220 kV ICTs at 400 kV GSS Ajmer which will work for all the operating scenarios:-

1. **SPS Group-1:** Trip commands are generated at time delay of 1.1 second to trip the following transmission line when 105% loading [105% current in all the three phases] on any one of the 2x315MVA, 400/220 kV Transformers at 400 kV GSS Ajmer is reached due to tripping of one of the transformer or any of the 220 kV lines associated with 400 kV GSS Ajmer or the overloading of transformers:-
   - 220 kV S/C Ajmer-Beawer line

   Implementation of SPS Logic-1: This logic will be implemented by taking reference from overcurrent relays of both 315MVA, 400/220 kV ICTs at 400 kV GSS Ajmer. Trip command will be initiated at time delay of 1.1 second when current reached the 105% loading of the ICTs [105% current in all three phases]. This trip command will be used to trip the 220 kV S/C Ajmer-Beawer line from 400 kV GSS Ajmer.

2. **SPS Group-2:** Trip commands are generated at time delay of 1.30 second to trip the following transmission lines when 105% loading [105% current in all the three phases] on any one of the 2x315MVA, 400/220 kV Transformers at 400 kV GSS Ajmer is reached due to tripping of one of the transformer or any of the 220 kV lines associated with 400 kV GSS Ajmer or the overloading of transformers:-
   - 220 kV Ajmer-Bherunda line Ckt-I
   - 220 kV Ajmer-Bherunda line Ckt-II

   Implementation of SPS Logic-2: This logic will be implemented by taking reference from overcurrent relays of both 315MVA, 400/220 kV ICTs at 400 kV GSS Ajmer. Trip command will be initiated at time delay of 1.30 second when current reached the 105% loading of the ICTs [105% current in all three phases]. This trip command will be used to trip the following 220 kV lines from 400 kV GSS Ajmer:-
   - 220 kV Ajmer-Bherunda line Ckt-I
   - 220 kV Ajmer-Bherunda line Ckt-II

3. **SPS Group-3:** Trip commands are generated at time delay of 1.50 second to trip the following transmission line when 105% loading [105% current in all the three phases] on any one of the 2x315MVA, 400/220 kV Transformers at 400 kV GSS Ajmer is reached due to tripping of one of the transformer or any of the 220 kV lines associated with 400 kV GSS Ajmer or the overloading of transformers:-
   - 220 kV S/C Ajmer-Kishangarh line

   Implementation of SPS Logic-3: This logic will be implemented by taking reference from overcurrent relays of both 315MVA, 400/220 kV ICTs at 400 kV GSS Ajmer. Trip command will be initiated at time delay of 1.50 second when current reached the 105% loading of the ICTs [105% current in all three phases]. This trip command will be used to trip the 220 kV S/C Ajmer-Kishangarh line from 400 kV GSS Ajmer.

- Schematic diagram of proposed SPS is shown in Fig. 2.

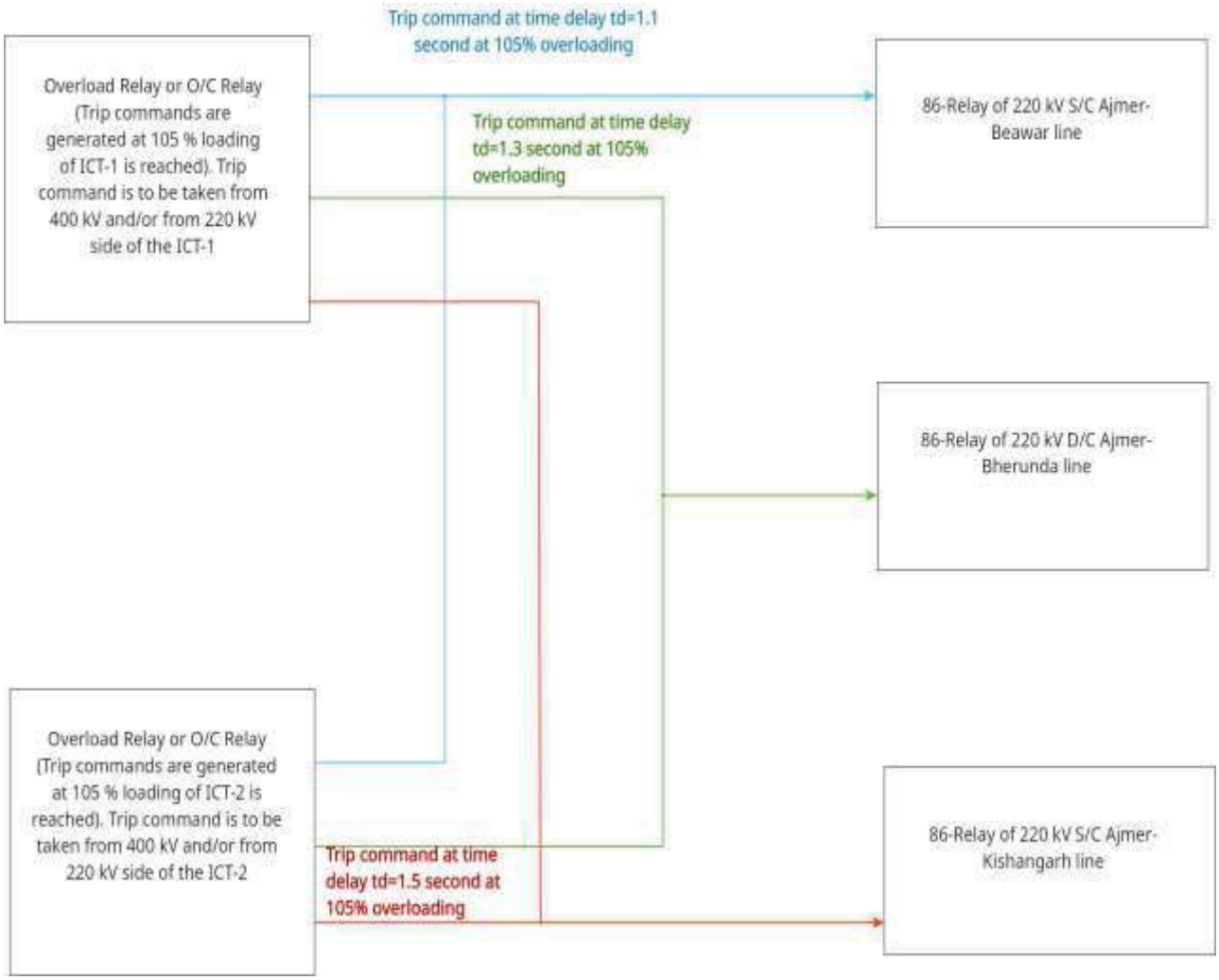

Fig. 2 Schematic diagram for implementation of proposed SPS Logics

- To maintain supply of critical loads connected to all the GSS in the region, tripped transformers and lines may be re-connected after applying load shedding on all the GSS in the region in such a quantum to maintain loadings on both the 315MVA, 400/220 kV ICTs or the healthy 315MVA, 400/220 kV ICT at 400 kV GSS Ajmer within permissible limits.

G. Requirement of Healthiness of the SPS

This SPS will function only if the present configuration of the transmission lines and transformers remain intact. Any change in configuration of lines and transformers will lead to mal-operation of the SPS. Further, LD Control room and SE (T&C), RVPN, Ajmer may ensure to take prior approval of NRLDC if any change is required in the configuration for which SPS is designed. Any change in configuration may be restored after the loading conditions are normalized.

सत्यमेव जयते

भारत सरकार

Government of India

विद्युत मंत्रालय

Ministry of Power

उत्तर क्षेत्रीय विद्युत समिति

Northern Regional Power Committee

संख्या: उ.क्षे.वि.स./ प्रचालन/106/01/2022/ दिनांक: 06.05.2022

विषय: उत्तर क्षेत्रीय विद्युत समिति की प्रचालन समन्वय उप-समिति की 194वीं बैठक का कार्यवृत |

Subject: Minutes of 194th OCC meeting of NRPC.

उत्तर क्षेत्रीय विद्युत समिति की प्रचालन समन्वय उप-समिति की 194वीं बैठक दिनांक 20.04.2022 को आयोजित की गयी थी। उक्त बैठक का कार्यवृत्त उत्तर क्षेत्रीय विद्युत समिति की वेबसाइट http://164.100.60.165 पर उपलब्ध है। यदि कार्यवृत पर कोई टिप्पणी हो तो कार्यवृत जारी करने के एक सप्ताह के अन्दर इस कार्यालय को भेजें |

194th meeting of the Operation Co-ordination Sub-Committee of NRPC was held on 20.04.2022. The Minutes of this meeting has been uploaded on the NRPC website http://164.100.60.165. Any comments on the minutes may kindly be submitted within a week of issuance of the minutes.

संलग्नक: यथोपरि

सौमित्र 06/05/2022

(सौमित्र मजूमदार)

अधीक्षण अभियंता (प्रचालन)

सेवा में,

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

UP SLDC had shared their assessment with NRLDC vide letter dated 31-03-2022.

Intra–State Generation(w/o Solar and Co-Gen)	TTC	RM	ATC
10000	15100	600	14500
11000	14400	600	13800
12000	13800	600	13200
13000	13300	600	12700

In 194 OCC meeting, it was discussed that:

- As per assessment done by NRLDC, the TTC computation pertaining to UP state control area seems to be in order. However, local load management would be required at Mau, Azamgarh, Nehtaur, Obra, Sarnath, Moradabad & Gorakhpur (UP) to arrive at these figures. Azamgarh ICTs should also be mentioned in the limiting constraints. Also, the actual load-generation scenario can change the TTC quantum based on the assumed local load distribution.
- UP SLDC was asked to share plan for load management at constained ICTs and also update on progress of underlying network at new stations such as 400/220kV Sambhal, Rasra, Sahupuri, Rampur, Jaunpur etc.

UP SLDC representative stated that 400/220kV Rasra substation is expected to be commissioned shortly. Many constrained ICTs are likely to be relieved with commissioning of Rasra sub-station. Moreover, revised ATC/TTC assessments along with load management plan would be shared shortly. It was also agreed that mock testing of SPS may be carried out before summer season as most of the constrained ICTs have SPS. SPS for 400/220kV Obra and Nehtaur substation would also be planned and commissioned before summer season.

Rajasthan

Rajasthan had shared ATC/TTC calculations with NRLDC on 22.10.2021. On 28.10.2021, NRLDC has shared their observations on basecase as well as simulation studies carried out by Rajasthan.

In 193 OCC meeting, Rajasthan SLDC representative informed there were some changes yet to be incorporated in basecase shared by NRLDC. NRLDC representative stated same may be carried out by Rajasthan before assessment of ATC in basecase shared. It was also informed by Rajasthan that proposal for SPS at constrained locations is under approval and would be brought for discussion in next OCC meeting. ICT Loadings observed above N-1 contingency limits were also discussed in the meeting.

Accordingly, Rajasthan SLDC has proposed SPS at 400/220kV Ajmer, Merta and Chittorgarh (Annexure-B.III of agenda).

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

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

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

Delhi

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

Delhi representative was not present in 192 OCC meeting for comments.

In 193 OCC meeting, Delhi SLDC was asked to implement SPS at Mundka and Bamnoli to save supercritical loads under N-1 contingency of one ICT. Delhi representative stated SPS at Mundka would be implemented before summer season. However, same is yet to be confirmed by DTL. NRLDC asked DTL and Delhi SLDC to coordinate and expedite shifting of ICT from Bamnauli to Mundka and implementation of SPS at 400/220kV Mundka. Delhi SLDC was asked to share the revised ATC/TTC limits for summer/monsoon 2022 along with anticipated generation scenario, basecase and reports with NRLDC at the earliest.

In 194 OCC meeting, it was informed that works for Mundka ICT are in place and ICT is expected before 30th April 2022. It was informed that SPS has been implemented at 400/220kV Mundka ICTs. NRLDC representative stated that SPS logic needs to be shared with NRLDC/ NRPC beforehand so that same can be discussed and approved in OCC/TCC/NRPC meeting before implementation. DTL was asked to share the logic and mock-testing exercise & ATC/TTC assessment with NRLDC/ NRPC at the earliest. Moreover, Delhi SLDC should immediately start uploading their ATC/TTC limits on their website.

Haryana

In 194 OCC meeting, Haryana SLDC was once again asked to expedite implementation of SPS and ICT capacity augmentation at 400/220kV Deepalpur and Kurukshetra (PG) to enhance their ATC/TTC limits at the earliest. Haryana SLDC informed SPS works are in process and would be implemented at Deepalpur by May'2022. For Kurukshetra, they have taken up the matter with STU to further take up with POWERGRID.

Haryana SLDC was asked to share the revised ATC/TTC limits for summer/monsoon 2022 along with anticipated generation scenario, basecase and reports with NRLDC at the earliest. Network arrangement for managing loading at Kurukshetra also needs to be shared. Haryana was also asked to expedite utilisation of underlying network at Bhiwani.

Annexure-B

RAJASTHAN RAJYA VIDYUT PRASARAN NIGAM LIMITED.

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

OFFICE OF THE SUPERINTENDING ENGINEER (P&P)

Room No. 336, Vidyut Bhawan, Jaipur T +91-141-2740623
e-mail:se.pp @rvpn.co.in WEBSITE :https://energy.rajasthan.gov.in/rvpnl

No. RVPN/CE (PP&D)/SE (P&P)/XEN-IAE-I/F D 238 Jaipur. Dt. 27/4/22

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

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

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

S. No.	Name of work	Estimated cost (in Lacs)	
		Without IDC	With IDC
1	Installation of 3rd 1x500 MVA, 400/220 kV transformer alongwith associated 400 kV & 220 kV bays at 400 kV GSS Jodhpur (Surpura)	4704.01	5043.64
2	Installation of 3rd 1x500 MVA, 400/220 kV transformer alongwith associated 400 kV & 220 kV bays at 400 kV GSS Ajmer	4664.86	4980.21
3	Installation of 3rd 1x500 MVA, 400/220 kV transformer alongwith associated 400 kV & 220 kV bays at 400 kV GSS Bikaner (Revsied A&FS approval)	4683.47	5021.62
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It is also intimate that Revised administrative and financial sanction for installation of 3rd 1x500MVA, 400/220kV transformer at 400kV GSS Bikaner is in place of already approved cost of Rs 2051.005 lacs for installation of 1x315MVA transformer conveyed vide this office letter no. 1807 dated 4.1.2022.

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

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

Encl.: Estimates.

Copy to the following for information & necessary action:-

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

Encl.: Estimates.

Superintending Engineer (P&P)

D:\AE-I\BoD Approvals

RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LTD.
Corporate Identity Number (CIN)-U40102RJ2000SGC016484
Regd. Office & H.O.: Vidyut Bhawan, Janpath, Jyoti Nagar, Jaipur-302005
OFFICE OF THE CHIEF ENGINEER (O&M)
SURATGARH SUPER THERMAL POWER STATION SURATGARH
Email: ce.stps@rrvun.com;

No. RVUN/STPS/CE (O&M)/F. /D. 688 Date: 07/02/2025 Annexure-A.X

The Zonal Chief Engineer (T&C)
RVPN, Jodhpur

Sub: To Expedite completion of temporary arrangement for 400kV Line and Status Update
Ref.: NRPC Meeting held on 19.10.2024

With reference to the discussions held in the NRPC meeting on 19.10.2024, it was decided that RRVPNL will conduct a field survey by 15.11.2024 for the feasibility of a temporary arrangement to connect one circuit of the 400kV Suratgarh Thermal-Ratangarh line to one circuit of the 400kV Suratgarh Supercritical-Babai D/C line. This work includes the erection of two new towers to facilitate the rearrangement, ensuring the reduction of high loading on the 400kV Switchyard STPS, Suratgarh and 400kV STPS-Ratangarh lines.

During the meeting, RRVPNL had assured that the said work would be completed by December 2024. However, considering the anticipated high load conditions at the 400kV Switchyard of STPS Suratgarh during the upcoming summer season due to increased solar power generation, it is crucial to complete this work at the earliest to avoid any operational challenges and overloading issues.

In view of the above, you are requested to kindly expedite the execution of the proposed arrangement and provide the latest status of work progress. This will help us in ensuring grid stability and smooth power evacuation during peak demand periods.

Your immediate attention to this matter will be highly appreciated. Kindly share an update on the present status of work at the earliest.

Thanking you.

Encl.: Minutes of the meeting held on 19.10.2024

(T. R. Soni)
Chief Engineer (O&M)
STPS, RVUN, Suratgarh

Copy submitted/ forwarded to the following for kind information and necessary action:

1. The Director (Project/ Technical), RVUN, Jaipur.
2. The Director (Operation), RVPN, Jaipur.
3. The Chief Engineer (SSCTPS), RVUN, Suratgarh
4. The Chief Engineer (PPMC & IT), RVUN, Jaipur.
5. The Chief Engineer (MPT &S/ LD), RVPN, Jaipur.
6. The TA to CMD, RVUN, Jaipur for kind perusal of the Hon'ble CMD.
7. The Superintending Engineer (M&P/SO&LD), RVPN, Jaipur
8. The Superintending Engineer (400 KV GSS), RVPN, Bikaner.

Chief Engineer (O&M)

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

विषय: Minutes of the meeting to discuss long pending bilateral issues between state power utilities of Rajasthan reg.

Kindly find attached minutes of the meeting held on **19.10.2024 (10:30 AM)** to discuss long pending bilateral issues between state power utilities of Rajasthan.

Signed by Dharmendra Kumar Meena
Date: 06-11-2024 09:52:56

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

सेवा में,

1. CMD, RRVUNL, (cmd@rrvun.com)
2. MD, RRVPNL (md@rvpn.co.in)
3. CGM(SO), NRLDC (somara.lakra@grid-india.in)
4. Director (Operation), RRVPNL (dir.oper@rvpn.co.in)
5. Director (Technical), RRVUNL (director.tech@rrvun.com)
6. Chief Engineer, SLDC Rajasthan (ce.ld@rvpn.co.in)

Copy for information to:

1. Member, GO&D, CEA

Contents

1. Delay in transmission lines affecting Grid operation adversely.....3
2. Low voltage issues at Hindaun, Alwar.....5
3. N-1 non-compliance of 400/220kV ICTs:.....8
4. Shifting of non-essential load from day-time to night time till transmission capacity augmentation.....10
5. High Mvar drawl by intrastate network and Status of approved capacitors in RRVPN control area:.....12
6. Frequent Outage of 400 KV Bhadla(Raj)-Bikaner(Raj) Ckt-1 & 2 and loading limitation thereof:.....12
7. Frequent outage of intrastate thermal generators in Rajasthan.....12
8. Shutdown of 400 KV Bhadla-Merta and 400 KV Bhadla-Jodhpur line for NHAI works (Additional Agenda by RRVPN).....13

Minutes of the meeting held on 19.10.2024 (10:30 AM) to discuss long pending bilateral issues between state power utilities of Rajasthan.

A meeting was held in Vidyut Bhawan, Jaipur, Rajasthan on 19.10.2024. List of participants is attached as **Annexure-I**.

Member Secretary, NRPC welcomed the representatives from NRPC, NRLDC, RRVPNL, Rajasthan SLDC, RRVUNL and JVVNL. He mentioned that during a recent meeting held in Ministry of Power, there was a review of the power supply situation in Northern Region, particularly for States of Rajasthan, Uttarakhand, and J&K. It was noted that Rajasthan was experiencing power shortages despite adequate availability in the grid, and constraints within the state's power system were identified. The Ministry inquired about potential measures to alleviate these constraints. Additionally, he emphasized that before considering any additional power allocation from the Central sector, the partial outages of units within Rajasthan's control area must be addressed. It was also mentioned that the overall power system needs to be viewed collectively, as a power shortage in one state can occur even when other states have a surplus. Further, all Northern states have been provided with a format regarding the partial outages prior to considering any additional allocations.

The representative of Suratgarh Super Critical TPS informed that after commissioning stage itself, the issues of partial outage have been observed it has been taken up with the OEM-BHEL. With support from OEM, the Forced Outages have now reduced. Unit Outage due to frequent Boiler tube leakages have come down significantly. It was also informed that NTPC has done technical audit of this plant.

Member Secretary, NRPC further mentioned that this special meeting has been called specially to discuss long-pending bilateral issues of Rajasthan, which was also discussed earlier in OCC meetings of NRPC but somehow could not be resolved fully.

Subsequently, deliberations on following agenda items were held;

1. Delay in transmission lines affecting Grid operation adversely.

NRLDC representative highlighted the following points:

- The commissioning of the 400 kV Suratgarh TPS – Babai (Jhunjhunu) D/C line has been delayed for 6-7 years, impacting grid operations and the constraints in evacuation of full generating capacity of 2820 MW at Suratgarh.
- Currently, only 45 km of the 230 km line has been constructed and energized against theft.

- This delay has led to evacuation challenges and overloading at the 400 kV Ratangarh GSS and Suratgarh TPS.
- There is a need to expedite the commissioning of the remaining line and to provide updates on progress along with a projected commissioning schedule.

- RRVPNL representative apprised that 123 km of the 400kV Suratgarh TPS – Babai (Jhunjhunu) D/C line is scheduled to be charged with anti-theft measures by November 15, 2024. Previously, 23 Nos. towers had collapsed due to theft incident, the123 km line (60 km from SSCTPS and 63 km from SCTPS) will be energized after the erection of three number of new towers. The total length of the line is 245 Km, includes 743 towers and the completion of Line is expected by June 2025, with efforts underway to finish it even earlier, by March 2025. Additionally, it was also informed by RRVPNL that there are currently no Right of Way (ROW) issues affecting the construction of the line.
- Suratgarh TPS representative inquired whether a load flow study had been conducted on the loading pattern of the 400kV Suratgarh TPS – Babai (Jhunjhunu) D/C line after it was energized. He also stated that there is a significant flow of power from Suratgarh Supercritical to Suratgarh Thermal, while low power flow on the Bikaner lines from Suratgarh Thermal.
- CGM (SO) NRLDC replied that due to high RE generation in peak solar hours significant power flow from Surtagrah Thermal to Bikaner is not observed.
- SLDC Rajasthan informed that according to the load flow study conducted, the commissioning of the 400kV Suratgarh Super Critical TPS – Babai (Jhunjhunu) D/C line, the load on the Babai lines is expected to be 1190 MW. Additionally, the loading from 400kV Suratgarh Supercritical to Suratgarh Thermal lines will decrease significantly.
- SLDC Rajasthan proposed a temporary solution to alleviate the high loading on the Suratgarh and Babai lines until the commissioning of the 400kV Suratgarh Super Critical TPS – Babai (Jhunjhunu) D/C lines. SLDC Rajasthan informed according to verbal information received from the STU, both the 400kV Suratgarh Supercritical-Babai D/C lines and the 400kV Suratgarh Thermal-Ratangarh lines run parallel to each other. The proposal involves connecting one circuit of the 400kV Suratgarh Thermal-Ratangarh line to one circuit of the 400kV Suratgarh Supercritical-Babai D/C line. It was informed that two new towers to be erected to facilitate this rearrangement and the line could be energized to reduce the high loading on the 400kV Suratgarh and 400kV Ratangarh lines. This change is expected to lower maintenance requirements at the 400kV Suratgarh. Additionally, RRVPNL confirmed that parallel work would continue for the commissioning of the 400kV Babai lines.
- MS, NRPC stated that since the line is intra-state, approval from the relevant state authorities will be necessary. SE (SOLD) mentioned that data available with them is based on verbal information and a load flow study has been carried out accordingly. However, this data needs to be revised based on the actual available information.
- MS, NRPC and CGM (SO), NRLDC asked to SLDC Rajasthan to share the study files & its results with NRPC and NRLDC for further examining at their end. It was also agreed in the meeting that FTC procedure for the rearrangement will be followed.

- RRVPNL representative informed that the 400 kV Kenchiya and 400 kV Bikaner New lines are being planned in Rajasthan. The 400 kV Kenchiya line will be a LILO (line-in, line-out) of the 400 kV Suratgarh Thermal - Bikaner line, while the 400 kV Bikaner New line will be a LILO of the 400 kV Suratgarh Supercritical - Bikaner D/C line. It was also informed that the work of Bikaner New Project is proposed to be part of their joint venture with PGCIL with approximately 1190 MW of renewable energy generation planned for Bikaner New. Representatives from Suratgarh raised concerns about the increased loading on their switchyard due to the upcoming Kenchiya station and suggested that it should be a LILO of the 400 kV Suratgarh Supercritical - Bikaner D/C line.
- RRVPNL representative stated that if the 400 kV Babai - Suratgarh Supercritical line is commissioned first, there would be no loading issues for the Suratgarh Thermal switchyard. The SLDC Rajasthan representative added that the load flow will depend on grid conditions, and switchyard strengthening work should be undertaken at the generating stations in Suratgarh. During peak solar hours, load flow will be higher in the integrated network, requiring thermal generation to be backed down to a technical minimum. Therefore, RRVUNL will need to ensure their switchyard is maintained accordingly. The SLDC Rajasthan representative also highlighted the advantages of strengthening work at KTPS where connectivity with Kota PG was restored recently and benefiting KTPS with access to multiple evacuation lines.
- CGM (SO) NRLDC emphasized that RRVPNL should keep RRVUNL updated on the planning and execution of the upcoming network. He also mentioned that GRID-INDIA provides quarterly operational feedback to the CTU, and a similar process could be implemented at the state level.

After detailed discussion following was decided:

a) *Field survey to be conducted by RRVPNL by 15.11.2024 for the feasibility of the temporary arrangement and material requirement etc. for connecting one circuit of the 400kV Suratgarh Thermal-Ratangarh line to one circuit of the 400kV Suratgarh Supercritical-Babai D/C line. It was informed that two new towers to be erected to facilitate this rearrangement and the line could be energized to reduce the high loading on the 400kV Suratgarh and 400kV Ratangarh lines. This change is expected to lower maintenance requirements at the 400kV Suratgarh.* ***Additionally, parallel work would continue by RRVPNL for the early commissioning of the 400kV Babai lines****. (Approval from higher management of RRVPNL/RVUNL and concerned authorities to be taken).*

b) *SLDC & RRVPNL will jointly study as per the revised/actual data to check the load flow/loading condition of lines if the new arrangement is carried out so that the benefits are visible explicitly.*

c) *The study will be shared by RRVPNL/SLDC with NRPC & NRLDC and decision is to be conveyed by RRVPNL.*

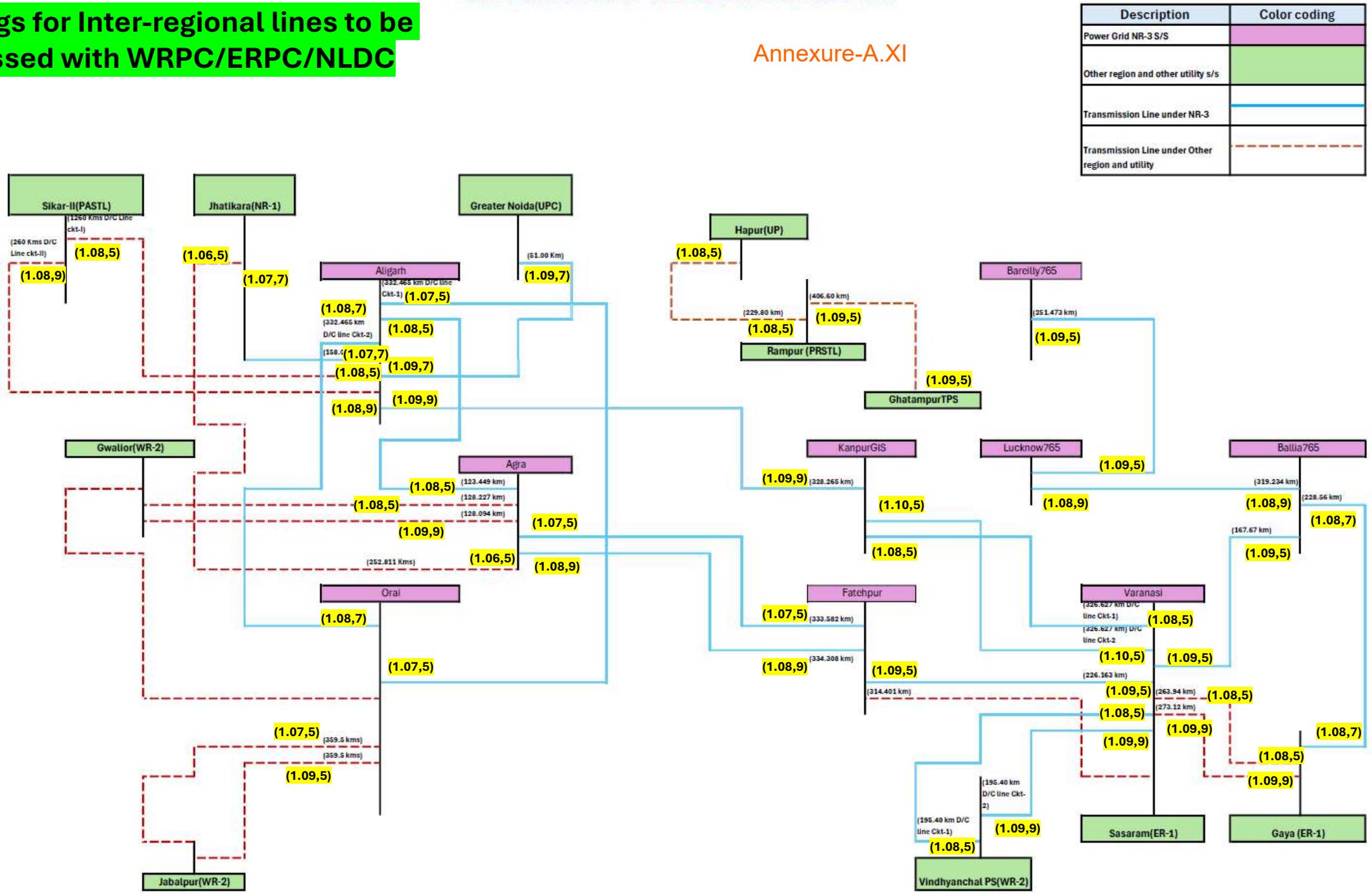
2. Low voltage issues at Hindaun, Alwar

NRLDC representative stated the following:

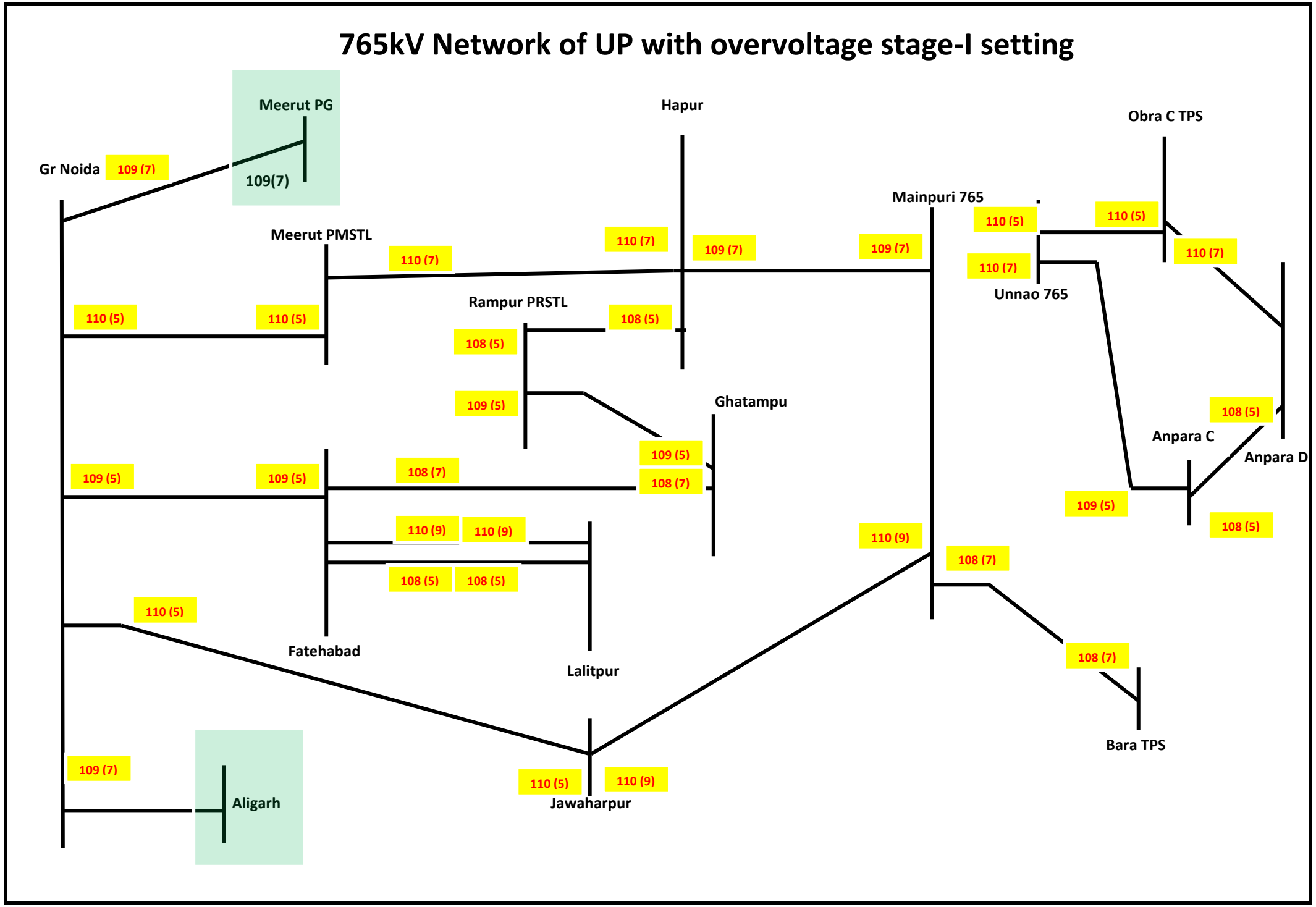
- Persistent low voltage problems have been observed in Hindaun, Alwar, and Dholpur.

Settings for Inter-regional lines to be discussed with WRPC/ERPC/NLDC

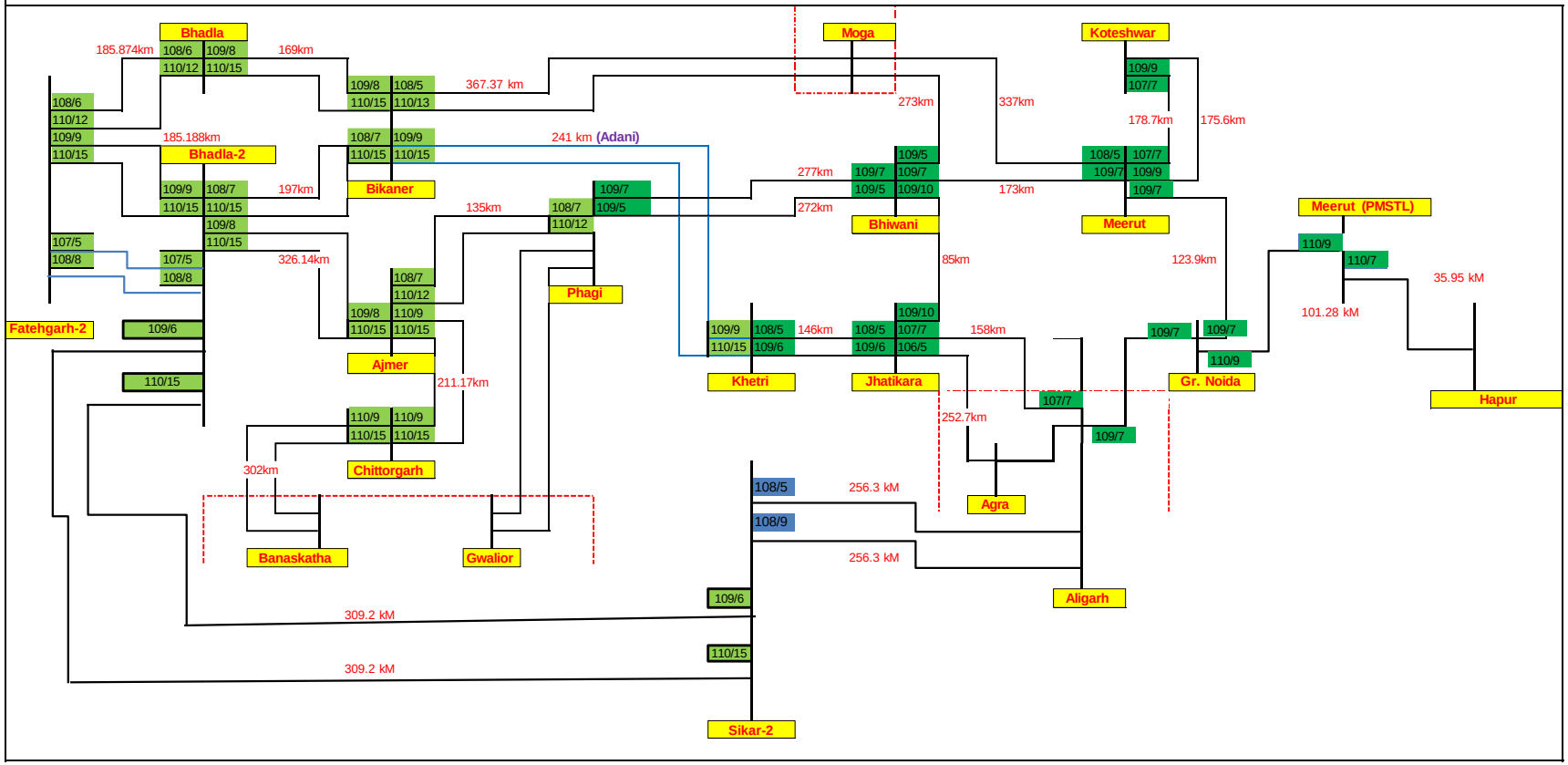
Annexure-A.XI



765kV Network of UP with overvoltage stage-I setting



OVER VOLTAGE RELAY SETTINGS (STAGE-I) OF 765kV SYSTEM OF NORTHERN REGION-I



Annexure-B.I

Status of actions points recommended during previous PSC meetings (to be discussed in 58th PSC meeting)

S. No	Agenda	Remdial actions recommended during PSC meeting	Status of remdial action taken	
			57th PSC (20.02.2025)	58th PSC (26.03.2025)
1	Frequent multiple elements tripping at 220kV Kunihar, Baddi, Upperla Nangal complex and load loss event in HP control area	**51 PSC:** PSC Forum requested HP to complete the protection audit as per mentioned timelines (protection audit of 220kV Kunihar has been awarded and it would be completed within next 15-20 days. In next phase, by 15th September, protection audit of substations in downstream and upstream of 220kV Kunihar S/s would be completed.) and resolve the protection related issues. HP was also requested to share the reports of protection audit to NRPC & NRLDC after completion of audits.	HPSEBL representatives were not present in the meeting.	
2	Multiple elements tripping at 220kV Hissar(BBMB) 07th May 2024, 11:16 hrs	**51 PSC:** a) Expedite the implementation of differential protection in short lines to avoid undesired operation of distance protection.	HVPNL representative informed that status is same and estimated timeline will be 6 months to complete the work. *PSC forum recommended HVPNL to expedite the implementation of differential protection in short lines and also share the expected timeline.*	
3	Multiple elements tripping at 400kV Sainj (HP), 400kV Parbati2 & Parbti3 (NHPC) Stations on 07th May 2024, 16:17 hrs	**51 PSC:** a) NHPC shall follow up with the relay engineer and taken necessary remedial actions to ensure proper operation of A/R scheme at Parbati2 end. b) NHPC and HPPTCL shall review the healthiness of PLCC at Parbati3 and Sainj end and take necessary actions to ensure their proper operation. c) Expedite the implementation of differential protection in 400kV Parbati2-Sainj line. d) Standardisation of recording instruments (DR/EL) need to be ensured.	NHPC representative informed that OPGW laying is ongoing. GE engineers are yet to visit and the work is expected to get completed by March 2025. *PSC forum recommended NHPC & HPPCL to take expeditious action at their end and ensure healthiness of protection system.*	
4	Multiple elements tripping at 220kV Sarna (PS) on 04th May 2024, 07:10 hrs	**51 PSC:** a) Punjab shall expedite the commissioning of new bus scheme. B) POWERGRID shall revise the Z-4 time delay setting of Kishenpur lines at Sarna (PS) end as 160msec till bus bar get operational.	PSTCL representative informed that there is delay in tender stage and bus bar protection at 220kV Sarna will be commissioned by June 2025. Materials are under inspection. *PSC forum requested PSTCL to expedite the work related to implementation of bus bar protection at Sarna S/s.*	
5	Multiple elements tripping at 400/132kV Masoli(UP) on 29th May 2024, 15:57 hrs	**51 PSC:** a) UP shall implement the bus bar protection at 132kv level at 400/132kV Masoli S/s.	UPPTCL representative stated that status is same. Shutdown has been planned after 25th February 2025 and bus bar commissioning at 132kV Masoli(UP) will get completed by March 2025. *PSC forum requested UPPTCL to expedite the process of bus bar protection implementation at 400/132kV Masoli(UP) and such other stations.*	
6	Multiple elements tripping at 220kV KTPS (RVUN) on 21st June 2024, 11:37 hrs	**51 PSC:** a) Commissioning of bus coupler between 220kV Bus-3 & 5 need to be expedited.	RVUNL representative stated that status is same and work is at stage of tender processing. *PSC forum requested RVUNL for expeditious actions at their end.*	
7	Frequent tripping of 220 KV Anta(NT)-Sakatpura(RS) (RS) Ckt-1	**52 & 53 PSC:** RVPN was requested to expedite the process of relay replacement and rectification of issues related to A/R operation.	RVPNL representative informed that there is delay in panel replacement. If the work is delayed further, A/R will be enabled in the old panel during shutdown on 27th and 28th February 2025. *PSC forum requested RVPNL to expedite the actions at their end.*	
8	Frequent tripping of 220 KV Khara(UP)-Saharanpur(PG) (UP) Ckt-1	**52 & 53 PSC:** UP was requested to expedite the process of relay replacement at Khara end. POWERGRID shall review and ensure the A/R operation at their end.	UPPTCL representative informed that relay replacement in Saharanpur line is completed and that in Beas line will be completed by 22nd February 2025. It is expected that relay replacement in unit-1 will get completed by the end of March 2025 followed by unit-2 & 3. *PSC forum requested UPPTCL to expedite the replacement of relay at Khara(UP) end.*	
9	Multiple elements tripping event at Patiala(PG)	**52 & 53 PSC:** POWERGRID was requested to expedite the process of commissioning of new bus bar scheme.	POWERGRID(NR-2) representative informed that status is same. *PSC forum requested POWERGRID(NR-2) to expedite the process.*	

10	Multiple elements tripping at 220kV Khodri HEP & Chibro HEP on 5th, 11th & 19th September 2024	**53 PSC:** a)Timely submission of disturbance recorder (DR) and event logger (EL) files need to be ensured. 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. b)HPPTCL shall taken necessary actions to rectify the protection related issue in 220kV Khdori-Majri ckt-2. c)OV protection needs to be disabled in 220kV lines at the earliest. d)Over frequency and over current protection operation in units at Khodri HEP need to be reviewed. e)A/R should be made operational in Sarsawan line at the earliest. f)UJVNL shall share the CPRI audit report and details of remedial action taken within one week. g)Replacement of Units breakers need to be expedited.	UJVUNL representative informed that GE team is already contacted to resolve the A/R issue in relay, but there is delay from GE end. Further, tender is under process regarding replacement of bus bar protection relay. Action plan is prepared and shared for attending the issue in unit/line breaker. *PSC forum requested UJVUNL & HPSEBL to take necessary remedial action at their end and ensure proper operation of protection system. UJVUNL shall expedite the action plan and HPSEBL shall review the protection setting of 220kV Khodri-Majri line-II.*	
11	Multiple elements tripping at 400/220kV Obra_A(UP) on 9th October 2024	**54 PSC Recommendations:** a)UPPTCL & Obra_A(UP) shall ensure the implementation of LBB protection at the earliest at 220kV side. b)GPS scheme shall be implemented at Obra_B(UP) by the **end of January 2025** and time sync of recording devices will be ensured.	UPPTCL representative informed that time sync issue will be resolved by March 2025 (delay in visit by ABB engineers). Further, bus bar relay replacement will be done within 1 year. *PSC forum requested UPPTCL for expedited corrective actions.*	
12	Multiple elements tripping at 220/132kV Obra_A(UP) on 9th October 2024	**54 PSC Recommendations:** Commissioning and Implementation of numerical relays in 132kV ICT-1&2 at Obra_A(UP) need to be expedited. Timely commissioning of the same need to be ensured.	UPPTCL representative informed that Commissioning and Implementation of numerical relays in 132kV ICT-1&2 at Obra_A(UP) will be completed by March 2025 (delay in visit by ABB engineers). *PSC forum requested UPPTCL for expedited corrective actions.*	
13	Multiple elements tripping at 400/220kV Kashipur(Utt) on 10th October 2024	**54 PSC Recommendations:** a)PTCUL shall review the SPS scheme at 400/220kV Kashipur S/s. b)Overcurrent protection setting (IDMT) need to be revised in line with the approved protection philosophy.	PTCUL representatives were not present in the meeting.	
14	Multiple elements tripping at 220kV Dausa(RS) on 21st October 2024 and on 29th December, 2024	**54 & 56 PSC Recommendations:** a) RVPNL will expedite the replacement of all the static relays at 220kV Dausa S/s with numerical relays. b) Time synchronization of all the recording instruments need to be ensured. c) Healthiness of protection system and their proper operation need to be ensured. d) Timely submission of disturbance recorder (DR) and event logger (EL) files need to be ensured.	RVPNL representative informed that 3 relays will be replaced during shutdown available on 21st, 22nd and 28th February 2025. Rest 2 relays are under procurement stage. *PSC forum requested RVPNL for expedited corrective actions.*	
15	Frequent tripping of 220 KV RAPS_A(NP)-Sakatpura (RS) (RS) Ckt-1 &2	**55 PSC Recommendations: E**xpeditious corrective actions to minimise frequent faults in line.	RVPNL representative informed that work is completed in 220kV RAPS_A(NP)-Sakatpura (RS) (RS) Ckt-1. For 220kV RAPS_A(NP)- Sakatpura (RS) (RS) Ckt-2 and 220kV RAPS_B(NP)- Sakatpura (RS) (RS) Ckt, it will be completed by March 2025. *PSC forum requested RVPNL for expedited corrective actions.*	
16	Frequent tripping of 400 KV Amritsar(PG)-Makhu(PS) (PSTCL) Ckt-1 & 400 KV Talwandi Saboo(PSG)-Nakodar (PSG) (PS) Ckt-1	**55 PSC Recommendations:** PSTCL was requested to plan replacement of porcelain insulators with polymer type.	PSTCL informed that status is same. *PSC forum requested PSTCL to for expeditious actions for insulators replacement.*	
17	Multiple element tripping event at 400kV Aligarh(UP) on 02nd November, 2024	**55 PSC Recommendations:** UPPTCL shall ensure the healthiness of carrier communication and A/R operation at Muradnagar_1(UP) end.	UPPTCL representative informed that carrier communication issue exists in Aligarh(UP) end also. Hence communication upgradation will be done at both the ends. Work is expected to get completed by end of May 2025. *PSC forum requested UPPTCL for expedited corrective actions.*	
18	Multiple element tripping event at 220kV Pong(BB) on 06th November, 2024	**55 PSC Recommendations:** BBMB shall share the event analysis and details of remedial action taken within one week.	Pong BBMB representative was not present. *PSC forum requested BBMB to ensure timely submission of DR/EL & tripping report.*	
19	Multiple element tripping event at 400kV Jaisalmer(RS) on 11th December, 2024	**56 PSC Recommendations:** a) RVPNL shall ensure the healthiness of protection system and their proper operation. b) Timely submission of disturbance recorder (DR) and event logger (EL) files need to be ensured.	RVPNL representative informed that during isolator changeover "LBB operated" signal was seen in BCU due to which all the elements connected to that bus tripped. There was no fault in system. Tripping occurred during isolator changeover as "LBB operated" signal was seen in BCU. Issue with LBB relay is not identified yet. OEM is present at site for commissioning of new 500MVA ICT which will be completed within 7-8 days. After that OEM will attend this issue in LBB relay. Temporarily busbar protection has been taken out of service and zone-4 settings of lines at Jaisalmer(RS) end is kept as 160ms. *PSC forum requested RVPNL to rectify issue in LBB relay at Jaisalmer end and take the busbar protection in service at the earliest.*	
20	Multiple elements tripping at 220kV Mehalkalan(PS)on on 27th November, 2024	**56 PSC Recommendations:** a) PSTCL shall share the DR/EL & tripping details within one week. b) Timely submission of disturbance recorder (DR) and event logger (EL) files need to be ensured.	PSTCL informed that they will be sharing the analysis shortly.	

21	Frequent tripping of 220 KV Agra(PG)-Bharatpur(RS) (PG) Ckt-1	**57 PSC Recommendations:** Impedance measurement and distance relay settings of the line need to be reviewed before summer (high demand period).	RVPNL representative informed that this line is radially connected, hence DR is insignificant at Bharatpur end. POWERGRID(NR-3) representative informed that most of the faults are occurring at the border of Rajasthan and Powergrid portion of the line. Patrolling is done in Powergrid portion of the line and nothing is observed at the fault location. *PSC forum requested Rajasthan and POWERGRID to complete review of impedance measurement and distance relay settings of the line this work before summer (high demand period).*	
22	Frequent tripping of 400 KV Anpara_B(UPUN)-Sarnath(UP) (UP) Ckt-2	**57 PSC Recommendations:** Healthiness of carrier communication need to be reviewed.	As per DR, there is delayed clearance of fault from Sarnath end (fault cleared in zone-2 from Sarnath end) in one of the events, hence carrier communication issue is suspected. *PSC forum requested UPPTCL to review healthiness of carrier communication in the line.*	
23	Frequent tripping of 400 KV Noida Sec 148-Noida Sec 123 (UP) Ckt-1	**57 PSC Recommendations:** a) Timely submission of disturbance recorder (DR) and event logger (EL) files need to be ensured. b) Time sync issue need to be addressed. c) Issue in A/R non-operation need to be resolved.	UPPTCL representative stated that A/R is implemented in BCU for this line and there is issue in A/R initiation in BCU. *PSC forum requested UPPTCL to resolve time sync issue and A/R non-operation issue at the earliest.*	
24	Frequent tripping of 220 KV Sohawal(PG)-Barabanki(UP) (UP) Ckt-1	**57 PSC Recommendations:** **S**tatus of A/R operation and PLCC issue at Sohawal end need to be reviewed.	As per DR, A/R is successful at Barabanki end in one of the 3 events and DT sent from Sohawal(PG) end for other two of the 3 events. *PSC forum requested POWERGRID NR-3 to review status of A/R operation and PLCC issue at Sohawal end.*	
25	Frequent tripping of 400 KV Merta-Ratangarh (RS) Ckt-1	**57 PSC Recommendations:** a) DR standardization need to be checked (DR time window of ~800ms is not as per standard). b) Phase sequence issue need to be resolved. c) Status of A/R operation at Ratangarh end need to be reviewed.	RVPNL representative stated that A/R was successful from Merta end in two of the events and status of A/R will be checked at Ratangarh end during shutdown along with the phase sequence issue. *PSC forum requested RVPNL to maintain DR uniformity for lines, resolve phase sequence issue and review staus of A/R operation at Ratangarh end.*	
26	Frequent tripping of 400 KV Mohanlalganj (PGYTL)-Unnao(UP) (PGYTL) Ckt-1	**57 PSC Recommendations:** a) Issue in over-voltage relay need to be identified and resolved at the earliest. b) CVT error may be reviewed at Unnao end.	UPPTCL representative informed that there may be issue in relay in which over-voltage is implemented as voltage observed was ~1.05 pu only. *PSC forum suggested to review CVT error and attend the issue in relay at the earliest.*	
27	Multiple elements tripping at 220/132kV Ropar(PS) on 06th January, 2025	**57 PSC Recommendations:** PSTCL need to share the DR/EL & tripping details within one week	PSTCL representative was not present during the meeting. *PSC forum requested PSTCL to share the DR/EL & tripping details within one week*.	
28	Multiple elements tripping at 400/220KV Heerapura(RS) on 10th January, 2025	**57 PSC Recommendations:** a) Instantaneous OC relay (High set) settings of ICTs at Heerapura(RS) may be reviewed. b) Replacement of remaining electromechanical/ static relays & schemes with numerical relay need to be expedited at Heerapura(RS).	RVPNL representative stated that there was fault due to falling of kite thread on 220 kV "E"-Bus at 400 kV GSS Heerapura. As it was a nearby fault. it was caused tripping on 400/132 kV ,250 MVA ICT-1 & 400/132 kV, 250 MVA ICT-2 on instantaneous OC relay (High set). As all relays were electromechanical type relay on 220 kV BUS Sectionalizer, Bus Bar protection Scheme, Bus Coupler and ICTs, no DR is available in relays. As remedial action taken, O/C & EF Electromechanical relays on all 03 Nos. 220 kV BUS Sectionalizer, 01 No. 220 kV Bus Coupler, 04 Nos. on 400 kV Side of all 400/220 kV ICTs have been retrofitted by Numerical Relays. Remaining Electromechanical/ static relays & schemes will be retrofitted in phased manner as per availability of relays and shutdown at the earliest. *PSC forum requested RVPNL to review Instantaneous OC relay (High set) settings of ICTs and replace remaining electromechanical/ static relays & schemes with numerical relay at Heerapura at the earliest.*	
29	Multiple element tripping at 220/132kV Agra Sikandra(UP) on 23rd January, 2025	**57 PSC Recommendations:** a) Carrier communication issue at Kirawali(UP) need to be resolved. b) Issue in isolator selection status at Agra Sikandra(UP) need to be addressed. c) Zone-2 and zone-3 settings of 220kV Kirawali- Agra Sikandra(UP) Ckt and 220kV Kirawali(UP)-Agra(PG) Ckt need to be reviewed at Kirawali end.	UPPTCL representative stated that shutdown was taken for replacement of damaged CT of 220kV Kirawali- Agra Sikandra(UP) Ckt and status of isolator of Bus A & Bus B busbar relay was thoroughly checked and & set right. POWERGRID(NR-3) representative informed that during the same time 220kV Kirawali(UP)-Agra(PG) Ckt also tripped and fault was cleared in zone-3 from Agra(PG) end. UPPTCL representative agreed that time delay at Kirawali end in zone-2 settings of 220kV Kirawali- Agra Sikandra(UP) Ckt was not correct, hence 220kV Kirawali(UP)-Agra(PG) Ckt tripped in zone-3 from Agra(PG) end. *PSC forum requested UPPTCL to resolve issues related to carrier communication at Kirawali(UP) and isolator selection status at Agra Sikandra(UP) and also to review zone-2 and zone-3 settings of 220kV Kirawali- Agra Sikandra(UP) Ckt and 220kV Kirawali(UP)-Agra(PG) Ckt at Kirawali end.*	

Annexure-B.II

Grid Event summary for February 2025

S.No.	Category of Grid Incident/ Disturbance	Name of Elements (Tripped/Manually opened)	Affected Area	Owner/ Agency	Outage		Event (As reported)	Loss of generation / loss of load during the Grid Disturbance		Fault Clearance time (in ms)	Compliance of Protection Protocol/Standard		
	(GI-1 to GD-V)				Date	Time		Generation Loss(MW)	Load Loss (MW)		Flash Report Submission (Y/N)	DR/EL Submission (Y/N)	Detail Tripping Report Submission (Y/N)
1	GI-1	i)220 kV Saharanpur(UP)-Khodri(UK) (UP) Ckt ii)220 KV Khodri(UK)-Majri(HP) (UK) Ckt-2 iii)220 KV Khodri - Chibro (UK) Ckt-2	Uttarakhand	PTCUL, HPTCL & UPPTCL	1-Feb-25	09:01	i)220KV Khodri(UK) generating station has 4 generating units of 30MW each and has double main bus scheme. The power is evacuated mainly through 220kV Khodri(UK)-Majri(HP) (UK) Ckt-1 & 2, 220kV Saharanpur(UP)-Khodri(UK) (UP) Ckt, 220KV Khodri – Sarsawan Ckt, 220KV Khodri – Jhajra Ckt and 220KV Khodri – Chibro Ckt-1 & 2. ii)As reported, at 09:01 hrs, while stopping of 30MW Unit-4 at Khodri(UK), its R-phase pole of CB stucked and the trip coil of R-phase burnt. Due to this, pole discrepancy operated which as per logic, led to LBB protection operation resulting in tripping of 220 KV Khodri(UK)-Majri(HP) (UK) Ckt-2, 220 KV Saharanpur(UP)-Khodri(UK) (UP) Ckt and 220 KV Khodri - Chibro (UK) Ckt-2. iii)As per PMU at Dehradun(PG), no fault was found in the system. iv)As per SCADA, no change in demand/generation in Uttarakhand control area was observed. v)As reported by SLDC-UK, testing of Generator CB of Unit -4 by expert service engineer has been carried out and fault has been rectified. As remedial action taken, the stuck pole of R-phase was opened manually and the control valve assembly was replaced with a new one.	0	0	NA	Y(d)	N (Partial detail received)	N (Partial detail received)
2	GI-1	i)220 KV Bhakra_R-Ganguwal (BB) Ckt-2 ii)220KV Bus 1 at Bhakra_R(BB) iii)220 KV Bhakra_R(BB)-Mahilpur(PS) (PS) Ckt-2 iv)157 MW Bhakra HPS - UNIT 6	Himachal Pradesh	BBMB and PSTCL	3-Feb-25	03:57	i)220KV Bhakra(BBMB) generating station has 6 generating units of 157MW each. Unit-I , VI and VII were connected to Bus-I of 220KV along with 220 KV Bhakra_R-Ganguwal (BB) Ckt-2 and 220 KV Bhakra_R(BB)-Mahilpur(PS) (PS) Ckt-2 . ii)During the antecedent condition only Bhakra HPS - UNIT 6 was operational and generating 157MW. 220 KV Bhakra_R-Ganguwal (BB) Ckt-2 and 220 KV Bhakra_R(BB)-Mahilpur(PS) (PS) Ckt-2 were carrying 1 MW and 48MW of load respectively. iii)As reported, at 03:57 hrs, R-N phase to earth fault occurred in 220 kV Bhakra- Jamalpur Ckt-2. At the same time Bus Bar protection for 220KV Bus-I operated. This led to tripping of 220KV Bus-I, 220 KV Bhakra_R-Ganguwal (BB) Ckt-2, 220 KV Bhakra_R(BB)-Mahilpur(PS) (PS) Ckt-2 and 157 MW Bhakra HPS - UNIT 6 (Details Awaited) iv)As per PMU at Bhakra(BBMB), R-N phase to earth fault was found in the system. v)As per SCADA, approx 157 MW hydro generation loss is observed at 220 kV Bhakra Dam S/S.	157	0	120	Y(d)	N	N
3	GI-2	i)400 KV Parbati_2(NH)-Sainj(HP) (PKTCL) Ckt-1 ii)400 KV Parbati_3(NH)-Parbati Pooling Banala(PG) (PKTCL) Ckt-1 iii)400 KV Parbati_3(NH)-Sainj(HP) (PKTCL) Ckt-1	Himachal Pradesh	NHPC, PGCIL & PKTCL	3-Feb-25	19:35	i)Total generated power of Sainj HEP(HP), Parbati_2(NH) and parbati_3(NH) evacuates through 400 kV Parbati_2(NH)- Banala(PG) (PKTCL) Ckt and 400 kV Parbati_3(NH)- Banala(PG) (PKTCL) Ckt via 400 KV Parbati_2(NH)-Sainj(HP) (PKTCL) Ckt and 400 KV Parbati_3(NH)-Sainj(HP) (PKTCL) Ckt. ii)During antecedent condition, only 50MW Unit-1 at Sainj HEP(HP) was running (generating approx. ~45MW) and 130MW Unit-4 at Parbati-3 HEP(NHPC) (generating approx. ~132MW). iii)As reported, at 06:31 hrs, R-N fault occurred on 400 KV Parbati_3(NH)-Sainj (HP) (PKTCL) Ckt-1 in Z-2 and fault current was 2.92 KA from Sainj end. iv)As per DR of the line of Parabati3 end, fault was sensed in Z-1 and tripping command to R-ph CB was given. However, R-ph pole failed to open leading to operation of LBB protection. This led to tripping of all the elements connected to the Bus (Tripping details awaited) and complete blackout of 400KV Parbati-3 s/stn occurred. v)As per PMU, R-N fault with delayed clearance of fault in 400msec is observed. vi)During this event, Approx 132 MW hydro generation loss is observed at Parbati-III and 45 MW hydro generation loss is observed at Sainj. (As per SCADA).	177	0	440	Y(d)	N (Partial detail received)	N (Partial detail received)
4	GI-1	i)220 KV Bhakra_R-Ganguwal (BB) Ckt-2 ii)220KV Bus 1 at Bhakra_R(BB) iii)220 KV Bhakra_R(BB)-Mahilpur(PS) (PS) Ckt-2 iv)157 MW Bhakra HPS - UNIT 6 v)157 MW Bhakra HPS - UNIT 7	Himachal Pradesh	BBMB and PSTCL	5-Feb-25	18:45	i)220KV Bhakra(BBMB) generating station has 6 generating units of 157MW each. Unit-I , VI and VII were connected to Bus-I of 220KV along with 220 KV Bhakra_R-Ganguwal (BB) Ckt-2 and 220 KV Bhakra_R(BB)-Mahilpur(PS) (PS) Ckt-2 . ii)During the antecedent condition only Bhakra HPS - UNIT 6 and 7 were operational and generating 156MW and 157MW respectively. 220 KV Bhakra_R-Ganguwal (BB) Ckt-2 and 220 KV Bhakra_R(BB)-Mahilpur(PS) (PS) Ckt-2 were carrying 33 MW and 110MW of load respectively. iii)As reported, at 03:57 hrs, Bus Bar protection for 220KV Bus-I operated. This led to tripping of 220KV Bus-I, 220 KV Bhakra_R-Ganguwal (BB) Ckt-2, 220 KV Bhakra_R(BB)-Mahilpur(PS) (PS) Ckt-2 and 157 MW Bhakra HPS - UNIT 6 and 7(Details Awaited) iv)As per PMU at Bhakra(BBMB), Y-N phase to earth fault was found in the system. v)As per SCADA, approx 427 MW hydro generation loss is observed at 220 kV Bhakra Dam S/S.	427	0	120	N	N	N
5	GI-2	i)400/220 KV 315 MVA ICT 1 AT AJMER(RS) ii)400/220 KV 315 MVA ICT 3 AT AJMER(RS) iii)400 KV AJMER-BHILWARA (RS) CKT-2	Rajathan	RVPNL	8-Feb-25	20:54	i)400/220KV Ajmer substation has One and half breaker scheme in 400KV and Double Main & Transfer bus scheme in 220KV system. ii)During antecedent condition, 400 KV AJMER-BHILWARA (RS) CKT-2 was carrying 23MW, 400/220 KV 315 MVA ICT 1 & 3 were loaded 214 and 223MW each. iii)As reported, at 20:54 hrs, B-N fault occurred on 400 KV AJMER-BHILWARA (RS) CKT-2. As per DR/ EL, two B-N faults occurred. The fault was detected in Z1 and the fault current was 3.88KA. iv)However, at the same time 400/220KV ICT-1 and ICT-3 tripped. As per DR/EL of ICT-1 & 3, 50-N (High Set Overcurrent Earth fault) and 67-N (Directional Overcurrent earth Fault) operated respectively. v)SLDC Rajasthan confirmed that due to low current relay settings of 50N and 67N on ICT 1 & 3, both elements picked up the current earth fault of 400 KV AJMER-BHILWARA (RS) CKT-2 and tripped. RVPNL has confirmed that relay settings have been corrected. vi)During this event, approx 170 MW of demand change was observed in Rajasthan control area. (As per SCADA).	0	170	280	Y(d)	N (Partial detail received)	Y(d)
6	GI-2	i)400 KV MURADNAGAR_2-MATHURA (UP) CKT-1 ii)400KV BUS 1 AT MURADNAGAR_2(UP)	Uttar Pradesh	UPPTCL	9-Feb-25	00:54	i)400/220/132kV Muradnagar-New(UP) has one and half breaker scheme at 400kV level and double main and transfer bus scheme at 220kV level. ii)As reported, at 00:54 hrs, 400kV Muradnagar_2-Mathura (UP) Ckt tripped on Y-N phase to earth fault with fault current of 4.084kA from Muradnagar_2 end and fault clearing time of 287 ms; zone-1 distance protection operated (as per DR at Muradnagar_2 end) and DT received at Mathura end (as reported). iii)Due to delayed opening of CB at Muradnagar_2 end of 400kV Muradnagar_2-Mathura (UP) Ckt, LBB protection operated and both main and tie CBs at Muradnagar_2 end of 400 KV MURADNAGAR_2-MATHURA (UP) CKT-1 opened and all the 400kV CBs connected at 400KV Bus-1 of Muradnagar_2 tripped. DT received at remote ends (as reported). iv)As per PMU at Muradnagar1(UP), Y-N phase to earth fault with delayed fault clearing time of 280ms is observed. v)As per SCADA, no change in demand is observed in UP control area.	0	0	280	Y	Y	Y
7	GI-1	i)220 KV Hissar(BB)-Hissar IA(HV) (BBMB) Ckt-2 ii)220 KV Hissar(BB)-Hissar IA(HV) (HVPNL) Ckt-1 iii)220 KV Hissar(PG)-Hissar IA(HV) (PG) Ckt-2 iv)220 KV Hissar(PG)-Hissar IA(HV) (PG) Ckt-1 v)220 KV Hissar IA(HV) Bus-2	Haryana	BBMB, PGCIL and HVPNL	11-Feb-25	21:13	i)220KV Hissar Sub-station has double main bus system. ii)During antecedent condition, 220 KV Hissar IA(HV) – Narwana Ckt, 220 KV Hissar IA – Masudpur Ckt 1 & 2, 220/132 KV 100 MVA ICT-1 & 160 MVA ICT-2 were connected to 220kV Bus-1 at Hissar IA(HV) and 220 KV Hissar(PG)-Hissar IA(HV) (PG) Ckt-1 & 2 and 220 KV Hissar(BB)-Hissar IA(HV) (HVPNL) Ckt-1 & 2 were connected to 220kV Bus-2 at Hissar IA(HV). 220 kV Bus Coupler at Hissar IA(HV) was in open condition. iii)As reported, at 21:13hrs, Y- phase CT of 220 KV Hissar(BB)-Hissar IA(HV) (BBMB) Ckt-2 got damaged with a heavy blast which caused collateral damage to 220kV L&E isolator. iv)220 KV Hissar(BB)-Hissar IA(HV) (BBMB) Ckt-2 tripped on distance protection operation (zone-1, fault distance=0 km from Hissa IA end; zone-2, fault current=5.18kA and fault distance-=4.06km from Hissar(BB)). v)During the same time, busbar protection operated at 220kV Bus-2 at Hissar IA(HV) end and all the elements connected to Bus-2 tripped. vi)As per PMU at Hissar(PG), Y-N phase to earth fault with fault clearing time of 80ms is observed. vii)As per SCADA, change in demand of approx. 112MW was observed in Haryana control area.	0	112	80	Y	N (Partial details received)	Y
8	GD-1	i)220 KV Panipat(BB)-Narela(DV) (BBMB) Ckt-1, 2 & 3 ii)220 KV Mandola(PG)-Narela(DV) (DTL) Ckt-1 & 2 iii)220 KV Delhi RR(BB)-Narela(DV) (BBMB) Ckt-1& 2 iv)220 KV DSIDC Bawana-Narela(DV) (DTL) Ckt-1 & 2 v)220 KV Bus-1 and Bus-2 at Narela(DTL) vi)220/66kV 100 MVA ICT-1, 2 and 3 at Narela(DTL)	Delhi	DTL, BBMB and PGCIL	15-Feb-25	09:35	i)220kV Narela(DTL) S/s has double main bus arrangement at 220kV level. 220/132kV 50MVA ICT-1 and 100MVA ICT-2 at Narela(BB) are connected on the same extended Bus of 220KV Narela(DTL). ii)During antecedent condition, 220 KV Panipat(BB)-Narela(DV) (BBMB) Ckt-1, 2 & 3, 220 KV Delhi RR(BB)-Narela(DV) (BBMB) Ckt-1& 2 and 220/66kV 100 MVA ICT-1, 2 and 3 at Narela(DTL) were connected to 220kV Bus-1 at Narela(DTL) and 220 KV Mandola(PG)-Narela(DV) (DTL) Ckt-1 & 2, 220 KV DSIDC Bawana-Narela(DV) (DTL) Ckt-1 & 2 and 220/132kV 50MVA ICT-1 and 100MVA ICT-2 at Narela(BB) were connected to 220kV Bus-2 at Narela(DTL). 220kV Bus coupler at Narela(DTL) was in OFF position. iii)As reported, sequence of event is as follows: a.At 09:19 hrs, both CBs at 220kV side of 220/132kV 50MVA and 100 MVA ICT-1 & 2 at Narela(BB) were manually opened for 220kV Bus isolator changeover operation from Bus-2 to Bus-1. b.At 09:30 hrs, 89A Bus-1 Isolator of 220/132kV 100MVA ICT-2 at Narela(BB) was closed. c.Since the 220kV Bus Coupler CB at Narela(DTL) was already in OFF position since 08.09hrs, the said closure of 89A isolator with 89B isolator already closed of 220/132kV 100MVA ICT-2 at Narela(BB) resulted in a position to function as a 220kV Bus Coupler. d.At 09:34 hrs, 89B Bus-2 isolator of 220/132kV 100MVA ICT-2 at Narela(BB) was tried to open, but the operation could not be done completely due to 89B isolator struck in between and heavy arcing flames evolved due to said ON load 89B isolator opening operation. e.It caused ionization in air around 89B isolator of 220/132kV 100MVA ICT-2 at Narela(BB) and R-B-N double phase to earth fault occurred due to arcing via isolator structure. f.This resulted in zone-2 busbar protection operation (as confirmed from DR) and all the elements connected to 220kV Bus-2 at Narela(DTL) tripped. g.Since 89B isolator opening operation was not complete, fault continued to be fed from Bus-1 through 220 KV Panipat(BB)-Narela(DV) (BBMB) Ckt-1, 2 & 3 via 89A Bus-1 Isolator of 220/132kV 100MVA ICT-2 at Narela(BB) to faulty 89B Bus-2 isolator. This led to zone-1 busbar protection operation (as confirmed from DR) and all the elements connected to 220kV Bus-1 at Narela(DTL) also tripped and complete blackout occurred at 220kV Narela(DTL). iv)As per DR at Narela(DTL), Zone 2 Bus Bar protection operated followed Zone 1 Bus Bar protection operation. v)As per PMU at Maharani Bagh(PG), Y-N phase to earth fault followed by Y-B phase to phase fault with fault clearing time of 120msec and 80msec is observed. vi)As per SCADA, change in demand of approx. 58 MW is observed in Delhi control area. However, SLDC-Delhi has reported load loss of approx. 194 MW.	0	194	120	N (Partial details received)	N (Partial details received)	N (Partial details received)
9	GD-1	i)220/33 kV 150 MVA ICT 1 at AHEJ4L PSS 4 HB_FGRAH_FBTL (AHEJ4L) ii)220/33 kV 150 MVA ICT 2 at AHEJ4L PSS 4 HB_FGRAH_FBTL (AHEJ4L)	Rajathan	AHEJ4L	15-Feb-25	06:55	i)Generation of 220kV AHEJ4L(IP) station evacuates through 220 KV Adani Renew Park SL_FGARH_FBTL (AREPRL)-AHEJ4L PSS 4 HB_FGRAH_FBTL (AHEJ4L) (AREPRL) Ckt. During antecedent condition, at 220kV AHEJ4L PSS 4 station was generating approx. 228 MW (as per PMU). ii)As reported, at 06:55hrs, transient B-N phase to earth fault occurred at 220 KV Adani Renew Park SL_FGARH_FBTL (AREPRL)-AHEJ4L PSS 4 HB_FGRAH_FBTL (AHEJ4L) (AREPRL) Ckt and line successfully auto-reclosed. iii)However, during the same time, 220/33 kV 150 MVA ICT 1 and 2 at AHEJ4L PSS 4 HB_FGRAH_FBTL (AHEJ4L) tripped (Exact reason and nature of protection operated yet to be shared) which led to complete blackout out of 220kV AHEJ4L PSS4(IP) S/s. iv)As per PMU at Fatehgarh_2(PG), B-N phase to earth fault (voltage dipped upto 0.87 p.u.) is observed with fault clearing time of 120ms. v)As per PMU at AWPS2(IP), wind generation loss of approx. 228 MW is observed at AHEJ4L PSS4(IP).	228	0	120	Y	N	N
10	GD-1	i) 220 KV Bikaner_2 (PBTSL)-JGCPL_SL_BIK2_PG (Juniper_NEPL) Ckt	Rajathan	JGCPL	16-Feb-25	14:27	i)Generation of 220kV JGCPL(IP) station evacuates through 220 KV Bikaner_2 (PBTSL)-JGCPL_SL_BIK2_PG (Juniper_NEPL) Ckt. During antecedent condition, 220kV JGCPL(IP) station was generating approx. 90 MW. ii)As reported, at 14:27hrs, 220 KV Bikaner_2 (PBTSL)-JGCPL_SL_BIK2_PG (Juniper_NEPL) Ckt tripped on B-N phase to earth fault due to differential protection operation (exact reason and location of fault yet to be shared). iii)Due to tripping of 220 KV Bikaner_2 (PBTSL)-JGCPL_SL_BIK2_PG (Juniper_NEPL) Ckt, JGCPL(IP) S/s lost its connectivity from grid and blackout occurred at 220kV JGCPL(IP)S/s. iv)As per PMU at Bikaner_2(PG), B-N phase to earth fault (voltage dipped upto 0.75 p.u.) with unsuccessful A/R is observed with fault clearing time of 80ms. After the fault clearance voltage increased upto 1.04 p.u. v)As per PMU, solar generation loss of approx. 90 MW is observed respectively at JGCPL(IP). vi)As per SCADA, dip in ISTS total solar generation of approx. 211 MW is observed.	90	0	80	N (Partial details received)	N (Partial details received)	N (Partial details received)
11	GI-1	i) 220/132kV 160MVA ICT -1 at Delina (JK) ii) 220/132kV 160MVA ICT -2 at Delina (JK) iii) 220/132kV 160MVA ICT -3 at Delina (JK)	J&K	PDD-JK	17-Feb-25	14:54	i)220/132kV Delina substation has Double main and transfer bus scheme. ii)During antecedent condition, 220kV Amargarh (INDIGRID) –Delina(JK) D/C was carrying 106 MW each and feeding Delina load. iii)As reported, at 14:54 hrs, 132KV Delina – Pattan line tripped due to broken jumper condition while returning the same line from shutdown (exact reason, nature and location of fault need to be shared). iv)During the same time, 220/132kV 160MVA ICT -1 at Delina(JK) tripped on earth fault (exact nature of protection operated need to be shared). v)Subsequently, this led to overloading of 220/132kV 160MVA ICT -2 & 3 at Delina(JK) and got tripped on over-current protection operation. vi)As per PMU at Amargarh (INDIGRID), R-Y-B 3 phase to earth fault with fault clearing time of 80 msec is observed. vii)As per SCADA, change in demand of approx. 210 MW is observed in J&K control area.	0	210	80	N	N	N

S.No.	Category of Grid Incident/ Disturbance	Name of Elements (Tripped/Manually opened)	Affected Area	Owner/ Agency	Outage		Event (As reported)	Loss of generation / loss of load during the Grid Disturbance		Fault Clearance time (in ms)	Compliance of Protection Protocol/Standard		
	(GI-I to GD-V)				Date	Time		Generation Loss(MW)	Load Loss (MW)		Flash Report Submission (Y/N)	DR/EL Submission (Y/N)	Detail Tripping Report Submission (Y/N)
12	GI-2	i) 400/220 KV 500 MVA ICT 1 at Moradabad(UP) ii) 220/132 KV 160 MVA ICT 2 at Moradabad-2(UP) iii) 220/132 KV 160 MVA ICT 3 at Moradabad-2(UP) iv) 220KV Moradabad-2 – Amroha (UP) Ckt v) 220KV Muradabad-2 – Sambhal (UP) Ckt	UP	UPPTCL	22-Feb-25	17:18	i)400/220kV Moradabad(UP) has double main and transfer bus scheme in both 400KV and 220KV system. 220/132KV Moradabad-2(UP) was connected to the same 220kV bus as that of 400/220kV Moradabad(UP). ii)During the antecedent condition, 400/220 KV 500 MVA ICT 1 at Moradabad(UP), 220/132 KV 160 MVA ICT 2 & ICT 3 at Moradabad-2(UP) were carrying 79MW, 20MW and 20MW. 400/220 KV 240 MVA ICT 3 at Moradabad(UP) was under shutdown. iii)As reported, at 17:18hrs, fault occurred in 132KV Moradabad-2 – Golbari Ckt (Exact reason, nature and location of fault yet to be shared). iv)Since the fault wasn't cleared at 132KV level, it propagated further into 220KV system which led to Bus Bar protection operation at both 220kV Bus-1 & 2 at Moradabad-2(UP) and all the elements connected to both the 220kV buses at Moradabad-2(UP) tripped. v)As per PMU at Bareilly(PG), Y-B phase to phase fault is observed with fault clearing time of 80ms. vi)As per SCADA, change in demand of approx. 106MW is observed in UP control area.	0	106	80	N	N	N
13	GD-1	i) 400 KV Bikaner(PG)-AzurePSS43 SL_BKN_PG(Azure) (Azure) Ckt ii) 400 KV AzurePSS43 SL_BKN_PG-AzureRS43 SL_BKN_PG (Azure) Ckt iii) 400/33 kV 150 MVA ICT 1 at AzurePSS43 SL_BKN_PG(Azure) iv) 400/33 kV 150 MVA ICT 2 at AzurePSS43 SL_BKN_PG(Azure) v) 400/33 kV 150 MVA ICT 1 at AzureRS43 SL_BKN_PG(Azure) vi) 400/33 kV 150 MVA ICT 2 at AzureRS43 SL_BKN_PG(Azure)	Rajasthan	Azure43(IP) & PGCIL	23-Feb-25	18:05	i)Generation of 400kV Azure43(IP) (both PSS and RS) evacuates through 400 KV Bikaner(PG)-AzurePSS43 SL_BKN_PG(Azure) (Azure) Ckt. ii)During antecedent condition, Azure43(IP) was generating approx. 29 MW (as per PMU). iii)As reported, at 18:05hrs, 400 KV Bikaner(PG)-AzurePSS43 SL_BKN_PG(Azure) (Azure) Ckt tripped due to DT received at Bikaner(PG) end. (Exact reason yet to be shared) iv)During the same time, 400 KV AzurePSS43 SL_BKN_PG-AzureRS43 SL_BKN_PG (Azure) Ckt, 400/33 kV 150 MVA ICT 1 & 2 at AzurePSS43 SL_BKN_PG(Azure) and 400/33 kV 150 MVA ICT 1 & 2 at AzureRS43 SL_BKN_PG(Azure) also tripped due to loss of evacuation path (Exact reason and nature of protection operated yet to be shared). This led to complete blackout of 400kV Azure43(IP) S/s. v)As per PMU at Bikaner(PG), no fault was observed in the system. vi)As per PMU at Azure43(IP), solar generation loss of approx. 29 MW is observed.	29	0	NA	N	N	N
14	GD-1	i)400 KV GURGAON(PG)-DAULATABAD(HV) (HV) CKT-2 ii)400/220 KV 315 MVA ICT 1 AT DAULATABAD(HV) iii)400/220 KV 315 MVA ICT 2 AT DAULATABAD(HV) iv)400/220 KV 315 MVA ICT 3 AT DAULATABAD(HV) v)400/220 KV 315 MVA ICT 4 AT DAULATABAD(HV) vi)400 KV JHAJJAR(APCL)-DAULATABAD(HV) (HV) CKT-2 vii)400 KV JHAJJAR(APCL)-DAULATABAD(HV) (HV) CKT-1 viii)400 KV GURGAON(PG)-DAULATABAD(HV) (HV) CKT-1	Haryana	Haryana, PGCIL &APCL	27-Feb-25	08:11	i)400kV Daulatabad(HV) has one and half breaker bus scheme in 400KV and double main bus transfer for 220KV system. ii)During the antecedent condition, 400 KV GURGAON(PG)-DAULATABAD(HV) (HV) CKT-1&2, 400 KV JHAJJAR(APCL)-DAULATABAD(HV) (HV) CKT-1 & 2 and 400kV DAULTABAD-DHANONDA CKT-1&2 were carrying 228MW (each circuit), 353MW (each circuit) and 138MW (each circuit) respectively. iii)As reported, at 08:11hrs, B-N fault occurred on 400 KV GURGAON(PG)-DAULATABAD(HV) (HV) CKT-2. On this fault, line successfully autoreclosed from Gurgaon(PG) end but CB at Daulatabad end failed to open. During patrolling, flag was found wrapped on phase conductor at tower location no. 54-55. iv)During inspection, both trip coils of 400 KV GURGAON(PG)-DAULATABAD(HV) (HV) CKT-2 at Daulatabad end were found burnt. v)As CB at Daulatabad end failed to open, LBB of Gurgaon Bay should have operated. However, LBB protection also didn't operate. During the inspection, it was found that bus bar relay was in error mode. vi)Further, all the 400kV lines i.e., 400 KV GURGAON(PG)-DAULATABAD(HV) (HV) CKT-1, 400 KV JHAJJAR(APCL)-DAULATABAD(HV) (HV) CKT-1 & 2 and 400kV DAULTABAD-DHANONDA CKT-1&2 tripped on operation of distance protection in Z-2. vii)Further, 400/220kV 315MVA ICT-1,2,3&4 at Daulatabad(HR) tripped on operation of non-directional O/C E/F protection operation and fault got cleared. Tripping of all the elements led to blackout of the 400/220kV Daulatabad(HR) S/s. viii)As per PMU at Gurgaon(PG), B-N phase to earth fault with delayed clearance of ~1080 msec is observed. ix)As per SCADA, change in demand of approx. 414MW is observed in Haryana control area. x)As reported, fault trip coils have been replaced and bus bar relay was reboot. Bus bar relay is working properly however it has been kept under observation and feedback has been given to relay OEM for review of relay.	0	414	1080	N (Partial details received)	N (Partial details received)	N (Partial details received)
15	GD-1	220 KV Bikaner_2 (PBTSL)-JGCPL_SL_BIK2_PG (Juniper_NEPL) Ckt-1	Rajasthan	PBTSL & Juniper	28-Feb-25	11:52	i)Generation of 220kV JUNIPER GREEN COSMIC Pvt Ltd (JGCPL)(IP) evacuates through 220 KV Bikaner_2 (PBTSL)-JGCPL_SL_BIK2_PG (Juniper_NEPL) Ckt-1 and 220KV JGCPL_SL_BIK2_PG (Juniper_NEPL) – MSEEPL Ckt. ii)During antecedent condition, 220 KV Bikaner_2 (PBTSL)-JGCPL_SL_BIK2_PG (Juniper_NEPL) Ckt-1 was carrying approx. 140 MW of load (as per PMU) and 220KV JGCPL_SL_BIK2_PG (Juniper_NEPL) – MSEEPL Ckt was in shutdown. iii)As reported, at 11:52hrs, 220 KV Bikaner_2 (PBTSL)-JGCPL_SL_BIK2_PG (Juniper_NEPL) Ckt tripped due to relay malfunctioning. (Exact reason yet to be shared) iv)Due to tripping of the line, complete RE generation of JGCPL(IP) got affected due to loss of evacuation path. v)As per PMU at JGCPL(IP), no fault was observed in the system. vi)As per PMU at JGCPL(IP), solar generation loss of approx. 140 MW is observed.	140	0	NA	N (Partial details received)	N (Partial details received)	N (Partial details received)
16	GI-1	i)220 KV Amargarh (INDIGRID)-Ziankote(JK) (PDD JK) Ckt-1 ii)220 KV Amargarh (INDIGRID)-Ziankote(JK) (PDD JK) Ckt-2	J&K	INDIGRID & JKPDD	28-Feb-25	03:30	i)220/132kV Ziankote S/s have two bus at 220kV side i.e., main bus & reserve bus. 220kV Amargarh-Ziankote ckt-1&2 are on the same tower (D/C tower) and line length is ~21.4km. ii)During antecedent condition, 220kV Amargarh (INDIGRID) –Ziankote (JK) ckt-2 was carrying 139 MW and feeding Ziankote load. 220kV Amargarh (INDIGRID) –Ziankote (JK) ckt-1 was already tripped at 02:40 hrs on R-N fault. iii)As reported, at 03:30 hrs 220 KV Amargarh (INDIGRID)-Ziankote(JK) (PDD JK) Ckt-2 also tripped on R-N fault (details of cause of fault and location of fault yet to be received). iv)As per PMU at Amargarh (INDIGRID), no fault was observed in system. v)As per SCADA, change in demand of approx. 126 MW is observed in J&K control area.	0	126	NA	N	N	N

Sr No	Element Name	Outage Date	Outage Time	Reason
1	220 KV RAPS_A(NP)-Sakatpura(RS) (RS) Ckt-1	06-Feb-25	01:29	Transient fault. As per PMU, B-N phase to earth fault occurred, no auto-reclosing is observed (delayed fault clearance 1560 ms).
		07-Feb-25	02:17	Phase to earth fault R-N. As per PMU, B-N phase to earth fault occurred, no auto-reclosing is observed.
		07-Feb-25	03:25	Transient fault. As per PMU, B-N phase to earth fault occurred, no auto-reclosing is observed.
		08-Feb-25	05:19	Phase to earth fault R-N. As per PMU, R-B fault is observed.
		11-Feb-25	04:13	Phase to earth fault R-N. As per PMU, B-N phase to earth fault occurred, no auto-reclosing is observed.
		13-Feb-25	04:14	Phase to earth fault R-N. As per PMU, B-N phase to earth fault occurred, no auto-reclosing is observed.
		21-Feb-25	05:07	Phase to Ground Fault R-N. As per PMU, R-B fault is observed.
		27-Feb-25	02:48	Transient fault. As per PMU, R-B fault is observed.
2	220 KV Debari(RS)-RAPS_A(NP) (RS) Ckt-1	04-Feb-25	04:05	Phase to earth fault R-N. As per PMU, R-N phase to earth fault occurred, no auto-reclosing is observed.
		17-Feb-25	02:05	Phase to earth fault Y-N. As per PMU, R-N phase to earth fault occurred, no auto-reclosing is observed (delayed fault clearance 880 ms).
		25-Feb-25	00:29	Transient fault. As per PMU, R-Y fault is observed.
3	220 KV Panipat(BB)-Narela(DV) (BBMB) Ckt-3	15-Feb-25	09:35	Bus Bar Protection Operated. As per PMU, Y-N fault followed by Y-B fault is observed.
		20-Feb-25	21:13	Phase to Phase Fault R-Y. As per PMU, B-N fault followed by R-B fault is observed.
		28-Feb-25	11:16	Phase to Phase Fault Y-B. As per PMU, R-Y fault is observed.

Annexure-B.IV

Grid Event to be discussed in 58th PSC Meeting

S.No.	Category of Grid Incident/ Disturbance (GI-I to GD-V)	Name of Elements (Tripped/Manually opened)	Affected Area	Owner/ Agency	Outage		Event (As reported)	Loss of generation / loss of load during the Grid Disturbance		Fault Clearance time (in ms)	Points of discussion
					Date	Time		Generation Loss(MW)	Load Loss (MW)		
1	GI-2	i)400 KV Parbati_2(NH)-Sainj(HP) (PKTCL) Ckt-1 ii)400 KV Parbati_3(NH)-Parbati Pooling Banala(PG) (PKTCL) Ckt-1 iii)400 KV Parbati_3(NH)-Sainj(HP) (PKTCL) Ckt-1	Himachal Pradesh	NHPC, PGCIL & PKTCL	3-Feb-25	19:35	i)Total generated power of Sainj HEP(HP), Parbati_2(NH) and parbati_3(NH) evacuates through 400 kV Parbati_2(NH)- Banala(PG) (PKTCL) Ckt and 400 kV Parbati_3(NH)- Banala(PG) (PKTCL) Ckt via 400 KV Parbati_2(NH)-Sainj(HP) (PKTCL) Ckt and 400 KV Parbati_3(NH)-Sainj(HP) (PKTCL) Ckt. ii)During antecedent condition, only 50MW Unit-1 at Sainj HEP(HP) was running (generating approx. ~45MW) and 130MW Unit-4 at Parbati-3 HEP(NHPC) (generating approx. ~132MW). iii)As reported, at 06:31 hrs, R-N fault occurred on 400 KV Parbati_3(NH)-Sainj (HP) (PKTCL) Ckt-1 in Z-2 and fault current was 2.92 KA from Sainj end. iv)As per DR of the line of Parabati3 end, fault was sensed in Z-1 and tripping command to R-ph CB was given. However, R-ph pole failed to open leading to operation of LBB protection. This led to tripping of all the elements connected to the Bus (Tripping details awaited) and complete blackout of 400KV Parbati-3 s/stn occurred. v)As per PMU, R-N fault with delayed clearance of fault in 400msec is observed. vi)During this event, Approx 132 MW hydro generation loss is observed at Parbati-III and 45 MW hydro generation loss is observed at Sainj. (As per SCADA).	177	0	440	Details analysis of the event and remedial action taken details.
2	GD-1	i)220 KV Panipat(BB)-Narela(DV) (BBMB) Ckt-1, 2 & 3 ii)220 KV Mandola(PG)-Narela(DV) (DTL) Ckt-1 & 2 iii)220 KV Delhi RR(BB)-Narela(DV) (BBMB) Ckt-1& 2 iv)220 KV DSIDC Bawana-Narela(DV) (DTL) Ckt-1 & 2 v)220 kV Bus-1 and Bus-2 at Narela(DTL) vi)220/66kV 100 MVA ICT-1, 2 and 3 at Narela(DTL)	Delhi	DTL, BBMB and PGCIL	15-Feb-25	09:35	i)220kV Narela(DTL) S/s has double main bus arrangement at 220kV level. 220/132kV 50MVA ICT-1 and 100MVA ICT-2 at Narela(BB) are connected on the same extended Bus of 220KV Narela(DTL). ii)During antecedent condition, 220 kV Panipat(BB)-Narela(DV) (BBMB) Ckt-1, 2 & 3, 220 KV Delhi RR(BB)-Narela(DV) (BBMB) Ckt-1& 2 and 220/66kV 100 MVA ICT-1, 2 and 3 at Narela(DTL) were connected to 220kV Bus-1 at Narela(DTL) and 220 KV Mandola(PG)-Narela(DV) (DTL) Ckt-1 & 2, 220 KV DSIDC Bawana-Narela(DV) (DTL) Ckt-1 & 2 and 220/132kV 50MVA ICT-1 and 100MVA ICT-2 at Narela(BB) were connected to 220kV Bus-2 at Narela(DTL). 220kV Bus coupler at Narela(DTL) was in OFF position. iii)As reported, sequence of event is as follows: a.At 09:19 hrs, both CBs at 220kV side of 220/132kV 50MVA and 100 MVA ICT-1 & 2 at Narela(BB) were manually opened for 220kV Bus Isolator changeover operation from Bus-2 to Bus-1. b.At 09:30 hrs, 89A Bus-1 Isolator of 220/132kV 100MVA ICT-2 at Narela(BB) was closed. c.Since the 220kV Bus Coupler CB at Narela(DTL) was already in OFF position since 08.09hrs, the said closure of 89A isolator with 89B Isolator already closed of 220/132kV 100MVA ICT-2 at Narela(BB) resulted in a position to function as a 220kV Bus Coupler. d.At 09:34 hrs, 89B Bus-2 isolator of 220/132kV 100MVA ICT-2 at Narela(BB) was tried to open, but the operation could not be done completely due to 89B isolator struck in between and heavy arcing flames evolved due to said ON load 89B isolator opening operation. e.It caused ionization in air around 89B isolator of 220/132kV 100MVA ICT-2 at Narela(BB) and R-B-N double phase to earth fault occurred due to arcing via isolator structure. f.This resulted in zone-2 busbar protection operation (as confirmed from DR) and all the elements connected to 220kV Bus-2 at Narela(DTL) tripped. g.Since 89B isolator opening operation was not complete, fault continued to be fed from Bus-1 through 220 KV Panipat(BB)-Narela(DV) (BBMB) Ckt-1, 2 & 3 via 89A Bus-1 Isolator of 220/132kV 100MVA ICT-2 at Narela(BB) to faulty 89B Bus-2 Isolator. This led to zone-1 busbar protection operation (as confirmed from DR) and all the elements connected to 220kV Bus-1 at Narela(DTL) also tripped and complete blackout occurred at 220kV Narela(DTL). iv)As per DR at Narela(DTL), Zone 2 Bus Bar protection operated followed Zone 1 Bus Bar protection operation. v)As per PMU at Maharani Bagh(PG), Y-N phase to earth fault followed by Y-B phase to phase fault with fault clearing time of 120msec and 80msec is observed. vi)As per SCADA, change in demand of approx. 58 MW is observed in Delhi control area. However, SLDC-Delhi has reported load loss of approx. 194 MW.	0	194	120	Details analysis of the event and remedial action taken details.
3	GI-1	i) 220/132kV 160MVA ICT -1 at Delina (JK) ii) 220/132kV 160MVA ICT -2 at Delina (JK) iii) 220/132kV 160MVA ICT -3 at Delina (JK)	J&K	PDD-JK	17-Feb-25	14:54	i)220/132kV Delina substation has Double main and transfer bus scheme. ii)During antecedent condition, 220kV Amargarh (INDIGRID) –Delina(JK) D/C was carrying 106 MW each and feeding Delina load. iii)As reported, at 14:54 hrs, 132KV Delina – Pattan line tripped due to broken jumper condition while returning the same line from shutdown (exact reason, nature and location of fault need to be shared). iv)During the same time, 220/132kV 160MVA ICT -1 at Delina(JK) tripped on earth fault (exact nature of protection operated need to be shared). v)Subsequently, this led to overloading of 220/132kV 160MVA ICT -2 & 3 at Delina(JK) and got tripped on over-current protection operation. vi)As per PMU at Amargarh (INDIGRID), R-Y-B 3 phase to earth fault with fault clearing time of 80 msec is observed. vii)As per SCADA, change in demand of approx. 210 MW is observed in J&K control area.	0	210	80	Details analysis of the event and remedial action taken details.
4	GI-2	i) 400/220 KV 500 MVA ICT 1 at Moradabad(UP) ii) 220/132 KV 160 MVA ICT 2 at Moradabad-2(UP) iii) 220/132 KV 160 MVA ICT 3 at Moradabad-2(UP) iv) 220KV Moradabad-2 – Amroha (UP) Ckt v) 220KV Muradabad-2 – Sambhal (UP) Ckt	UP	UPPTCL	22-Feb-25	17:18	i)400/220kV Moradabad(UP) has double main and transfer bus scheme in both 400KV and 220KV system. 220/132KV Moradabad-2(UP) was connected to the same 220kV bus as that of 400/220kV Moradabad(UP). ii)During the antecedent condition, 400/220 KV 500 MVA ICT 1 at Moradabad(UP), 220/132 KV 160 MVA ICT 2 & ICT 3 at Moradabad-2(UP) were carrying 79MW, 20MW and 20MW. 400/220 KV 240 MVA ICT 3 at Moradabad(UP) was under shutdown. iii)As reported, at 17:18hrs, fault occurred in 132KV Moradabad-2 – Golbari Ckt (Exact reason, nature and location of fault yet to be shared). iv)Since the fault wasn't cleared at 132KV level, it propagated further into 220KV system which led to Bus Bar protection operation at both 220kV Bus-1 & 2 at Moradabad-2(UP) and all the elements connected to both the 220kV buses at Moradabad-2(UP) tripped. v)As per PMU at Bareilly(PG), Y-B phase to phase fault is observed with fault clearing time of 80ms. vi)As per SCADA, change in demand of approx. 106MW is observed in UP control area.	0	106	80	Details analysis of the event and remedial action taken details.
5	GD-1	i)400 KV GURGAON(PG)-DAULATABAD(HV) (HV) CKT-2 ii)400/220 KV 315 MVA ICT 1 AT DAULATABAD(HV) iii)400/220 KV 315 MVA ICT 2 AT DAULATABAD(HV) iv)400/220 KV 315 MVA ICT 3 AT DAULATABAD(HV) v)400/220 KV 315 MVA ICT 4 AT DAULATABAD(HV) vi)400 KV JHAJJAR(APCL)-DAULATABAD(HV) (HV) CKT-2 vii)400 KV JHAJJAR(APCL)-DAULATABAD(HV) (HV) CKT-1 viii)400 KV GURGAON(PG)-DAULATABAD(HV) (HV) CKT-1	Haryana	Haryana, PGCIL &APCL	27-Feb-25	08:11	i)400kV Daulatabad(HV) has one and half breaker bus scheme in 400KV and double main bus transfer for 220KV system. ii)During the antecedent condition, 400 KV GURGAON(PG)-DAULATABAD(HV) (HV) CKT-1&2, 400 KV JHAJJAR(APCL)-DAULATABAD(HV) (HV) CKT-1 & 2 and 400kV DAULTABAD-DHANONDA CKT-1&2 were carrying 228MW (each circuit), 353MW (each circuit) and 138MW (each circuit) respectively. iii)As reported, at 08:11hrs, B-N fault occurred on 400 KV GURGAON(PG)-DAULATABAD(HV) (HV) CKT-2. On this fault, line successfully autoreclosed from Gurgaon(PG) end but CB at Daulatabad end failed to open. During patrolling, flag was found wrapped on phase conductor at tower location no. 54-55. iv)During inspection, both trip coils of 400 KV GURGAON(PG)-DAULATABAD(HV) (HV) CKT-2 at Daulatabad end were found burnt. v)As CB at Daulatabad end failed to open, LBB of Gurgaon Bay should have operated. However, LBB protection also didn't operate. During the inspection, it was found that bus bar relay was in error mode. vi)Further, all the 400kV lines i.e., 400 KV GURGAON(PG)-DAULATABAD(HV) (HV) CKT-1, 400 KV JHAJJAR(APCL)-DAULATABAD(HV) (HV) CKT-1 & 2 and 400kV DAULTABAD-DHANONDA CKT-1&2 tripped on operation of distance protection in Z-2. vii)Further, 400/220kV 315MVA ICT-1,2,3&4 at Daulatabad(HR) tripped on operation of non-directional O/C E/F protection operation and fault got cleared. Tripping of all the elements led to blackout of the 400/220kV Daulatabad(HR) S/s. viii)As per PMU at Gurgaon(PG), B-N phase to earth fault with delayed clearance of ~1080 msec is observed. ix)As per SCADA, change in demand of approx. 414MW is observed in Haryana control area. x)As reported, fault trip coils have been replaced and bus bar relay was reboot. Bus bar relay is working properly however it has been kept under observation and feedback has been given to relay OEM for review of relay.	0	414	1080	Details analysis of the event and remedial action taken details.
6	GI-1	i)220 KV Amargarh (INDIGRID)-Ziankote(JK) (PDD JK) Ckt-1 ii)220 KV Amargarh (INDIGRID)-Ziankote(JK) (PDD JK) Ckt-2	J&K	INDIGRID & JKPDD	28-Feb-25	03:30	i)220/132kV Ziankote S/s have two bus at 220kV side i.e., main bus & reserve bus. 220kV Amargarh-Ziankote ckt-1&2 are on the same tower (D/C tower) and line length is ~21.4km. ii)During antecedent condition, 220kV Amargarh (INDIGRID) –Ziankote (JK) ckt-2 was carrying 139 MW and feeding Ziankote load. 220kV Amargarh (INDIGRID) –Ziankote (JK) ckt-1 was already tripped at 02:40 hrs on R-N fault. iii)As reported, at 03:30 hrs 220 KV Amargarh (INDIGRID)-Ziankote(JK) (PDD JK) Ckt-2 also tripped on R-N fault (details of cause of fault and location of fault yet to be received). iv)As per PMU at Amargarh (INDIGRID), no fault was observed in system. v)As per SCADA, change in demand of approx. 126 MW is observed in J&K control area.	0	126	NA	Details analysis of the event and remedial action taken details.

Utilities are requested to prepare detailed analysis report and present the event details during 58th PSC meeting of following grid events (Events involving more than one utility may be jointly prepared and presented):

S. No.	Name of Transmission Element Tripped	Owner/ Utility	Outage		Load Loss/ Gen. Loss	Brief Reason (As reported)	Category as per CEA Grid standards	# Fault Clearance Time (>100 ms for 400 kV and 160 ms for 220 kV)	*FIR Furnished (YES/NO)	DR/EL provided in 24 hrs (YES/NO)	Other Protection Issues and Non Compliance (inference from PMU, utility details)	Suggestive measures	Remarks
			Date	Time									
1	400 KV Gorakhpur(PG)-Muzaffarpur(PG) (POWERLINK) Ckt-2	POWERLINK	08-Feb-25	03:11	Nil	Phase to Phase Fault R-B	NA	80 msec	Yes (After 24 hours)	Yes (After 24 hours)	NA		As per PMU (Agra PG), R-B phase to phase fault occurred. As per DR & EL, fault current was Ir=~4.75kA & Ib=~4.71kA and fault distance was 123.5 km (47.5%) from Gorakhpur end; fault sensed in zone-1 at Gorakhpur end.
2	220 KV Auraiya(NT)-Mehgaon(MP) (MPSEB) Ckt-1	POWERGRID	12-Feb-25	00:48	Nil	Phase to earth fault R-N	NA	80 msec	No	Partially Yes (After 24 hours)	NA	FIR/EL needs to be shared	As per PMU (Unnao UP), R-N phase to earth fault occurred (time sync issue observed), no auto-reclosing is observed. As per DR, fault current was Ir=~2.86kA from Auraiya end; fault sensed in zone-1 at Auraiya end.
3	220 KV Auraiya(NT)-Malanpur(MP) (PG) Ckt-1	POWERGRID	19-Feb-25	02:21	Nil	Phase to earth fault R-N	NA	80 msec	No	Partially Yes (After 24 hours)	NA	FIR/EL needs to be shared	As per PMU (Unnao UP), R-N phase to earth fault occurred, no auto-reclosing is observed. As per DR, fault current was Ir=~5.43kA from Auraiya end; fault sensed in zone-1 at Auraiya end.
4	765 KV Orai-Jabalpur (PG) Ckt-2	POWERGRID	28-Feb-25	15:33	Nil	DT received at Jabalpur end.	NA	NA	Yes (After 24 hours)	Yes (After 24 hours)	NA		As per PMU (Mainpuri PG). fluctuation in voltage (unequal voltage in all the three phases) is observed. As reported, line tripped from Jabalpur end only and nothing abnormal is found at Orai end.

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

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

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

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

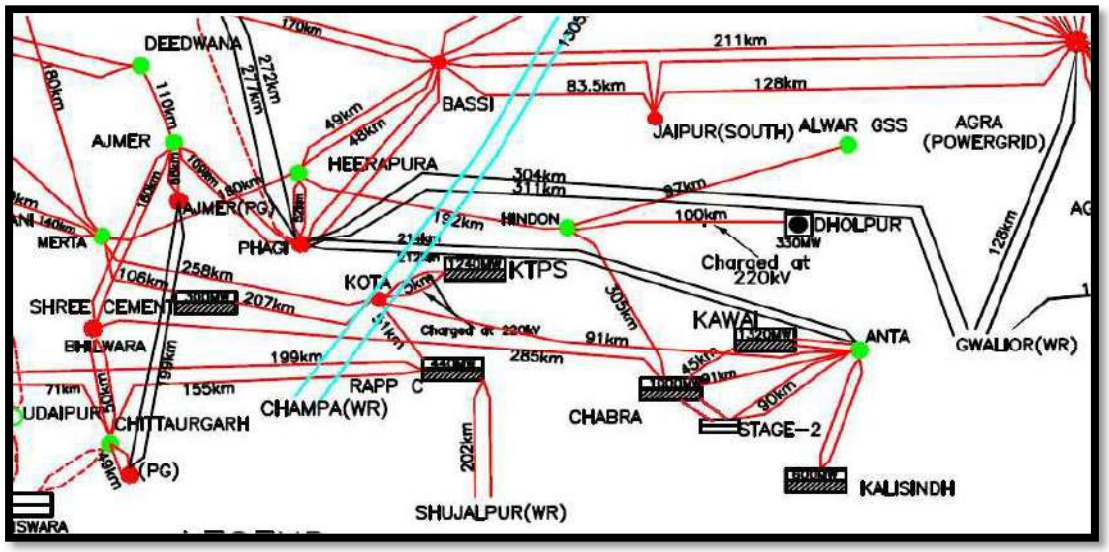
Reporting of Violation of Regulation for various issues for above tripping

1	Fault Clearance time(>100ms for 400kV and >160ms for 220kV)	1. CEA Grid Standard-3.e 2. CEA Transmission Planning Criteria
2	DR/EL Not provided in 24hrs	1. IEGC 37.2(c) 2. CEA Grid Standard 15.3
3	FIR Not Furnished	1. IEGC 37.2(b) 2. CEA Grid Standard 12.2 (Applicable for SLDC, ALDC only)
4	Protection System Mal/Non Operation	1. CEA Technical Standard of Electrical Plants and Electric Lines: 43.4.A 2. CEA (Technical Standards for connectivity to the Grid) Regulation, 2007: Schedule Part 1. (6.1, 6.2, 6.3)
5	A/R non operation	1. CEA Technical Standard of Electrical Plants and Electric Lines: 43.4.C 2. CEA Technical Planning Criteria

Status of Mock Test of SPS in NR

Sr. No.	Scheme Name	Control Area	Mock testing conducted before 2024-25	Date of SPS Mock testing conducted during 2024-25	Remarks
1	SPS for WR-NR corridor - 765kV Agra-Gwalior D/C	POWERGRID	12-03-2024	Not conducted for FY 24-25	Schedule yet to be received
2	SPS for contingency due to tripping of HVDC Mundra-Mahendergarh	ADANI			Review is being done at OCC/PSC forum
3	SPS for high capacity 400 kV Muzaffarpur-Gorakhpur D/C Inter-regional tie-line related contingency	POWERGRID			Schedule yet to be received
4	SPS for 1500 MW HVDC Rihand-Dadri Bipole related contingency	POWERGRID		Partially conducted on 19-03-2025	Conducted for FY 24-25
5	System Protection Scheme (SPS) for HVDC Balia-Bhiwadi Bipole	POWERGRID		Not conducted for FY 24-25	Schedule yet to be received
6	SPS for contingency due to tripping of multiple lines at Dadri(NTPC)	NTPC			Review is being done at OCC/PSC forum
7	SPS for reliable evacuation of power from NJPS, Rampur, Sawra Kuddu, Baspa Sorang and Karcham Wangtoo HEP	SJVN/HPPTCL/JSW		conducted on 19-12-2024	Conducted for FY 24-25
8	SPS for Reliable Evacuation of Ropar Generation	Punjab		Not conducted for FY 24-25	Schedule yet to be received
9	SPS for Reliable Evacuation of Rosa Generation	Uttar Pradesh	07-05-2022	conducted on 20-04-2024	Conducted for FY 24-25
10	SPS for contingency due to tripping of evacuating lines from Narora Atomic Power Station	NAPS		Not conducted for FY 24-25	Schedule yet to be received
11	SPS for evacuation of Kawai TPS, Kalisindh TPS generation complex	Rajasthan		Partially conducted on 14-03-2025	Conducted for FY 24-25
12	SPS for evacuation of Anpara Generation Complex	Uttar Pradesh	06-07-2020	conducted on 08.10.2024 (unit-7) and 19.10.2024 (unit-6)	Conducted for FY 24-25
13	SPS for evacuation of Lalitpur TPS Generation	Uttar Pradesh	14-07-2018	conducted on 21.05.2024	
14	SPS for Reliable Evacuation of Bara TPS Generation	Uttar Pradesh		conducted on 20.11.2024	
15	SPS for Lahal Generation	Himachal Pradesh	08-07-2020	Not conducted for FY 24-25	Schedule yet to be received
16	SPS for Transformers at Ballabhgarh (PG) substation	POWERGRID			Not in service, Review is being done in OCC/PSC forum
17	SPS for Transformers at Maharanibagh (PG) substation	POWERGRID			
18	SPS for Transformers at Mandola (PG) substation	POWERGRID			
19	SPS for Transformers at Bamnauli (DTL) Substation	Delhi			Review is being done at OCC/PSC forum
20	SPS for Transformers at Moradabad (UPPTCL) Substation	Uttar Pradesh		conducted on 20-04-2024	Conducted for FY 24-25
21	SPS for Transformers at Muradnagar (UPPTCL) Substation	Uttar Pradesh	07-02-2023	conducted on 20-04-2024	
22	SPS for Transformers at Muzaffarnagar(UPPTCL) Substation	Uttar Pradesh		conducted on 20-04-2024	
23	SPS for Transformers at Greater Noida(UPPTCL) Substation	Uttar Pradesh		SPS Unhealthy	SPS not required now, as informed by Transmission wing; Hence SPS may be reviewed
24	SPS for Transformers at Agra (UPPTCL) Substation	Uttar Pradesh	12-07-2023	Not conducted for FY 24-25	Schedule yet to be received
25	SPS for Transformers at 400kV Sarojininagar (UPPTCL) Substation	Uttar Pradesh	17-05-2023		
26	SPS for Transformers at 220kV Sarojininagar (UPPTCL) Substation	Uttar Pradesh	18-05-2022		
27	SPS for Transformers at 400kV Unnao (UPPTCL) Substation	Uttar Pradesh	19-05-2023	SPS Unhealthy	SPS need to be made healthy; Expected functioning before 20.03.2025, as informed by Transmission wing.
28	SPS for Transformers at 220kV Unnao (UPPTCL) Substation	Uttar Pradesh		Not conducted for FY 24-25	Schedule yet to be received
29	SPS for Transformers at 400kV Sultanpur (UPPTCL) Substation	Uttar Pradesh		SPS Unhealthy	SPS not required now, as informed by Transmission wing; Hence SPS may be reviewed
30	SPS for Transformers at 400kV Bareilly (UPPTCL) Substation	Uttar Pradesh		Not conducted for FY 24-25	Schedule yet to be received
31	SPS for Transformers at 400kV Azamgarh (UPPTCL) Substation	Uttar Pradesh	14-05-2023	conducted on 06-05-2024	Conducted for FY 24-25
32	SPS for Transformers at 400kV Mau (UPPTCL) Substation	Uttar Pradesh	17-01-2019	conducted on 27-04-2024	
33	SPS for Transformers at 400kV Gorakhpur (UPPTCL) Substation	Uttar Pradesh	14-05-2023	conducted on 27-04-2024	
34	SPS for Transformers at 400kV Sarnath (UPPTCL) Substation	Uttar Pradesh	19-05-2023	conducted on 23-05-2024	
35	SPS for Transformer at 400kV Rajpura (PSTCL) Substation	Punjab		conducted on 31-01-2025	
36	SPS for Transformers at 400kV Mundka (DTL) Substation	Delhi	19-06-2023	conducted*	
37	SPS for Transformers at 400kV Deepalpur (JKTPL) Substation	Haryana		Not conducted for FY 24-25	Schedule yet to be received
38	SPS for Transformers at 400kV Ajmer (RVPN) Substation	Rajasthan		conducted on 10.09.2024	Conducted for FY 24-25
39	SPS for Transformers at 400kV Merta (RVPN) Substation	Rajasthan		conducted on 12.09.2024	
40	SPS for Transformers at 400kV Chittorgarh (RVPN) Substation	Rajasthan		conducted on 31.08.2024 & 05.09.2024	
41	SPS for Transformers at 400kV Jodhpur (RVPN) Substation	Rajasthan		conducted on 24.09.2024	
42	SPS for Transformers at 400kV Bhadla (RVPN) Substation	Rajasthan		conducted on 27.09.2024	
43	SPS for Transformers at 400kV Ratangarh (RVPN) Substation	Rajasthan		Conducted on 20.09.2024	
44	SPS for Transformers at 400kV Nehtaur(WUPPTCL) Substation	Uttar Pradesh	05-07-2022	Conducted on 11.01.2025	
45	SPS for Transformers at Obra TPS	Uttar Pradesh		conducted on 20-05-2024	
46	SPS for Transformers at 400KV Kashipur (PTCUL) substation	Uttarakhand	03-09-2023	Septemeber 2024	
47	SPS for Transformers at 400KV Fatehgarh Solar Park (AREPRL)	ADANI		Not conducted for FY 24-25	Schedule yet to be received
48	SPS to relive transmission congestion in RE complex (Bhadla2)	POWERGRID			
49	SPS for Transformers at 400kV Bikaner (RVPN) Substation	Rajasthan		conducted on 26.09.2024	Conducted for FY 24-25
50	SPS for Transformers at 400kV Bawana (DTL) Substation	Delhi	06-09-2023		Schedule yet to be received
51	SPS for Transformers at 400kV Bhilwara (RVPN) Substation	Rajasthan		conducted on 09.07.2024 & 10.07.2024	Conducted for FY 24-25
52	SPS for Transformers at 400kV Hinduan (RVPN) Substation	Rajasthan		conducted on 26.09.2024	
53	SPS for Transformers at 400kV Suratgarh (RVPN) Substation	Rajasthan		Not conducted for FY 24-25	Schedule yet to be received
54	SPS for Transformers at 400kV Babai(RS) Substation	Rajasthan			Schedule yet to be received. Implemented in 2024-25
55	SPS for Transformers at 400kV Allahabad(PG) Substation	Uttar Pradesh			
56	SPS for Transformers at 400kV Jaunpur(UP) Substation	Uttar Pradesh			

Northern Region SPS Details

Item	Information Explanation
Reporting Party	RRVPNL/ NRLDC
Scheme's Name	Chhabra/ Chhabra Super Critical/ Kawai/ Kalisindh Complex
Classification	SPS related to Safe evacuation of generation
Reference No.	SPS/NR/GEN/05
Operating Procedure	Refer to Chapter 14, Point No 14.5 of Operating Procedure of NR
Design Objectives	SPS (Inter trip) arrangement has been implemented for taking care of any N-1/ N-1-1/ N-2 contingency in the Chhabra/ Chhabra SCTPS/ Kawai/ Kalisindh complex.
Operation	Automatic back down / tripping of generation in the complex
Modelling	

Chhabra TPS

1. **Case-1:** N-1 contingency of 400kV Chhabra-Hindaun or Chhabra-Bhilwara

   Action-1: No backing down required

2. **Case-2:** N-1-1/N-2 contingency of 400kV Chhabra-Kawai & Chhabra-Hindaun or N-1-1/N-2 contingency of 400kV Chhabra-Kawai & Chhabra-Bhilwara

   Action: No backing down required.

3. **Case-3:** N-1-1/N-2 contingency of 400kV Chhabra-Hindaun & Chhabra-Bhilwara

   Action: Trip two units at Chhabra TPS.

Northern Region SPS Details

Item	Information Explanation
	Chhabra SCTPS 1. **Case-1:** N-1 contingency of Chhabra SCTPS-Anta 1 & 2 *Action-1: No backing down required* . 2. **Case-2:** N-1-1/ N-2 contingency of Chhabra SCTPS-Anta 1 & 2 *Action: No backing down required* **Kalisindh TPS** 1. **Case-1:** N-1-1/ N-2 contingency of Kalisindh-Anta 1 & 2 *Action-1: Tripping of both units at Kalisindh* . **Chhabra and Kawai TPS complex** 1. **Case-1:** N-1 contingency of 400kV Kawai-Anta ckt 1 & 2 *Action-1: No backing down required* . 2. **Case-2:** N-1-1/ N-2 contingency of 400kV Kawai-Anta ckt 1 & 2 *Action: Trip one unit of Kawai TPS* **Chhabra, Kawai and Kalisindh TPS Complex** 1. **Case-1:** N-1-1/N-2 of 765/400 kV Anta ICTs *Action-1: Trip one unit of 660 MW at Chhabra SCTPS to limit the flow on the remaining ICT with in safe range* . 2. **Case-2**: N-1 of Anta-Phagi 1 & 2 *Action: No action required* 3. **Case-3:** N-1-1/ N-2 of Anta-Phagi 1 & 2 *Action: One unit each at Kawai, Chhabra, Kalisindh and Chhabra SCTPS shall be tripped through SPS.*

Northern Region SPS Details

Item	Information Explanation
	Kawai TPS . 1. **Case-1:** Line Loading on Kawai-Chhabra line more than 850 MW but less than 900 MW *Action: Back down of 240 MW at Kawai* 2. **Case-2:** Line Loading on Kawai-Chhabra line more than 900 MW *Action: Tripping of one selected unit at Kawai* With the loss of generation of about 2100 MW in the complex in case C.3, equivalent load shedding shall take place in Rajasthan state control area to avoid overloading of WR-NR corridor as well as to avoid over drawal by Rajasthan. However, considering logistics etc, approx 750 MW automatic load shedding in Rajasthan Control area would be required and rest could be manual (almost similar or slightly higher impact as tripping of one unit of 660 MW). RRVPNL was requested to identify the feeders for 750 MW and dovetail the Automatic Load shedding with logic of the SPS given above. RRRVPNL shall endeavour to implement the automatic load shedding within four months. It was agreed that till the time automatic load shedding is operational, manual load shedding shall be done by SLDCs through a pre-agreed procedure with Discoms to keep Rajasthan area load-generation in balance after tripping of the generation. In other cases of contingencies, where backing down and unit tripping is carried out (though to less extent compared to case C.3), appropriate manual load shedding shall be got done by Rajasthan SLDC to keep load generation balance. For implementation of Automatic load shedding scheme target date provided by Rajasthan is 28.02.2018
Original In-Service Year/ Approved date	Approved on 06-01-2016 during special meeting at NRPC, In Service (26-07-2016)
Recent Assessment Group	RRVPNL/ APL/ NRLDC/ NRPC
Recent Assessment Date	11-11-2019 (Revised SPS approved) and has been implemented in the field.

Annexure-B.VIII

Fw: Mundra-Mohindergarh HVDC , SPS-NR defect resolutions

Deepak Kumar

Tue 04-Feb-25 17:04

To:Sugata Bhattacharya (सुगाता भट्टाचार्या) <sugata@grid-india.in>;

1 attachments (23 KB)

Revised Schedule for Site Visit.xlsx;

From: Sumeet Sharma <Sumeet.Sharma@adani.com>
Sent: Monday, February 3, 2025 6:58 PM
To: aen.com; m.alwar@rvpn.co.in; aen.mpt&s.rtg@rvpn.co.in; aen.comm.ratangarh@rvpn.co.in; aen.subsldc.bhl@rvpn.co.in; xen.mpts.bhl@rvpn.co.in; aen.prot.mertacity@RVPN.CO.IN; aen.comm.merta@RVPN.CO.IN; nainwal@powergrid.in; vinaykumargupta@powergrid.in; ravindra_kumar@powergrid.in; smahajan1999@powergrid.in; rkagrawal83@powergrid.in; dharmendrameena@powergrid.in; vineet@powergrid.in; bhakalramjash@powergrid.in; dhanonda400kv@gmail.com; sse220kvlulaahir@hvpn.org.in; sse220kvrwr@hvpn.org.in; sse132kvdadri@hvpn.org.in; ae-220kvg1-mgg@pstcl.org; sse-pm-lalton@pstcl.org; sse-pm-mlrk@pstcl.org; eeetdshamli@upptcl.org; ee400mrd2@upptcl.org; aeprotection@upsldc.org; ase-sldcop@pstcl.org; bl.gujar@dtl.gov.in; ce.ld@rvpn.co.in; ce-sldc; dtldata@yahoo.co.in; dtlscheduling@gmail.com; eesldccontrol@upsldc.org; ldrvpnl@rvpn.co.in; ldshutdown@gmail.com; ldshutdown@rvpn.co.in; paritosh.joshi@dtl.gov.in; pccont@bbmb.nic.in; pc-sldcop@pstcl.org; rajbir-walia79@yahoo.com; rtamc.nr1@powergrid.in; pankaj.jha@powergrid.in; neerajk@powergrid.in; se.mpts.udr@rvpn.co.in; se.prot.engg@rvpn.co.in; se.sold@rvpn.co.in; sera@upsldc.org; sesc@upsldc.org; sesldcop@hvpn.org; se-sldcop; setncmrt@upptcl.org; sldcdata@gmail.com; sldcharyanacr@gmail.com; sldcmintoroad@gmail.com; system.uppcl@gmail.com; xenemtcbhpp2@bbmb.nic.in; xenmpccggn@hvpn.org; xenplgss@hvpn.org
Cc: NRLDC SO 2; Somara Lakra (सोमारा लाकरा); Mahavir Prasad Singh (महावीर प्रसाद सिंह); Deepak Kumar; Sunil Kumar Raval; Namandeep Matta; Kali Charan Sahu; RAVINDRA ATALE; Nihar Raj; Milan Popat; Abhishek Kukreja; Naman Vyas; Abhishek Kumar Singh
Subject: Mundra-Mohindergarh HVDC , SPS-NR defect resolutions

Dear Sirs,

This refers to the matter discussed during recent Protection subcommittee (PSC) meetings with regards to the requirement of rectifications of SPS-NR implemented for Mundra-Mohindergarh HVDC transmission. We have awarded the service to M/s commtel for survey and restoration of possible elements installed at the locations.

Please note that Engineers from M/s Commtel shall be visiting your stations as per the attached schedule and necessary coordination shall be done by Mr. Abhishek Singh (Station -in charge) of Mohindergarh HVDC station (AESL-GD). He can be contacted at Mobile: 9671306831.

We request your kind permission and necessary support in carrying out the observations/possible restorations of the installations at your respective stations.

Thank you.

Regards,

Sumeet Sharma
Head- Automation, Communications , OT-Cyber & Technology
Adani Energy Solutions Limited.(Grid Division)
Mob +91 90990 05648 | sumeet.sharma@adani.com | www.adani.com
KP Epitome|10th Floor South Wing | SG Highway |Ahmedabad-382421| Gujarat

Project : To check Sytem healthiness anc configuration of system installed Under M/s Adani

S. No	Site name	Region	Site visit
1	laltokalan	Punjab	03.02.2025
2	Gobidngarh		04.02.2025
3	Malerkotla		05.02.2025
4	Mandula	UP	06.02.2025
5	Bamnauli	DTL	07.02.2025
6	Ratangarh	Rajasthan	06.02.2025
7	Bhilwara		07.02.2025
8	Merta		07.02.2025
9	Alwar		08.02.2025
10	PG Bhiwani	Haryana	10.02.2025
11	BBMB bhiwani		10.02.2025
12	Hissar		11.02.2025
13	Dadri		11.02.2025
14	Bahadurgah		12.02.2025
15	Dhanoda		12.02.2025
16	Shamli	UP	12.02.2025

RE: Mock testing of SPS of 500kV HVDC Mundra-Mahindergarh link

Thu 8/29/2024 7:29 PM

To:NRLDC SO 2 <nrldcso2@grid-india.in>; CPCC1 <rtamc.nr1@powergrid.in>;

Cc:seo-nrpc <seo-nrpc@nic.in>; Somara Lakra (सोमारा लाकरा) <somara.lakra@grid-india.in>; Mahavir Prasad Singh (महावीर प्रसाद सिंह) <mahavir@grid-india.in>; Arunkumar P <Arunkumar.P@adani.com>; Sugata Bhattacharya (सुगाता भट्टाचार्या) <sugata@grid-india.in>; Deepak Kumar <deepak.kr@grid-india.in>; AMIT SHARMA <amsharma@grid-india.in>; Bikas Kumar Jha (बिकास कुमार झा) <bikaskjha@grid-india.in>; Manas Ranjan Chand (मानस रंजन चंद) <manas@grid-india.in>; Aman Gautam (अमन गौतम) <amangautam@grid-india.in>; Gnanaguru . <Gnanaguru.1@adani.com>; Sumeet Sharma <Sumeet.Sharma@adani.com>; Naman Vyas <Namany.Vyas@adani.com>; Milan Popat <Milan.Popat@adani.com>; Nihar Raj <nihar.raj@adani.com>; Abhishek Kukreja <Abhishek.Kukreja@adani.com>;

5 attachments (9 MB)

Counter (2).jpg; Counter.jpg; TPS (2).jpg; TPS.jpg; 220KV Alwar ss.jpg;

Dear Sir,

Please find the attached Photos. on 28-08-2024, a representative from M/s. Commtel Networks visited the Mahendragarh site and confirmed the healthiness of the SDH and TPS, along with their associated cards.

All SPS System equipment are functioning properly. The 15 TPS installed in the remote substation.

The details and status of TPS and Counter at Mahendragarh End.

S.No	TPS	TPS Status	Counter	Counter Status
1	PG Hissar	ON	17	OKAY
2	Bhiwani	ON	17	OKAY
3	Dadari	ON	17	OKAY
4	Alwar	ON	-	OFF
5	Bhilwara	ON	12	OKAY
6	Merta	ON	14	OKAY
7	Ratangarh	ON	-	OFF
8	Gobinugarg	ON	-	OFF
9	Malerkotla	ON	-	OFF
10	Laton Kalan	ON	6	OKAY
11	Mandula	ON	12	OKAY
12	Bamnauli	ON	-	OFF
13	Shamli	ON	-	OFF
14	Bahadurgarh	ON	10	OKAY

15	Dhanonda	ON	-	OFF

There alarms on the system are due to the following reasons.

1. Equipment Failure/ card failure/ power failure at Remote Sites.
2. Cable connectivity break between the remote System and cable coming from Field.
3. E1 connectivity outage at remote Sites.

Our team, with support from Commtel Networks, visited the nearest TPS installed at the 220/132 kV Alwar Substation to check its healthiness. However, during the inspection, the panel was found to be de-energized, necessitating an end-to-end test. (Photo Attached) Similarly, each substation needs to be ensured the healthiness of the TPS by respective Substation owner.

We request you to please confirm the healthiness of the Sr no 1 and 2 .

Thanks and Regards,

Kalicharan Sahu
(O&M) HVDC & EHV Substations,
Adani Energy Solutions Limited
| ±500kV HVDC Mahendragarh Terminal Sub Station I
Village-Kheri- Aghiyar, Taluka- Kanina, Mahendragarh 123 029, Haryana, India
Mob +91 9764006167| Off +91 1285 277326

From: NRLDC SO 2 <nrldcso2@grid-india.in>
Sent: Tuesday, August 27, 2024 10:07 AM
To: SLDC Punjab <se-sldcprojects@pstcl.org>; PC PSTCL SLDC PUNJAB <pcpstcl@gmail.com>; Haryana <sldcharyanacr@gmail.com>; Delhi <sldcmintoroad@gmail.com>; UP <sera@upsldc.org>; Rajasthan <SE.LDRVPNL@RVPN.CO.IN>; ce.ld@rvpn.co.in; CPCC1 <rtamc.nr1@powergrid.in>; neerajk@powergrid.in; setncmrt@upptcl.org; bharatlalgujar@gmail.com; akashdeep3433786@gmail.com; xenemtcbhpp2@bbmb.nic.in; PC Control Room <pccont@bbmb.nic.in>; se.prot.engg@rvpn.co.in; Arunkumar P <Arunkumar.P@adani.com>; Kali Charan Sahu <Kalicharan.Sahu@adani.com>; rajbir-walia79@yahoo.com; ase-sldcop@pstcl.org; sesldcop@hvpn.org.in; cepso@upsldc.org; se-sldcop <se-sldcop@pstcl.org>; SICHVDC Controlroom <SICHVDC.Controlroom@adani.com>
Cc: seo-nrpc <seo-nrpc@nic.in>; somara.lakra <somara.lakra@grid-india.in>; Mahavir Prasad Singh (महावीर प्रसाद सिंह) <mahavir@grid-india.in>; Sugata Bhattacharya (सुगाता भट्टाचार्या) <sugata@grid-india.in>; deepak.kr <deepak.kr@grid-india.in>; AMIT SHARMA <amsharma@grid-india.in>; bikaskjha <bikaskjha@grid-india.in>; Manas Ranjan Chand (मानस रंजन चंद) <manas@grid-india.in>; Aman Gautam (अमन गौतम) <amangautam@grid-india.in>
Subject: Re: Mock testing of SPS of 500kV HVDC Mundra-Mahindergarh link

Sir,

उत्तर प्रदेश राज्य भार प्रेषण केन्द्र लि०
यू०पी०एस०एल०डी०सी०परिसर, विभूति
खण्ड II,गोमती नगर, लखनऊ–226010
ई मेल : sera@upsldc.org

U.P. State Load Despatch Centre Ltd.
UPSLDC Complex, Vibhuti Khand II
Gomti Nagar, Lucknow- 226010
E-mail: sera@upsldc.org

No: - 2661 /SE(R&A)/EE-II/SPS Dated:- 07/08/ 2024

General Manager, NRLDC18-A,
SJSS Marg, Katwaria Sarai,
New Delhi – 110016

Subject- Regarding SPS of HVDC Mundra-Mahendargarh line

Kindly refer to SE (ETC) Muzaffarnagar letter no/062/E.T.C./MZN/400 kV S/S Shamli dated 05.05.2024. (copy enclosed) regarding feeder wise load of Shamli area. As per the letter, at present complete load relief (i.e. 300MW) may not be provided by 220 kV Shamli, so that alternatively feeder and load details of 400 kV Shamli has also been provided. Also it is informed that at present SPS system at 220 kV Shamli is not healthy which is being maintained by PGCIL.

It is therefore requested to kindly instruct the concerned to incorporate 132 kV feeders of 220 kV Shamli & 400 kV Shamli in SPS of HVDC Mundra-Mahendargarh line so that appropriated load relief may be provided from UP Control area and take necessary action regarding healthiness of SPS system

Sangeet

(Sangeeta)
Superintending Engineer (R&A)

No: - /SE(R&A)/EE-II/SPS Dated: - 2024

Copy forwarded to following via e-mail for kind information and necessary action:-

1. Director, UPSLDC, Vibhuti Khand – II, Gomti Nagar, Lucknow.
2. Director (Operation), UPPTCL, 11th Floor, Shakti Bhawan Extn., Lucknow.
3. Chief Engineer (PSO), Vibhuti Khand – II, Gomti Nagar, Lucknow.
4. Chief Engineer (Trans. West),PareshanBhawan, 130D, Hydel Colony, Victoria Park, Meerut 250001.
5. SE (Operations), 18 – A SJSS Marg, Katwaria Sarai, New Delhi, 110016.

(Sangeeta)
Superintending Engineer (R&A)

कार्यालय
अधीक्षण अभियन्ता
विद्युत पारेषण मण्डल
उ०प्र०पावर ट्रांसमिशन कारपोरेशन लि०
132 के०वी० भोपारोड उपकेन्द्र
मुजफ्फरनगर-251001

OFFICE OF THE
SUPERINTENDING ENGINEER
Electricity Transmission Circle
U.P. Power Transmission Corporation Ltd.
132 KV Bhopa Road Sub-station
Muzaffarnagar-251001

दूरभाष [0131-2608038
Ph.[0131-2608038
E-mail : seetcmzn@upptcl.org, seetcmzn@gmail.com

संख्या / No. 1062 /E.T.C./MZN/400 KV S/S Shamli दिनांक / DATED 05/08/24

Subject: - Regarding SPS of HVDC Mundra-Mahendargarh.

Superintending Engineer (R & A)
U.P State Load Despatch Centre Ltd.
UPSLDC Complex, Vibhuti Khand-II
Gomti Nagar, Lucknow.
Email. sera@upsldc.org

Please refer to your office letter no. 2187 dt. 01.07.2024, forwarded to this office by SE (T&C), Meerut vide endorsement no. 2237/CE(TW)/MT/SPS dt. 23.07.2024 vide which it has been requested to provide details of 132 KV feeders for planned relief to HVDC Mundra-Mahendargarh SPS.

In this reference, it is to apprise that following is the details of 132 KV feeders being fed from 220 KV Sub-Station Shamli.

S.No.	Name of feeder	Connected Load (MVA)	Maximum Load (MW)	Average Load (MW)
1	132 KV Lalukheri	63+63	72	47
2	132 KV Jhinjhana	63+40+40	80	52
3	132 KV Kairana-I/II	63+63	41	27
4	132 KV Jasala	63+40	58	38
	Total		251	164

1. Following Case wise Trippings of 132 KV Feeders at 220 KV Sub-Station, Shamli for tripping of HVDC Mundra-Mahendergarh Line may be used.

(A) In Maximum Load Condition:-

S. No.	State.L.S quantum	Name of feeding substation	Feeder/line/ equipment	MW	Case-1 50 MW	Case-2 100 MW	Case-3 200MW	Case-4 300 MW
1	Uttar Pradesh Case-1 =50 MW Case-2 =100 MW Case-3 =200 MW Case-4 300 MW	220 KV Subsatatio n, Shamli	132 KV Jasala	58	1	1	1	1
2			132 KV Kairana-I	20.5		1		1
3			132 KV Kairana-II	20.5	-	1		1
4			132 KV Lalukheri	72	-	-	1	1
5			132 KV Jinjhana	80	-		1	1
			Total Relief	251	58	99	210	251

(B) In Average Load Condition :-

S. No.	State.L.S quantum	Name of feeding substation	Feeder/line/ equipment	MW	Case-1 50 MW	Case-2 100 MW	Case-3 200MW	Case-4 300 MW
1	Uttar Pradesh Case-1 =50 MW Case-2 =100 MW Case-3 =200 MW Case-4 =300 MW	220 KV Subsatatio n, Shamli	132 KV Jasala	38	1		1	1
2			132 KV Kairana-I	13.5	1		1	1
3			132 KV Kairana-II	13.5	-		1	1
4			132 KV Lalukheri	47	-	1	1	1
5			132 KV Jinjhana	52	-	1	1	1
			Total Relief	164	51.5	99	164	164

Alternatively HVDC Mundra-Mahendargarh SPS may be shifted to 400 KV Sub-Station Shamli, details of 132 KV feeders from 400 KV Sub-Station Shamli with its Maximum and Average load is as follows :

S.No.	Name of feeder	Connected Load (MVA)	Maximum Load (MW)	Average Load (MW)
1	132 KV Budhana	63+40	82	53
2	132 KV Kharad	63+40	78	51
3	132 KV Jalalpur	40+40	41	27
4	132 KV Thanabhawan	63+63+40	74	48
5	132 KV Kaniyan	40+40	35	23
	Total		310	202

2. Following Case wise Trippings of 132 KV Feeders at 400 KV Sub-Station, Shamli for tripping of HVDC Mundra-Mahendergarh Line is hereby recommended

(A). In Maximum Load Condition :-

S. No.	State.L.S quantum	Name of feeding substation	Feeder/line/ equipment	MW	Case-1 50 MW	Case-2 100 MW	Case-3 200MW	Case-4 300 MW
1	Uttar Pradesh Case-1 =50 MW Case-2 =100 MW Case-3 =200 MW Case-4 =300 MW	400 KV Subsatatio n, Shamli	132 KV Budhana	82	-	-	1	1
2			132 KV Kharad	78	-	-	1	1
3			132 KV Jalalpur	41	1	-	1	1
4			132 KV Thanabhawan	74	-	1	-	1
5			132 KV Kaniyan	35	1	1	-	1
			Total Relief	310	76	109	201	310

(B). In Average Load Condition :-

S. No.	State.L.S quantum	Name of feeding substation	Feeder/line/ equipment	MW	Case-1 50 MW	Case-2 100 MW	Case-3 200MW	Case-4 300 MW
1	Uttar Pradesh Case-1 =50 MW Case-2 =100 MW Case-3 =200 MW Case-4 =300 MW	400 KV Subsatatio n, Shamli	132 KV Budhana	53	-	1	1	1
2			132 KV Kharad	51	1	1	1	1
3			132 KV Jalalpur	27	-	-	1	1
4			132 KV Thanabhawan	48	-	-	1	1
5			132 KV Kaniyan	23	-		1	1
			Total Relief	202	51	104	202	202

Submitted for information and necessary action

(Nikhil Kumar)
Superintending Engineer

संख्या / No. /E.T.C./MZN/ दिनांक / DATED

Copy forwarded to the following for information and necessary action :

1. Chief Engineer (TW) UPPTCL Meerut.
2. Superintending Engineer, Electricity (T&C) Circle, UPPTCL Meerut.
3. Executive Engineer Electricity Transmission Division, Shamli

(Nikhil Kumar)
Superintending Engineer

कार्यालय
अधीक्षण अभियन्ता
विद्युत परीक्षण एवं परिचालन मण्डल
उ0प्र0 पावर ट्रांसमिशन कारपोरेशन लि0
प्रथम तल पारेषण भवन, 130–डी, विक्टोरिया पार्क
मेरठ– 250 003
मोबाइल: 9412749817

OFFICE OF THE
SUPERINTENDING ENGINEER
Electricity Test & Commissioning Circle
U.P. POWER TRANSMISSION CORPORATION LTD.
1st Floor Pareshan Bhawan, 130-D, Victoria Park,
Meerut 250 003
Mobile: 9412749817

No. 82 / ETCC-MT / Dated- 30/05/24

Sub :- SPS related to HVDC Mundra-Mahendargarh.

Superintending Engineer (R&A) (By e-mail)
UPSLDC Vibhuti Khand ,
Gomti Nagar,
Lucknow.

In reference to the above cited subject, UPSLDC via email on 22.05.2024 informed that on 17.05.2024 at 16:20 hrs, Case-3 of SPS related to HVDC Mundra - Mahendergarh operated. As per action in case-3 operation of this line SPS, 200MW load relief at 220kV Shamli (UP) is desired. However, no load relief at 220kV Shamli was observed at given date and time. It is to bring in your notice that due to commissioning of 400kV Shamli S/s entire power flow scenario has been changed. Current situation is summarized as below.

At 220kV Shamli S/s feeders shown in the list	Planned load relief (MW)	Current situation
Thana Bhawan -1	25	The only line cateting Thana Bhawan has been made LILO at 132kV Jalalpur. Now Jalalpur is fed from 220kV Shamli S/s while load of Thana Bhawan is fed from 400kV Shamli S/s.
Thana Bhawan -2	25	
Jasala-1	25	Only one line exists.
Jasala-2	25	
Kharad-1	50	Only one line exists which is normally kept open at Kharad and load of Kharad is normally fed from 400kV Shamli S/s.
Kharad-2	50	
Baraut-1	150 (case-4)	No such line exist at 220kV Shamli S/s.
Baraut-2	150 (case-4)	

In view of the above facts, entire load relief strategy needs to be reviewed and redesigned for SPS. On 17.05.2024 at 16:20 hrs, no tripping observed at 220kV S/S Shamli as SPS system is unhealthy, which is being maintained by M/s PGCIL.

Hence it is requested to you to kindly coordinate with M/s PGCIL for modification of the scheme and rectification of the fault in SPS.

(Pramod Kumar Mishra)
Superintending Engineer

No. 82 /ETCC-MT/ Dated/– 30/05/24

Copy forwarded to the following for information & necessary action:-

1. Chief Engineer (TW), UPPTCL Victoria Park, Meerut.
2. Executive Engineer, Electricity Test & Commissioning Div., Muzaffarnagar.

(Pramod Kumar Mishra)
Superintending Engineer

SK/SENew/NewEngLetter01

Rajasthan Details

Revised updated feeder details (radial) along with expected average Load Relief

S.No.	Name of Sub- Station	Feeder name as per existing detail	Revised name of Existing Feeder /Line/Equipment	Average Load relief (MW)	Remark
1	220 kV GSS Alwar	132 kV GSS Mundawar	132 kV GSS Pinan	25	
		132 kv GSS Bansoor	132 kV GSS Telco	45	
		132 kV GSS Ramgarh	132 kV GSS Ramgarh	65	
		132 kV GSS Malakhera	132 kV GSS Malakhera	50	
		132 kV Alwar (LOCAL)	132 kV GSS Alwar (LOCAL)	120	
2	220 kV GSS Ratangarh	132 kV Sardar Sher			Generally Feed from 220 kV Halasar
3	220 kV GSSV Bhilwara	132 kV GSS Gangapur	132 kv GSS Karoi	15	
		132 kV GSS Danta	132 kV GSS Danta	30	
		132 kV GSS Devgarh	132 kV GSS Bankali	18	
		132 kV GSS Kareda			
4	400 kV GSS Merta	132 kV GSS Kuchera	132 kV GSS Dhawa	25	
		132 kV GSS Lamba	132 kV GSS Lamba jatan	55	
		132 kV GSS Gotan			

Email **Control Room CONTROL ROOM SLDC**

Re: Review of SPS installed for 500kV HVDC Mundra - Mahindergarh.

From : Executive Engineer TS Rewari <xentsrwr@hvpn.org.in> Thu, Aug 29, 2024 01:20 PM

Subject : Re: Review of SPS installed for 500kV HVDC Mundra - Mahindergarh.

To : Control Room CONTROL ROOM SLDC <controlroomsldc@hvpn.org.in>

Cc : SE TS GGN <setsggn@hvpn.org.in>, Executive Engineer Executive Engineer <xen400kvdhanoda@hvpn.org.in>, Substation Engineer <sse220kvlulaahir@hvpn.org.in>

In continuation of trailing email and discussion held today telephonically, it is gathered that desired load relief shall not get as load of 220 kV Lula Ahir shall be fed through 220 kV Dadri-Lula Ahir line being synchronized. Therefore, it is proposed that in the existing scheme SPS, the tripping of 220 kV D/C Lula Ahir line at 400 kV Dhanonda end may be removed and tripping of all incomers (2 no. 132 kV Incomers of 100 MVA 220/132 kV TFs and one no. 33 kV incomer of 100 MVA 220/33 kV TF) at 220 kV Lula Ahir substation may be added.

The maximum load (for FY 2023-24) on three no. 100 MVA TFs installed at 220 kV Lula Ahir is 53.46 MVA, 86.26 MVA and 87.02 MVA

The average load on three no. 100 MVA TFs installed at 220 kV Lula Ahir is 50 MVA, 70 MVA and 70 MVA

From: "Executive Engineer TS Rewari" <xentsrwr@hvpn.org.in>
To: "Control Room CONTROL ROOM SLDC" <controlroomsldc@hvpn.org.in>
Cc: "SE TS GGN" <setsggn@hvpn.org.in>, "Executive Engineer Executive Engineer" <xen400kvdhanoda@hvpn.org.in>, "Substation Engineer" <sse220kvnarnaul@hvpn.org.in>
Sent: Wednesday, August 28, 2024 12:46:13 PM
Subject: Re: Review of SPS installed for 500kV HVDC Mundra - Mahindergarh.

In reference of trailing email it is submitted that 220 kV Lula Ahir is connected with 400 kV Dhanonda through 220kV D/C line and with 220 kV Dadri through 220kV S/C line and with 220 kV Rewari with 220kV S/C line.
In general circuits of 400 kV Dhanonda and 220 kV Dadri runs in synchronization. The maximum load (for FY 2023-24) on three no. 100 MVA TFs installed at 220 kV Lula Ahir is 53.46 MVA, 86.26 MVA and 87.02 MVA. It is further added that in general 220 kV Dadri takes load from 220 kV Lula Ahir substation and thus act as sink.

In case of operation of SPS at 400 kV Dhanonda, the desired load relief as mentioned in trailing email (90+95 MW) can be achieved through existing scheme (by outage of three no. 100 MVA TFs and 220 kV Dadri (acting as sink)).

Regards
XEN/TS Division
HVPNL Rewari.

From: "Control Room CONTROL ROOM SLDC" <controlroomsldc@hvpn.org.in>
To: "Executive Engineer TS Rewari" <xentsrwr@hvpn.org.in>, "Executive Engineer TS Rohtak" <xentsrtk@hvpn.org.in>, "Executive Engineer Ts Bhiwani" <xentsbhw@hvpn.org.in>, "Executive Engineer Executive Engineer" <xen400kvdhanoda@hvpn.org.in>, xendhanonda@gmail.com
Cc: "Chief Engineer SO Commercial" <cesocomml@hvpn.org.in>, "Chief Engineer TS Panchkula" <cetspkl@hvpn.org.in>, "Chief Engineer TS Hisar" <cetshsr@hvpn.org.in>, "Superintending Engineer SLDC OP" <sesldcop@hvpn.org.in>, "SE TS Rohtak" <setsrtk@hvpn.org.in>, "SE TS GGN" <setsggn@hvpn.org.in>, "Superintending Engineer TS Hisar" <setshsr@hvpn.org.in>, "Superintending Engineer MP CC Dhulkote" <sempccdkt@hvpn.org.in>, "Superintending Engineer MP CC Delhi" <sempccdelhi@hvpn.org.in>, "Executive Engineer MP Rohtak" <xenmpccrtk@hvpn.org.in>, "XEN MP Hisar" <xenmpcchsr@hvpn.org.in>, "XEN MP CC" <xenmpccggn@hvpn.org.in>
Sent: Wednesday, August 21, 2024 11:57:59 AM
Subject: Review of SPS installed for 500kV HVDC Mundra - Mahindergarh.

Sir,

Please see the attachments.

--
Regards,
SCE (पाली प्रभारी अभियंता)/SLDC Control room,
HVPNL Panipat
Contact No- 9053090722,9053090721,0180-2664095

Fwd: Review of SPS installed for 500kV HVDC Mundra - Mahindergarh.

Control Room CONTROL ROOM SLDC <controlroomsldc@hvpn.org.in>

Fri 8/30/2024 12:44 PM

To:NRLDC SO 2 <nrldcso2@grid-india.in>; NRLDC SO-II <nrldcso2@gmail.com>; Deepak Kumar <deepak.kr@grid-india.in>;

Cc:Superintending Engineer SLDC OP <sesldcop@hvpn.org.in>;

2 attachments (209 KB)

Email SPS Rewari.pdf; Regarding SPS Bhiwani.pdf;

Sir,

In reference to the SPS installed for 500kV HVDC Munda - Mahindergarh link the information received from TS wing (copy attached) is as under:

1. At 400kV Dhanonda through Lula Ahir substation:- It is proposed that in the existing scheme SPS, the tripping of 220 kV D/C Lula Ahir line at 400 kV Dhanonda end may be removed and tripping of all incomers (2 no. 132 kV Incomers of 100 MVA 220/132 kV TFs and one no. 33 kV incomer of 100 MVA 220/33 kV TF) at 220 kV Lula Ahir substation may be added. The maximum load (for FY 2023-24) on three no. 100 MVA TFs installed at 220 kV Lula Ahir is 53.46 MVA, 86.26 MVA and 87.02 MVA. The average load on three no. 100 MVA TFs installed at 220 kV Lula Ahir is 50 MVA, 70 MVA and 70 MVA.

2. At 400/220kV Bhiwani BBMB: It is proposed that in the existing scheme SPS, the tripping of 220 kV Bapora (Bhiwani HVPNL) D/C line at Bhiwani BBMB end may be removed and tripping of all incomers (2 no. 132 kV Incomers of 100 MVA 220/132 kV T-1 & T-2 TFs) at 220 kV Bapora (Bhiwani HVPNL) substation may be added. The maximum load on two no. 100 MVA TFs installed at 220kV Bhiwani HVPNL is 80 MW and 85 MW respectively. The average load on two no. 100 MVA TFs installed at 220kV Bhiwani HVPNL is 70 MW and 70 MW respectively.

3. At 132kV Charkhi Dadri: It is proposed that in the existing scheme SPS, the tripping of 132kV Kalanaur line at Dadri BBMB end may be removed and tripping of 132kV Haluwas & 132kV Dadri old at Dadri BBMB may be added. The maximum load on 132kV Haluwas & 132kV Dadri old line is 45 MW and 50 MW respectively. The average load on 132kV Haluwas & 132kV Dadri old line is 40 MW and 40 MW respectively.

Rest information kept unchanged. It is also added here that the fiber connectivity is also available on all the above substations.
It is also pertinent to mention here that 700 MW load relief is expected from Haryana. Rest of the states have been allotted with a relative less amount of relief as compared to Haryana for 500kV HVDC Mundra - Mahendargarh link. The Haryana share from APL Mundra has also been reduced now. In view of the above, the expected load relief from the NR states is required to be reviewed accordingly. The same was also pointed out by this office during the online meeting held on dated 20.08.2024.

This is for information & further necessary action please.

From: "Executive Engineer TS Rewari" <xentsrwr@hvpn.org.in>
To: "Control Room CONTROL ROOM SLDC" <controlroomsldc@hvpn.org.in>
Cc: "SE TS GGN" <setsggn@hvpn.org.in>, "Executive Engineer Executive Engineer" <xen400kvdhanoda@hvpn.org.in>, "Substation Engineer" <sse220kvlulaahir@hvpn.org.in>
Sent: Thursday, August 29, 2024 1:20:08 PM
Subject: Re: Review of SPS installed for 500kV HVDC Mundra - Mahindergarh.

In continuation of trailing email and discussion held today telephonically, it is gathered that desired load relief shall not get as load of 220 kV Lula Ahir shall be fed through 220 kV Dadri-Lula Ahir line being synchronized. Therefore, it is proposed that in the existing scheme SPS, the tripping of 220 kV D/C Lula Ahir line at 400 kV Dhanonda end may be removed and tripping of all incomers (2 no. 132 kV Incomers of 100 MVA 220/132 kV TFs and one no. 33 kV incomer of 100 MVA 220/33 kV TF) at 220 kV Lula Ahir substation may be added.

The maximum load (for FY 2023-24) on three no. 100 MVA TFs installed at 220 kV Lula Ahir is 53.46 MVA, 86.26 MVA and 87.02 MVA
The average load on three no. 100 MVA TFs installed at 220 kV Lula Ahir is 50 MVA, 70 MVA and 70 MVA

From: "Executive Engineer TS Rewari" <xentsrwr@hvpn.org.in>
To: "Control Room CONTROL ROOM SLDC" <controlroomsldc@hvpn.org.in>
Cc: "SE TS GGN" <setsggn@hvpn.org.in>, "Executive Engineer Executive Engineer" <xen400kvdhanoda@hvpn.org.in>, "Substation Engineer" <sse220kvnarnaul@hvpn.org.in>
Sent: Wednesday, August 28, 2024 12:46:13 PM
Subject: Re: Review of SPS installed for 500kV HVDC Mundra - Mahindergarh.

In reference of trailing email it is submitted that 220 kV Lula Ahir is connected with 400 kV Dhanonda through 220kV D/C line and with 220 kV Dadri through 220kV S/C line and with 220 kV Rewari with 220kV S/C line.
In general circuits of 400 kV Dhanonda and 220 kV Dadri runs in synchronization. The maximum load (for FY 2023-24) on three no. 100 MVA TFs installed at 220 kV Lula Ahir is 53.46 MVA, 86.26 MVA and 87.02 MVA. It is further added that in general 220 kV Dadri takes load from 220 kV Lula Ahir substation and thus act as sink.

In case of operation of SPS at 400 kV Dhanonda, the desired load relief as mentioned in trailing email (90+95 MW) can be achieved through existing scheme (by outage of three no. 100 MVA TFs and 220 kV Dadri (acting as sink)).

Regards
XEN/TS Division
HVPNL Rewari.

From: "Control Room CONTROL ROOM SLDC" <controlroomsldc@hvpn.org.in>
To: "Executive Engineer TS Rewari" <xentsrwr@hvpn.org.in>, "Executive Engineer TS Rohtak" <xentsrtk@hvpn.org.in>, "Executive Engineer Ts Bhiwani" <xentsbhw@hvpn.org.in>, "Executive Engineer Executive Engineer" <xen400kvdhanoda@hvpn.org.in>, xendhanonda@gmail.com
Cc: "Chief Engineer SO Commercial" <cesocomml@hvpn.org.in>, "Chief Engineer TS Panchkula" <cetspkl@hvpn.org.in>, "Chief Engineer TS Hisar" <cetshsr@hvpn.org.in>, "Superintending Engineer SLDC OP" <sesldcop@hvpn.org.in>, "SE TS Rohtak" <setsrtk@hvpn.org.in>, "SE TS GGN" <setsggn@hvpn.org.in>, "Superintending Engineer TS Hisar" <setshsr@hvpn.org.in>, "Superintending Engineer MP CC Dhulkote" <sempccdkt@hvpn.org.in>, "Superintending Engineer MP CC Delhi" <sempccdelhi@hvpn.org.in>, "Executive Engineer MP Rohtak" <xenmpccrtk@hvpn.org.in>, "XEN MP Hisar" <xenmpcchsr@hvpn.org.in>, "XEN MP CC" <xenmpccggn@hvpn.org.in>
Sent: Wednesday, August 21, 2024 11:57:59 AM
Subject: Review of SPS installed for 500kV HVDC Mundra - Mahindergarh.

Sir,

Please see the attachments.

--
Regards,
SCE (पाली प्रभारी अभियंता)/SLDC Control room,
HVPNL Panipat
Contact No- 9053090722,9053090721,0180-2664095

--
Regards,
SCE (पाली प्रभारी अभियंता)/SLDC Control room,
HVPNL Panipat
Contact No- 9053090722,9053090721,0180-2664095

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HARYANA VIDYUT PRASARAN NIGAM LIMITED

Regd. Office: Shakti Bhawan, Plot No. C-4, Sector-6, Panchkula, 134109.
Corporate Identity Number: U40101HR1997SGC033683
Website: www.hvpn.org.in, E-mail - xentsbhw@hvpn.org.in
Phone No: 01664-242797(O)

To

The Executive Engineer,
LDPC, HVPNL,
Panipat.

Memo No.Ch-116/OMBE-7 Dated: 29.08.2024

Subject: SPS scheme at HVPNL substations for getting load relief due to tripping of 500Kv HVDC Mundra – Mahendargarh

Please refer to this O/Memo No. 108/OMBE-7 dated 27.08.2024 and O/Email dated 09.08.2024 on the subject cited matter.

In this continuation to above, the details of SPS under TS division, HVPNL, Bhiwani is as under:

S No.	Name of feeding S/Stn	Feeder/Line/Equipment	SPS Installed	Max. Load	Load Relief (Avg Load)	Remarks
1	220KV S/Stn Bhiwani	132KV IA Bhiwani Line	UFR	50MW	40 MW	SPS (UFR)Installed and healthy
2	220KV S/Stn Bhiwani	132KV Bhiwani Ckt 2	UFR	50MW	40 MW	SPS (UFR)Installed and healthy
3	220KV S/Stn Bhiwani	132KV Tosham	UFR	-	-	SPS (UFR) Installed and healthy but line is running on No load as 2nd source to 132KV Tosham
4	220KV S/Stn Bhiwani	132KV Incomer of Transformer 100MVA Transformer T2	-	85MW	70 MW	SPS may be provided for load relief as mentioned on subject above.
5	220KV S/Stn Bhiwani	132KV Incomer of 100MVA Transformer T1	-	80MW	70 MW	SPS may be provided for load relief as mentioned on subject above.
6	132kV substation Dadri-2	132kV Dadri-kalanaur ckt	Yes		Nil	SPS Installed and healthy but line is running on No load as 2nd source to 132KV Kalanaur
7	132kV substation Dadri-2	132kV Dadri-Makrani ckt	Yes		Nil	SPS Installed and healthy but line is running on No load as 2nd source to 132KV Makrani
8	132kV substation Dadri-2	132kV Dadri-Haluwas ckt	-	45MW	40MW	SPS may be provided for load relief as mentioned on subject above.
9	132kV substation Dadri-2	132kV Dadri-Dadri old	-	50MW	40MW	SPS may be provided for load relief as mentioned on subject above.

This is for kind information and necessary action please.

Executive Engineer,
Transmission System Division,
HVPNL, Bhiwani

CC to:

1. SE/TS Circle, HVPNL, Hisar for kind information, please.

Delhi Details

Re: Mock testing of SPS of 500kV HVDC Mundra-Mahindergarh link

SLDC, DELHI <sldcmintoroad@gmail.com>

Wed 8/28/2024 3:48 PM

To:NRLDC SO 2 <nrldcso2@grid-india.in>;

Cc:sinha.surendra <sinha.surendra@yahoo.com>; dgmsodelhisldc@gmail.com <dgmsodelhisldc@gmail.com>; Manager (T) SO <managersogd@gmail.com>;

In reference to trailing mail, the maximum load on 220kV feeders covered under SPS of 500kV HVDC Mundra-Mahindergarh link are as under:

S. No.	Name of the Element	MW
1	220 KV BAMNAULI-PAPANKALAN-I CKT.-I	120
2	220 KV BAMNAULI-PAPANKALAN-I CKT.-II	120
3	220 KV MANDAULA- GOPALPUR CKT.-I	212
4	220 KV MANDAULA- GOPALPUR CKT.-II	214

Regards,
SLDC Delhi

On Tue, Aug 27, 2024 at 10:07 AM NRLDC SO 2 <nrldcso2@grid-india.in> wrote:

> Sir,
>
> In reference of the trailing mail, it is to be mentioned that inputs have received from Rajasthan only. Members agreed to shared the details by 22nd August 2024, however no further details received from Haryana, Punjab, Delhi, UP & ADANI.
>
> Kindly share the details as discussed during the meeting held on 20th August 2024, so that further remedial actions can be initiated on the basis of those details.
>
> सादर धन्यवाद/ Thanks & Regards
> प्रणाली संचालन-II/ System Operation-II
> उ॰क्षे॰भा॰प्रे॰के॰/ NRLDC
> ग्रिड कंट्रोलर ऑफ इंडिया लिमिटेड/ Grid Controller of India Limited
> Formerly known as
> पोसोको / POSOCO

Punjab Details

	Name of S/S	66kV Feeders	Average Demand(Amp.)	Maximum Demand(Amp.)
Punjab Control Area	220/66kV Gobindgarh	66kV Talwara-19(ADANI SPS)	375	430
		66kV Talwara-2(ADANI SPS)	375	430
	220/66kV Lalton kalan	66kV Gill road-1(DADRI SPS)	543	610
		66kV Gill Road-2(DADRI SPS)	518	692
		66kV Dugri(DADRI SPS)	325	450
	220/66kV Malerkotla	66kV Malerkotla(ADANI SPS)	213	403
		66kV Amargarh(ADANI SPS)	238	405
		66kV Malaud ckt 1(DTPC SPS)	257	356

Note: 66kV Malaud at 220kV S/S Malerkotla was bifurcated into two circuits in the month of July 2024.

Nodal officers details

Control Area	Station Name	Nodal Person (SPS, communication system)	Contact details	Email Id
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Delhi	400/220kV Bamnauli			
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