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

दिनांक:11.02.2025

सेवा में : संरक्षण उप-समिति के सदस्य (सूची के अनुसार) ।
To: Members of Protection Sub-Committee (As per mail list)

विषय: संरक्षण उप-समिति की 56 वीं बैठक की कार्यवृत्त |
Subject: Minutes for 56th Protection Sub-Committee Meeting.

संरक्षण उप-समिति की **56 वीं बैठक, दिनांक 20.01.2025 को 11:00 बजे** से **एनआरपीसी सचिवालय, कटवारिया सराय, नई दिल्ली** में आयोजित की गयी थी | उक्त बैठक की कार्यवृत्त संलग्न है । यह उत्तर क्षेत्रीय विद्युत् समिति की वेबसाइट (http://164.100.60.165/) पर भी उपलब्ध है |

The **56th meeting** of Protection Sub-Committee was held on **20.01.2025** at **11:00 Hrs** at **NRPC Secretariat, Katwaria Sarai, New Delhi**. The minutes of the meeting is attached herewith. The same is also available on NRPC website (http://164.100.60.165/).

Signed by Dharmendra Kumar Meena
Date: 12-02-2025 09:51:52

(डी.के. मीना)
(D.K. Meena)
निदेशक (संरक्षण)

56th Protection Sub-Committee Meeting (20th January, 2025)-MoM

Contents

Minutes of
56th Meeting of Protection Sub-Committee (PSC) of
Northern Regional Power Committee

Date and time of meeting : ***20.01.2025 11.00 Hrs.***

Venue : ***NRPC Secretariat, Katwaria Sarai, New Delhi***

MS, NRPC welcomed all the participants. List of participants is attached as **Annexure-P.**

Part-A: NRPC

A.1. Confirmation of minutes of 55th meeting of Protection Sub-Committee

A.1.1 EE (P), NRPC apprised that 55th PSC meeting was held on 20.12.2024. Minutes of the meeting were issued vide letter dtd. 10.01.2025.

A.1.2 HPSLDC has submitted request for correction of MoM as below:

(PART-B, Item No. B.1.1 (i) i.e. Multiple elements tripping at 220kV KTPS (RVUN) on 21st June 2024, 11:37)

Existing MOM	Proposed comments to be included in existing MOM
NRLDC representative requested RVPNL to follow up with the **SLDC-HP** & RVUNL to ensure their attendance in PSC meeting and necessary actions at their end.	NRLDC representative requested RVPNL to follow up with the **SLDC-Rajasthan** & RVUNL to ensure their attendance in PSC meeting and necessary actions at their end.

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Decision taken by Forum:

Forum approved the minutes of 55th PSC meeting with above correction.

A.2. Status of action taken on decisions of 55th Protection Sub-Committee meeting (agenda NRPC Secretariat)

A.2.1 Status of action taken on the decisions of 55th PSC meeting were informed to the Forum.

A.2.2 Concerned utilities submitted the status of action taken. Forum noted the same.

A.2.3 *Updated status of action taken is attached as* ***Annexure-A.I****.*

Decision taken by Forum

Forum instructed to concern utilities for take necessary action on pending issues.

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)

A.3.1 EE (P), NRPC apprised that 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

Further, as per clause 15 (7) of IEGC 2023;

- *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.3.1 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.3.2 Accordingly, the status of the indices reported for the month of **December-2024** was presented before forum as attached as **Annexure-A.II. Utilities from where, indices**

were pending, were asked to submit it timely in future.

A.3.3 Following issues were highlighted by EE (P):

i. Some Utilities have not submitted data for Dec-2024.
ii. Utilities have submitted date for some plants but not all.
iii. Utilities have not mentioned corrective action taken for indices less than unity.
iv. Some utilities have sent data after cut-off date of 7th.

A.3.4 **NTPC was asked to share indices of all plants as indices of Anta, Auriya and Singrauli was pending.**

A.3.5 **Following utilities were found non-compliant, as indices were not received even on date of meeting:**

i. **BBMB**
ii. **HPGCL**
iii. **APCPL**
iv. **RENEW Power Pvt Ltd**
v. **NTPC Green Energy Limited**
vi. **Azure Power India Pvt. Ltd.**
vii. **Avaada Energy Private Limited**
viii. **Adani Green Energy Limited**
ix. **UT of J&K**
x. **UT of Ladakh**
xi. **UT of Chandigarh**
xii. **POWERLINK**
xiii. **Sekura Energy Limited**

A.3.6 Incidents causing indices less than one, were discussed. Concerned officials apprised the cause and corrective action undertaken/ planned. Summary of such incidents is attached as **Annexure-A.III.**

A.3.7 EE (P) highlighted that reason for indices less than unity has not been mentioned by Alakhnanda plant. UPSLDC was asked to follow up with plant and inform NRPC accordingly.

A.3.8 BBMB representative conveyed that the indices will be submitted shortly.

A.3.9 SLDCs were directed to share the compiled data of all utilities (GENCOs, & TRANSCOs) under their jurisdiction. They may take regular follow ups with other utilities who are not members of NRPC and arrange the protection performance

indices.

A.3.10 Subsequently, MS, NRPC highlighted that utilities may 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.3.11 EE (P) highlighted that IEGC 2023 has given responsibility to RPCs for receiving indices from all utilities however, all utilities are not members of NRPC. SLDCs have been requested in earlier PSC meetings to follow up with concerned utilities of states which are not NRPC members and to send compiled indices to NRPC. UP SLDC is complying it also but other states are lacking in compliance. Further, RE plants are not submitting indices although evacuation of RE is of top most priority.

A.3.12 MS, NRPC suggested that all utilities may be called in future to attend PSC meetings.

A.3.13 Forum agreed that all utilities (having elements of 220 kV and above) in NR including RE Generators shall be called in PSC meetings so that discussion can be done on indices, protection audit and compliance etc. Meeting may be kept in hybrid mode (physical as well as Video-Conferencing).

Decision of the Forum:

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. All utilities (having elements of 220 kV and above) including RE Generators shall be called in PSC meetings so that discussion can be done on indices, protection audit and compliance etc. Meeting may be kept in hybrid mode (physical as well as Video-Conferencing).

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 meetings, all utilities were requested to submit the annual protection audit plan.

A.4.3 Audit plan submitted by utilities were presented and it was observed that following utilities had not submitted their Audit plan, 2024-25 and thus are non-compliant:

i. **NPCIL**
ii. **MEJA Urja Nigam Ltd**
iii. **HPPCL**
iv. **Sekura Energy Limited**
v. **UT of J&K**
vi. **UT of Ladakh**
vii. **UT of Chandigarh**

A.4.4 EE (P) apprised that NAPS has submitted audit report for 220 kV station. Similarly, UP, and HVPN have also submitted report after issuance of agenda. The same shall be put up for discussion in next PSC meeting.

A.4.5 Status of annual audit plans is enclosed as **Annexure- A.IV**.

Decision of the Forum:

Non-compliant utilities were asked to submit annual audit plan 2024-25 without any further delay. Other utilities were asked to submit report and compliance status within one month of completion of audit.

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

A.5.1 EE (P), NRPC apprised that 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 the 54th and 55th PSC meeting.

A.5.3 Audit plan submitted by utilities were presented and it was observed that following utilities had not submitted their Audit plan 2025-26 and thus are non-compliant:

i. **BBMB**
ii. **NPCIL**
iii. **PTCUL**
iv. **PSTCL**
v. **HPGCL**
vi. **Aravali Power Company Pvt. Ltd**
vii. **Apraava Energy Private Limited**
viii. **MEIL Anpara Energy Ltd**
ix. **MEJA Urja Nigam Ltd.**
x. **Adani Power Rajasthan Limited**
xi. **JSW Energy Ltd. (KWHEP)**
xii. **Adani Energy Services Limited**
xiii. **Tata Power Renewable Energy Ltd.**
xiv. **UT of J&K**
xv. **UT of Ladakh**
xvi. **UT of Chandigarh**
xvii. **INDIGRID**
xviii. **ADHPL**
xix. **Sekura Energy Limited**

A.5.4 Status of submitted annual audit plans is enclosed as **Annexure- A.V**.

Decision of the Forum:

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.

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

A.6.1 EE (P), NRPC apprised that as 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, some utilities have submitted their third-party protection audit plans (enclosed as **Annexure-A.VI)**.

A.6.3 It was observed that third party protection audit plan has not been received from following:

i. BBMB

ii. HVPNL

iii. RVPNL

iv. PSTCL

v. HPPTCL

vi. HPGCL UJVNL HPSEBL

vii. Aravali Power Company Pvt. Ltd

viii. MEJA Urja Nigam Ltd.

ix. Tata Power Renewable Energy Ltd.

x. UT of J&K

xi. UT of Ladakh

xii. UT of Chandigarh

xiii. Sekura Energy Limited

Decision of the Forum:

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.

A.7. Compliance of recommendations of protection audit (agenda by NRPC Secretariat)

A.6.1 EE (P), NRPC apprised that as per clause 15 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.6.2 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.6.3 Following utilities have submitted the internal audit report based on the audit done at their substations:

S.N.	Utility	Stations
1	HPPTCL	Gumma, Lahal, Phozal
2	Prayagraj Power Generation Company Limited	3X660MW STPP
3	RVPN	220 kV Chaksu 220 kV Mansarovar 765 kV Anta 220 kv Mandalgarh 220 kV Pratapgarh
4	RVUN	Ramgarh Gas Sutargarh Supercritical
5	Nabha Power Limited	400 kV NPL Sub-station

A.6.4 Following utilities have submitted reports of 3rd Party audit:

S.N.	Utility	Stations
1	UJVN	220kV Substation at 304 MW MB-II Power House, Dharasu
2	M/s Adani Power	2x660 MW Kawai Plant

A.6.5 **The above submitted reports were made available at NRPC website:**

http://164.100.60.165/meetings/prsub.html

A.6.6 In the meeting, above reports were discussed and concerned utilities were asked to submit compliance report of the issues/observations highlighted by audit party.

A.6.7 It was observed that PPGCL has sent unsigned audit report. Same may be sent again by PPGCL with signature of officials of audit team.

A.6.8 EE (P) informed the status of compliance reported by Koteshwar HEP as below:

Recommendations: Upgradation of Line Protection from Distance to Differential Protection may be expedited for resolving issue of time synchronization of Line Protection Relays.
Compliance: MOU for Upgradation of Line Protection from Distance to Differential Protection has already been signed with POWERGRID and material required for said purpose has also reached site. The work is expected to be completed by Jan'25.

Decision of the Forum:

Forum noted the audit report and directed utilities to submit compliance report. Further, other utilities were directed to submit the protection audit report (for audited S/s as per submitted plan) to NRPC Secretariat and to update the compliance status regularly.

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 pervious 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 were requested to share the status of remedial actions taken. List of points discussed in 56th PSC meeting is attached as Annexure-B.I of agenda. During the meeting constituents were requested to apprise the status of the same. Discussion during the meeting were as follows:

i. Frequent multiple elements tripping at 220kV Kunihar, Baddi, Upperla Nangal complex and load loss event in HP control area

PSC (51, 52 & 53) recommendations: 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.

During 54th PSC meeting, HPSEBL informed that Protection audit of 220kV Kunihar was conducted by POWERGRID on 19th October 2024. Protection audit of rest of the stations (Bhabha, Upperla Nangal, Baddi etc.) shall be conducted in near future and will be completed by December 2024. HPSEBL also submitted protection audit and its compliance report (attached as Annexure-A.VII of agenda).

During 55th PSC meeting, compliance report submitted by HPSEBL was discussed. NRLDC representative highlighted protection related non-compliance mentioned in 3rd party protection audit report. HPSEBL representatives were not present in the meeting. SLDC-HP was requested to further follow-up with HPSEBL for expedited corrective actions at their end.

During 56th PSC meeting, HPSEBL was requested to apprise the present status.

HPSEBL representative stated that they have applied for the PSDF for rectification of issues in this complex. Some observations have come from PSDF. They will again submit the application by incorporating the observations.

PSC forum requested HPSEBL to take expeditious actions at your end and ensure the healthiness of protection system in this complex.

ii. Multiple elements tripping at 220kV Hissar(BBMB) 07th May 2024, 11:16 hrs

PSC (51 & 52) recommendations: Expedite the implementation of differential protection in short lines to avoid undesired operation of distance protection.

During 53rd PSC meeting, HVPNL representative stated that matter has been taken up with HVPNL and is pending at their end. HVPNL representative informed that design team has compiled all such requirements in Haryana control area and is now working on the further process.

During 54th PSC meeting, HVPNL representative informed that existing earth wire is normal earth wire which is to be replaced with OPGW. Process of the same has been started. After this, process of implementation of differential protection will be started.

During 55th PSC meeting, HVPNL representative informed that availability of OPGW has been confirmed. Design team of HVPNL is taking further actions in this regard.

During 56th PSC meeting, HVPNL was requested to apprise the present status.

HVPNL representative informed that status is same, HVPNL design team is following up this case. They are compiling all such cases and then purchase order will be placed for complete package.

NRLDC representative requested HVPNL to expedite the process and also share the estimate timeline.

PSC forum recommended HVPNL to expedite the implementation of differential protection in short lines and also share the expected timeline.

iii. Multiple elements tripping at 400/220kV Akal(RS) on 02nd Jan 2024, 07:28 hrs:

PSC 51 recommendations:

- Bus bar protection at 220kV bus at 400/220kV Akal shall be made operational by June 2024.
- Time synchronization of recording instruments (DR/EL) need to be ensured.

During 52nd PSC meeting, RVPNL representative informed that three faulty PU were replaced from the future bay and one PU is still unhealthy which is in warranty period. Process is getting delayed due to lack of response from the OEM. Process will be expedited and will try to resolve the bus bar protection issue on priority.

During 53rd PSC meeting, RVPNL representative stated that correspondence with the firm is still going on and as an alternative, possibility of replacing healthy PU from any other station is being explored. Issue of time sync will be able to resolve only if bus bar protection get operational.

During 54th & 55th PSC meeting, RVPNL representative stated that issue not resolved yet, continuous follow-ups are being done. Forum requested Rajasthan for expeditious action for restoration of bus bar protection at Akal S/s.

During 56th PSC meeting, RVPNL was asked to apprise the forum about the present status.

NRLDC representative highlighted two grid events recently occurred in January 2025 (09th & 12th Jan) at Akal S/s during which significant quantum of RE generation affected during the event. Reason of significant delayed clearance of fault during 12th Jan event was also asked. Non submission of DR/EL & unavailability of SCADA data was also highlighted.

RVPNL representative stated that work got delayed due to manpower issue because of parallel work at Pachpadra S/s (newly commissioned) and issue of bus bar at Akal S/s shall be resolved by the end of February 2025. Further, they will take remedial actions to avoid complete outage of station. Regarding non submission of DR/EL of recently occurred grid events, it was informed that due to unavailability of designated manpower, DR/EL files couldn't be extracted timely which later got lapsed.

NRLDC representative requested Rajasthan to resolve the issue of bus bar protection at Akal at the earliest. It was further suggested that training programs may be organized for site engineers regarding DR/EL extraction and their uploading on TMS. It will help SLDC in ensuring timely submission of DR/EL and further analysis of the event.

PSC forum recommended RVPNL to expedite the process and make bus bar protection at Akal S/s healthy & operational at the earliest.

iv. Multiple elements tripping at 400kV Sainj (HP), 400kV Parbati2 & Parbti3 (NHPC) Stations on 07th May 2024, 16:17 hrs:

PSC 51 recommendations:

- NHPC shall follow up with the relay engineer and taken necessary remedial actions to ensure proper operation of A/R scheme at Parbati2 end.
- NHPC and HPPTCL shall review the healthiness of PLCC at Parbati3 and Sainj end and take necessary actions to ensure their proper operation.
- Expedite the implementation of differential protection in 400kV Parbati2-Sainj line.
- Standardisation of recording instruments (DR/EL) need to be ensured.

NHPC representative informed following during 52nd PSC meeting:

- Shutdown has been planned in 1st week of November 2024, testing of A/R scheme and implementation of differential protection will be done during that period.
- PLCC card at Parabti3 end will be replaced by the end of September 2024. For dual test of PLCC operation, PLCC at Sainj end also need to be healthy. Sainj HEP representative was not present in the meeting. HPPTCL was requested to intimate concerned person of HPPCL to taken necessary corrective actions and ensure healthiness of PLCC at Sainj end.

Further in 53rd PSC meeting, NHPC representative informed following:

- Due to unavailability of OEM, shutdown plan has been now rescheduled in last week of November or 1st week of December. Testing of A/R scheme and implementation of differential protection will be done during that period.
- PLCC card at Parabti3 end has been replaced and made functional. However, for dual test, PLCC at Sainj end also need to be functional.

During 54th PSC meeting, NHPC representative informed that status is same. Implementation of differential protection & testing of A/R in 400kV Parbati2-Sainj line will be completed by December end. Further, PLCC at Sainj HEP end also need to be healthy for testing of PLCC at Parbati3 end and proper operation of carrier communication in line.

During 55th PSC meeting, NHPC representative informed that they will receive differential relay in January 2025 and laying of OPGW on 400kV Parbati2-Sainj line (length 700-800m) will take ~2 months. Visit of GE engineer is also scheduled in January 2025. Representatives of Sainj HEP were not present in the meeting.

During 56th PSC meeting, NHPC & Sainj HEP were requested to apprise the forum about the present status.

NHPC representative informed that visit of GE engineer is scheduled in February 2025. Implementation of differential protection and testing of A/R operation will be done during that time only.
Representative from HPPCL informed that they will take remedial action to ensure healthiness of PLCC at their end and will also conduct loop test of PLCC in coordination with NHPC.

NRLDC representative requested NHPC and HPPCL to compete the work as per mentioned timeline.

PSC forum recommended NHPC & HPPCL to take expeditious action at their end and ensure healthiness of protection system.

v. Multiple elements tripping at 400kV Khedar(RGTPS) Station at 10th May 2024, 19:35 hrs

PSC 51 recommendations: Revised corrected protection settings of Main-2 Micom P442 distance protection relay and A/R scheme at Khedar(RGTPS) end need to implemented at the earliest.

During 52nd PSC meeting, HVPNL representative informed that Khedar(RGTPS) have conducted 3rd party protection audit. Status of corrective action taken yet to be confirmed.

During 53rd PSC meeting, Khedar RGTPS representative informed that issues with the settings of the Micom relays has been resolved however in REL 670 relay installed at Khedar end, only 1-ph A/R option is not available. 3-ph A/R has been disabled now and it has been kept as 1-ph/2-ph A/R.

On this, NRLDC representative stated that 2-ph A/R is not desirable as most of the 2-ph fault will be of permanent nature only and being a generating station, keeping 2-ph A/R is not healthy. RGTPS representative was suggested to consult with the OEM

and ensure only 1-ph A/R. In case option is not there then option of replacement of relay may be explored.

Khedar(RGTPS) representative agreed to take up the issue with OEM.

During 54th PSC meeting, RGTPS representative informed that OEM has agreed to revise the logic of A/R function in relay and issue related to A/R operation will be resolved at the earliest.

During 55th PSC meeting, RGTPS representative informed that shutdown is planned in January 2025, issue will be resolved during that period.

During 56th PSC meeting, HVPNL and RGTPS were requested to apprise the forum about the present status.

RGTPS representative informed that work is in process, and it will be completed by the end of this month i.e., January 2025 only.

NRLDC representative requested RGTPS to ensure the desired correction in logic of A/R function at Khedar TPS at the earliest.

PSC forum requested RGTPS to take necessary remedial action as per mentioned timeline and ensure healthiness of protection system.

vi. Multiple elements tripping at 400kV Koteshwar(PG) on 17th May 2024, 17:21 hrs

PSC 51 recommendation: In view of short line length of 400KV Koteshwar(PG)-Tehri D/C, POWERGRID shall plan for the differential protection in the line on priority in near future to avoid overreach of distance protection.

During 53rd PSC meeting, POWERGRID (NR-1) representative informed that order for the material of differential protection has been placed. It is estimated that materials will get delivered in next 3-months. In addition, to avoid delayed fault clearance in case of high resistive fault, time delay of DEF protection and carrier aided DEF operation has been implemented.

During 54th PSC meeting, POWERGRID(NR-1) representative informed that, material for differential protection is expected to be arrived by the end of December 2024 and the same will be implemented by the end of January 2025.

During 55th PSC meeting, POWERGID(NR-1) representative informed that materials related to differential protection have been received and work has been started. It will get completed by the end of January 2024.

During 56th PSC meeting, POWERGRID(NR-1) was requested to apprise the forum about the present status.

POWERGRID(NR-1) representative informed that, work is in progress, shutdown is planned on 27-28th Jan 2025. It will be completed by the end of January 2025 only.

vii. Multiple elements tripping at 220kV Sarna (PS) on 04th May 2024, 07:10 hrs

PSC 51 recommendations:

- Punjab shall expedite the commissioning of new bus scheme.
- POWERGRID shall revise the Z-4 time delay setting of Kishenpur lines at Sarna (PS) end as 160msec till bus bar get operational.

During 52nd PSC meeting, Punjab representative informed that tender of bus bar protection has been processed, bus bar protection at 220kV Sarna will be commissioned within 4-5 months tentatively.

During 53rd PSC meeting, PSTCL representative informed that tender of bus bar scheme is in process and POWERGID (NR-2) representative informed that Z-4 time delay setting of lines of their control area has been revised.

During 54th PSC meeting, PSTCL representative stated that process is still at the tender stage. It will be commissioned in next 3 months.

During 55th PSC meeting, PSTCL representatives were not present in the meeting.

During 56th PSC meeting, PSTCL was requested to apprise the forum about the present *status.*

PSTCL representative informed that bus bar protection at 220kV Sarna will be commissioned by the end of March 2025.

NRLDC representative requested PSTCL for expeditious remedial actions and ensure implementation of bus bar protection as per mentioned timeline.

PSC forum requested PSTCL to expedite the work related to implementation of bus bar protection at Sarna S/s.

viii. Multiple elements tripping at 400/132kV Masoli(UP) on 29th May 2024, 15:57 hrs

PSC 51 recommendations: UP shall implement the bus bar protection at 132kV level at 400/132kV Masoli S/s.

During 52nd & 53rd PSC meeting, UP representative informed that this case has been communicated to design team. Design team is compiling all such requirements and further process will be initiated within 1-2 months.

During 54th PSC meeting, UPPTCL representative informed that process is still at the design team stage. Continuous follow ups are being done for expeditious implementation of bus bar protection at such stations.

During 55th PSC meeting, UPPTCL representative informed that bus bar protection has been arranged for Masoli(UP) station. Shutdown has been planned after 24th February (after Kumbh Mela) and it is expected that bus bar commissioning at 132kV Masoli(UP) will get completed by the end of March 2025.

During 56th PSC meeting, UPPTCL was requested to apprise the forum about the present status.

UPPTCL representative stated that status is same. Bus bar commissioning at 132kV Masoli(UP) will get completed by the end of March 2025.

PSC forum requested UPPTCL to expedite the process of bus bar protection implementation at 400/132kV Masoli(UP) and such other stations.

ix. Multiple elements tripping at 220kV KTPS (RVUN) on 21st June 2024, 11:37 hrs

PSC 51 recommendations: Commissioning of bus coupler between 220kV Bus-3 & 5 need to be expedited.

During 52nd PSC meeting, RVUNL representative informed that informed that tender for the same has been floated.

During 53rd PSC meeting RVUNL representative informed that process is at same stage. It will take around 01 year to complete all the process and implementation of bus coupler.

During 54th PSC meeting, RVUNL representative stated that whole process will take time. Tender process is completed, and review meeting is scheduled on 25th December 2024.

During 55th PSC meeting, RVUNL representatives were not present in the meeting.

During 56th PSC meeting, RVUNL representative was requested to apprise the present status.

RVUNL representative stated that work is at stage of tender processing. Necessary follow up actions are being taken.

NRLDC representative requested RVPNL to expedite the tender and other followed action.

PSC forum requested RVUNL for expeditious actions at their end.

x. Frequent tripping of 220 KV Anta(NT)-Sakatpura(RS) (RS) Ckt-1 : Non operation of A/R in line

PSC 52 recommendations: RVPN was requested to expedite the process of relay replacement and rectification of issues related to A/R operation.

During 53rd PSC meeting, RVPNL representative informed that request of relay panel has been floated however DI of the same is yet to be issued.

During 54th PSC meeting, RVPNL representative informed that existing panels are of simplex type which have to be replaced with duplex panels. Panels have been issued however civil work is required for installation of the same. Delay is due to civil work.

During 55th PSC meeting, RVPNL representative informed that civil work has not been completed yet. Implementation of duplex panels will be started after completion of civil work.

During 56th PSC meeting, RVPNL representative was requested to apprise the present status.

RVPNL representative informed that major part of the civil work has been completed at Sakatpura S/s. Work of panel replacement will be completed by the end of February 2025.

NRLDC representative requested RVPNL to take necessary follow-up actions to ensure expeditious completion of work.

PSC forum requested RVPNL to expedite the actions at their end.

xi. Frequent tripping of 220 KV Khara(UP)-Saharanpur(PG) (UP) Ckt-1

PSC 52 recommendations:

- 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.

Discussion during 53rd PSC meeting:

UPPTCL representative informed that status is same and follow up is being done to ensure the relay replacement in Nov-Dec 2024.

NRLDC representative highlighted the issue of non-operation of A/R in this line also at Saharanpur end and requested POWERGRID (NR-1) to review the healthiness of A/R operation in all the lines at Saharanpur (PG). Issue in A/R operation at Khara end in case of Y-ph fault is observed. 2*ph A/R is occurring in this scenario. UPPTCL may review the same.

UPPTCL representative stated that remedial actions are been taken to rectify the cause of faults such as replacement of old insulators etc. Further necessary actions will also be initiated to minimise the occurrence of faults in line.

During 54th PSC meeting, POWERGRID(NR-1) representative informed that, A/R function in the line has been reviewed and it is healthy and operational. He further raised concern over frequent faults in line. Further, UPPTCL representative informed that all the line protection relays at Khara(UP) are of electromechanical type. Relays will be replaced with numerical relays by the end of December 2024.

During 55th PSC meeting, UPPTCL representative informed that work of relay replacement has been started and all the line protection electromechanical relays at Khara(UP) will be replaced with numerical relays by the end of December 2024.

During 56th PSC meeting, UPPTCL were requested to apprise the forum about present status.

UPPTCL representative informed that continuous shutdown is going on for work of relay replacement at Khara S/s. Work is completed in Unit-1 and currently going on in Unit-2. Relay replacement in Saharanpur line will also get completed within next 07 days. It is expected that complete work i.e., relay replacement and their testing will get completed by the end of March 2025.

NRLDC representative requested UPPTCL for expeditious completion of work.

PSC forum requested UPPTCL to expedite the replacement of relay at Khara(UP) end.

xii. Multiple elements tripping event at Patiala(PG)

PSC 52 recommendation: Implementation of new bus bar relay at Patiala (PG).

During 54th PSC meeting, POWERGRID(NR-2) representative informed that materials have been arrived. Presently, team is working at Nallagarh(PG) S/s, thereafter work will start at Patiala(PG). Implementation of new bus bar protection at Patiala (PG) will be completed by the end of January 2025.

During 55th PSC meeting, POWERGRID (NR-2) representative informed that status is same and implementation of new bus bar protection at Patiala (PG) will be completed by the end of January 2025.

During 56th PSC meeting, POWERGRID(NR-2) representative was requested to apprise the present status.

POWERGRID(NR-2) representative informed that work at Nallagarh S/s hasn't completed yet. Therefore it is expected that implementation of bus bar protection at Patiala (PG) will be completed by the end of March 2025.

NRLDC representative requested POWERGRID(NR-2) for expeditious completion of work.

PSC forum requested POWERGRID(NR-2) to expedite the process.

xiii. Frequent tripping of 220 KV Nara(UP)-Roorkee(UK) (UP) Ckt-1

PSC 53 recommendation: PTCUL was requested to analyse the tripping events and take necessary remedial action to avoid undesired tripping.

During 54th PSC meeting, discussion was as follows:

- PTCUL representative stated that this line is being operated in radial mode due to which issue of single phasing of transformers observed many a times during fault. To avoid this, A/R has been kept off.

- *With the reference of similar case in Rajasthan control area, RVPNL representative suggested that some changes in protection settings can help in avoiding such issues.*

- *NRLDC representative raised concern over disabling the A/R without intimation to the forum. PTCUL was requested to enable the A/R in line and any issues may first be intimate to forum for necessary recommendation / actions. Further, PTCUL was requested to thoroughly analyse the tripping incidents and identify the root cause which will help in taking necessary remedial actions. PTCUL was also requested to on the A/R PTCUL may also discuss with RVPNL in reference to Rajasthan case study.*

- *PSC forum recommended following actions to PTCUL:*
  - ✓ *A/*R shall be enabled in the line. Any issues may be put up in the PSC forum.
  - ✓ Root causes analysis of the frequent tripping of line need to be submitted.
  - ✓ Necessary remedial actions need to be taken to avoid frequent tripping of the line.

During 55th PSC meeting, PTCUL representatives were not present in the meeting.

During 56th PSC meeting, PTCUL was requested to apprise the forum about analysis and remedial action w.r.t. frequent tripping of this line.

PTCUL representative informed that A/R in the line has been enabled. Review of relay setting and necessary remedial action has been taken. Also. there is no tripping observed since December 2025.

xiv. Multiple elements tripping at 220kV Khodri HEP & Chibro HEP on 5th, 11th & 19th September 2024

PSC 53 recommendation:

- 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.
- HPPTCL shall take necessary actions to rectify the protection related issue in 220kV Khdori-Majri ckt-2.

- OV protection needs to be disabled in 220kV lines at the earliest.
- Over frequency and over current protection operation in units at Khodri HEP need to be reviewed.
- A/R should be made operational in Sarsawan line at the earliest.
- UJVNL shall share the CPRI audit report and details of remedial action taken within one week.
- Replacement of Units breakers need to be expedited.

During 54th PSC meeting, UJVUNL representative informed following during the meeting:

- Timely submission of DR/EL & tripping reports for the tripping incidents are being ensured.
- Overvoltage setting in all the lines at Khodri HEP has been disabled. However, 220kV Khodri-Mazri ckt-2 is in jurisdiction of HPSEBL.
- Over frequency & overcurrent protection in generating units have been proposed to review.
- Audit report of the CPRI conducted in October 2023 has already been submitted by mail.
- A/R operation in Sarsawan line and replacement of Unit breakers has been proposed. Follow ups are being done with OEM.
- Time delay setting of Z-4 in distance protection in all the lines at Khodri has been revised from 1sec to 160msec.

During 55th PSC meeting, HPSEBL representatives were not present in the meeting and UJVUNL representative informed following during the meeting:

- Over frequency & overcurrent protection in generating units are yet to be reviewed. It will be done at the earliest.
- There are wiring related issues which have to be corrected to enable the A/R operation in Sarsawan line. Visit of OEM is being planned as per shutdown availability.
- Replacement of Unit breakers is also planned. Follow ups are being done with OEM.
- Isolator selection relay is also planned to be replaced within next 2 months. After this, bus bar protection will be made operational.

During 56th PSC meeting, UJVUNL was requested to apprise the forum about present status of remedial actions.

UJVUNL representative informed following during the meeting:

- *Over frequency & overcurrent protection has been reviewed and found in order.*
- *Visit of GE team has been planned. A/R operation related issue will be resolved during that time.*
- *Bus bar protection relay is of electromechanical type. Tender has been floated for replacement of some component. Commissioning of numerical relay will take long time therefore we are planning to make existing electromechanical relay healthy.*
- *Maintenance and testing of Unit breakers was done on 10.12.2024. Thereafter, breakers are working smoothly. Apart from this, tender process for commissioning of new unit breakers has also been planned and same has been shared by mail.*

NRLDC representative stated that unit breakers at Khodri HEP have to be replaced on priority because their improper operation is leading to loss of generation of two hydro generating stations (Khodri & Chibro HEP). UJVUNL was requested to expedite the necessary remedial action and also to share the action plan.

Further, NRLDC representative requested HPSEBL to review the protection settings of 220kV Khodri-Majri line-II specifically overvoltage protection. Ensure protection setting in line as per approved protection philosophy.

HPSEBL representatives agreed to review the protection settings in 220kV Khodri-Majri line-II.

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.

xv. Multiple elements tripping at 400/220kV Jaisalmer(RS) on 20th September 2024

PSC 53 recommendation: RVPNL shall share the detailed analysis of the event within one week.

During 54th PSC meeting, RVPNL representative stated that multiple elements tripping occurred during this event on operation of LBB relay. However, LBB relay is not communicating due to which DRs couldn't be extracted. Therefore, analysis of the events hasn't submitted yet. OEM has been requested to update the software of relay.

During 55th PSC meeting, RVPNL representative informed that issue is not resolved yet. Continuous follow up is being done with OEM however no response is received from OEM. Relay will have to be replaced if no support from OEM will receive. Necessary actions will be taken on priority.

During 56th PSC meeting, RVPNL was requested to share the analysis and status of remedial action taken.

RVPNL representative informed that with the support of OEM, issues with the LBB relay at Jaisalmer has been rectified. Work was done during last week of December 2024.

xvi. Frequent tripping of 220 KV Nanauta(UP)-Saharanpur(PG) (UP) Ckt-1 & 220 KV Sarsawan(UP)-Khodri(UK) (UP) Ckt-1:

PSC 54 recommendation: PSC forum requested UPPTCL to ensure resolution of issue with the Main-2 relay configuration at Nanauta(UP) & Sarsawan(UP) at the earliest.

During 55th PSC meeting, UPPTCL representative informed that issue hasn't been resolved yet. As a precautionary measure Z-1 time delay in Main-2 relay has been kept 100msec. In case of Ph-N fault, Main-1 relay would be able to facilitate A/R

operation. Issue in relay configuration will be resolved during next available shutdown.

During 56th PSC meeting, UPPTCL was requested to share the present status.

UPPTCL representative stated that no A/R operation related issues are observed since changes in Main-1 relay was done at both the stations. Issue in relay configuration will be resolved during next available shutdown (approx. after 2-3 months).

NRLDC representative requested UPPTCL to ensure the correction in the relay configuration in Main-2 relay at both the stations when there is shutdown opportunity.

PSC forum requested UPPTCL for expedited corrective actions.

xvii. Multiple elements tripping at 220kV Obra_A(UP) on 9th October 2024

PSC 54 recommendation:

I. UPPTCL & Obra_A(UP) shall ensure the implementation of LBB protection at the earliest at 220kV side.

II. GPS scheme shall be implemented at Obra_B(UP) by the end of January 2025 and time sync of recording devices will be ensured.

During 55th PSC meeting, UPPTCL representative informed that Bus bar protection relay is of electromechanical type, and it has to be replaced with numerical relay. Around 6-month (till June 2025) time will be required for this work. Issue of time sync will be resolved by the end of January 2025.

During 56th PSC meeting, UPPTCL was requested to share the present status

UPPTCL representative informed that status is same.

NRLDC representative requested UPPTCL to take necessary follow up actions for expeditious completion of work.

PSC forum requested UPPTCL for expedited corrective actions.

xviii. Multiple elements tripping at 220/132kV Obra_A(UP) on 9th October 2024

PSC 54 recommendation: 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.

During 55th PSC meeting, UPPTCL representative informed that Commissioning and Implementation of numerical relays in 132kV ICT-1&2 at Obra_A(UP) is expected to get completed by 1st week of February 2025.

During 56th PSC meeting, UPPTCL was requested to share the present status

UPPTCL representative informed that status is same.

NRLDC representative requested UPPTCL to take necessary follow up actions for expeditious completion of work.

PSC forum requested UPPTCL for expedited corrective actions.

xix. Multiple elements tripping at 400kV Muradnagar_2(UP) on 17th October 2024

PSC 54 recommendation:

i. UPPTCL shall ensure the necessary correction in ZIV make bus bar protection at 400kV Muradnagar_2(UP) by the end of December 2024.
ii. Time synchronisation and standardisation of recording instrument need to be ensured.

During 55th PSC meeting, UPPTCL representative informed that work of correction in ZIV make bus bar relay will get completed within next one week and testing of the same will be done at the earliest.

During 56th PSC meeting, UPPTCL was requested to share the present status.

UPPTCL representative informed that necessary correction in ZIV make bus bar protection at 400kV Muradnagar_2(UP) has been done during last week of December 2024. Now, issue related to LBB operation has been resolved.

xx. Multiple elements tripping at 400/220kV Kashipur(Utt) on 10th October 2024

PSC 54 recommendation:

i. PTCUL shall review the SPS scheme at 400/220kV Kashipur S/s.
ii. Overcurrent protection setting (IDMT) need to be revised in line with the approved protection philosophy.

During 55th PSC meeting, PTCUL representatives were not present in the meeting.

During 56th PSC meeting, PTCUL was requested to share the present status

PTCUL representative informed that some correction in protection setting / protection coordination has been done.

NRLDC representative asked whether any review of SPS logic has been done or not. Because, during the grid event occurred on 10th October, despite of operation of SPS, remaining ICT got tripped. PTCUL was requested to review the existing SPS scheme and propose changes if any required to avoid blackout of S/s.

PTCUL agreed to review the SPS scheme at Kashipur S/s.

PSC forum requested PTCUL to review the SPS scheme and submit in next PSC/OCC meeting.

xxi. Multiple elements tripping at 220kV Dausa(RS) on 21st October 2024

PSC 54 recommendation:

i. RVPNL will expedite the replacement of all the static relays at 220kV Dausa S/s with numerical relays.
ii. Time synchronization of all the recording instruments need to be ensured.

During 55th PSC meeting, RVPNL representative informed that total 5 electromechanical have to be replaced with numerical relays. 3 no. of relays have been allotted, remaining 2 relay will get allotted in next phase. It is expected that work of relay replacement will get completed by the end of January 2025.

During 5th PSC meeting, RVPNL was requested to share the present status.

RVPNL representative informed that one relay is planned to be replaced within next 2-3 days. Bassi-I&II line is of POWERGRID and their shutdown is planned in February 2025. Remaining two relays shall be replaced during bulk relay replacement.

NRLDC representative further asked whether issue of time sync has been resolved at Dausa S/s.

RVPNL representative informed that time sync issue is not resolved yet. Resolution of time sync issue has also been taken up in parallel.

NRLDC representative requested RVPNL to take necessary follow up actions for expeditious completion of work.

PSC forum requested RVPNL for expedited corrective actions.

xxii. Multiple elements tripping at 400kV Alwar(RS) on 30th October 2024

PSC 54 recommendation: RVPNL shall design a suitable SPS for 400/220kV Alwar S/s a propose the same in next OCC/PSC meeting for discussion.

During 55th PSC meeting, RVPNL representative informed that proposal of SPS at Alwar has been sent to planning team and agenda of the same is expected to be submitted in next meeting.

During 56th PSC meeting, RVPNL was requested to share the present status.

RVPNL representative stated that SPS shall be proposed in next OCC meeting.

xxiii. Frequent tripping of 220 KV Auraiya(NT)-Mehgaon(MP) (MPSEB) Ckt-1

PSC 54 recommendation: NTPC shall take necessary actions to minimise the tripping and ensure proper operation of A/R in line.

During 55th PSC meeting, NTPC representative stated that as informed by the site there are no protection related issues at Auraiya end.

NRLDC representative stated that DR files submitted from Auraiya end shows A/R block after few msec of A/R start. Reason of the same need to be identified. NTPC was requested to further review the tripping incidents.

During 56th PSC meeting, NTPC was requested to share the analysis w.r.t. A/R issue.

NTPC representatives were not present in the meeting.

xxiv. Frequent tripping of 220 KV RAPS_A(NP)- Sakatpura (RS) (RS) Ckt-1 &2

PSC 55 recommendation: Expeditious corrective actions to minimise frequent faults in line.
(Rajasthan representative informed that Installation of bird guard throughout the line, replacement of earth wire throughout the line and replacement of damaged disc insulators are being done in lines evacuating from Sakatpura(RS). Work is almost completed in line connected to RAPP_A and in line connected to RAPP_B, it will get completed within next 35-40 days)

During 56th PSC meeting, RVPNL was requested to apprise the forum about present status.

*RVPNL representative informed that w*ork has been completed in both the lines connected to RAPP_A and in line connected to RAPP_B, it will get completed by the end of January 2025.

xxv. Frequent tripping of 400 KV Amritsar(PG)- Makhu(PS) (PSTCL) Ckt-1 & 400 KV Talwandi Saboo(PSG)-Nakodar (PSG) (PS) Ckt-1

PSC 55 recommendation: PSTCL was requested to plan replacement of porcelain insulators with polymer type.

During 56th PSC meeting, PSTCL was requested to apprise the forum about action plan in this regard.

PSTCL representative informed that replacement of insulators of these lines are planned in next financial year (2025-26).

NRLDC representative requested PSTCL for expedite the replacement of insulators in these lines to minimise the trippings.

PSC forum requested PSTCL to for expeditious actions for insulators replacement.

xxvi. Multiple element tripping event at 400kV Aligarh(UP) on 02nd November, 2024

PSC 55 recommendation: UPPTCL shall ensure the healthiness of carrier communication and A/R operation at Muradnagar_1(UP) end.

During 56th PSC meeting, UPPTCL was requested to apprise the forum about present status.

UPPTCL representative stated that issue of carrier communication still persists there. ZIV is the OEM and they are not able receive OEM support. Further follow up is being done for corrective actions otherwise new carrier system will be implemented.

NRLDC representative requested UPPTCL to take necessary follow up actions for expeditious rectification of carrier communication issue at Muradnagar_1 (UP) end.

PSC forum requested UPPTCL for expedited corrective actions.

xxvii. Multiple element tripping event at 765/400kV Jawaharpur(UP) on 11th November, 2024

PSC 55 recommendation: UPPTCL shall submit the root cause analysis of the grid event before next PSC meeting.

During 56th PSC meeting, UPPTCL was requested to share the analysis and details of remedial action taken.

UPPTCL representative informed that exact root cause behind the grid event couldn't be identified. However, OEM has done different testing of protection system, no discrepancy was found.

xxviii. Multiple element tripping event at 400/220kV Merta(RS) on 11th November, 2024

PSC 55 recommendation:

a) RVPNL shall share the further analysis of this grid event within one week.
b) RVPNL shall take necessary remedial actions to ensure timely collection of DRs from site after any grid incidents.

During 56th PSC meeting, RVPNL was requested to share the analysis and details of remedial action taken.

RVPNL representative informed that fault was on 220kV Jethana line. Line tripped from Jethana end in Z-2 with carrier. However, at Merta end, jumper snapped and fell on both the bus led to bus fault on both the 220kV bus at Merta S/s. On this fault, bus bar protection of both the bus operated. However, CB of Bhopalgarh feeder got stuck and fault cleared with the tripping of breaker from Bhopalgarh end in Z-2. Due to this, there was delayed clearance of fault.

NRLDC representative highlighted that issue of breaker stuck are being observed frequently which further lead to multiple elements tripping. Routine maintenance / inspection need to be conducted to minimise cases of breaker stuck.

RVPNL representative stated that routine maintenance is done on regular basis. In addition, they have followed up with OEMs for inspection of breaker and necessary actions to resolve the issues faced at site.

PSC forum requested RVPNL to take necessary remedial actions and ensure proper operation of protection system.

xxix. Multiple element tripping event at 400/220kV Hinduan(RS) on 16th November, 2024

PSC 55 recommendation:

a) RVPNL shall share the further analysis of this grid event within one week.
b) RVPNL shall review the protection system at Hinduan S/s (specifically TEED protection) and take necessary remedial actions to ensure proper operation of protection system.

During 56th PSC meeting, RVPNL was requested to share the analysis and details of remedial action taken.

RVPNL representative informed that fault was towards bus reactor thus it was not bus fault. Fault occurred during switching of reactor.

Members stated that as per fault location shared by RVPNL, it should be come under zone of TEED protection. Regarding TEED protection, RVPNL representative couldn't able to share the analysis.

NRLDC representative requested RVPNL to review the TEED protection and its settings. RVPNL shall share the analysis / observation at the earliest.

PSC forum requested RVPNL to review the TEED protection and ensure proper operation of protection system.

xxx. Multiple element tripping event at 400/220kV Bhadla(PG) at 22:11 hrs on 23rd November, 2024

PSC 55 recommendation: RVPNL shall review the back-up impedance protection settings at Bhadla end and take necessary remedial actions to ensure proper operation of protection system.

During 56th PSC meeting, RVPNL was requested to share the analysis and details of remedial action taken.

RVPNL representative informed that protection setting of back up impedance protection has been reviewed and corrected. Review of protection system at Bhadla S/s has also done. Other issues identified during review have also been rectified.

xxxi. Multiple element tripping event at 220kV Pong(BB) on 06th November, 2024

PSC 55 recommendation: BBMB shall share the event analysis and details of remedial action taken within one week.

During 56th PSC meeting, BBMB was requested to share the analysis and details of remedial action taken.

BBMB representative couldn't able to share the tripping analysis and assured that they will share the details within 1-2 days.

CGM SO, NRLDC suggested BBMB to share the tripping analysis details along with remedial action taken with NRLDC. Further, it can be discussed in next PSC meeting.

NRLDC representative requested BBMB to ensure timely submission of DR/EL & tripping report in line with the clause 37.2(c) of IEGC 2023 and clause 15.2 of CEA Grid Standard.

PSC forum requested BBMB to ensure timely submission of DR/EL & tripping report

B.1.2 *States expressed that frequent transfer of protection engineers from sub-station has created issues in implementation of protection code of IEGC 2023. Further, training protection skill to a new officer takes considerable time. Moreover, officers posting in protection circle/ department is also less.*

B.1.3 *MS, NRPC suggested that management of state may be apprised that protection is a typical skill set that takes considerable time to understand things. Therefore, protection department may be strengthened in States for benefit of grid.*

B.2 Multiple elements tripping events in Northern region in the month of December 2024 (agenda by NRLDC)

B.2.1 A total of 15 grid events occurred in the month of **December'24** of which **05** are of GD-1 category, **03** are of GI-2 Category and **07** are of GI-1 Category. The tripping report of all the events have been issued from NRLDC. A list of all these events is attached at Annexure-B.II of agenda.

B.2.2 Maximum delayed clearance of fault observed in event of multiple elements tripping at 220/132kV CB Ganj(UP) and 220KV Tanakpur HEP on 29th December, 2024 (As per PMU at Bareilly(PG), Y-B phase to phase fault with delayed fault clearing time of 920ms is observed).

B.2.3 Delayed clearance of fault (more than 100ms for 400kV and 160ms for 220kV system) observed in total 05 events out of 15 grid events occurred in the month. In 04 (no.) of grid event, there was no fault in the grid.

B.2.4 Regarding *delayed clearance of fault during multiple element tripping event at 220/132kv Haldwani(Utt), PTCUL representative informed that fault was on 132kV line. However, due to delayed opening of breaker at 132kV level, 220/132kV ICTs tripped.*

B.2.5 *NRLDC representative raised concern over such delayed opening of breaker. PTCUL representative informed that overhauling of breaker has been planned.*

B.2.6 *Further, NRLDC representative presented the reporting status of DR/EL & tripping reports w.r.t. grid events occurred in December 2024. It was highlighted that detailed report of majority of the tripping events have not received. Utilities were requested to start preparing the detailed report of the tripping events as per timeline mentioned in IEGC 2023 and share the report with NRLDC, NRPC and PSC forum. Remedial actions taken by constituents to avoid such multiple elements tripping may also be included in the detail report.*

B.2.7 *Members stated that delay occurred due to non-submission of DR/EL & tripping details from site however they are taking continuous follow up actions to ensure timely completion of tripping analysis within stipulated timeline.*

B.2.8 ***As per IEGC clause 37.2 (c), Disturbance Recorder (DR), station Event Logger (EL), Data Acquisition System (DAS) shall be submitted within 24 hrs of the event and as per IEGC clause 37.2 (e), the user shall submit a detailed report in the case of grid disturbance or grid incidence within one (1) week of the occurrence of event to RLDC and RPC.***

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

B.3 Analysis of the tripping events occurred during December-2024 and status of remedial action taken (agenda by NRLDC)

a) Frequent elements tripping during December 2024:

B.3.1 The following transmission elements were frequently tripping during the month of **December'24**:

S. NO.	Element Name	No. of forced outages	Utility/SLDC
1	220 KV Debari(RS)-RAPS_A(NP) (RS) Ckt-1	10	NPCIL/Raj
2	220 KV RAPS_A(NP)-Sakatpura(RS) (RS) Ckt-1	5	NPCIL/Raj
3	400 KV Akal-Jodhpur (RS) Ckt-1	3	Raj
4	400 KV Anpara_B(UPUN)-Mau(UP) (UP) Ckt-1	3	UP
5	400 KV Anpara_B(UPUN)-Sarnath(UP) (UP) Ckt-2	3	UP
6	400 KV Muradnagar_2-Mathura (UP) Ckt-1	3	UP
7	765 KV Agra-Aligarh (PG) Ckt-1	3	PG
8	500 KV HVDC Balia-Bhiwadi (PG) Ckt-1	2	PG

B.3.2 220 KV RAPS_A(NP)-Sakatpura(RS) (RS) Ckt-1 already tripped two (no.s) times in January 2025 till 09.01.2025.

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

B.3.3 NRLDC representative highlighted that frequent tripping of transmission elements affects the reliability and security of the grid. In view of the same, utilities were requested to analyse the root cause of the tripping and share the remedial measures taken/being taken in this respect.

Discussion during the meeting:

- **220 KV Debari(RS)-RAPS_A(NP) (RS) Ckt-1:** *NRLDC representative raised concern over frequent incidents of faults and non-operation of A/R. It was further highlighted that the line tripped 10 number of times in December month and DR/EL of most of the tripping also not received. RVPNL representative informed that*

insulators are being replaced at fault prone locations. It will help in minimising faults in line. Regarding non-submission of DR/EL, challenge related to delay in file extraction due to parallel work, NRLDC representative suggested to assign this work to site engineer.

- **220 KV RAPS_A(NP)-Sakatpura (RS) (RS) Ckt-1 & 2:** *NRLDC representative raised concern over frequent incidents of faults and non-operation of A/R. RVPNL representative stated that this line passes through forest area due to which this line is prone to frequent faults and shutdown also get available for short period of time as forest is reserved forest area. However, remedial actions are being taken to avoid frequent tripping of line. Installation of bird guard throughout the line, replacement of earth wire throughout the line and replacement of damaged disc insulators are being done in lines evacuating from Sakatpura(RS). Work has been completed in both the lines connected to RAPP_A and in line connected to RAPP_B, it will get completed by the end of January 2025. It will help in minimising fault incidents in line. NRLDC representative stated that we will observe number of trippings in January 2025 to review the effectiveness of remedial action taken by RVPNL for minimising tripping of line.*

- **400 KV Akal-Jodhpur (RS) Ckt-1:** *NRLDC representative raised concern over frequent faults in line and non-operation of A/R. DR/EL of the tripping also not received in 2 number of the tripping. RVPNL representative informed that there is issue at Jodhpur end w.r.t. A/R operation. Due to old version of the relay, engineers couldn't able to rectify the issue. Now, A/R operation has been shifted to Main-2 earlier it was on Main-1. Now, A/R will operate from Jodhpur end also.*

  NRLDC representative requested RVPNL to rectify the issue in Main-I relay.

- **400 KV Anpara_B(UPUN)-Mau(UP) (UP) Ckt-1:** *NRLDC representative raised concern over frequent tripping of line. UPPTCL representative informed that bird nests on tower was found at fault locations. Cleaning of towers have been done as a precautionary measure.*

- **400 KV Anpara_B(UPUN)-Sarnath(UP) (UP) Ckt-2:** *NRLDC representative asked reason of delayed clearance of fault in one of the incident however, successful A/R was observed in further tripping. UPPTCL representative stated that no issue was found in that particular case and A/R worked properly in further tripping also. During patrolling, kite threads were found at few locations which was removed after taking shutdown.*

- **400 KV Muradnagar_2-Mathura (UP) Ckt-1:** *NRLDC representative raised concern over frequent faults in line. UPPTCL representative stated that insulators cleaning has been done to minimise the fault incidents. On query of NRLDC, it was also informed that insulators are of polymer type in this line. Therefore, cleaning of insulators may reduce the fault incidents.*

- **765 KV Agra-Aligarh (PG) Ckt-1:** *NRLDC representative informed that this line tripped on overvoltage in all three cases. Voltage observed was ~1.06 pu only. POWERGRID was asked to review the overvoltage protection. POWERGRID representative stated that protection setting at Aligarh end of this line is 1.06 pu only. It was kept after revision of OV setting during review of protection setting at Aligarh(PG).*

- **500 KV HVDC Balia-Bhiwadi (PG) Ckt-1:** *NRLDC representative raised concern over frequent tripping of this HVDC line in December month. POWERGRID(NR-1) representative informed that one of the tripping occurred due to failure of power supply card which led to AC DC mixing. Due to this, master trip relay operated whose operating voltage was 80 voltage. During transient due to AC DC mixing, Master trip relay got pick up due to 80 V at their terminal. Now, the master trip relay has been replaced which is having standard operating voltage i.e., 150V. POWERGRID (NR-3) representative informed that 2nd incident of fault occurred due to damage of valve cooling pipe which has been replaced.*

B.3.4 **NRLDC *representative emphasized that A/R (auto re-closer) issue was found in many of these tripping. He sensitized all the utilities to ensure healthiness/in service of A/R in 220 kV and above transmission lines in compliance to CEA Grid Standards. He further informed that most of the tripping are transient in nature but due to non-operation of A/R, it resulted into tripping of the transmission element thus reducing the reliability of the grid. All the utilities shall endeavour to keep auto re-closer in service and healthy condition of 220***

kV and above voltage level transmission line. The issue of time syncing of DR/EL at many of the stations was highlighted, constituents were requested to ensure the time syncing of DR/EL. In addition, necessary actions also need to be taken to ensure the Right of Way and other operation & maintenance issues to minimize the frequent faults in the line. All utilities agreed for the same.

B.3.5 NRLDC representative also suggested members to organize the training programs for site engineers regarding DR/EL extraction and their uploading on TMS. It will help SLDC in ensuring timely submission of DR/EL and further analysis of the event

B.3.6 **EE (P), NRPC suggested utilities to train their engineers at sub-stations via video-conferencing. Engineers at sub-station should be capable enough to extract DR/EL and to upload on NRLDC tripping portal. By this decentralized way, DR/EL upload may be ensured timely as uploading of DR/EL/analysis report at centralized level is causing delay in timely analysis of incidents.**

B.3.7 **PSC forum reiterated that frequent outages of such elements affect the reliability and security of the grid. Members were requested to investigate such frequent outages and share the suitable 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:

The list of major tripping events occurred during December 2024 is attached as Annexure-B.IV of agenda. Concerned constituents/utilities were requested to share the detailed analysis of the tripping elements along with status of remedial action taken/to be taken.

Utilities were requested to prepare detailed analysis report and present the event details during 56th PSC meeting. Events involving more than one utility may be jointly prepared and presented.

Discussion during the meeting:

Tripping Events

A. Multiple element tripping event at 400kV Jaisalmer(RS) at 12:13 hrs on 11th December, 2024

Discussion during the meeting:

i. Brief of the event shared by NRLDC representative based on detail available is as follows:

- 400/220kV Jaisalmer (RS) has one and half breaker scheme at 400kV level and double main and transfer bus scheme at 220kV level.
- During antecedent condition, Renew Solar, Fortum Solar, ACME Aklera and Clean solar was injecting approx. 109 MW, 236 MW, 267 MW and 245 MW respectively to Jaisalmer(RS) at 220kV level. Active power was going out to Akal (RS) through 220kV Jaisalmer (RS)-Akal Ckt-1 & 2 carrying approx. 253 MW each. 400/220 kV 500 MVA ICT 1 & 3 at Jaisalmer (RS) were carrying approx. 261 MW and 248 MW respectively from 220kV level to 400kV level.
- As reported, at 12:13 hrs, 400/220 kV 500 MVA ICT 1 & 3 tripped along with 220KV lines of Renew Solar, Fortum Solar, ACME Aklera and Clean solar connected from 220KV Jaisalmer(Exact reason for tripping needs to be shared).
- As per PMU at Fatehgarh3(PG), no fault is observed.
- During this event, as per SCADA, solar generation loss of approx. 835 MW is observed in Rajasthan control area.
- As per SCADA, no change in demand is observed in Rajasthan control area.
- Major observations:
  - Exact reason of tripping need to be shared.
  - DR/EL (.dat/.cfg file) of all tripped elements along with detailed tripping report not received yet. Same need to be shared.
  - Remedial action taken report need to be shared.

ii. RVPNL representative and others informed the following:

- There was no fault in system. Tripping occurred during maloperation of LBB relay during shifting of elements from one bus to another bus to avail shutdown for reconfiguration of LBB relay.
- Issue with the LBB relay at Jaisalmer S/s has been rectified. OEM has reconfigured the relay and testing of the same has also been done. Relay is working properly now.

NRLDC representative requested RVPNL to ensure healthiness of protection system.

PSC Recommendations:

- *RVPNL shall ensure the healthiness of protection system and their proper operation.*
- *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. Multiple element tripping event at 400/220kV Basti(UP) at 12:02 hrs on 12th December, 2024

Discussion during the meeting:

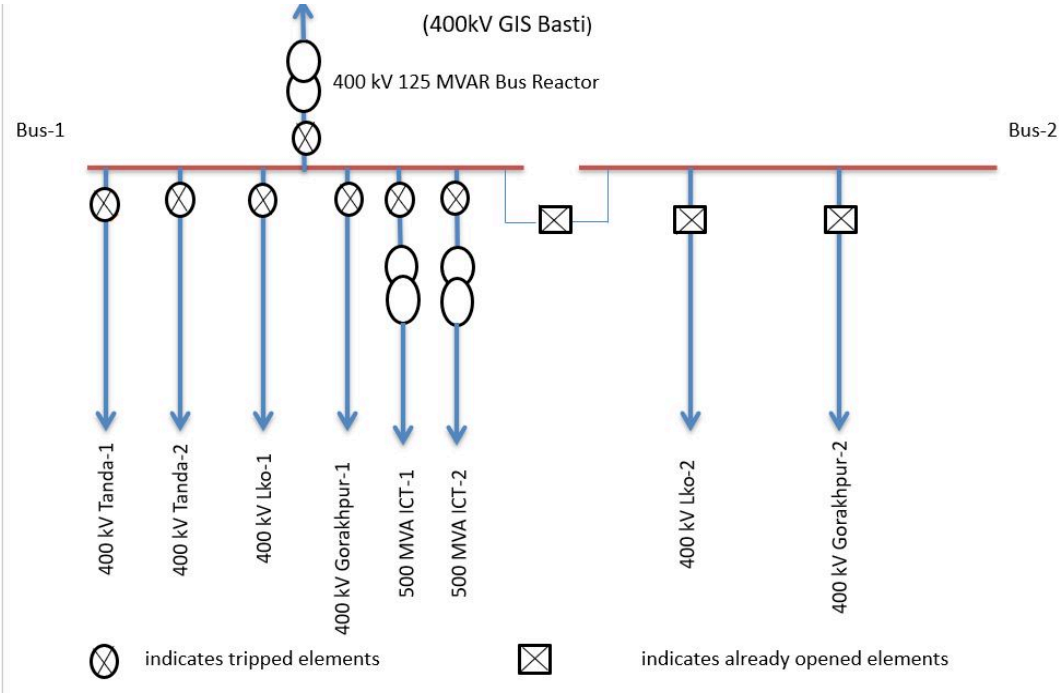
i. Brief of the event shared by NRLDC representative based on details available is as follows:

- During antecedent condition, 400/220 kV 500 MVA ICT 1 and ICT 2 at Basti was carrying approx. 97 MW each. 400KV Gorakhpur (PG)-Basti (UP) (PG) Ckt-2 and 400 KV LUCKNOW_1(PG)-BASTI(UP) (PG) CKT-2 was in open condition and site engineers were checking wiring of LBB and carrying out Circuit Breaker at Basti end .
- As reported, at 12:02 hrs, during CB timing testing of 400 KV LUCKNOW_1(PG)-BASTI(UP) (PG) CKT-2 (Z1) Bus-Bar protection operated due to malfunction of 89A Gas density Monitor.
- This led to the tripping of both 400KV Bus-I & II and the elements connected with them.
- As per PMU at 400KV Lucknow (PG), no fault in system is observed.
- SCADA data of 400/220 kV 500 MVA ICT 3 was in suspected condition before and tripping the tripping incident.
- As per SCADA, change in demand of approx. 140MW is observed in UP control area.
- **Major observations:**
  - Exact cause of maloperation need to be shared.

- Standard Operating procedure needs to be followed during Testing of Electrical Equipment's at the site.
- SCADA data of 400/220kV ICT-3 was not healthy during the event. Availability and healthiness of SCADA data need to be ensured.
- Remedial action taken report need to be shared.

ii. UPPTCL representative and others informed the following:

SLD diagram and bus arrangement of 400/220kV Basti during antecedent condition



- 400kV Lucknow-II & Gorakhpur-II were under shutdown along with 400kV Bus-II at Basti (UP). Bus coupler was in open condition. All other elements were connected to 400kV Bus-1 at Basti (UP). Shutdown was going on to rectify the spurious operation of bus bar protection during past event.
- GE Engineers were onsite to rectify aforesaid problem & in parallel CB timing testing of 400kV LKO-2nd bay was also going on by firm engineer. After event flag found on LKO-2nd LCC Panel-89A ,RYB-PH, GD-2, Compressor Gas pressure low Second stage Alarm blocked out (<0.45 MPA).
- However, actual gas pressure was found normal (0.55 MPa). CB timing testing was being done at lucknow-2nd ckt. During repeated operation of CB C-O testing positive DC supply taken for C.B. analyzer was

accidentally extended to K605 wire of KGD-2 contractor which gave annunciation of 2nd stage low gas leakage contact of 89A of 400kV LKO-2nd line and gave command to the busbar relay protection and all the bays installed on busbar 1 opened.

NRLDC representative stated that frequent incidents of multiple elements tripping due to some maloperation during testing work have observed in recent past. Special precautions need to be taken during any testing work at S/s so that unwanted tripping shall not occur.

PSC Recommendations:

- *Members may ensure that special precautions need to be taken during any testing work at substations to avoid any unwanted tripping.*

C. Multiple element tripping event at 220kV Bhiwani(BBMB) at 10:41 hrs on 13th December, 2024

Discussion during the meeting:

i. Brief of the event shared by NRLDC representative based on detail available is as follows:

- During antecedent condition, 220 KV Bhiwani-Charkhi Dadri (BB) Ckt-4, 220 KV Bhiwani-Charkhi Dadri (BB) Ckt-2 and 220 KV Bhiwani (HV)-Bhiwani (BB) (HVPNL) Ckt-2 were carrying appx. 18MW, 17MW and 186 MW respectively.
- As reported, at 10:41 hrs, load shifting from 220KV Bus-2 to Bus-1 at 400/220KV Bhiwani was being done to avail shutdown of 220KV Bus-2 under annual maintenance. During load shifting Bus Bar protection operated causing tripping of 220KV Bus-2 and all the elements connected to it.
- At the same time, 220 KV Bhiwani (HV)-Bhiwani(BB) (HVPNL) Ckt-1 also tripped which was connected to 220kV Bus-1 (exact nature of protection operated yet to be shared). Detailed report of the tripping is yet to be furnished from SLDC end.
- As per PMU at Bhiwani (BBMB), Y-B phase to phase fault is observed with fault clearing time of ~120 ms.
- As per SCADA, 40MW loss occurred in Haryana control area.

- Major observations:
  - Detailed report related to protection operation needs to be shared by both BBMB and SLDC Haryana.
  - Exact reason for triggering of Bus-Bar protection needs to be shared.
  - DR/EL (.dat/.cfg file) along with tripping report need to be shared for each element from both the ends.
  - Remedial action taken report to be shared.

ii. BBMB representative and others informed the following:

- Bus fault occurred on Bus-2 due to snapping of conductor of 220kV Bhiwani-Bapora ckt which fell on Bus-2.
- All the elements connected at 220kV Bus-2 tripped. Elements connected at 220kV Bus-1 remained intact.

NRLDC representative raised concern over non-submission of DR/EL files. BBMB was requested to ensure timely submission of tripping details so that analysis pf event could be done in time.

BBMB agreed to share all the details within 1-2 days.

PSC Recommendations:

- *BBMB shall share the DR/EL & tripping details within one week.*
- *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.*

D. Multiple elements tripping at 220kV Mehalkalan(PS)on at 13:48 hrs on 27th November, 2024

Discussion during the meeting:

i. Brief of the event shared by NRLDC representative based on detail available is as follows:

- 220/66kV Mehalkalan has double main bus scheme at 220kV level.

- As reported at 13:48 hrs, Bus Bar protection operated due to the damage in B-phase Circuit Breaker limb of 220 KV PAKHOWAL(PSTCL)- MEHAL- KALAN(PS) (PSTCL) CKT-1 (details yet to be furnished).
- Due to the operation of Bus Bar protection all the elements connected in the 220KV system tripped. Complete blackout occurred at 220kV Mehal_Kalan S/s.
- As per PMU at Moga (PG), R-N phase to earth fault with fault clearing time of 120ms is observed.
- As per SCADA, change in demand of approx. 20 MW is observed in Punjab control area.
- **Major observations:**
  - Exact reason for Bus-Bar protection needs to be shared.
  - DR/EL (.dat/.cfg file) of all the tripped elements along with detailed tripping report need to be shared from both the ends.
  - Remedial action taken report to be shared.
  - SCADA data availability needs to be ensured.
  - Remedial action taken report to be shared.

PSTCL representative stated that they couldn't analyse the grid event. DR/EL & tripping details are yet to be collected. They will share the tripping analysis within one week.

NRLDC representative raised concern over non-submission of DR/EL & tripping analysis. PSTCL was requested to ensure submission of tripping details within time and also analyse multiple elements tripping event on priority.

<u>PSC Recommendations:</u>

- *PSTCL shall share the DR/EL & tripping details within one week.*
- *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.*

E. Multiple elements tripping at 220kV CB Ganj(UP) at 15:56 hrs on 29th December, 2024

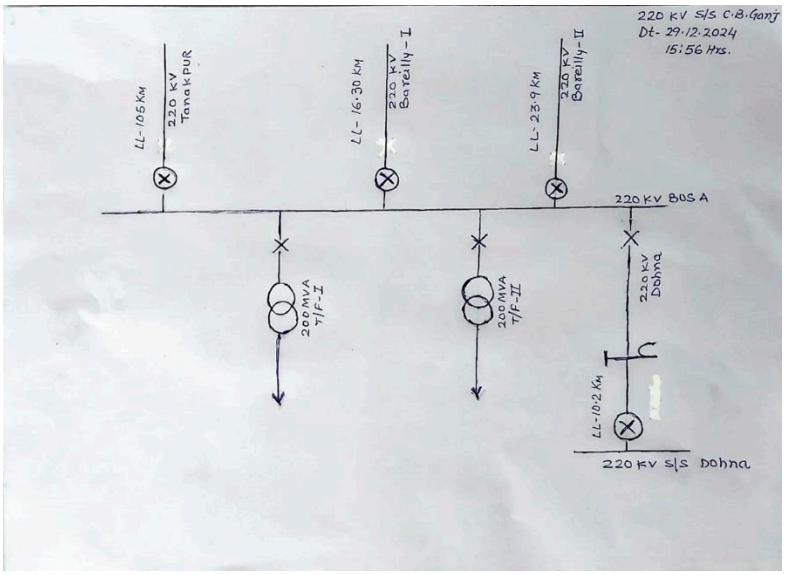
Discussion during the meeting:

i. Brief of the event shared by NRLDC representative based on detail available is as follows:

- 220/132kV CB Ganj (UP) has double main and transfer bus scheme at 220kV level. 220KV Rosa – CB Ganj line was not in service.
- During the antecedent condition, 2 generators at Tanakpur were generating 19MW (Unit-2) and 16MW (Unit-3).
- As reported at 15:56 hrs, 220kV CB Ganj-Dohna ckt tripped on Y-B phase to phase fault, fault distance was ~7.23km (Z-1) from CB Ganj end. At the same time, all the other lines connected to 220 CB Ganj (except 220kV CB Ganj-Sitarganj) and 220kV Tanakpur-Sitarganj ckt also tripped. 220 KV TANAKPUR(NH)-SITARGANJ(PG) (PG) CKT tripped due to Y-B phase to phase fault with fault current of 1.14KA. The fault was in Zone-3.
- Further, 132kV Tanakpur-Mahindernagar ckt was hand tripped for safety purpose leading to tripping of 31.4 MW Unit-2&3 at Tanakpur HEP due to loss of evacuation path.
- As per PMU at Bareilly (PG), Y-B phase to phase fault with delayed fault clearing time of 920ms is observed.
- As per SCADA, change in demand of approx. 27 MW is observed in Uttar Pradesh control area.
- **Major observations:**
  - Exact nature and location of fault need to be shared.
  - Reason of delayed clearance of fault need to be shared.
  - Sequence of tripping of elements need to be shared.
  - Reason of tripping of all the line along with details of protection operated need to be shared.
  - DR/EL(.dat/.cfg file) of all the tripped elements along with detailed tripping report need to be shared from both the ends. (UP end DR are not received)
  - Whether Tanakpur-CB Ganj ckt tripped or not?
  - Remedial action taken report to be shared.

ii. UPPTCL representative and others informed the following:

- Elements connected to 220kV Bus-1 were as per below diagram:



- 220kV Bareilly-I&II, Dohna, Tanakpur, 200 MVA Trf-I&II were connected to 220kV Bus-1. All the other elements were connected to 220kV Bus-2. Bus coupler was in open condition.
- At 15:56 hrs, fault occurred on 220KV Dohna line, line trip from Dohna end but breaker didn't trip at 220KV CB Ganj end due to which fault reflected to 220KV bus-1.
- During investigation it was found that, PT fuse fail alarm was persisting in Dohna line at CB Ganj end due to which distance protection was in blocked condition. Site engineer didn't attend this alarm.
- This fault was in back up distance protection zone from remote end of the lines and in Z-4 zone for other feeders at CB Ganj end (connected to Bus-1).
- 220kV Bareilly-I line tripped in Z-4. 220kV Bareilly line tripped on phase over current protection before Z-4. Overcurrent protection was inadvertently ON in this lines, same has been disabled now.
- Z-4 in Tanakpur line picked up with some delay. Before Z-4 time delay of this line from CB Ganj end, 220kV Sitarganj-Tanakpur line tripped from Sitarganj end in Z-3.
- During investigation w.r.t. protection non-operation at in Dohna line, it was found that Line PT was not available on Relay measurements & PT fuse of all R,Y,B Phase were found broken in Switch Yard (PT Terminal

box) and also cable from relay Panel to PT Junction box for both Main & Backup Protection core, was found damaged due to which Distance and Back up Protection was Blocked and Protection not Operated.

- PT Fuse of all Phases has been replaced of 220KV Dohna Line (Faulty Line). Cable from Relay Panel to PT Junction box for both Main & Backup Protection core has been replaced.

NRLDC representative raised concern over non-attending of alarms at site. UPPTCL was requested to sensitise the site engineer about important alarms and practice to attend those alarms on priority.

UPPTCL representative stated that they have sensitised the site engineers in this regard. However, they will take further necessary actions.

PSC Recommendations:

- *UPPTCL shall sensitise the site engineer about important alarms and practice to attend those alarms on priority.*
- *Healthiness of protection system and their proper operation need to be ensured.*
- *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.*

F. Multiple element tripping event at 400/220kV Bikaner(RS) at 18:05 hrs on 14th December, 2024

Discussion during the meeting:

i. Brief of the event shared by NRLDC representative based on detail available is as follows:

- During antecedent condition, 400/220 kV 315 MVA ICT 1 and ICT 2 at Bikaner(RS) was carrying approx. 240MW each. 400KV Bikaner-Sikar(PG) Ckt-2 and 220kV Bikaner-Dungargarh (RS) line were in open condition.

- As reported, at 18:35 hrs, Y phase isolator on 220KV side of 400/220 kV 315 MVA ICT 2 at Bikaner(RS) burnt and tripped.
- As per PMU at Bhadla(PG), R-Y fault in system is observed with delayed fault clearance of 760ms .
- Due to tripping of ICT-2, SPS implemented at Bikaner(RS) S/s related to overloading of remaining ICTs after tripping of any ICT operated. As per SPS scheme, 220kV Bikaner-Nokha (RS) line and 220kV Bikaner-Dungargarh (RS) line should open. However, 220kV Bikaner-Dungargarh (RS) line was already in open condition.
- During the event, both 400/220kV 315MVA ICT-1&2 tripped. At the same time, 125 MVAR BUS REACTOR NO 2 AT 400KV BIKANER(RS) also tripped due to Backup Impedance protection operation.
- As per SCADA, change in demand of approx. 400MW is observed in Rajasthan control area.
- As observed, the SCADA data remained frozen upto 18:10 hrs and subsequently became unavailable after 18:10hrs.
- **Major observations:**
  - Exact location of fault need to be shared.
  - Exact details of SPS operation need to be shared.
  - Expeditious actions need to be taken to commission the new 220kV Isolator at Bikaner(RS) to ensure N-1 compliance at 400/220kV Bikaner(RS) S/s.
  - SCADA data of 400/220kV Bikaner(RS) S/s was not healthy during the event. Availability and healthiness of SCADA data need to be ensured.
  - Remedial action taken report need to be shared.
  - Reasons for operation of Backup Impedance protection of 125 MVAR BUS REACTOR NO 2 needs to be shared.
  - DR/EL (.dat/.cfg file) along with tripping report need to be shared for each element from both the ends.

ii. RVPNL representative and others informed the following:

- Bus fault occurred due to burning of R & Y phase isolator on 220KV side of 400/220 kV 315 MVA ICT 2 at Bikaner(RS).

- Bus bar protection was not healthy during the event due to faulty FO cable (interconnecting cables).
- Due to this, all the feeders tripped in Z-4 and later ICTs tripped on OC E/F protection.
- Case for replacement of FO cable is in process and will be resolved during commissioning work of new 500 MVA transformed at Bikaner(RS). Commissioning of ICT is panned in April 2025.

NRLDC representative requested RVPNL to expedite the resolution of issue related to FO cable in bus bar protection. Different protection related issues are being observed in almost all the RE evacuating stations in Rajasthan. Healthiness of protection system at all these stations is very important.

RVPNL representative agreed to taken necessary action on priority

PSC Recommendations:

- *RVPNL shall resolve the issue with the bus bar protection at Bikaner(RS) at the earliest.*
- *Healthiness of protection system and their proper operation need to be ensured.*
- *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.*

G. Multiple element tripping event at 220kV Dausa(RS) at 11:30 hrs on 29th December, 2024

Discussion during the meeting:

i. Brief of the event shared by NRLDC representative based on detail available is as follows:

- 220/132kV Dausa(RS) has double main and transfer bus scheme at 220kV level.

- During antecedent condition, 220 kV Alwar(RS)-Dausa(RS) Ckt and 220 kV Lalsot(RS)-Dausa(RS) Ckt were not in service.
- As reported, at 11:30 hrs, heavy sparking in the isolator of the 220 KV BASSI(PG)-DAUSA(RS) (PG) CKT-1 resulted into snapping of conductor and line tripped.
- At the same time, all the elements connected to both the 220kV buses tripped and there was no source of supply at 132kV level, complete blackout occurred at 220/132kV Dausa(RS) S/s.
- As per PMU at Bassi(PG), R-B phase to phase fault with delayed fault clearing time of 480ms is observed.
- As per SCADA, change in demand of approx. 308 MW is observed in Rajasthan control area.
- **Major observations:**
  - Exact location and nature of fault?
  - Sequence of tripping of elements need to be shared.
  - Reason of delayed clearance of fault (480msec)
  - Reason of tripping of all the line along with details of protection operated need to be shared.
  - SCADA data at 220/132kV Dausa(RS) freezed after the event. Availability and healthiness of the same need to be ensured.
  - DR/EL (.dat/.cfg file) of elements pertaining to Rajasthan control area not received yet.
  - Remedial action taken report to be shared.

ii. RVPNL representative and others informed the following:

- During shifting of 220kV Bassi-I from Bus-1 to Bus-2 to attend the hotspot on line, ph-ph fault occurred.
- NRLDC showed the DR files of Bassi end, which showed that Line-1 tripped from Bassi end in Z-2 with carrier. It indicates, R-Y fault on 220kV Dausa-Bassi line-I with Z-1 from Dausa end and Z-2 from Bassi end.
- Furthe, DR of Bassi-II, showed that Bassi-II tripped from Bassi end in Z-2 with Z-2 time delay. This shows that fault didn’t clear in time from Dausa end.

- On query of non-clearance of fault from Dausa end, it was informed that one of the relay (static type) was faulty and other relay (numerical type) didn't operated due to PT fuse fail alarm.
- Case of replacing stating relays with numerical relays has already been initiated. To address the issue of PT fuse fail, PT selection will be switched from bus PT to line PT. Three number of relays are available and shall be replaced in priority in Bassi-I&II and Sawaimadhopur feeder.

NRLDC representative requested RVPNL to take necessary corrective action and ensure healthiness of protection system. Non availability of one of the main protections will affect the security and reliability of protection system. Therefore, this issue need to be addressed on priority.

PSC Recommendations:

- *RVPNL shall expedite the replacement of static relays with numerical relay.*
- *Healthiness of protection system and their proper operation need to be ensured.*
- *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.*

Grid event analysis details of all the aforementioned grid incidents is attached as **Annexure-B.I**.

B.4 Details of tripping of Inter-Regional lines from Northern Region for December'24

B.4.1 A total of 8 inter-regional lines tripping occurred in the month of December'24. The list is attached at Annexure-B.V of agenda**.** 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.

B.4.2 NRLDC representative asked the nature of fault in 220kV Ranpur-Bhanpura Line. DR/EL of this tripping not received, and PMU is also not available nearby. RVPNL representative informed that the line is being maintained by ADANI (in PPP mode). They will discuss the tripping incident with ADANI and share the details.

B.4.3 Regarding tripping of 500 KV HVDC Mahindergarh(APL)-Adani Mundra(APL) (ATIL) Ckt-2, ADANI representative stated that this was due to operation of TDM (Time Division Multiplexing) bus bar protection. This bus is mainly used for communication to control system.

B.4.4 NRLDC representative stated that tripping of HVDC Mundra-Mahindergarh pole on TDM bus bar protection was observed in last month also. Frequent tripping of high capacity HVDC link will affect the security and reliability of the grid.

B.4.5 ADANI representative stated that they will communicate the concerned officials regarding this and will ensure necessary actions in this regard.

B.4.6 NLRDC representative requested all the members to please note and advise the concerned for taking corrective action to avoid such tripping as well as timely submission of the information.

PSC forum recommended members to take necessary actions to minimise the tripping on inter regional line and ensure proper operation of protection system.

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

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 53 numbers of System Protection Scheme (SPS) approved in Northern Region out of which 05 number of SPS are under implementation stage. These SPS are implemented at major generation complexes, important evacuating transmission lines and ICTs which are N-1 non-complaint. Details of SPS in Northern Region is available on NRLDC website at link https://nrldc.in/download/nr-sps-2024/?wpdmdl=13255&lang=en .

B.5.4 NRLDC representative stated that 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 / utility were requested to share the tentative schedule plan for conducting mock testing of SPS in their respective control area during 2024-25 in format attached as Annexure-B.VI of agenda. 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 meeting since May 2024.

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

B.5.7 DTL representative stated that they conduct test once in a year. They will share the date of mock test conducted of SPS in Delhi control.

B.5.8 PSTCL representative stated that mock testing of SPS at Rajpur S/s will be done in next week only (by the ned of January 2025).

B.5.9 Regarding unhealthy SPS system at Gr. Noida & Unnao, UPPTCL representative informed that issue has been raised and sent to head quarter for further actions. Regarding SPS at Sultanpur, it was informed that SPS is no longer due to change in network configuration and load shifting.

B.5.10 NRLDC requested UPPTCL to further review different aspects, future planning and share the confirmation.

B.5.11 NRLDC representative requested POWERGRID to review the SPS document and share the tentative schedule plan of mock testing of SPS of their control area.

B.5.12 It was further requested to all the constituents to review the existing SPS schemes in their control area. At many of the stations, augmentation of ICTs has already done. So, review *of requirement of SPS by taking consideration of load enhancement in near future may be done. In view of this, concerned members were requested to share their input for further discussion in this regard.*

PSC forum requested members 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 after conducting mock test.

B.6 Corrective action for healthiness of 500kV Mundra-Mahindergarh SPS

B.6.1 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.6.2 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.

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 the all the communication link healthy. POWERGRID & ADANI shall review the healthiness of SPS system at different load centres and 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.6.3 Load end details have been received from UP, Haryana, Punjab Rajasthan & Delhi. Details are attached as Annexure-B.VII of agenda.

B.6.4 ADANI 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.6.5 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.6.6 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.6.7 ADANI agreed for the same and stated that update would be given within 01 week. However, no detail received yet from ADANI.

B.6.8 During discussion in 54th PSC meeting also there was no further update received from ADANI team.

B.6.9 During 55th PSC meeting, ADANI representative stated that there are basically communication related issues at various location involved in this scheme. OEM / vendor has been assigned and instructed to inspect all the stations and list out the different issues. After compilation of all the issues comprehensive action plan would be shared. Further, issue related to coordination & communication with the state nodal officers was highlighted by ADANI representative.

B.6.10 NRLDC representative emphasized that ADANI shall take lead as this SPS scheme was commissioned by them and further stated that details of nodal officers will be provided. States were also requested to ensure proper coordination from their end. Further, states were also requested to ensure incorporation of revised decided feeders during work at their stations.

B.6.11 States representative assured to provide all necessary coordination from their end.

B.6.12 During 56th PSC meeting, ADANI was requested to apprise the forum about the

present status of remedial actions.

B.6.13 ADANI representative stated that they have raised 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.

B.6.14 *NRLDC representative requested ADANI to ensure completion of whole work before summer 2025. State representatives were also requested to coordinate with the ADANI team and also ensure incorporation of identified revised feeders for load relief in SPS.*

PSC forum emphasized the importance of 500kV Mundra-Mahindergarh SPS and its healthiness is important to ensure rectification of issue sin SPS system before summer 2025. 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.

B.7 Confirmation of implemented protection settings at site in line with the approved NRPC protection philosophy

B.7.1 After due deliberation of NRPC PSC forum, protection settings of Transmission line, ICTs and Shunt Reactors have already been finalised and same is available on NRPC website with link http://164.100.60.165/protection/Annexure-XIV(finalized_ICT_Reactor_Philosophy_22.10.2024).pdf

B.7.2 NRLDC representative stated that Protection philosophy was made to ensure uniform implementation of protection settings throughout the Northern Region and it is also being used by all the NR constituents as a reference. Uniform protection philosophy ensures coordinated operation of protection system and enhances grid security.

B.7.3 Further it was highlighted that sometimes deviation from the protection philosophy is being observed during analysis of grid events and during FTC applications. Majorly deviation such as keeping phase overcurrent protection in line, improper protection coordination, non-operation of A/R or carrier aided scheme, incorrect protection

settings have been observed. Recently a grid disturbance occurred in Eastern Region at 400kV Barh S/s (Thermal Power Station) in which multiple lines tripped on overcurrent protection. Complete generation of Barh TPS (1790 MW) affected due to loss of evacuation path. If overcurrent protection wouldn't have there in lines, this grid disturbance would have not occurred.

B.7.4 In view of above, NRLDC requested all the constituents to ensure that all the protection system in their respective control area are in line with the NRPC approved protection philosophy. Members were requested to review the protection system of their control area and share the confirmation.

PSC forum requested all the members to ensure healthiness of protection system in their respective control area. Protection settings need to be kept in line with the NRPC approved protection philosophy. Any changes in protection settings need to be done after prior approval of NRPC.

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 December-2024

C.1.1 EE (P), NRPC mentioned that NRLDC has submitted the list of FTCs allowed in month of Dec-2024. 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. However, none of the following utilities (whose FTCs has been allowed) have submitted agenda:

i. RVPNL
ii. PATRAN
iii. POWERGRID SIKAR TRANSMISSION LTD
iv. AMP Energy Green Four Private Limited
v. AYANA RENEWABLE POWER THREE PRIVATE LIMITED (ARP3PL)
vi. Serentica Renewables India 5 Pvt Ltd (SRI5PL)
vii. PBTSL
viii. Juniper_GCPL

C.1.3 It is 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

C.1.4 *MS, NRPC stated that utilities should take approval as procedure has been approved by forum only and it is requirement of IEGC 2023.*

C.1.5 *CGM (SO), NRLDC stated that FTCs are allowed only to facilitate timely commissioning of elements but utilities have to ensure approval of forum.*

Decision required from Forum:

Members were requested to put up agenda timely for approval of settings.

C.2. Final approval of protection settings of new element of HPPTCL charged in Dec-2024 (agenda by HPPTCL)

C.2.1 EE(P), NRPC apprised that HPPTCL vide letter dated 08.01.2025 has intimated that FTC has been accorded by HPSLDC for following elements:

Sr. No.	Element Name	FTC accorded by
1.	220 kV Lahal Heiling ckt. from 400/220/33 kV GIS S/stn. at Lahal to 220/66 kV GIS S/stn. of HPPTCL at Heiling	HPSLDC (in Dec, 2024)
2.	220 kV Heiling- Holi ckt. from 220/66 kV GIS S/stn. of HPPTCL at Heiling to GMR Bajoli Holi (3x60 MW HEP) at Holi	
3.	220/66 kV Power Transformer at Heiling S/stn. of HPPTCL	
4.	132 kV Sunda-Tangnu ckt. from 220/132/66 kV GIS S/stn. of HPPTCL at Sunda (**Anti theft charging on no load**)	

C.2.2 Settings received from HPPTCL is available at NRPC website: http://164.100.60.165/meetings/prsub.html

C.2.3 Forum approved the settings.

Decision required from Forum:

Forum approved the settings.

C.3. Approval of protection setting of UHL Stage-III (100 MW) HEP of HPSEBL (agenda by HPSLDC)

C.3.1 EE(P), NRPC apprised that HPSLDC vide mail dated 10.01.2025 has informed that HPSEBL has proposed for first time charging of UHL Stage-III (100 MW) HEP during January-2025.

C.3.2 Settings received from HPSLDC is available at NRPC website: http://164.100.60.165/meetings/prsub.html

C.3.3 It was observed that elements are of voltage level below 220 kV. Accordingly, it was suggested that HPSLDC may allow FTC at its level. There is no requirement for approval of PSC forum for elements below 220 kv.

Decision required from Forum:

HPSLDC may allow FTC at its level. There is no requirement for approval of PSC forum for elements below 220 kV.

*****

Address List

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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.*		

Annexure-P

56th Protection Sub-Committee Meeting held on 20.01.2025

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Annexure-A.I

Status of action taken on decision of 55th PSC

S.N.	Agenda No.	Agenda	Decision of 55th PSC	Status of action Taken (after discussion in 56th PSC)
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. BBMB representative conveyed that indices will be submitted shortly. ii. PSTCL was requested to send the performance indices timely. PSTCL representative agreed to ensure the same. iii. NTPC was again requested to communicate Meja Urja Nigam Limited for submitting the protection performance indices.	i. BBMB has sent Dec-24 indices on 20.01.2025. ii. PSTCL has sent indices for Oct and Dec-24. iii. Indices awaited from Meja as well as some stations of NTPC.
2	A.4	Annual protection audit plan for FY 2024-25 and third-party protection audit plan (agenda by NRPC Secretariat)	Utilities were requested to submit the Annual Internal Protection Audit plan for FY 2024-25 and third-party protection audit plan at the earliest	Agenda was discussed in 56th PSC.

Status of action taken on decision of 55th PSC

3	A.13	Tripping of Rihand Stage-3 Units, during Monopole Ground Return Mode Operation of Rihand Dadri HVDC line (agenda by NTPC)	Forum was of view that there is no further deliberation required as a committee has been formed.	Committee has been constituted.
4	B.1	Status of remedial actions recommended during previous PSC meetings	Forum requested members to take necessary preventive measures to avoid such grid incidents / disturbances in future and report actions taken by respective utilities in OCC & PSC forum. Moreover, utilities may impress upon all concerned for providing the Preliminary Report, DR/EL & detailed report of the events to RLDC in line with the regulations.	Agenda was discussed in 56th PSC.
5	B.8	Corrective action for healthiness of 500kV Mundra-Mahindergarh SPS (agenda by NRLDC)	M/s ADANI was requested to take the lead, coordinate with the respective states to rectify the issues in the SPS system and share action plan along with the status of remedial action taken / planned to be taken.	Agenda was discussed in 56th PSC.

Annexure-A.II

Status of perfomance indices report of December 2024 (Last date of submission 07.01.2025)							
S. No.	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	08.01.2025	NR-1	No	NA
			Yes	17.01.2025	NR-2	Yes	Yes
			Yes	13.01.2025	NR-3	No	NA
2	NTPC	Central Generating Company	Yes	07.02.2025	Anta		
			No		Auriya		
			Yes	20.01.2025	Dadri	No	NA
			Yes	08.01.2025	Koldam	No	NA
			Yes	07.01.2025	Rihand	No	NA
			No		Singrauli		
			Yes	07.01.2025	Unchahar	No	NA
			Yes	07.01.2025	Tanda	No	NA
3	BBMB		Yes	22.01.2025		NO	NA
4	THDC		Yes	09.01.2025			
5	SJVN		Yes	07.01.2025		No	NA
6	NHPC		Yes	02.01.2025		Yes	Yes
7	NPCIL		Yes	06.01.2025	RAPS-5&6	No	NA
			Yes	09.01.2025	RAPS-B	No	NA
8	DTL	State Transmission Utility	Yes	09.01.2025		Yes	Yes
9	HVPNL		Yes	07.01.2025		No	NA
10	RRVPNL		Yes	09.01.2025		Yes	Yes
11	UPPTCL		Yes	03.01.2025	Meerut Circle	Yes	Yes
			Yes	04.01.2025	Agra Circle	No	NA
			Yes	07.01.2025	Jhansi Circle	No	NA
			Yes	07.01.2025	Prayagraj Circle	No	NA
			Yes	07.01.2025	Gorakhpur Circle	Yes	Yes
			Yes	07.01.2025	Lucknow Circle	No	NA
			Yes	07.01.2025	Sultanpur Circle	No	NA
12	PTCUL		Yes	09.01.2025		No	
13	PSTCL		Yes	12.01.2025		Yes	Yes
14	HPPTCL		Yes	08.01.2025		No	
15	IPGCL	State Generating Company	Yes	04.01.2025		No	
16	HPGCL		No				
17	RRVUNL		Yes	07.01.2025			
18	UPRVUNL		Yes	03.01.2025	Parichha 400 kV	Yes	Yes
			Yes	07.01.2025	Parichha 220 kV	No	NA
			Yes	06.01.2025	DTPS Anpara	No	NA
			Yes	07.01.2025	Obra 765 kV	No	NA
			Yes	07.01.2025	Obra 400 kV	No	NA
			Yes	07.01.2025	Harduaganj 400 kV	No	NA
			Yes	07.01.2025	Ghatampur 765 kV	No	NA
			Yes	07.01.2025	Anpara-A&B	No	NA
			No		Jawaharpur		
19	UJVNL		Yes	03.01.2025	Dharasu and Tiloth Power House	No	NA
20	HPPCL		Yes	19.01.2025	Kashang HEP	No	NA
			Yes	19.01.2025	Sawara Kuddu	No	NA
			Yes	19.01.2025	Sainj	No	NA
21	PSPCL	State Generating Company & State owned Distribution Company	Yes	01.01.2025	RSD	No	NA
			Yes	09.01.2025	GGSTPS, Rupnagar	No	NA
			No		GHSTPS, Lehra Mohabbat		
22	HPSEBL	Distribution company having Transmission connectivity ownership	Yes	08.01.2025	Hamirpur Circle	No	NA
			Yes	16.01.2025	Shimla Circle	No	NA
23	Prayagraj Power Generation Co. Ltd.	IPP having more than 1000 MW installed capacity	Yes	03.01.2025		No	NA
24	Aravali Power Company Pvt. Ltd		No				
25	Apraava Energy Private Limited		Yes	15.01.2025		No	NA
26	Talwandi Sabo Power Ltd.		Yes	09.01.2025		No	NA
27	Nabha Power Limited		Yes	17.01.2025		No	NA
28	MEIL Anpara Energy Ltd		Yes	03.01.2025		No	NA
29	Rosa Power Supply Company Ltd		Yes	07.01.2025	No	No	NA
30	Lalitpur Power Generation Company Ltd		Yes	07.01.2025	No	No	NA
31	MEJA Urja Nigam Ltd.		Yes	20.01.2025		No	NA
32	Adani Power Rajasthan Limited		Yes	08.01.2025		No	NA
33	JSW Energy Ltd. (KWHEP)		Yes	06.01.2025		No	NA
34	RENEW Power Pvt Ltd	RE Generating Company having more than 1000 MW installed capacity	No				
35	NTPC Green Energy Limited		No				
36	Azure Power India Pvt. Ltd.		No				
37	Avaada Energy Private Limited		No				
38	Adani Green Energy Limited		No				
39	Tata Power Renewable Energy Ltd.	IPP having less than 1000 MW installed capacity (alphabetical rotaional basis)	Yes	09.01.2025			
40	UT of J&K	UT of Northern Region	No				
41	UT of Ladakh		No				
42	UT of Chandigarh		No				
	Non-Member Utilities		No				
43	INDIGRID		Yes	13.01.2025		Yes	Yes
44	POWERLINK		No				
45	ADHPL		Yes	07.01.2025		No	
46	Sekura Energy Limited		No				
47	Adani Energy Solution Limited		Yes	06.01.2025		No	
	State Utilities						
48	Vishnuprayag Hydro Electric Plant (J.P.)		Yes	07.01.2025		No	
49	Alaknanda Hydro Electric Plant (GVK)		Yes	07.01.2025		Yes	No
50	Khara Power House (Khara)		Yes	07.01.2025		No	
51	WUPPTCL		Yes	03.01.2025		No	
52	SEUPPTCL		Yes	07.01.2025		No	
53	Obra-C Badaun Transmission Ltd		Yes	06.01.2025		No	

Reason for Performance Indices less than Unity- December 2024 (RVPN)

Case-1 400 KV Jodhpur-Rajwesrt line, 400 KV Jodhpur-Kankani-II line, 400 KV Jodhpur-Kankaroli line at 400KV GSS Jodhpur on 01.12.2024

No. of Unwanted operation – 3

Reason of unwanted operation –

During busbar testing (BUS-B) for pre commissioning of 400KV, 125 MVAR bus reactor.

Corrective Action taken – YES

DC link which caused the tripping removed.

Case-2 400 KV Merta-Bikaner Line at 400 KV GSS MERTA on 08.12.2024

No. of Unwanted operation – 1

Reason of unwanted operation –

Tripping occurred during work in panel

Corrective Action taken – YES

Person working in panel asked to be more careful.

Case-3 400 KV JAISALMER II- BARMER-2 LINE at 400 KV GSS Jaisalmer on 11.12.2024

No. of Unwanted operation – 1

Reason of unwanted operation –

LBB relay wiring problem.

Corrective Action taken – YES

LBB relay wiring problem rectified and tested.

Case-4 400 KV Merta- Bikaner and 400 kV Merta- Kota LINE at 400 KV GSS MERTA on 26.12.2024

No. of Unwanted operation – 2

Reason of unwanted operation –

Wiring issue in carrier panel.

Corrective Action taken – NO

Wiring issue shall be rectified soon.

Case-5 220KV Tinwari-Phalodi Line, 220KV Dechu-Phalodi-I and 220KV Dechu-Phalodi-II at 220 KV GSS Phalodi on 12.12.2024

No. of Unwanted operation – 3

Reason of unwanted operation –

Interruption occurred due to failure of 132 KV line CB due to Time grading issue of backup relays.

Corrective Action taken – YES

Time grading revised and tested.

Case-6 220KV IG Nagar- HEERAPURA LINE at 220 KV GSS IG Nagar on 20.12.2024

No. of Unwanted operation – 1

Reason of unwanted operation –

Due to VT selection issue.

Corrective Action taken – YES

VT selection issue rectified.

Case-7 220 KV DCCPP- Dholpur line at 220 KV GSS Dholpur on 26.12.2024

No. of Unwanted operation – 1

Reason of unwanted operation –

Due to DC problem.

Corrective Action taken – YES

DC problem detected and rectified.

Case-8 220/132, 100MVA Power transformer at 220KV GSS on 11.12.2024

No. of Unwanted operation – 1

Reason of unwanted operation –

Buchholz relay defective.

Corrective Action taken – YES

Buchholz relay replaced.

Case-9 220/132 KV 100 MVA Telk Make Transformer - I at 220 kV GSS Hindaun on 26.12.2024

No. of Unwanted operation – 1

Reason of unwanted operation –

Differential relay defective.

Corrective Action taken – YES

Differential relay replaced.

S.No.	Substation	Element name	Total number of tripping	Nc	Nf	Nu	Ni	Dependability Index (D)	Security Index(S)	Reliability Index(R)
1	400 KV ALAKNANDA	400 KV ALAKNANDA - SRINGAR line -1	NIL							
		400 KV ALAKNANDA - SRINGAR line -2	NIL							
		400 KV ALAKNANDA - VISHNUPRAYAG line -3	NIL							
		400 KV ALAKNANDA - MUZAFFARNAGAR line -4	NIL	0	1	0	1	0	0	0

The Dependability Index defined as (D) = Nc/(Nc+Nf)
The Security Index defined as (S) = Nc/(Nc+Nu)
The Reliability Index defined as (R) = Nc/(Nc+Ni)
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 the sum of Nf and Nu.
*** PPI (Protection Performance indices) should be submitted only for tripped elements of any sub station (Example 1,2 & 3)**
*** In case of no tripping of any element in a sub station it is should be submitted as "Nil" (Example 4)**
*** In case of single tripping which is Nf or Nu, PPI will be "Zero" (Example 1)**
*** In case of PPI less than one, details for that tripping should be submitted seperately (Example "Remarks for less than one sheet")**

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: December 2024

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	220kV Okhla	100MVA (220/33kV) Transformer-V	1	0	0	0	1	1	1	
2	400kV Harsh Vihar	315MVA (400/220kV) ICT-III	1	0	1	1	1	0.5	0.5	Faulty Buchholz relay of 220kV side cable end box replaced.
		400kV Dadri Ckt-1	1	0	0	0	1	1	1	
3	220kV Peeragarhi	100MVA (220/33kV) Transformer-II	1	0	0	0	1	1	1	
4	220kV Shalimar Bagh	100MVA (220/33kV) Transformer-III	1	0	0	0	1	1	1	
5	220kV South of Wazirabad	220kV Kashmere Gate Ckt-II	2	0	0	0	1	1	1	
		220kV Geeta Colony Ckt-I	1	0	0	0	1	1	1	
		220kV Kashmere Gate Ckt-I	1	0	0	0	1	1	1	
6	400kV Bamnauli	400kV Jhatikara Ckt-2	1	0	0	0	1	1	1	
		400kV Dwarka	1	0	0	0	1	1	1	
7	220kV Maharani Bagh	220kV Sarita Vihar	1	0	0	0	1	1	1	
8	220kV BTPS	220kV Okhla Ckt-1	2	0	0	0	1	1	1	
		220kV Alwar Ckt-1	1	0	0	0	1	1	1	
9	220kV Geeta Colony	220kV Patparganj Ckt-2	1	0	0	0	1	1	1	
10	220kV Patparganj	220kV Geeta Colony Ckt-2	1	0	0	0	1	1	1	
11	220kV Gopalpur	220kV Mandola Ckt-1	1	0	0	0	1	1	1	
12	220kV Sarita Vihar	220kV Maharani Bagh	1	0	0	0	1	1	1	
		220kV Pragati Ckt-1	1	0	0	0	1	1	1	
13	220kV Pragati	220kV Sarita Vihar Ckt-1	1	0	0	0	1	1	1	
14	400kV Bawana	400kV Maharani Bagh Ckt-1	0	0	1	1	0	0	0	Implemented settings were Phase-phase. Over-voltage occurred due to floating neutral (loose star point earthing). The settings now changed to phase-earth. Also, star point earthing issue has been resolved.

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

Office of Superintending Engineer
Electy. Test & Commissioning Circle
U.P. Power Trans. Corporation Ltd.
Pareshan Bhawan ,Mohaddipur,
Gorakhpur-273008
E-mail: setncgkp@upptcl.org

(U.P. Government Undertaking)
GSTIN : 09AAACU8823E1Z9

कार्यालय
अधीक्षण अभियन्ता
विद्युत परीक्षण एवं परिचालन मण्डल
उ0प्र0 पावर ट्रांसमिशन कारपोरेशन लि0
पारेषण भवन, मोहददीपुर,
गोरखपुर–273008

L.N:- 20 **/ET&CC(G)/Performance indices** **Date:-** 04.01.2025

Sub:- **Calculation of protection performance indices for the month of December-2024.**

Chief Engineer, (North-East) **(By E-mail)**
U.P. Power Transmission Corporation Ltd.,
Mohaddipur-Gorakhpur.

Kindly find enclosed herewith the **calculation of protection performance indices** under Electricity Test & Commissioning Circle-Gorakhpur for the month of December-2024.

This is for your kind information & necessary action.

Encl: As above.

(Sanjay Singh)
Superintending Engineer

(By E-mail) L.N:- 20 **/ET&CC(G)/ Performance indices/Date:-** 04.01.2025

Copy forwarded for kind information and necessary action.

1. Director (Operation), UPPTCL, Lucknow.
2. Chief Engineer (PSO), UPSLDC, Lucknow.
3. Superintending Engineer (R&A), UPSLDC, Lucknow.
4. Executive Engineer, ET&C Division-Azamgarh/Basti/Gorakhpur.

(Sanjay Singh)
Superintending Engineer

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

under Electricity Test & Commissioning Circle-Gorakhpur for the Month of December-2024

ET&CD, AZAMGARH

S.N.	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))	Relibality Index (R) R=(Nc/(Nc+Ni))	REMARK
1	400KV S/S Kasara, Mau	400KV Mau-Anpara Line	3	0	0	0	1	1	1	
2	220 kV S/S Azamgarh-1	220 kV Jaunpur Line	0	0	2	0	0	0	0	1. PLCC Malfunctioning at Azamgarh End. 2. While checking event in relay, it found temporary DT command due to cable fault between PLCC panel and relay panel at Azamgarh end. Fault has been Rectified & Isolated.
3	220 kV S/S Azamgarh-2	220 kV Machhali Shahar (Jaunpur) Line	1	0	0	0	1	1	1	
		TOTAL	**4**	**0**	**2**	**2**	**1**	**0.67**	**0.67**	

ET&CD, BASTI

S.N.	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))	Relibality Index (R) R=(Nc/(Nc+Ni))	REMARK
1	400 kV S/S GIS Basti	400 kV Tanda Ckt-1	0	0	1	0	0	0	0	On date 12.12.2024 400 kV Lucknow-2 Ckt & 400 kV Gorakhpur-2 Ckt were in shutdown and 400 kV Bus Coupler was in open condition for testing and solving previoius spurious operation of Bus bar Protection GE Engineer were also onsite to rectify aforesaid problem & in parallel CB timing testing of 400kV Lucknow-2 bay was also going on by firm Engineer. After event flag found on Lucknow-2 LCC Panel-89A, R,Y,B-ph, GD-2, Compressor Gas pressure low second stage Alram block out (<0.45MPA). How ever, actual gas pressure was found normal (0.55MPA). CB timing testing was being done at Lucknow-2 Ckt. During repeated operation of CB C-O testing positive DC supply taken for CB. Analyser was accidentally extended to K605 wire of KGD-2 contractor which gave annunciation of 2nd stage low gas leakage contact of 89A of 400kV Lucknow-2 Line and gave command to the busbar relay protection and all the bays installed on busbar 1 opened. (According to the scheme 89A is connected to Bus-1)
		400 kV Tanda Ckt-2	0	0	1	0	0	0	0	
		400 kV Lucknow Ckt-1	0	0	1	0	0	0	0	
		400 kV PGCIL-Gorakhpur Ckt-1	0	0	1	0	0	0	0	
		500 MVA ICT-1	0	0	1	0	0	0	0	
		500 MVA ICT-2	0	0	1	0	0	0	0	
		125 MVAR Bus Reactor	0	0	1	0	0	0	0	
		TOTAL	**0**	**0**	**7**	**7**	**0**	**0**	**0**	

ET&CD, GORAKHPUR

NIL

ET&C Circle-Gorakhpur	**GRAND TOTAL**	**4**	**0**	**9**	**9**	**1**	**0.31**	**0.31**	As above.

PERFORMANCES INDICES FROM TNE ZONE UPPTCL		
	Dependability index (D) D=(Nc/(Nc+Nf))	**1**
	Security Index (S) S=(Nc/(Nc+Nu))	**0.31**
	Relibality Index (R) R=(Nc/(Nc+Ni))	**0.31**

NOTE:- (i) Reason for performance indices less than unity is mentioned in above particular element remark.

Nc - No. of correct operations at internal power system faults
Nf - No. of failures to operate at internal power system faults
Nu - No. of unwanted operations
Ni - No. of incorrect operations. (Ni=Nf+Nu)

(Sanjay Singh)
Superintending Engineer

EE(A)

Reporting of performance indices for protection system
(For element connected at 220kV and above)
Name of Utility : ET&CC,UPPTCL,MEERUT
Month : December-24

ET&CD, Ghaziabad

S.N.	Sub-station	Unit (SPS/Line/ICT/GT/etc)	Nc	Nf	Nu	Ni	Dependability Index (D)	Security Index (S)	Reliability Index (R)	REMARK
1	400 kV Muradnagar-I	400 kV Hapur Line	0	0	1	1	NA	0	0	False DT received from PLCC CH-I at Muradnagar end. **Action taken:-** DT send & DT receive of channel-I has been disabled by M/s PGCIL for the time being.
2		220 kV Sahibabad Line	1	0	0	0	1	1	1	
3	400 kV -II MURADNAGAR	400kV MATHURA LINE	17	0	0	0	1	1	1	
4		400kV SIMBHAOLI CKT-2	1	0	0	0	1	1	1	
5		400/220kV 240MVA ICT-3	1	0	0	0	1	1	1	
6		220/132kV 100MVA T/F-1	1	0	0	0	1	1	1	
7		220/132kV 100MVA T/F-2	1	0	0	0	1	1	1	
8	220kV Sahibabad	220kV Muradnagar Line CB NO.84	1	0	0	0	1	1	1	

ET&CD, Moradabad-I

S.N.	Sub-station	Unit (SPS/Line/ICT/GT/etc)	Nc	Nf	Nu	Ni	Dependability Index (D)	Security Index (S)	Reliability Index (R)	REMARK
1	220 kV Chandausi	220kV Chandausi- Badaun Line	1	0	0	0	1	1	1	

ET&CD, Moradabad-II

S.N.	Sub-station	Unit (SPS/Line/ICT/GT/etc)	Nc	Nf	Nu	Ni	Dependability Index (D)	Security Index (S)	Reliability Index (R)	REMARK
1	220 kV Nehtaur	220 kV Nehtaur-Mataur(PGCIL) line	3	0	0	0	1	1	1	

ET&CD, Muzaffarnagar

S.N.	Sub-station	Unit (SPS/Line/ICT/GT/etc)	Nc	Nf	Nu	Ni	Dependability Index (D)	Security Index (S)	Reliability Index (R)	REMARK
1	220 kV SHAMLI	220 kV NIRPURA LINE	1	0	0	0	1	1	1	
2	400kV GIS SHAMLI	400 kV ALIGARH CKT-2	1	0	0	0	1	1	1	
3	220kV NARA	220kV Nara-Mator LINE	1	0	0	0	1	1	1	

ET&CD, Noida

S.N.	Sub-station	Unit (SPS/Line/ICT/GT/etc)	Nc	Nf	Nu	Ni	Dependability Index (D)	Security Index (S)	Reliability Index (R)	REMARK
1	400 kV Sec-123 Noida	400 kV Sec-123 to 400 kV Atour Ckt	1	0	0	0	1	1	1	
2	220 kV Sec-62 Noida	220/132 kV 160 MVA TF-II	1	0	0	0	1	1	1	

ET&CD, Gr. Noida

S.N.	Sub-station	Unit (SPS/Line/ICT/GT/etc)	Nc	Nf	Nu	Ni	Dependability Index (D)	Security Index (S)	Reliability Index (R)	REMARK
1	220 kV Simbhaoli	220 kV Matore Line	2	0	0	0	1	1	1	
		765 kV Hapur line ckt-II	1	0	0	0	1	1	1	
		40 MVA T/F	1	0	0	0	1	1	1	
		60 MVA T/F -I	1	0	0	0	1	1	1	

ET&CD, MEERUT

S.N.	Sub-station	Unit (SPS/Line/ICT/GT/etc)	Nc	Nf	Nu	Ni	Dependability Index (D)	Security Index (S)	Reliability Index (R)	REMARK
1	220kV S/S Partapur (J.V.)	220kV Partapur (J.V.) - Hapur-1st Line	1	0	0	0	1	1	1	
2	220 KV S/S Baraut	200 MVA T/F-1 CB NO. 884/784	1	0	0	0	1	1	1	
3	220kV S/S Nirpura	220kV Nirpura - Shamli	1	0	0	0	1	1	1	
		GRAND TOTAL	**40**	**0**	**1**	**1**				

PERFORMANCES INDICES FROM TW ZONE UPPTCL

Dependability index (D) D=(Nc/(Nc+Nf))	1
Security Index (S) S=(Nc/(Nc+Nu))	0.98
Relibality Index (R) R=(Nc/(Nc+Ni))	0.98

NOTE:- (i) Reason for performance indices less than unity is mentioned in respective element remark.

Nc - No. of correct operations at internal power system faults
Nf - No. of failures to operate at internal power system faults
Nu - No. of unwanted operations
Ni - No. of incorrect operations, (Ni=Nf+Nu)

(Pramod Kumar Mishra)
Superintending Engineer

Reporting of Performance Indices for IndiGrid Assets In NR-Region
Month: December'24

S. No.	Name of Utility	Elements (Line/ICT/BR/LR)	Nc	Nf	Nu	Ni	Dependability Index (D=Nc/(Nc+Nf))	Security Index (S=Nc/(Nc+Nu))	Reliability Index (R=Nc/(Nc+Ni))	Remark
25	NRSS-XXIX TRANSMISSION LTD	Sambha-Amargarh -2	2.00	-	2.00	2.00	1	0.5	0.5	On 30-10-2024, 400kV A-5 Ckt-02 A/R operated due to R-phase to earth faults at 04:19 Hrs and 07:07 Hrs. In both instances, A/R operated successfully from the Amargarh end while tripping occurred at the Samba end, confirming correct A/R operation from the Amargarh end
42	PATRAN TRANSMISSION COMPANY LTD	KAITHAL-PATRAN-I	2.00	-	2.00	2.00	1	0.5	0.5	1.The 400kV Patran-Kaithal Circuit-01 tripped at 13:07 Hrs on 13-12-2024 due to a relay maloperation at the PTCL Patran substation. 2. Tripped at 13:28 Hrs on 26-12-2024 due to Relay Maloperation

S.No.	Substation	Element name	Total number of tripping	Nc	Nf	Nu	Ni	Dependability Index (D)	Security Index(S)	Reliability Index(R)
1	400KV PARICHHA	400KV PARICHHA-ORAI LINE 1	1	1	0	1	1	1	0.5	0.5
		400KV PARICHHA-ORAI LINE 2	NIL	0	0	0	0			

The Dependability Index defined as (D) = Nc/(Nc+Nf)
The Security Index defined as (S) = Nc/(Nc+Nu)
The Reliability Index defined as (R) = Nc/(Nc+Ni)
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.
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*** PPI (Protection Performance indices) should be submitted only for tripped elements of any sub station (Example 1,2 & 3)**
*** In case of no tripping of any element in a sub station it is should be submitted as "Nil" (Example 4)**
*** In case of single tripping which is Nf or Nu, PPI will be "Zero" (Example 1)**
*** In case of PPI less than one, details for that tripping should be submitted seperately (Example "Remarks for less than one sheet")**

Performance Indices for Protection System

Punjab State Transmission Corporation Limited

December-2024

S.N.	Sub-Station	Unit (SPS/Line/ICT/GT/etc.)	Nc	Nf	Nu	Ni	Dependability Index (D)	Security Index (S)	Reliabilty Index (R)
1	220 kV S/S Wadala Granthian	100 MVA, 220/132 kV P.T/F t-4	0	0	1	0	0	0	0
2	220 kV S/S Wadala Granthian	100 MVA, 220/132 kV P.T/F T-1	0	0	1	0	0	0	0
3	400 kV S/S Makhu	500 MVA, 400/220 kV ICT-3	0	0	1	0	0	0	0
4		220 kV Jamsher-Rehana Jattan ckt.	1	0	0	0	1	1	1
5		220 kV Bassi Pathana-RTP ckt.	1	0	0	0	1	1	1
6		220 kV G-1-RTP ckt.III	1	0	0	0	1	1	1
7		220 kV G-1-RTP ckt.I	1	0	0	0	1	1	1
8		220 kV Mohali-Ganguwal ckt.	1	0	0	0	1	1	1
9		220 kV Katorewala-Abohar ckt.	1	0	1	1	1	0.5	0.5
10		220 kV Dhandari-PGCIL ckt.I	0	0	0	0	0	0	0
11		220 kV Dhanolla-Lehra Mohabbat ckt.	1	0	0	0	1	1	1
12		220 kV Muktsar(400)-Abohar ckt. I	0	1	0	1	0	0	0
13	220 kV S/S Passiana	100 MVA, 220/66 kV P.T/F T-4	1	0	0	0	1	1	1
14		400 kV Ropar-Ludhiana(P.G.) ckt.	0	0	1	0	0	0	0
15		220 kV Dera-Bassi-Railway ckt.	1	0	0	0	1	1	1
16		220 kV Rajpura-Rajpura(400) ckt.I	0	0	3	0	0	0	0
17		220 kV Rajpura-Rajpura(400) ckt.II	0	0	3	0	0	0	0
18		220 kV Rajpura-Banur ckt.	0	0	2	0	0	0	0
19		220 kV Rajpura-UltraTech ckt.	0	0	1	0	0	0	0
20		400 kV Rajpura-Bhiwani ckt.	1	0	0	0	1	1	1
21		220 kV Sarna-Udhampur ckt.	0	1	0	1	0	0	0
22		220 kV Sarna-Hiranagar ckt.	0	1	0	1	0	0	0
23		220 kV Mehalkalan-Pakhowal ckt.I	1	0	0	0	1	1	1
	PSTCL OVERALL		**11**	**3**	**14**	**17**	**0.785714286**	**0.44**	**0.392857143**

Status of Internal Protection Audit Plan for FY 2024 -25

S. No.	NRPC Member	Category	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
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 for Jhansi, Lucknow, Meerut, Gorakhpur, Prayagraj, Agra zone)
19	PTCUL		Received
20	PSTCL		Received
21	HPPTCL		Received
22	IPGCL	State Generating Company	Received (PPCL-I,III)
23	HPGCL		
24	RRVUNL		Received
25	UPRVUNL		Received (obra -B, Anpara-B,D switch yard, Harduganj-C,D,E))
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
31	Aravali Power Company Pvt. Ltd		Received
32	Apraava Energy Private Limited		Received
33	Talwandi Sabo Power Ltd.		
34	Nabha Power Limited		Received
35	MEIL Anpara Energy Ltd		Received
36	Rosa Power Supply Company Ltd		Received
37	Lalitpur Power Generation Company Ltd		Received
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
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)
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)
26	UJVNL		Received (Dharashu, Tiloth)
27	HPPCL		
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		
33	Talwandi Sabo Power Ltd.		
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		
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)
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				
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				
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				
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
26	UJVNL				
27	HPPCL				
28	PSPCL	State Generating Company & State owned Distribution Company	Reeceived (GHTP)	Dec. 2025	
			Received (GATP)	May 2025	
			GGSSTP		
			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.				
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	Report is to be submitted
37	Lalitpur Power Generation Company Ltd		Conducted	26.03.2024	
38	MEJA Urja Nigam Ltd.				
39	Adani Power Rajasthan Limited		Conducted	November, 2024	
40	JSW Energy Ltd. (KWHEP)		Received	December 2024 to March 2025	
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	
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	

Annexure-B.I

Multiple element tripping event at 220kV Khodri & Chibro HEP

At 20:02 hrs on 05th December, 2024

Tripped Elements

S. No	Name of Elements	Outage Time	Revival Time	Reason of tripping
1.	220 KV Khodri(UK)-Majri(HP) (UK) Ckt-2	20:02 hrs	21:04 hrs	LBB protection of 30 MW Khodri Unit-2 operated
2.	220 KV Saharanpur(UP)-Khodri(UK) (UP) Ckt-1		21:21 hrs	
3.	220 KV Khodri - Chhibro (UK) Ckt-1			
4.	30 MW Khodri - UNIT 2			
5.	60MW Chhibro – UNIT 2	20:02 hrs		Details Awaited
6.	60MW Chhibro – UNIT 3	20:02 hrs		

Brief details of the event

i) During antecedent condition, three 30MW units of Khodri (Unit 1,2 & 4) and three 60 MW units of Chhibro (Unit 2,3 & 4) were running and total active power generation of Khodri and Chhibro was approx. 75 MW and 123 MW (as per SCADA).

ii) As reported, at 20:02 hrs, while stopping of 30MW Khodri Unit-2, its 220kV CB malfunctioned and pole discrepancy operated. This led to LBB protection operation resulting in tripping of 220 KV Khodri(UK)-Majri(HP) (UK) Ckt-2 and 220 KV Saharanpur(UP)-Khodri(UK) (UP) Ckt, 220 KV Khodri-Chhibro (UK) Ckt-1 and 30MW Khodri Unit-2.

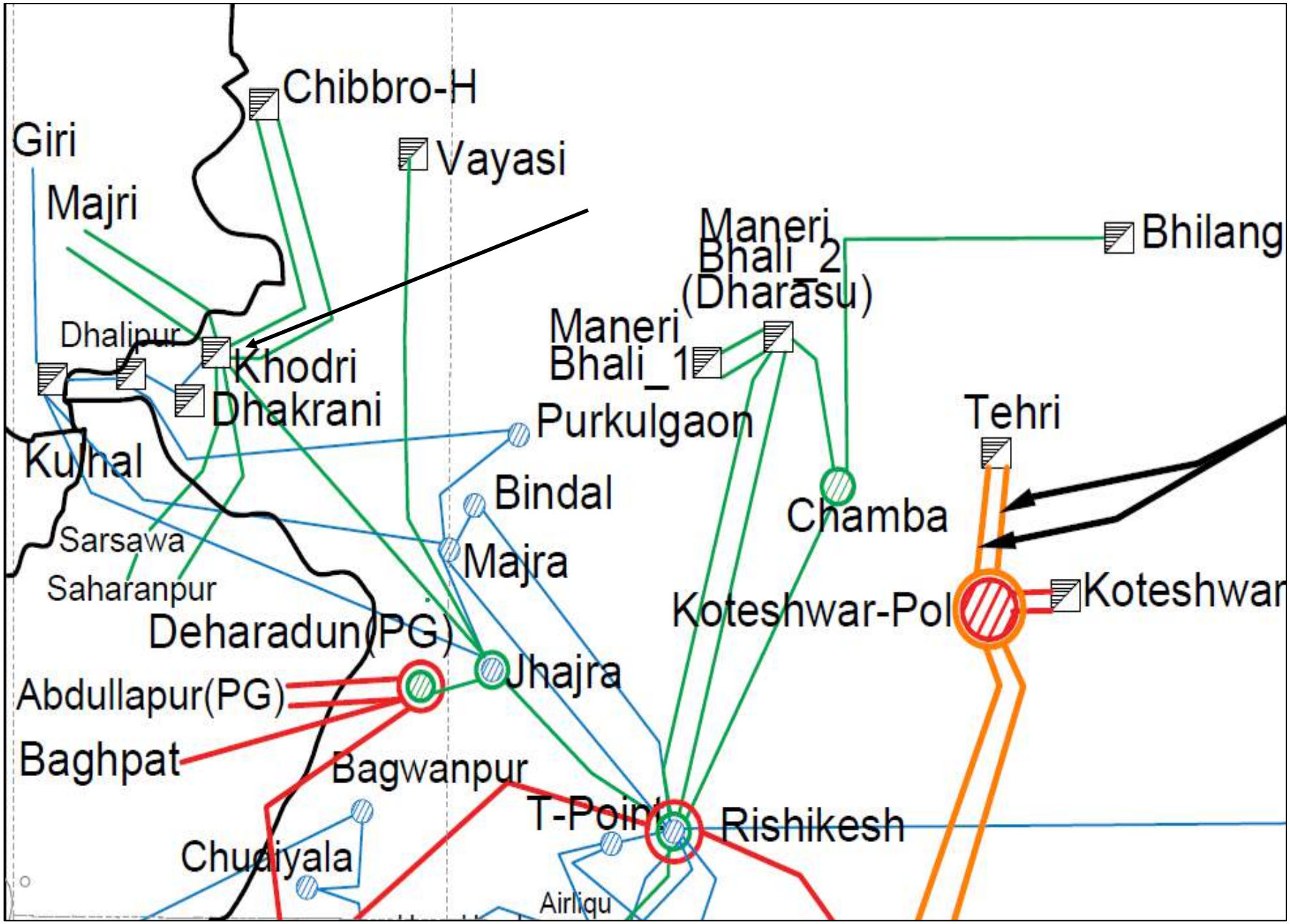
iii) As per SCADA, two 60 MW units of Chhibro Unit 2 & 3 also tripped at the same time which caused generation loss of 103 MW (exact reason yet to be shared).

iv) As per PMU, no fault was observed in the system.

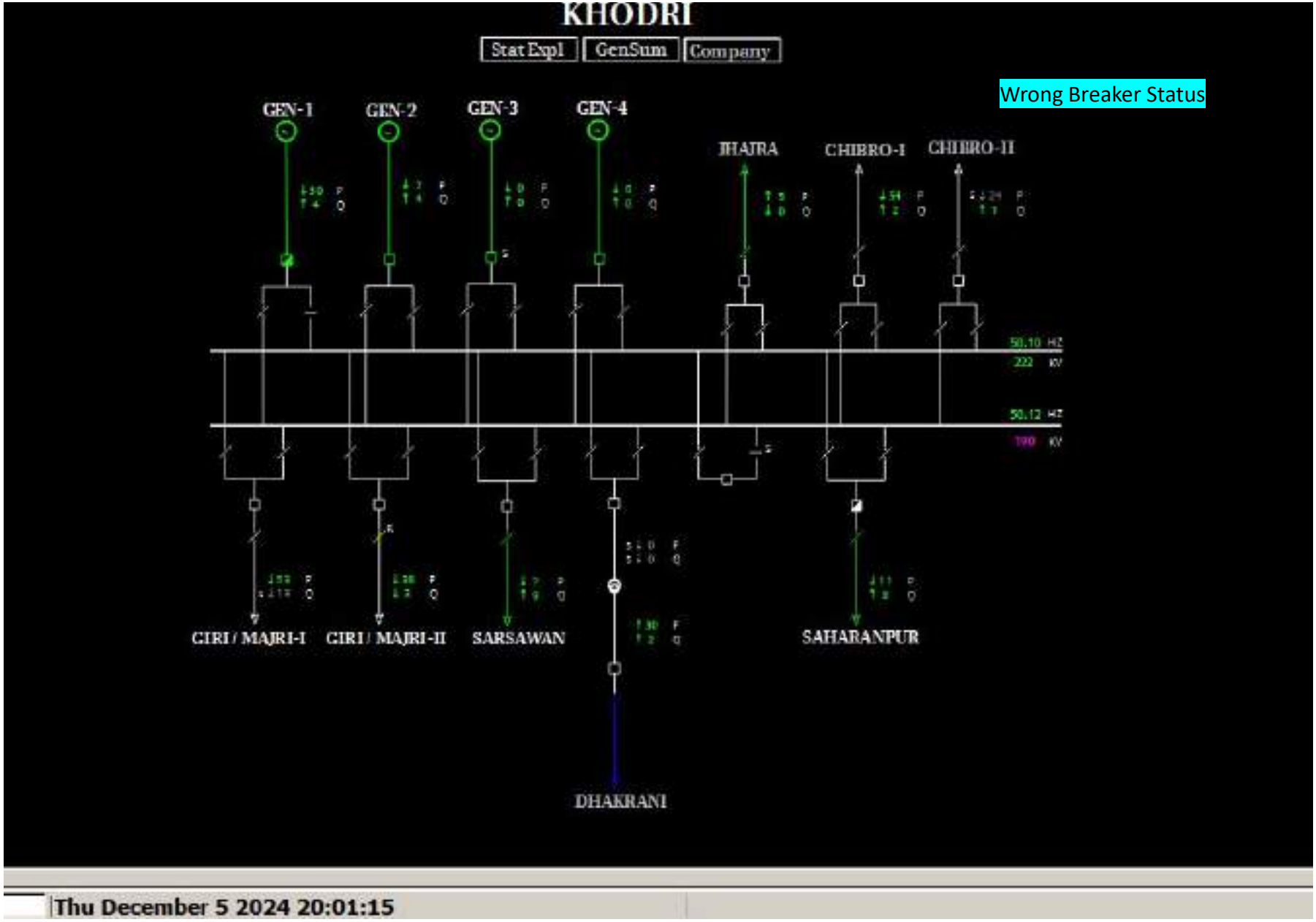
v) As per SCADA, change in demand and generation of approx. 83 MW and 223 MW respectively in Uttarakhand control area were observed.

vi) As remedial action taken, over hauling & testing of generator CB has been performed and found satisfactory.

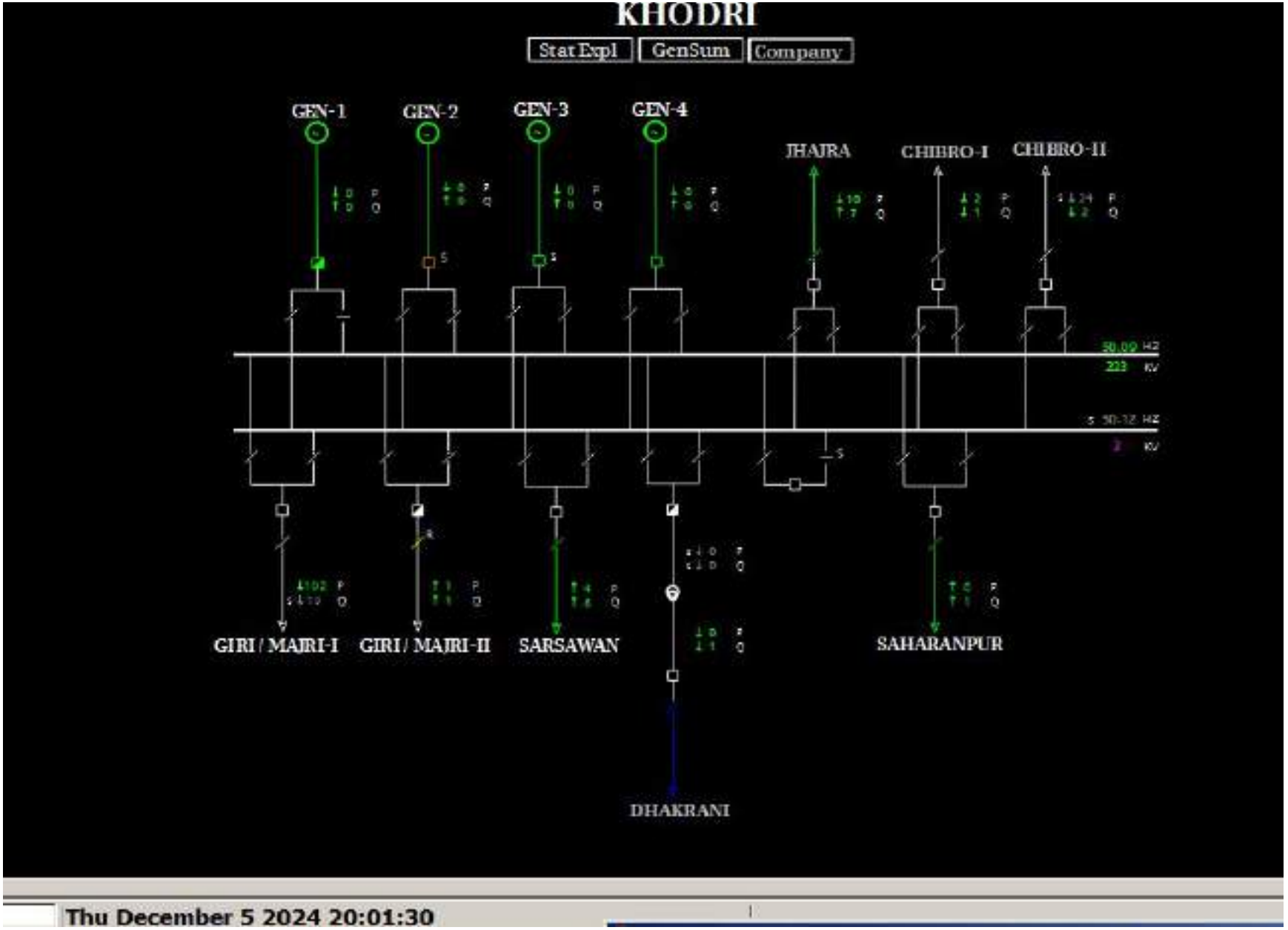
Network Diagram



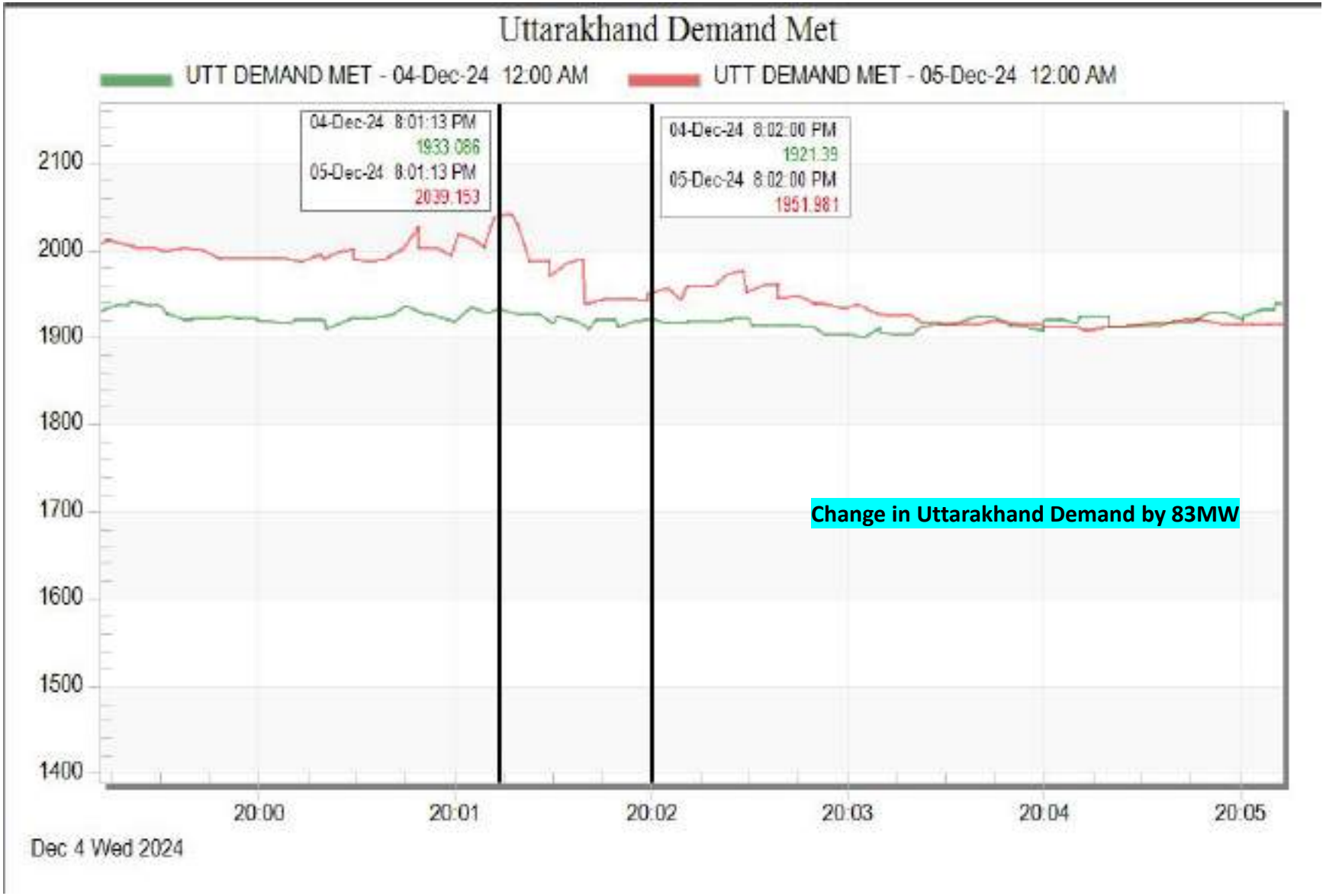
SLD of 220kV Khodri(UK) before the event



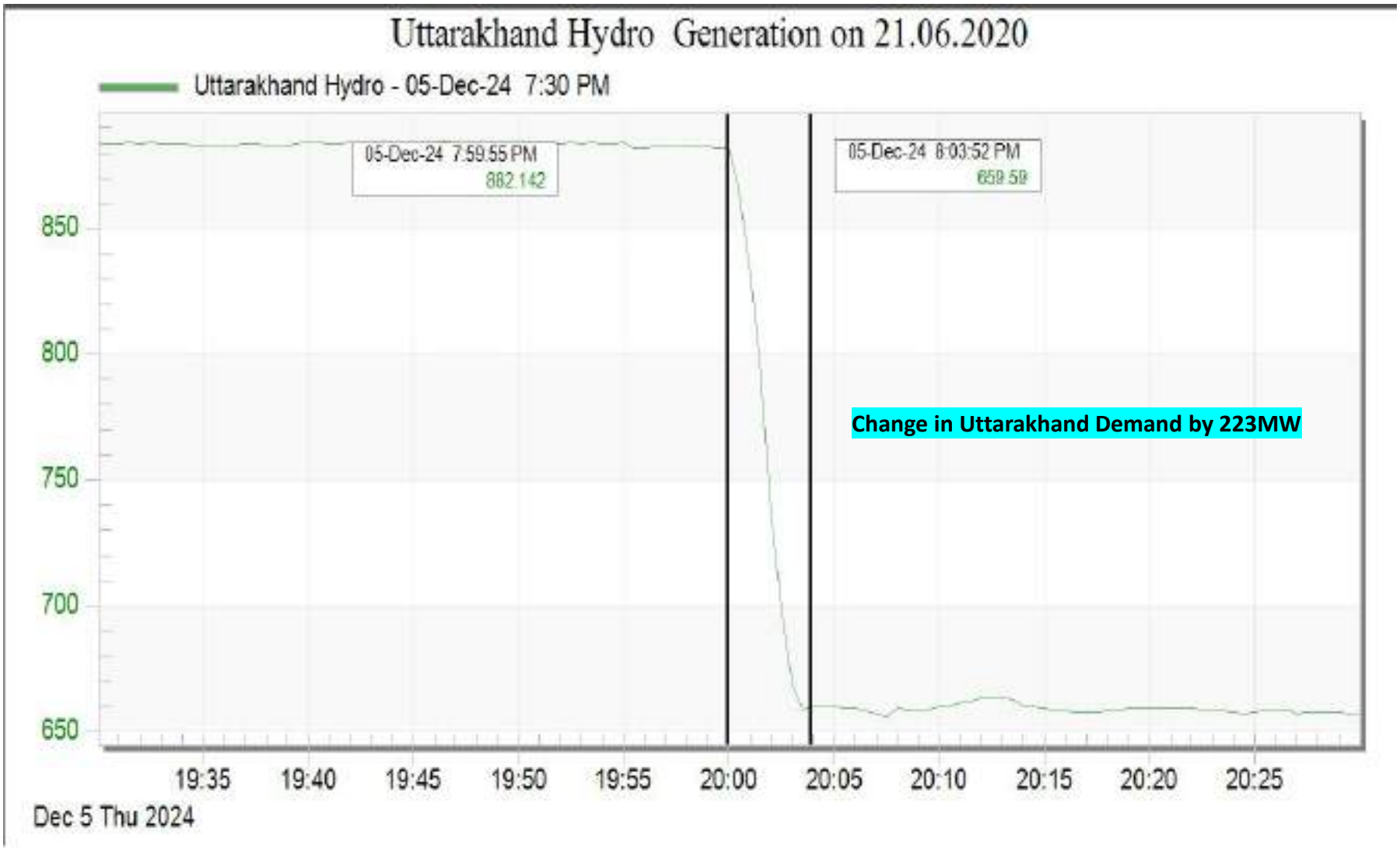
SLD of 220kV Khodri(UK) after the event



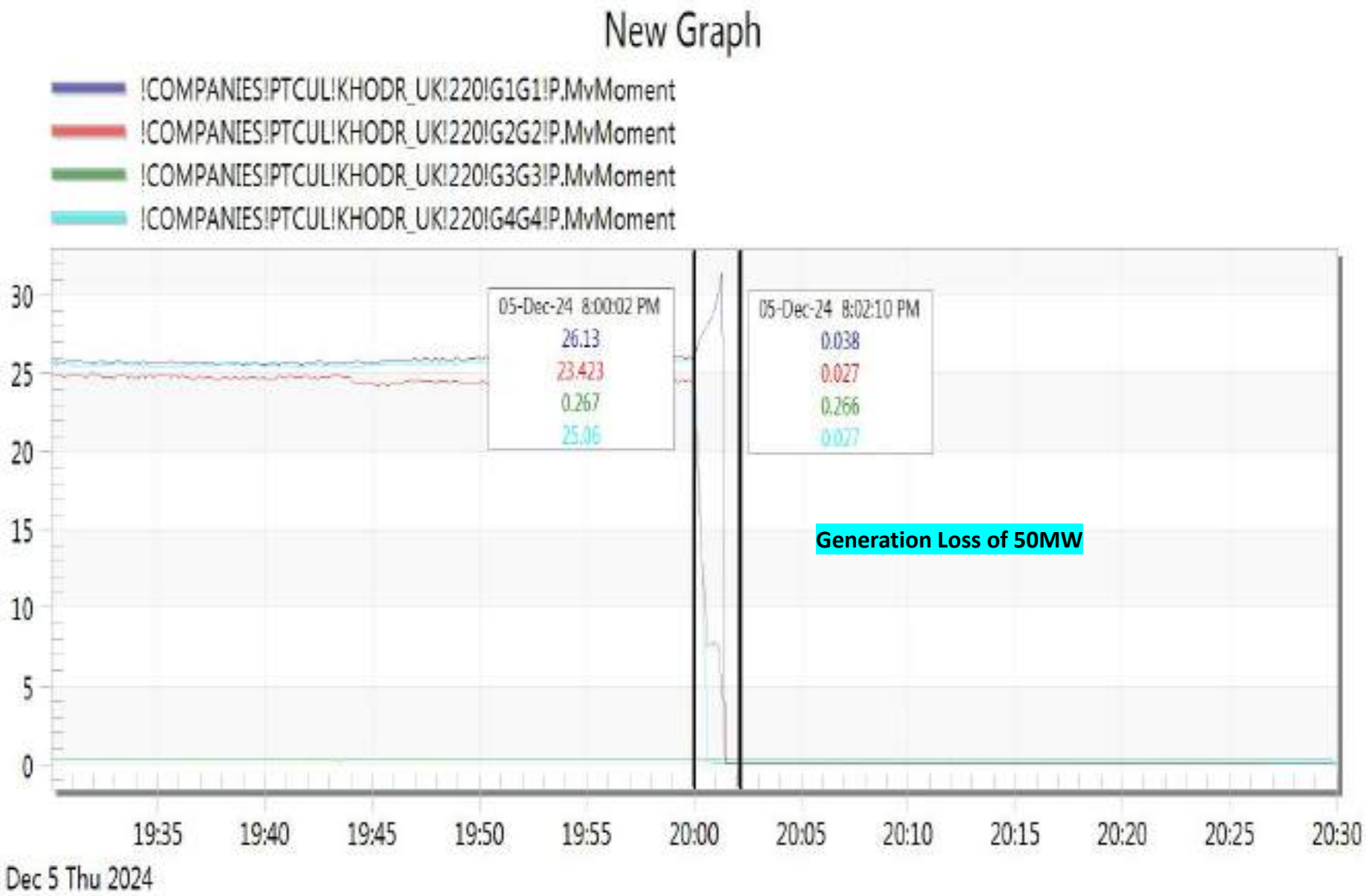
Uttarakhand demand during the event



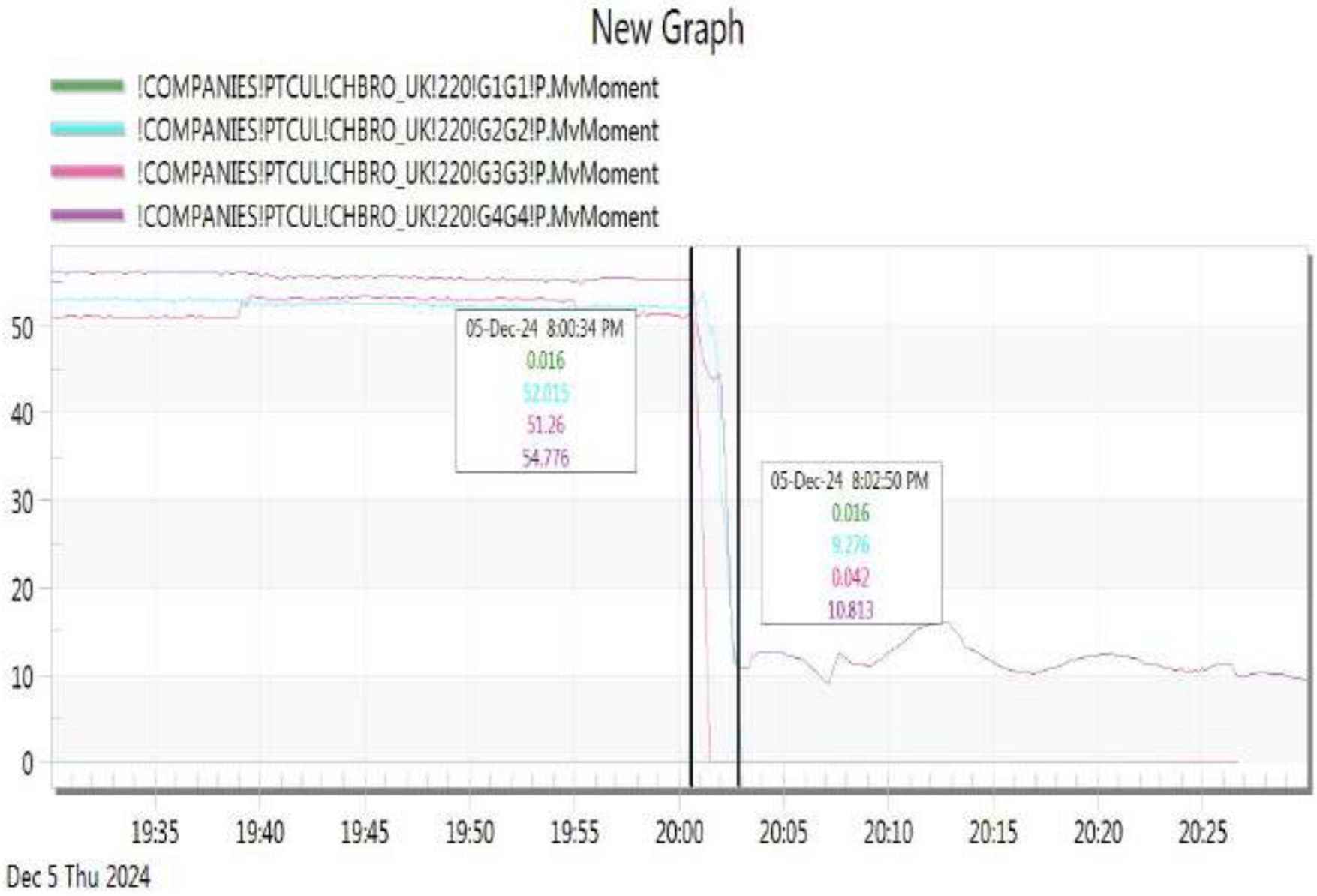
Uttarakhand generation during the event



Khodri generation during the event

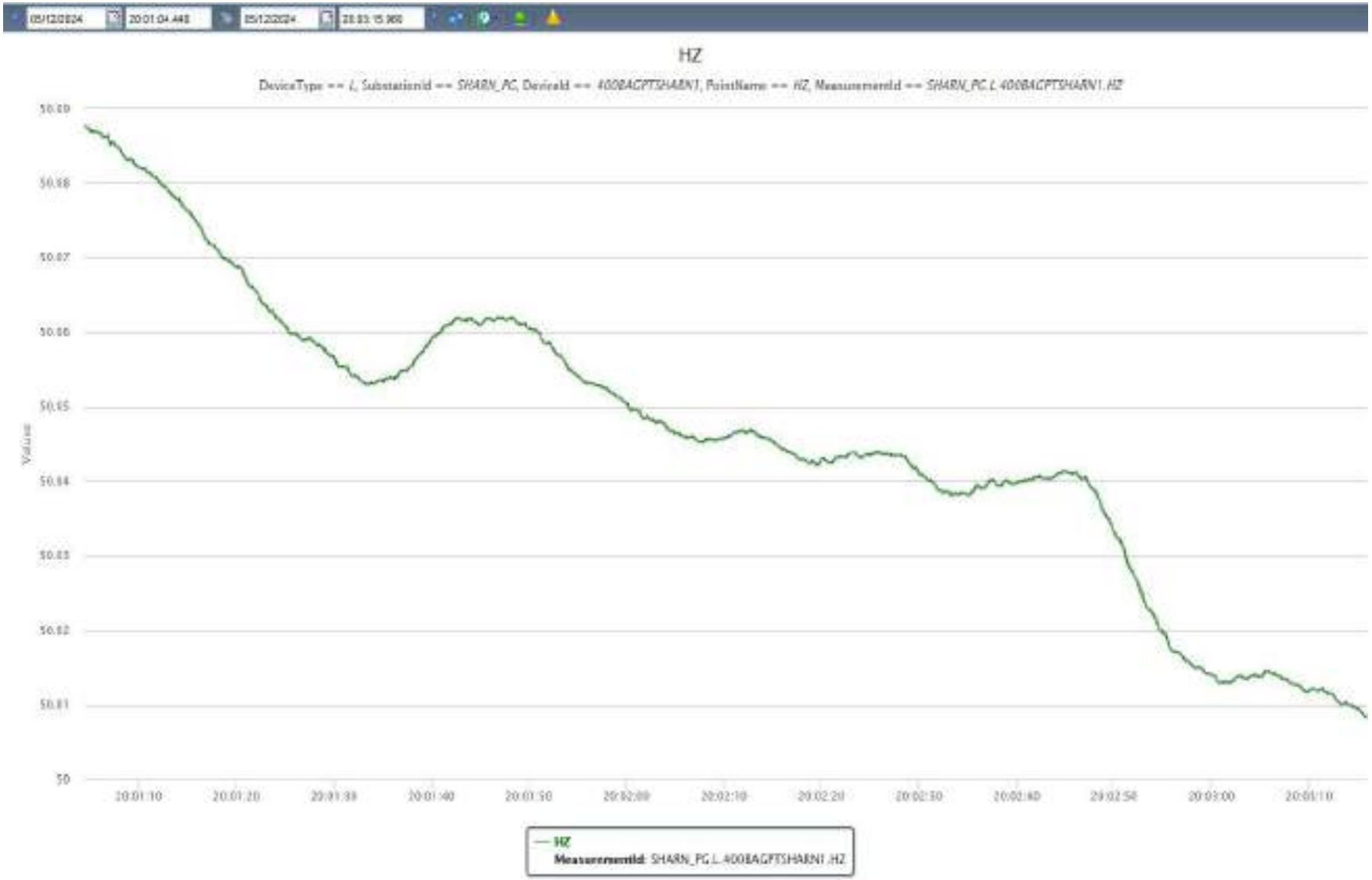


Chhibro generation during the event



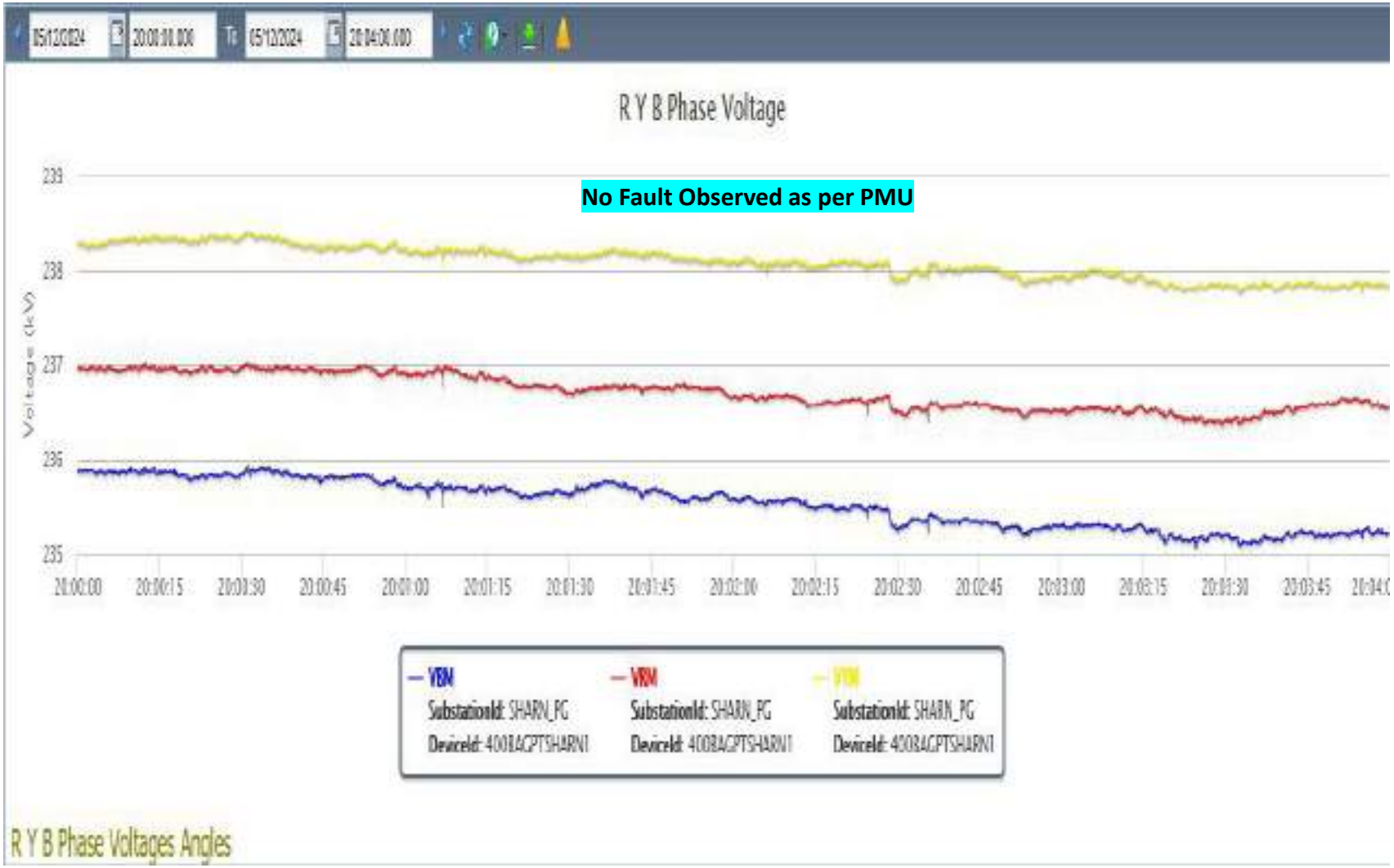
PMU Plot of frequency at Saharanpur(PG)

20:02 hrs/05-Dec-24



PMU Plot of Phase Voltage Magnitude at Saharanpur(PG)

20:02 hrs/05-Dec-24



Details received from UJVUNL

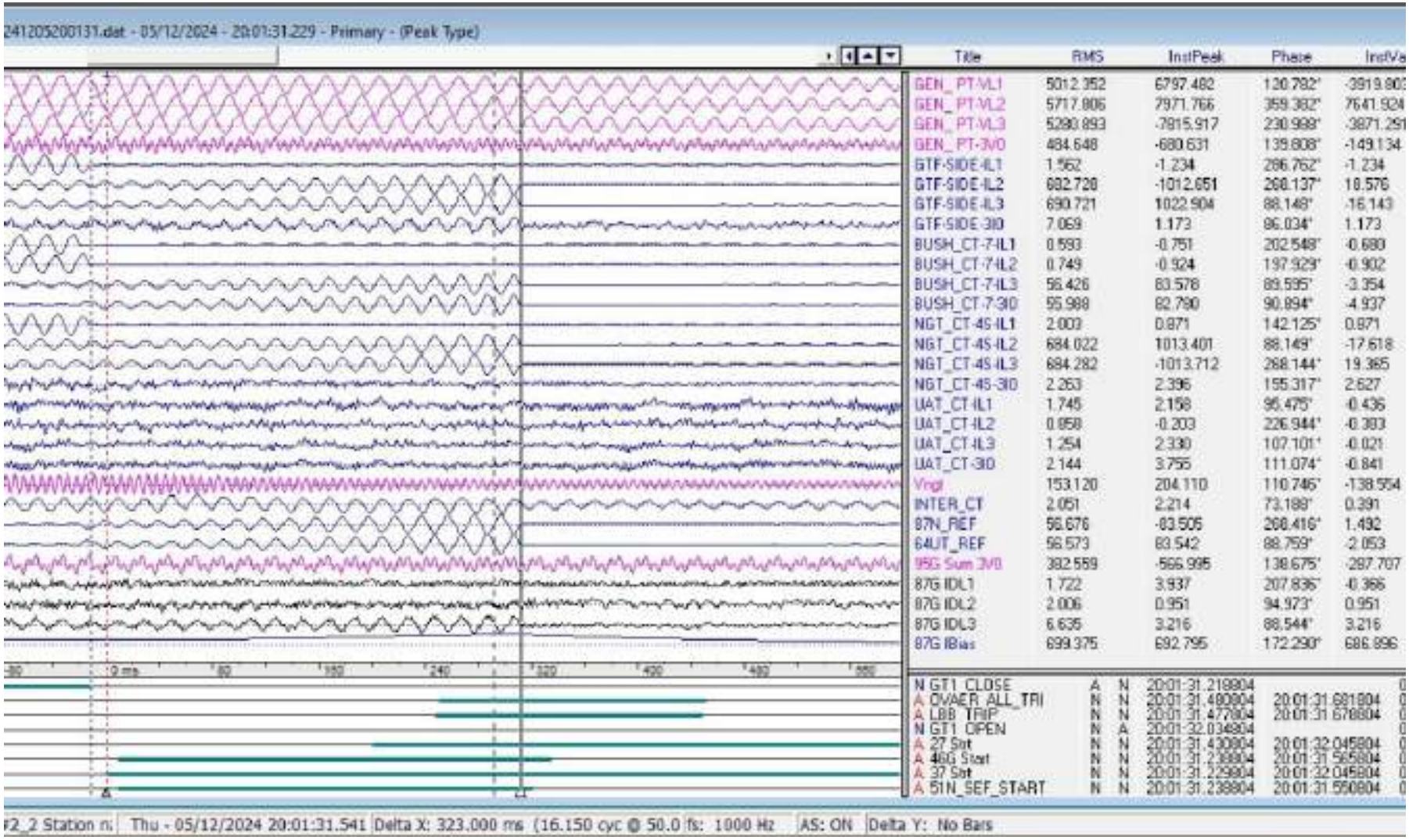
Detailed Report format

1. Time & Date of Event :	05/12/2024 20:01 HRS
2. Station Name:	Khodri
3. Name of the tripped elements & time of tripped elements:	220KV Khodri -Mazri- II (88)feeder, 20:01
4. Triggering Incident:	During Stopping of Unit no-2, its 220 kV Circuit Breaker malfunctioned and pole discrepancy operated resulting in breaker Failure protection (50BF) operated in bus B at 220 Kv Switchyard of Khodri Power station. Due to this , 220kV Khodri- Mazri II(88), Khodri-Saharanpur II (84), Khodri-ChibroII(82),and 100 MVA Auto Transformer (885/785) and bus coupler(85) Tripped.

Details received from UJVUNL

S.N.	Point wise Status of Observations on multiple tripping elements at Khodri on Dated 03, 05 and 06 December 2024	
1	Bus-wise arrangement of elements needs to	Bus-wise arrangement at Khodri on dated 03.12.2024 Bus A- Khodri-Sarsawa,, Khodri-Jhajra ,Khodri-Mazri -I, , Khodri-Chibro-I, Unit # 1 Bus B- Khodri-Chibro-II , Khodri-Saharanpur, Khodri-Mazri -II, 132 KV Khodri-Dhakrani, 100 MVA ICT, Unit # 2 & Unit # 4 Bus-wise arrangement at Khodri on dated 05.12.2024 Bus A- Khodri-Sarsawa,, Khodri-Jhajra ,Khodri-Mazri -I, , Khodri-Chibro-I, Unit # 1 Bus B- Khodri-Chibro-II , Khodri-Saharanpur, Khodri-Mazri -II, 132 KV Khodri-Dhakrani, 100 MVA ICT, Unit # 2 & Unit # 4 Bus-wise arrangement at Khodri on dated 06.12.2024 Bus A- Khodri-Sarsawa,, Khodri-Jhajra ,Khodri-Mazri -I, , Khodri-Chibro-I, Unit # 1 Bus B- Khodri-Chibro-II , Khodri-Saharanpur, Khodri-Mazri -II,132 KV Khodri-Dhakrani, 100 MVA ICT, Unit # 2 & Unit # 4
2	Exact reason of tripping of 60 MW Chibro Un	At the time of event, at Chibro 220 KV, Chibro-Khodri-I and II feeders were connected on separate bus A and B. Bus A was separated for 220 KV cable testing .220 KV Chibro-Khodri-II feeder and generating Unit #2 & 3 were connected to bus B. At the time of event, 220 KV, Chibro-Khodri-II feeder tripped from Khodri end due to LBB protection operated at Khodri bus B. Thus due to loss of evacuating path, generating Unit #2 & 3 of Chibro were tripped.
3	Wrong status of CB at Khodri was observed during the event. Availability and healthiness of SCADA data at 220kV Khodri(UK) need to be ensured.	Due to defective Contact multiplying relays, wrong status observed. CMRs are under procurement and soon to be replaced.

DR of 30 MW Khodri - UNIT 2



- ✓ LBB Protection Operated

SCADA SOE

Time	Station Name	Voltage Level	Element Name	Element Type	Element Status	Remarks
20:01:20,570	KHODRI HYDRO	220kV	88MAJRI2	Circuit Breaker	disturbe	Line CB at Khodri(UK) end of 220 kV Majri (UP)-Khodri(UK) (UP) Ckt 2 opened
20:01:20,570	KHODRI HYDRO	220kV	E_T1 (T1)	Circuit Breaker	disturbe	
20:01:20,570	KHODRI HYDRO	220kV	E_F7 (SHARN-2	Circuit Breaker	Open	Line CB at Khodri(UK) end of 220 kV Saharanpur (UP)-Khodri(UK) (UP) Ckt 1 opened

Points for Discussion

i) Bus-wise arrangement of elements needs to be shared.

ii) Exact reason of tripping of 60 MW Chhibro Unit 2 & 3 need to be shared.

iii) Wrong status of CB at Khodri was observed during the event. Availability and healthiness of SCADA data at 220kV Khodri(UK) need to be ensured.

iv) DR/EL (.dat/.cfg file) of all tripped elements need to be shared from both ends.

v) Testing report of Generator CB of Unit -2 needs to be shared.

Multiple element tripping event at 220kV Khodri & Chibro HEP

At 21:01 hrs on 06th December, 2024

Tripped Elements

S. No	Name of Elements	Outage Time	Revival Time	Reason of tripping
1.	220 KV Khodri(UK)-Majri(HP) (UK) Ckt-2	21:01 hrs	22:36 hrs	LBB protection of 30 MW Khodri Unit-2 operated
2.	220 KV Khodri-Chhibro (UK) Ckt-1			
3.	220 KV Saharanpur(UP)-Khodri(UK) (UP) Ckt		23:21 hrs	
4.	30 MW Khodri - UNIT 2		22:36 hrs	

Brief details of the event

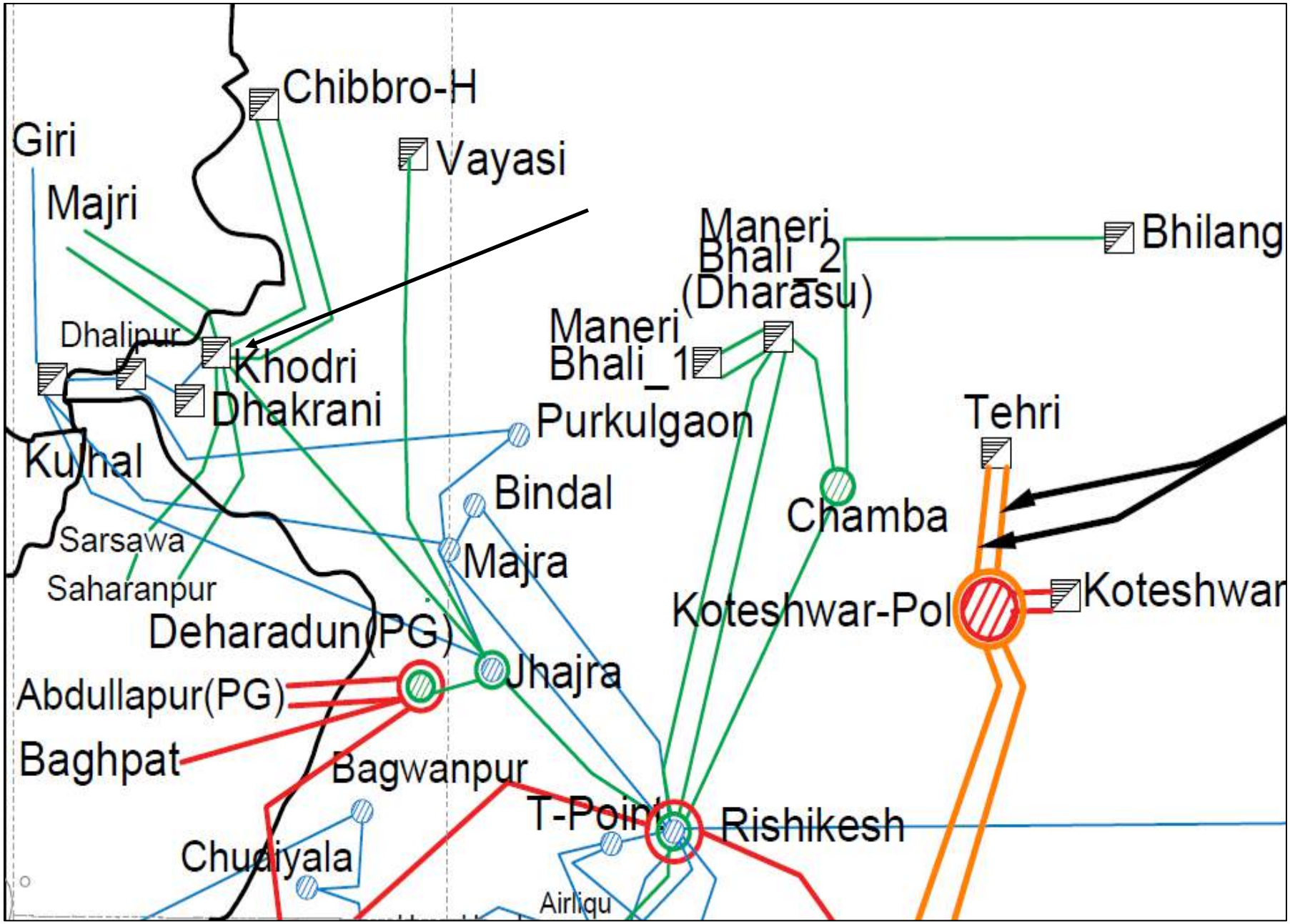
i) During antecedent condition, only one 30MW unit of Khodri (Unit 2) and one 60 MW unit of Chhibro (Unit 4) were running and total active power generation of Khodri and Chhibro was approx. 21 MW and 49 MW (as per SCADA).

ii) As reported, at 21:01 hrs, while stopping of 30MW Khodri Unit-2, its 220kV CB malfunctioned and pole discrepancy operated. This led to LBB protection operation resulting in tripping of 220 KV Khodri(UK)-Majri(HP) (UK) Ckt-2 and 220 KV Saharanpur(UP)-Khodri(UK) (UP) Ckt, 220 KV Khodri-Chhibro (UK) Ckt-1 and 30MW Khodri Unit-2 .

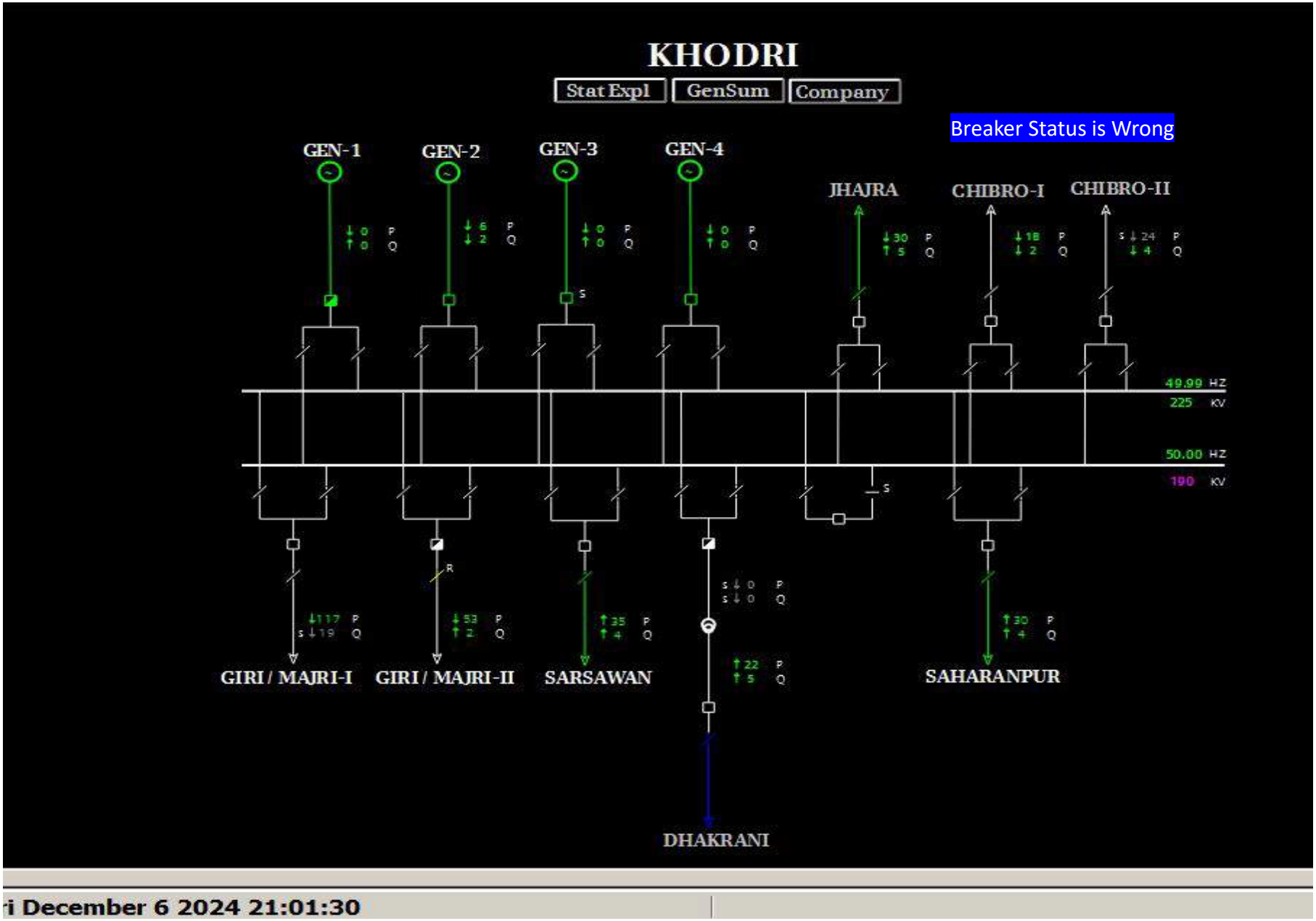
iii) As per SCADA, change in demand and generation of approx. 74 MW and 21 MW respectively in Uttarakhand control area were observed.

iv) As reported by SLDC-UK, testing of Generator CB of Unit -2 by expert service engineer is under progress.

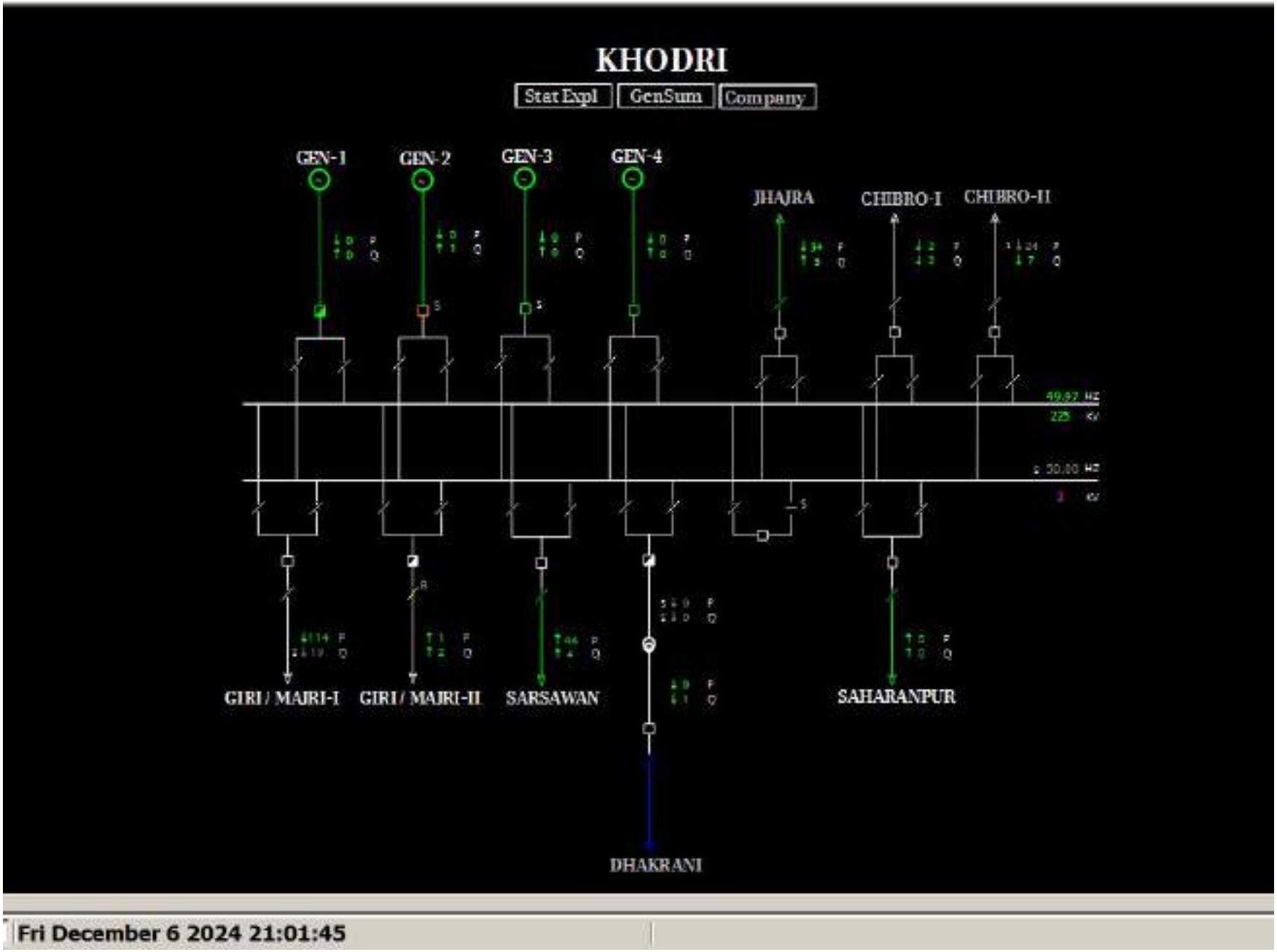
Network Diagram



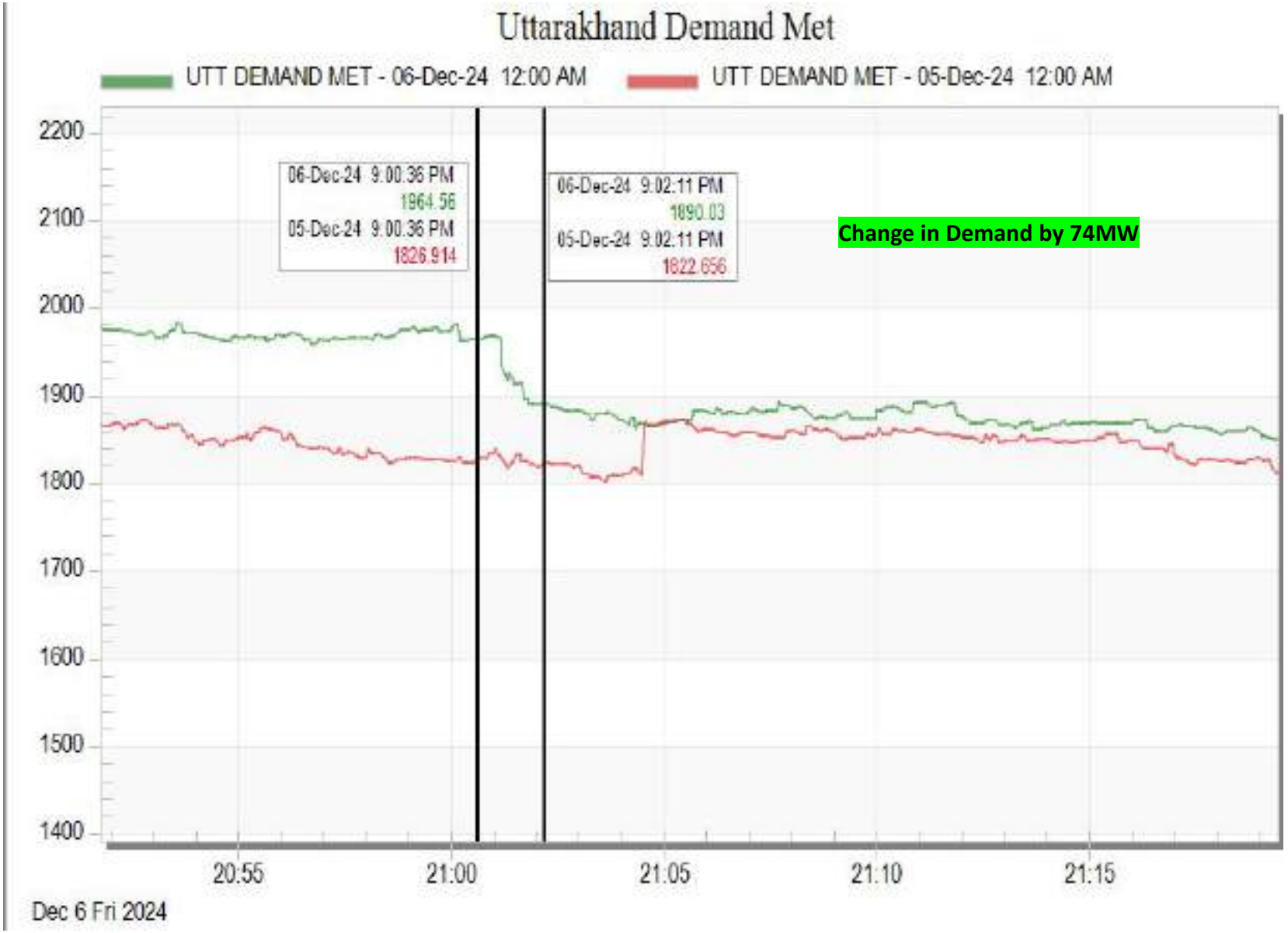
SLD of 220kV Khodri(UK) before the event



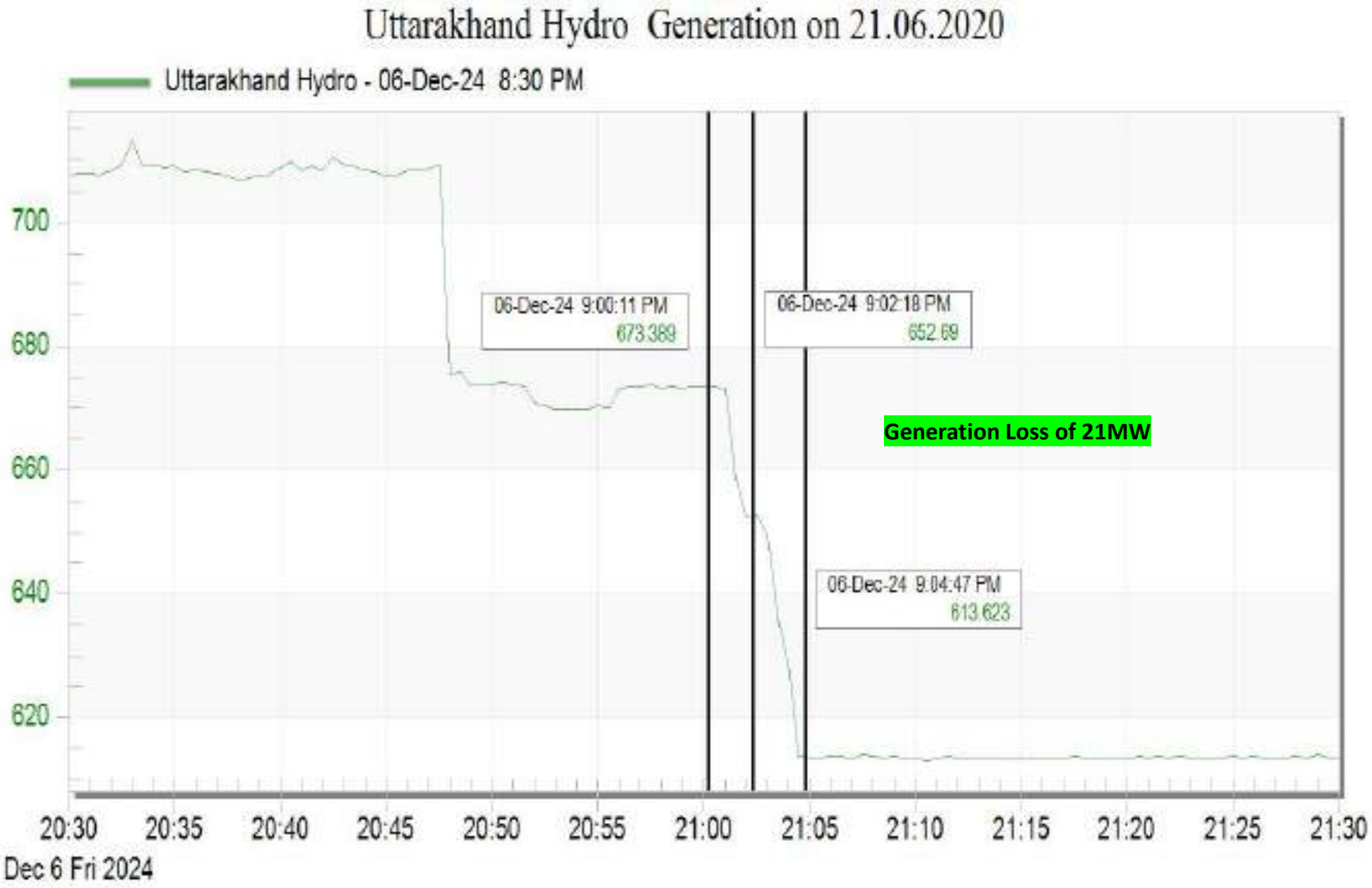
SLD of 220kV Khodri(UK) after the event



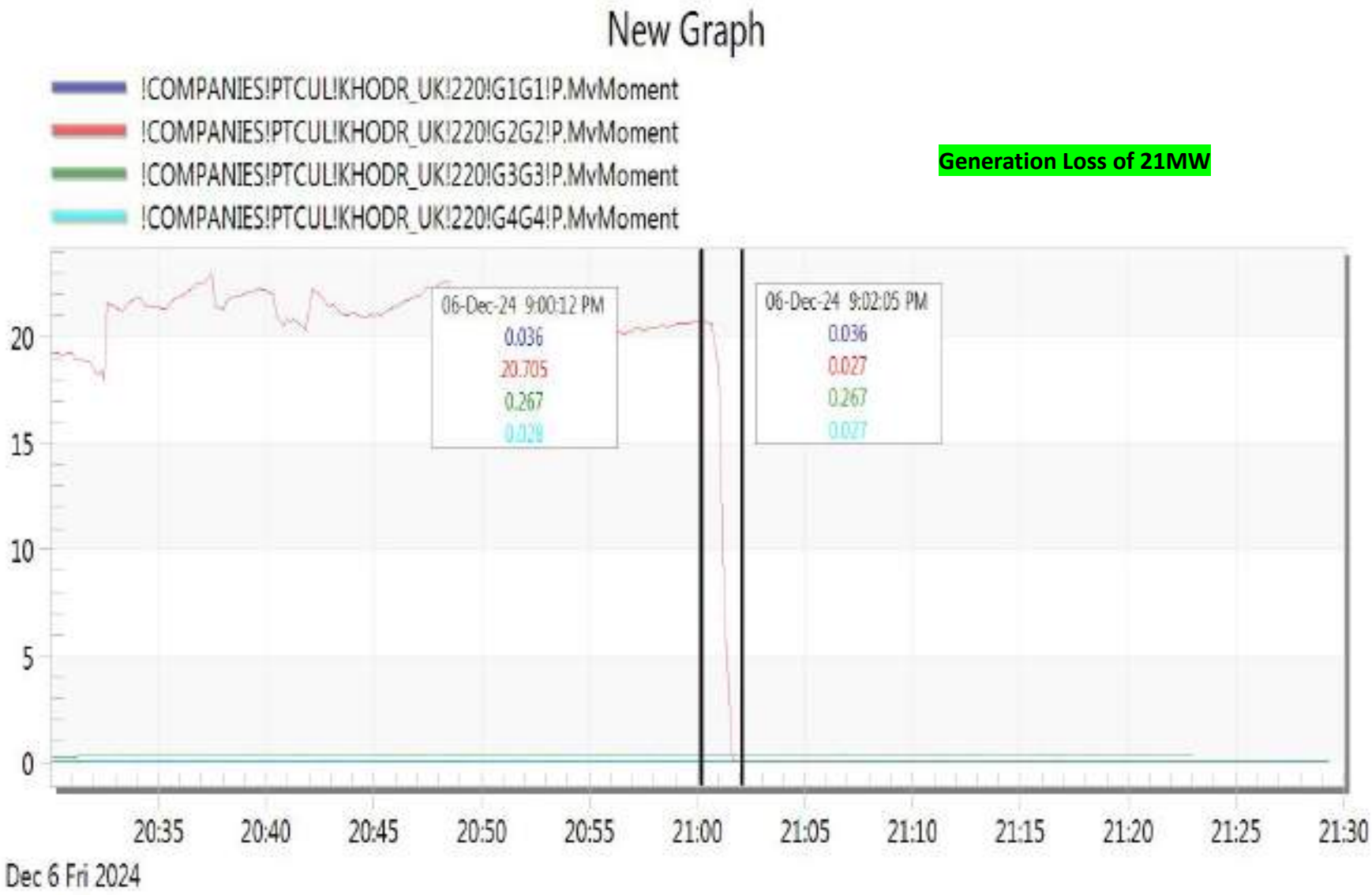
Uttarakhand demand during the event



Uttarakhand generation during the event

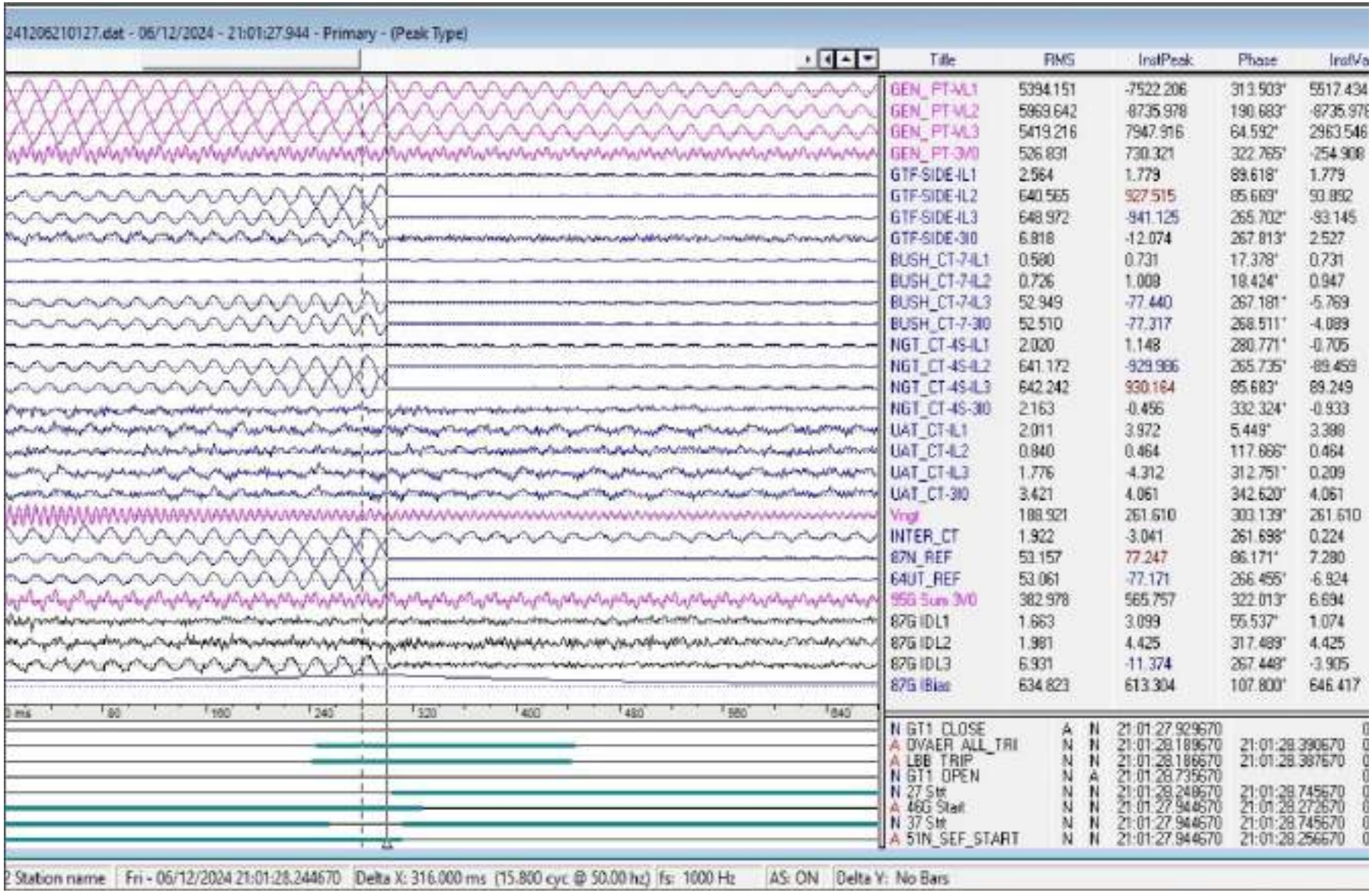


Khodri generation during the event



Generation Loss of 21MW

DR of 30 MW Khodri - UNIT 2



- ✓ LBB protection operated

SCADA SOE

Time	Station Name	Voltage Level	Element Name	Element Type	Element Status	Remarks
21:01:17,103	KHODRI HYDRO	220kV	88MAJRI2	Circuit Breaker	disturbe	
21:01:17,103	KHODRI HYDRO	220kV	E_T1 (T1)	Circuit Breaker	disturbe	
21:01:17,103	KHODRI HYDRO	220kV	E_F7 (SHARN-2	Circuit Breaker	Open	Line CB at Khodri(UK) end of 220 kV Saharanpur (UP)-Khodri(UK) (UP) Ckt 1 opened

Points for Discussion

i) Bus-wise arrangement of elements needs to be shared.

ii) Exact reason of tripping of 60 MW Chhibro Unit 2 & 3 need to be shared.

iii) Wrong status of CB at Khodri was observed during the event. Availability and healthiness of SCADA data at 220kV Khodri(UK) need to be ensured.

iv) DR/EL (.dat/.cfg file) of all tripped elements need to be shared from both ends.

v) Testing report of Generator CB of Unit -2 needs to be shared.

Multiple element tripping event at 400kV Jaisalmer(RS)

At 12:13 hrs on 11th December, 2024

Tripped Elements

S. No	Name of Elements	Outage Time	Revival Time	Reason of tripping
1.	400/220 kV 500 MVA ICT 1 at Jaisalmer(RS)	12:13 hrs	13:20 hrs	Tripping Details yet to be shared.
2.	400/220 kV 500 MVA ICT 3 at Jaisalmer(RS)		13:40 hrs	
3.	400 KV Jaisalmer-Barmer (RS) Ckt-2		14:12 hrs	
4.	220kV Jaisalmer(RS)-Renew Solar Ckt			
5.	220kV Jaisalmer(RS)-Fortum Solar Ckt			
6.	220kV Jaisalmer(RS)-Akal Ckt-1			
7	220kV Jaisalmer(RS)-Akal Ckt-2			

Brief details of the event

i) 400/220kV Jaisalmer(RS) has one and half breaker scheme at 400kV level and double main and transfer bus scheme at 220kV level.

ii) During antecedent condition, Renew Solar, Fortum Solar, ACME Aklera and Clean solar was injecting approx. 109 MW, 236 MW, 267 MW and 245 MW respectively to Jaisalmer(RS) at 220kV level. Active power was going out to Akal(RS) through 220kV Jaisalmer(RS)-Akal Ckt-1 & 2 carrying approx. 253 MW each. 400/220 kV 500 MVA ICT 1 & 3 at Jaisalmer(RS) were carrying approx. 261 MW and 248 MW respectively from 220kV level to 400kV level.

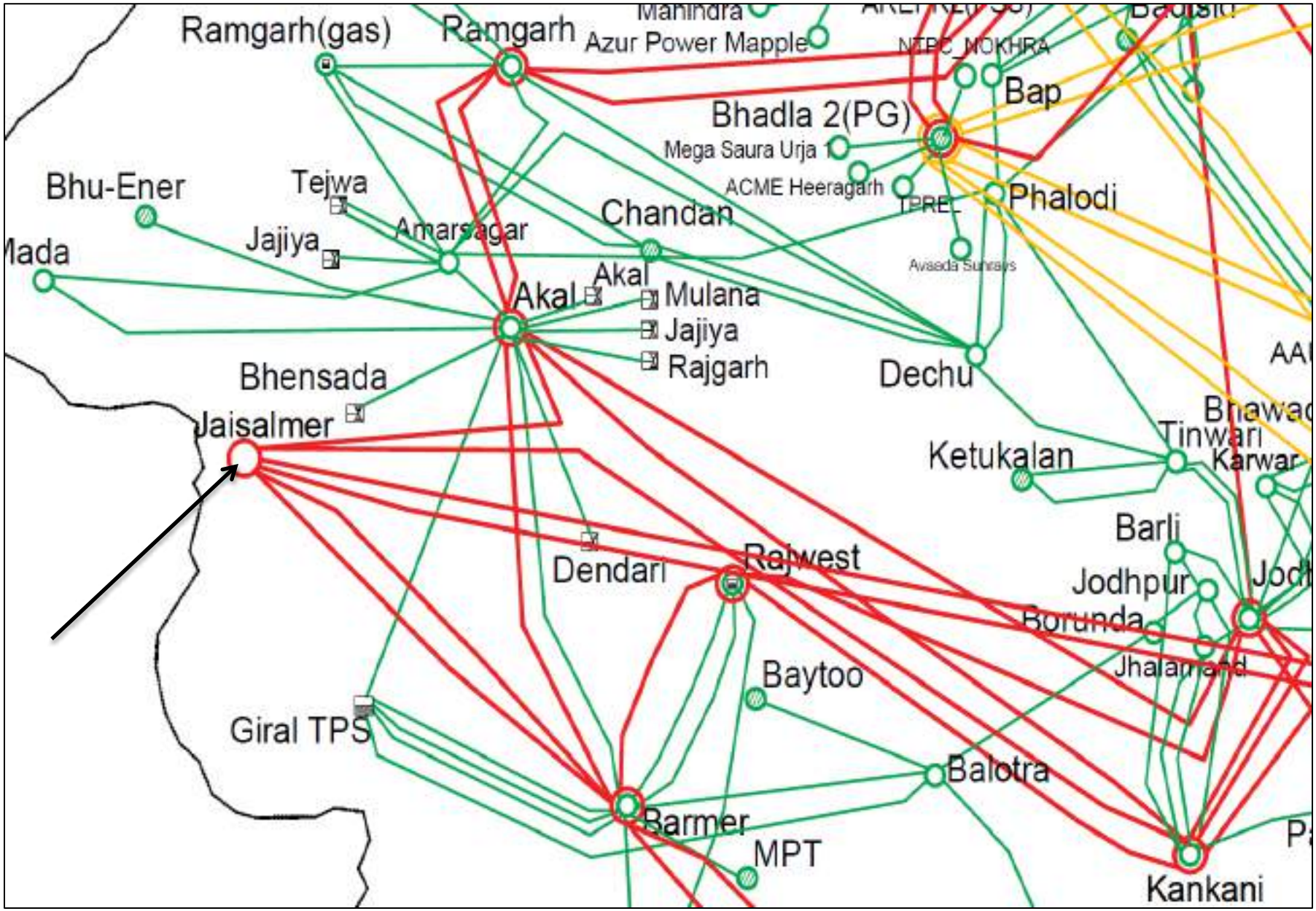
iii) As reported, at 12:13 hrs, 400/220 kV 500 MVA ICT 1 & 3 tripped along with 220KV lines of Renew Solar, Fortum Solar, ACME Aklera and Clean solar connected from 220KV Jaisalmer(Exact reason for tripping needs to be shared).

iv) As per PMU at Fatehgarh3(PG), no fault is observed.

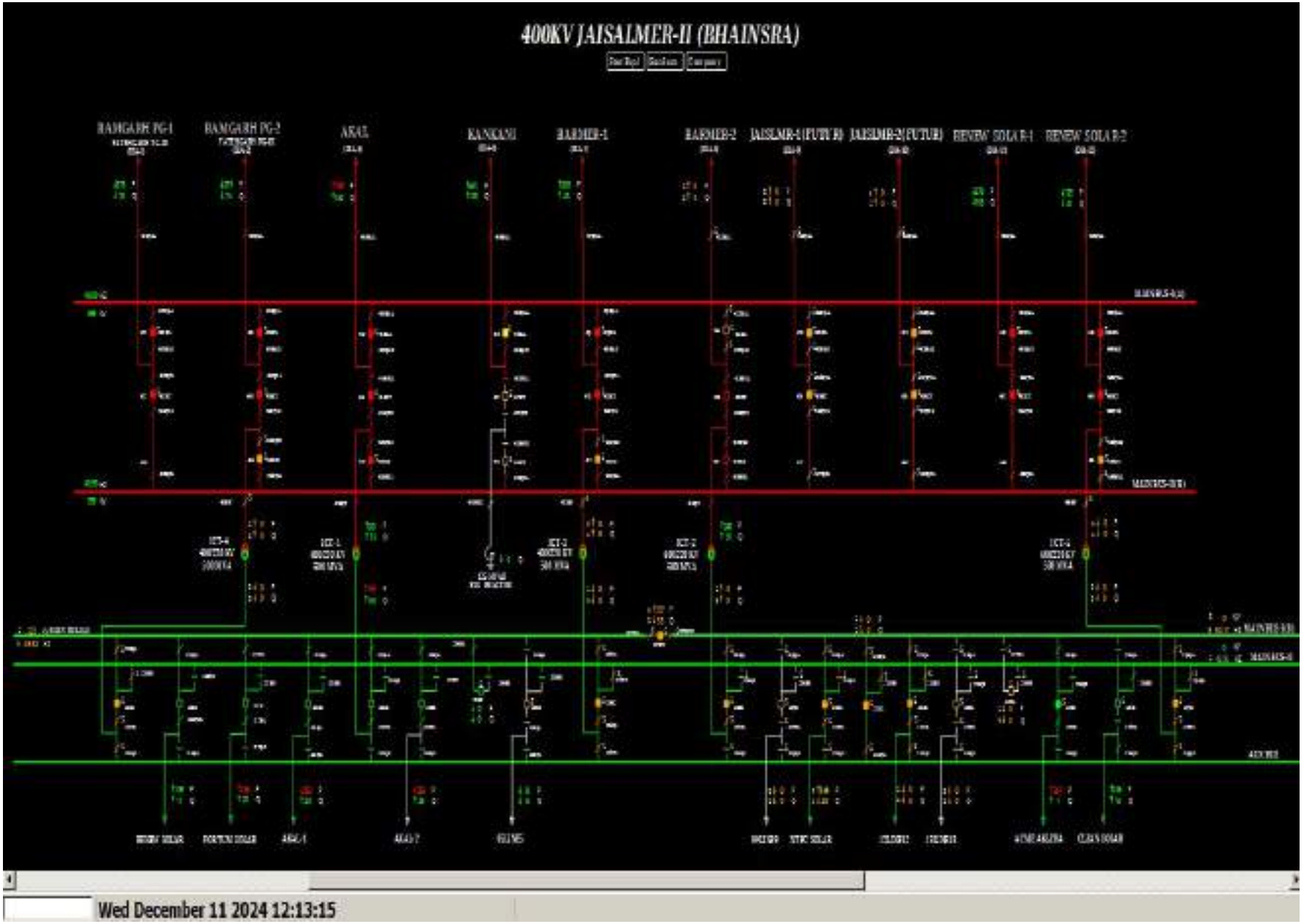
v) During this event, as per SCADA, solar generation loss of approx. 835 MW is observed in Rajasthan control area.

vi) As per SCADA, no change in demand is observed in Rajasthan control area.

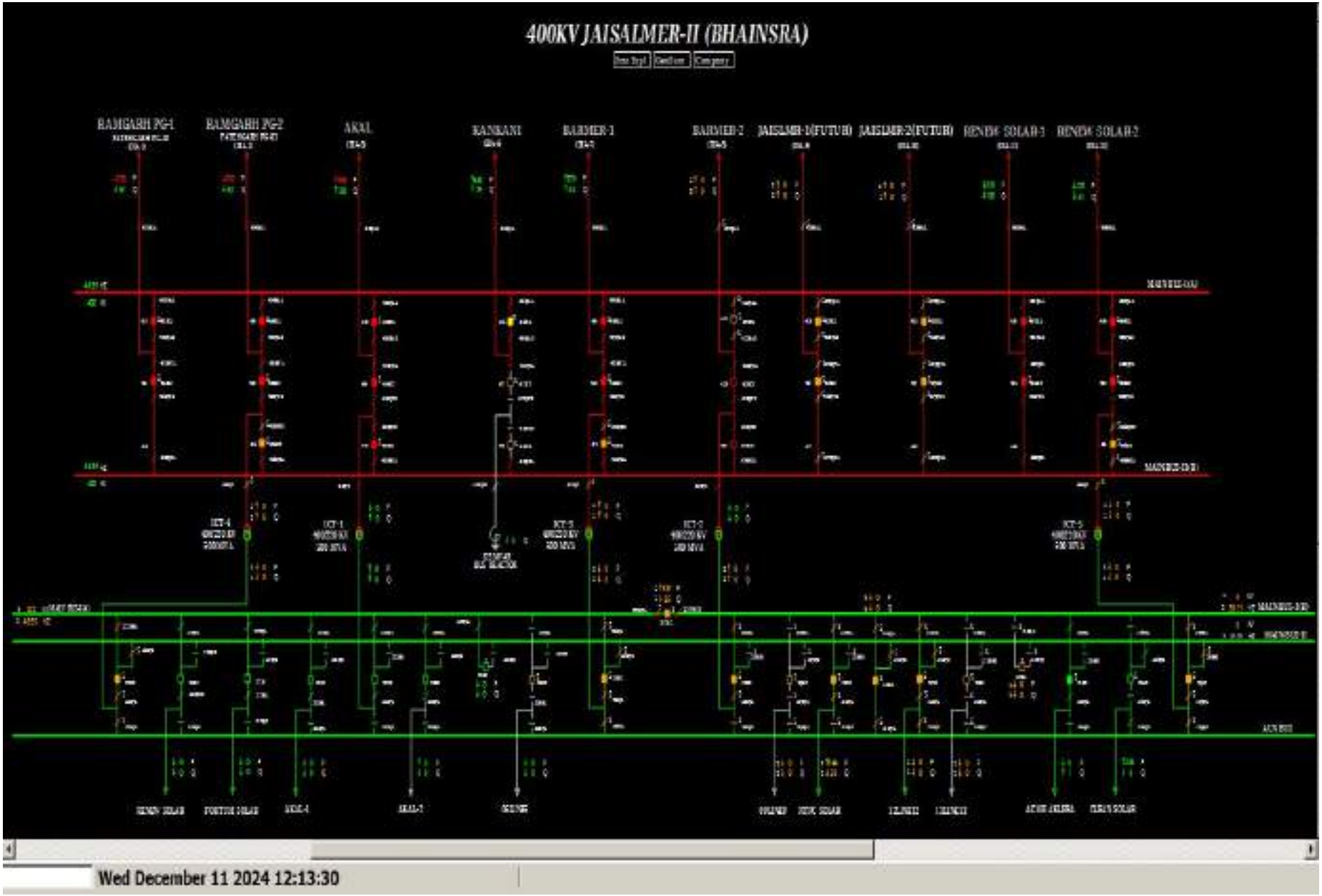
Network Diagram



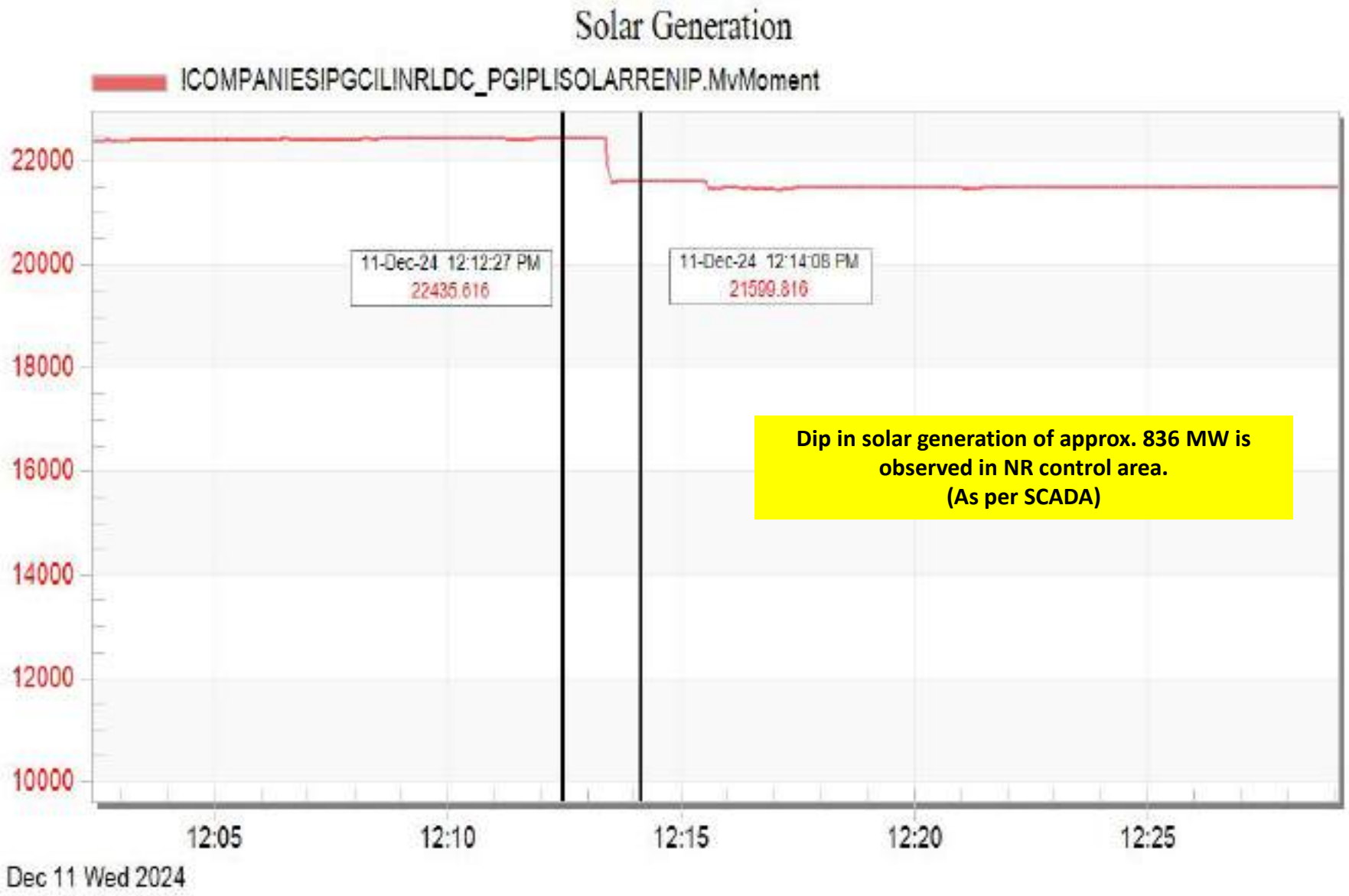
SLD of 400/220kV Jaisalmer(RS) before the event



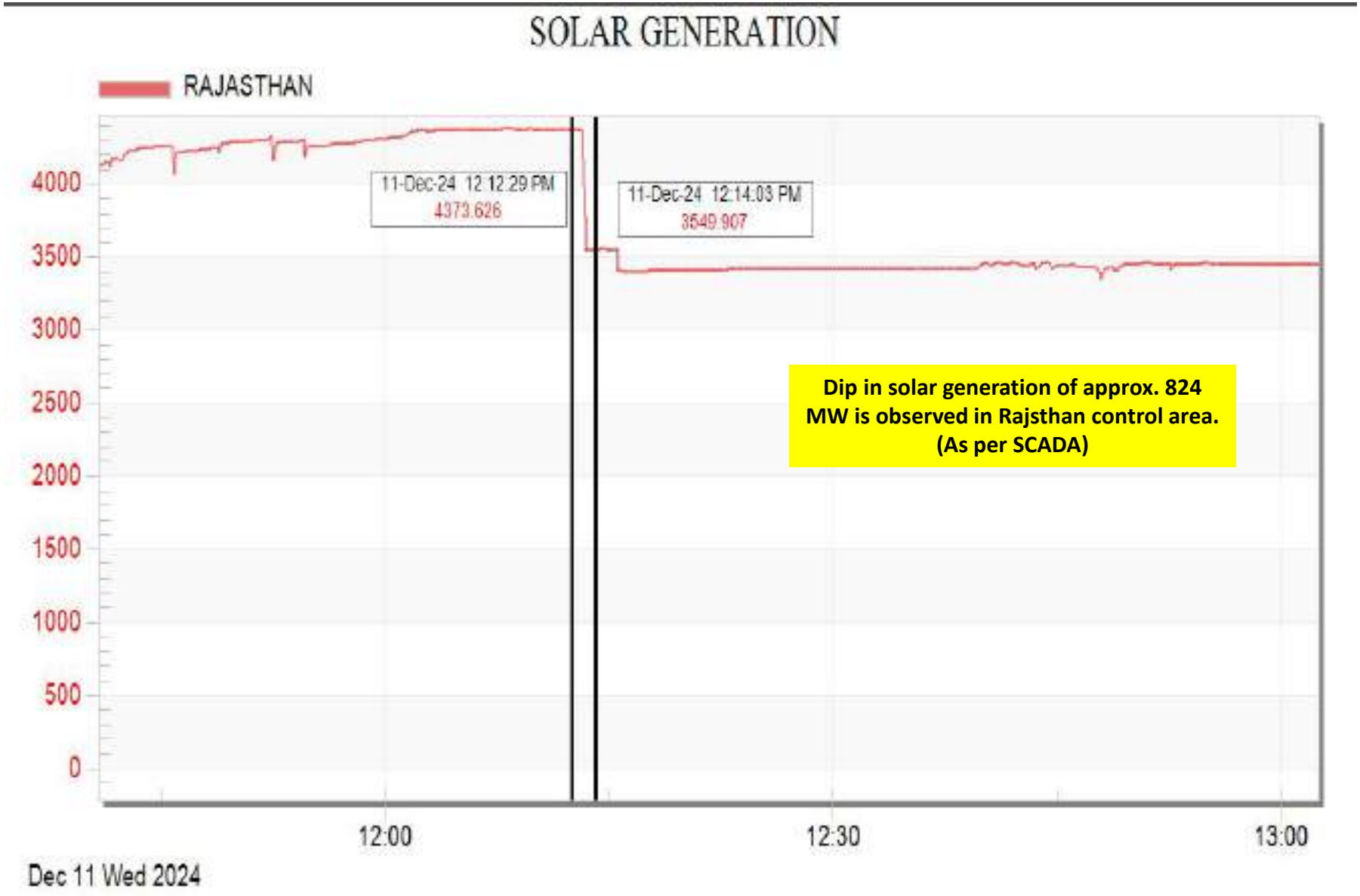
SLD of 400/220kV Jaisalmer(RS) after the event



NR total Solar Generation during the event

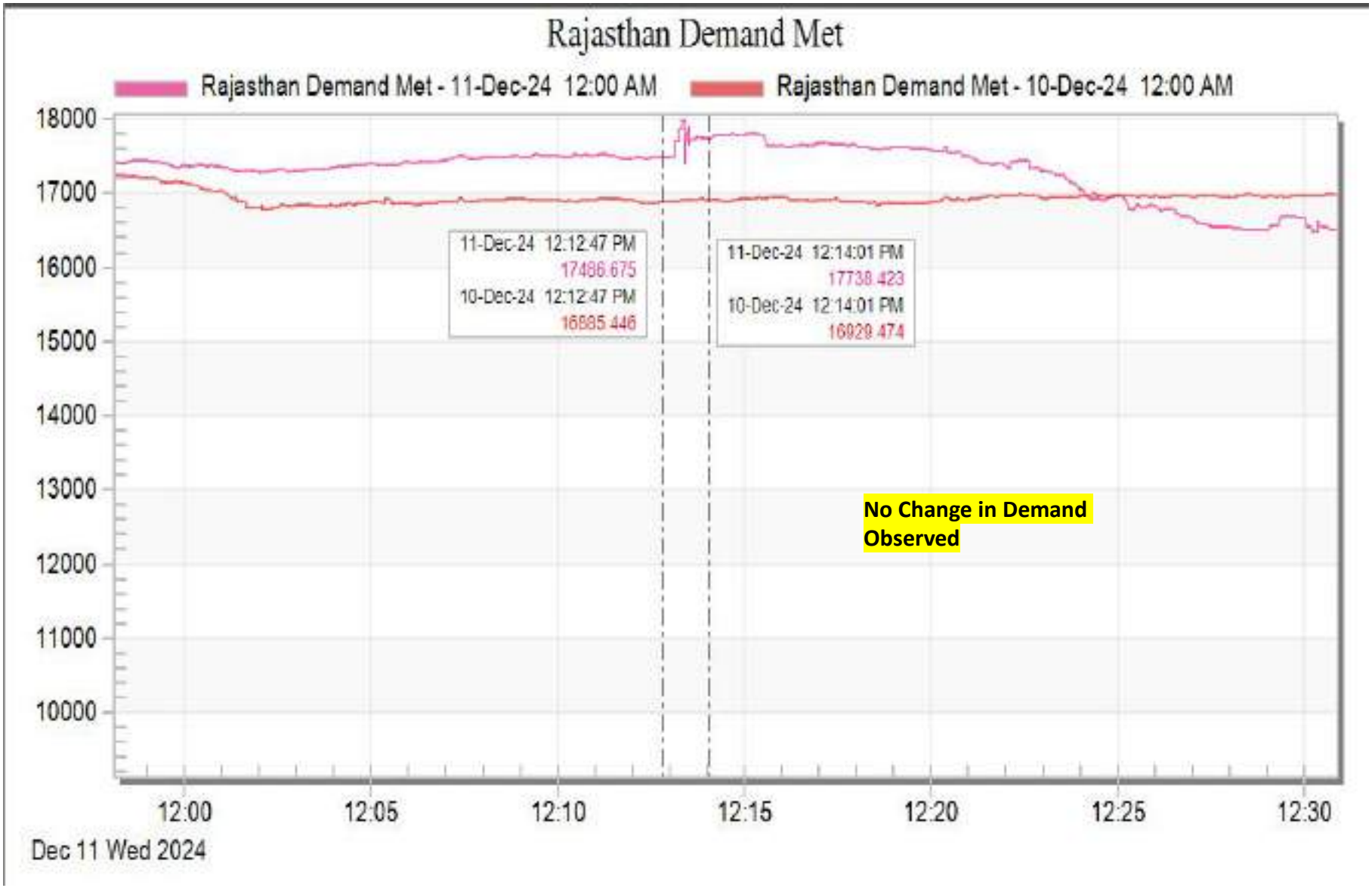


Rajasthan Solar Generation during the event



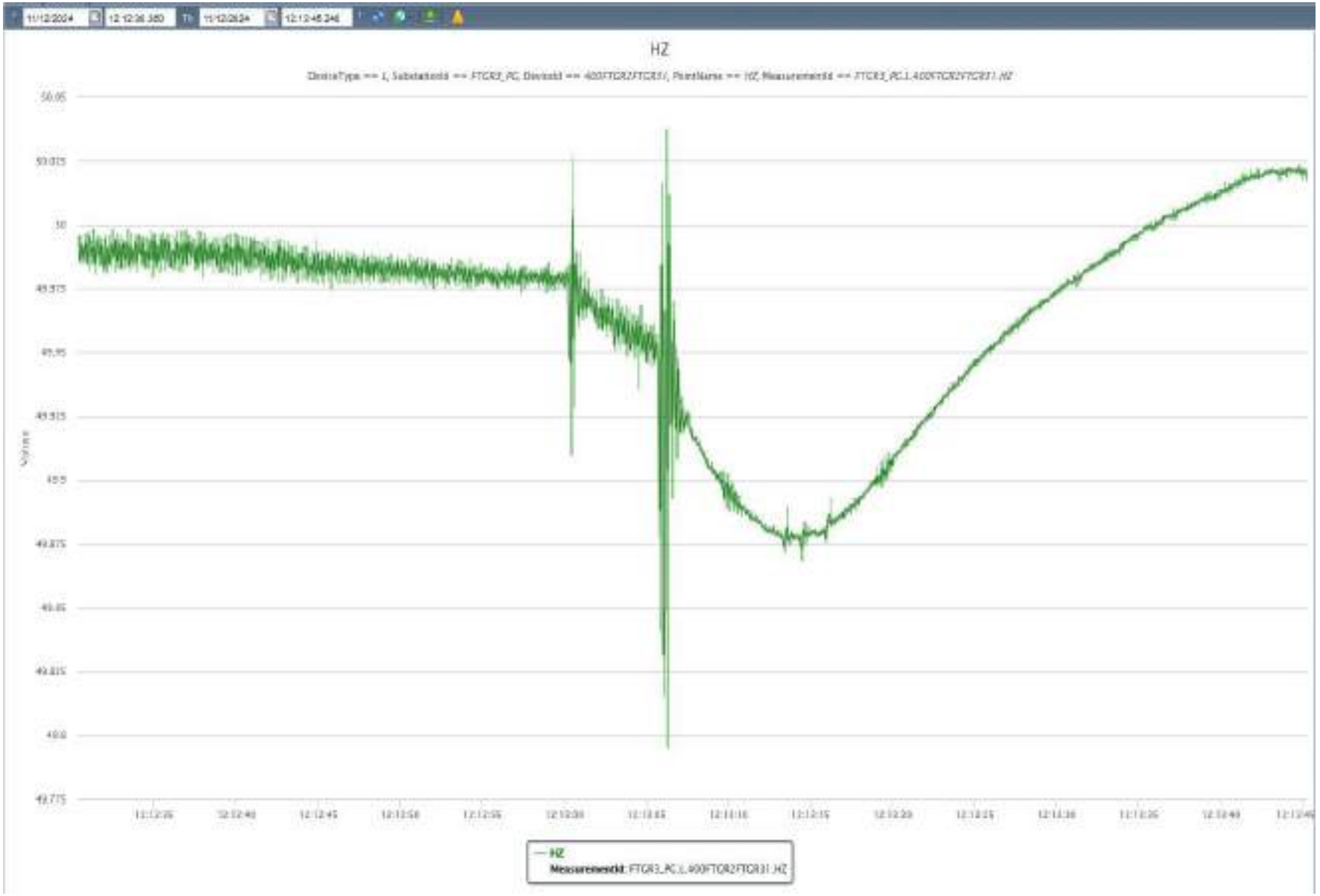
Dip in solar generation of approx. 824 MW is observed in Rajsthan control area. (As per SCADA)

Rajasthan Demand during the event



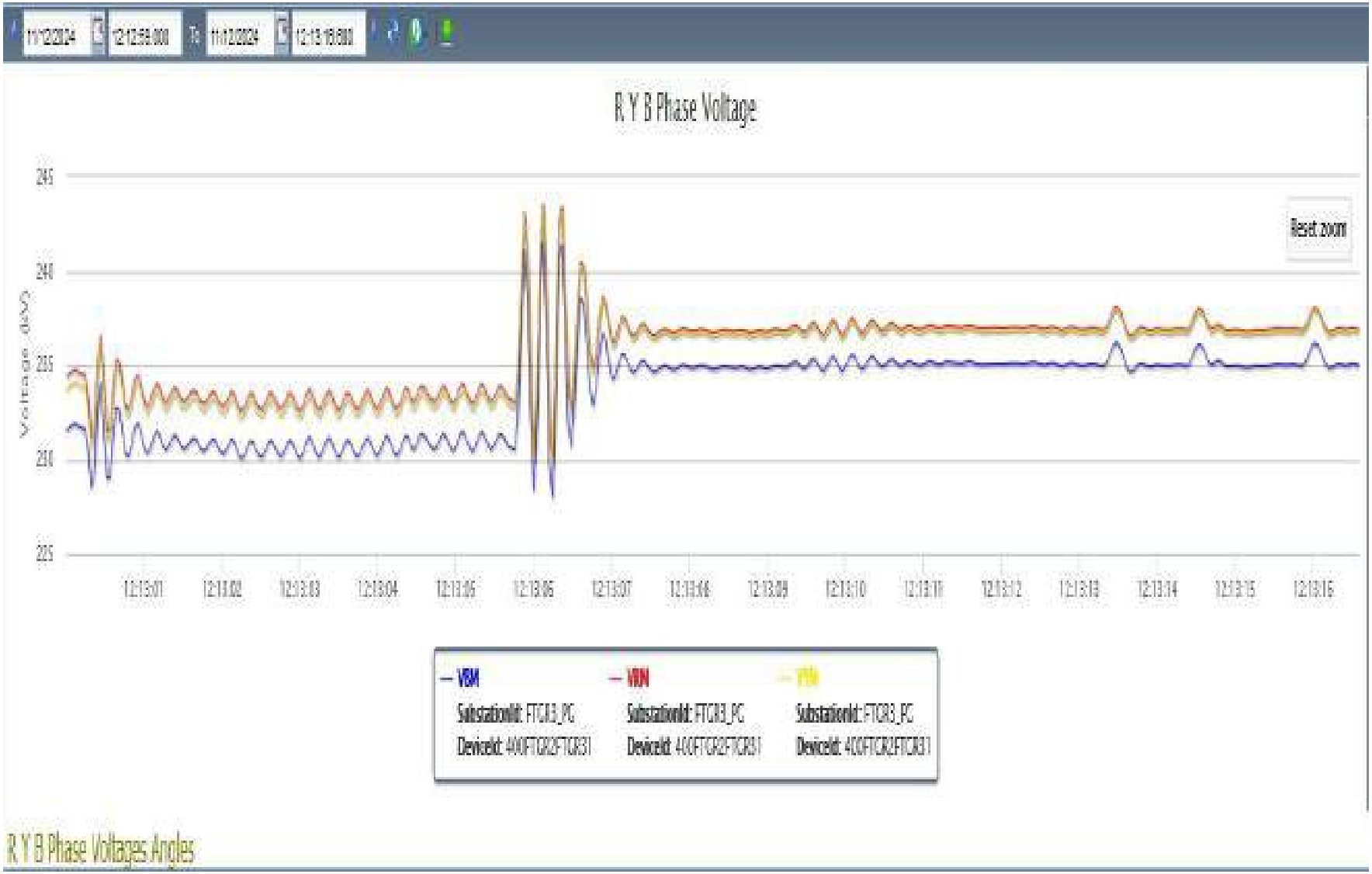
PMU Plot of frequency at Fatehgarh3(PG)

12:13 hrs/11-Dec-24



PMU Plot of phase voltage magnitude at Fatehgarh3(PG)

12:13 hrs/11-Dec-24



SCADA SOE

Time	Station Name	Voltage Level	Element Name	Element Type	Element Status	Remarks
12:13:00,293	JASL4_R	220	01AKAL1	Circuit Breaker	Open	Line CB at Jaisalmer(RS) end of 220kV Jaisalmer(RS)-Akal Ckt-1 opened
12:13:00,332	JASL4_R	220	17FORTM	Circuit Breaker	Open	Line CB at Jaisalmer(RS) end of 220kV Jaisalmer(RS)-Fortum Solar Ckt opened
12:13:00,335	JASL4_R	220	18RENEW	Circuit Breaker	Open	Line CB at Jaisalmer(RS) end of 220kV Jaisalmer(RS)-Renew Solar Ckt opened
12:13:00,335	JASL4_R	220	03AKAL2	Circuit Breaker	Open	Line CB at Jaisalmer(RS) end of 220kV Jaisalmer(RS)-Akal Ckt-2 opened
12:13:00,336	JASL4_R	220	02T1	Circuit Breaker	Open	CB at 220kV side of 400/220kV 500MVA ICT-1 at Jaisalmer(RS) opened
12:13:05,803	JASL4_R	400	23BRT3	Circuit Breaker	Open	Tie CB at 400kV side of 400/220kV 500MVA ICT-1 at Jaisalmer(RS) opened
12:13:05,807	JASL4_R	400	24T2	Circuit Breaker	Open	CB at 400kV side of 400/220kV 500MVA ICT-1 at Jaisalmer(RS) opened

Points for Discussion

i) Exact reason of tripping need to be shared.

ii) DR/EL(.dat/.cfg file) of all tripped elements along with detailed tripping report need to be shared.

iii) Remedial action taken report need to be shared.

Multiple element tripping event at 400/220kV Basti(UP)

At 12:02 hrs on 12th December, 2024

Tripped Elements

S. No	Name of Elements	Outage Time	Revival Time	Reason of tripping
1.	400 KV Gorakhpur (PG)-Basti(UP) (PG) Ckt-1	12:02 hrs	14:48 hrs	Bus-Bar protection operated due to malfunction of 89A Gas density Monitor of 400 KV LUCKNOW_1(PG)-BASTI(UP) (PG) CKT-2
2.	400/220 kV 500 MVA ICT 1 at Basti(UP)		14:52 hrs	
3.	400 KV Tanda(NT)-Basti(UP) (UP) Ckt-2		14:40 hrs	
4.	400 KV Lucknow_1(PG)-Basti(UP) (PG) Ckt-1		14:15 hrs	
5.	400/220 kV 500 MVA ICT 2 at Basti(UP)		14:54 hrs	
6.	400 KV Tanda(NT)-Basti(UP) (UP) Ckt-1		14:28 hrs	

Brief details of the event

i) During antecedent condition, 400/220 kV 500 MVA ICT 1 and ICT 2 at Basti was carrying approx. 97 MW each. 400KV Gorakhpur (PG)-Basti(UP) (PG) Ckt-2 and 400 KV LUCKNOW_1(PG)-BASTI(UP) (PG) CKT-2 was in open condition and site engineers were checking wiring of LBB and carrying out Circuit Breaker at Basti end .

ii) As reported, at 12:02 hrs, during CB timing testing of 400 KV LUCKNOW_1(PG)-BASTI(UP) (PG) CKT-2 (Z1) Bus-Bar protection operated due to malfunction of 89A Gas density Monitor.

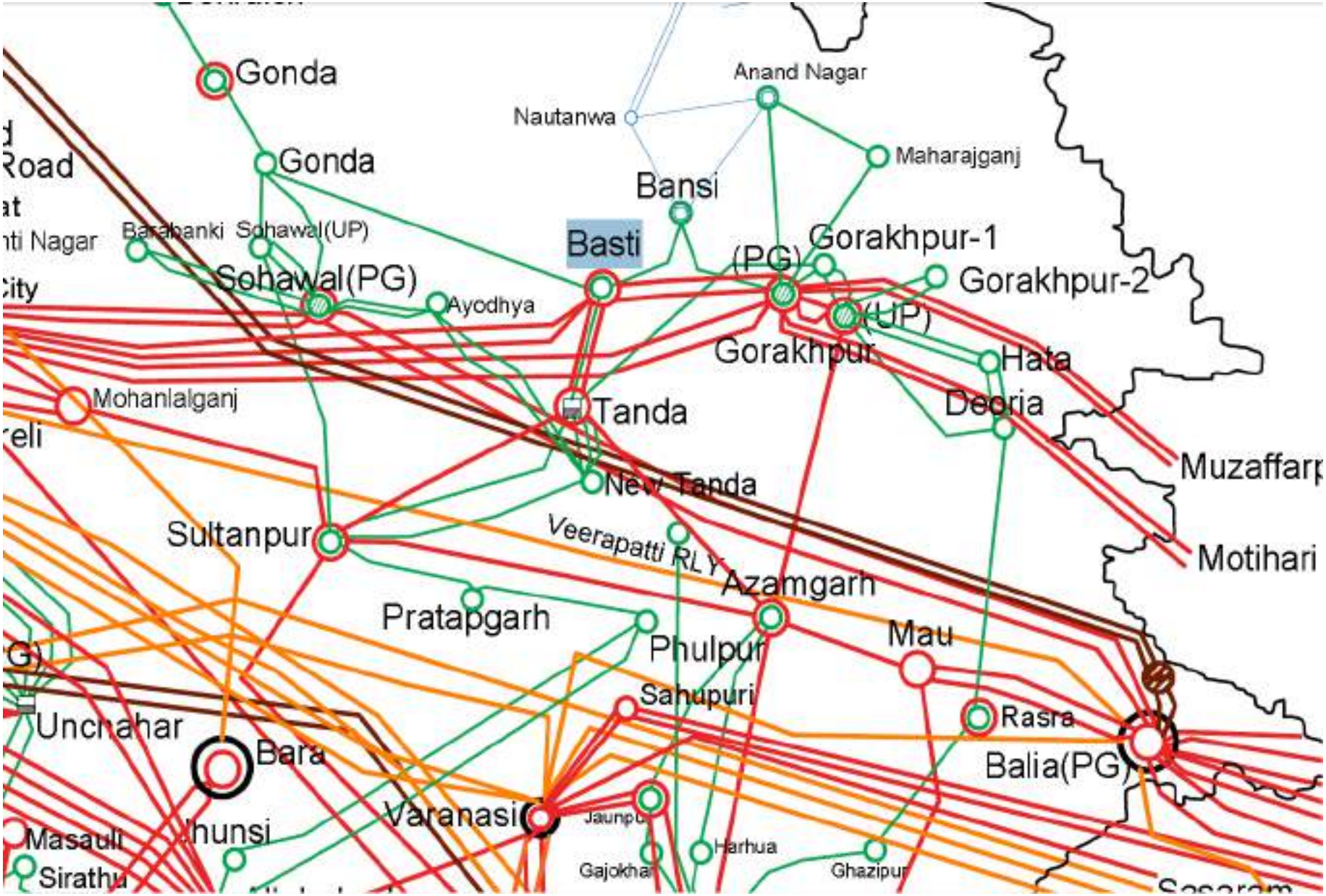
iii) This led to the tripping of both 400KV Bus-I & II and the elements connected with them.

iv) As per PMU at 400KV Lucknow(PG), no fault in system is observed.

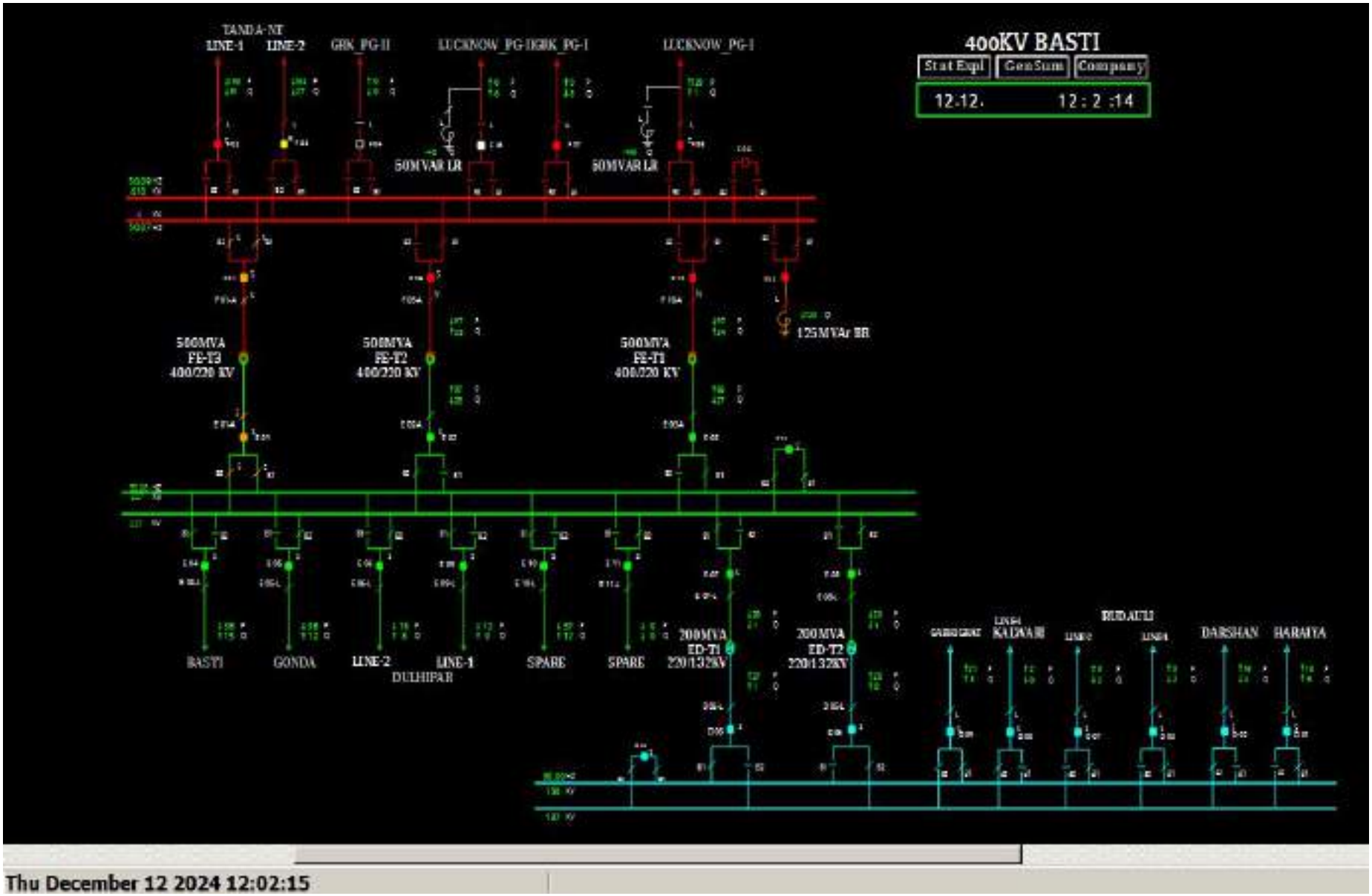
v) SCADA data of 400/220 kV 500 MVA ICT 3 was in suspected condition before and tripping the tripping incident.

vi) As per SCADA, change in demand of approx. 140MW is observed in UP control area.

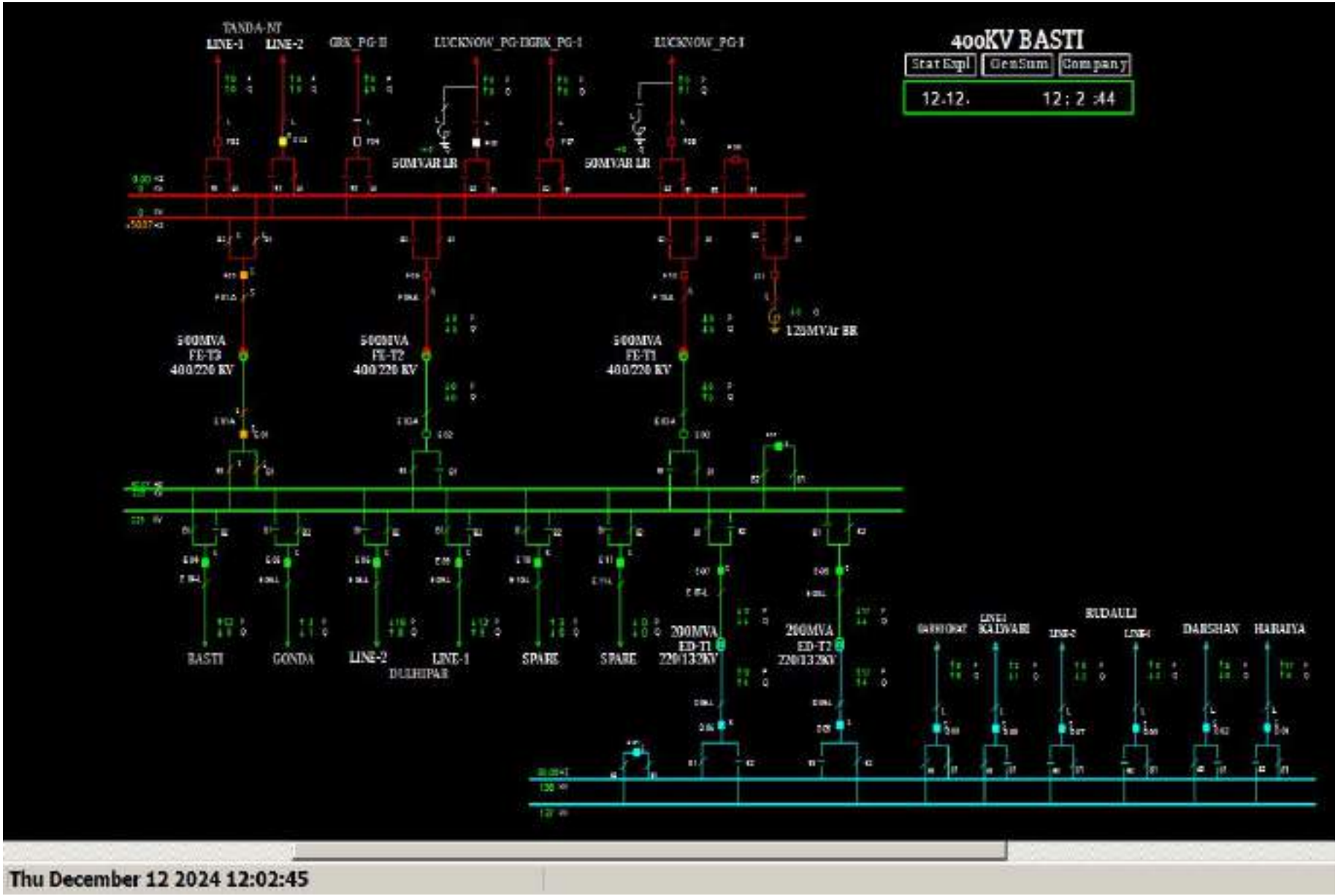
Network Diagram



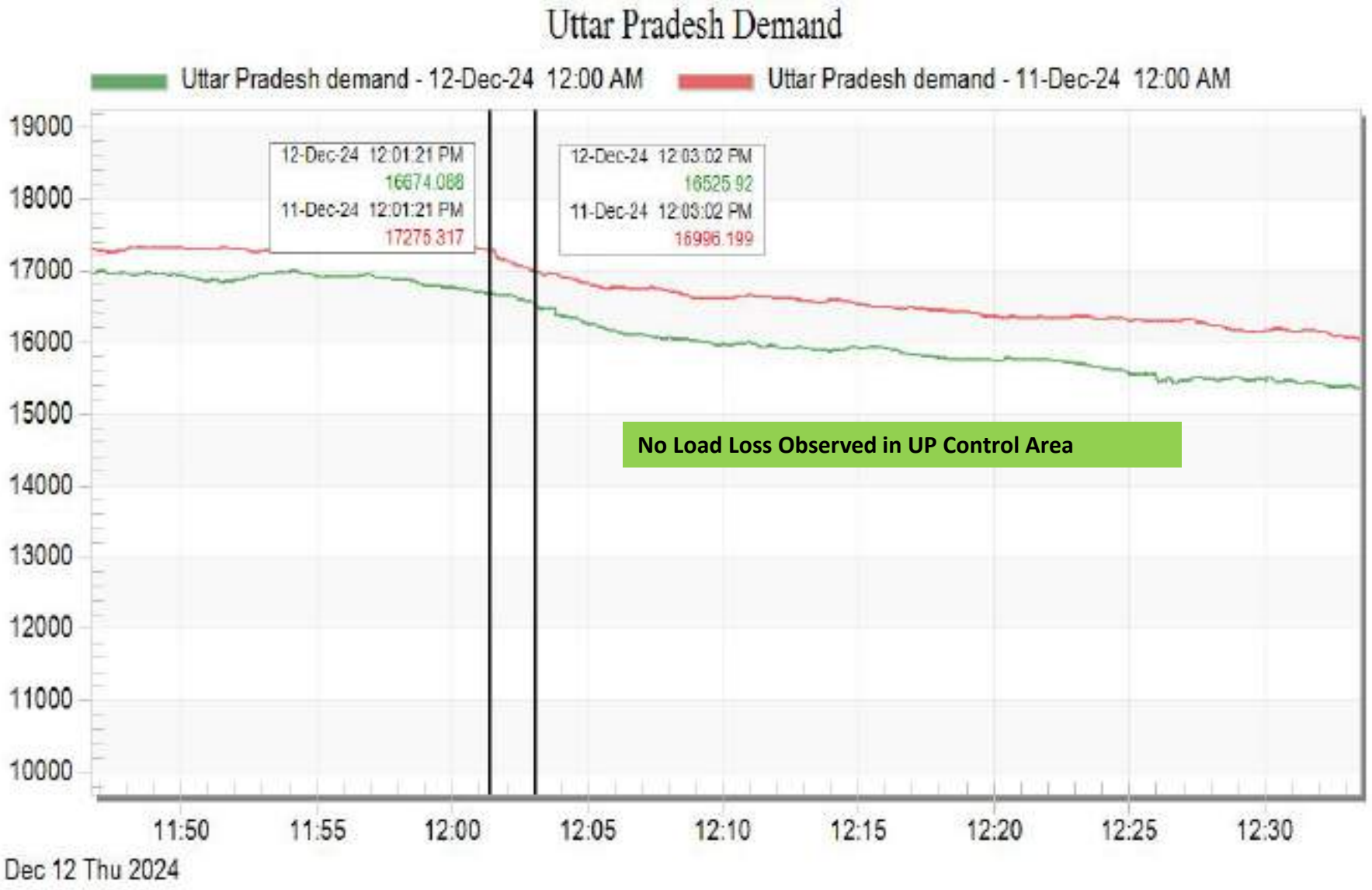
SLD of 400/220/132kV Basti(UP) before the event



SLD of 400/220/132kV Basti(UP) after the event



Uttar Pradesh Demand during the event



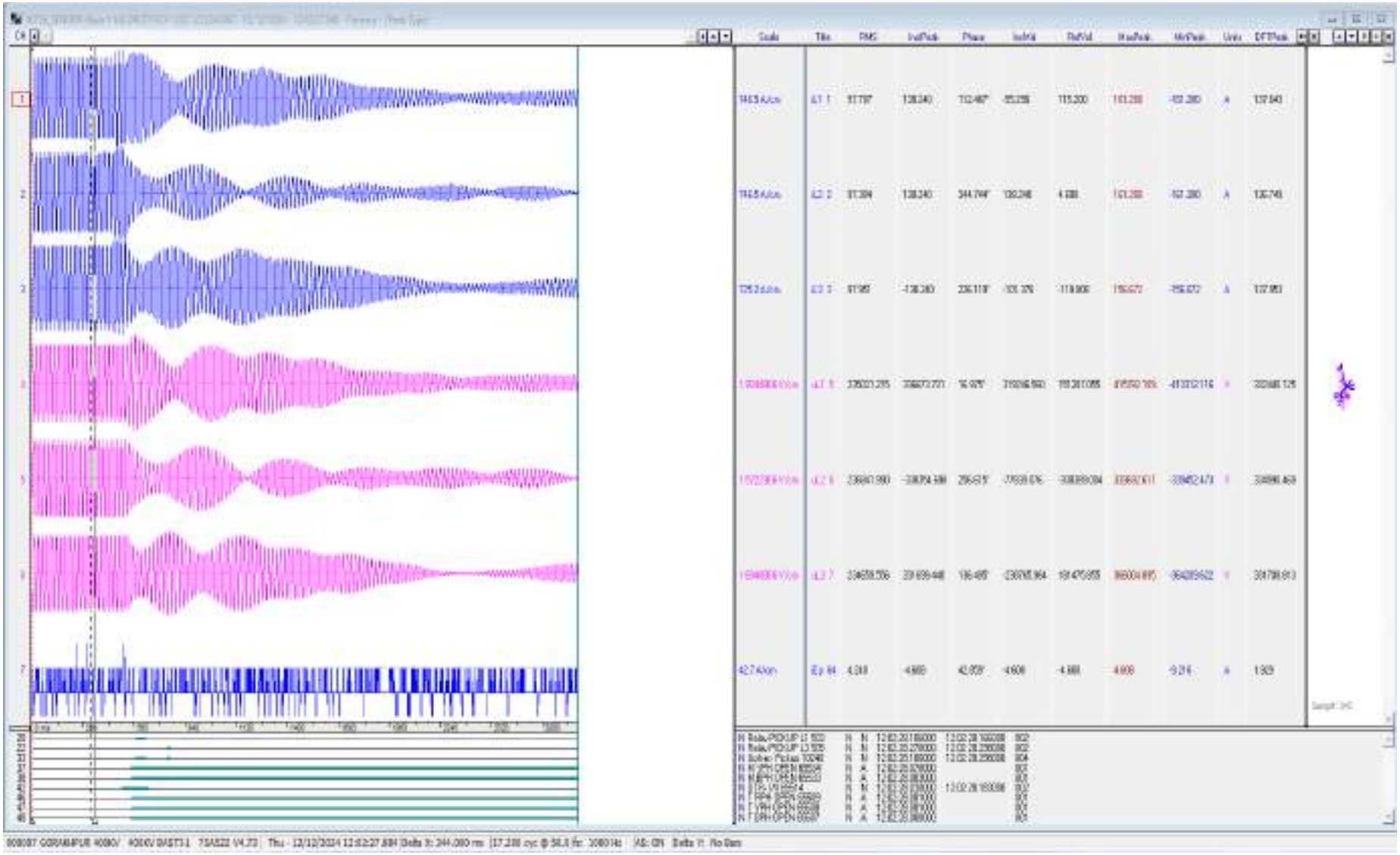
PMU Plot of frequency at Lucknow(PG)

12:02 hrs/12-Dec-24

PMU Plot of phase voltage magnitude at Lucknow(PG)

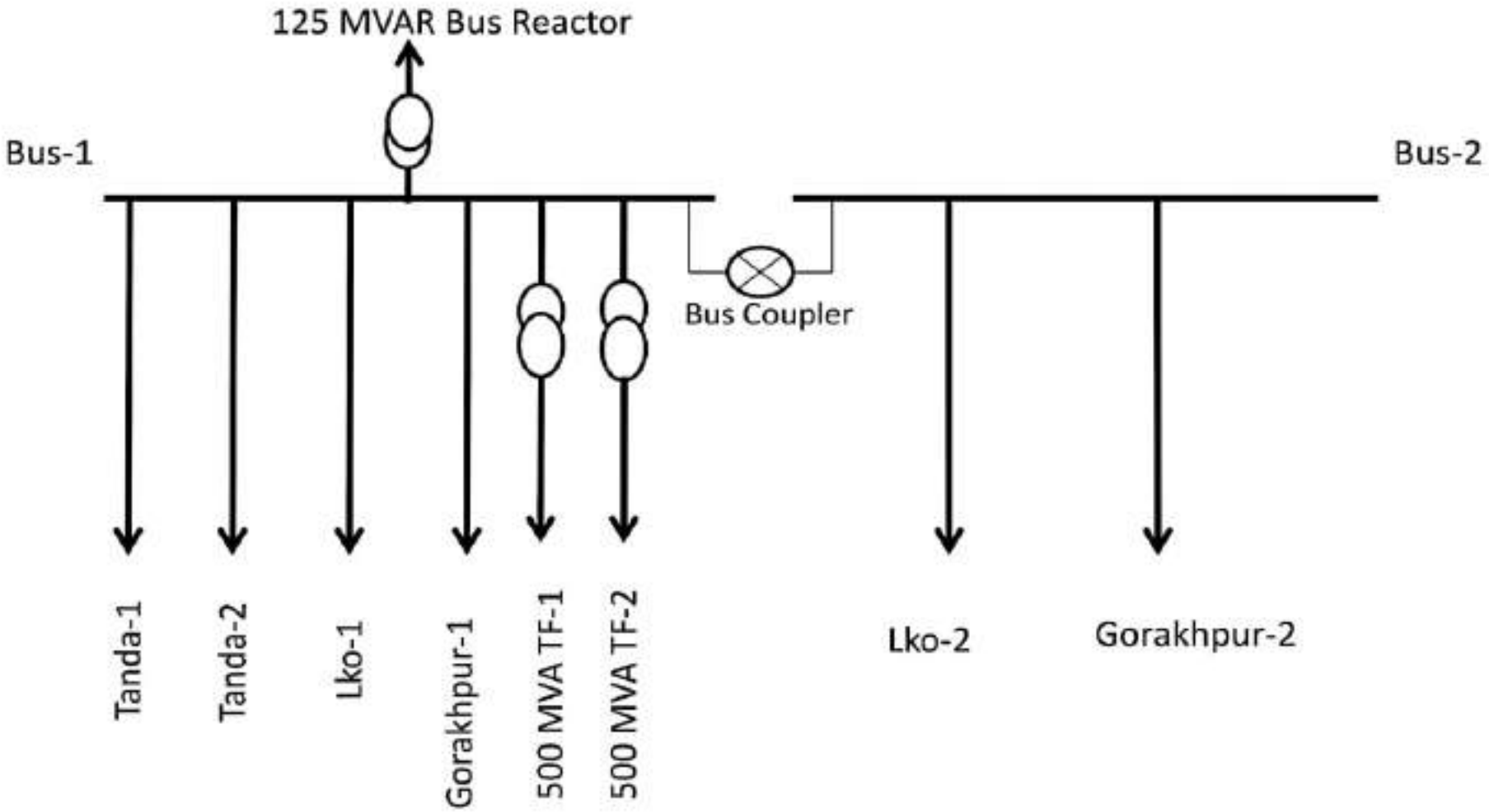
12:02 hrs/12-Dec-24

DR of 400kV Gorakhpur(PG)(end)-Basti line-1



No fault in system, DT received at Gorakhpur end

Details received from UP



1.Lucknow-2 ckt & Gorakhpur-2 ckt were in Shutdown and Bus Coupler was Open in Condition.
2. All Other Bay were Connected to Bus-1

Details received from UP

D	EVENT DESCRIPTION/ANALYSIS OF THE EVENT	
1	DESCRIPTION: DETAILED DESCRIPTION INCLUDING THE REFERENCE OF DR/EL AND EXPLANATION BASED ON PT C EVENT DATA	On date 12.12.2024 400kV Lucknow-2 ckt & 400kV Gorakhpur-2 ckt were in Shutdown and 400kV Bus Coupler was in open condition for Tesing and Solving previous spurious operation of Bus Bar Protection.CE Engineer were also onsite to rectify aforesaid problem & in parallel CB timing testing of 400 kV LKO-2 bay was also going on by firm engineer. After event flag found on LKO-2 LCC Panel-89A ,RYB-PH,GD-2,Compressor Gas pressure low Second stage Alarm block out(<0.45 MPA) .However,actual gas pressure was found normal(0.55 MPa).CB timing testing was being done at lucknow-2 ckt. During repeated operation of CB C-O testing positive DC supply taken for C.B. analyser was accidentally extended to K605 wire of KGD-2 contractor which gave annunciation of 2nd stage low gas leakage contact of 89A of 400kV Lko2 line and gave command to the busbar relay protection and all the bays installed on busbar 1 opened. (According to the scheme 89A is connected to Bus-1.)
E	CAUSE OF CONCERN/REMEDIAL ACTION	
1	CAUSE OF CONCERN	Accidental extension of DC to k605 wire during multiple testing.
2	REMEDIAL ACTION TAKEN	More vigilance will be taken during CB testing. DC shall be taken from safer position / main source.
3	Issues to be discussed	NA
4	REMEDIAL ACTION TO BE TAKEN ALONG WITH TIME FRAME	NA
5	LESSON LEARNT	More vigilance will be taken during CB testing. DC shall be taken from safer position / main source.
6	ANY OTHER INFORMATION	NA

Points for Discussion

i) Exact cause of maloperation need to be shared.

ii) Standard Operating procedure needs to be followed during Testing of Electrical Equipment's at the site.

iii) SCADA data of 400/220kV ICT-3 was not healthy during the event. Availability and healthiness of SCADA data need to be ensured.

iv) Remedial action taken report need to be shared.

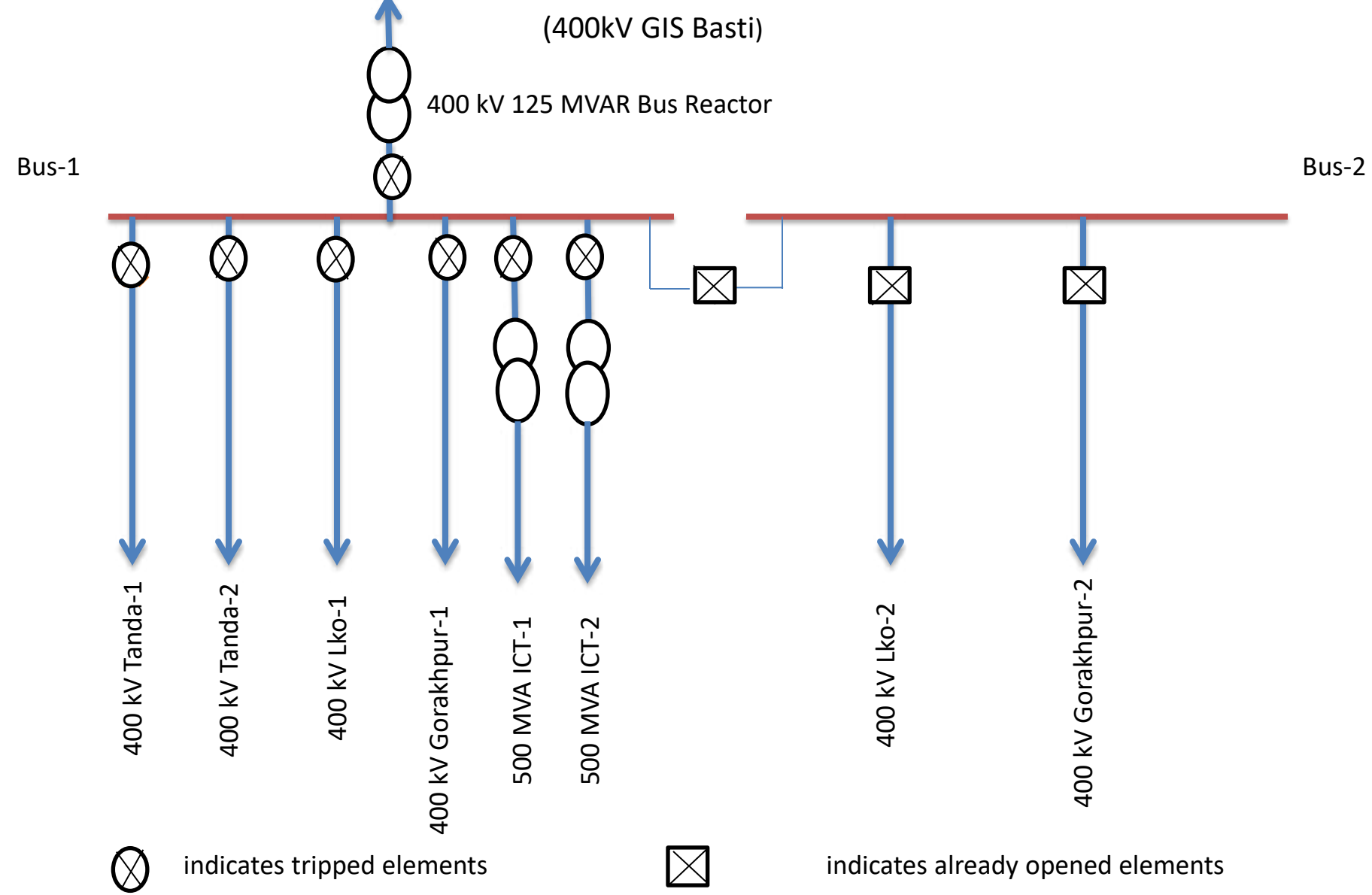
400kV Sub-Station Basti (UPPTCL)

12.12.2024, 12:02:27 hrs

Trippped element-400kV Tanda-1st&2nd ckt, 400kV Gorakhpur-1st ckt, 400kV Lucknow-1st ckt, 400/220kV 500MVA ICT-1st &2nd, 400 kV 125MVAR Bus Reactor.

400kV Basti :Tripping of 400kV Tanda-1st&2nd ckt, 400kV Gorakhpur-1st ckt, 400kV Lucknow-1st ckt, 400/220kV 500MVA ICT-1st&2nd, 400 kV 125MVAR Bus Reactor.

- **Date & Time of event**: 12/12/2024, 12:02:27 hrs
- **Sub-Station affected**: 400kV Basti
- **Date & Time of restoration**: On Dt-12.12.2024
- 1.400kV Tanda ckt-1st Charge at:-14:28:40hrs
- 2.400kV Tanda ckt-2nd Charge at:-14:40:00hrs
- 3.400kV Lucknow ckt-1st Charge at:-14:15:43hrs
- 4.400kV Gorakhpur ckt-1st Charge at:-14:48:05hrs
- 5.400/220kV 500MVA ICT-1st Charge at:-14:52:22hrs
- 6.400/220kV 500MVA ICT-2nd Charge at:-14:54:39hrs
- 7.400 kV 125 MVAR Bus Reactor Charge at-14:44hrs.



1. Lucknow-2nd ckt & Gorakhpur-2nd ckt were in Shutdown and Bus Coupler was in Open Condition.
2. All Other Bay were Connected to Bus-1.

Note-:There were no real fault occurred on lines or Bus. Accidental extension of DC to K605 Wire of KGD2 contractor during multiple testing.

400kV GIS Basti under ET&CC, Gorakhpur

Load before incident at 400 kv Basti on Dt-12.12.2024 ,12:00 hrs

Name of Eliments	Load(MW)	Amp
400 kv Tanda-1 ckt	-158	238
400 kv Tanda-2 ckt	-159	242
400 kv Gorakhpur-1 ckt	-10	25
400 kv Lucknow-1 ckt	114	168
500 MVA ICT-1(HV)	105	155
500 MVA ICT-2(HV)	108	157
500 MVA ICT-1(LV)	-107	290
500 MVA ICT-1(LV)	-109	295
400 kv Lucknow-2 ckt	S/D	Nil
400 kv Gorakhpur-2 ckt	S/D	Nil
400 kv Bus Coupler	S/D	Nil

Event Discription

⟹ On date 12.12.2024 400kV Bus-2 was connected with LKO-2 ,GKP-2.400kV Bus-1 was connected to Tanda-1st &2nd , LKO-1st, GKP-1st, 125 MVAR Bus Reactor, 500MVA ICT-1st &2nd . Bus Coupler was in open condition For S/D of 400kV Bus-2 to rectify previous spurious operation of Bus Bar protection.

⟹ GE Engineer were onsite to rectify aforesaid problem & in parallel CB timing testing of 400kV LKO-2nd bay was also going on by firm engineer. After event flag found on LKO-2nd LCC Panel-89A ,RYB-PH, GD-2, Compressor Gas pressure low Second stage Alarm block out (<0.45 MPA) .

⟹ However, actual gas pressure was found normal (0.55 MPa). CB timing testing was being done at lucknow-2nd ckt. During repeated operation of CB C-O testing positive DC supply taken for C.B. analyser was accidentally extended to K605 wire of KGD-2 contractor which gave annunciation of 2nd stage low gas leakage contact of 89A of 400kV LKO-2nd line and gave command to the busbar relay protection and all the bays installed on busbar 1 opened. {According to the scheme 89A (Bus Isolator) is connected to Bus-1.}

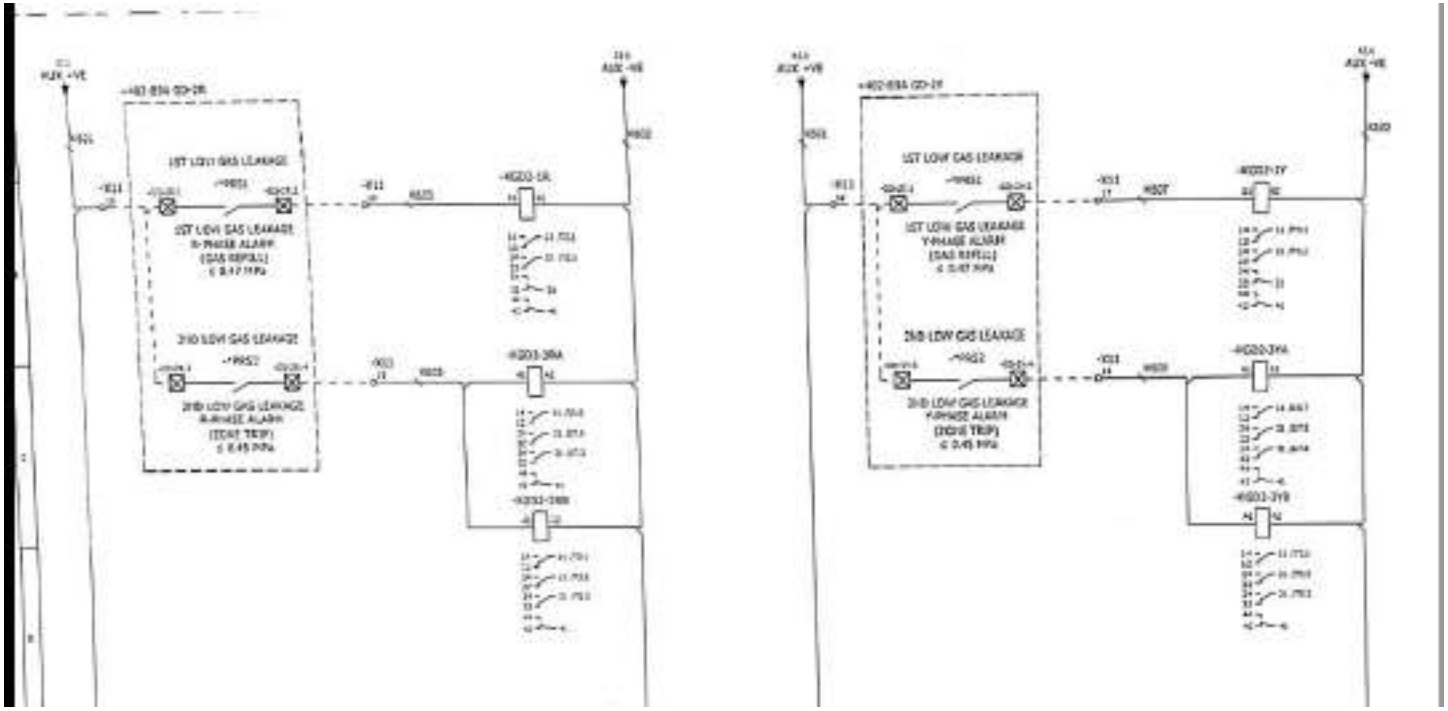
⟹ Event of 400 kV Tanda-1 & Bus Bar is attached Below(DR is not available due to Relay did not Trip on actual fault).

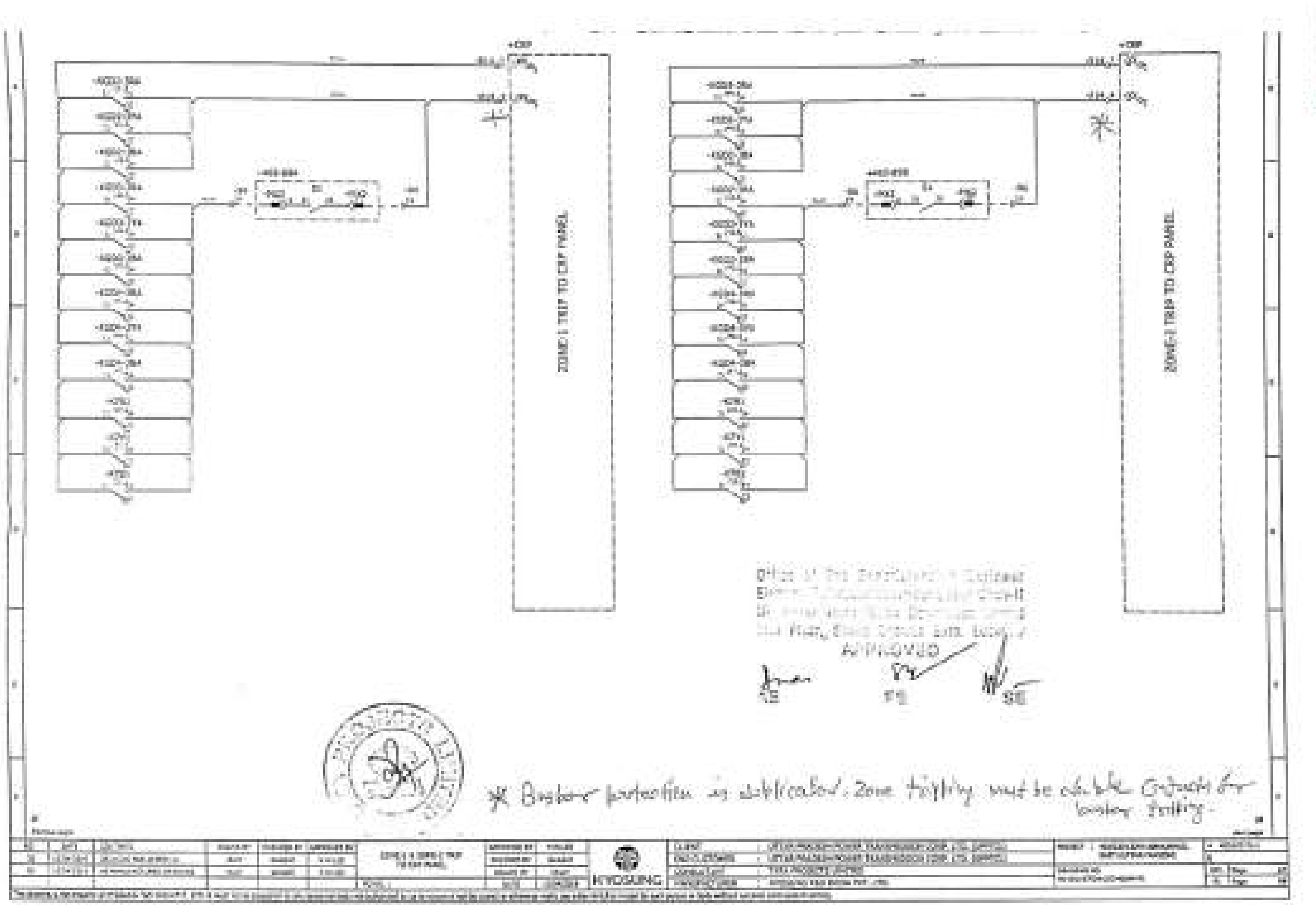
	DETAILED ANALYSIS REPORT(Updated and complete report to be shared by concerned)	
A	**INTRODUCTION**	
1	**TIME AND DATE OF EVENT**	12:02:00 hrs — 12.12.2024
2	**SUBSTATION AFFECTED ALONG WITH VOLTAGE LEVEL**	400 kV S/S Basti
3	**BRIEF SUMMARY**	
B	**ANTECEDENT CONDITIONS**	
1	**WEATHER INFORMATION**	Clear
2	**ADDITIONAL RELEVANT INFORMATION VIZ POWER FLOW AND SHUTDOWN**	400 kV BUS-2 was connected with LKO-2, GKP2. 400kV BUS-1 was Connected to Tanda-I&II,LKO-I,GKP-1,125 MVAR Reactor , 500 MVA ICT -I&II. BC was in open condition for S/D of 400 kV Bus-2 to rectify previous spurious operaion of Bus Bar Protection. MOM has been attached.
C	**EVENT DATA**	
1	**CHANGE IN FREQUENCY**	NA
2	**GENERATION LOSS**	NA
3	**LOAD LOSS**	215 Appox MW as per SCADA
4	**ENERGY LOSS IN MU**	NA
5	**SINGLE LINE DIAGRAM**(Detailing Bus arrangement and Tripped elements)	YES
6	**DR / EL**	YES(EL)
7	**NAME AND TIME OF THE TRIPPED ELEMENT IN TIME CHRONOLOGY ALONG**	Tripped element in time sequence(upto msec.order) to be UPDATED by concerned.

S.NO	NAME OF ELEMENT	TRIPPING DATE	TRIPPING TIME (upto millisecond resolution)	RESTORATION DATE	RESTORATION TIME	FLAGS END 1 (INCLUDING A/R)	FLAGS END 2 (INCLUDING A/R)
1	400 kv Tanda-1 ckt	12.12.2024	12:02:00	12.12.2024	14:28.00hrs.	96A&96B LBB OPTD (LCC panel flag of LKO-2 89A ,RYB-PH,GD-2,Compressor Gas pressure low Second stage Alarm block out-<0.45 MPA)	NA
2	400 kv Tanda-2 ckt				14:40.00hrs.		
3	400 kv Lucknow-1st				14:15.00hrs.		
4	400 kv Gorakhpur-1 ckt				14:49.00hrs.		
5	500 MVA TF-1st				14:52.00hrs.		
6	500 MVA TF-2nd				14:54.00hrs.		
7	125 MVAR Bus Reactor				14:44.00hrs.		
8							

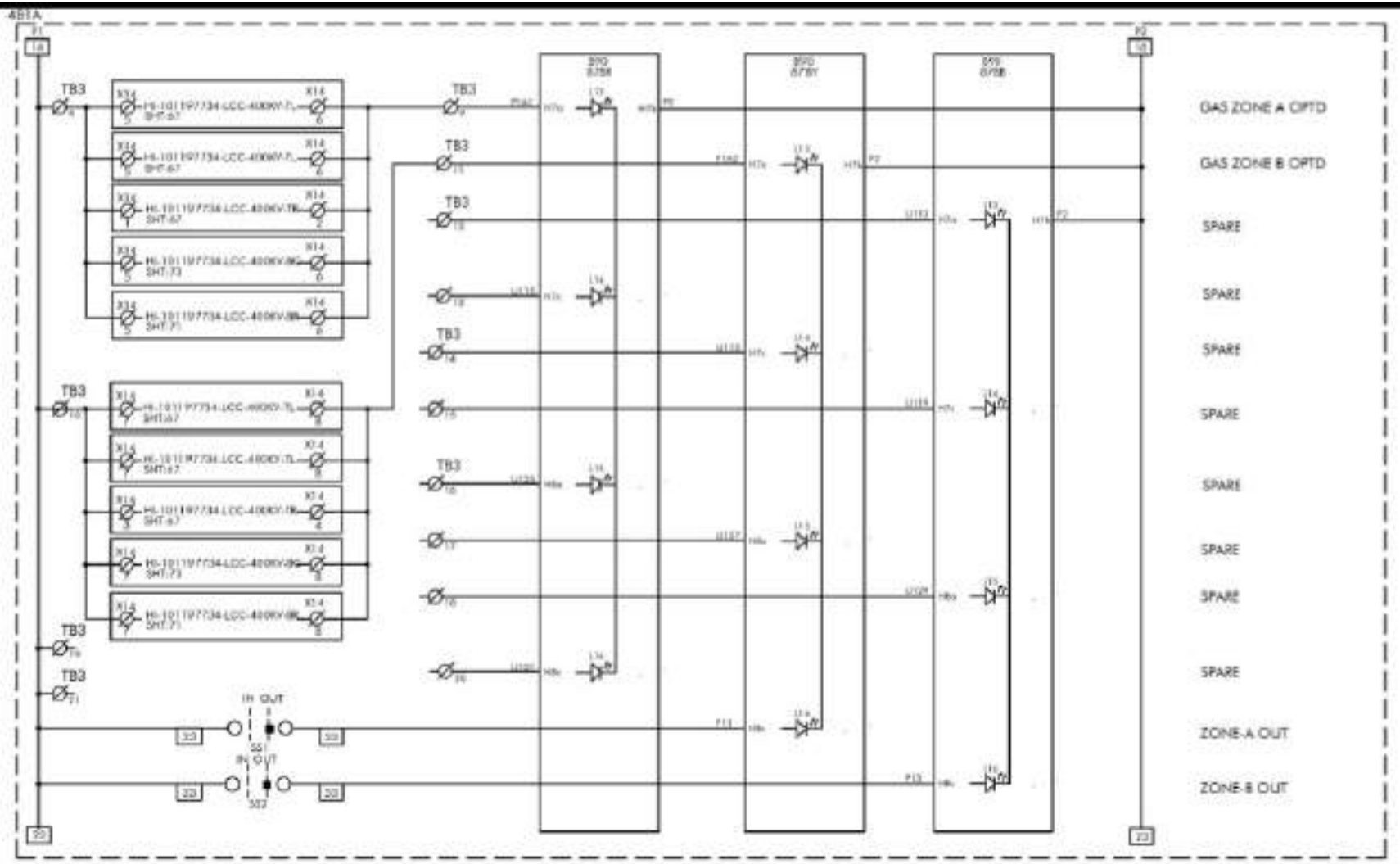
7	**LOCATION AND TYPE OF FAULT**	NA
8	**EQUIPMENT FAILURE**	NA
D	**EVENT DESCRIPTION/ANALYSIS OF THE EVENT**	
1	**DESCRIPTION: DETAILED DESCRIPTION INCLUDING THE REFERENCE OF DR/EL AND EXPLANATION BASED ON PT C.EVENT DATA**	On date 12.12.2024 400kV Lucknow-2 ckt & 400kV Gorakhpur-2 ckt were in Shutdown and 400kV Bus Coupler was In open condition for Tesing and Solving previous spurious operaion of Bus Bar Protection.GE Engineer were also onsite to rectify aforesaid problem & in parallel CB timing testing of 400 kV LKO-2 bay was also going on by firm engineer. After event flag found on LKO-2 LCC Panel -89A ,RYB-PH,GD-2,Compressor Gas pressure low Second stage Alarm block out(<0.45 MPA) .However,actual gas pressure was found normal(0.55 MPa).CB timing testing was being done at lucknow-2 ckt. During repeated operation of CB C-O testing positive DC supply taken for C.B. analyser was accidentally extended to K605 wire of KGD-2 contractor which gave annunciation of 2nd stage low gas leakage contact of 89A of 400kV Lko2 line and gave command to the busbar relay protection and all the bays installed on busbar 1 opened. (According to the scheme 89A is connected to Bus-1.)
E	**CAUSE OF CONCERN/REMEDIAL ACTION**	
1	**CAUSE OF CONCERN**	Accidental extension of DC to k605 wire during multiple testing.
2	**REMEDIAL ACTION TAKEN**	More vigilance will be taken during CB testing. DC shall be taken from safer position / main source.
3	**Issues to be discussed**	NA
4	**REMEDIAL ACTION TO BE TAKEN ALONG WITH TIME FRAME**	NA
5	**LESSON LEARNT**	More vigilance will be taken during CB testing. DC shall be taken from safer position / main source.
6	**ANY OTHER INFORMATION**	NA

JE(T) J.E(TKC) A.E(TKC) SDO(T) Basti E.E E-TD Basti-5 EETKC





400kV GIS Basti under ET&CC, Gorakhpur


TB3
GAS ZONE A OPTD
GAS ZONE B OPTD
SPARE
SPARE
SPARE
SPARE
SPARE
SPARE
SPARE
ZONE-A OUT
ZONE-B OUT
IN OUT
IN OUT

GE Power Management Logo B90 Bus Relay
Revision 7.81 Relay Name: 87BR
IP Address: 10.22.91.150 UR Logo
Event Recorder: Last 500 Events
Click Here For The Main Menu

Event Number	Time and Date	Event Cause
115484	Dec 12 2024 14:15:44.260466	LKO4 CLS CMD Off (DI38)
115483	Dec 12 2024 14:15:43.867973	LKO4 CB OPN Off (DI37)
115482	Dec 12 2024 14:15:43.767965	LKO4 CLS CMD On (DI38)
115481	Dec 12 2024 14:07:28.037346	GKP3 BFI R Off (DO15)
115480	Dec 12 2024 14:07:28.037346	GKP3 BFI R Off (VO28)
115479	Dec 12 2024 14:07:28.031113	GKP3 LBB INIT R Off (CI5)
115478	Dec 12 2024 14:05:45.967342	LKO3 BFI R Off (DO17)
115477	Dec 12 2024 14:05:45.967342	LKO3 BFI R Off (VO29)
115476	Dec 12 2024 14:05:45.964844	LKO3 BFI 3P Off (DI63)
115475	Dec 12 2024 14:05:38.501293	LKO3 LBB INIT R Off (CI7)
115474	Dec 12 2024 14:03:35.548792	RELAY IN SERVICE
115473	Dec 12 2024 14:03:35.548792	TEST MODE DISABLED
115472	Dec 12 2024 14:02:37.266287	LKO3 TRIP Off (CO34)
115471	Dec 12 2024 13:59:59.332833	TEST MODE FORCING ON
115470	Dec 12 2024 13:59:59.332833	LKO3 TRIP Closed (CO34)
115469	Dec 12 2024 13:58:19.865337	TEST MODE FORCING OFF
115468	Dec 12 2024 13:58:19.862832	RELAY OUT OF SERVICE
115467	Dec 12 2024 13:58:19.862832	TEST MODE FORCIBLE
115466	Dec 12 2024 13:57:30.764325	LKO3 TRIP Off (CO34)
115465	Dec 12 2024 13:57:30.761818	RELAY OUT OF SERVICE
115464	Dec 12 2024 13:57:30.761818	TEST MODE ISOLATED
115463	Dec 12 2024 13:56:47.199412	TEST MODE FORCING ON
115462	Dec 12 2024 13:56:47.199412	LKO3 TRIP Closed (CO34)
115461	Dec 12 2024 13:53:56.810763	RELAY OUT OF SERVICE
115460	Dec 12 2024 13:53:56.810763	TEST MODE FORCIBLE
115459	Dec 12 2024 13:44:27.785327	GKP3 BFI R On (DO15)
115458	Dec 12 2024 13:44:27.785327	GKP3 BFI R On (VO28)
115457	Dec 12 2024 13:44:27.778681	LKO3 LBB INIT R On (CI7)
115456	Dec 12 2024 13:44:27.778681	GKP3 LBB INIT R On (CI5)
115455	Dec 12 2024 13:44:27.677747	GKP3 BFI R Off (DO15)
115454	Dec 12 2024 13:44:27.677747	GKP3 BFI R Off (VO28)
115453	Dec 12 2024 13:44:27.671676	LKO3 LBB INIT R Off (CI7)
115452	Dec 12 2024 13:44:27.671676	GKP3 LBB INIT R Off (CI5)
115451	Dec 12 2024 13:34:10.709640	LKO3 BFI 3P On (DI63)
115450	Dec 12 2024 13:19:51.115474	GKP3 BFI R On (DO15)
115449	Dec 12 2024 13:19:51.115474	GKP3 BFI R On (VO28)
115448	Dec 12 2024 13:19:51.108157	GKP3 LBB INIT R On (CI5)
115447	Dec 12 2024 13:16:29.841968	LKO3 BFI R On (DO17)
115446	Dec 12 2024 13:16:29.841968	LKO3 BFI R On (VO29)
115445	Dec 12 2024 13:16:29.834050	LKO3 LBB INIT R On (CI7)
115444	Dec 12 2024 13:13:36.061009	LKO3 BFI R Off (DO17)
115443	Dec 12 2024 13:13:36.061009	LKO3 BFI R Off (VO29)

115442	Dec 12 2024 13:13:36.058509	LKO3 BFI 3P Off (DI63)
115441	Dec 12 2024 13:11:43.888522	RESET OP(PUSHBUTTON)
115440	Dec 12 2024 13:07:08.001620	LKO3 BFI R On (DO17)
115439	Dec 12 2024 13:07:08.001620	LKO3 BFI R On (VO29)
115438	Dec 12 2024 13:07:07.999120	LKO3 BFI 3P On (DI63)
115437	Dec 12 2024 12:54:13.518094	RESET OP(PUSHBUTTON)
115436	Dec 12 2024 12:18:53.237292	TAN2 BFI 3P Off (DO24)
115435	Dec 12 2024 12:18:53.237292	TAN2 BFI R Off (DO14)
115434	Dec 12 2024 12:18:53.237292	TANDA2 BFI R Off (VO27)
115433	Dec 12 2024 12:18:53.229111	TANDA2 LBB INIT 3P Off (CI4)
115432	Dec 12 2024 12:02:28.471187	ANY TRIP Off (VO2)
115431	Dec 12 2024 12:02:28.289021	LKO3 CB OPN Off (DI33)
115430	Dec 12 2024 12:02:28.104201	TAN2 BFI 3P On (DO24)
115429	Dec 12 2024 12:02:28.104201	TAN2 BFI R On (DO14)
115428	Dec 12 2024 12:02:28.104201	TANDA2 BFI R On (VO27)
115427	Dec 12 2024 12:02:28.098179	TANDA2 LBB INIT 3P On (CI4)
115426	Dec 12 2024 12:02:28.009396	ICT1 CB OPN On (DI41)
115425	Dec 12 2024 12:02:28.006816	ICT2 CB OPN On (DI31)
115424	Dec 12 2024 12:02:28.004318	BR CB OPN On (DI56)
115423	Dec 12 2024 12:02:28.004318	GAS Z1 OP Off (DO29)
115422	Dec 12 2024 12:02:28.004318	LKO4 TRIP Off (CO36)
115421	Dec 12 2024 12:02:28.004318	GKP4 TRIP Off (CO35)
115420	Dec 12 2024 12:02:28.004318	ICT2 TRIP Off (CO33)
115419	Dec 12 2024 12:02:28.004318	TANDA2 TRIP Off (CO31)
115418	Dec 12 2024 12:02:28.004318	TANDA1 TRIP Off (CO30)
115417	Dec 12 2024 12:02:28.004318	BUS REACTOR TRIP Off (CO6)
115416	Dec 12 2024 12:02:28.004318	ICT1 TRIP Off (CO4)
115415	Dec 12 2024 12:02:28.004318	Z1 TRIP Off (VO18)
115414	Dec 12 2024 12:02:28.001821	LKO4 CB OPN On (DI37)
115413	Dec 12 2024 12:02:28.001821	GKP4 CB OPN On (DI35)
115412	Dec 12 2024 12:02:28.001821	TAN2 CB OPN On (DI27)
115411	Dec 12 2024 12:02:28.001821	TAN1 CB OPN On (DI25)
115410	Dec 12 2024 12:02:27.997178	GAS Z1 OPTD Off (CI13)
115409	Dec 12 2024 12:02:27.966869	GAS Z1 OP On (DO29)
115408	Dec 12 2024 12:02:27.966869	LKO4 TRIP Closed (CO36)
115407	Dec 12 2024 12:02:27.966869	GKP4 TRIP Closed (CO35)
115406	Dec 12 2024 12:02:27.966869	ICT2 TRIP Closed (CO33)
115405	Dec 12 2024 12:02:27.966869	TANDA2 TRIP Closed (CO31)
115404	Dec 12 2024 12:02:27.966869	TANDA1 TRIP Closed (CO30)
115403	Dec 12 2024 12:02:27.966869	BUS REACTOR TRIP Closed (CO6)
115402	Dec 12 2024 12:02:27.966869	ICT1 TRIP Closed (CO4)
115401	Dec 12 2024 12:02:27.966869	OSCILLOGRAPHY TRIG'D
115400	Dec 12 2024 12:02:27.966869	Z1 TRIP On (VO18)
115399	Dec 12 2024 12:02:27.966869	ANY TRIP On (VO2)
115398	Dec 12 2024 12:02:27.958675	GAS Z1 OPTD On (CI13)
115397	Dec 12 2024 12:02:27.921936	LKO3 CB OPN On (DI33)
115396	Dec 12 2024 12:01:03.264889	LKO3 CB OPN Off (DI33)
115395	Dec 12 2024 11:59:49.828111	LKO3 CB OPN On (DI33)
115394	Dec 12 2024 11:59:49.588151	LKO3 CB OPN Off (DI33)
115393	Dec 12 2024 11:58:25.675415	LKO3 CB OPN On (DI33)

Event Record // 400_220_132KV_GIS_SS_BASTI: B402_21M2_TANDA1: Actual Values: Records

File Name: C:\Users\Public\Documents\GE Power Management\URPC\Data\Device Files\B402_21M2_TANDA1\20191105_
Date / Time of Last Clear: Tuesday, November 05, 2019 09:52:28
Events Since Last Clear: 160498
Shown Number of Events: 1024

Event Number	Date/Time
160498	Dec 12 2024 14:28:41.002142
160497	Dec 12 2024 14:28:41.002142
160496	Dec 12 2024 14:28:40.997135
160495	Dec 12 2024 14:28:40.997135
160494	Dec 12 2024 14:28:40.997135
160493	Dec 12 2024 14:28:40.933937
160492	Dec 12 2024 14:28:40.930936
160491	Dec 12 2024 14:28:40.927939
160490	Dec 12 2024 14:16:01.998214
160489	Dec 12 2024 12:16:47.851688
160488	Dec 12 2024 12:02:28.073904
160487	Dec 12 2024 12:02:28.066479
160486	Dec 12 2024 12:02:28.063921
160485	Dec 12 2024 12:02:28.063921
160484	Dec 12 2024 12:02:28.063921
160483	Dec 12 2024 12:02:28.061469
160482	Dec 12 2024 12:02:28.058931
160481	Dec 12 2024 12:02:28.058931
160480	Dec 12 2024 12:02:28.058931
160479	Dec 12 2024 12:02:28.007809
160478	Dec 12 2024 12:02:28.005806
160477	Dec 12 2024 12:02:28.004308
160476	Dec 12 2024 12:02:27.974803
160475	Dec 09 2024 10:34:44.003058
160474	Dec 09 2024 10:31:23.997345
160473	Dec 08 2024 00:17:04.999273
160472	Dec 08 2024 00:13:44.999978
160471	Dec 07 2024 23:59:57.522874
160470	Dec 06 2024 18:36:20.398480
160469	Dec 06 2024 11:09:45.999394
160468	Dec 06 2024 06:01:18.919899
160467	Dec 05 2024 22:42:06.125494
160466	Dec 05 2024 22:42:06.125494
160465	Dec 05 2024 22:42:06.115494
160464	Dec 05 2024 22:42:06.115494
160463	Dec 05 2024 22:42:06.115494
160462	Dec 05 2024 22:42:06.050622
160461	Dec 05 2024 22:42:06.048121
160460	Dec 05 2024 22:42:06.044620
160459	Dec 05 2024 20:26:07.462446
160458	Dec 05 2024 20:26:06.763206
160457	Dec 05 2024 20:26:06.756867
160456	Dec 05 2024 20:22:27.173596
160455	Dec 05 2024 20:17:20.132849
160454	Dec 05 2024 20:17:20.130299
160453	Dec 05 2024 20:17:20.127853
160452	Dec 05 2024 20:17:20.127853
160451	Dec 05 2024 20:15:39.712017
160450	Dec 05 2024 20:15:39.264518
160449	Dec 05 2024 20:15:39.264518
160448	Dec 05 2024 20:15:39.264518
160447	Dec 05 2024 20:15:39.264518
160446	Dec 05 2024 20:15:39.264518

Shown Number of Events: 1024

Cause
SYNC 1 CLS OP
SYNC 1 SYNC OP
E/S CLSNG IL Off (CO8)
SYNC 1 CLS DPO
SYNC 1 DEAD S DPO
CB OPEN Y Off (CI2)
CB OPEN B Off (CI3)
CB OPEN R Off (CI1)
DATE/TIME CHANGED
96B OPTD Off (CI9)
SRC1 VT FF VOL LOSS
OPEN POLE OP B
E/S CLSNG IL Closed (CO8)
SYNC 1 CLS OP
SYNC 1 DEAD S OP
OPEN POLE OP C
OPEN POLE OP A
SYNC 1 CLS DPO
SYNC 1 SYNC DPO
CB OPEN R On (CI1)
CB OPEN B On (CI3)
CB OPEN Y On (CI2)
96B OPTD On (CI9)
DATE/TIME CHANGED
DATE/TIME CHANGED
DATE/TIME CHANGED
DATE/TIME CHANGED
RXGOOSE OFFLINE
RXGOOSE OFFLINE
DATE/TIME CHANGED
RXGOOSE OFFLINE
SYNC 1 CLS OP
SYNC 1 SYNC OP
E/S CLSNG IL Off (CO8)
SYNC 1 CLS DPO
SYNC 1 DEAD S DPO
CB OPEN Y Off (CI2)
CB OPEN B Off (CI3)
CB OPEN R Off (CI1)
CR-2 OUT Off (CI7)
CARR FAIL Off (VO43)
CR-1 OUT Off (CI17)
86B OPTD Off (CI8)
LED RESET-VO-66 Off (VO66)
RESET OP(OPERAND)
LED RESET-VO-66 On (VO66)
RESET OP(PUSHBUTTON)
ANY TRIP Off (VO37)
M2 OPTD Off (CO27)
GEN TRIP Off (CO14)
86B TRIP Off (CO12)
86A TRIP Off (CO11)
CONT MX B Off (CO7)

Remedial Taken

➡ More vigilance will be taken during CB testing. DC shall be taken from safer position / main source.

THANK YOU.

Multiple element tripping event at 220kV Bihiwani(BBMB)

At 10:41 hrs on 13th December, 2024

Tripped Elements

S. No	Name of Elements	Outage Time	Revival Time	Reason of tripping
1.	220 KV Bhiwani-Charkhi Dadri (BB) Ckt-4	10:41 hrs	13:38 hrs	Bus-Bar protection of 220KV Bus -2 operated at Bhiwani (BBMB)
2.	220 KV Bhiwani-Charkhi Dadri (BB) Ckt-2		13:38 hrs	
3.	220 KV Bhiwani (HV)-Bhiwani (BB) (HVPNL) Ckt-2		13:36 hrs	
4.	220 KV Bhiwani(HV)-Bhiwani(BB) (HVPNL) Ckt-2			Details Awaited
5	220 KV Bhiwani(HV)-Bhiwani(BB) (HVPNL) Ckt-1			Details Awaited

Brief details of the event

i) During antecedent condition, 220 KV Bhiwani-Charkhi Dadri (BB) Ckt-4, 220 KV Bhiwani-Charkhi Dadri (BB) Ckt-2 and 220 KV Bhiwani (HV)-Bhiwani (BB) (HVPNL) Ckt-2 were carrying appx. 18MW, 17MW and 186 MW respectively.

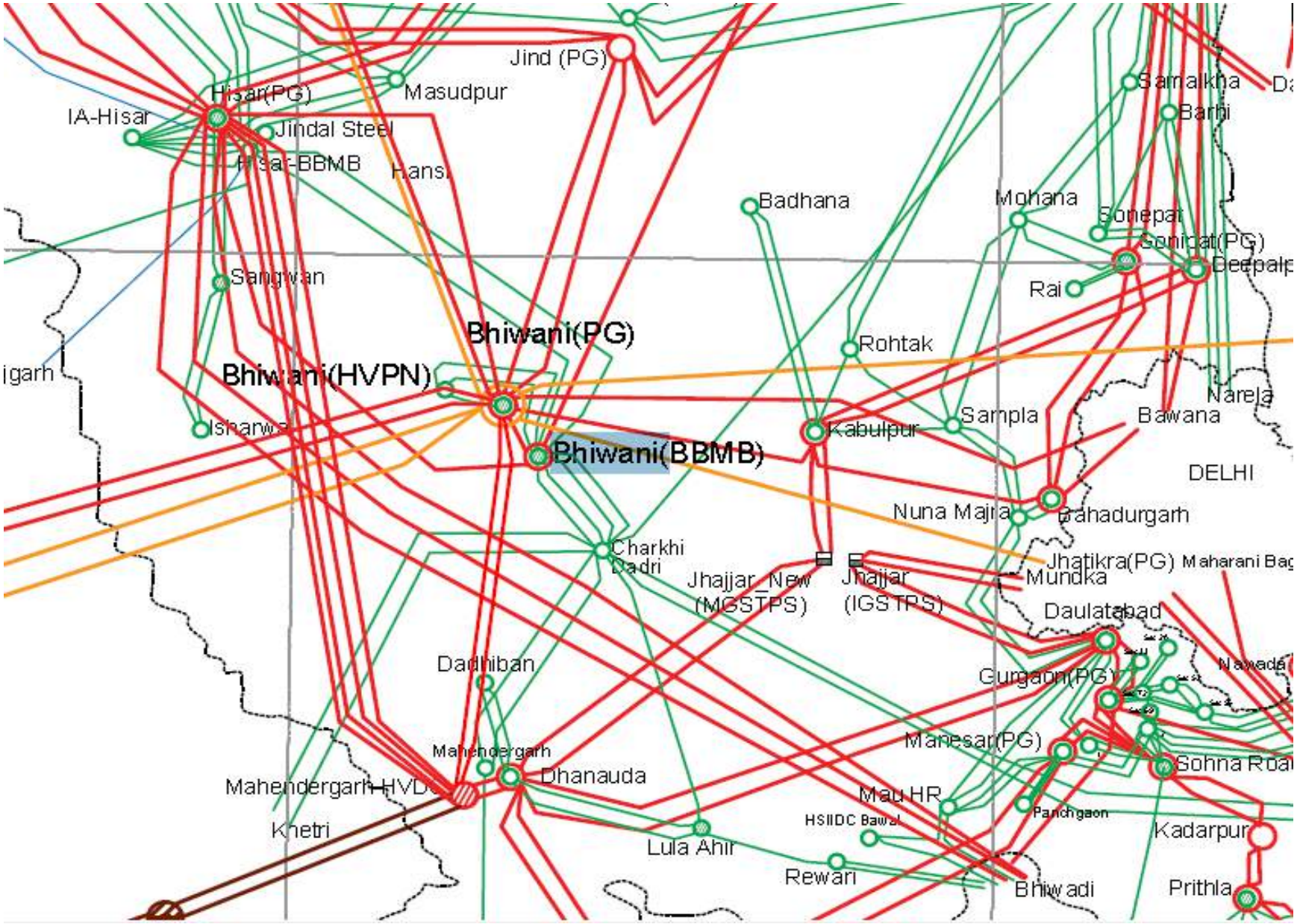
ii) As reported, at 10:41 hrs, load shifting from 220KV Bus-2 to Bus-1 at 400/220KV Bhiwani was being done to avail shutdown of 220KV Bus-2 under annual maintenance. During load shifting Bus Bar protection operated causing tripping of 220KV Bus-2 and all the elements connected to it.

iii) At the same time, 220 KV Bhiwani(HV)-Bhiwani(BB) (HVPNL) Ckt-1 also tripped which was connected to 220kV Bus-1 (exact nature of protection operated yet to be shared). Detailed report of the tripping is yet to be furnished from SLDC end.

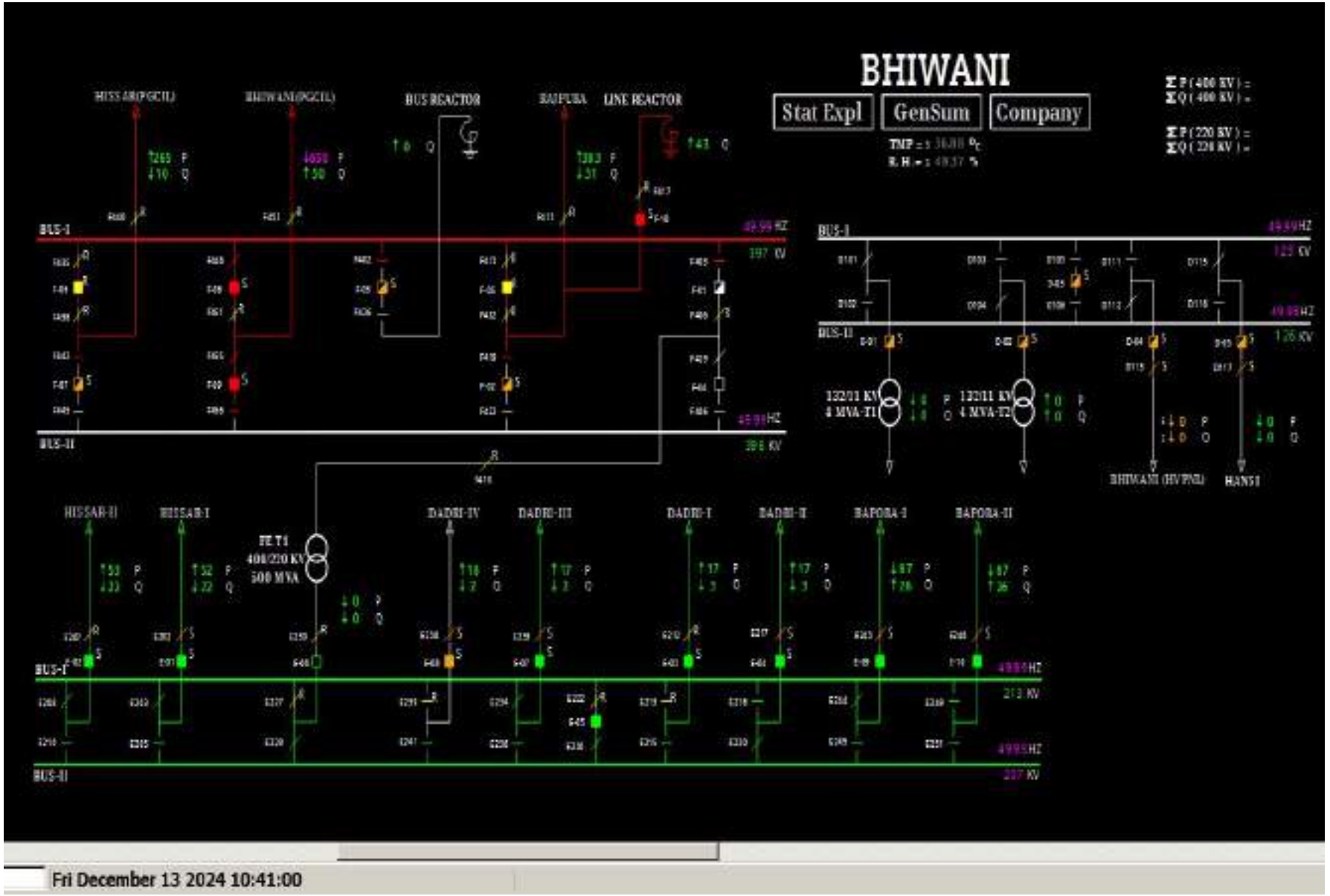
iv) As per PMU at Bhiwani (BBMB), Y-B phase to phase fault is observed with fault clearing time of ~120 ms.

v) As per SCADA, 40MW loss occurred in Haryana control area.

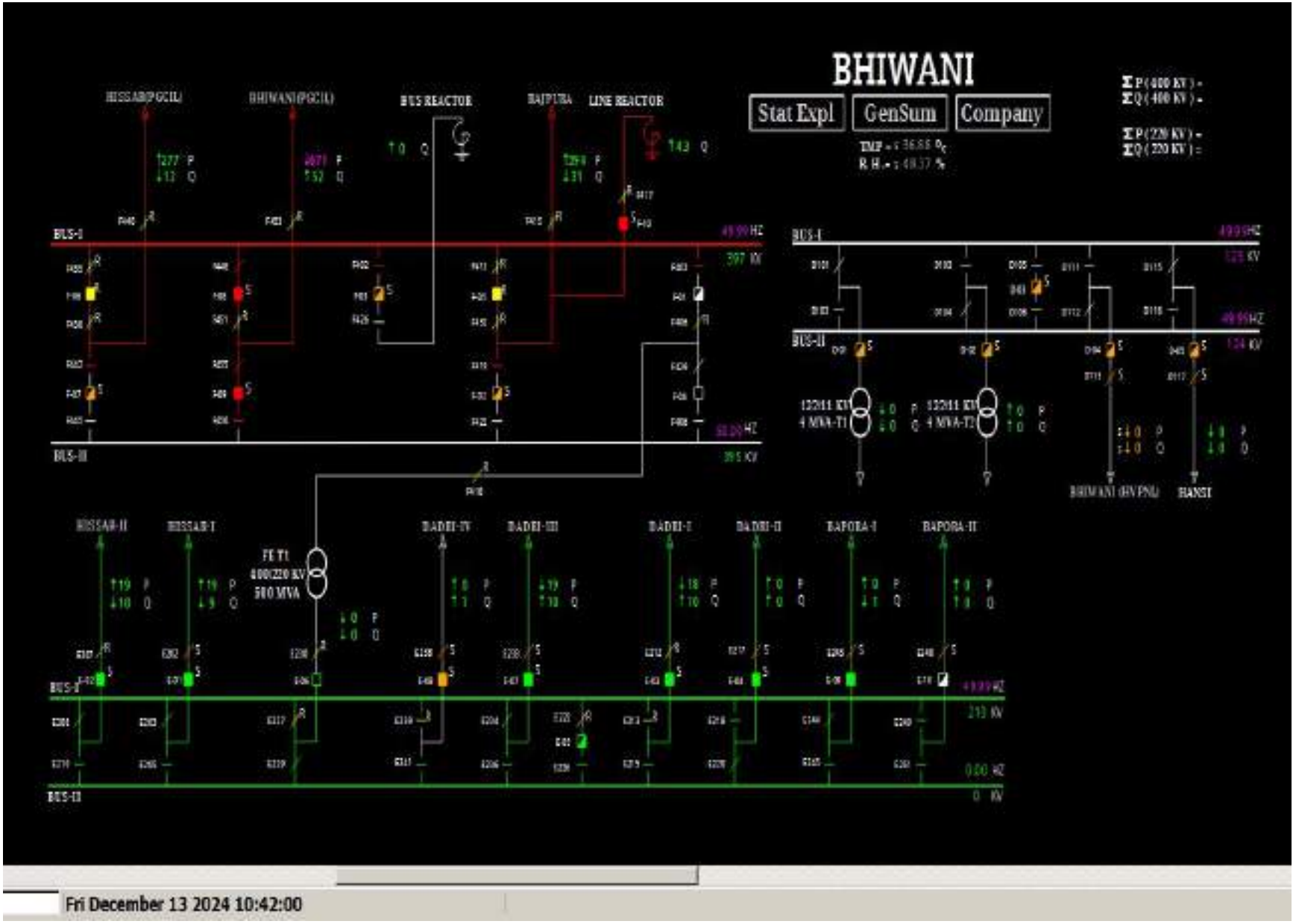
Network Diagram



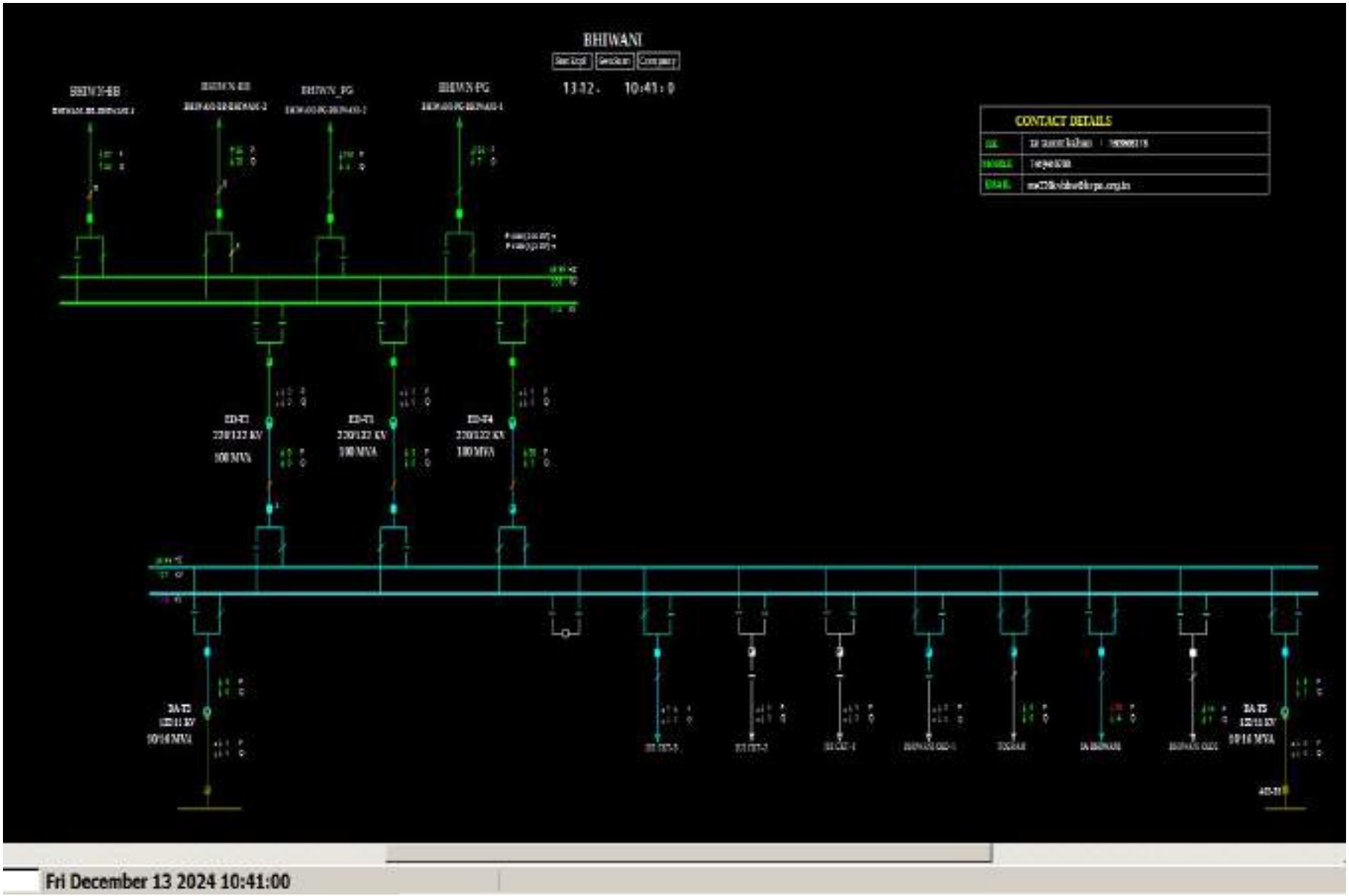
SLD of 400/220kV Bhiwani(BB) before the event



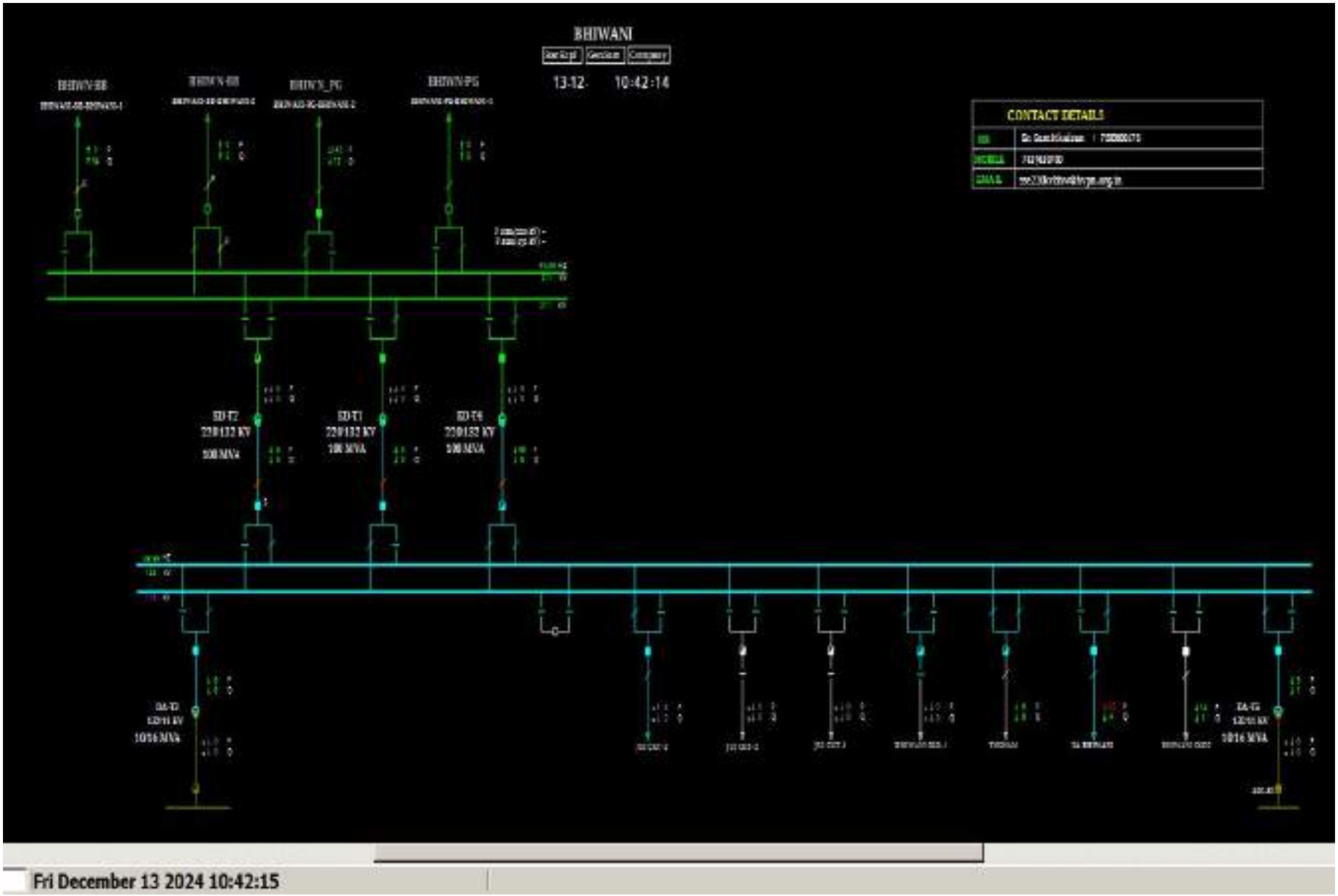
SLD of 400/220kV Bhiwani(BB) after the event



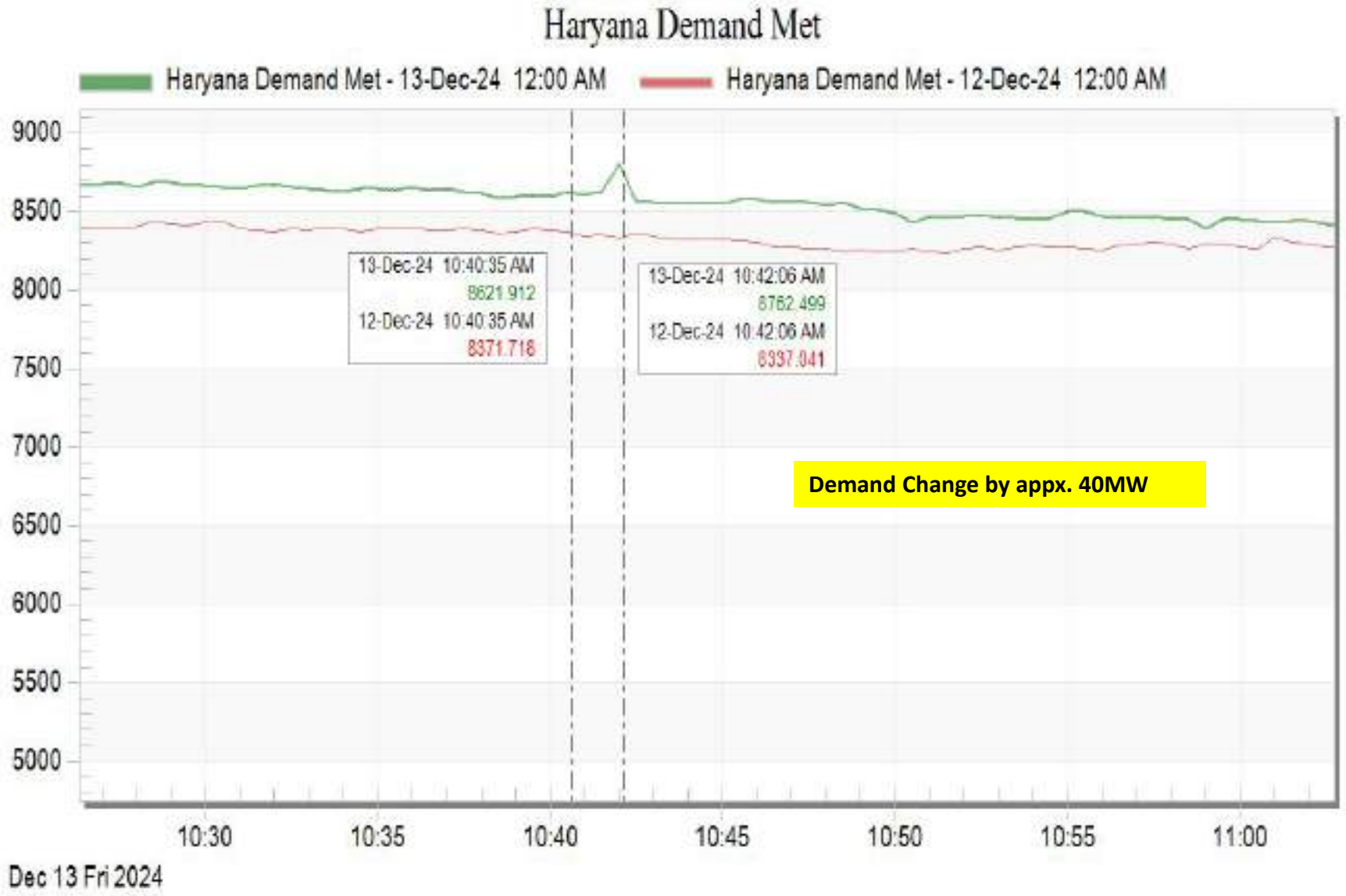
SLD of 220/132kV Bhiwani(HV) before the event



SLD of 220/132kV Bhiwani(HV) after the event



Haryana Demand during the event



PMU Plot of frequency at Bhiwani(BBMB)

10:41 hrs/13-Dec-24

PMU Plot of phase voltage magnitude at Bhiwani(BB)

10:41 hrs/13-Dec-24

SOE SCADA

Time	Station Name	Voltage Level	Element Name	Element Type	Element Status	Remarks
10:41:13,961	BHIWANI	220kV	BHIWANI_BBMB-2	Circuit Breaker	Open	Line CB of 220 KV Bhiwani(HV)-Bhiwani(BB) (HVPNL) Ckt-2 opened at Bhiwani (HV) end
10:41:13,983	BHIWANI	220kV	BHIWANI_PG-1	Circuit Breaker	Open	Line CB of 220 KV Bhiwani(HV)-Bhiwani(PG) Ckt-1 opened at Bhiwani (HV) end
10:41:14,018	BHIWANI	220kV	05MBC	Circuit Breaker	disturbe	
10:41:14,028	BHIWANI	220kV	E_10(BHIWN-2)	Circuit Breaker	disturbe	
10:41:45,952	BHIWANI	220kV	BHIWANI_BBMB-1	Circuit Breaker	Open	Line CB of 220 KV Bhiwani(HV)-Bhiwani(BB) (HVPNL) Ckt-1 opened at Bhiwani (HV) end

Details received from BBMB

On dated 13.12.24 in 220KV Side of 400KV GSS Bhiwani , while shifting of feeders from bus2 to bus 1 (as there was planned shutdown on Bus 2), one limb of Blue phase isolator of 220kV Hisar-Bhiwani ckt.-2 got broken. Simultaneously bus post insulator bus 2 connecting Hisar ckt. 2 also gets broken. Due to this, a bus earth fault was created thereby operating Bus Bar protection scheme in Zone-2. Resulting in tripping of all 220 kV feeder connected with Bus2 (Bapora ckt.-2, Bus-coupler, Dadri ckt -2 & Dadri-ckt4).

Points for Discussion

i) Detailed report related to protection operation needs to be shared by both BBMB and SLDC Haryana.

ii) Exact reason for triggering of Bus-Bar protection needs to be shared.

iii) DR/EL (.dat/.cfg file) along with tripping report need to be shared for each element from both the ends.

iv) Remedial action taken report to be shared.

Multiple element tripping event at 400/220kV Bikaner(RS)

At 18:05 hrs on 14th December, 2024

Tripped Elements

S. No	Name of Elements	Outage Time	Revival Time	Reason of tripping
1.	400/220 kV 315 MVA ICT 1 at Bikaner(RS)	18:05 hrs	19:00 hrs	Y phase isolator on 220KV side of 400/220 kV 315 MVA ICT 2 at Bikaner(RS) burnt.
2.	400/220 kV 315 MVA ICT 2 at Bikaner(RS)		03:00 hrs (15/12/2024)	
3.	125 MVAR BUS REACTOR NO 2 AT 400KV BIKANER(RS)		21:42 hrs	Due to Backup Impedance protection operation.

Brief details of the event

i) During antecedent condition, 400/220 kV 315 MVA ICT 1 and ICT 2 at Bikaner(RS) was carrying approx. 240MW each. 400KV Bikaner-Sikar(PG) Ckt-2 and 220kV Bikaner-Dungargarh (RS) line were in open condition.

ii) As reported, at 18:35 hrs, Y phase isolator on 220KV side of 400/220 kV 315 MVA ICT 2 at Bikaner(RS) burnt and tripped.

iii) As per PMU at Bhadla(PG), R-Y fault in system is observed with delayed fault clearance of 760ms .

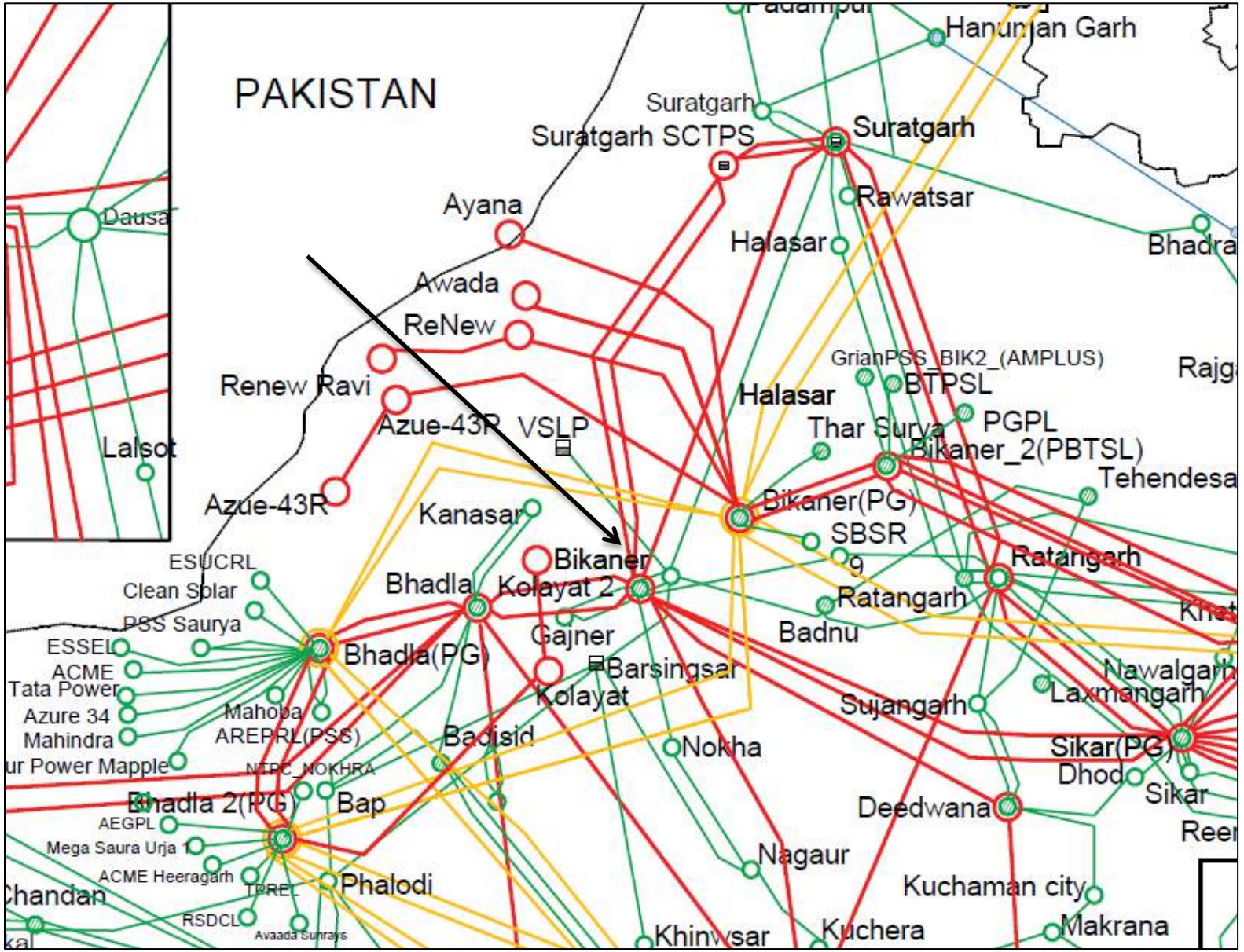
iv) Due to tripping of ICT-2, SPS implemented at Bikaner(RS) S/s related to overloading of remaining ICTs after tripping of any ICT operated. As per SPS scheme, 220kV Bikaner-Nokha (RS) line and 220kV Bikaner-Dungargarh (RS) line should open. However, 220kV Bikaner-Dungargarh (RS) line was already in open condition.

v) During the event, both 400/220kV 315MVA ICT-1&2 tripped. At the same time, 125 MVAR BUS REACTOR NO 2 AT 400KV BIKANER(RS) also tripped due to Backup Impedance protection operation.

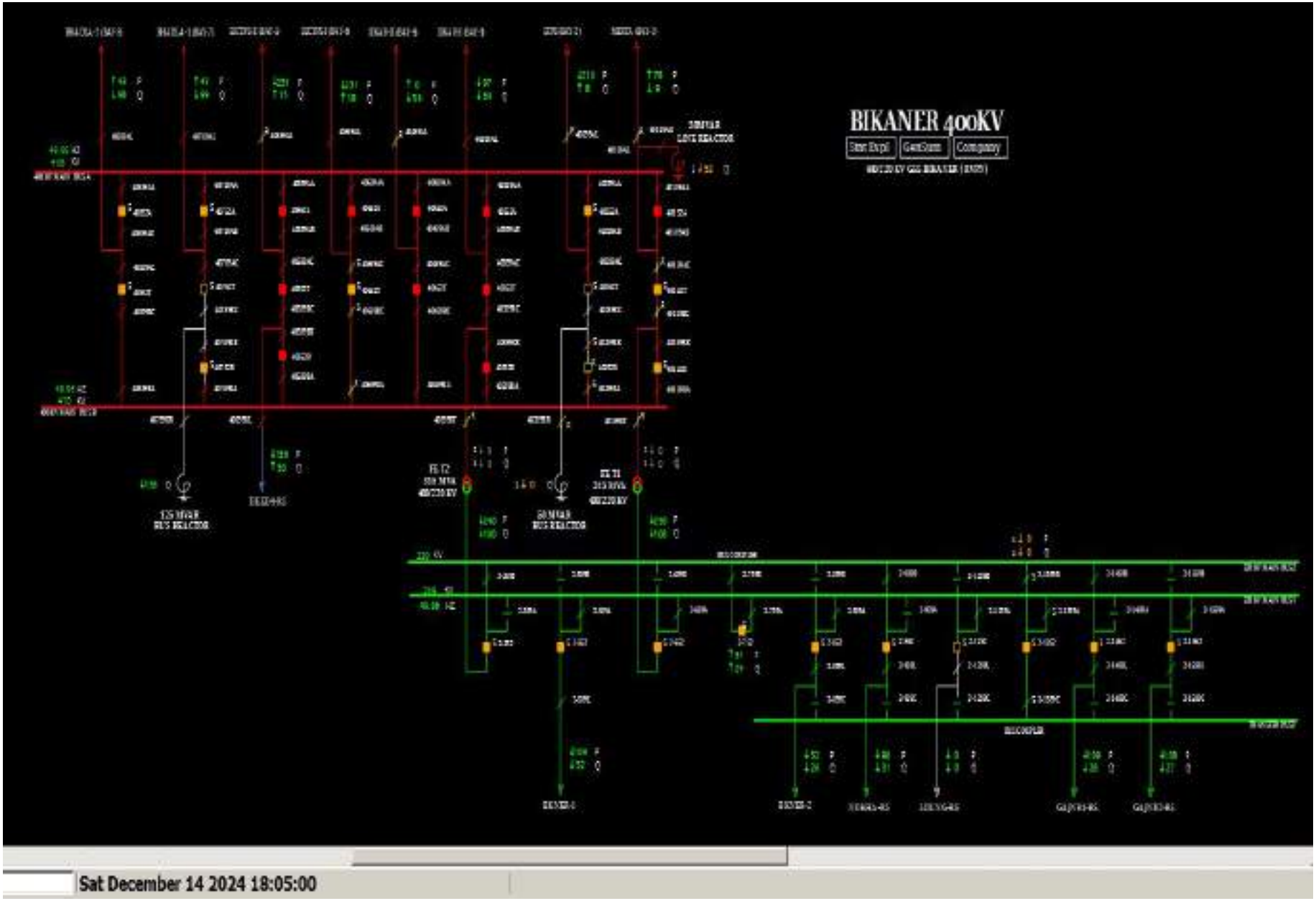
vi) As per SCADA, change in demand of approx. 400MW is observed in Rajasthan control area.

vii) As observed, the SCADA data remained frozen upto 18:10 hrs and subsequently became unavailable after 18:10hrs.

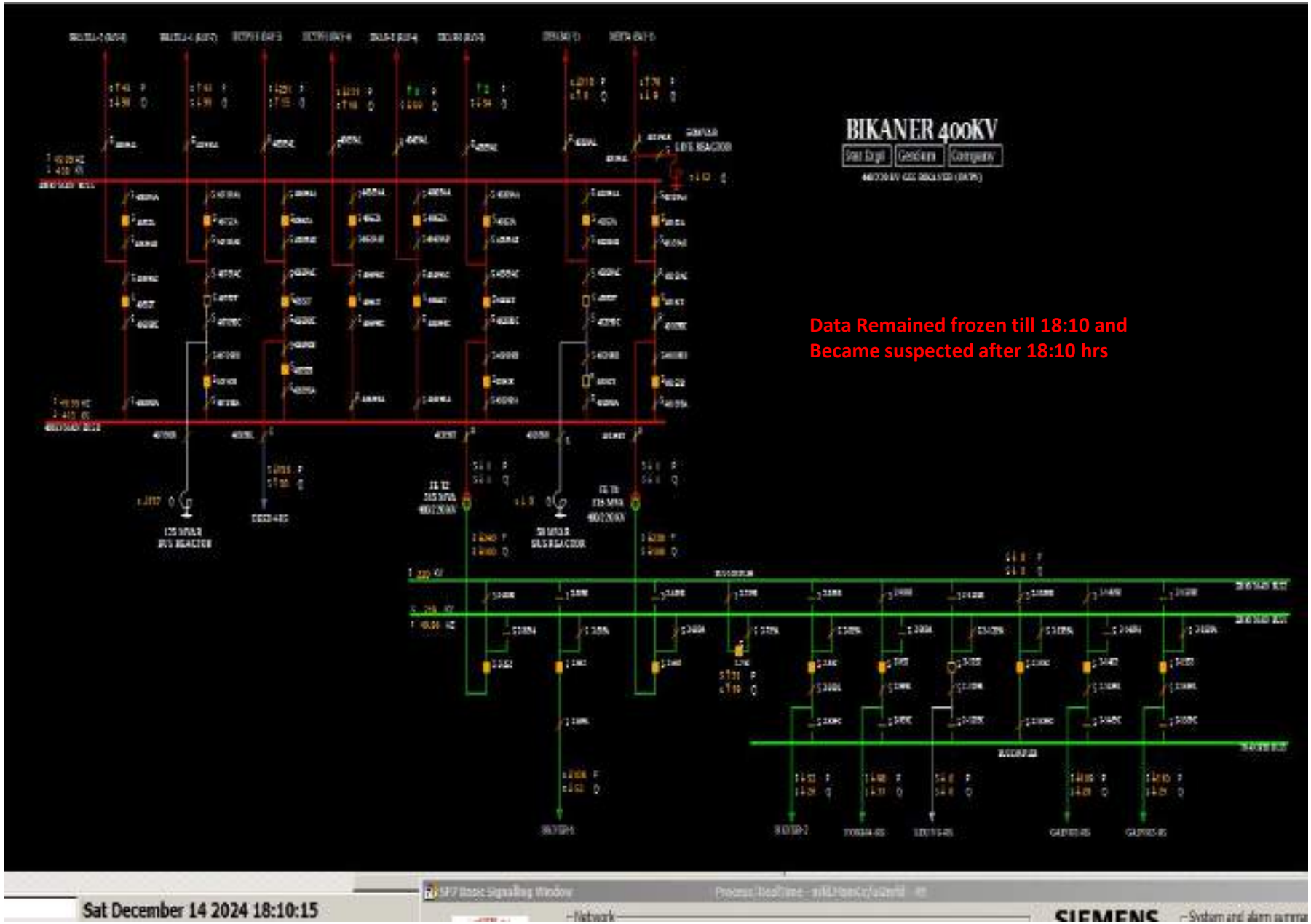
Network Diagram



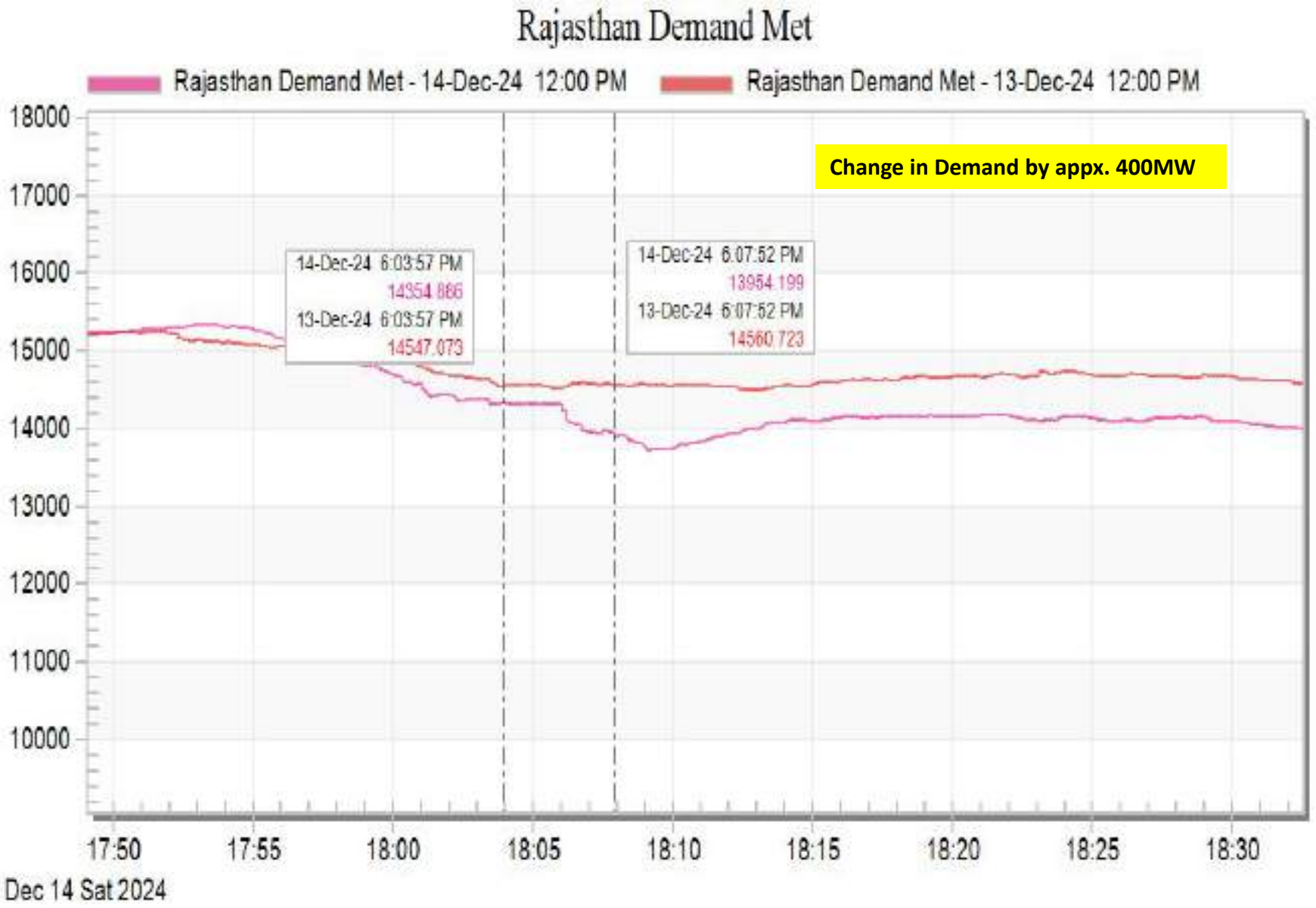
SLD of 400/220kV Bikaner(RS) before the event



SLD of 400/220kV Bikaner(RS) after the event



Rajasthan Demand during the event



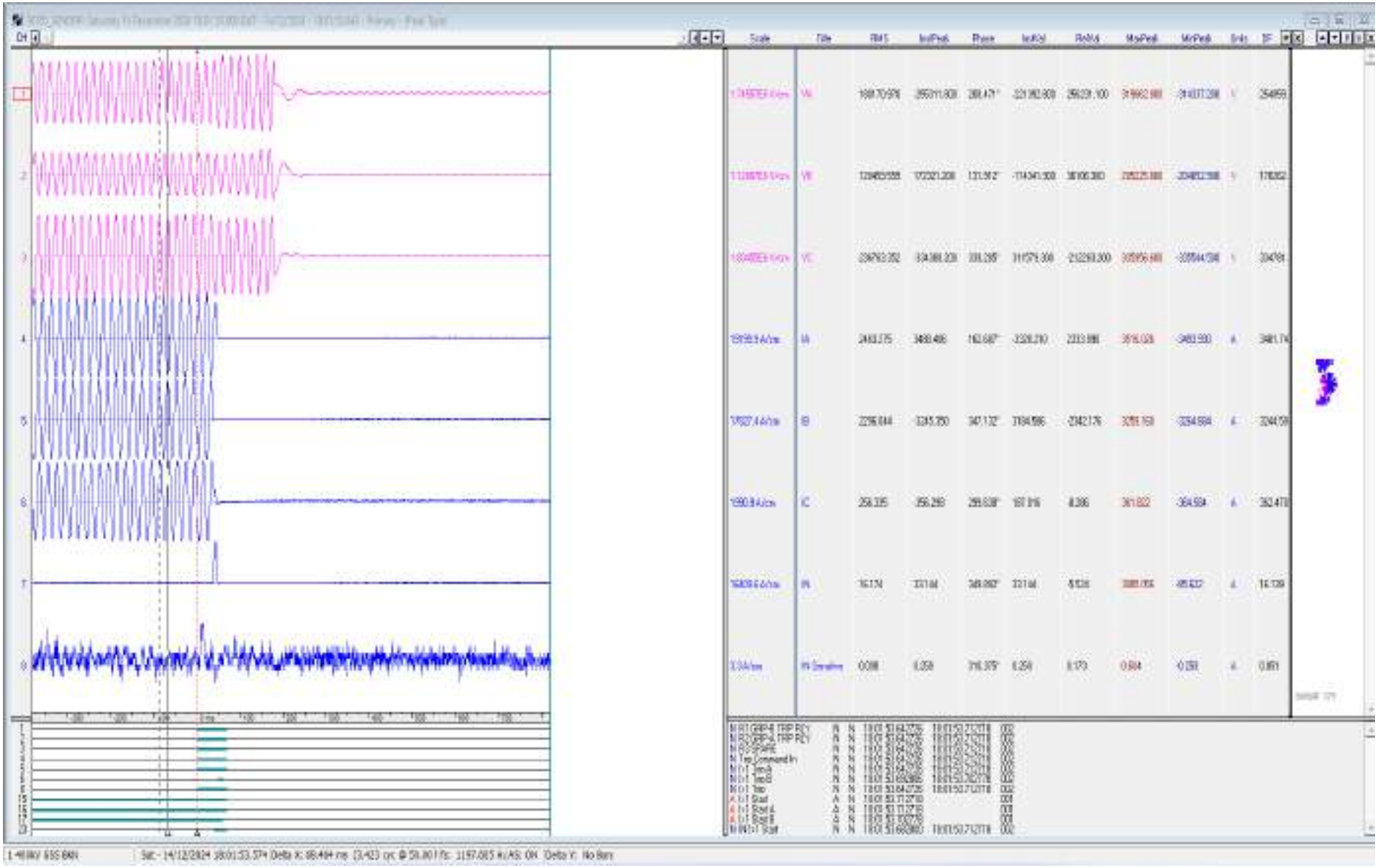
PMU Plot of frequency at Bhadla(PG)

18:05 hrs/14-Dec-24

PMU Plot of phase voltage magnitude at Bhadla(PG)

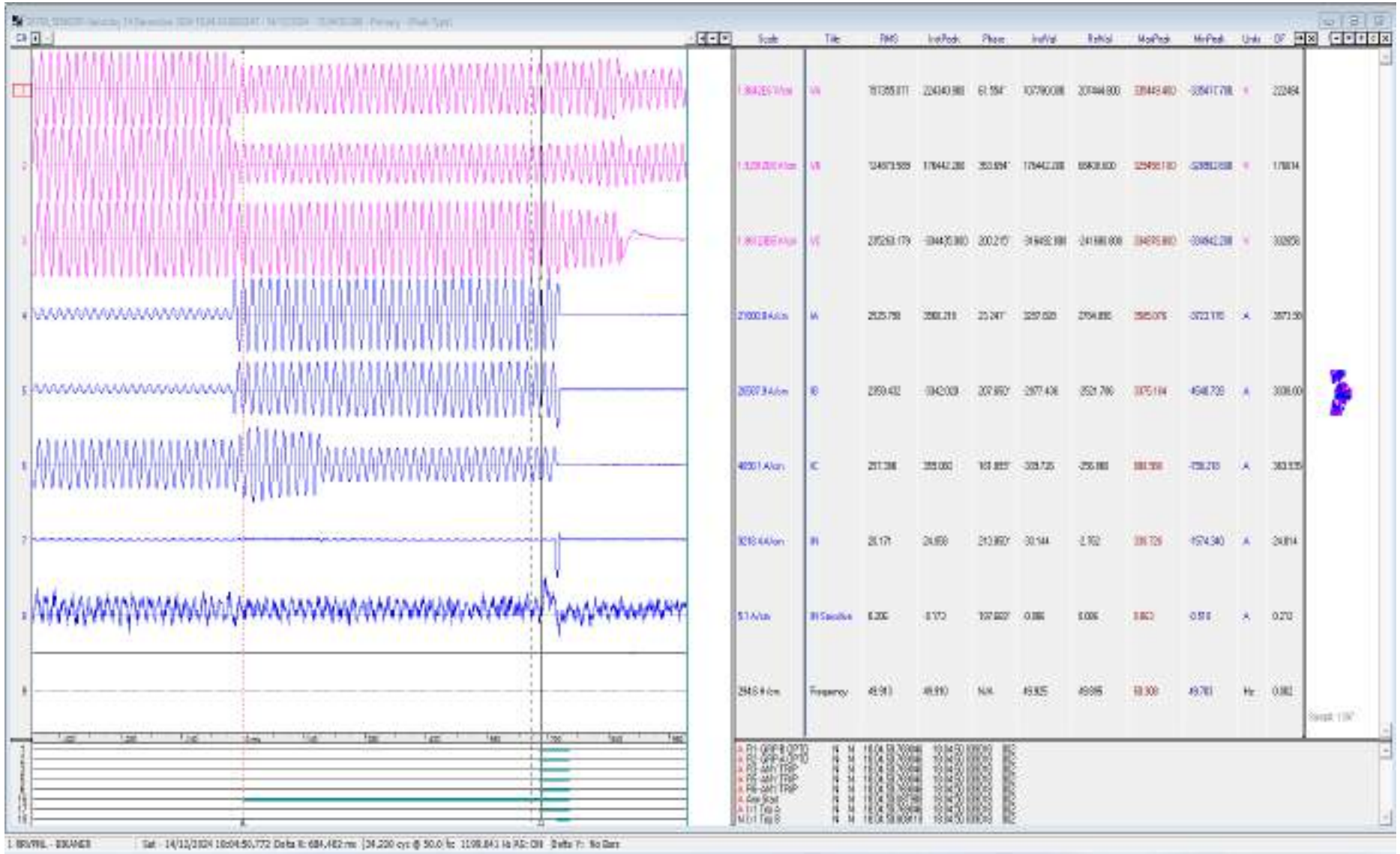
18:05 hrs/14-Dec-24

DR of 400/220kV 315MVA ICT-1 at Bikaner(RS)



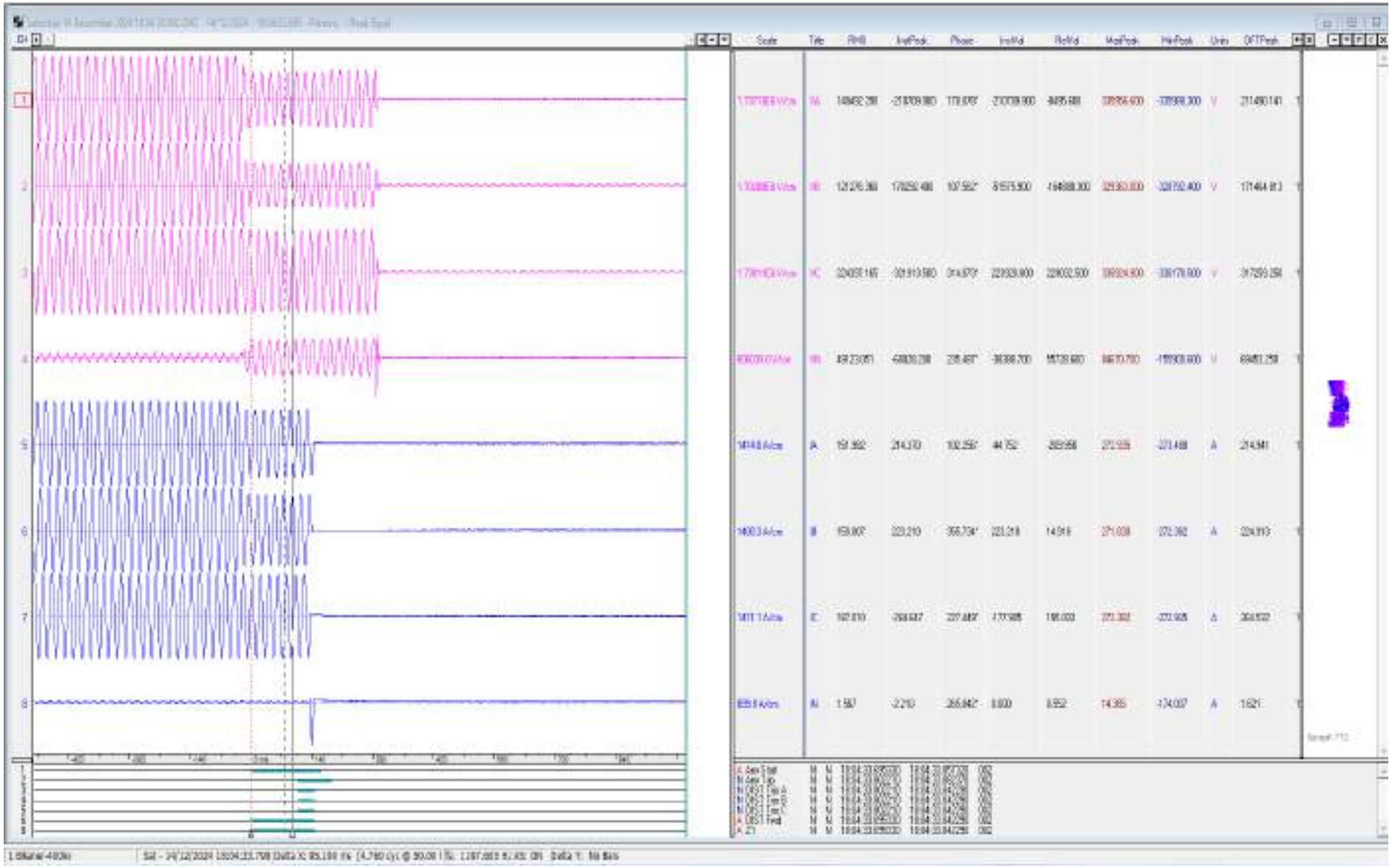
R-Y fault, 2.4kA, O/C E/F operated, Time not synced

DR of 400/220kV 315MVA ICT-2 at Bikaner(RS)



R-Y fault, 2.5kA, O/C E/F operated, trip time: ~700msec, Time not synced

DR of 125 MVAr Bus reactor at Bikaner(RS)



Z-1 trip is observed

SPS at 400/220kV Bikaner(RS)

Item	Information Explanation
Reporting Party	Bikaner (RVPN)/ NRLDC
Scheme's Name	SPS for Transformers at 400KV Bikaner (RVPN) substation
Classification	SPS related to overloading of remaining ICTs after tripping of any ICT at 400KV Bikaner Substation, RVPN
Reference No.	SPS/NR/TRF/33
Operating Procedure	Refer to Chapter 12, Point No 12.5 of Operating Procedure of NR
Design Objectives	To avoid overloading of Transformers
Operation	
Modelling	**ICT Details: 2 x 315 MVA = 650 MVA** **Case 1:** If any of the two 315 MVA ICT trips on fault/Protection then tripping command will be extended from 86(Master-trip) of that ICT to following feeders. In that case following elements will trip: **Element details for tripping during SPS operation** 1. 220 kV Bikaner(400kV)-Nokhra Line 2. 220 kV Bikaner(400kV)-Sri Dungargarh Line
Original In-Service Year/ Approved date	2023 / Approved in 208 OCC held on 20.06.2023

Points for Discussion

i) Exact location of fault need to be shared.

ii) Exact details of SPS operation need to be shared.

iii) Expeditious actions need to be taken to commission the new 220kV Isolator at Bikaner(RS) to ensure N-1 compliance at 400/220kV Bikaner(RS) S/s.

iv) SCADA data of 400/220kV Bikaner(RS) S/s was not healthy during the event. Availability and healthiness of SCADA data need to be ensured.

v) Remedial action taken report need to be shared.

vi) Reasons for operation of Backup Impedance protection of 125 MVAR BUS REACTOR NO 2 needs to be shared.

vii) DR/EL (.dat/.cfg file) along with tripping report need to be shared for each element from both the ends.

Multiple element tripping event at 220kV Mehalkalan(RS)

At 13:48 hrs on 27th December, 2024

Tripped Elements

S. No	Name of Elements	Outage Time	Revival Time	Reason of tripping
1.	220 KV MOGA(PG)-MEHAL-KALAN(PS) (PSTCL) CKT-1	13:48 hrs	15:08 hrs	Bus Bar protection operated in Mehal Kalan
2.	220 KV MOGA(PG)-MEHAL-KALAN(PS) (PSTCL) CKT-2		15:44 hrs	
3.	220 KV PAKHOWAL(PSTCL)-MEHAL- KALAN(PS) (PSTCL) CKT-1			
4.	220 KV PAKHOWAL(PSTCL)-		14:52 hrs	

Brief details of the event

i) 220/66kV Mehal_Kalan has double main bus scheme at 220kV level.

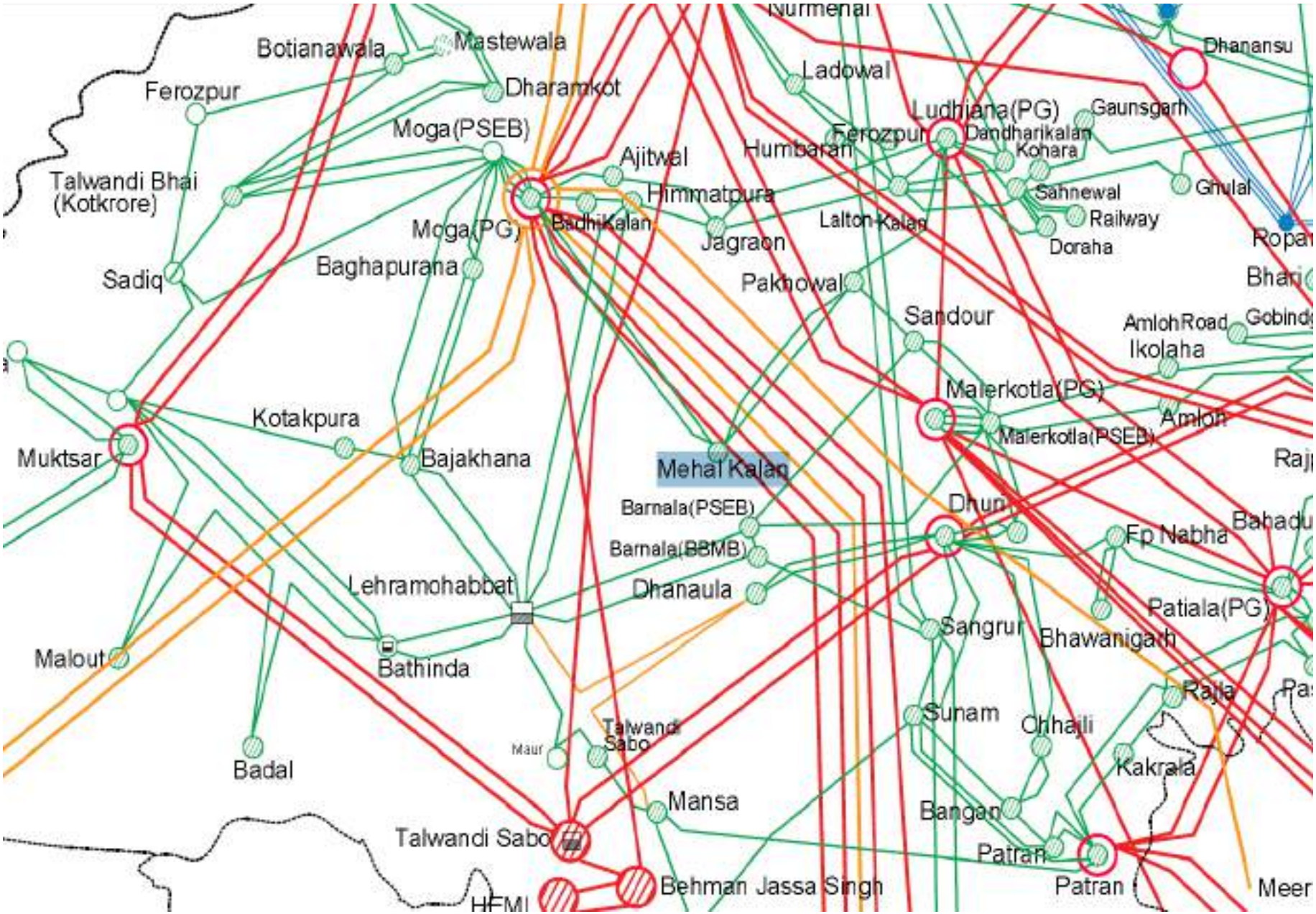
ii) As reported at 13:48 hrs, Bus Bar protection operated due to the damage in B-phase Circuit Breaker limb of 220 KV PAKHOWAL(PSTCL)- MEHAL- KALAN(PS) (PSTCL) CKT-1 (details yet to be furnished).

iii) Due to the operation of Bus Bar protection all the elements connected in the 220KV system tripped. Complete blackout occurred at 220kV Mehal_Kalan S/s.

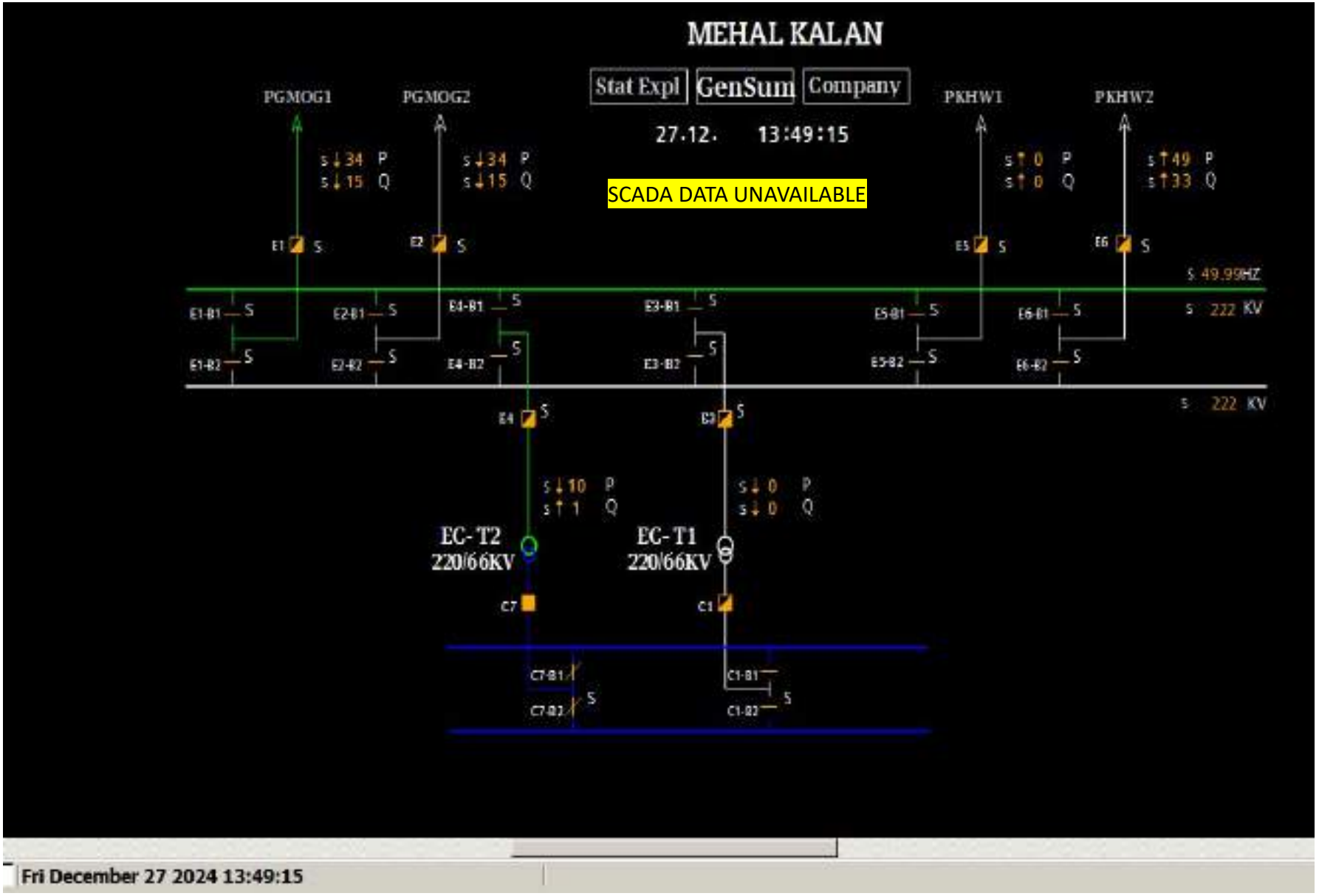
iv) As per PMU at Moga (PG), R-N phase to earth fault with fault clearing time of 120ms is observed.

v) As per SCADA, change in demand of approx. 20 MW is observed in Punjab control area.

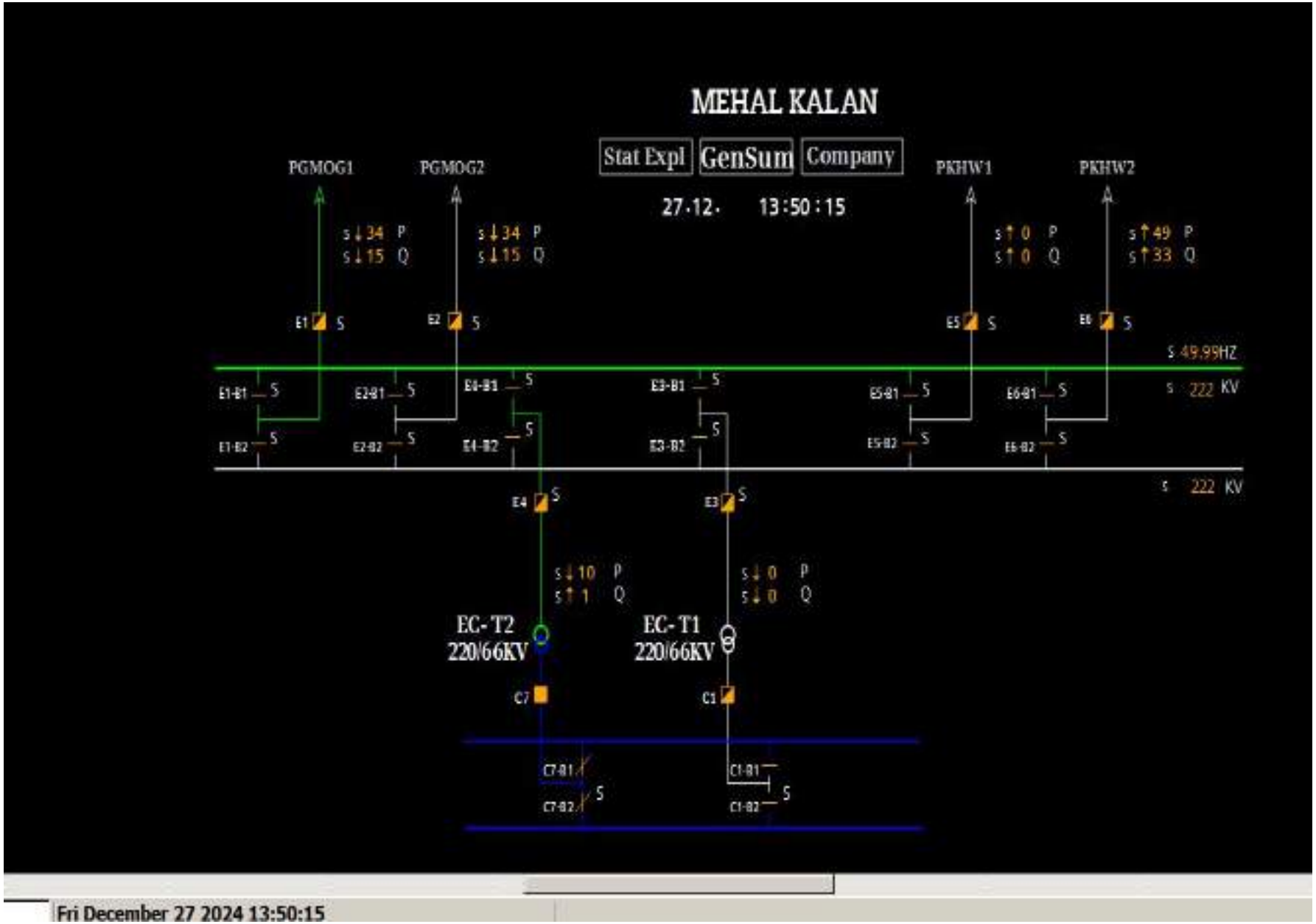
Network Diagram



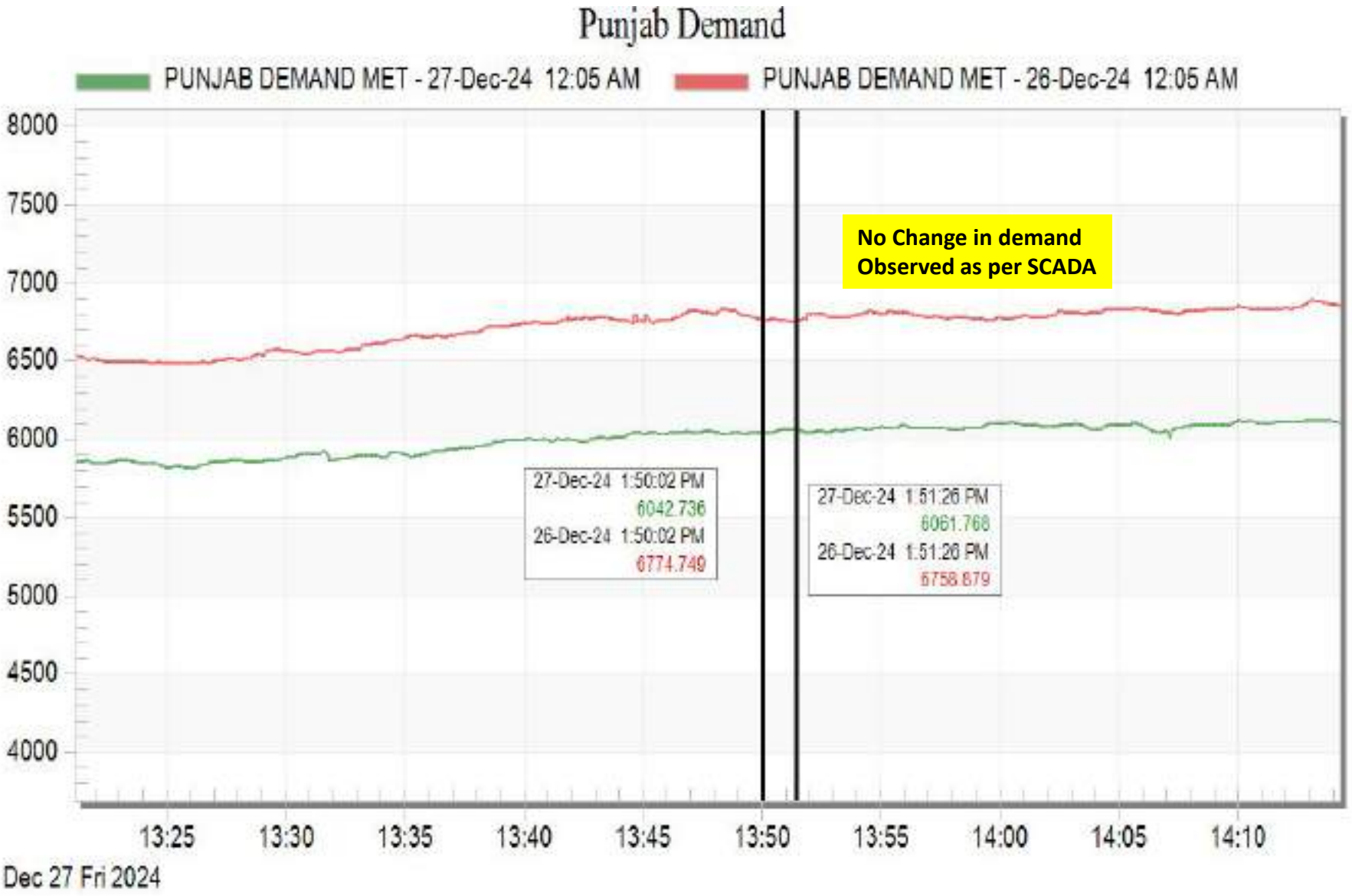
SLD of 220/66KV Mehal_Kalan(PS) before the event



SLD of 220/66KV Mehal_Kalan(PS) after the event



Punjab Demand during the event

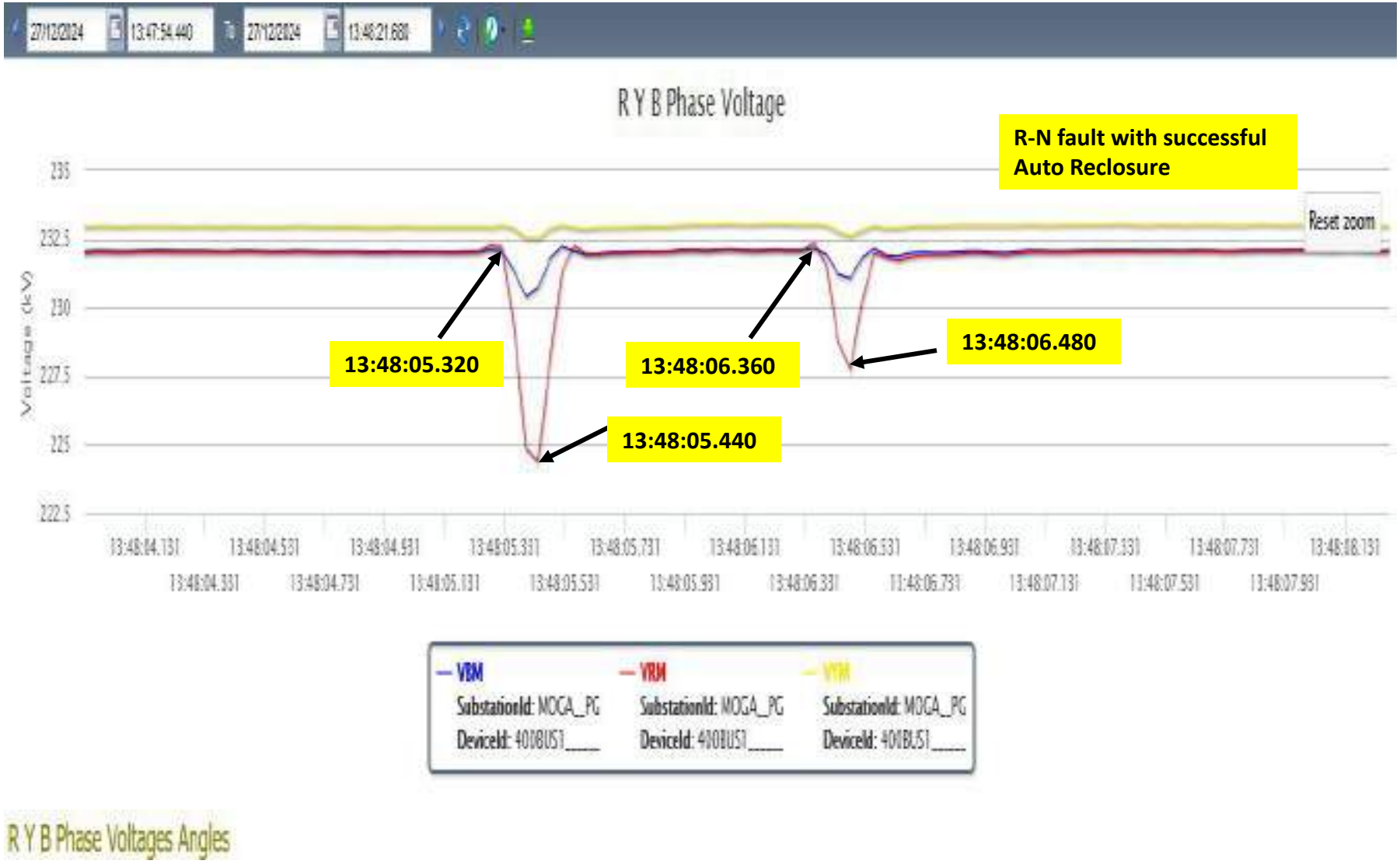


PMU Plot of frequency at Moga(PG)

13:50 hrs/27-Dec-24

PMU Plot of phase voltage magnitude at Moga(PG)

13:50 hrs/27-Dec-24



Points for Discussion

i) Exact reason for Bus-Bar protection needs to be shared.

ii) DR/EL (.dat/.cfg file) of all the tripped elements along with detailed tripping report need to be shared from both the ends.

iii) Remedial action taken report to be shared.

iv) SCADA data availability needs to be ensured.

Multiple element tripping event at 220kV CB Ganj(UP)

At 15:56 hrs on 29th December, 2024

Tripped Elements

S. No	Name of Elements	Outage Time	Revival Time	Reason of tripping
1.	220 KV TANAKPUR(NH)-CBGANJ(UP) (PG) CKT-1	15:56 hrs	18:10 hrs	Distance Protection, Z-4, 0.66 KM
2.	31.4 MW TANAKPUR HPS - UNIT 3		16:56 hrs	Loss Of Evacuation Path
3.	31.4 MW TANAKPUR HPS - UNIT 2		16:56 hrs	
4.	220 KV TANAKPUR(NH)-SITARGANJ(PG) (PG) CKT-1		16:54 hrs	Y-B fault with fault current of 1.14KA
5.	220 kv Bareilly-CB Ganj (UP) ckt-1		17:43 hrs	
6.	220 kv Bareilly-CB Ganj (UP) ckt-2		17:43 hrs	
7.	220 KV CB Ganj-Dohna			Y-B fault, Z-1, 7.3km from CB Ganj end
8.	132kV Tanakpur-Mahindernagar ckt		16:57 hrs	Hand Tripped

Brief details of the event

i) 220/132kV CB Ganj(UP) has double main and transfer bus scheme at 220kV level. 220KV Rosa – CB Ganj line was not in service.

ii) During the antecedent condition, 2 generators at Tanakpur were generating 19MW (Unit-2) and 16MW (Unit-3).

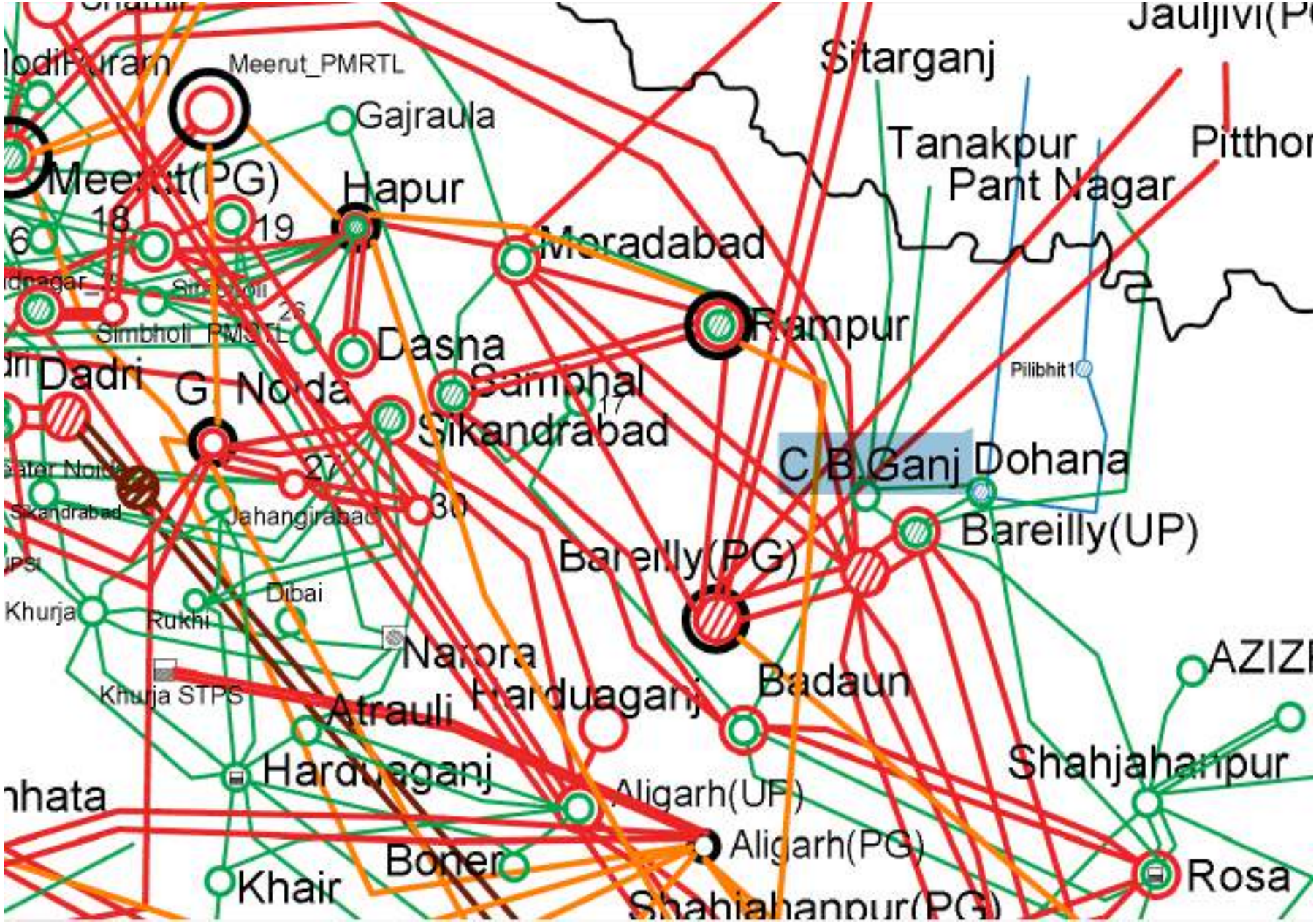
iii) As reported at 15:56 hrs, 220kV CB Ganj-Dohna ckt tripped on Y-B phase to phase fault, fault distance was ~7.23km (Z-1) from CB Ganj end. At the same time, all the other lines connected to 220 CB Ganj (except 220kV CB Ganj-Sitarganj) and 220kV Tanakpur-Sitarganj ckt also tripped. 220 KV TANAKPUR(NH)-SITARGANJ(PG) (PG) CKT tripped due to Y-B phase to phase fault with fault current of 1.14KA. The fault was in Zone-3.

iv) Further, 132kV Tanakpur-Mahindernagar ckt was hand tripped for safety purpose leading to tripping of 31.4 MW Unit-2&3 at Tanakpur HEP due to loss of evacuation path.

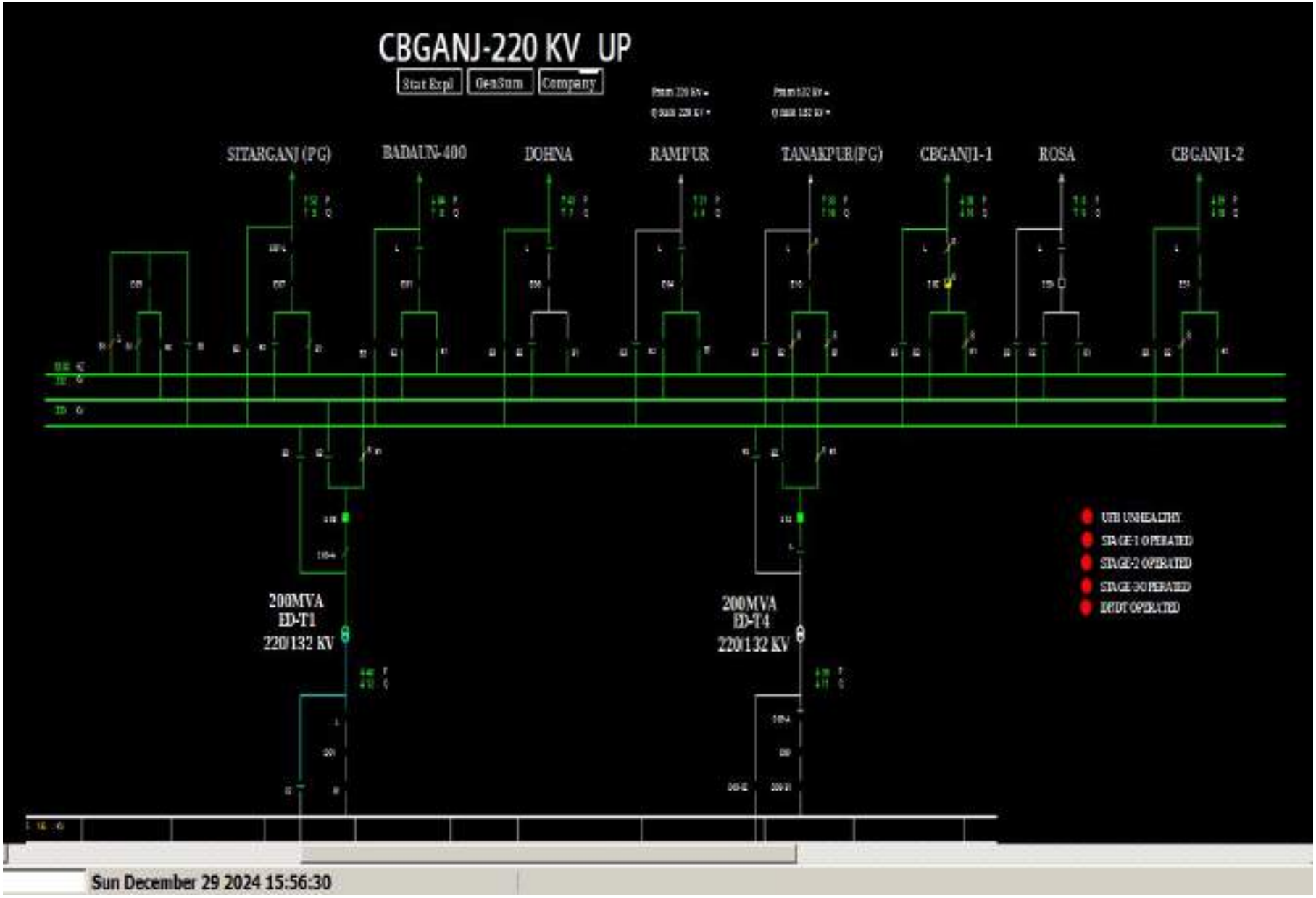
v) As per PMU at Bareilly(PG), Y-B phase to phase fault with delayed fault clearing time of 920ms is observed.

vi) As per SCADA, change in demand of approx. 27 MW is observed in Uttar Pradesh control area.

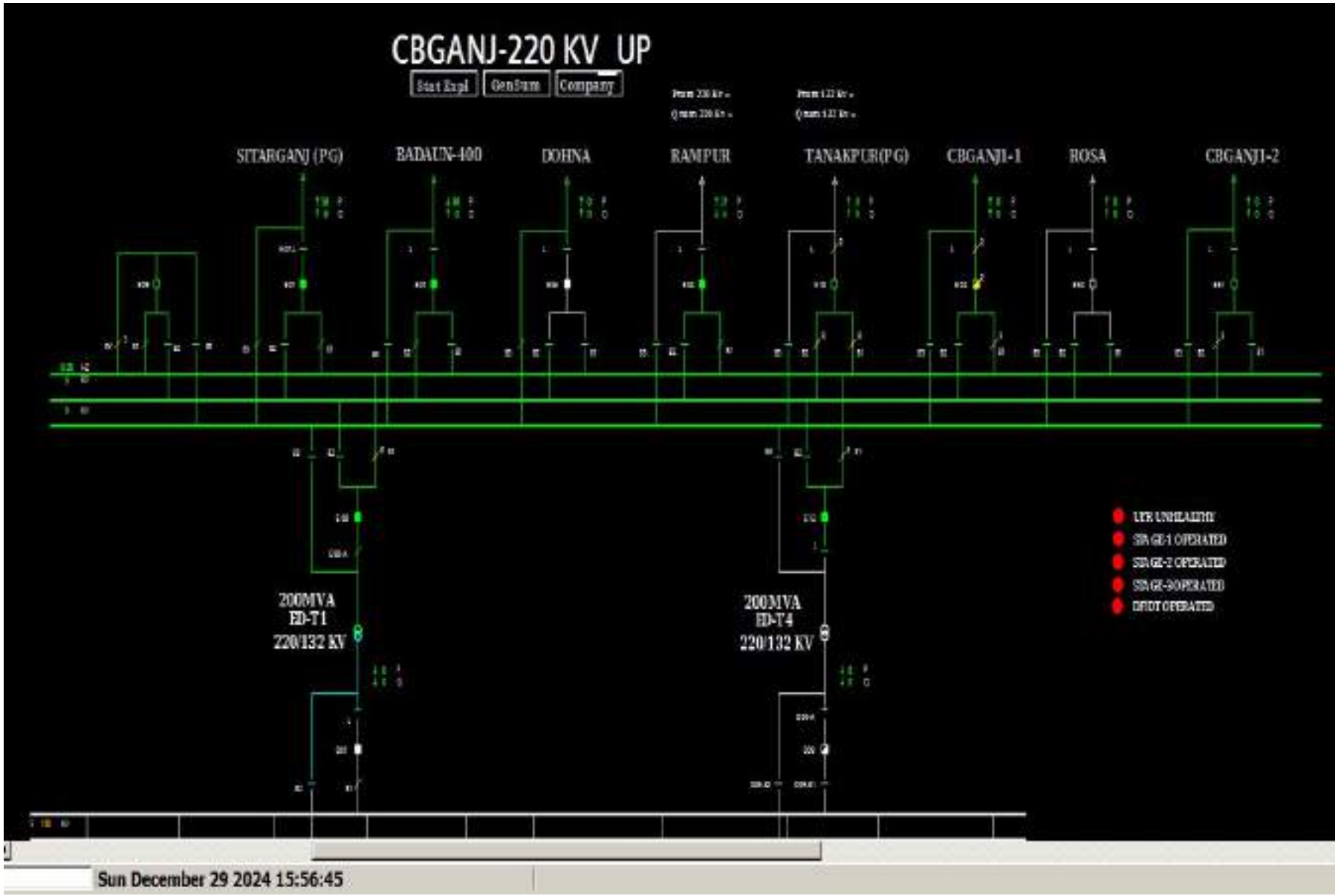
Network Diagram



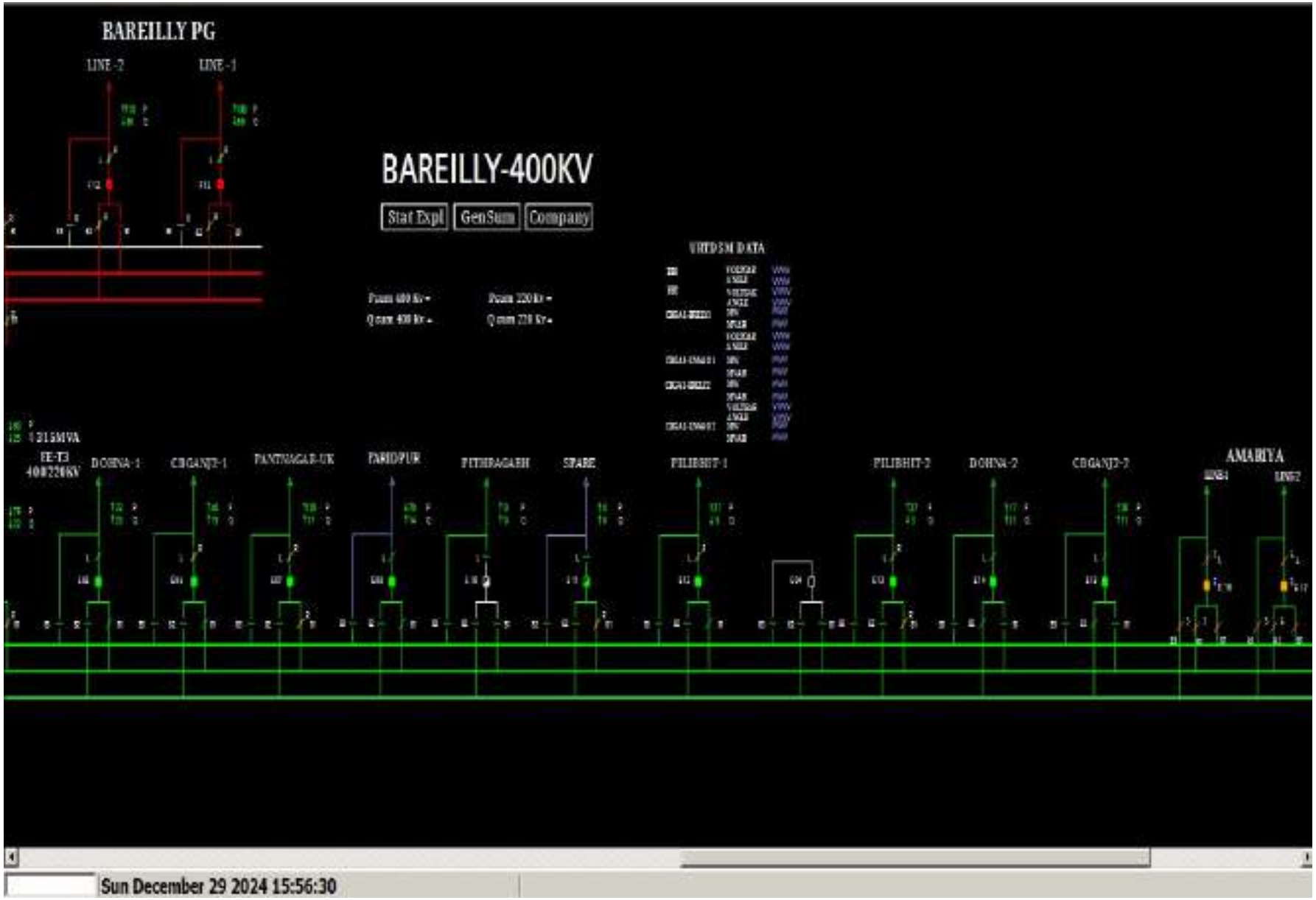
SLD of 220/132KV CB Ganj(UP) before the event



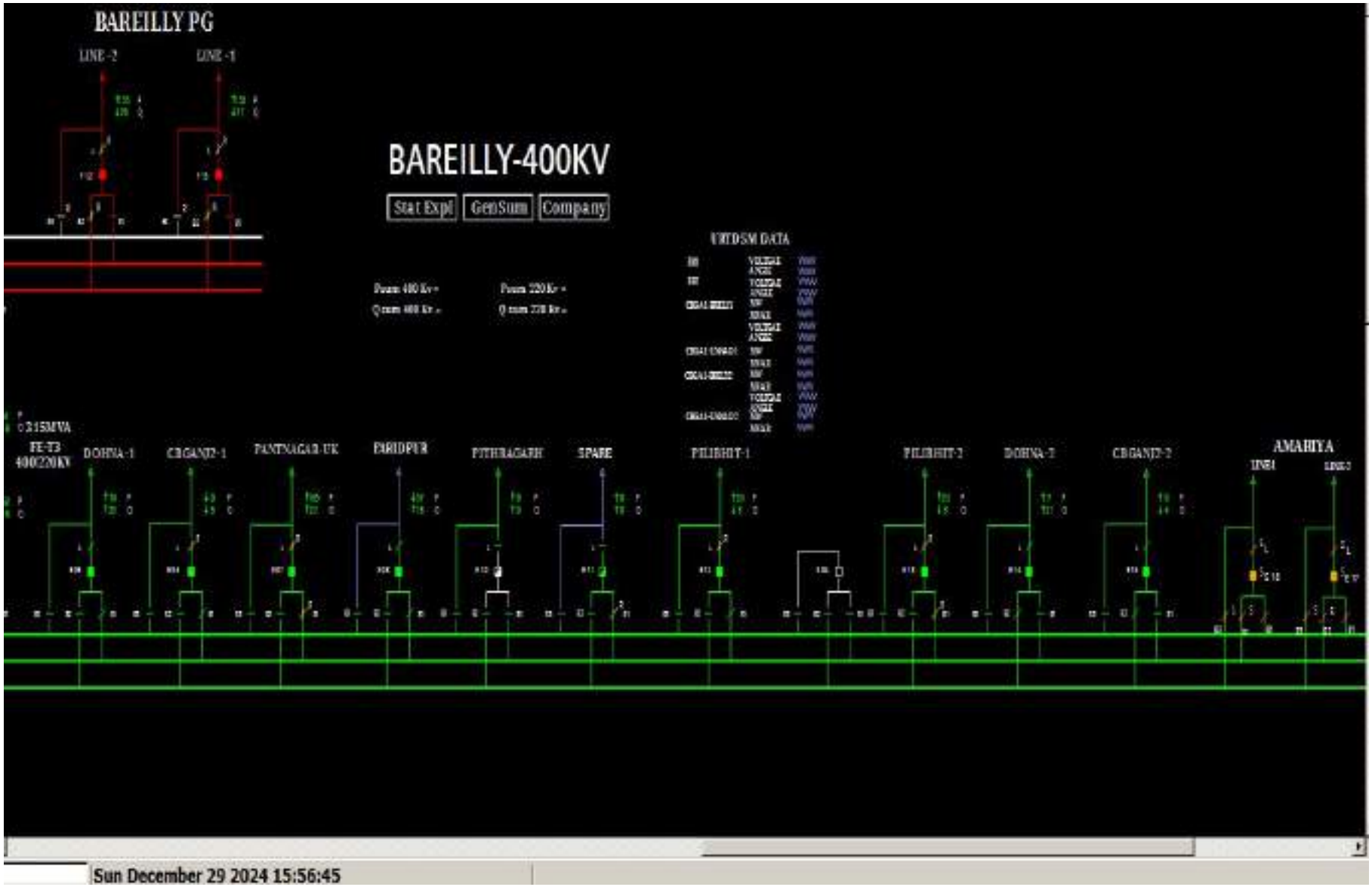
SLD of 220/132KV CB Ganj(UP) after the event



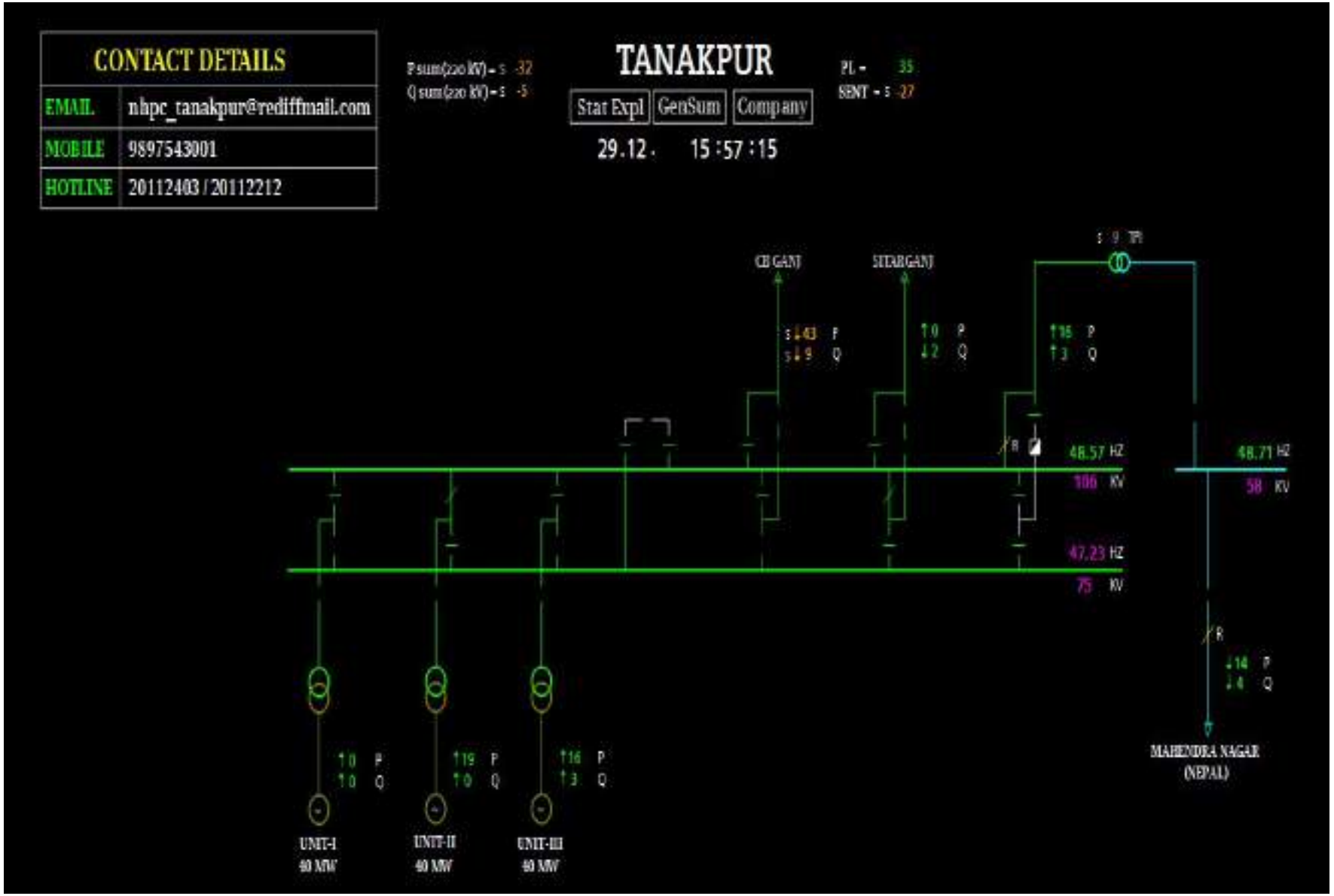
SLD of 400/220KV Bareily(UP) before the event



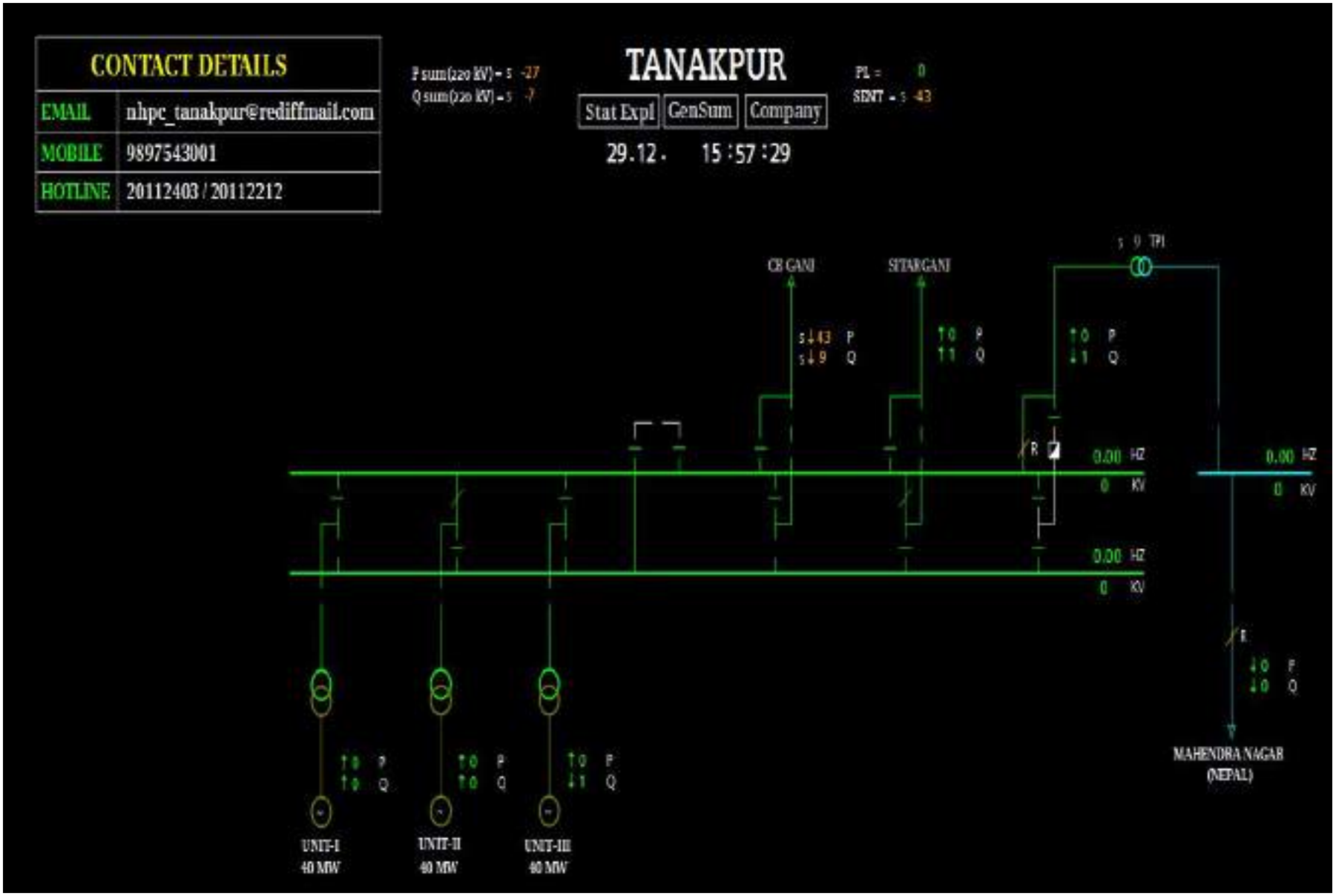
SLD of 400/220KV Bareily(UP) after the event



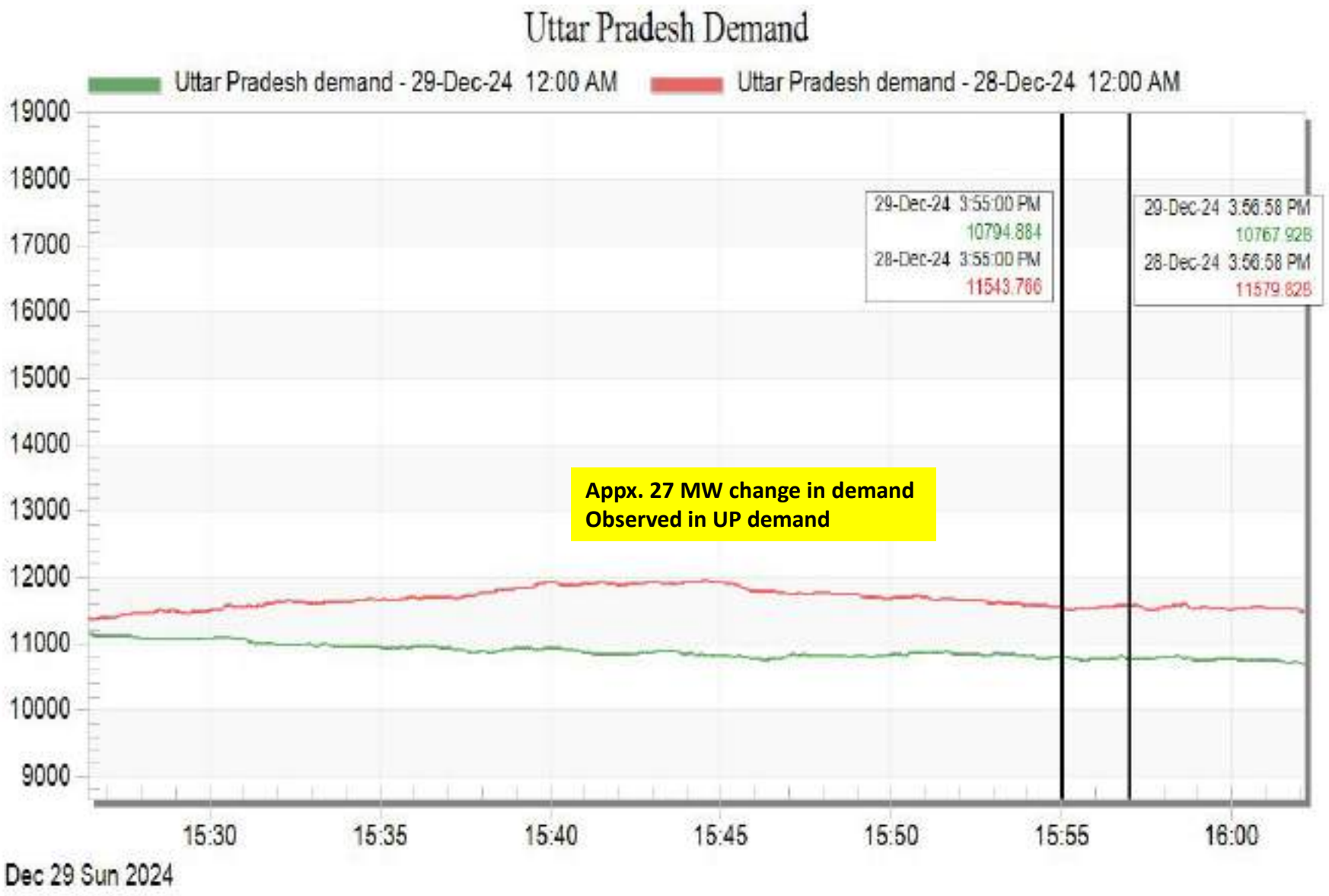
SLD of 220/132KV Tanakpur(NHPC) before the event



SLD of 220/132KV Tanakpur(NHPC) after the event



Uttar Pradesh Demand during the event

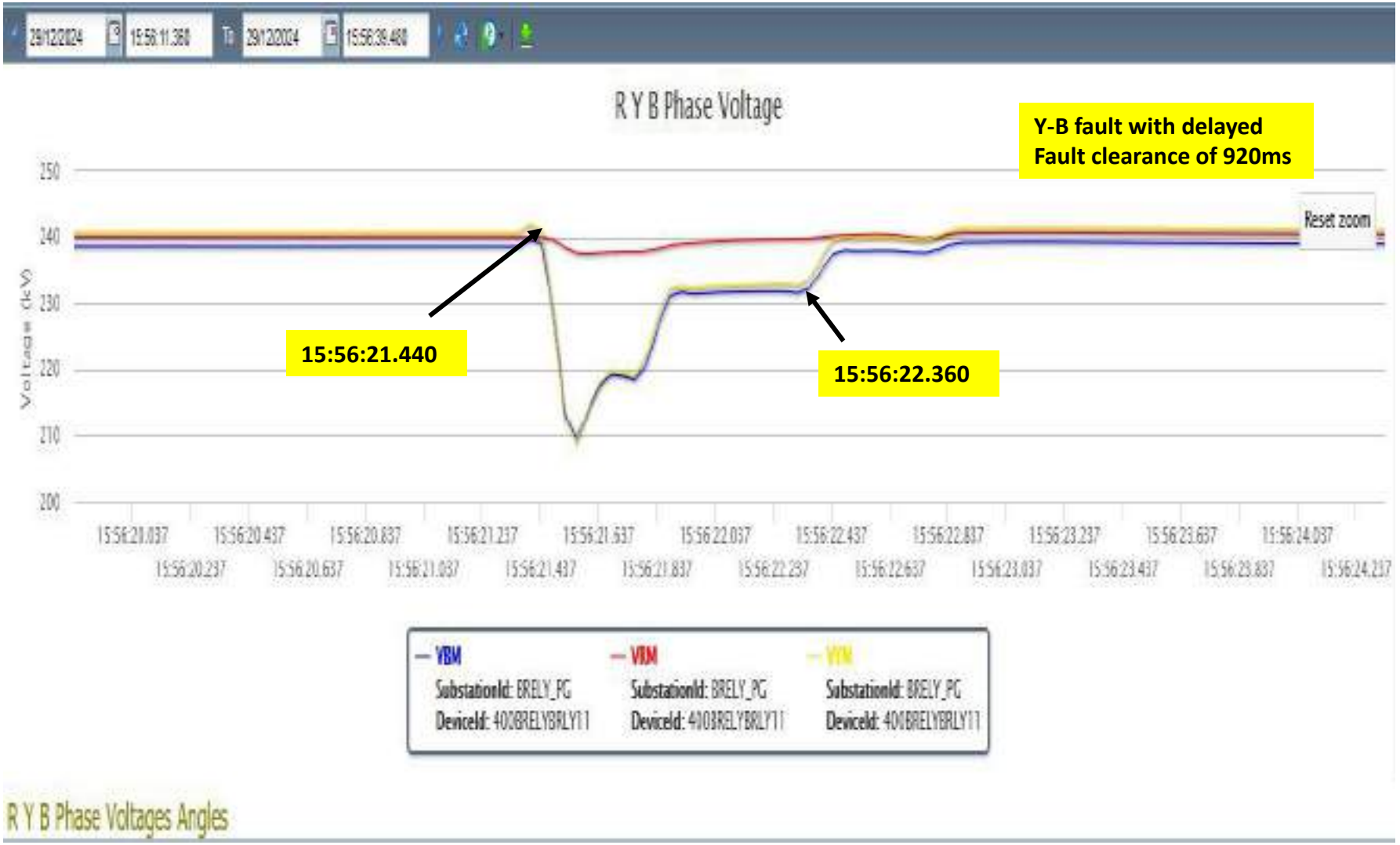


PMU Plot of frequency at Bareily(PG)

15:56 hrs/29-Dec-24

PMU Plot of phase voltage magnitude at Bareily(PG)

15:56 hrs/29-Dec-24



Details received

Tanakpur end:

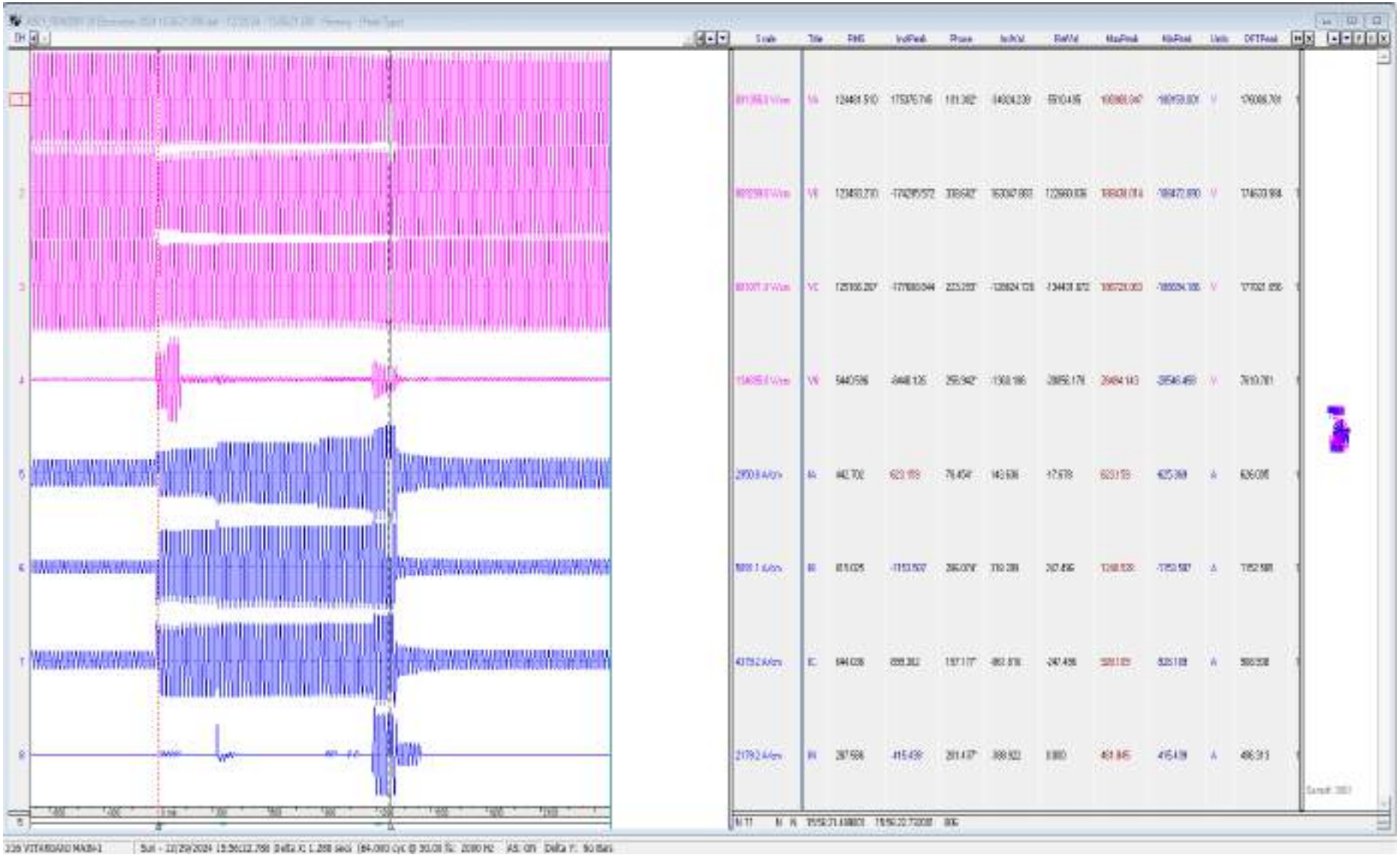
- No line tripped from Tanakpur end.
- Unit tripped (Unit-2&3) on over frequency protection operation.

CB Ganj end:

- 220KV Tankapur, 220KV Bareilly -I, 220KV Bareilly -II, 220KV Dohna, 200MVA T/F - I & II were on same bus (Main Bus A)
- Bus coupler was in opened condition
- 220kV Sitarganj, Badaun & Rampur ckt were on Bus B.
- Fault on Dohna line, line tripped from Dohna end but CB at CB Ganj end didn't open. All line connected to Bus A tripped (back up protection). (Protection details, Tanakpur line tripping)

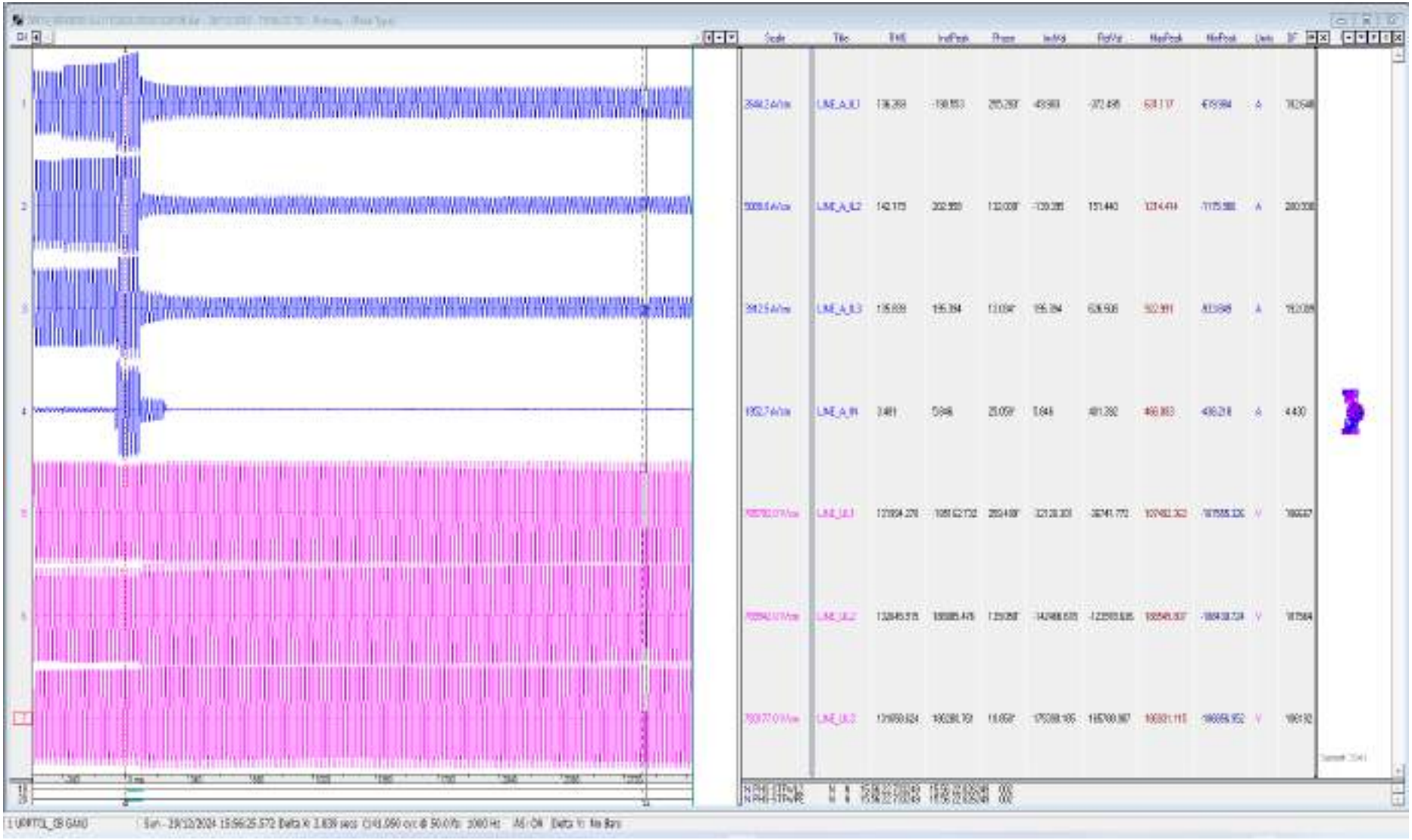
On Dated 29.12.24 at 220KV CBGANJ, 220KV Tankapur, 220KV Bareilly -I, 220KV Bareilly -II, 220KV Dohna, 200MVA T/F -I & II were on same bus (Main Bus A) and bus coupler was at open position. At 15:56Hrs fault occurred on 220KV Dohna line, line trip from Dohna end but breaker didn't trip at 220KV CBGanj end due to which fault reflected to 220KV Main Bus A and all 220KV lines connected to Main Bus A trip at local end. During investigation it was found that Line PT is not available on Relay measurements & PT fuse of all R,Y,B Phase were found broken in Switch Yard and also cable from relay Panel to PT Junction box for both Main & Backup Protection core, was found damgaed due to which Distance and Back up Protection was Blocked.

DR of 220kV Tanakpur-CB Ganj(end) ckt



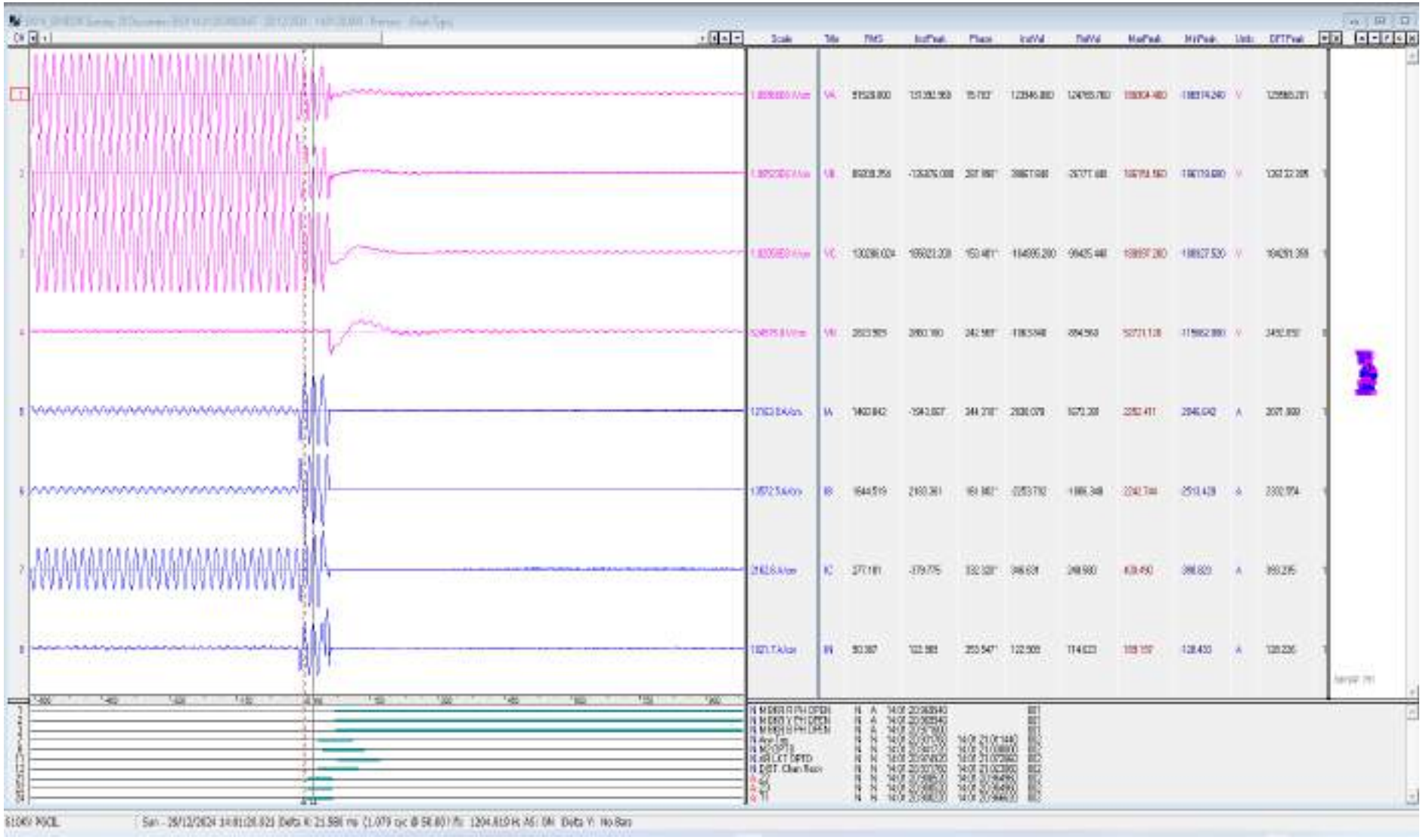
Fault clearance time: ~1280msec; Y-N fault was sensed by Main-2 relay. Line didn't trip

DR of 220kV CB Ganj(end)-Sitarganj ckt



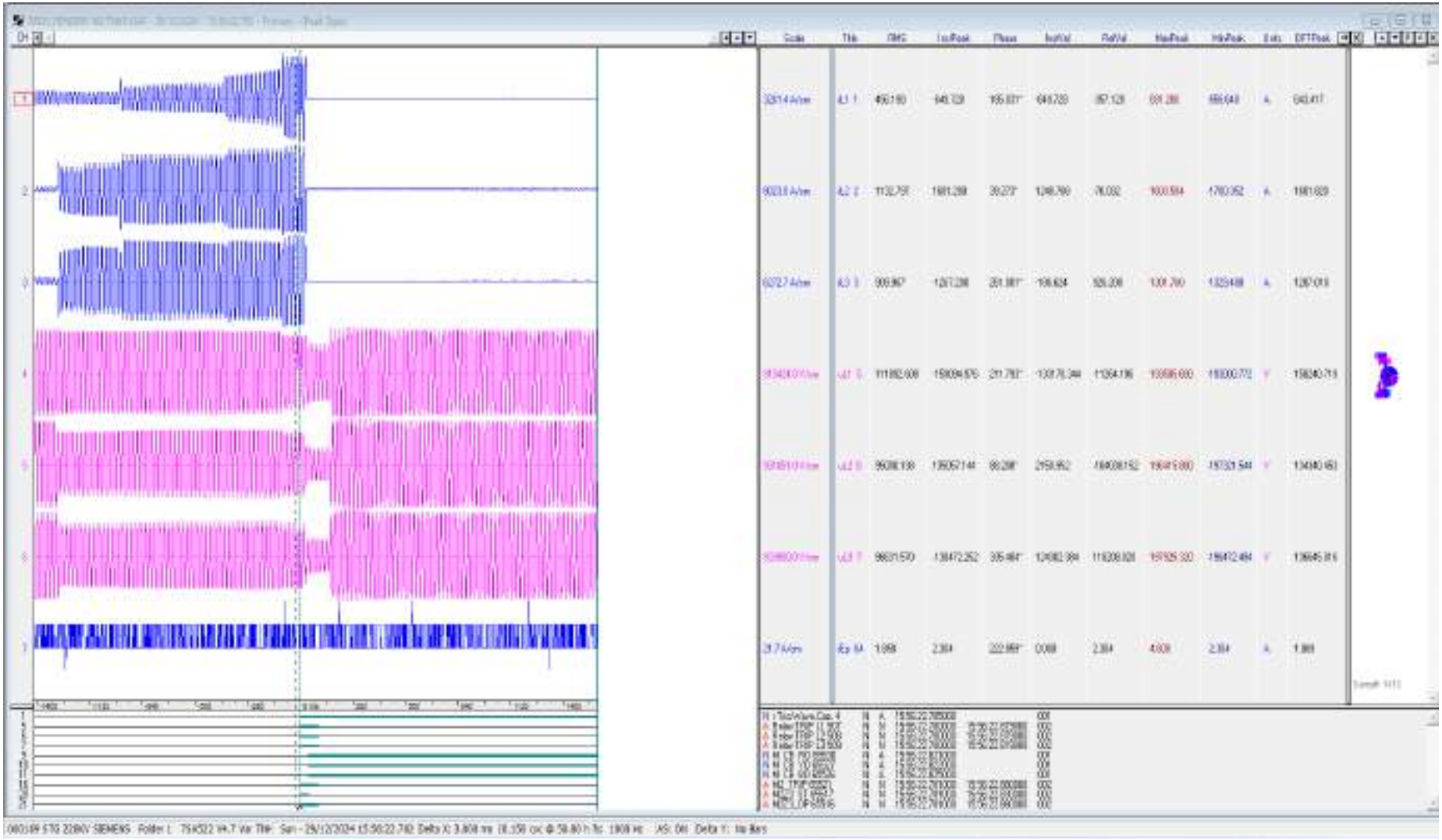
Fault clearance time: ~1280msec; Y-N fault was sensed by Main-2 relay. Line didn't trip

DR of 220kV CB Ganj-Sitarganj(end) ckt



Fault clearance time: ~1280msec; R-Y fault was sensed in Z-2(99km, 95%). Line tripped instantaneously; Time also not synced

DR of 220kV Tanakpur-Sitarganj(end) ckt



Fault clearance time: ~1280msec; R-Y fault was sensed in Z-3(292km, 677%).

Points for Discussion

i) Exact nature and location of fault need to be shared.

ii) Reason of delayed clearance of fault need to be shared.

iii) Sequence of tripping of elements need to be shared.

iv) Reason of tripping of all the line along with details of protection operated need to be shared.

v) DR/EL(.dat/.cfg file) of all the tripped elements along with detailed tripping report need to be shared from both the ends. (UP end DR are not received)

vi) Whether Tanakpur-CB Ganj ckt tripped or not?

vii) Remedial action taken report to be shared.

220KV Substation CB-Ganj, UPPTCL

29.12.2024, 15:56Hrs

Tripping of 220KV Dohna, 220KV Tanakpur, 220KV Bareilly-I, 220KV Bareilly-II due to fault on 220KV CBGanj-Dohna line

220 KV CBGANJ Tripping Of 220KV Dohna, Tanakpur, Bareilly-I, Bareilly-II Due To Fault On 220KV CBGanj-Dohna on dated 29.12.2024

- **Date & Time of event**: 29.12.2024 at 15:56 hrs
- **Sub-Station affected**: 220KV S/S CBGANJ
- **Date & Time of Restoration**: 220KV Dohna, Tanakpur, Bareilly-I, Bareilly-II On 29.12.2024 at 19:23 hrs,18:10hrs & 17:43 hrs for Bareilly I/II respectively.

Antecedents condition

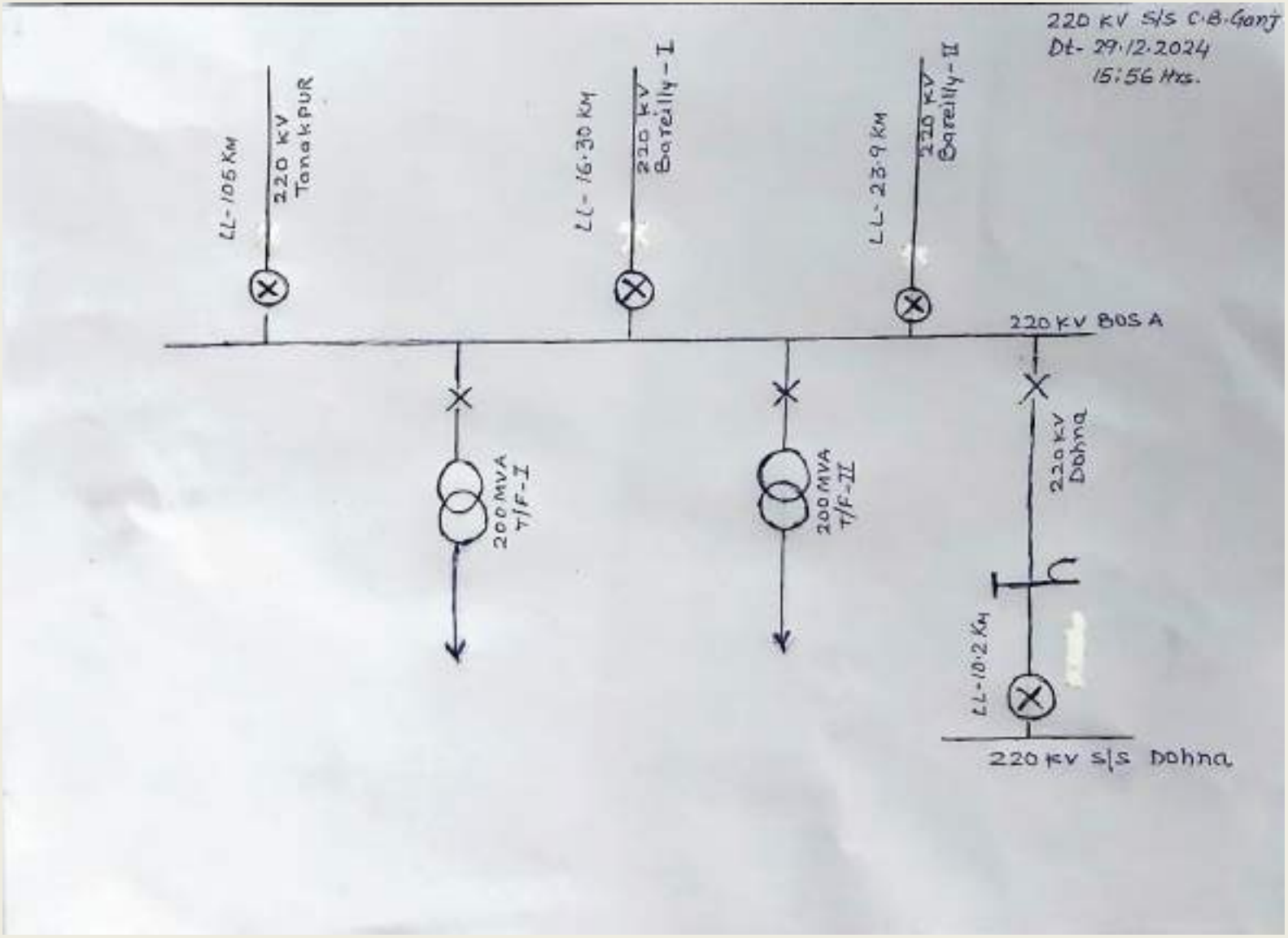
SL.No	Bus Position	Element Name	Load at 15:00hrs (A)
1	Main Bus A	220KV TANAKPUR	151
2	Main Bus A	220KV DOHNA	120
3	Main Bus A	220KV BAREILLY-I (400)	124
4	Main Bus A	220KV BAREILLY-II (400)	100
5	Main Bus A	200MVA T/F -I	106
6	Main Bus A	200MVA T/F -II	106
7	Main Bus B	220KV SITARGANJ	138
8	Main Bus B	220KV GIS BADAN ROAD	215
9	Main Bus B	220KV MORADABAD	67

Report

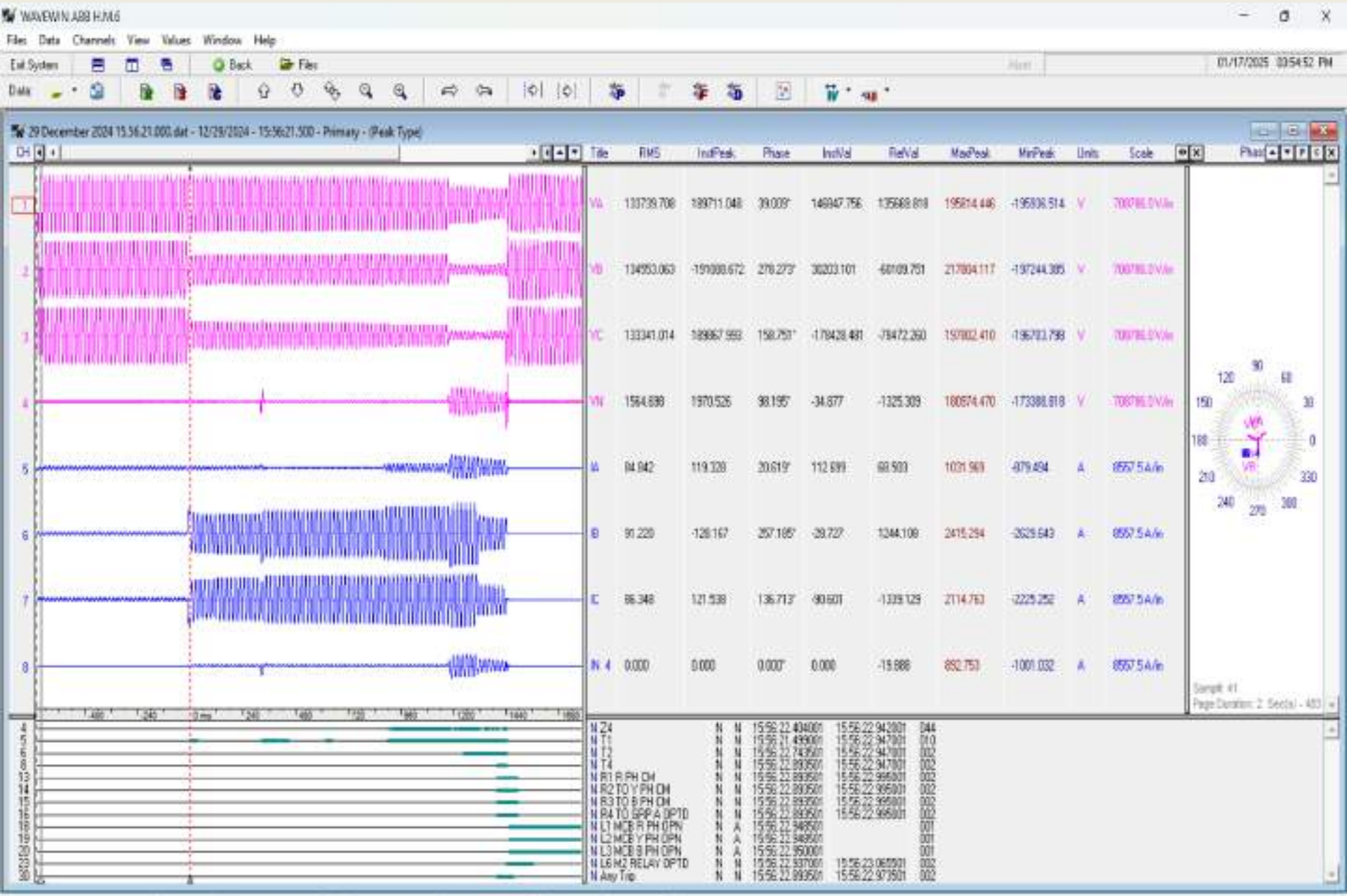
Multiple Tripping Report of 220KV CBGanj Substation on dated - 29.12.2024 at 15:56hrs

. NO.	NAME OF SUB-STATION	TRIPPING DATE/ TIME	CLOSING DATE/ TIME	C.B. NO/ DIRECTION	TYPE OF PROTEC-TION SCHEME	FLAGS OBSERVED		REMARK	ANAL YSIS
						THIS END			
						RELAY FLAGS	F.L. READING		
1	2	3	4	5	6	7	8	10	11
1	220 KV C.B.Ganj	29.12.24 15:56	29.12.24 18:10	220KV Tanakpur	Distance Protection	Started phase B,C , Trip phase A,B,C, Z4, 0.665 km, IA-232.1A, IB-1.551KA, IC-1.405KA			On Dated 29.12.24 at 220KV CBGANJ, 220KV Tankapur, 220KV Bareilly -I, 220KV Bareilly -II, 220KV Dohna, 200MVA T/F -I & II were on same bus (Main Bus A) and bus coupler was at open position. At 15:56Hrs fault occurred on 220KV Dohna line, line trip from Dohna end but breaker didn't trip at 220KV CBGanj end due to which fault reflected to 220KV Main Bus A and all 220KV lines connected to Main Bus A trip at local end. During investigation it was found that Line PT is not available on Relay measurements & PT fuse of all R,Y,B Phase were found broken in Switch Yard and also cable from relay Panel to PT Junction box for both Main & Backup Protection core, was found damgaed due to which Distance and Back up Protection was Blocked.
2	220 KV C.B.Ganj	29.12.24 15:56	29.12.24 19:23	220 KV Dohna	Distance Protection	Trip from Dohna end -Y phase , B phase, Z1, Distance 7.23km. Fault current IA- 89.33 A, IB-7.421 KA, IC - 7.349 KA			
3	220 KV C.B.Ganj	29.12.24 15:56	29.12.24 17:43	220 KV Bareilly I	Distance Protection	Gen trip, B phase,E, Dist- (-11 km), IL1-0.2KA, IL2-5.35KA, IL3-5.25KA			
4	220 KV C.B.Ganj	29.12.24 15:56	29.12.24 17:43	220 KV Bareilly II	Backup Protection	Gen trip,Y, B Phase, I>1 Trip, O/C Trip, IL1-0.4KA, IL2-6.53KA, IL3-6.24KA		Remedial Action: O/C Protection has been disabled.	

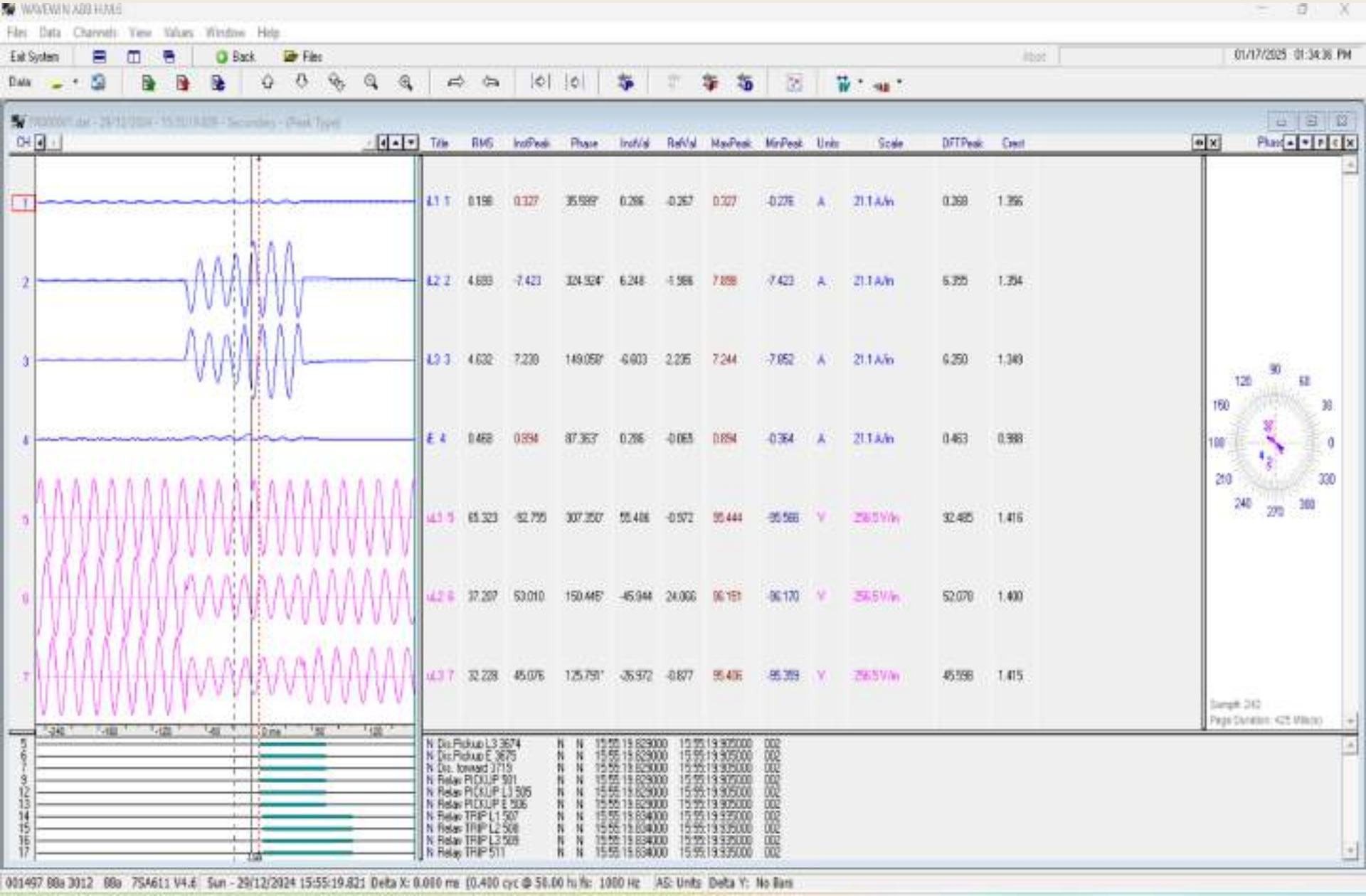
SLD


220 KV S/S C.B.Ganj
Dt- 29.12.2024
15:56 Hrs.
LL-105 KM
220 KV
Tanakpur
LL-16.30 KM
220 KV
Bareilly-I
LL-23.9 KM
220 KV
Bareilly-II
220 KV BUS A
200 MVA
T/F-I
200 MVA
T/F-II
220 KV
Dohna
LL-10.2 KM
220 KV S/S Dohna

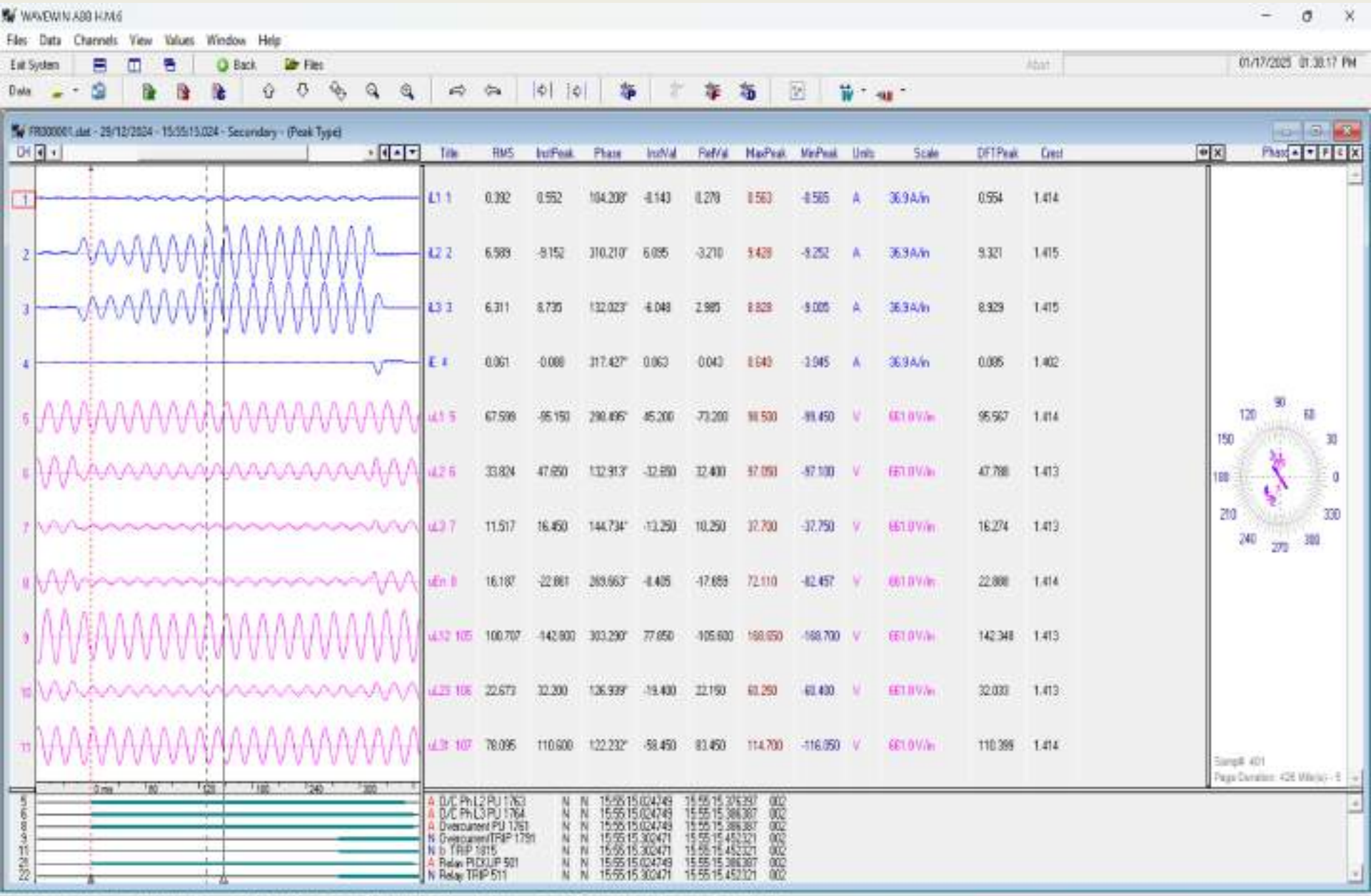
DR 220 KV Tanakpur Line



DR 220KV Bareilly - I (400)



DR 220KV Bareilly - II (400)



Events Description

- On Dated 29.12.24 at 15:56Hrs at 220KV S/S CBGANJ, 220KV Tankapur, 220KV Bareilly -I, 220KV Bareilly -II, 220KV Dohna, 200MVA T/F -I & II were on same bus (Main Bus A) and bus coupler was at open position.
- At 15:56Hrs fault occurred on 220KV Dohna line, line trip from Dohna end but breaker didn't trip at 220KV CBGanj end due to which fault reflected to 220KV Main Bus A and 220KV Tankapur, 220KV Bareilly -I, 220KV Bareilly –II connected to Main Bus A trip at local end.

Events Description

- During investigation it was found that Line PT is not available on Relay measurements & PT fuse of all R,Y,B Phase were found broken in Switch Yard (PT Terminal box) and also cable from relay Panel to PT Junction box for both Main & Backup Protection core, was found damaged due to which Distance and Back up Protection was Blocked and Protection not Operated.

Remedial Measures Taken

- O/C Protection Operated in 220KV Bareilly-II (400) Line in Back up Protection Relay Model – Siemens Siprotec 7SJ8031 Which has been made disabled.
- PT Fuse of all Phases has been replaced of 220KV Dohna Line (Faulty Line).
- Cable from Relay Panel to PT Junction box for both Main & Backup Protection core has been replaced.

THANK YOU.

Multiple element tripping event at 220kV Dausa(RS)

At 11:30 hrs on 29th December, 2024

Tripped Elements

S. No	Name of Elements	Outage Time	Revival Time	Reason of tripping
1.	220 KV BASSI(PG)-DAUSA(RS) (PG) CKT-1	11:30 hrs	17:38 hrs	Snapping of Jumper due to Sparking on Isolator CLAMP OF 220 KV DAUSA - BASSI Ckt-1
2.	220 KV BASSI(PG)-DAUSA(RS) (PG) CKT-2		12:10 hrs	
3.	220 KV SAWAIMADHOPUR(RS)-DAUSA(RS) (PG) CKT-1		12:12 hrs	
4.	220 KV Sikarai - Dausa(RS) Ckt		12:38 hrs	

Brief details of the event

i) 220/132kV Dausa(RS) has double main and transfer bus scheme at 220kV level.

ii) During antecedent condition, 220 kV Alwar(RS)-Dausa(RS) Ckt and 220 kV Lalsot(RS)-Dausa(RS) Ckt were not in service.

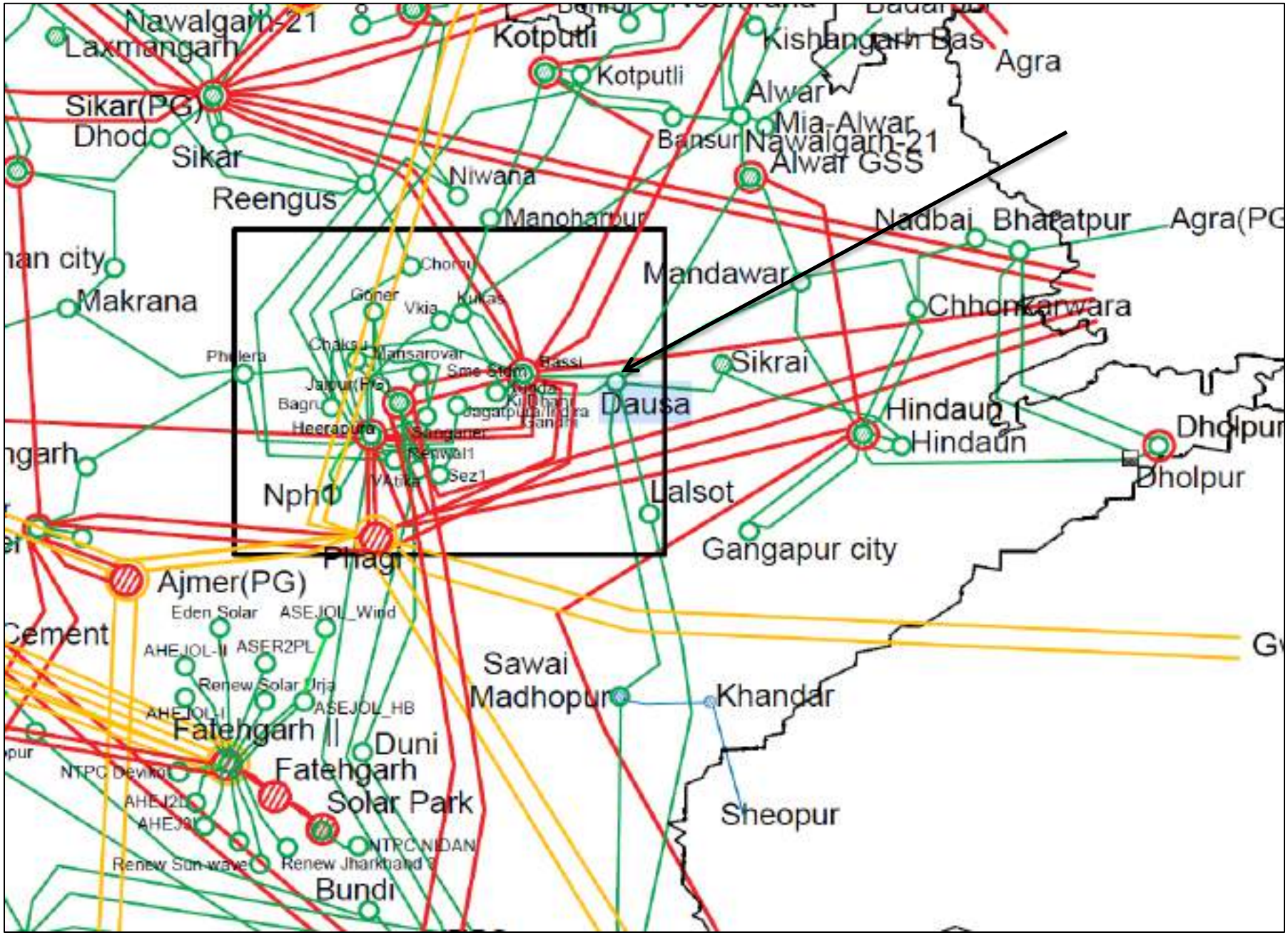
iii) As reported, at 11:30 hrs, heavy sparking in the isolator of the 220 KV BASSI(PG)-DAUSA(RS) (PG) CKT-1 resulted into snapping of conductor and line tripped.

iv) At the same time, all the elements connected to both the 220kV buses tripped and there was no source of supply at 132kV level, complete blackout occurred at 220/132kV Dausa(RS) S/s.

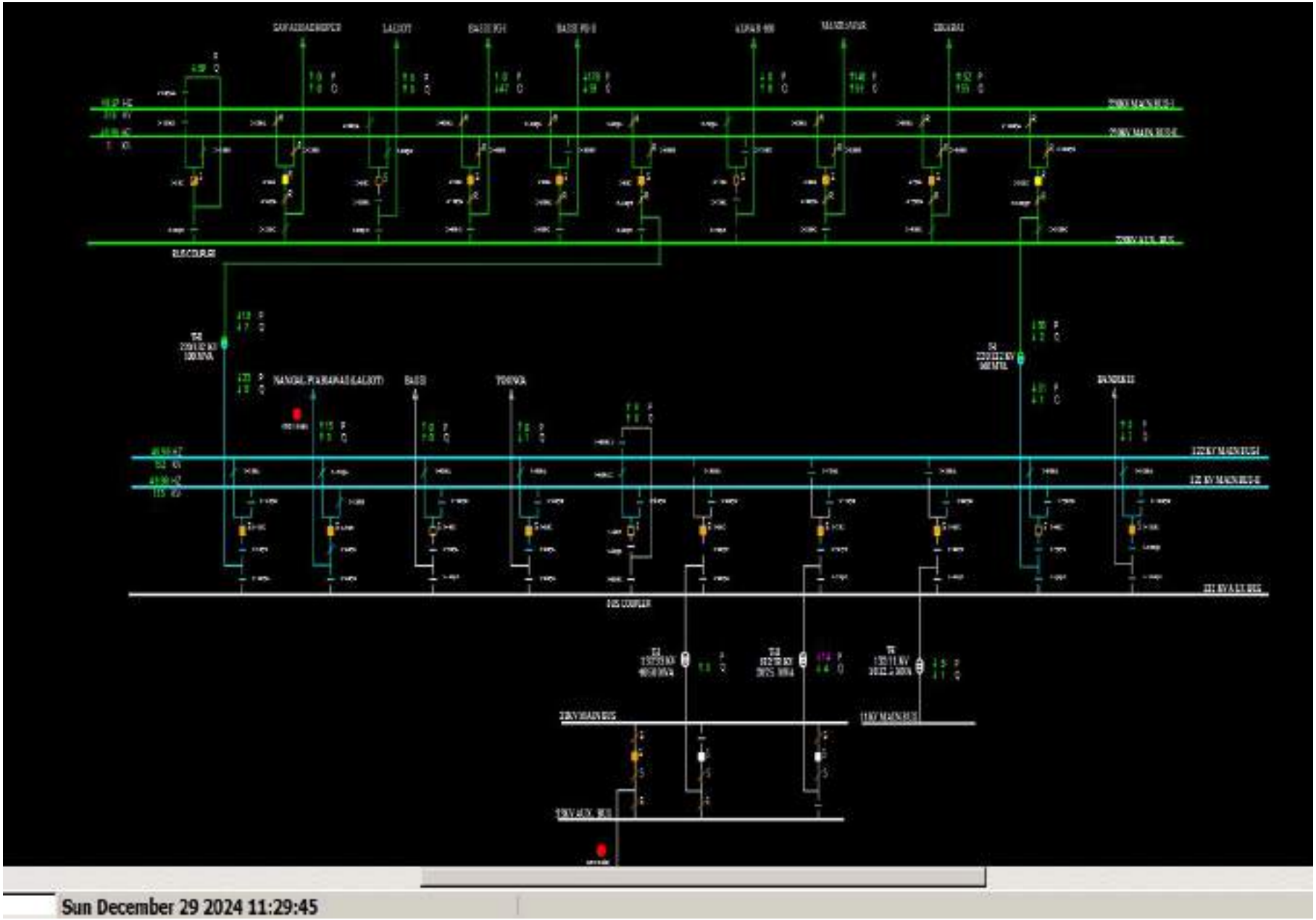
v) As per PMU at Bassi(PG), R-B phase to phase fault with delayed fault clearing time of 480ms is observed.

vi) As per SCADA, change in demand of approx. 308 MW is observed in Rajasthan control area.

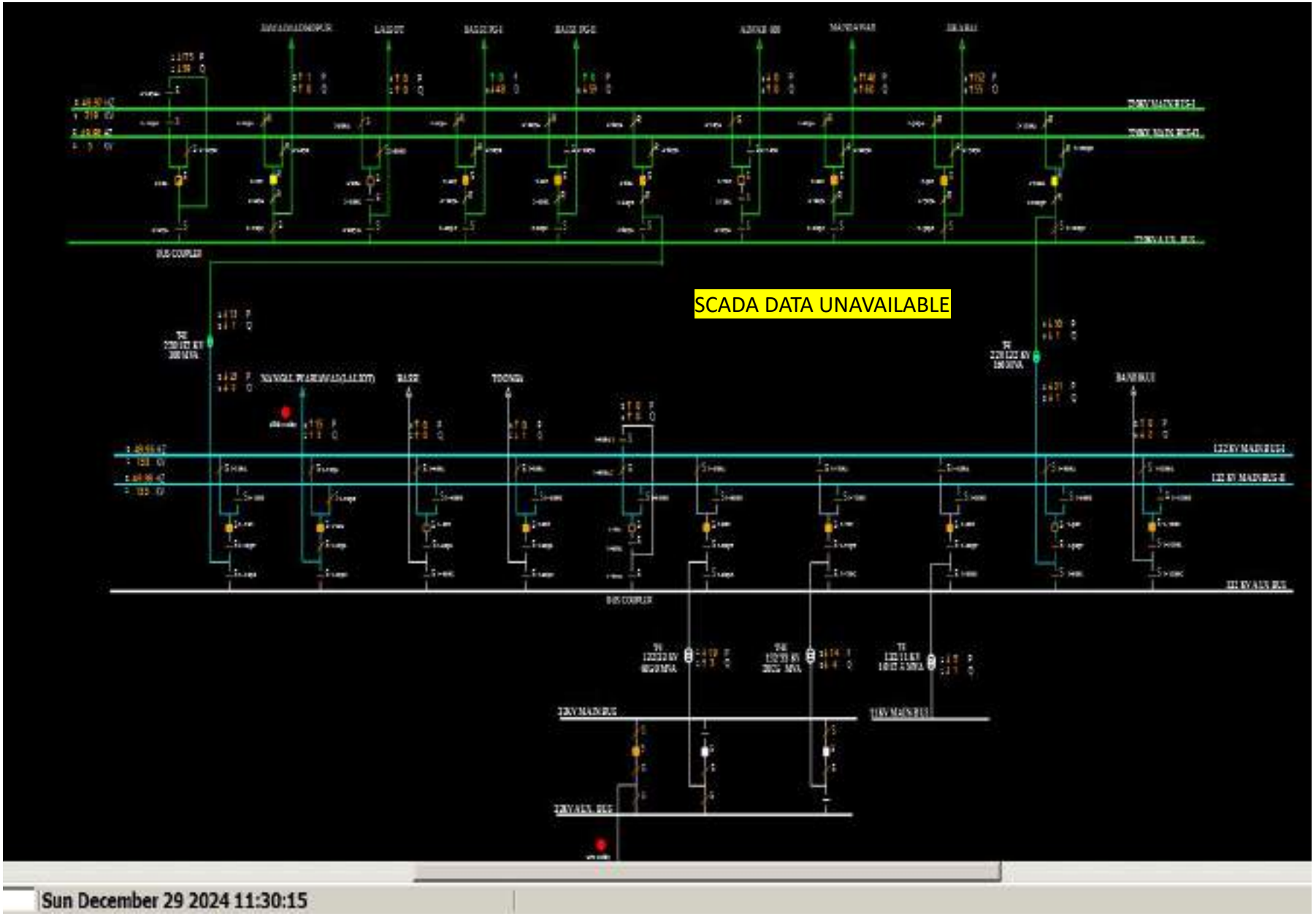
Network Diagram



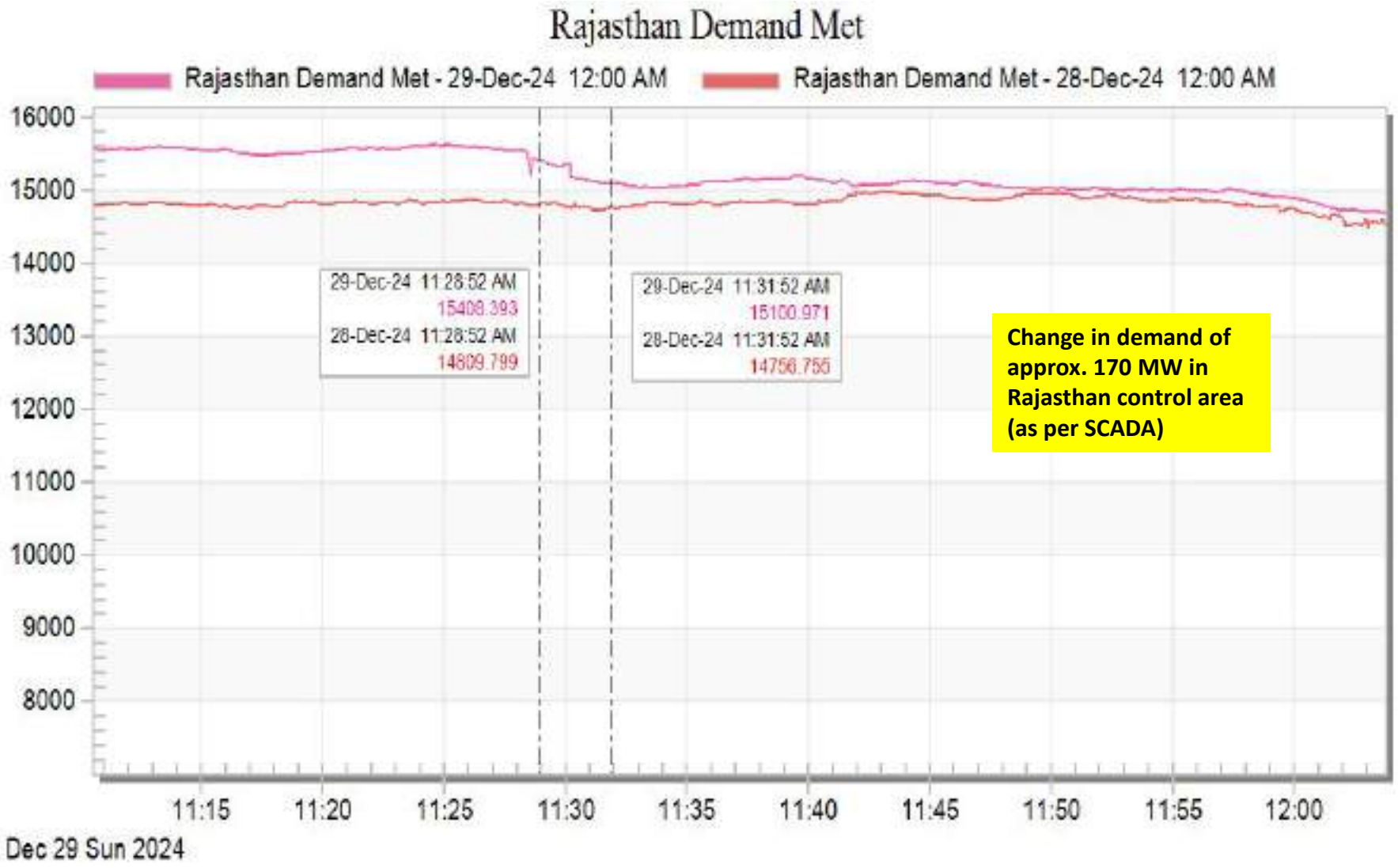
SLD of 220/132/33kV Dausa(RS) before the event



SLD of 220/132/33kV Dausa(RS) after the event



Rajasthan Demand during the event

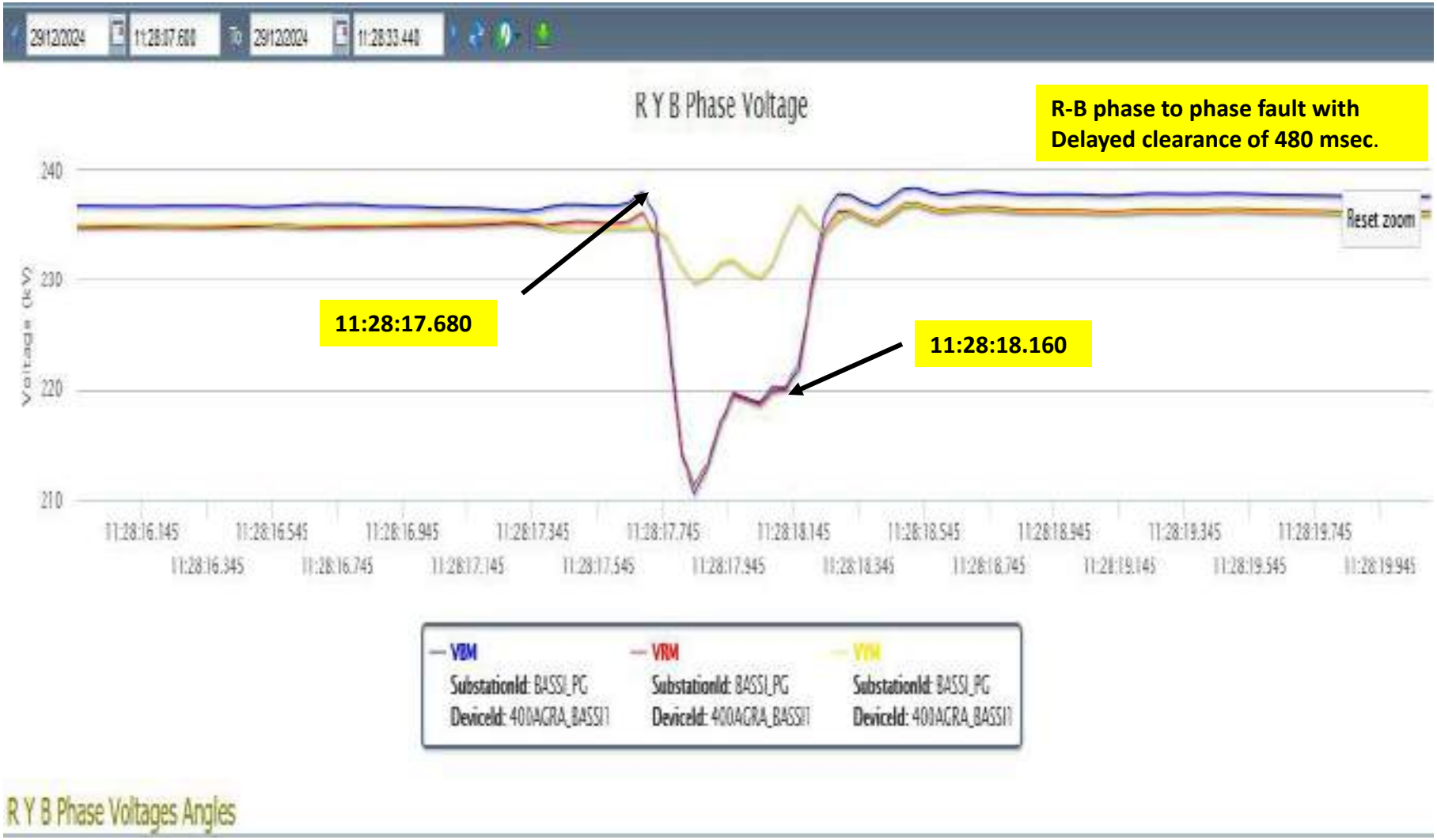


PMU Plot of frequency at Bassi(PG)

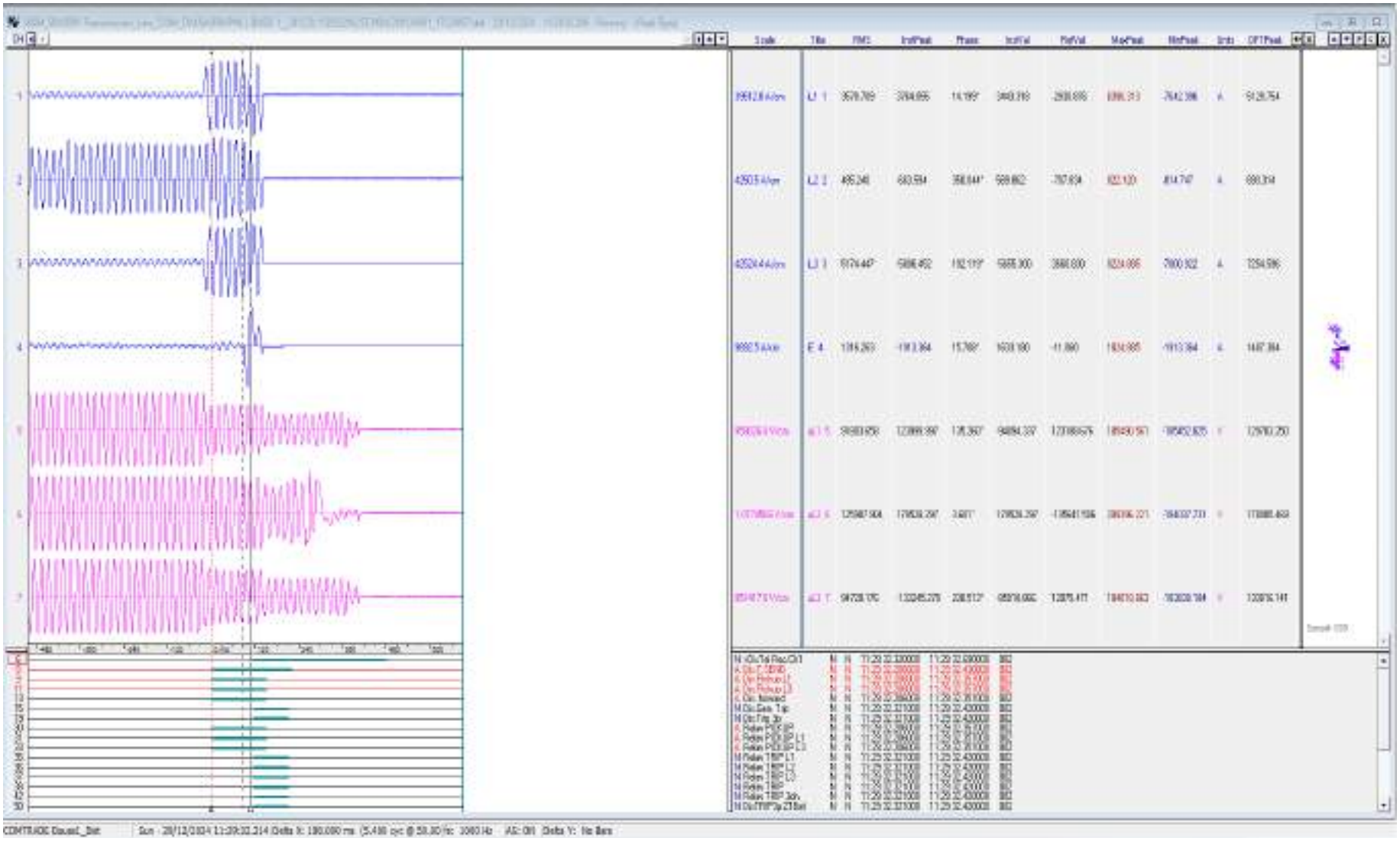
11:30 hrs/27-Dec-24

PMU Plot of phase voltage magnitude at Bassi(PG)

11:30 hrs/27-Dec-24

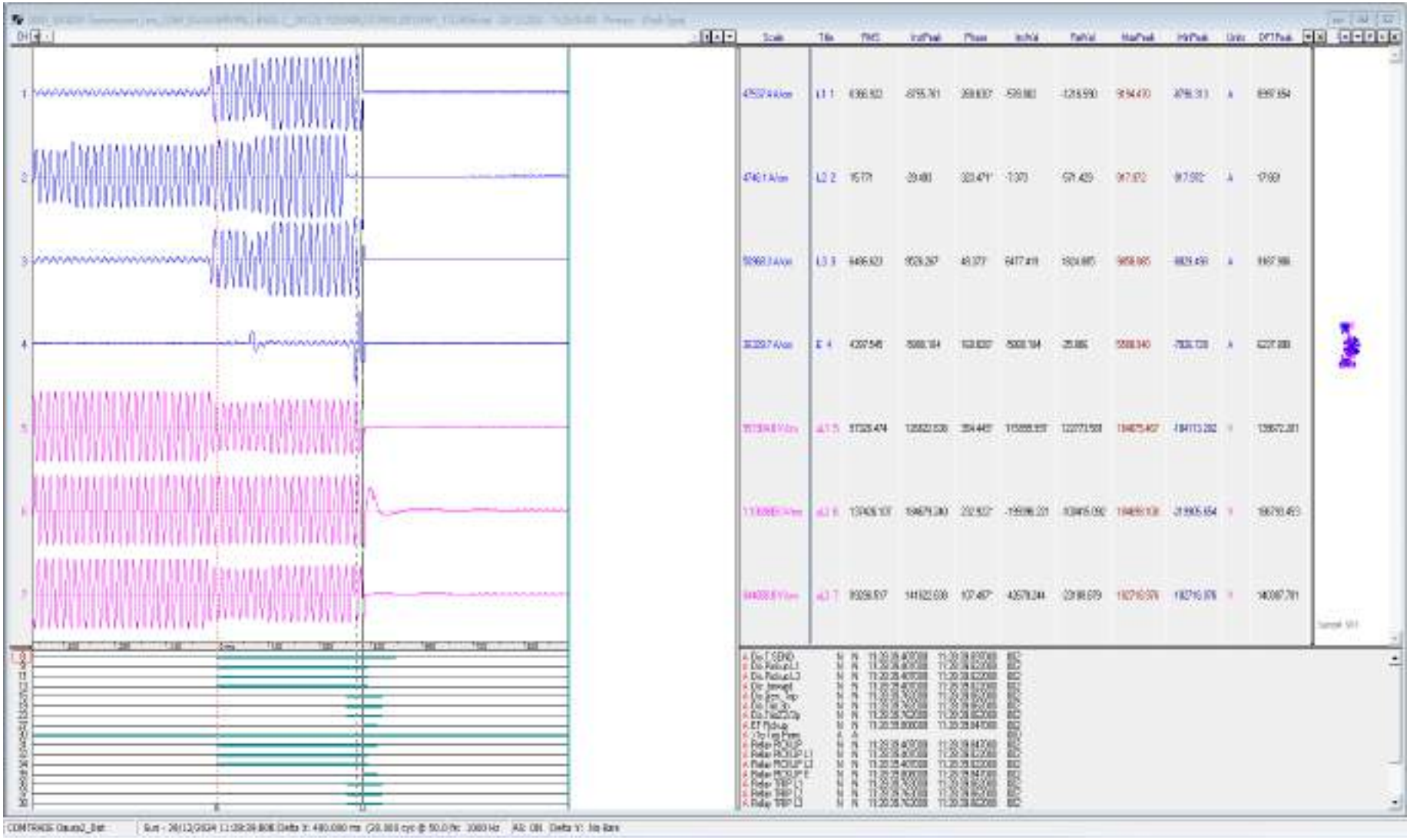


DR of 220kV Bassi (end)-Dausa ckt-1



- R-B fault converted into R-B-N within 80msec
- R-B-N fault, 5.1kA
- Tripped from Bassi end after 120msec of fault initiation.

DR of 220kV Bassi (end)-Dausa ckt-2



- R-B fault converted into R-B-N after 400msec
- R-B-N fault in Z-2, 6.39kA
- Tripped from Bassi end after 400msec of fault initiation.

Points for Discussion

i) Exact location and nature of fault?

ii) Sequence of tripping of elements need to be shared.

iii) Reason of delayed clearance of fault (480msec)

iv) Reason of tripping of all the line along with details of protection operated need to be shared.

v) SCADA data at 220/132kV Dausa(RS) freezed after the event. Availability and healthiness of the same need to be ensured.

vi) DR/EL (.dat/.cfg file) of elements pertaining to Rajasthan control area not received yet.

vii) Remedial action taken report to be shared.