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

दिनांक: 21.03.2025

सेवा में
As per attached list of Members and Other invitees

विषय: संरक्षण उप-समिति की 57 वीं बैठक की कार्यवृत्त |
Subject: Minutes for 57th Protection Sub-Committee Meeting.

संरक्षण उप-समिति की **57 वीं बैठक, दिनांक 20.02.2025 को 11:00 बजे** से **एनआरपीसी सचिवालय, कटवारिया सराय, नई दिल्ली** में हाइब्रिड माध्यम से 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 **57th meeting** of Protection Sub-Committee was held on **20.02.2025** at **11:00 Hrs** at **NRPC Secretariat, Katwaria Sarai, New Delhi** via hybrid mode. 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: 21-03-2025 16:02:43

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

57th Protection Sub-Committee Meeting (20th February, 2025)-MoM

Contents

Minutes of
57th Meeting of Protection Sub-Committee (PSC) of
Northern Regional Power Committee

Date and time of meeting : ***20.02.2025 11.00 Hrs.***

Venue : ***NRPC Secretariat, Katwaria Sarai, New Delhi (Hybrid Mode)***

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

Part-A: NRPC

A.1. Confirmation of minutes of 56th meeting of Protection Sub-Committee

A.1.1 EE (P), NRPC apprised that 56th PSC meeting was held on 20.01.2024. Minutes of the meeting were issued vide letter dtd. 12.02.2025. No comment has been received till date.

Decision taken by Forum:

Forum approved the minutes of 56th PSC meeting as issued.

A.2. Status of action taken on decisions of 56th Protection Sub-Committee meeting (agenda NRPC Secretariat)

A.2.1 Status of action taken on the decisions of 56th PSC meeting was 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 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 **January-2025** 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 January-2025.

ii. Some utilities have submitted date for some plants but not all.

iii. Some 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 **Following utilities were found non-compliant as indices were not received even on date of meeting:**

i. **PSTCL**
ii. **RAP-A**
iii. **Singrauli NTPC**
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**
xiv. **NRSS 36 (Tata Power)**
xv. **RE Generators as annexure-A.II**

A.3.5 EE (P), NRPC added that nodal officer may be nominated by RE plants for proper coordination and communication. MS, NRPC stated that a formal letter may be issued to all RE plants to seek nomination of nodal officer for compliance of protection related data as per IEGC. CGM, NRLDC added that RE plants may be said to attend the protection meeting regularly.

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 POWERGRID NR-2 representative mentioned that 33kV Transformer has been insulated with tape to avoid tripping due to flashover caused by monkey.

A.3.8 765 kV LPGCL- FATEHABAD (AGRA) Circuit-1 tripped where both Main & TIE Breaker were tripped as Auto reclose block function was operated at UPPTCL end.

Corrective action taken was not reported in the meeting and conveyed that same will be communicated later.

A.3.9 EE (P), NRPC highlighted that corrective action taken for event caused indices less than unity, should be mentioned along with submission of 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. He also requested RE Plants to comply the IEGC 2023 including protection chapter added newly in the IEGC.

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.

A.3.12 Accordingly, 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.

Decision of the Forum:

Non-compliant utilities including RE Generators *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.*

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

A.4.1 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.4.2 Starting from 48th PSC and in every PSC meeting, all utilities were requested to

submit the annual protection audit plan.

A.4.3 Audit plan submitted by utilities were presented and it was observed that following utilities had not submitted their plans 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 all 220kv and above stations in J&K are under control of PGCIL hence compliance of Protection audit may be done by PGCIL.

A.4.5 MS, NRPC highlighted that Managing Director of J&K, Ladakh may be added in the addressee list of PSC members so that issues for non-compliance of protection related data may be flagged to higher authorities as no officers are joining the meeting even after one delegation visited J&K and apprised the issues of J&K to higher officials.

A.4.6 Status of annual audit plans is enclosed as **Annexure- A.IV**.

Decision of the Forum:

Non-compliant utilities including RE Generators *were asked to submit annual audit plan 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, 55th & 56th PSC meeting.

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

i. **NPCIL**
ii. **PTCUL**
iii. **PSTCL**
iv. **HPGCL**
v. **Aravali Power Company Pvt. Ltd**
vi. **Apraava Energy Private Limited**
vii. **MEIL Anpara Energy Ltd**
viii. **MEJA Urja Nigam Ltd.**
ix. **Adani Power Rajasthan Limited**
x. **JSW Energy Ltd. (KWHEP)**
xi. **Adani Energy Services Limited**
xii. **Tata Power Renewable Energy Ltd.**
xiii. **UT of J&K**
xiv. **UT of Ladakh**
xv. **UT of Chandigarh**
xvi. **INDIGRID**
xvii. **ADHPL**
xviii. **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 including RE Generators *were asked to submit annual audit plan 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 per clause 15 of IEGC 2023:

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

A.6.2 In view of above, some utilities have submitted their third-party protection audit plans (enclosed as **Annexure-A.VI)**.

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

i. HVPNL
ii. RVPNL
iii. PSTCL
iv. HPGCL
v. UJVNL
vi. 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

A.6.4 EE (P), NRPC requested BBMB to submit the audit compliance actions.

A.6.5 RVPN representative mentioned that RVPN has been trying to get engaged with other Transmission utilities for third party audit. However, it has not been finalized yet. Therefore, they could not submit the third party protection audit plan.

A.6.6 HVPN representative stated that they have conveyed to higher authorities about mutual protection audit of RVPN and HVPN. However, decision is pending at higher level.

A.6.7 PSTCL representative submitted that third party protection audit plan has not still been finalized at higher level. After receiving approval from higher authorities, the same will be conveyed possibly within one week. CGM, NRLDC stated PSTCL to explore the mutual audit possibilities like HVPN and RVPN.

A.6.8 EE (P), NRPC highlighted that **most of the RE plants have not submitted the third party protection audit plans.**

Decision of the Forum:

Forum directed all utilities including RE Generators to submit 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.7.1 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.7.2 As per clause 15 (4) of IEGC 2023;

- *The* third-party protection audit report shall contain information sought in the format enclosed as Annexure–1 (IEGC). The protection audit reports, along with **action plan for rectification of deficiencies detected, if any, shall be submitted to the respective RPC and RLDC or SLDC, as the case may be, within a month of submission of third-party audit report.** The necessary compliance to such protection audit report shall be followed up regularly in the respective RPC.

A.7.3 Following utilities have submitted the internal audit report based on the audit done at their substations:

S.N.	Utility	Stations
1	RVPN	30 stations BARLI, NPH, TINWARI, ALWAR, BANSUR, BEHROR, BHARATPUR, BHIWADI, CHHONKARWADA, DHOLPUR,

		KG BAS, KHUSKHERA, KOTPUTALI, MANDAWAR, MANOHARPUR, NADBAI, NEEMRANA, PHAGI, AJMER, DOONI, GGC, SIKRAI, HINDAUN, SWM, BHENSARA, ANTA, BHILWARA, RAMGARH, RATANGARH, LALSOT Note: Pachpadra not signed
2	UPRVUN	Harduaganj, Anpara-B, C, D
3	Other Genco	Vishnuprayag, Lalitpur
4	WUPPTCL	Greater Noida

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

S.N.	Utility	Stations
1	PTCUL	1. 400kV S/s Rishikesh 2. 400 kV S/s Kashipur 3. 220kV S/s Chamba 4. 220kV S/s Rishikesh 5. 220kV S/s Roorkee 6. 220kV S/s Haridwar (SIDCUL) 7. 220kV S/s Jhajra. 8. 220 kV S/s Pantnagar. 9. 220 kV S/s Haldwani. 10.220kV S/s Mahuakheraganj
2	JSW	KWHEP
3	NPCIL	Narora
4	RPSCL	Rosa 220/400kV SWITCHYARD

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

S.N.	Utility	Stations
1	NPCIL	NAPS
2	RPSCL	Rosa Plant
3	UJVN	Dharasu

A.7.6 **The above submitted reports were made available at NRPC website: http://164.100.60.165/meetings/prsub.html**

A.7.7 In the meeting, above reports were discussed and concerned utilities were asked to submit compliance report of the issues highlighted by audit team.

A.7.8 EE (P), NRPC highlighted that in audit report of RVPN, it has been mentioned that method and calculations to arrive the setting have to be submitted to NRPC Secretariat.

A.7.9 He added that settings adopted in the substations have not been mentioned in many audit reports. In some audit reports, no observations have been mentioned by audit team in spite of deviation as per the Northern Region Protection philosophy.

A.7.10 RVPN representative admitted that they also have observed issue with audit reports and they are taking action to correct it.

A.7.11 EE (P), NRPC stated that there are DC fault issues have been observed in several audit reports which reflects that DC circuitry are not healthy conditions in substations. The same needs to be corrected without any delay as DC play critical role in Power system operation of substation.

A.7.12 He also mentioned that issues of Bus bar protection have also been found in the audit report.

A.7.13 EE (P), NRPC highlighted that CT ratio may be mentioned in the audit report to get understanding of the settings applied. Further, all settings need to be updated as per

the Northern region protection philosophy.

A.7.14 EE (P), NRPC mentioned that SOTF is disabled in the substations. RVPN representative replied that this is old practice in use in the Rajasthan following to prior order. UPPTCL, POWERGRID stated that SOTF are enabled in their substations. Forum requested RVPN to review the SOTF disabling and may discuss the same with other utilities.

A.7.15 EE (P), NRPC highlighted that relay replacement has not been completed for Anta substations.

A.7.16 Further, RVPN representative replied that RVPN is trying to get the internal audit completed for all substations for FY 2024-25 by February 2025 end. After that compliance actions based on the observations would be addressed after scrutinizing the audit reports.

A.7.17 He also added that for 400kV & 765kV substation, RVPN is planning to conduct inter regional audit also in addition to internal audit schedule.

A.7.18 EE (P), NRPC asked UPSLDC about the compliance action status on the internal audit of Anpara BTPS related to earth fault issue. In audit report of Anpara C, protection settings have not been checked by audit team. This needs to be checked while audit of any station. There was issue observed in the over protection settings in the Transformer of Anpara D.

A.7.19 EE (P), NRPC mentioned that PTCUL has already started the corrective action has been taken with respect to external audit points.

A.7.20 As per IEGC, 2023, there is need to do simulation for Protection settings coordination. However, this has not been complied by any protection audit team. EE (P), NRPC asked the same from all utilities.

A.7.21 NRLDC representative apprised that software tools are different for protection simulation studies.

A.7.22 CGM, NRLDC was of the view that concerned software may be used for study.

A.7.23 EE (P), NRPC highlighted that as per audit report submitted by JSW, there is need to submit the compliance action against DC problem.

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.

A.8. Tripping of Type-3 filters (5/27) on overload protections at HVDC Rihand & Dadri terminals (agenda by POWERGRID, NR-3)

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

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

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

A.8.4 POWERGRID proposed to review the 5th harmonics in the Grid and resolve the issue.

A.8.5 CGM, NRLDC asked about the any study done on the harmonics addition by others in to the grid. POWERGRID NR-3 representative replied that such detailed study has not been done however, the harmonic addition to the grid may be due to other plants available nearby to Rihand and Dadri. Detailed study and review on this are necessary with respect to long term.

A.8.6 NRLDC representative requested POWERGRID to share DR of converter side as well

as grid side during the time of tripping. It was also highlighted that DR of nearby generators may be shared for 5th harmonic content checking.

A.8.7 POWERGRID representative highlighted that detailed measurement of contributions from converter end and grid end has already been shared. The same and desired information from NRLDC will also be shared.

A.8.8 CGM, NRLDC asked POWERGRID about starting time of the issue. POWERGRID representative replied that 3-4 years have been passed with this issue. Detailed studies took such time.

A.8.9 EE (P), NRPC stated that pattern of Distortion may be observed.

A.8.10 MS, NRPC asked about OEM point of view from POWERGRID. POWERGRID representative replied that as per OEM the system has changed a lot and detailed studies would be needed. Although OEM has also observed that system has external issue. He guided POWERGRID to contact OEM and get the detailed studies done. Expert's opinion may also be sought by POWERGRID.

A.8.11 POWERGRID representative requested to arrange analysis of the harmonics status of nearby plants.

A.8.12 RVPN representative suggested that Power Quality Analyzer may be installed on the lines by the POWERGRID for measurement.

A.8.13 POWERGRID corporate representative mentioned that 5th harmonic is getting generated mainly from the Aluminum plants. Therefore, these plants may install filter to curtail this.

A.8.14 EE (P), NRPC suggested that measurement of the harmonics may be done before arriving to any conclusion thereafter steps may be taken accordingly.

Decision of the Forum:

Forum decided that the agenda may be discussed with detailed analysis and study report in the next PSC meeting. POWERGRID may approach to OEM and may also take expert opinion from expert or third-party audit vendor to analyse and find out the root cause.

A.9. Un-necessary Trippings on 220KV ANTA-LALSOT Line (agenda by RVPN)

A.9.1 RVPN representative apprised that 220 kV GSS Lalsot has two sources of supply, (i) 220 kV Anta line (NTPC) and (ii) 220kV Dausa line (RVPN), out of which, CB of 220 kV Dausa line normally remains open at Dausa end. Practically, 220 kV Anta line is generally the only source of supply to 220 kV Lalsot GSS.

A.9.2 Abnormal trippings have occurred in recent on 220 kV Anta- Lalsot line at Anta end. Some of these interruptions are detailed below:-

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

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

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

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

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

A.9.3 RVPN engineers are regularly contacting to engineers at Anta (NTPC) and it was appraised by Anta (NTPC) engineers that Bus Bar protection PU of 220 kV Anta-Lalsot line is defective and the supply to 220 kV GSS is given through transfer bus. This defective PU causes the operation of Bus Bar protection with external faults of low intensity.

A.9.4 Even after pursuance several times **NTPC is neither blocking the defective PU nor revising the settings to avoid such unnecessary interruptions.**

A.9.5 RVPN representative added that NTPC always says to get the approval of protection

setting revision from engineering team at HQ. NTPC was also suggested to block bus bar protection of Transfer bus till PU relay is replaced. He also mentioned that setting of bus bar protection operation may be changed to 50% of actual through fault current because in case of actual bus fault, all feeder will feed fault current which will be higher than from the new suggested setting and bus bar will function correctly.

A.9.6 NTPC representative mentioned that now settings have been changed to 1800 Amp (.9 times) and no tripping has been observed. He added that PU replacement work is going to be started soon and would be completed by March 2025 end most probably.

A.9.7 RVPN representative added that NTPC should increase the setting to a quantity which will be less than the reflected current of transformers of Lalsot end. By this unnecessary tripping may be avoided due to any other fault than line.

A.9.8 MS, NRPC suggested that RVPN and NTPC may sit together again and resolve the matter. He requested NTPC to expedite the replacement of PU relay.

A.9.9 NRLDC representative mentioned that if PU is not healthy then bus bar protection may be blocked to avoid any unnecessary tripping. Else NTPC should opt the solution provided by RVPN to increase the bus bar protection setting to higher then the 220kV Transformer reflected current.

A.9.10 UPPTCL representative also supported RVPN point and suggested that NTPC may adopt the same setting till replacement of PU relay. Bus bar operation may be blocked and zone -4 time setting may be reduced.

A.9.11 MS, NRPC stated that RVPN to provide the suggested settings. The same agenda will further be taken for discussion in next PSC meeting.

A.9.12 RVPN representative suggested that the reflected fault current on 220 kV Anta NTPC - Lalsot line due to fault on 132 kV side comes around 4 kA. He also proposed that the setting of Bus Bar Differential current shall be 4kA instead of 1.8 kA to stop such unwanted tripping as the PU is lying defective since long.

A.9.13 NLDC representative suggested that NTPC may contact OEM to set the logic to continue with operation of Bus bar even in block condition of defective PU relay.

A.9.14 NTPC representative replied that main concern is with OEM and OEM does not respond many times.

A.9.15 MS, NRPC asked NTPC Anta to attend the PSC meeting physically.

Decision of the Forum:

Forum decided to deliberate the agenda in the next PSC meeting. NTPC was requested to submit comment on proposal of RVPN in writing before next PSC.

A.10. Bus bar protection scheme and provision of event logger at J&K sub-stations (agenda by NRPC Secretariat)

A.10.1 EE (P), NRPC apprised that issue was discussed in meeting on 23.12.2024 chaired by Member (Power System), CEA in relation to FTC of 1x25 MVAR, 220 kV bus reactor at 220/66 kV Alusteng S/s of JKPTCL. (MoM attached as **Annexure-A.VIII**)

A.10.2 In that meeting, it was decided that the issue of bus bar protection scheme and provision of event logger at J&K sub-stations to be taken up in TCC/OCC/PCC meetings of NRPC.

A.10.3 As no officials were present from J&K, agenda was not discussed.

Decision of the Forum:

Agenda was not discussed.

A.11. Review of Distance Protection requirement Philosophy for Renewable plants having one evacuation line (agenda by Adani Green Energy Limited)

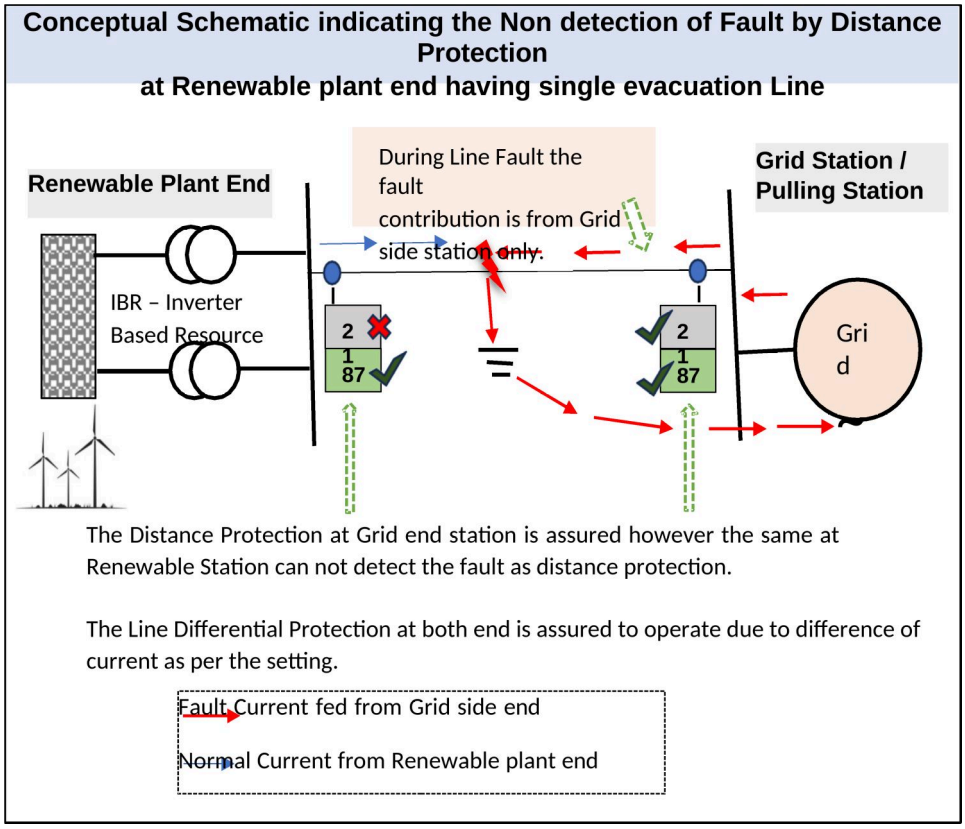
A.11.1 EE (P), NRPC apprised that the agenda was discussed in the 1st RE Sub-Committee meeting held on 24.10.2024 wherein all RE members were requested to send their comment on the proposal of AGEL. However, no comments have been received as of now.

A.11.2 The agenda was again discussed in 54th PSC meeting on 25.11.2024 and it was decided to discuss the agenda after receiving the inputs of RE members on the proposals of AGEL. However, no comments have been received as of now.

A.11.3 AGEL representative mentioned that for Renewable Power lants with a single

evacuation line, the requirement of Line Distance Protection at Renewable Plant needs to be reviewed due to following reasons:

1. During the line fault the contribution from Renewable plant is negligible, the fault is fed from grid side source or connected station end only, as being a Radial feeder.
2. Due to (1) above, the operation of distance protection employed at Renewable plant cannot detect and interpret the fault impedance as compared to opposite end i.e. Grid source and there is no operation of distance protection at Renewable Plant end. However, operation of the distance protection may happen due to voltage dip and coincidental measurement of impedance within the Zone with normal current.
3. The Line Differential Protection employed at both ends detect the fault on current differential principle and assures the protection as required.
4. The following conceptual schematic indicates the operation of protection for fault on the single line connected with renewable plant with Grid station



A.11.4 As the above phenomena, to avoid complexity of scheme and undesired operations at Renewable Plant end following was suggested by AGEL:

- The Line Distance Protection (Impedance based measurement) at Renewable plant end is not required as to be considered as Radial Feeder.
- For 220 kV and above lines, Redundant i.e. two Main Protections (main-1 and Main-2) Current based Line Differential Protection with Back up Earth fault protection is required.
- For such Lines, other schemes like inters trip signalling, Direct Trip & Auto reclosure scheme based on Differential Protection and other schemes as per Philosophy are required.
- The Distance Protection at Grid End station is to be considered as per philosophy without any change.
- The Back-Up Earth fault Protection at Grid End Station should be co-ordinated with the Renewable Plant Power Transformer HV side or

Main Substation Bus coupler, as the case may be.

A.11.5 EE (P), NRPC informed that no feedback has been received from any RE plants on this proposal.

A.11.6 NRLDC representative asked AGEL about the reason for excluding the distance protection. AGEL representative replied that the distance protection is not working at Renewable plant end with a single evacuation line.

A.11.7 RVPN representative highlighted that in case there may be addition of line in future leading to conversion of single line to multiple evacuating lines at RE plant. Then, there distance relay will come into picture. Therefore, available distance relay would be useful.

A.11.8 AGEL representative stressed that AGEL is going to implement this proposal for single evacuating line only.

A.11.9 RVPN representative stated that Differential relay requires healthiness of OPGW. However, in case of unhealthiness of OPGW, only relying on differential relays may not be helpful.

A.11.10 NLDC representative suggested that wider protection philosophy may be prepared for RE plants based on deliberation.

A.11.11 Forum acknowledged the proposal of AGEL with respect to Renewable plants with a single evacuation line only.

Decision of the Forum

Forum acknowledged the proposal of AGEL with respect to Renewable Power Plants with a single evacuation line only and it was decided that protection philosophy may be prepared for RE plants based on deliberation. Accordingly, settings may be implemented after RE protection philosophy.

A.12. Review of protection setting of Thermal, Hydro, IBR based generations/HVDC and FACTS (agenda by NLDC)

A.12.1 EE (P), NRPC apprised that agenda was discussed in 54th PSC meeting wherein following was decided:

i. Forum requested all generating members to share the inputs for protection settings for conventional generators.

ii. Forum directed NLDC to seek the inputs on protection philosophy of IBR based RE generations/HVDC and FACTS from RE generators, HVDC owners, NRLDC, other RPCs & RLDCs and compile the received inputs. Accordingly, a meeting a may be called by NRPC for discussion and philosophy may be finalized.

A.12.2 NLDC has proposed that the existing HVDC operational philosophy is vendor specific. Due to proprietary nature the settings have been shared in a limited domain. So, in order of annual review of the HVDC protection control (LCC and VSC) a committee may be formed by PSC.

A.12.3 Accordingly, Forum decided that a committee may be constituted under the chairmanship of SE (O), NRPC having members from NRLDC, NLDC, POWERGRID, Adani to prepare protection philosophy for the HVDC system. Vendor specific inputs may be sought for the same.

Decision of the Forum:

Forum decided to constitute a committee under the chairmanship of SE (Protection), NRPC having members from NRLDC, NLDC, POWERGRID, Adani to prepare protection philosophy for the HVDC system.

A.13. Miscellaneous agenda by NLDC

A.13.1 NLDC representative apprised the following issues:

A.RE complex black start: RE complex in Rajasthan is a major power injection hub in NR to all important load centers. During high solar period the availability of RE complex is highly important. Hence, he requested to advise concerned SLDC and RLDC reliability to be assigned task for finding the suitable cranking paths and carrying out black start process of RE complex.

CGM, NRLDC informed that grid forming inverters are required in this line. He stated that there is need to do micro level management for extending the power from the sources for black start.

NLDC representative added that studies are required to be done in this field for load generation balance also. CGM, NRLDC agreed with the same.

Forum recommended that a SOP may be prepared by NRPC Secretariat, NRLDC, NLDC, Rajasthan SLDC & Adani Green Energy Limited after having the studies. Prepared draft SOP may have scenarios of availability and unavailability of various RE plants.

Decision of the Forum:

Forum directed that a SOP may be prepared by NRPC Secretariat, NRLDC, NLDC, Rajasthan SLDC & Adani Green Energy Limited after having the studies.

B. PSS operation and settings: NLDC representative apprised that during inter area oscillations on 08.12.2024 power swings observed in almost all generators in Northern Region. This would cause pole slip and rotor damage. PSC sub-committee was requested to review the PSS operation and settings in all generators in region.

He asked generators to provide the data proactively in order to have further analysis.

NTPC representative ensured to provide the data.

MS, NRPC stressed that hunting is a serious issue that have been observed in many plants and has already been reported by JSW, NPCIL, RVUN etc. In order to have proper analysis, generating plants may provide the required data to NLDC whenever asked.

Decision of the Forum:

Forum asked all generating plants to provide the requisite data to Grid-India as and when required.

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

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

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

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

A.14.3 Settings of 765 kV are attached as **Annexure-A.IX.**

A.14.4 Further, he stated that the above committee has no members from some states, therefore it was requested that settings may be examined for any issue.

A.14.5 NRLDC representative asked utilities to submit the drop off to pick up ratio.

A.14.6 MS, NRPC mentioned that the recommended settings may be shared with all states of NR and concerned transmission utilities. The same may be reviewed by all concerned and share the observation, if any.

A.14.7 He added that agenda may be taken in the next PSC meeting for final approval of Forum. Directions will accordingly be given to change the protection settings, if recommended settings differ from existing settings.

Decision of the Forum:

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

A.15. Training on Electrical Protection of Power System for officials of NRPC Constituents (agenda by NRPC Secretariat)

A.15.1 EE (P), NRPC apprised that the agenda was discussed in 52nd TCC & 77th NRPC meeting held during 27-28 Dec 2024, wherein Forum approved for training on electrical protection of power system.

A.15.2 Accordingly, NRPC Secretariat is planning a 5-day residential training program for approx. 130 nos. of officers (2 from each organization) covering various topic as shared in the agenda.

A.15.3 EE (P), NRPC asked suggestions from all the members for addition in the curriculum of course.

A.15.4 RVPN representative suggested that topics related to protection based on communication may be added.

A.15.5 RVUN representative suggested that end to end relay testing module may be included in the training also.

A.15.6 Accordingly, the training module decided for the training is as below-

A. Brief theory on protection of following topic:

i. Protection of Transmission Lines and Cables including compensated lines

ii. Generator and Generator Transformer Protection including Protection of RE plants (Solar/Wind/Hydro)

iii. Protection of Power Transformers & Shunt Reactor

iv. Protection of Busbar & Local Breaker Backup Protection

v. Protection of Facts (FSC/TCSC/SVC/STATCOM)

vi. Protection of HVDC Systems

B. Calculation of settings for above sr. no. i to vi with examples.

C. Protection Co-ordination.

D. Hands on for seeding settings in relay. Downloading of DR/EL from relay.

E. Fault analysis using DR/EL.

F. Communication (PLCC) for protection

G. Relay testing

A.15.7 RVPN and UPPTCL requested to increase the no. of participants from their organizations as there are more zones.

A.15.8 MS, NRPC highlighted that NRPC fund will be utilized for this training and asked utilities to send the protection related officials to attend the training. Nominations from the CEA will also be sought.

Decision of the Forum:

Forum approved the proposal of training on Electrical Protection of Power System for approx. 135 officials of NRPC Constituent members with decided course curriculum. Forum recommended the same for approval of NRPC Forum.

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**. 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.

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 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.

During 57th PSC meeting, HPSEBL representatives were not present in the meeting.

PSC Forum requested HPSEBL to take expeditious actions at their 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 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.

During 57th PSC meeting, HVPNL representative informed that status is same and estimated timeline will be 6 months to complete the work.

NRLDC representative requested HVPNL to expedite the process at their end.

PSC Forum directed 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.

During 57th PSC meeting, RVPNL representative informed that issue of bus bar at Akal S/s has been rectified. Work was done during February 2025.

iv. Multiple elements tripping at 400kV Sainj(HP), 400kV Parbati2 & Parbati3 (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 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.

During 57th PSC meeting, NHPC representative informed that OPGW laying is ongoing. GE engineers are yet to visit and the work is expected to get completed by March 2025.

PSC Forum directed 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, 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.

During 57th PSC meeting, RGTPS representative informed that work is completed during January 2025.

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.

During 57th PSC meeting, POWERGID(NR-1) representative informed that work is completed.

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

During 57th PSC meeting, PSTCL representative informed that there is delay in tender stage and bus bar protection at 220kV Sarna will be commissioned by June 2025. Materials are under inspection.

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

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

During 57th PSC meeting, UPPTCL representative stated that status is same. Shutdown has been planned after 25th February 2025 and bus bar commissioning at 132kV Masoli(UP) will get completed by March 2025.

PSC Forum directed 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 stated that work is at stage of tender processing. Necessary follow up actions are being taken.

During 57th PSC meeting, RVUNL representative stated that status is same and work is at stage of tender processing.

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

PSC Forum directed 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 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.

During 57th PSC meeting, RVPNL representative informed that there is delay in panel replacement. If the work is delayed further, A/R will be enabled in the old panel during shutdown on 27th and 28th February 2025.

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

PSC Forum directed 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 representative informed that continuous shutdown is going on for work of relay replacement at Khara S/s. Relay replacement in Saharanpur line will 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.

During 57th PSC meeting, UPPTCL representative informed that relay replacement in Saharanpur line is completed and that in Beas line will be completed by 22nd February 2025. It is expected that relay replacement in unit-1 will get completed by the end of March 2025 followed by unit-2 & 3.

NRLDC representative requested UPPTCL for expeditious completion of work.

PSC Forum directed 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 Patial(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 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.

During 57th PSC meeting, POWERGRID(NR-2) representative informed that

status is same.

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

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

xiii. 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 taken 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 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.

During 57th PSC meeting, UJVUNL representative informed that GE team is already contacted to resolve the A/R issue in relay, but there is delay from GE end. Further, tender is under process regarding replacement of bus bar protection relay. Action plan is prepared and shared for attending the issue in unit/line breaker.

PSC Forum directed 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.

xiv. 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 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).

During 57th PSC meeting, UPPTCL representative informed that the status is same. However, this issue is addressed for now. They will ensure the correction in the relay configuration in Main-2 relay at both the stations when there is shutdown opportunity.

xv. 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 representative informed that status is same.

During 57th PSC meeting, UPPTCL representative informed that time sync issue will be resolved by March 2025 (delay in visit by ABB engineers). Further, bus bar relay replacement will be done within 1 year.

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

PSC Forum requested UPPTCL for expedited corrective actions.

xvi. 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 representative informed that status is same.

During 57th PSC meeting, UPPTCL representative informed that Commissioning and Implementation of numerical relays in 132kV ICT-1&2 at Obra_A(UP) will be completed by March 2025 (delay in visit by ABB engineers).

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

PSC Forum directed UPPTCL for expedited corrective actions.

xvii. 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 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.

During 57th PSC meeting, PTCUL representatives were not present in the meeting.

PSC Forum directed PTCUL to review the SPS scheme and submit in next PSC/OCC meeting.

xviii. 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 relays will get allotted in next phase. It is expected that work of relay replacement will get completed by the end of January 2025.

During 56th PSC meeting, 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. Further time sync issue is not resolved yet same. Resolution of time sync issue has also been taken up in parallel.

During 57th PSC meeting, RVPNL representative informed that 3 relays will be replaced during shutdown available on 21st, 22nd and 28th February 2025. Rest 2 relays are under procurement stage.

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

PSC Forum requested RVPNL for expedited corrective actions.

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

During 57th PSC meeting, RVPNL representative stated that SPS at Alwar is not feasible.

xx. 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 representatives were not present in the meeting.

During 57th PSC meeting, NTPC representative stated that A/R issue is resolved.

xxi. 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 representative informed that work has been completed in one of the lines connected to RAPP_A and in other line and the line connected to RAPP_B, it will get completed by the end of January 2025.

During 57th PSC meeting, RVPNL representative informed that work is completed in 220kV RAPS_A(NP)- Sakatpura (RS) (RS) Ckt-1. For 220kV RAPS_A(NP)- Sakatpura (RS) (RS) Ckt-2 and 220kV RAPS_B(NP)- Sakatpura (RS) (RS) Ckt, it will be completed by March 2025.

PSC Forum directed RVPNL for expedited corrective actions.

xxii. 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 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 tripping events.

During 57th PSC meeting, PSTCL informed that status is same.

NRLDC representative requested PSTCL for expedite the replacement of insulators in these lines (by October 2025) to minimise the tripping events due to fog during next winter season. PSTCL agreed for the same.

PSC Forum directed PSTCL for expeditious actions for insulators replacement.

xxiii. 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 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.

During 57th PSC meeting, UPPTCL representative informed that carrier communication issue exists in Aligarh(UP) end also. Hence communication upgradation will be done at both the ends. Work is expected to get completed by end of May 2025.

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

PSC Forum directed UPPTCL for expedited corrective actions.

xxiv. 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 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 needs 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.

During 57th PSC meeting, RVPNL representative informed that issue in breaker is resolved.

xxv. 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 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.

During 57th PSC meeting, RVPNL informed that TEED protection has been reviewed and it was found that TEED protection was disabled. It is enabled now. After enabling TEED no event has occurred till now.

xxvi. 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 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.

During 57th PSC meeting, Pong BBMB representative was not present.

NRLDC representative requested BBMB to present the detailed analysis of the event in next PSC meeting.

PSC Forum directed BBMB to ensure timely submission of DR/EL & tripping report.

xxvii. Frequent tripping of 400 KV Akal-Jodhpur(RS) Ckt-1

PSC 56 recommendation: RVPNL shall rectify A/R issue of Main-I relay at Jodhpur end.

During 57th PSC meeting, RVPNL representative informed that 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.

PSC Forum directed RVPNL to rectify A/R issue of Main-I relay at Jodhpur end.

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

PSC 56 recommendation:

a) RVPNL shall ensure the healthiness of protection system and their proper operation.

b) Timely submission of disturbance recorder (DR) and event logger (EL) files need to be ensured.

During 57th PSC meeting, RVPNL representative informed that during isolator changeover "LBB operated" signal was seen in BCU due to which all the elements connected to that bus tripped. There was no fault in system. Tripping occurred during isolator changeover as "LBB operated" signal was seen in BCU. Issue with LBB relay is not identified yet. OEM is present at site for commissioning of new 500MVA ICT which will be completed within 7-8 days. After that OEM will attend this issue in LBB relay. Temporarily busbar protection has been taken out of service and zone-4 settings of lines at Jaisalmer(RS) end is kept as 160ms.

PSC Forum directed RVPNL to rectify issue in LBB relay at Jaisalmer end and take the busbar protection in service at the earliest.

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

PSC 56 recommendation:

a) BBMB shall share the DR/EL & tripping details within one week.

b) Timely submission of disturbance recorder (DR) and event logger (EL) files need to be ensured.

During 57th PSC meeting, it was informed that BBMB has shared the details.

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

PSC 56 recommendation:

a) PSTCL shall share the DR/EL & tripping details within one week.

b) Timely submission of disturbance recorder (DR) and event logger (EL) files need to be ensured.

During 57th PSC meeting, PSTCL informed that they will be sharing the analysis shortly.

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

PSC 56 recommendation:

a) UPPTCL shall sensitise the site engineer about important alarms and practice to attend those alarms on priority.

b) Healthiness of protection system and their proper operation need to be ensured.

c) Timely submission of disturbance recorder (DR) and event logger (EL) files need to be ensured.

During 57th PSC meeting, UPPTCL informed that issue is attended and they have sensitised the site engineer about important alarms and practice to attend those alarms on priority.

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

PSC 56 recommendation:

a) RVPNL shall resolve the issue with the bus bar protection at Bikaner (RS) at the earliest.

b) Healthiness of protection system and their proper operation need to be ensured.

c) Timely submission of disturbance recorder (DR) and event logger (EL) files need to be ensured.

During 57th PSC meeting, RVPNL informed that issue with the bus bar protection at Bikaner(RS) is attended.

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

PSC 56 recommendation:

a) RVPNL shall expedite the replacement of static relays with numerical relay.

b) Healthiness of protection system and their proper operation need to be ensured.

c) Timely submission of disturbance recorder (DR) and event logger (EL) files need to be ensured.

During 57th PSC meeting, RVPNL representative informed that 3 relays will be replaced during shutdown available on 21st, 22nd and 28th February 2025. Rest 2 relays are under procurement stage.

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

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

B.2.1 A total of 11 grid events occurred in the month of **January 2025** of which **06** are of GD-1 category, **04** are of GI-2 Category and **01** is 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.**

B.2.2 Maximum delayed clearance of fault observed in event of multiple elements tripping at 400/220kV Akal(RS) on 12th January, 2025 (As per PMU at Bhadla(PG), B-N phase to earth fault converted into Y-B-N double phase to earth fault with delayed fault clearing time of 2120ms 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 **11** grid events occurred in the month. In 01 (no.) of grid event, there was no fault in the grid.

B.2.4 NRLDC representative presented the reporting status of DR/EL & tripping reports w.r.t. grid events occurred in January 2025. 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.2.5 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.

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.

Decision of the Forum

PSC forum directed 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 January-2025 and status of remedial action taken (agenda by NRLDC)

a) Frequent elements tripping during January 2025:

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

S. NO.	Element Name	No. of forced outages	Utility/SLDC
1	220 KV RAPS_A(NP)-Sakatpura(RS) (RS) Ckt-1	8	NPCIL/Raj
2	220 KV Agra(PG)-Bharatpur(RS) (PG) Ckt-1	5	PG/Raj
3	400 KV Anpara_B(UPUN)-Sarnath(UP) (UP) Ckt-2	3	UP
4	400 KV Noida Sec 148-Noida Sec 123 (UP) Ckt-1	3	UP
5	132 KV Dehar(BB)-Kangoo(HP) (HPPTCL) Ckt-1	3	BBMB/HP
6	220 KV RAPS_A(NP)-Sakatpura(RS) (RS) Ckt-2	3	NPCIL/Raj
7	220 KV Sohawal(PG)-Barabanki(UP) (UP) Ckt-1	3	PG/UP
8	400 KV Merta-Ratangarh (RS) Ckt-1	3	Raj
9	400 KV Mohanlalganj (PGYTL)-Unnao(UP) (PGYTL) Ckt-1	3	PG/UP

B.3.2 List of tripping is attached as **Annexure-B.III**.

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 RAPS_A(NP)-Sakatpura(RS) (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 8 number of times in January 2025 and DR/EL is also not received from RAPS_A end for any of the event. 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 is completed in 220kV RAPS_A(NP)- Sakatpura (RS) (RS) Ckt-1. For 220kV RAPS_A(NP)- Sakatpura (RS) (RS) Ckt-2 and 220kV RAPS_B(NP)- Sakatpura (RS) (RS) Ckt, it will be completed by March 2025. It will help in minimising fault incidents in line.*

- **220 KV Agra(PG)-Bharatpur(RS) (PG) Ckt-1:** *NRLDC representative raised concern over frequent incidents of faults. It was further highlighted that DR/EL is also not received from Bharatpur end. RVPNL representative informed that this line is radially connected, hence DR is insignificant at Bharatpur end. NRLDC representative further highlighted that faults are of permanent nature as unsuccessful A/R is observed, hence location of fault need to be identified. POWERGRID(NR-3) representative informed that most of the faults are occurring at the border of Rajasthan and Powergrid portion of the line. Patrolling is done in Powergrid portion of the line and nothing is observed at the fault location. Hence POWERGRID(NR-3) representative suggested to review the impedance measurement and distance relay settings of the line. PSC forum requested Rajasthan and POWERGRID to complete this work before summer (high demand period).*

- **400 KV Anpara_B(UPUN)-Sarnath(UP) (UP) Ckt-2:** *NRLDC representative raised concern over frequent incidents of faults with most of the faults of the nature of L-L fault. It was further highlighted that there is delayed clearance of fault from*

Sarnath end (fault cleared in zone-2 from Sarnath end) in one of the events, hence carrier communication issue is suspected. UPPTCL representative agreed that they will review the carrier communication issue in the line.

- **400 KV Noida Sec 148-Noida Sec 123 (UP) Ckt-1:** *NRLDC representative raised concern over frequent incidents of faults and non-operation of A/R. It was further highlighted that DR/EL (.dat/.cfg) file is also not received for any of the event. UPPTCL representative stated that A/R is implemented in BCU for this line and there is issue in A/R initiation in BCU. NRLDC representative stated that there is difference between reported tripping time and fault time as per PMU in two events. This can be due to GPS time sync issue or simply reporting error. UPPTCL is advised to look into this issue and resolve at the earliest.*

- **132 KV Dehar(BB)-Kangoo(HP) (HPPTCL) Ckt-1:** *NRLDC representative raised concern over frequent faults in line and DR/EL of the tripping is also not received for any of the events. BBMB representative informed that relays of both the ends are owned by HP. HPPTCL representative agreed to submit DR/EL within timeline in future.*

- **220 KV RAPS_A(NP)-Sakatpura(RS) (RS) Ckt-2:** *Already discussed with frequent tripping of 220 KV RAPS_A(NP)-Sakatpura(RS) (RS) Ckt-1.*

- **220 KV Sohawal(PG)-Barabanki(UP) (UP) Ckt-1:** *NRLDC representative raised concern over frequent faults in line. It was further highlighted that as per DR, A/R is successful at Barabanki end in one of the 3 events and DT sent from Sohawal(PG) end for other two of the 3 events. POWERGRID(NR-3) is suggested to check the status of A/R operation and PLCC issue at Sohawal end. POWERGRID(NR-3) representative agreed for the same.*

- **400 KV Merta-Ratangarh (RS) Ckt-1:** *NRLDC representative raised concern over frequent faults in line. It was further highlighted that phase sequence issue is observed as per PMU and DR time window is not as per standard (~800msec). RVPNL representative stated that A/R was successful from Merta end in two of the*

events and status of A/R will be checked at Ratangarh end during shutdown along with the phase sequence issue. PSC forum suggested to maintain DR uniformity for lines.

- **400 KV Mohanlalganj (PGYTL)-Unnao(UP) (PGYTL) Ckt-1:** *NRLDC representative informed that this line tripped on overvoltage at Unnao end in two of the 3 events (as per DR) and phase sequence issue is also observed as per PMU in one event. UPPTCL representative informed that there may be issue in relay in which over-voltage is implemented as voltage observed was ~1.05 pu only. NRLDC representative further highlighted that there was significant variation in all three phase voltages as per DR in one of the 3 events, hence CVT error may be reviewed. PSC forum suggested to review CVT error and attend the issue in relay at the earliest.*

B.3.4 NRLDC representative emphasized that A/R (auto re-closer) issue was found in many of these tripping. All the utilities are sensitized to ensure healthiness/in service of A/R in 220 kV and above transmission lines in compliance to CEA Grid Standards. It was further informed that most of the tripping are of 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.

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:

B.3.5 The list of major tripping events occurred during January 2025 is attached as **Annexure-B.IV.** Concerned constituents/utilities were requested to share the detailed analysis of the tripping elements along with status of remedial action taken/to be taken.

B.3.6 Utilities were requested to prepare detailed analysis report and present the event details during 57th PSC meeting. Events involving more than one utility may be jointly prepared and presented.

Discussion during the meeting:

Tripping Events

A. Multiple elements tripping at 220/132kV Ropar(PS) at 09:32 hrs on 06th January, 2025

Discussion during the meeting:

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

- 220/132 KV Ropar (GGSTP) has double main bus system in 220KV and 132KV side.
- During antecedent condition, 210 MW Guru Gobind Singh TPS (Ropar) - UNIT 3, Unit 4 and Unit 6 were generating approx. 180MW, 167MW and 176MW respectively.
- As reported, at 09:32 hrs, during the synchronization of the 210 MW Unit-5 at Guru Gobind Singh Thermal Power Station (Ropar), the R-phase limb of the 220 kV generator transformer circuit breaker for Unit-5 ruptured. This incident triggered the tripping of Units 3, 4, and 6, each with a capacity of 210 MW. Consequently, a blackout occurred at the 220 kV Guru Gobind Singh TPS substation. (Details of protection operation yet to be received).
- As per PMU at Abdullapur (PG) S/s, R-N phase to earth fault with fault clearing time of 120ms was observed.

- As per SCADA, total generation loss of approx. 521MW was observed in Punjab control area.
- As per SCADA, change in demand of approx. 225MW is observed in Punjab control area.
- **Major observations:**
  - Sequence of protection operation needs to be shared.
  - Bus section wise arrangement of elements at Ropar GGSTPS(PS) need to be shared.
  - SCADA status of the breakers and isolators were incorrect during the event and SCADA data of 220kV feeders after the event was also suspected. Availability and healthiness of SCADA data need to be ensured.
  - DR/EL (.dat/.cfg file) of all tripped elements along with detailed tripping report and remedial action taken report need to be shared.
  - Trippings at Ropar(GGSTP) (PS) S/s are not recorded in SCADA SOE. Availability of SCADA SOE data needs to be ensured.

PSTCL representative was not present during the meeting.

NRLDC representative requested SLDC Punjab to ensure submission of detailed tripping report within 1 week. CGM SO, NRLDC suggested that it can further be discussed in next PSC meeting.

PSC Forum Recommendations:

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

B. Multiple elements tripping at 400/220kV Akal(RS) at 23:35 hrs on 09th January, 2025

Discussion during the meeting:

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

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

- During antecedent condition, 400/220 kV 500 MVA ICT-1 & ICT-2 were connected to 400kV bus-1 and 400/220 kV 315 MVA ICT-3 & 500 MVA ICT-4 were connected to 400kV bus-2 at Akal(RS).
- As reported, at 23:35 hrs, B-phase jumper of line and 220kV Bus-2 isolator snapped of 220kV Akal-Bhensara Ckt-1 which created bus fault on both 220kV buses at Akal(RS).
- Bus bar protection is not in service at 220kV side of Akal S/s. Therefore, fault cleared with the operation of back up O/C E/F protection operation of 400/220kV ICTs at Akal(RS).
- Due to tripping of all four ICTs at Akal(RS), evacuation path lost for all the wind power plants connected at 220kV bus-1 & bus-2 at Akal(RS). On this, both 220kV buses became dead at Akal(RS) S/s.
- As per PMU at Bhadla(PG), Y-N phase to earth fault with delayed fault clearance time of 720 msec is observed (Phase sequence issue observed).
- As per SCADA, dip in Rajasthan wind generation of approx. 523 MW is observed out of which approx. 232 MW recovered within 6 minutes.
- As per SCADA, change in demand of approx. 171MW is observed in Rajasthan control area.
- **Major observations:**
  - Reason for delayed fault clearance needs to be shared.
  - Phase sequence issue need to be resolved at Akal(RS)/Bhadla(PG).
  - SCADA data was frozen during the event. Availability and healthiness of SCADA data need to be ensured.
  - DR/EL (.dat/.cfg file) of all tripped elements along with detailed tripping report and remedial action taken report need to be shared.
  - Trippings at Akal(RS) S/s are not recorded in SCADA SOE. Availability of SCADA SOE data needs to be ensured.
  - Restoration of bus bar protection at 220kV Akal need to be expedited.

ii. RVPNL representative and others informed the following:

- The CB of 220kV Akal-Bhensara Ckt-1 at Akal GSS was in Lockout condition hence it did not open at fault. LBB relay also operated for re-trip after 100 ms but the said CB did not trip.
- LBB relay supposed to provide further trip command to Busbar scheme but unfortunately at the time of fault the 220 kV Busbar protection scheme was under blocked condition because of PU error, FO cable issue, SCADA integration issue of PU etc. Hence, tripping of all local CB could not be matured through busbar protection scheme.
- **As remedial action taken, the issue in CB of 220kV Akal-Bhensara Ckt-1 at Akal GSS is attended and 220 kV Busbar protection scheme at 400 kV GSS Akal has been made operative on 15.02.2025 and in healthy condition.**

PSC Forum Recommendations:

- *Members may ensure healthiness of CBs, protection system and auxiliary components at substations to avoid any unwanted tripping in future.*

C. Multiple elements tripping at 400/220KV Heerapura(RS) at 10:41 hrs on 10th January, 2025

Discussion during the meeting:

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

- 400/220KV Heerapura(RS) S/s has one and half breaker scheme in the 400KV side and double main & transfer scheme in the 220 KV side.
- As reported at 13:35hrs, a kite thread fell on the 220KV side of the ICTs. As a result Bus- Bar protection operated on the 220KV side led to tripping 400/220 kV 250 MVA ICT 1 and 3 at Heerapura(RS). (exact reason and nature of protection operated yet to be shared).
- As per PMU at Heerapura (RS), R-N fault is observed with delayed fault clearing time of 320ms.

- As per SCADA, change in demand of approx. 320MW in Rajasthan control area is observed.

- **Major observations:**
  - Exact reason, nature and location of fault need to be shared.
  - The exact nature of protection operated during tripping of 400/220kV ICTs need to be shared.
  - Reason of delayed clearance of fault need to be shared.
  - DR/EL along with tripping report for each element need to be shared from both the ends.
  - Remedial action taken report to be shared.

ii. RVPNL representative and others informed the following:

- There was fault due to falling of kite thread on 220 kV "E"-Bus at 400 kV GSS Heerapura.
- BUS bar protection relay operated which caused tripping on following feeders/transformers.
  - 220 kV Heerapura - KTPS LINE
  - 220 kV Heerapura - Phulera Line
  - 220 kV side of 400/220 kV 250 MVA ICT-3,
  - 220 kV Bus-coupler (E-D)
  - 220 kV Bus sectionalizer E to C
- As it was a nearby fault. it was caused tripping on 400/132 kV ,250 MVA ICT-1 & 400/132 kV, 250 MVA ICT-2 on instantaneous OC relay (High set).
- 400/132 kV, 315 MVA ICT-4 which was on "D" Bus , 220 kV SEZ and 220 kV Sanganer remained connected to the grid.
- As all relays were electromechanical type relay on 220 kV BUS Section-alizer, Bus Bar protection Scheme, Bus Coupler and ICTs, no DR is available in relays.
- **As remedial action taken, O/C & EF Electromechanical relays on all 03 Nos. 220 kV BUS Sectionalizer, 01 No. 220 kV Bus Coupler, 04 Nos. on 400 kV Side of all 400/220 kV ICTs have been retrofitted by Numerical Relays. Remaining Electromechanical/ static relays &**

schemes will be retrofitted in phased manner as per availability of relays and shutdown at the earliest.

PSC Forum Recommendations:

- *Instantaneous OC relay (High set) settings of ICTs at Heerapura(RS) may be reviewed.*
- *Replacement of remaining electromechanical/ static relays & schemes with numerical relay need to be expedited at Heerapura(RS).*

D. Multiple elements tripping at 400/220kV Akal(RS) at 06:31 hrs on 12th January, 2025

Discussion during the meeting:

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

- 400/220kV Akal(RS) has one and half breaker scheme at 400kV level and double main and transfer bus scheme at 220kV level.
- During antecedent condition, 400/220 kV 500 MVA ICT-1 & ICT-2 were connected to 400kV bus-1 and 400/220 kV 315 MVA ICT-3 & 500 MVA ICT-4 were connected to 400kV bus-2.
- As reported, at 06:31 hrs, B-N fault occurred on 400 KV Akal-Barmer (RS) Ckt, fault distance was 99.62KM and fault current was 2.42 KA from Barmer end.
- However, as observed from PMU at Bhadla (PG) S/s, B-N fault was observed and subsequently it converted to Y-B-N double phase to earth fault (Phase sequence issue). Delayed fault clearance time of 2120 msec can be seen in the PMU.
- On this fault, line tripped from Barmer end but breaker of Akal end got stuck due to issue in SF6 gas pressure. Due to non-opening of breaker of Akal end, LBB protection would have operated.
- However, all the 400kV lines and 400/220kV ICTs at Akal tripped during the event. Exact details of protection operation not received yet from SLDC-Rajasthan.

- Due to tripping of all four ICTs at Akal(RS), evacuation path lost for all the wind power plants connected at 220kV bus-1 & bus-2 at Akal(RS). On this, both 400 and 220kV buses became dead at Akal(RS) S/s.
- During this event, a dip in Rajasthan wind generation of approx. 340 MW is observed which recovered completely within 5 minutes. (As per SCADA).
- As per SCADA, 206MW of change in demand is observed in Rajasthan control area.
- **Major observations:**
  - Reason for delayed fault clearance needs to be shared.
  - Phase sequence issue at Akal(RS)/ Bhadla(PG) need to be resolved.
  - Time sync issue in DR at Akal end need to be resolved at the earliest.
  - Details of protection operation and sequent of the tripping need to be shared.
  - Why did LBB protection not operate after stuck of Akal side breaker of Akal-Barmer line?
  - SCADA data was frozen during the event. Availability and healthiness of SCADA data need to be ensured.
  - DR/EL (.dat/.cfg file) of all tripped elements along with detailed tripping report and remedial action taken report need to be shared.
  - Tripping at Akal(RS) S/s are not recorded in SCADA SOE. Availability of SCADA SOE data needs to be ensured.

iii. RVPNL representative and others informed the following:

- Fault was created as R-Ph Disc insulator broke at loc No. 45 of 400 KV Akal-Barmer (RS) Ckt.
- After elapse of nearly 730 ms the fault converted into R-B-N fault as per DR of 400 kV Akal-Ramgarh Ckt-1 & 2. These line were tripped on Z3 fault with time delay of 1 sec.
- Due to defective compressor of main CB of 400 kV Akal-Barmer Ckt, air pressure was not maintained & CB lockout condition occurred. Consequently main CB did not trip during fault and only tie CB tripped.

- At the time of fault, the 400 kV Busbar protection scheme (in built LBB feature) was under blocked condition because of PU error, FO cable issue, SCADA integration issue of PU etc. Hence, LBB operation could not be matured and lines tripped from other end in zone-3 and all transformers tripped on backup O/C E/F.
- **As remedial action taken, the issue in main CB of 400 kV Akal-Barmer Ckt at Akal GSS is attended and 400 kV Busbar protection scheme at 400 kV GSS Akal has been made operative on 14.02.2025 and in healthy condition.**

NRLDC representative raised concern over delayed clearance of fault. RVPNL stated that all 400 kV lines were tripped in less than 1.2 s from other end in zone-3. Later on fault was continuously being fed from existing 4 nos. 400/220/kV Power transformers and these took nearly 1 s (time of operation as per B/U relay employing 3 sec NI curve) to isolate the fault. Hence it may be established that fault clearance time is nearly 2120 ms. The source for power transformer were from the 220 kV Lines viz Amarsagar, Giral, Bhainsda-I/II, Barmer (other lines were from RE).

PSC Forum Recommendations:

- *Members may ensure healthiness of CBs, protection system and auxiliary components at substations to avoid any unwanted tripping in future.*

E. Multiple elements tripping at 220/132/33KV Hukmawali(HS) at 06:09 hrs on 23rd January, 2025

Discussion during the meeting:

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

- 220/132/33kV Hukmawali(HS) S/s has double main bus scheme in all voltage level.
- During antecedent condition, 220 KV Fatehabad(PG)-Hukmawali (HV) (HVPNL) Ckt-1, 220 KV Fatehabad(PG)-Hukmawali (HV) (HVPNL) Ckt-

2, and 220 kV HUKMAWALI(HV)-CHORMAR(HV) CKT-1 were carrying 27MW, 28MW and 19MW respectively.

- As reported at 06:09hrs, B-phase CT of 220 kV HUKMAWALI(HV)-CHORMAR(HV) CKT-1 exploded and thereby led to Bus bar protection operation. This resulted in tripping of all the elements connected to 220KV Bus bar. As a result, the Sub-station lost its connectivity to the Grid and blackout occurred.
- As per DR at 220KV Fatehabad end of 220 KV Fatehabad(PG)-Hukmawali (HV) (HVPNL) Ckt-1 & 2, the lines tripped due to Zone-2 protection operation in Main-I relay.
- As per PMU at 400 Fatehabad (PG), B-N fault converted to Y-B-N fault is observed with delayed fault clearing time of 400ms.
- As per SCADA, no change in demand in Haryana control area is observed.
- **Major observations:**
  - Exact reason, nature and location of fault need to be shared.
  - Reason for delayed clearance of fault need to be shared.
  - SCADA data of 220/132/33kV Hukmawali(HS) was freezed during the event. Availability and healthiness of SCADA data need to be ensured.
  - DR/EL along with tripping report for each element need to be shared from Haryana.
  - Remedial action taken report to be shared.

ii. HVPNL representative and others informed the following:

- At 06:09 Hrs on 23.01.2025, a heavy blast occurred with the damage of 02 No. 220 KV CTs (Y & B Phase) installed on 220 KV Hukmawali-Chormar Ckt-1. This damage also resulted in collateral damage to the Line Isolator. As a result, the 220 KV Hukmawali- Chormar Ckt-1 got tripped from both ends as per the relays mentioned above.
- All other 220 KV Ckt's i.e. 220 KV Hukmawali-Chormar Ckt-2, 220 KV Hukmawali-Fatehabad(PG) Ckt-1 & 2 got tripped from other end.

- The Busbar protection at 220 KV S/Stn. Hukmawali failed to operate which led to the tripping of all elements from the other ends. The Busbar protection failed to operate due to the Dead-Zone alarm and general alarm which is due to the wrong isolator and breaker status on the bus-bar protection relay.
- Consequently, due to the failure of Busbar protection at 220 KV S/Stn. Hukmawali end, all other Ckt's were tripped from other end in Zone-2.
- **As remedial action taken, 220 kV Busbar protection scheme at 220/132 kV Hukmawali S/s has been made operative and in healthy condition.**

NRLDC representative raised concern over issue in isolator and breaker status.

PSC Forum Recommendations:

- *The isolator and breaker status were wrong on the busbar protection relay which is causing the Dead Zone alarm and general alarm, which further led to blocking of the Busbar protection. The isolator status and breaker status in the busbar protection should be checked regularly to avoid any unwanted tripping in future.*
- *Healthiness of protection system and their proper operation need to be ensured.*

F. Multiple element tripping at 220/132kV Agra Sikandra(UP) at 04:29 hrs on 23rd January, 2025

Discussion during the meeting:

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

- 220/132kV Agra Sikandra(UP) S/s has double main and transfer bus scheme at 220kV level.
- During antecedent condition, 220kV Auraiya(NT)-Agra Sikandra(UP) Ckt, 220kV Saifai- Agra Sikandra(UP) Ckt, 220kV Kirawali-Agra Sikandra(UP) Ckt, 220/132kV 160MVA ICT 1 & 2 and 100MVA ICT 3 were

connected to 220kV Bus-1 at Agra Sikandra(UP) and rest of the elements were connected to Bus-2.

- As reported at 04:29 hrs, Y-Ph CT of 220kV Kirawali- Agra Sikandra(UP) Ckt damaged and Y-Ph Line side jumper grounded. Distance protection relay operated in zone-1 and tripped the CB.
- At the same time, bus side Jumper of Y-Ph CT also failed and came in range of R and B-Phase hence bus bar relay operated and tripped Bus 1 elements.
- Also, wrong status of isolator caused tripping of Bus 2 elements. This resulted complete tripping of 220kV Agra Sikandra(UP).
- As per PMU at Agra(PG), Y-N fault followed by B-N fault with fault clearing time of 80ms was observed.
- As per SCADA, change in demand of approx. 60MW is observed in UP control area.
- **Major observations:**
  - DR/EL (.dat/.cfg file) of all tripped elements along with detailed tripping report need to be shared.
  - Remedial action taken report need to be shared.

ii. UPPTCL representative and others informed the following:

- Y-Ph CT of 220kV Kirawali- Agra Sikandra(UP) Ckt was damaged and Y-Ph Line side jumper grounded. Distance protection relay operated in zone-1 at Agra Sikandra end and tripped the CB. But, CB at Kirawali end tripped in zone-2. Carrier communication issue is suspected at Kirawali.
- At the same time, bus side Jumper of Y-Ph CT failed and came in range of R and B-Phase, hence bus bar relay operated and tripped Bus A elements. Also, wrong status of isolator caused tripping of Bus B elements. This resulted complete tripping of 220kV system.
- **As remedial action taken, shutdown was taken for replacement of damaged CT of 220kV Kirawali- Agra Sikandra(UP) Ckt and status of isolator of Bus A & Bus B busbar relay was thoroughly checked and & set right.**

NRLDC representative raised concern about issue in isolator selection.

POWERGRID(NR-3) representative informed that during the same time 220kV Kirawali(UP)-Agra(PG) Ckt also tripped and fault was cleared in zone-3 from Agra(PG) end. UPPTCL representative agreed that time delay at Kirawali end in zone-2 settings of 220kV Kirawali- Agra Sikandra(UP) Ckt was not correct, hence 220kV Kirawali(UP)-Agra(PG) Ckt tripped in zone-3 from Agra(PG) end.

PSC Forum Recommendations:

- *Carrier communication issue at Kirawali(UP) need to be resolved.*
- *Issue in isolator selection status at Agra Sikandra(UP) need to be addressed.*
- *Zone-2 and zone-3 settings of 220kV Kirawali- Agra Sikandra(UP) Ckt and 220kV Kirawali(UP)-Agra(PG) Ckt need to be reviewed at Kirawali end.*

G. Multiple element tripping at 400/220kV Jehta (UP) at 12:09 hrs on 29th January, 2025

Discussion during the meeting:

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

- 400/220/132KV Jehta(UP) S/s has double main bus scheme in all voltage level.
- During antecedent condition, 400/220 kV 500 MVA ICT-1 & ICT-2 at Jehta(UP) were connected to 400kV bus-1 and bus-2 respectively and were carrying approx. 107MW each. 220/132KV ICT-3 and ICT-4 were carrying approx. 35MW each.
- As reported at 12:09 hrs, 400/220KV ICT -1 and ICT-2 at Jehta(UP) tripped due to Bus Bar protection operation. This led to further tripping of 220/132KV ICT-3 and ICT-4 downstream along with tripping of both 220KV Bus-I and Bus-II at Jehta(UP). As a result, all the elements connected to both the 220KV Buses tripped.
- As per DR of 400/220KV ICT-1 and 2 at Jehta (UP), 96 relay operated.
- As per PMU at Unnao(UP), no fault was observed in the system.

- As per SCADA, change in demand of approx. 252MW is observed in UP control area.
- **Major observations:**
  - Exact nature of protection operation and sequence of the tripping need to be shared.
  - DR/EL (.dat/.cfg file) of all tripped elements along with detailed tripping report need to be shared.
  - Remedial action taken report need to be shared.

iv. UPPTCL representative and others informed the following:

- On 29.01.2025, morning, 'DC Earth fault operated flag' was observed on DCDB-1 and DCDB-2. Positive ground to earth was observed on measurement.
- At 12:09 hrs on the same date, during maintenance, concerned personnel was trying to trace out the DC problem using DC earth fault detector kit. At the same time, 220KV Bus 1 & 2 tripped at 400/220/132KV GIS Jehta S/S due to a loose contact wire.
- DR and event record of all the elements were analysed and it was found that the tripping was due to false activation of binary input of gas zone 1 and gas zone 2.
- Gas pressure of all the elements were physically checked and it was found to be OK.
- A damaged wire was found in bay 2 i.e. 200 MVA ICT-1(HV Side) circuit breaker.
- **As remedial action taken, damaged wire was attended and the DC problem was resolved.**

NRLDC representative raised concern about false activation of binary input of gas zone 1 and 2 due to which busbar protection operated. UPPTCL representative informed that they have already sensitized the maintenance personnel about this issue.

PSC Forum Recommendations:

- *Precautionary measures need to be taken during maintenance works to avoid any maloperation of protection system which may lead to un-wanted tripping.*
- *Members are requested to sensitize the maintenance personnel regarding the same.*

B.3.7 Grid event analysis details of all the aforementioned grid incidents is attached as **Annexure-B.IV (A).**

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

B.4.1 A total of 5 inter-regional lines tripping occurred in the month of January 2025. The list is attached at **Annexure-B.V.** The status of receipt of preliminary reports, DR/EL within 24hrs of the event and fault clearing time as per PMU data has also been mentioned in the table. The non-receipt of DR/EL & preliminary report within 24hrs of the event from SLDCs / ISTS licensees / ISGSs is in violation of regulation 37.2(c) of IEGC and regulation 15(3) of CEA Grid Standards. As per regulations, all the utilities shall furnish the DR/EL, flag details & preliminary report to RLDC/RPC within 24hrs of the event. They shall also furnish the detailed investigation report within 7 days of the event if fault clearance time is higher than that mandated by CEA (Grid Standard) Regulations.

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 400 KV Allahabad-Sasaram (PG) Ckt-1 and 400 KV Gorakhpur (PG)-Motihari(BS) (PG) Ckt-2, POWERGRID representative stated that decapped insulator is replaced.

B.4.4 Regarding tripping of 800 KV HVDC Kurukshetra (PG) Pole-1, POWERGRID

representative stated that it is a global problem in DCCT sensor of this make, even a little noise in optical fibre may cause wrong measurement in DCCT which further leads to DCCT maloperation. After changing the logic and settings some improvements are there, but issue is yet not resolved completely.

B.4.5 Regarding tripping of 132 KV Rihand(UP)-Garwa(JS) (UP) Ckt-1 and 132 KV Rihand(UP)-Nagar Untari(JS) (UP) Ckt-1, UPPTCL representative informed that these lines are under Jharkhand jurisdiction.

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

Decision of the Forum

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 (agenda by NRLDC)

B.5.1 As per IEGC clause 16.2

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

B.5.2 As per IEGC clause 16.3

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

B.5.3 There are 56 numbers of System Protection Scheme (SPS) approved in Northern Region. These SPS are implemented at major generation complexes, important evacuating transmission lines and ICTs which are N-1 non-complaint. System Protection Scheme Document of Northern Region has been revised/updated on 31st January, 2025. Revised version of the document is available on the NRLDC website in Document section and can be accessed at below link: https://newnr.nrldc.in/documents/Documents.

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. Therefore, the pending mock exercises need to be conducted in March 2025 itself.

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.** 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 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.5.8 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.

Decision of the Forum

PSC Forum directed 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 (agenda by NRLDC)

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**.

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.

B.6.15 During 57th PSC meeting, ADANI representative informed that visit by COMTEL engineers at all the sites is completed and COMTEL will submit the report within 10 days.

B.6.16 NRLDC representative requested ADANI to share the report at the earliest and make Action Plan accordingly to ensure completion of whole work before summer 2025.

Decision of the Forum

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. ADANI is requested to share the report submitted by COMTEL at the earliest. State representatives were also requested to coordinate with the ADANI team and also ensure incorporation of identified revised feeders for load relief in SPS. Desired remedial actions need to be expedited.

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 January-2025

A. January 2025

C.1.1 EE (P), NRPC mentioned that NRLDC has submitted the list of FTCs allowed in month of Jan-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.

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

i. POWERGRID
ii. PBTSL
iii. RVPN

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

i. UPPTCL
ii. AGE24L
iii. AMP_EG4PL
iv. AMP Energy Green Four Private Limited
v. Adani Green Energy Twenty Four Limited
vi. Kolayat Solar Power Plant NTPC Limited

C.1.5 Further, HVPN has submitted settings for FTC allowed at Haryana SLDC level.

C.1.6 UPPTCL informed that they have shared the settings. However, it was requested to share the settings again as mail has not been received may be due to size constraints of attached file.

C.1.7 The Solar plants has got connectivity at POI earlier however several blocks have been coming at 33kV level gradually. AGEL requested that requirement for agenda to be submitted for final approval of protection settings of blocks at 33kV may be reviewed.

C.1.8 NRLDC representative mentioned that generally LVRT, HVRT, inverter settings and

Over voltage/ under voltage trippings are checked. Therefore, at least one feeder of RE/Capacitor bank at 33kV may be submitted for final approval of protection settings. After that settings may be kept for other remaining feeder/block and capacitor bank aligning to already approve.

C.1.9 Forum also agreed that after commissioning of first block at the time of POI connectivity, RE plant may submit the agenda for final approval of protection settings by PSC forum. There is no need for further submission of protection settings for final approval of other blocks going to get connectivity at voltage level less than 220kV. However, FTC needs to be done by the RE plant for each block. Similar case applies for capacitor bank connectivity.

B. Dec-2024

C.1.10 Indigrid has submitted settings for FTC allowed in Dec-2024 for augmentation Scheme at 400/220 kV Patran (GIS) Substation to Patran Transmission Company Limited.

C.1.11 Settings are available at NRPC website: http://164.100.60.165/meetings/prsub.html

C.1.12 Regarding, settings of 220 KV Samaypur-Harfali, NRLDC representative mentioned that relays are of same make in Main-1 and Main-2 BBMB Samaypur end. He added that these relays are commissioned by HVPN at Samaypur end. However, settings have been reviewed at both ends and required changes in the settings have been arranged. Forum recommended that as per philosophy both relays should be of different make.

C.1.13 Further, it was highlighted 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.1.14 MS, NRPC stated that utilities should take approval as procedure has been approved by forum only and it is requirement of IEGC 2023.

Decision of the Forum:

After detailed deliberation, following was decided as below-

1) *Forum approved the proposed protection settings.*
2) *Regarding, 220 KV Samaypur-Harfali, Forum recommended that as per philosophy both relays should be of different make at both ends.*
3) *Concerned members who have not submitted the agenda were requested to put up agenda timely for approval of settings.*
4) *RE plants needs to submit the agenda for final approval of protection settings of first block/feeder of RE plant. There is no need for further submission of protection settings for final approval of other blocks going to get connectivity at voltage level less than 220kV. However, FTC is required for each block of the RE plant. Similar case applies for capacitor bank connectivity.*

*****

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Status of action taken on decisions of 56th PSC

S.N.	Agenda No.	Agenda	Decision of 55th PSC	Status of action Taken
1	A.3	Submission of protection performance indices along with reason and corrective action taken for indices less than unity to NRPC Secretariat on monthly basis (agenda by NRPC Secretariat)	i.Non-compliant utilities were asked to submit the Protection performance indices timely by 7th day of month element wise along with corrective action taken for indices less than unity. ii.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).	i. Status of reporting of indices has been taken as an agenda. ii. All utilities (having elements of 220 kV and above) including RE Generators has been called in meeting.
2	A5	Annual protection audit plan for FY 2025-26 (agenda by NRPC Secretariat)	Non-compliant utilities were asked to submit annual audit plan 2025-26 without any further delay. Other utilities were asked to submit report and compliance status within one month of completion of audit.	Some utilities have submitted audit report. Same has been taken as agenda.

3	A6	Third-party protection audit plan (agenda by NRPC Secretariat)	Forum directed utilities to submit the third-party protection audit plan. Subsequently, the audit reports along with compliance status may be submitted to NRPC Secretariat within one month of completion of audit.	Some utilities have submitted audit report. Same has been taken as agenda.
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 to RPC/RLDC.	Status has been taken as agenda.
5	B.6	Corrective action for healthiness of 500kV Mundra-Mahindergarh SPS (agenda by NRLDC)	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	Vide mail dt 3rd February 2025, ADANI has informed that they have awarded the rectification work service to M/s COMTEL for survey and restoration of possible elements installed at the locations and engineers from M/s

			requirement will be completed by the end February 2025. Thereafter, after financial approval, rectification of issues will be done.	COMTEL shall be visiting respective stations as per the schedule.

Status of perfomance indices report of Jan 2025 (Last date of submission 07.02.2025)							
S. No.	**Member Utility**		**Received Status (Yes/No)**	**Vide mail dated**	**Remarks**	**Indices less than 1 (Yes/No)**	**Reason submitted and corrective action taken**
1	PGCIL	Central Government owned Transmission Company	Yes	05.02.2025	NR-1	No	NA
			Yes	07.02.2025	NR-2	Yes	NA
			Yes	12.02.2025	NR-3	No	NA
2	NTPC	Central Generating Company	Yes	06.02.2025	Anta	No	NA
			Yes	07.02.2025	Auriya		
			Yes	06.02.2025	Dadri	No	NA
			Yes	06.02.2025	Koldam		
			Yes	08.02.2025	Rihand		
					Singrauli		
			Yes	07.02.2025	Unchahar		
			Yes	06.02.2025	Tanda	No	NA
3	BBMB		Yes	18.02.2025		No	NA
4	THDC		Yes	04.02.2025		No	NA
5	SJVN		Yes	07.02.2025	RHPS	Yes	Yes
			Yes	07.02.2025	NJHPS	No	NA
6	NHPC		Yes	04.02.2025		Yes	Yes
7	NPCIL				RAPS-A		
			Yes	10.02.2025	RAPS-B	NO	NA
			Yes	07.02.2025	RAPS-C(5&6)	NO	NA
			Yes	04.02.2025	NAPS-1&2	NO	NA
8	DTL	State Transmission Utility	Yes	12.02.2025		Yes	Yes
9	HVPNL		Yes	07.02.2025		No	NA
10	RRVPNL		Yes	13.02.2025		Yes	Yes
11	UPPTCL		Yes	03.02.2025	Meerut Circle	Yes	Yes
			Yes	04.02.2025	Agra Circle	Yes	Yes
			Yes	03.02.2025	Jhansi Circle	No	NA
			Yes	04.02.2025	Prayagraj Circle	No	NA
			Yes	04.02.2025	Gorakhpur Circle	Yes	Yes
			Yes	04.02.2025	Lucknow Circle	Yes	Yes
12	PTCUL		Yes	06.02.2025		No	NA
13	PSTCL						
14	HPPTCL		Yes	10.02.2025		No	NA
15	IPGCL	State Generating Company	Yes	04.02.2025	PPS-I	No	NA
			Yes	04.02.2025	PPS-III, Bawana	No	NA
16	HPGCL						
17	RRVUNL						
18	UPRVUNL		Yes	07.02.2025	Parichha B (220 kV)	No	NA
			Yes	06.02.2025	Parichha C (400 kV)	Yes	Yes
			Yes	04.02.2025	DTPS Anpara	No	NA
			Yes	07.02.2025	Obra B	No	NA
			Yes	07.02.2025	Obra C	No	NA
			Yes	15.02.2025	Harduaganj 400 kV	No	NA
			Yes	07.02.2025	Ghatampur 765 kV	No	NA
			Yes	07.02.2025	Anpara-A&B	No	NA
			Yes	18.02.2025	Jawaharpur	No	NA
19	UJVNL		YES	03.02.2025	Dharasu	No	NA
			YES	03.02.2025	Tiloth	No	NA
			YES	06.02.2025	Khodri	No	NA
			YES	06.02.2025	Chibro	No	NA
			YES	06.02.2025	Vyasi	No	NA
20	HPPCL		yes	15.02.2025	Kashang HEP	No	NA
			Yes	07.02.2025	Sawara Kuddu	No	NA
			yes	15.02.2025	Sainj	No	NA
21	PSPCL	State Generating Company & State owned Distribution Company	Yes	01.02.2025	RSD	No	NA
			Yes	10.02.2025	GGSTPS, Rupnagar	No	NA
			Yes	10.02.2025	GHSTPS, Lehra Mohabbat	No	NA
22	HPSEBL	Distribution company having Transmission connectivity ownership	Yes	07.02.2025	Hamirpur Circle	No	NA
			Yes	13.02.2025	Shimla Circle	No	NA
23	Prayagraj Power Generation Co. Ltd.	IPP having more than 1000 MW installed capacity	Yes	07.02.2025		No	NA
24	Aravali Power Company Pvt. Ltd		Yes	05.02.2025		No	NA
25	Apraava Energy Private Limited		Yes	17.02.2025		No	NA
26	Talwandi Sabo Power Ltd.		YES	11.02.2025		No	NA
27	Nabha Power Limited		YES	03.02.2025		No	NA
28	MEIL Anpara Energy Ltd (Anpara-C)		YES	04.02.2025		No	NA
29	Rosa Power Supply Company Ltd		YES	07.02.2025		No	NA
30	Lalitpur Power Generation Company Ltd		YES	03.02.2025		Yes	Yes
31	MEJA Urja Nigam Ltd.		YES	10.02.2025		No	NA
32	Adani Power Rajasthan Limited		YES	06.03.2025		No	NA

Status of perfomance indices report of Jan 2025 (Last date of submission 07.02.2025)							
S. No.	**Member Utility**		**Received Status (Yes/No)**	**Vide mail dated**	**Remarks**	**Indices less than 1 (Yes/No)**	**Reason submitted and corrective action taken**
33	JSW Energy Ltd. (KWHEP)		Yes	04.02.2025		No	NA
34	RENEW Power Pvt Ltd	RE Generating Company having more than 1000 MW installed capacity					
35	NTPC Green Energy Limited						
36	Azure Power India Pvt. Ltd.						
37	Avaada Energy Private Limited						
38	Adani Green Energy Limited						
39	Tata Power Renewable Energy Ltd.	IPP having less than 1000 MW installed capacity (alphabetical rotaional basis)	Yes	10.02.2025		No	NA
40	UT of J&K	UT of Northern Region					
41	UT of Ladakh						
42	UT of Chandigarh						
	ISTS Transmission Utilities						
43	INDIGRID		Yes	07.02.2025		No	NA
44	POWERLINK						
45	ADHPL						
46	NRSSXXXI(B)'s Northern Region Transmission System	Sekura Energy Limited					
47	NRSSXXXVI's Northern Region Transmission System	Tata Power					
48	Adani Transmission Limited	AESL	Yes	04.02.2025		No	NA
49	Bikaner Khetri Transmission Limited		Yes	07.02.2025		Yes	Yes
50	Fatehgarh Bhadla Transmission Limited		Yes	07.02.2025		No	NA
	State Utilities						
	Uttar Pradesh						
51	Vishnuprayag Hydro Electric Plant (J.P.)		YES	07.02.2025		No	NA
52	Alaknanda Hydro Electric Plant (GVK)		YES	03.02.2025		No	NA
53	Khara Power House (Khara)		YES	07.02.2025		No	NA
54	WUPPTCL		YES	03.02.2025		No	NA
55	SEUPPTCL		YES	07.02.2025		No	NA
56	ATSCL	**ADANI**	Yes	15.02.2025		No	NA
57	GTL	**ADANI**	Yes	15.02.2025		No	NA
58	HPTSL	**ADANI**	Yes	15.02.2025		No	NA
59	MTSCL	**ADANI**	Yes	15.02.2025		No	NA
60	OCBTL	**ADANI**	Yes	15.02.2025		No	NA
	Rajasthan						
61	220 KV Dhorimanna-Rajwest Line	**JSW**	Yes	13.02.2025		No	NA
62	400 KV ANTA - CHABRA II	**ADANI**	Yes	13.02.2025		No	NA
63	Barsingsar Plant	**NLC**	Yes	13.02.2025		No	NA
	RE Utilities						
64	ABC Renewable Pvt. Ltd						
65	ACME Heeragarh powertech Pvt. Ltd						
66	ACME Chittorgarh Solar Energy Pvt Ltd						
67	Adani Hybrid Energy Jaisalmer One Ltd.						
68	Adani Hybrid Energy Jaisalmer Two Ltd.						
69	Adani Hybrid Energy Jaisalmer Three Ltd.						
70	Adani Hybrid Energy Jaisalmer Four Ltd.						
71	Adani Renewable Energy (RJ) limited Rawara						
72	Adani Solar Energy Jaisalmer One Pvt. Ltd._450MW (Solar)						
73	Adani Solar Enegry Four Private Limited						
74	Adani Solar Energy Jaisalmer Two Private Limited						
75	Project Two						
76	SB ENERGY FOUR PRIVATE LIMTED, Bhadla						
77	SB Energy Six Private Limited, Bhadla						
78	Adani Solar Enegry Jodhpur Two Limited, Rawara						
79	Adept Renewable Technologies Pvt. Ltd.						
80	Adani Solar Energy RJ Two Pvt. Ltd. (Devikot)						
81	Adani Solar Energy RJ Two Pvt. Ltd. (Phalodi)						
82	Adani Green Energy 19 Limited						
83	Altra Xergi Pvt. Ltd.						
84	AMP Energy Green Five Pvt. Ltd.						
85	AMP Energy Green Six Pvt. Ltd.						
86	Amplus Ages Private Limited						
87	Avaada RJHN_240MW						
88	Avaada sunce energy Pvt limited						
89	Avaada Sunrays Pvt. Ltd.						
90	Avaada Sustainable RJ Pvt. Ltd.						

Status of perfomance indices report of Jan 2025 (Last date of submission 07.02.2025)							
S. No.	**Member Utility**		**Received Status (Yes/No)**	**Vide mail dated**	**Remarks**	**Indices less than 1 (Yes/No)**	**Reason submitted and corrective action taken**
91	Ayana Renewable Power Three Private Limited						
92	Ayaana Renewable Power One Pvt. Ltd.						
93	Azure Power Forty One Pvt limited						
94	Azure Power Forty Three Pvt. Ltd._RSS						
95	Azure Maple Pvt. Ltd.						
96	AZURE POWER INDIA Pvt. Ltd., Bhadla						
97	Azure Power Thirty Four Pvt. Ltd.						
98	Clean Solar Power (Jodhpur) Pvt. Ltd.						
99	Clean Solar Power (Bhadla) Pvt. Ltd						
100	Eden Renewable Cite Private Limited						
101	Grian Energy private limited						
102	Mahindra Renewable Private Limited						
103	Mega Surya Urja Pvt. Ltd. (MSUPL)						
104	AURAIYA Solar						
105	DADRI SOLAR						
106	SINGRAULI SOLAR						
107	Anta Solar						
108	Unchahar Solar						
109	NTPC Devikot Solar plant_240MW						
110	NTPC Kolayat_400kV						
111	Nedan Solar NTPC						
112	NTPC Nokhra_300MW						
113	One Volt energy Pvt. Ltd.						
114	ReNew Solar Energy (Jharkhand Three) Private Limited						
115	RENEW SOLAR POWER Pvt. Ltd. Bhadla						
116	ReNew Solar Urja Private Limited						
117	Renew Sun Bright Pvt. Ltd. (RSBPL)						
118	Renew Sun Waves Private Limited (RSEJ4L)						
119	Renew Surya Partap Pvt. Ltd.						
120	Renew Surya Ravi Pvt. Ltd.						
121	Renew Surya Roshni Pvt. Ltd.						
122	Renew Surya Vihan Pvt. Ltd.						
123	Renew Surya Ayaan Pvt. Ltd.						
124	RENEW SOLAR POWER Pvt. Ltd. Bikaner						
125	Rising Sun Energy-K Pvt. Ltd.						
126	Serentica Renewables India 4 Private Limited						
127	Tata Power Green Energy Ltd. (TPGEL)						
128	Tata Power Renewable Energy Ltd. (TPREL)						
129	Thar Surya Pvt. Ltd.						
130	TP Surya Pvt. Ltd.						
131	Banderwala Solar Plant TP Surya Ltd.						
132	TRANSITION ENERGY SERVICES PRIVATE LIMITED						
133	Transition Green Energy Private Limited						
134	Transition Sustainable Energy Services Private Limited						

PROTECTION PERFORMANCES INDICES POWERGRID NR2

ELEMENT NAME	OUTAGE	RESTORATION	category code	Fault details	Type of tripping	Remarks
800KV KISHENPUR-MOGA-II	1/30/2025 11:52	1/30/2025 12:12	OMST	Line tripped during online reactification of DC earth fault at Kishenpur Substation.	Nu is the number of unwanted operations,	
DEHAR 315 MVA ICT-I	1/10/2025 9:15	1/10/2025 11:19	OMST	ICT tripped on operation of differential protection due to external flashover in 33kV bushing caused by Monkey.	Nu is the number of unwanted operations,	
220KV WAGOORA-KISHANGANGA-II	1/13/2025 21:36	1/14/2025 0:54	SBBU	Line remains charged from Wagoora(PG) but tripped from NHPC Kishenganga due to maloperation of BB protection at NHPC Kishenganga. Following documents has been attached for reference: 1. Voltage graph from Wagoora (PG) showing line remains charged. 2. DR from Kishenganga (NHPC) end showing maloperation of busbar relay (87B). 3. Mail from Kishenganga (NHPC) indicating maloperation of Bus Bar protection	Nc is the number of correct operations at internal power system faults	220KV BB protection maloperation at NHPC Kishenganga
400KV KISHENPUR-SAMBA-II	1/23/2025 12:44	1/23/2025 13:04	SPLT	Line tripped from Kishenpur SS during CSD testing.	Nu is the number of unwanted operations,	
220KV BAIRASIUL-PONG	1/16/2025 2:02	1/16/2025 8:25	SRMU	Line tripped from Bairasuil(NHPC) due to maloperation of Overvoltage protection at NHPC Bairasuil. Following documents has been attached for reference: 1.Tipping report from NHPC Bairasuil 2.DR from Bairasiul (NHPC) end showing CB open 2.Tripping report	Nc is the number of correct operations at internal power system faults	O/V Protction maloperation at NHPC Bairasuil
220KV HAMIRPUR-NEHRIAN (HPSEB)-I	1/25/2025 20:11	1/25/2025 21:02	SRMU	Line Auto-reclosed on R-N fault from Hamirpur(PG) but tripped from Nehrian(HPSEB) due to Auto-reclose Relay maloperation at Nehrian(HPSEB). Bay at Nehrain (HPSEB) is owned and maintained by Nehrian (HPSEB). FLR Hamirpur (AFAS): R-N fault ,FL= 7.149 km,8.96 kA. Following Documents attached. 1. DR from Hamirpur(PG) showing line successful Autoreclose 2. Mail from HPSEB regarding tripping at their end. 2. Voltage graph at Hamirpur(PG)	Nc is the number of correct operations at internal power system faults	A/R Scheme maloperation at HPPTCL Nehrian

	Total tripping including LNCC & successful autoreclosures	21
NC	Nc is the number of correct operations at internal power system faults	18
NF	Nf is the number of failures to operate at internal power system faults,	0
NU	Nu is the number of unwanted operations,	3
NI	Ni is the number of incorrect operations and is the sum of Nf and Nu	3
	The Dependability Index defined as $D = Nc/(Nc+Nf)$	100.00%
	The Security Index defined as $S = Nc/(Nc+Nu)$	85.71%
	The Reliability Index defined as $R = Nc/(Nc+Ni)$	85.71%

Protection Performance Indices of Rampur HPS

Tripping of 80 MVAR Bus Reactor of Rampur HPS on 20.01.2025.

Number of unwanted operations = 1

Reason for unwanted operation – Bus Reactor tripped due to electromagnetic relay malfunction.

Corrective action –Electromagnetic relay was replaced with spare available.

Taken- Yes (Corrective action has been taken)

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

Sl No	Name of Utility	Name of PS	Elements (Line/ Unit)	From		To		Total Outage	Outage Reason	Nc	Nf	Nu	Ni	Dependability Index (D=Nc/(Nc +Nf))	Security Index (S=Nc/(Nc +Nu))	Reliability Index (R=Nc/(Nc +Ni))	Reason for wrong operation	Action Taken
1	NHPC Ltd	KISHANGANGA	220 KV KISHANGANGA-WOOGORA LINE#4	13-Jan-25	21:46	14-Jan-25	00:54	3:08	Busbar Protection operated	1	0	1	1	1	0.5	0.5	Due to improper feedback status of earth switch at Control Room, Bus Isolator was closed while earth switch was physically in closed condition	The feedback status of earth switch has been corrected and operators were sensetized to check phycal status of earth switches, before charging.
2	NHPC Ltd	Biarasuil	220 KV Biarasuil-Pong Line#1	16-Jan-25	02:02	16-Jan-25	08:25	6:23	Over Voltage stage-1 protection operated	1	0	0	0	1	1	1		

No Line tripping has been observed from other Power Stations of NHPC of NR region for Minth of January'2025

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: January 2025

S. No.	Substation	Unit (SPS/Line/ICT/GT etc)	Nc	Nf	Nu	Ni	Dependability Index (D=Nc/(Nc+Nf))	Security Index (S=Nc/(Nc+Nu))	Reliability Index (R=Nc/(Nc+Ni))	Remedial Action Taken (if applicable)
1	400kV Bawana	315MVA ICT-I	0	0	1	1	0	0	0	Buchholz relay maloperated. Problem rectified.
		400kV Mundka Ckt-I	1	0	0	0	1	1	1	
		220kV DSIDC Bawana Ckt-II	1	0	0	0	1	1	1	
		220kV DSIDC Bawana Ckt-I	1	0	0	0	1	1	1	
2	220kV Maharani Bagh	220kV Sarita Vihar	2	0	0	0	1	1	1	
3	220kV Naraina	220kV Dwarka Ckt-II	1	0	0	0	1	1	1	
4	220kV South of Wazirabad	220kV Geeta Colony Ckt-1	1	0	0	0	1	1	1	
5	220kV Geeta Colony	220kV South of Wazirabad Ckt-1	1	0	0	0	1	1	1	
6	220kV Patparganj	220kV Geeta Colony Ckt-I	1	0	0	0	1	1	1	
7	220kV South of Wazirabad	220kV Geeta Colony Ckt-I	1	0	0	0	1	1	1	
8	400kV Bamnauli	400kV Jhatikara Ckt-2	1	0	0	0	1	1	1	
		400kV Dwarka	1	0	0	0	1	1	1	
9	220kV Maharani Bagh	220kV Sarita Vihar	2	0	0	0	1	1	1	
10	220kV Sarita Vihar	220kV Maharani Bagh	2	0	0	0	1	1	1	
		220kV Pragati Ckt-1	1	0	0	0	1	1	1	
11	220kV BTPS	220kV Alwar Ckt-I	1	0	0	0	1	1	1	
		220kV Ballabgarh Ckt-II	1	0	0	0	1	1	1	
		220kV Okhla Ckt-1	2	0	0	0	1	1	1	
12	220kV Patparganj	220kV Geeta Colony Ckt-II	1	0	0	0	1	1	1	
13	400kV Bamnauli	400kV Tuglakabad Ckt-II	1	0	0	0	1	1	1	
14	220kV Tuglakabad	220kV Mehrauli Ckt-I	1	0	0	0	1	1	1	
		220kV Mehrauli Ckt-II	1	0	0	0	1	1	1	
15	220kV Dwarka	220kV Naraina Ckt-II	1	0	0	0	1	1	1	
16	220kV Naraina	220kV Dwarka Ckt-II	1	0	0	0	1	1	1	

Justification for less than one index may be attached separately.

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

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

Nu is the number of unwanted operations

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

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

Case-1 400/200 KV, 315 MVA, ICT-I at 400KV GSS Jodhpur on 20.01.2025
No. of Unwanted operation – 1

Reason of unwanted operation –

Wrong operation of differential relay, due to incorrect relay setting.

Corrective Action taken – YES

Relay setting revised, presently tripping is out and relay is under observation.

Case-2 400/220/33 KV, 500 MV ICT-III at 400 KV GSS HINDAUN on 25.01.2025

No. of Unwanted operation – 1

Reason of unwanted operation –

Newly commissioned ICT, tripped due to wrong Thermal overload setting.

Corrective Action taken – YES

Relay setting revised.

Case-3 400/220/33 KV, 315 MVA ICT-IV at 400 KV GSS HEERAPURA on 28.01.2025

No. of Unwanted operation – 1

Reason of unwanted operation –

Mal-operation of KBCH differential relay.

Corrective Action taken – Partial

Planning to replace relay. Relay arranged, waiting for shutdown.

Case-4 220KV NPH-Heerapura U/G Cable at 400 KV GSS Heerapura on 10.01.2025
No. of Unwanted operation – 1

Reason of unwanted operation –

Mal-operation of line differential element of relay.

Corrective Action taken – NO

Line differential element put out of ckt.

Case-5 220 kV Chittorgarh-Debari-Madri line at 400 KV GSS Chittorgarh on 17.01.2025
No. of Unwanted operation – 1

Reason of unwanted operation –

Z3 /PSB setting found incorrect.

Corrective Action taken – YES

Z3 /PSB setting revised.

Case-6 220 KV Lalsot Anta Line from ANTA (NTPC) on 17.01.2025
No. of Unwanted operation – 1

Reason of unwanted operation –

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

Corrective Action taken – NO

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

Case-7 220/132KV, 160MVA, BBL Make Transformer -II & 132KV Incomer-II at 220 kV GSS Niwana on 14.01.2025
No. of Unwanted operation – 1

Reason of unwanted operation –

OSR relay defective.

Corrective Action taken – YES

OSR relay replaced.

Case-8 220/132 KV, 100MVA TRF-I at 220 KV GSS RATANGARH on 27.01.2025
No. of Unwanted operation – 1

Reason of unwanted operation –

DC fault.

Corrective Action taken –Partial

DC fault checked but no fault found relay automatically reset.

कार्यालय
निदेशक (आपरेशन)

U.P. Power Transmission Corporation Ltd.
Shakti Bhawan Extn.
14 Ashok Marg, Lucknow– 226001
Tel/Fax: 0522–2287833/2286476
Email: director_op@upptcl.org

No: 660 /Dir (Op)/ NRPC Date: 04/02/2025

Subject: Performance indices of protection system.

SEO
NRPC
New Delhi.

Through E- Mail

Mail ID – seo-nrpc@nic.in

Kindly find enclosed herewith copy of compiled Performance indices along with the Performance indices obtained from all 06 Zonal offices of UPPTCL for the month of January, 2025.

It is for your kind information.

Hchandra
04/02/2025

(Harishchandra Verma)
Executive Engineer (A)

No: /Dir (Op)/ Date:

Copy to :-

Director (Operation) UPPTCL, Lucknow for information.

(Harishchandra Verma)
Executive Engineer (A)

Perfomance Indices

S.No	Transmission Zone	Dependability index	Security index	Reliability index	Remark
1	TC, Lucknow	1	0.99	0.99	**At 220 kV S/S Sitapur :** 220 kV Sitapur- SPN (PGCIL) line tripped on 23.01.25 at 08:45 Hrs. due to malfunctioning of Breaker. Fault has been rectified on 29.01.25 at 20:18 Hrs.
2	TSC, Jhansi	1	1	1	---
3	TW, Meerut	1	0.98	0.98	**At 220 kV S/S Sambhal :** 160 MVA T/F-II tripped on REF protection. REF relay was programmed as two winding T/F instead of auto T/F which has been corrected.
4	TNE, Gorakhpur	1	0.722	0.722	1. **400 kV GIS S/S Rasra :** 400 kV Rasra- Kasara line tripped. Because at 400 kV Kasara Mau end 400 kV Mau-Rasara Main Breaker was in shutdown for Breaker replacement. Line was charged through Tranfer breaker. During CB/Annunciation testing (by PGCIL Team) on pressing Annunciation test push button DT Command send through channel-2 (i) DT wiring from TNC switch Bus Breaker was not connected in Transfer Bus Panner as per Scheme. (ii) DT wiring was connected in Bus Coupler Pannel in Place of Transfer Bus Pannel. (iii) DT wiring was connected to isolator interlock circuit of Azamgarh line in Bus coupler pannel which was on DC. (iv) When DC was changed to DC selection switch in Mau-Rasara Pannel DC2 of DT channel 2 was mixed with DC1. (v) Mixing of DC Sources caused Potential Difference in PLCC DT terminal which resulted in "DT sent" through PLCC channel-2 on dated 17.01.25. Action taken : DT wiring issues has been resloved. DT wiring has been connected in bus transfer panel TNC switch on dated 31.01.25 2- **At 220 kV S/S Maharajganj :** Busbar protection operated on dated 18.01.25. In busbar protection pannel the MCU relay patch cord and connection part of 220 kV Maharajganj - PGCIL line found damgae that was caused differential current in Busbar relay consequently Busbar Protection operated and multiple element tripped. Action taken : Faulty Patch cord and port has been replaced on dated : 18.01.25
5	TSW, Agra	1	0.91	0.91	**At 220 Kv S/S Sikandara :** Bus Bar protection opreated on dated 23.01.25 at 04:26 Hrs. due to 220 kV Kirawali line Y-Phase CT jumper damaged and CT heavy leakage.
6	TSE, Prayagraj	1	1	1	---
Total indices value		**1.000**	**0.934**	**0.934**	---

H.Chandra
04/02/25
HARISHCHANDRA VERMA
Executive Engineer (A)
Director (Operation)
U.P.P.T.C.L.

S.No.	Substation	Element name	Date & Time of the tripping	Categorization (F/U) F = Failures to operate at internal power system faults U = Unwanted operations	Reason for failures/Unwanted operation	Corrective action taken/ to be taken
1	400KV PARICHHA	400KV PARICHHA-ORAI CIRCUIT 1	1/19/2024 8:22	U	During a single-phase transient fault, Auto reclose lockout shot recorded at Parichha end becaude of continuously persisting COS (carrier out of service) alarm.	Testing of Distance relay at Parichha end has been completed and found that carrier healthy signal must be received continuosly for auto reclose operation.Transmission wing has planned to check and rectify the issue in their panel.

Annexure-X

Format No.-PI-01

Reporting of performance indices for protection system

(for elements connected at 220 kV and above)

Name of Utility: Lalitpur Power Generation Company Limited

Month: JAN - 2025

S.N.	Sub- station	Unit (SPS/Line/ICT/ GT/ etc)	Nc	Nf	Nu	Ni	Dependabilit y Index (D) Nc/(Nc+Nf)	Security Index (S) Nc/(Nc+Nu)	Reliability Index (R) Nc/(Nc+Ni)
1	LPGCL	765 kV & 220 kV Switchyard	1	1	0	0	**0.5**	**1**	**1**

Note : 765 kV LPGCL- FATEHABAD (AGRA) Circuit-1 tripped on Dated 28-Jan-2025 on Single B-Phase to ground fault

LPGCL End: Main Breaker Auto reclosure was sucessful but TIE Breaker tripped as A/R Block fuction was operated due to unhealthy status of Breaker . Immedialty corrective action taken and resolved the issue.

Fatehabad End (UPPTCL Susbation): Both Main & TIE Breaker was tripped as Auto reclose block fuction was operated .Suitable action is pending to resolved the matter by UPPTCL

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

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

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

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

SUPPORTING DATA/DOCUMENTS FOR ANALYSIS AT RIHAND END

1. There are total 03 nos. of Type 3 Filter Banks named Z13, Z23 & Z33 are installed at HVDC Rihand and it has been observed that whenever any of the Type-3 Filter Bank (5/27) charged either from RPC or manually, filter banks got tripped on resistive or reactive overload protections due to higher 5th Order Harmonics coming from Grid.
2. On 22.06.2022 at 12:31 Hrs Filter Bank Z13 was connected and at 12:42 Hrs Filter bank got tripped on Reactor Overload of R phase. However Tripping setting is 51 A and Recorded Current before tripping was 52 A **(TFR of 22.06.2022 at 12:31 hrs is saved in folder)**
3. On 11.01.2023 at 11:52 Hrs Filter Bank Z33 was connected and at12:52 Hrs Filter bank got tripped on Reactor Overload of R phase. Recorded Current before tripping was 53 A (**TFR of 11.01.2023 at 12:52 hrs is saved in folder**)
4. To analyze, measurement of 5th Harmonics were carried out during both poles in service on 05.02.2024 and during Bipole Shutdown on 12.02.2024. **(The Details of Harmonics is saved in folder**)

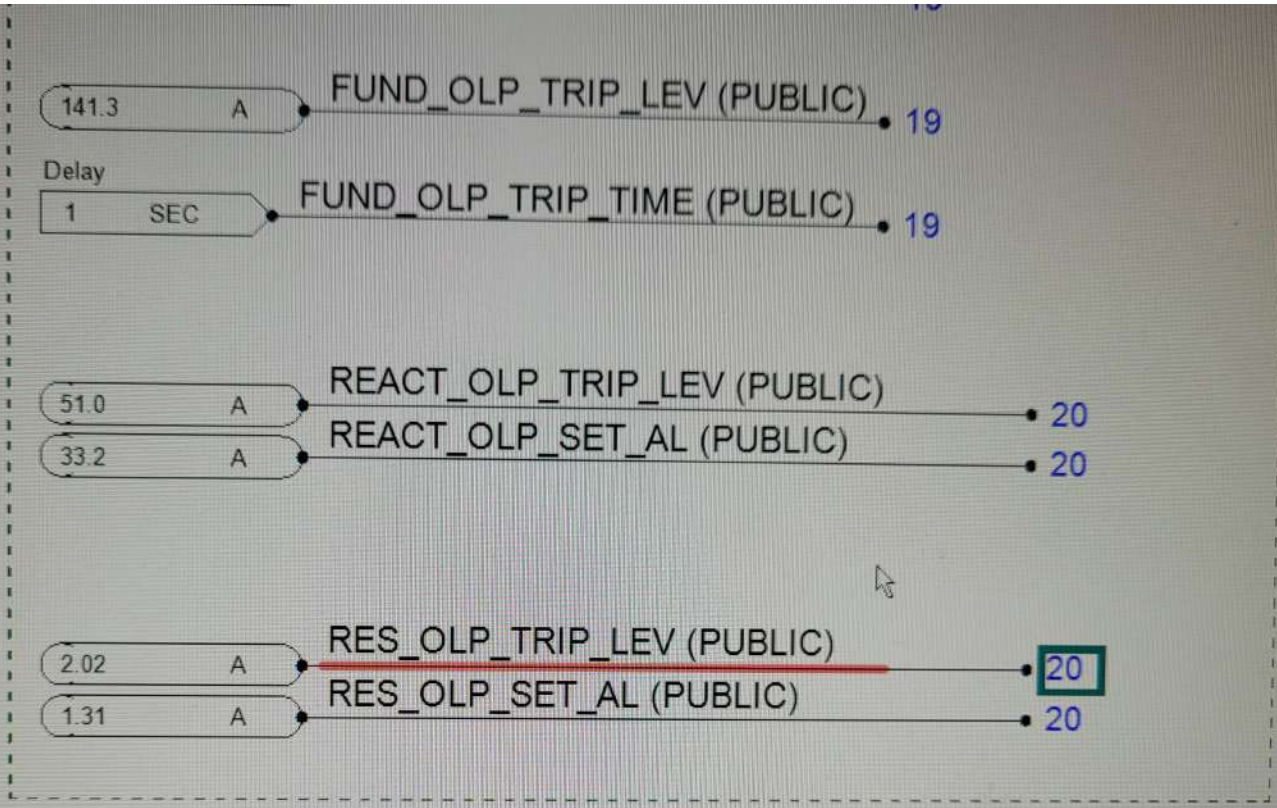
SUPPORTING DATA/DOCUMENTS FOR ANALYSIS AT DADRI END

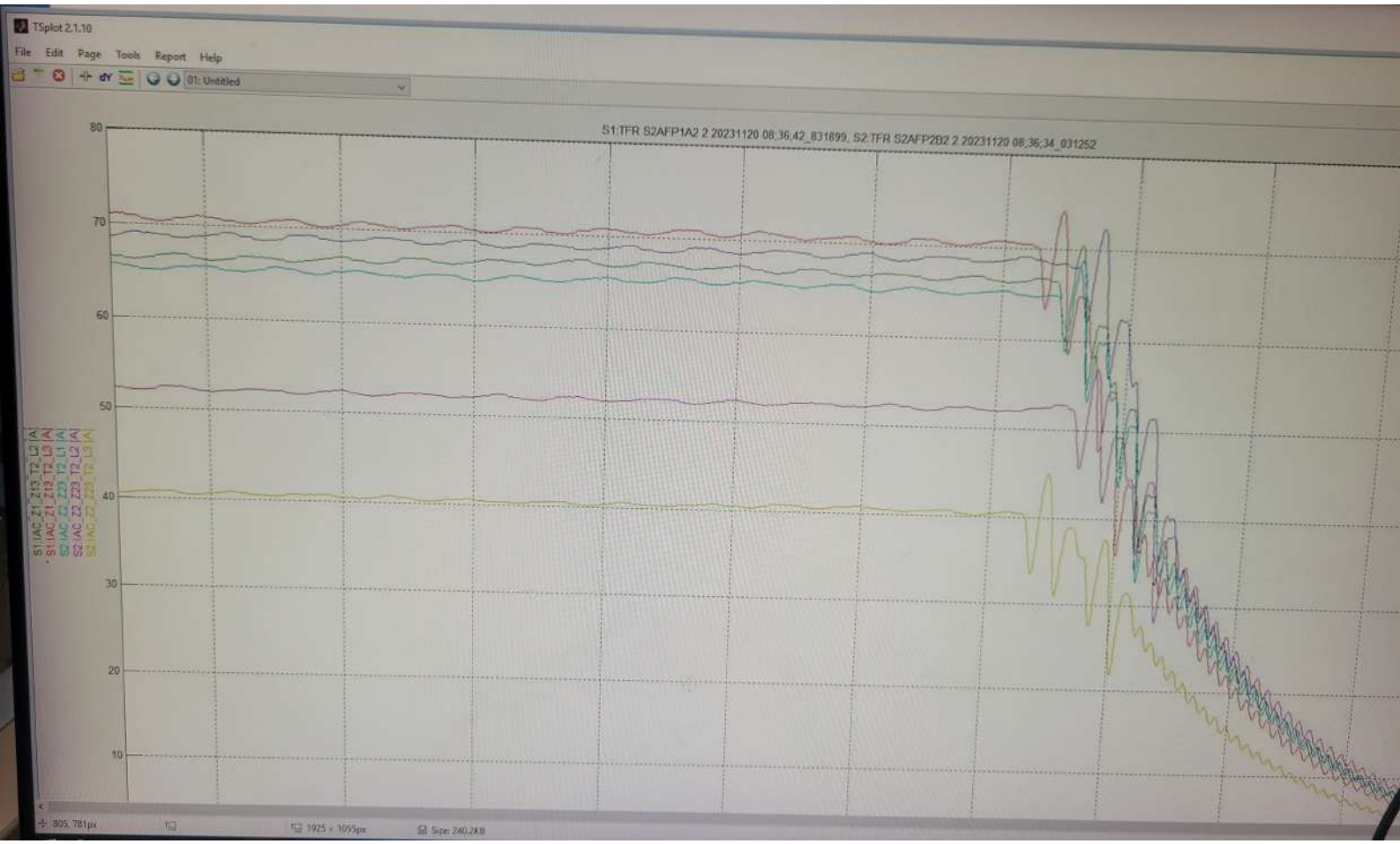
At the HVDC Dadri Sub-station, three Type 3 (5/27) filter banks, designated as Z13, Z23, and Z33 are installed.

Similar tripping incidents of these filter banks due to Resistor and Reactor Overload Protection, as highlighted in Note 1, have also been observed at Dadri Sub-station.

On 20th November 2023 at 08:34 Hrs., during the Bipole Shutdown of HVDC Link two Type 3 Filter Banks (Z13, Z23) were taken into service at Dadri Sub-station while all other filter banks and both HVDC poles were isolated. At 08:36 Hrs., both filter banks tripped on Resistor Overload Protection.
Subsequent analysis revealed a significant presence of the 5th harmonic component in the current measured on the Overload Protection CT. A detailed harmonic analysis of the current, measured at the Overload CT, is **saved in folder**. The event list and TFR associated with this tripping are also **enclosed**.

In view of the above, the issue of Type 3 Filter Bank tripping due to overload protection at the Dadri Sub-station is submitted for further discussion and resolution with NRPC.




TSplot 2.1.10
File Edit Page Tools Report Help
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80
70
60
50
40
30
20
10
S1:IAC_Z1_Z13_T2_L3 [A]
S1:IAC_Z1_Z13_T2_L3 [A]
S1:IAC_Z3_Z33_T2_L1 [A]
S2:IAC_Z2_Z23_T2_L2 [A]
S2:IAC_Z2_Z23_T2_L3 [A]
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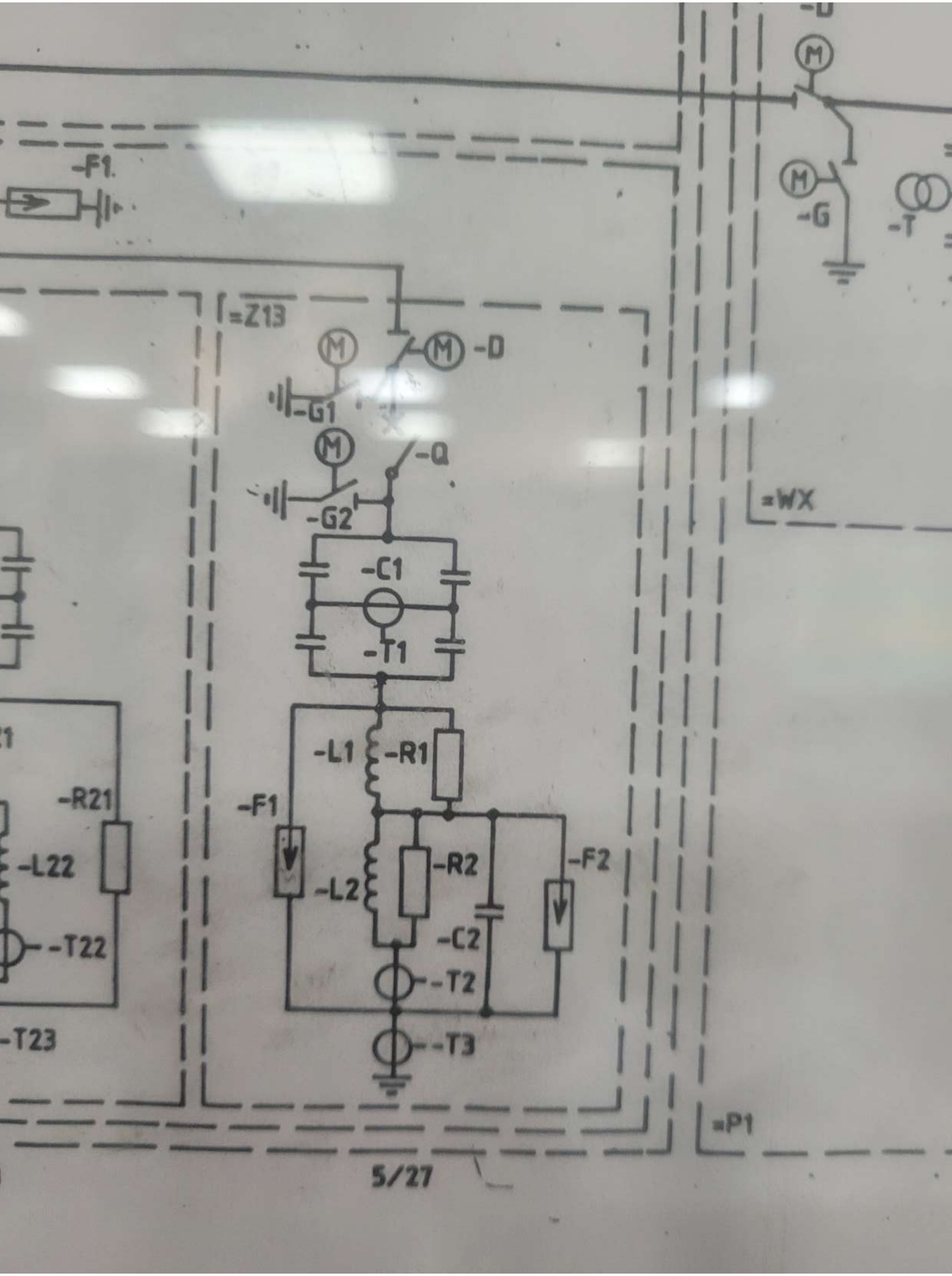
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=Z13
M
-D
-G1
-G2
-Q
-C1
-T1
-L1
-R1
-F1
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-G
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=P1

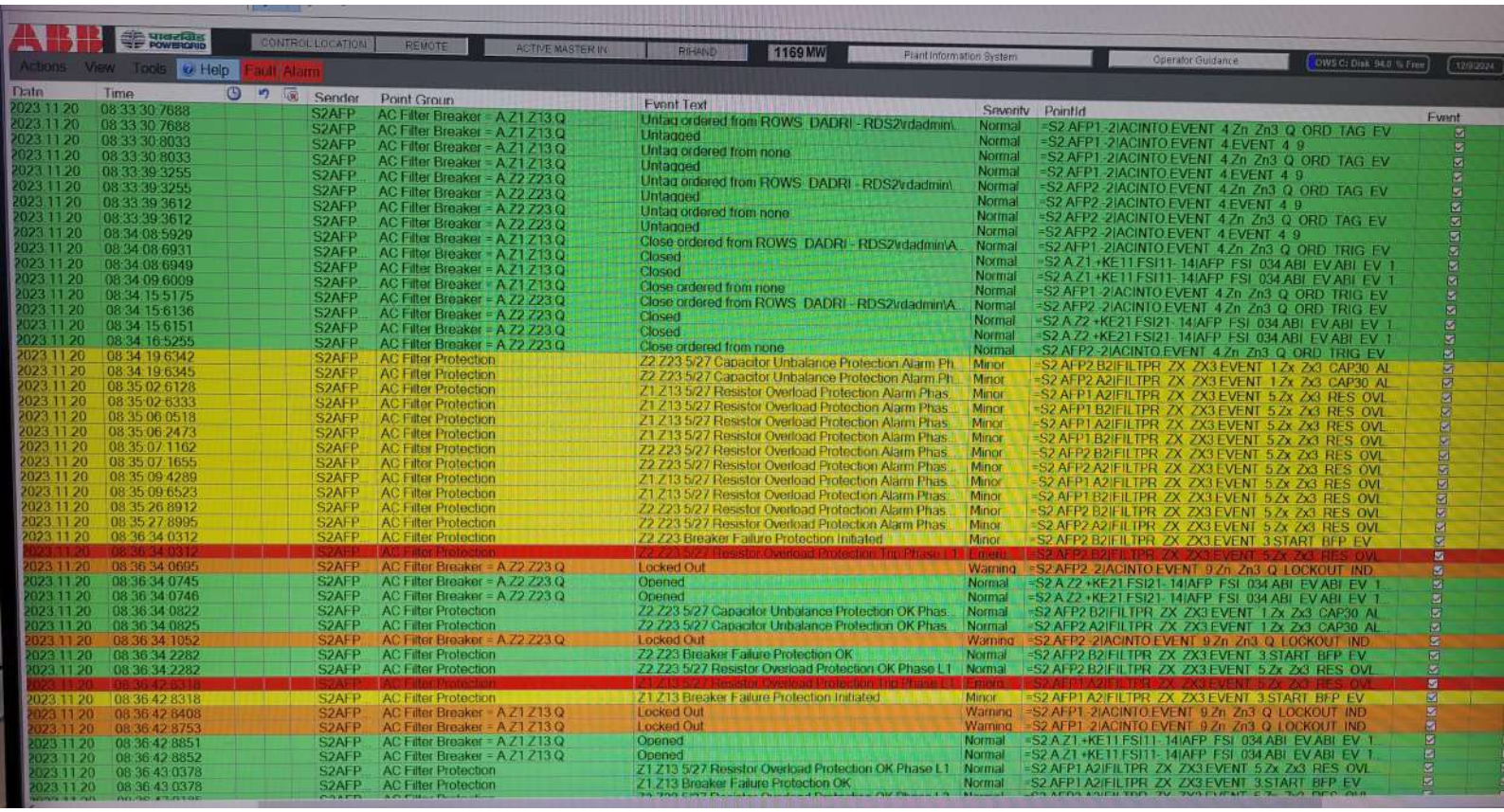


ABB | CONTROL LOCATION | REMOTE | ACTIVE MASTER IN | RHAND | 1169 MW | Plant Information System | Operator Guidance | OWS C: Disk: 94.0 % Free | 12/9/2024

Actions View Tools Help Fault Alarm

Date	Time	Sender	Point Group	Event Text	Severity	PointId	Event
2023.11.20	08:33:30.7688	S2AFP	AC Filter Breaker = A.Z1.Z13.Q	Untag ordered from ROWS_DADRI - RDS2\rdadmin\	Normal	=S2.AFP1.-2\ACINTO.EVENT_4.Zn_Zn3_Q_ORD_TAG_EV	
2023.11.20	08:33:30.7688	S2AFP	AC Filter Breaker = A.Z1.Z13.Q	Untagged	Normal	=S2.AFP1.-2\ACINTO.EVENT_4.EVENT_4_9	
2023.11.20	08:33:30.8033	S2AFP	AC Filter Breaker = A.Z1.Z13.Q	Untag ordered from none	Normal	=S2.AFP1.-2\ACINTO.EVENT_4.Zn_Zn3_Q_ORD_TAG_EV	
2023.11.20	08:33:30.8033	S2AFP	AC Filter Breaker = A.Z1.Z13.Q	Untagged	Normal	=S2.AFP1.-2\ACINTO.EVENT_4.EVENT_4_9	
2023.11.20	08:33:39.3255	S2AFP	AC Filter Breaker = A.Z2.Z23.Q	Untag ordered from ROWS_DADRI - RDS2\rdadmin\	Normal	=S2.AFP2.-2\ACINTO.EVENT_4.Zn_Zn3_Q_ORD_TAG_EV	
2023.11.20	08:33:39.3255	S2AFP	AC Filter Breaker = A.Z2.Z23.Q	Untagged	Normal	=S2.AFP2.-2\ACINTO.EVENT_4.EVENT_4_9	
2023.11.20	08:33:39.3612	S2AFP	AC Filter Breaker = A.Z2.Z23.Q	Untag ordered from none	Normal	=S2.AFP2.-2\ACINTO.EVENT_4.Zn_Zn3_Q_ORD_TAG_EV	
2023.11.20	08:33:39.3612	S2AFP	AC Filter Breaker = A.Z2.Z23.Q	Untagged	Normal	=S2.AFP2.-2\ACINTO.EVENT_4.EVENT_4_9	
2023.11.20	08:34:08.5929	S2AFP	AC Filter Breaker = A.Z1.Z13.Q	Close ordered from ROWS_DADRI - RDS2\rdadmin\A...	Normal	=S2.AFP1.-2\ACINTO.EVENT_4.Zn_Zn3_Q_ORD_TRIG_EV	
2023.11.20	08:34:08.6931	S2AFP	AC Filter Breaker = A.Z1.Z13.Q	Closed	Normal	=S2.A.Z1.+KE11.FSI11-14\AFP_FSI_034.ABI_EV.ABI_EV_1	
2023.11.20	08:34:08.6949	S2AFP	AC Filter Breaker = A.Z1.Z13.Q	Closed	Normal	=S2.A.Z1.+KE11.FSI11-14\AFP_FSI_034.ABI_EV.ABI_EV_1	
2023.11.20	08:34:09.6009	S2AFP	AC Filter Breaker = A.Z1.Z13.Q	Close ordered from none	Normal	=S2.AFP1.-2\ACINTO.EVENT_4.Zn_Zn3_Q_ORD_TRIG_EV	
2023.11.20	08:34:15.5175	S2AFP	AC Filter Breaker = A.Z2.Z23.Q	Close ordered from ROWS_DADRI - RDS2\rdadmin\A...	Normal	=S2.AFP2.-2\ACINTO.EVENT_4.Zn_Zn3_Q_ORD_TRIG_EV	
2023.11.20	08:34:15.6136	S2AFP	AC Filter Breaker = A.Z2.Z23.Q	Closed	Normal	=S2.A.Z2.+KE21.FSI21-14\AFP_FSI_034.ABI_EV.ABI_EV_1	
2023.11.20	08:34:15.6151	S2AFP	AC Filter Breaker = A.Z2.Z23.Q	Closed	Normal	=S2.A.Z2.+KE21.FSI21-14\AFP_FSI_034.ABI_EV.ABI_EV_1	
2023.11.20	08:34:16.5255	S2AFP	AC Filter Breaker = A.Z2.Z23.Q	Close ordered from none	Normal	=S2.AFP2.-2\ACINTO.EVENT_4.Zn_Zn3_Q_ORD_TRIG_EV	
2023.11.20	08:34:19.6342	S2AFP	AC Filter Protection	Z2.Z23 5/27 Capacitor Unbalance Protection Alarm Ph...	Minor	=S2.AFP2.B2\FILTPR_ZX_ZX3.EVENT_1.Zx_Zx3_CAP30_AL	
2023.11.20	08:34:19.6345	S2AFP	AC Filter Protection	Z2.Z23 5/27 Capacitor Unbalance Protection Alarm Ph...	Minor	=S2.AFP2.A2\FILTPR_ZX_ZX3.EVENT_1.Zx_Zx3_CAP30_AL	
2023.11.20	08:35:02.6128	S2AFP	AC Filter Protection	Z1.Z13 5/27 Resistor Overload Protection Alarm Phas...	Minor	=S2.AFP1.A2\FILTPR_ZX_ZX3.EVENT_5.Zx_Zx3_RES_OVL	
2023.11.20	08:35:02.6333	S2AFP	AC Filter Protection	Z1.Z13 5/27 Resistor Overload Protection Alarm Phas...	Minor	=S2.AFP1.B2\FILTPR_ZX_ZX3.EVENT_5.Zx_Zx3_RES_OVL	
2023.11.20	08:35:06.0518	S2AFP	AC Filter Protection	Z1.Z13 5/27 Resistor Overload Protection Alarm Phas...	Minor	=S2.AFP1.A2\FILTPR_ZX_ZX3.EVENT_5.Zx_Zx3_RES_OVL	
2023.11.20	08:35:06.2473	S2AFP	AC Filter Protection	Z1.Z13 5/27 Resistor Overload Protection Alarm Phas...	Minor	=S2.AFP1.B2\FILTPR_ZX_ZX3.EVENT_5.Zx_Zx3_RES_OVL	
2023.11.20	08:35:07.1162	S2AFP	AC Filter Protection	Z2.Z23 5/27 Resistor Overload Protection Alarm Phas...	Minor	=S2.AFP2.B2\FILTPR_ZX_ZX3.EVENT_5.Zx_Zx3_RES_OVL	
2023.11.20	08:35:07.1655	S2AFP	AC Filter Protection	Z2.Z23 5/27 Resistor Overload Protection Alarm Phas...	Minor	=S2.AFP2.A2\FILTPR_ZX_ZX3.EVENT_5.Zx_Zx3_RES_OVL	
2023.11.20	08:35:09.4289	S2AFP	AC Filter Protection	Z1.Z13 5/27 Resistor Overload Protection Alarm Phas...	Minor	=S2.AFP1.A2\FILTPR_ZX_ZX3.EVENT_5.Zx_Zx3_RES_OVL	
2023.11.20	08:35:09.6523	S2AFP	AC Filter Protection	Z1.Z13 5/27 Resistor Overload Protection Alarm Phas...	Minor	=S2.AFP1.B2\FILTPR_ZX_ZX3.EVENT_5.Zx_Zx3_RES_OVL	
2023.11.20	08:35:26.8912	S2AFP	AC Filter Protection	Z2.Z23 5/27 Resistor Overload Protection Alarm Phas...	Minor	=S2.AFP2.B2\FILTPR_ZX_ZX3.EVENT_5.Zx_Zx3_RES_OVL	
2023.11.20	08:35:27.8995	S2AFP	AC Filter Protection	Z2.Z23 5/27 Resistor Overload Protection Alarm Phas...	Minor	=S2.AFP2.A2\FILTPR_ZX_ZX3.EVENT_5.Zx_Zx3_RES_OVL	
2023.11.20	08:36:34.0312	S2AFP	AC Filter Protection	Z2.Z23 Breaker Failure Protection Initiated	Minor	=S2.AFP2.B2\FILTPR_ZX_ZX3.EVENT_3.START_BFP_EV	
2023.11.20	08:36:34.0312	S2AFP	AC Filter Protection	Z2.Z23 5/27 Resistor Overload Protection Trip Phase L1	Critical	=S2.AFP2.B2\FILTPR_ZX_ZX3.EVENT_5.Zx_Zx3_RES_OVL	
2023.11.20	08:36:34.0695	S2AFP	AC Filter Breaker = A.Z2.Z23.Q	Locked Out	Warning	=S2.AFP2.-2\ACINTO.EVENT_9.Zn_Zn3_Q_LOCKOUT_IND	
2023.11.20	08:36:34.0745	S2AFP	AC Filter Breaker = A.Z2.Z23.Q	Opened	Normal	=S2.A.Z2.+KE21.FSI21-14\AFP_FSI_034.ABI_EV.ABI_EV_1	
2023.11.20	08:36:34.0746	S2AFP	AC Filter Breaker = A.Z2.Z23.Q	Opened	Normal	=S2.A.Z2.+KE21.FSI21-14\AFP_FSI_034.ABI_EV.ABI_EV_1	
2023.11.20	08:36:34.0822	S2AFP	AC Filter Protection	Z2.Z23 5/27 Capacitor Unbalance Protection OK Phas...	Normal	=S2.AFP2.B2\FILTPR_ZX_ZX3.EVENT_1.Zx_Zx3_CAP30_AL	
2023.11.20	08:36:34.0825	S2AFP	AC Filter Protection	Z2.Z23 5/27 Capacitor Unbalance Protection OK Phas...	Normal	=S2.AFP2.A2\FILTPR_ZX_ZX3.EVENT_1.Zx_Zx3_CAP30_AL	
2023.11.20	08:36:34.1052	S2AFP	AC Filter Breaker = A.Z2.Z23.Q	Locked Out	Warning	=S2.AFP2.-2\ACINTO.EVENT_9.Zn_Zn3_Q_LOCKOUT_IND	
2023.11.20	08:36:34.2282	S2AFP	AC Filter Protection	Z2.Z23 Breaker Failure Protection OK	Normal	=S2.AFP2.B2\FILTPR_ZX_ZX3.EVENT_3.START_BFP_EV	
2023.11.20	08:36:34.2282	S2AFP	AC Filter Protection	Z2.Z23 5/27 Resistor Overload Protection OK Phase L1	Normal	=S2.AFP2.B2\FILTPR_ZX_ZX3.EVENT_5.Zx_Zx3_RES_OVL	
2023.11.20	08:36:42.8318	S2AFP	AC Filter Protection	Z1.Z13 5/27 Resistor Overload Protection Trip Phase L1	Critical	=S2.AFP1.A2\FILTPR_ZX_ZX3.EVENT_5.Zx_Zx3_RES_OVL	
2023.11.20	08:36:42.8318	S2AFP	AC Filter Protection	Z1.Z13 Breaker Failure Protection Initiated	Minor	=S2.AFP1.A2\FILTPR_ZX_ZX3.EVENT_3.START_BFP_EV	
2023.11.20	08:36:42.8408	S2AFP	AC Filter Breaker = A.Z1.Z13.Q	Locked Out	Warning	=S2.AFP1.-2\ACINTO.EVENT_9.Zn_Zn3_Q_LOCKOUT_IND	
2023.11.20	08:36:42.8753	S2AFP	AC Filter Breaker = A.Z1.Z13.Q	Locked Out	Warning	=S2.AFP1.-2\ACINTO.EVENT_9.Zn_Zn3_Q_LOCKOUT_IND	
2023.11.20	08:36:42.8851	S2AFP	AC Filter Breaker = A.Z1.Z13.Q	Opened	Normal	=S2.A.Z1.+KE11.FSI11-14\AFP_FSI_034.ABI_EV.ABI_EV_1	
2023.11.20	08:36:42.8852	S2AFP	AC Filter Breaker = A.Z1.Z13.Q	Opened	Normal	=S2.A.Z1.+KE11.FSI11-14\AFP_FSI_034.ABI_EV.ABI_EV_1	
2023.11.20	08:36:43.0378	S2AFP	AC Filter Protection	Z1.Z13 5/27 Resistor Overload Protection OK Phase L1	Normal	=S2.AFP1.A2\FILTPR_ZX_ZX3.EVENT_5.Zx_Zx3_RES_OVL	
2023.11.20	08:36:43.0378	S2AFP	AC Filter Protection	Z1.Z13 Breaker Failure Protection OK	Normal	=S2.AFP1.A2\FILTPR_ZX_ZX3.EVENT_3.START_BFP_EV	

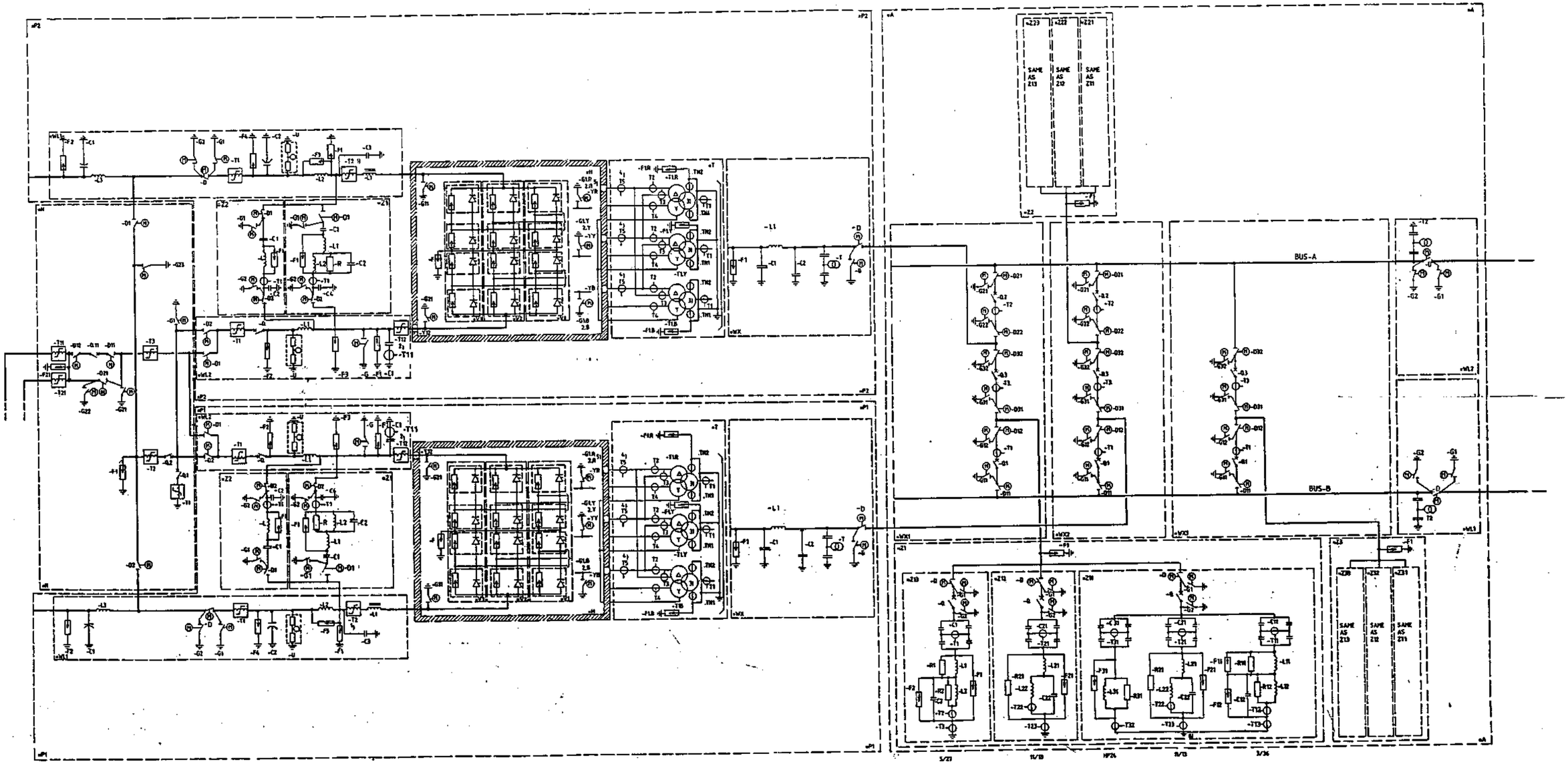
Filter Type 3 Harmonic Table.txt - Notepad

File Edit Format View Help

Result from frequency analysis
Fundamental frequency: 50.0
Used frequency deviation when finding max values: 5.00

Signal 1: S2:IAC_Z2_Z23_T2_L1 [A]
Signal 2: S2:IAC_Z2_Z23_T2_L2 [A]
Signal 3: S2:IAC_Z2_Z23_T2_L3 [A]
Signal 4: S1:IAC_Z1_Z13_T2_L1 [A]
Signal 5: S1:IAC_Z1_Z13_T2_L2 [A]
Signal 6: S1:IAC_Z1_Z13_T2_L3 [A]

N [pu]	Signal 1 [A]	Signal 2 [A]	Signal 3 [A]	Signal 4 [A]	Signal 5 [A]	Signal 6 [A]
1	96.038	101.690	96.659	101.943	98.753	97.512
2	4.197	4.739	3.149	4.574	4.278	3.037
3	1.973	2.743	1.318	1.509	2.527	0.943
4	2.153	2.238	0.631	1.646	2.295	0.856
5	59.635	49.127	36.199	65.028	60.913	62.743
6	2.483	2.213	1.825	2.706	2.407	3.246
7	3.961	3.354	4.150	3.775	2.955	4.570
8	0.271	0.978	0.756	1.222	0.356	1.066
9	0.171	0.853	0.642	1.155	0.323	0.764
10	0.117	0.533	0.455	0.760	0.172	0.647
11	0.341	0.614	0.496	0.826	0.405	0.655
12	0.155	0.464	0.307	0.618	0.046	0.586
13	0.179	0.463	0.429	0.577	0.083	0.574
14	0.260	0.462	0.289	0.576	0.319	0.485
15	0.104	0.379	0.273	0.482	0.132	0.373
16	0.064	0.321	0.230	0.473	0.122	0.338
17	0.057	0.306	0.213	0.445	0.117	0.344
18	0.105	0.300	0.191	0.383	0.100	0.323
19	0.066	0.274	0.182	0.397	0.085	0.291
20	0.415	0.348	0.296	0.716	0.552	0.453
21	0.079	0.250	0.172	0.349	0.080	0.286
22	0.161	0.333	0.297	0.257	0.231	0.273
23	0.101	0.256	0.197	0.310	0.096	0.318
24	0.183	0.291	0.146	0.275	0.096	0.302
25	0.109	0.213	0.140	0.301	0.104	0.230
26	0.175	0.213	0.158	0.348	0.132	0.332
27	0.035	0.180	0.150	0.255	0.058	0.181
28	0.129	0.256	0.191	0.284	0.100	0.257
29	0.045	0.176	0.129	0.234	0.077	0.176



NOTES:
1)DIRECT CURRENT TRANSDUCER -T2 IS PLACED AT THE YC LINE BUSHING OF THE SMOOTHING REACTOR

2)DIRECT CURRENT TRANSDUCER -T2 IS PLACED IN THE NEUTRAL BUS WALL BUSHING.

3)CURRENT TRANSFORMERS -T3-T4 AND TH1-TH2 ARE PLACED AT THE CONVERTER TRANSFORMER BUSHINGS.

4)CURRENT TRANSFORMERS -T5 ARE PLACED IN THE DELTA WALL BUSHINGS.

5)VALVE WALL GROUNDING SWITCH M-G1 IS FOR Δ CONNECTION & M-G2 FOR Y CONNECTION

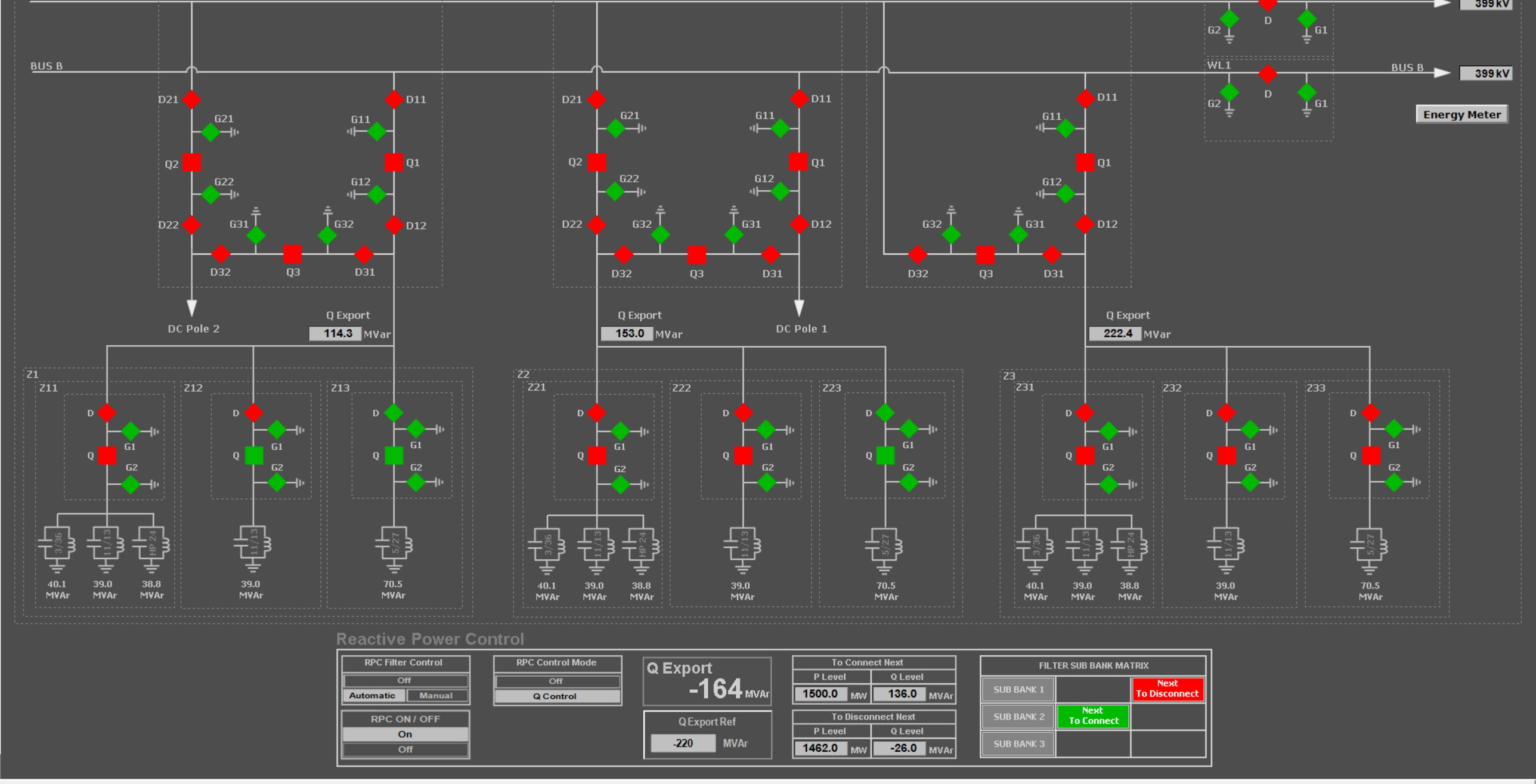
6)AC FILTER NEUTRAL = MIDDLE PHASE DIRECTLY GROUNDED OUTER PHASES GROUNDED VIA ARRESTERS ; -F1, -F2

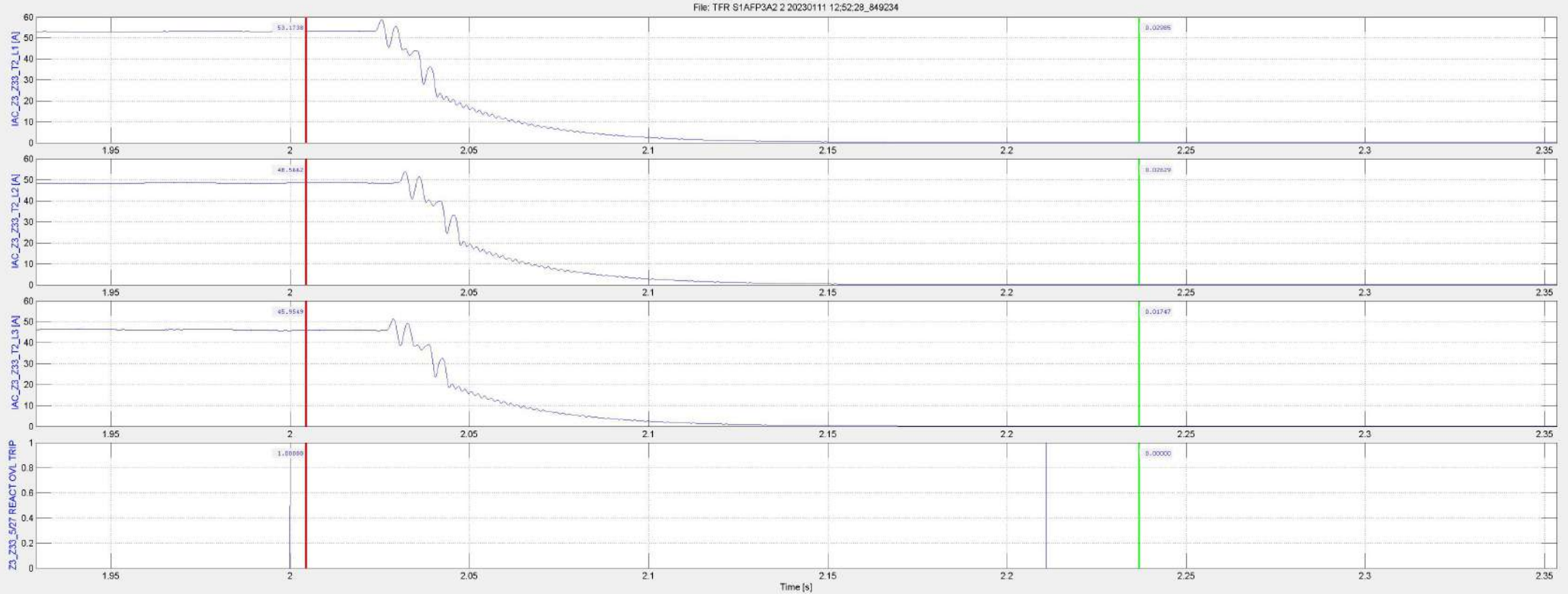
8	Curr.Trans1.P1.WL2 -T11 and P2.WL2 -T11 installed	93 27	
7	CAP. P.Z1-C3 MOVED TO P.WL1-C3	87 39	
6	REDRAWN CONV. TRANSFORMER GROUNDING	87 22	
5	REDRAWN DC FILTERS	87 06	
4	REDRAWN: FILTERS ADJUSTED: DISCONNECT AND EARTHINGSWITCHES	87 02	
3	REDRAWN. AC FILTERS ADJUSTED	86 24	
2	REDRAWN. AC FILTERS ADDED.	86 18	
1	COMPLETELY REDRAWN	86 08	

NTPC राष्ट्रीय थरमल पॉवर कारपोरेशन
National Thermal Power Corporation
RIHAND-DELHI
HVDC TRANSMISSION SYSTE

Checked by	Approved for prod. by	Drawing Number	
		SINGLE LINE DIAGRAM	
Design checked by	Drawn by OW	CMB	Installation name (project)
		RIHAND	
Standard checked by	Date for prod. Year Week		
L.LINDSTRÖM	HTK02 86 45	L 5598.1008 XN 840 156-AB	7

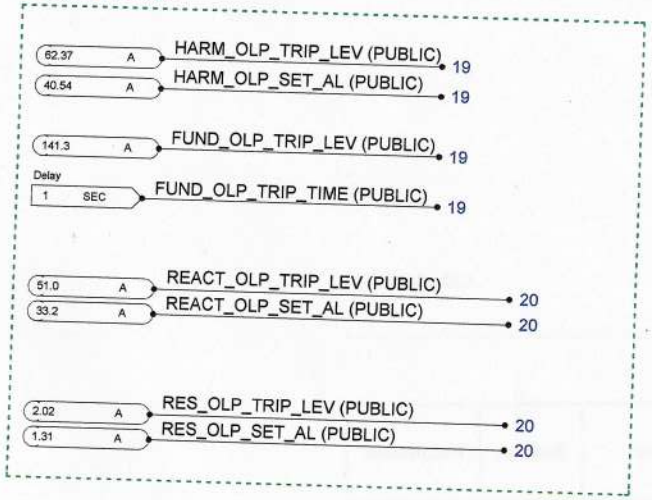
ASEA


399 kV
G2
D
G1
BUS B
WL1
BUS B
399 kV
Energy Meter
D21
G21
G11
D11
Q2
Q1
G22
G12
D22
G31
G32
D12
D32
Q3
D31
DC Pole 2
Q Export
114.3 MVar
DC Pole 1
Q Export
153.0 MVar
Q Export
222.4 MVar
Z1
Z11
Z12
Z13
Z2
Z21
Z22
Z23
Z3
Z31
Z32
Z33
D
Q
G1
G2
3/36
11/13
HP 24
5/27
40.1 MVAr
39.0 MVAr
38.8 MVAr
39.0 MVAr
70.5 MVAr
Reactive Power Control
RPC Filter Control
Off
Automatic
Manual
RPC ON / OFF
On
Off
RPC Control Mode
Off
Q Control
Q Export
-164 MVAr
Q Export Ref
-220 MVAr
To Connect Next
P Level
Q Level
1500.0 MW
136.0 MVAr
To Disconnect Next
P Level
Q Level
1462.0 MW
-26.0 MVAr
FILTER SUB BANK MATRIX
SUB BANK 1
SUB BANK 2
SUB BANK 3
Next To Disconnect
Next To Connect


File: TFR S1AFP3A2 2 20230111 12;52;28_849234
IAC_Z3_Z33_T2_L1 [A]
53.1738
0.02985
IAC_Z3_Z33_T2_L2 [A]
48.5862
0.02629
IAC_Z3_Z33_T2_L3 [A]
45.9549
0.01747
Z3_Z33_51/27 REACT OVL TRIP
1.00000
0.00000
1.95
2
2.05
2.1
2.15
2.2
2.25
2.3
2.35
Time [s]

OLP External Settings

Overload Settings



Application Directory
Base Application

Name: SET_OLP Settings Breaker Failure Protection	Prepared by: Manikandan Devaraj Approved by: Jorgen Bertals	Functional Block Diagram AC Filter Protections		Project: Rihand-Dadri Refurbishment	Target System: MainCPU
Type: Subtask	Responsible Department: PGGI/2222/T2	ABB AB, HVDC	Release Date: 2020-01-08	Identification number: 1JNL739377-FILTPR_Zx_Zx3	Rev Ind: 00 / Sheet: 41 / Cont: ...

Back-up protections

- The back-up unbalance protection

4.3
AC filter overload protections

4.3.1
AC filter high voltage capacitor, reactor and resistor overload protection QHLA 278

Protective zone

The high voltage capacitor strings

The high voltage reactor. 3/36, 5/27, 11/13 = LH.HP24 = L

The high voltage resistor. 3/36, 5/27, = RH.HP24 = R

Primary objective

- To detect short circuits in the high voltage capacitor of such nature that they will not be detected by the unbalance protection.
- To protect the filter reactors and resistors against thermal overload

Detection principles

The protection has two functions. One part detects the fundamental frequency component of the total filter current indicating partial short circuits within the high voltage capacitor. Another part detects the harmonic current by an inverse time characterstic function . The measuring point is in the neutral of the filter, measuring the total filter current.

Protective switching actions

- Trip of sub-bank a.c. circuit breaker

Settings

BRANCH	HARMONIC OVERLOAD SETTINGS			FUNDAMENTAL OVERLOAD SETTINGS	
	I_{TRIP}	I_{ALARM}	TIME KONSTANT	I_{TRIP}	TIME DELAY
	(A)	(A)	(S)	(A)	(S)
11/13	137.9	89.6	300	78.5	1.0
3/36	50.38	32.74	60	78.5	1.0
5/27	62.37	40.54	60	141.3	1.0
HP24	48.54	31.55	60	78.5	1.0

Back-up protection

The harmonic overload protection is back-up for malfunction of the Reactive Power controller, causing lack of filtering capability, which in turn would cause harmonic overload of remaining filters. The fundamental frequency overload part shall detect faults that result in complete or partial capacitor rack short circuits in the high voltage capacitor and that neither the a.c. bus differential overcurrent protections nor the unbalance protections are able to detect.

4.3.2
AC filter low voltage reactor overload protection, QHLA 278

Protective zone

- The low voltage reactor, LL.

Primary objective

- To protect the filter reactor against thermal overload.

Detection principles

- For the 3/36:th and the 5/27:th branches the protection is measuring the sum of the current through the reactor, LL, and the resistor, RL, where the reactor current is approximately 95% of the total current.
- For the 11/13:th branch the protection is directly measuring the reactor current.

  The protections has an inverse time characteristic function to which the amplitude and time duration of the measured harmonic current is compared.

Protective switching actions

- Trip of sub-bank a.c. circuit breaker.

Settings

BRANCH	PROTECTED COMPONENT	I_{TRIP} (A)	I_{ALARM} (A)	TIME KONSTANT (S)
11/13	Reactor LL	1197.0	778.1	
3/36	Reactor LL	122.1	79.4	
5/27	Reactor LL	51.0	33.2	

Back-up protection

The protection is back-up for malfunction of the reactive power controller, causing lack of filtering capability, which in turn cause harmonic overload of remaining filters.

4.3.3
AC filter low voltage resistor overload protection.

An a.c. filter replica circuit board together with circuit board QHLA 278 are used for this protection.

Protective zone

The low voltage resistor RL, of the 3/36 and 5/27 branches.

The low voltage resistor R of the 11/13 branch.

Primary objective

- To protect the filter resistor against thermal overload.

Detection principles

- For the 3/36 and the 5/27 branches, the sum of the current through the low voltage components RL and LL is measured.
- For the 11/36 branch, the total filter branch current is measured.

The protection consist of the corresponding a.c. filter replica, by which the current through the resistor is detected. The amplitude and duration of the detected current is compared to the inverse time characteritic function of the protection in order to detect component stresses.

Protective switching actions

- Trip of sub-bank a.c. circuit breakers.

Settings

BRANCH	PROTECTED COMPONENT	I_{TRIP} (A)	I_{ALARM} (A)	TIME KONSTANT (S)
11/13	Resistor R	6.58	4.28	60
3/36	Resistor RL	3.35	2.18	60
5/27	Resistor RL	2.02	1.31	60

Back-up protection

The protection is back-up for malfunction of the reactive power controller, causing lack of filtering capability, which in turn cause harmonic overload of remaining filters.

Annexure-A.VIII

भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
केन्द्रीय विद्युत प्राधिकरण
Central Electricity Authority
विद्युत प्रणाली योजना एवं मूल्यांकन-I प्रभाग
Power System Planning & Appraisal-I Division

सेवा में / To

1. COO, CTUIL, Plot No. 16, IRCON International Tower, Institutional Area, Sector 32, Gurugram, Haryana-122001
2. Director (System Operation), Grid- India, B-9, Qutab Institutional Area, Katwaria Sarai, New Delhi-110010
3. Director (Projects), POWERGRID, Saudamini, Plot No.2, Sector 29, Gurugram, Haryana-122001
4. Chief Engineer (Kashmir), JKPTCL, PDD Complex, Bemina, Srinagar, UT of J&K-190010

विषय / Subject: Minutes of the meeting regarding FTC of 1x25 MVAR, 220 kV bus reactor at 220/66 kV Alusteng S/s of JKPTCL

Madam/Sir,

The minutes of the meeting held through VC on 23.12.2024 under Member (Power Systems), CEA, regarding FTC of 1x25 MVAR, 220 kV bus reactor at 220/66 kV Alusteng S/s of JKPTCL is attached herewith.

संलग्न / Encl: यथोपरि / as above

भवदीय / Yours faithfully,

Signed by Nitin Deswal
Date: 02-01-2025 11:18:43
(नितिन देसवाल / Nitin Deswal)
उप निदेशक / Deputy Director

प्रति लिपि/Copy to:

1. SA to Member (PS), CEA
2. Member Secretary (NRPC), Qutab Institutional Area, Katwaria Sarai, New Delhi-110010

Minutes of the meeting regarding FTC of 1x25 MVAR, 220 kV bus reactor at 220/66 kV Alusteng S/s of JKPTCL

List of participants is at Annex-I.

Background

Implementation of 1x25 MVAR, 220 kV bus reactor at 220/66 kV Alusteng sub-station of JKPTCL was approved in the 6th meeting of NCT on 29.10.2021 through RTM mode with POWERGRID as the implementing agency. It is part of the transmission scheme for strengthening of Srinagar – Leh Transmission System (SLTS). The scope of work at Alusteng sub-station includes: 25 MVAr, 220 kV bus reactor - 1 No. & 220 kV reactor bay - 1 No.

POWERGRID informed that there was space constraint at Alusteng S/s for construction of independent reactor bay construction and the matter was taken up with JKPTCL and subsequently, the space near the 220 kV Bus Coupler Bay has been utilized for the reactor and the 220 kV bus isolator of the Bus Coupler Bay has been be utilized for connecting the reactor. Now, POWERGRID has requested for the FTC (first time charging) of the bus reactor through the above arrangement.

Deliberations held in the meeting

POWERGRID stated that considering the space constraint at Alusteng sub-station (JKPTCL) and the importance of Bus Reactor at Alusteng station being connected directly to Srinagar Leh Transmission System (SLTS), the arrangement of utilizing the existing Bus Coupler Bay for connecting new 25 MVAr Bus Reactor through its isolator at Alusteng sub-station may be agreed and first time charging clearance may be accorded by Grid India. Similar type of arrangement is already operational at Wagoora sub-station.

Grid India stated that the arrangement made by POWERGRID for connecting the bus reactor is not in accordance with the scheme approved by NCT. Grid India added that Remote Terminal Unit (RTU) is also not installed at Alusteng sub-station; therefore, it would not be possible to get the actual continuous data during the continuous trial run of the reactor for 24 hours. Also, there would be issues in declaration of availability of the asset. Further, bus bar protection scheme and Event Logger is not present at the sub-station.

POWERGRID informed that LoA has already been placed for RTU (under ULDC Phase-III scheme) at Alusteng and same would be installed by July 2025. POWERGRID suggested that in the meantime, data could be measured at specific intervals and after getting it certified from JKPTCL, it could be submitted/transmitted to RLDC.

CTUIL stated that issue of availability of space at Alusteng sub-station and arrangement made by POWERGRID for connecting the bus reactor was not intimated to CTUIL/NCT earlier. The issues should have been intimated at the stage of identification of the problem so that the deviation in the scope of works could have been taken up with the approving authority.

Regarding the query from CTUIL about the other associated works under the scheme for strengthening of SLTS, POWERGRID informed that the cable works in SLTS are at advance stage and would be commissioned shortly after clearing of snow and the 2x25 MVAr reactor at Drass sub-station (PG) is almost ready and would be commissioned in few weeks.

CEA stated that any deviation from the agreed scope of works of the transmission scheme should be intimated to CTUIL so that the same could be timely brought in the notice of NCT.

Grid India highlighted that real time data availability from JKPTCL sub-stations is an issue and it becomes very difficult to monitor the data. The issue has been flagged in various meetings of NRPC.

Member (Power Systems), CEA, stated that it is not advisable to operate bus reactor without proper monitoring arrangements. The present case may be treated as an exceptional condition. The bus reactor may be permitted for charging subject to condition of safe and secure operation in writing by the concerned stakeholders. The issue of bus bar protection scheme and provision of event logger at JKPTCL sub-station should to be taken up in TCC/OCC meetings of NRPC.

After deliberations, following was agreed:

1. The implementation arrangement of 25 MVAr Bus Reactor at Alusteng (JKPTCL) by utilizing the existing Bus Coupler Bay through its isolator may be noted.
2. The first time charging of 25 MVAr bus reactor at Alusteng (JKPTCL) may be permitted as an exceptional case as agreed by the stakeholders. POWERGRID and JKPTCL to ensure availability of data to Grid India. Modalities of data transfer to be firmed up by POWERGRID and JKPTCL in consultation with Grid India.
3. POWERGRID to expedite the implementation of RTU at Alusteng sub-station and other critical locations in J&K.
4. POWERGRID to note that any deviation from the agreed scope of works of the transmission scheme being implemented by POWERGRID should be timely intimated to CTUIL/CEA.
5. The issue of bus bar protection scheme and provision of event logger at J&K sub-stations to be taken up in TCC/OCC/PCC meetings of NRPC.

***

Annex-I

List of Participants:

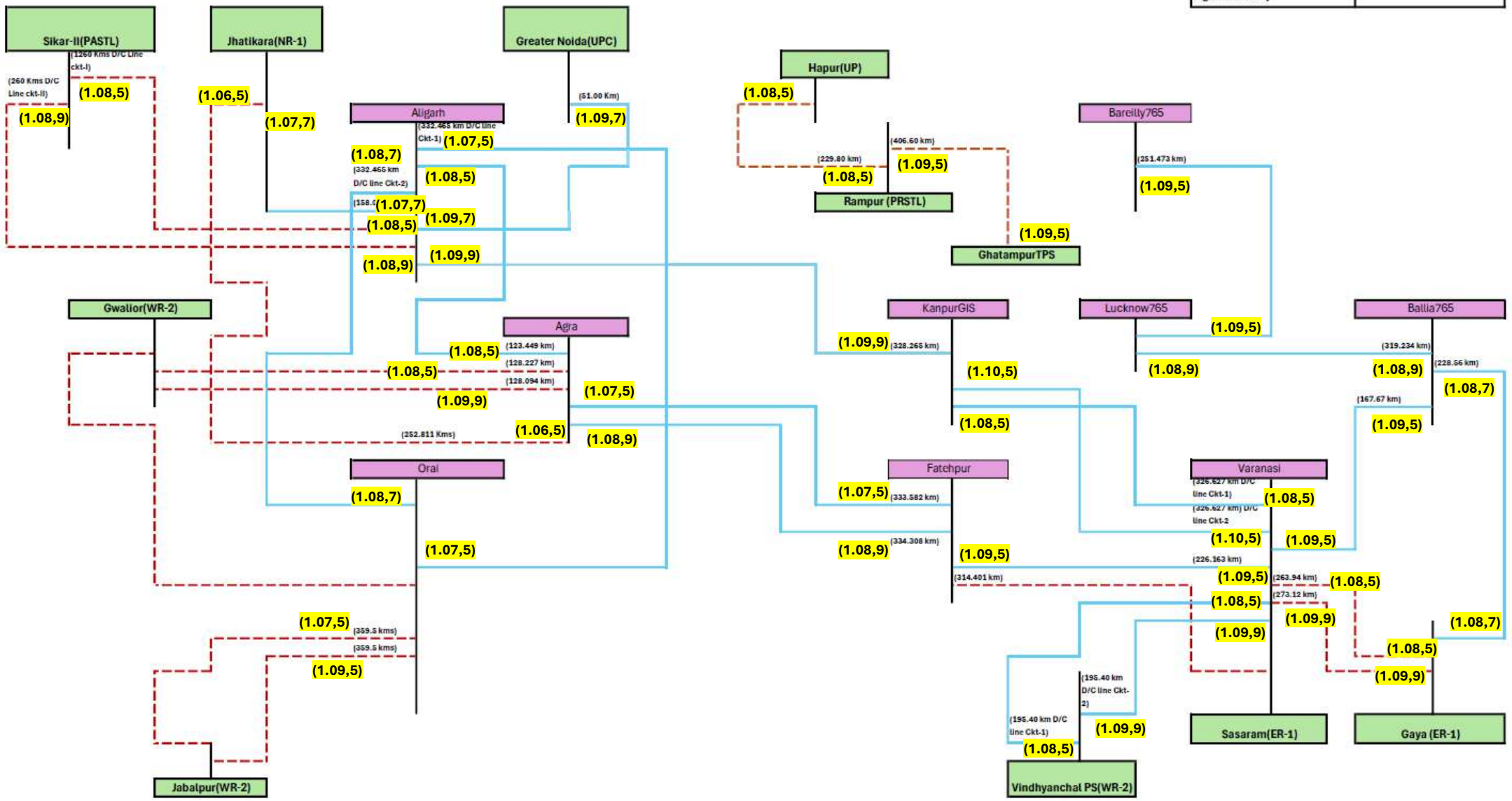
Sl. No.	Name	Designation
	CEA	
1	Sh. A.K. Rajput	Member (Power Systems)
2	Sh. Ishan Sharan	Chief Engineer (PSPA-I)
3	Sh. Nitin Deswal	Dy. Director (PSPA-I)
	Grid India	
2	Sh. Vivek Pandey	Sr. General Manager
3	Sh. Sunil Aharwal	General Manager (SO)
4	Sh. Priyam Jain	Chief Manager (SO)
5	Sh. Gaurav Singh	Chief Manager
6	Sh. Gaurab Dash	Dy. Manager
	CTUIL	
1	Sh. K.K Sarkar	Sr. GM
2	Sh. Kashish Bhambhani	GM
	POWERGRID	
1	Sh. Arindam Chakraborty	CGM (Projects)
2	Sh. Jagat Ram	GM (AM)
3	Sh. Praveen Kumar	Sr. DGM (PESM)
4	Sh. Rakesh Gupta	Chief Manager (RTAMC)
5	Sh. Mitin Gupta	Chief Manager
	JKPTCL	
1	Sh. Mohammad Saleem	AEE

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

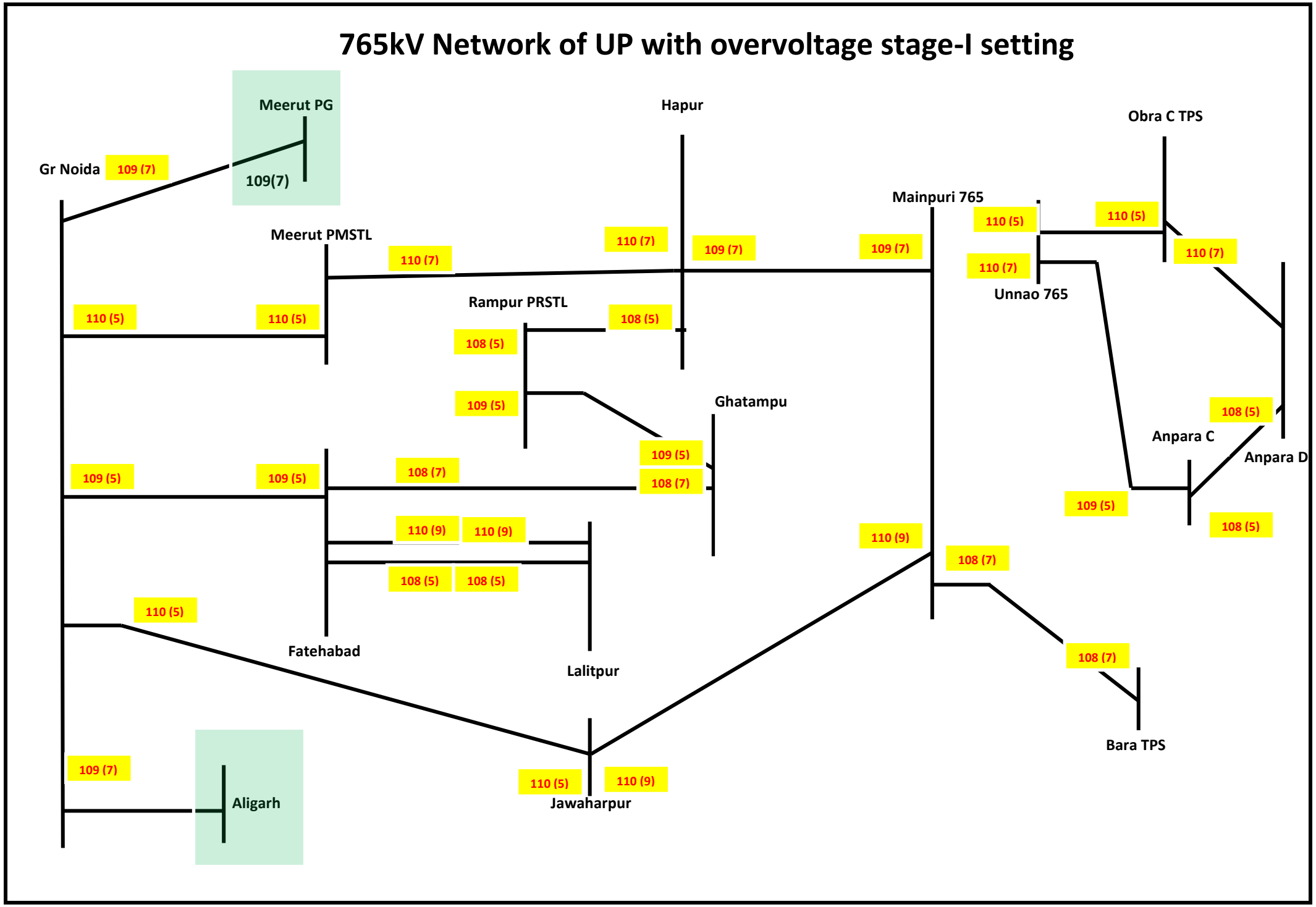
Annexure-A.IX

CONNECTION DIAGRAM OF 765kV SYSTEM IN POWERGRID NR-III

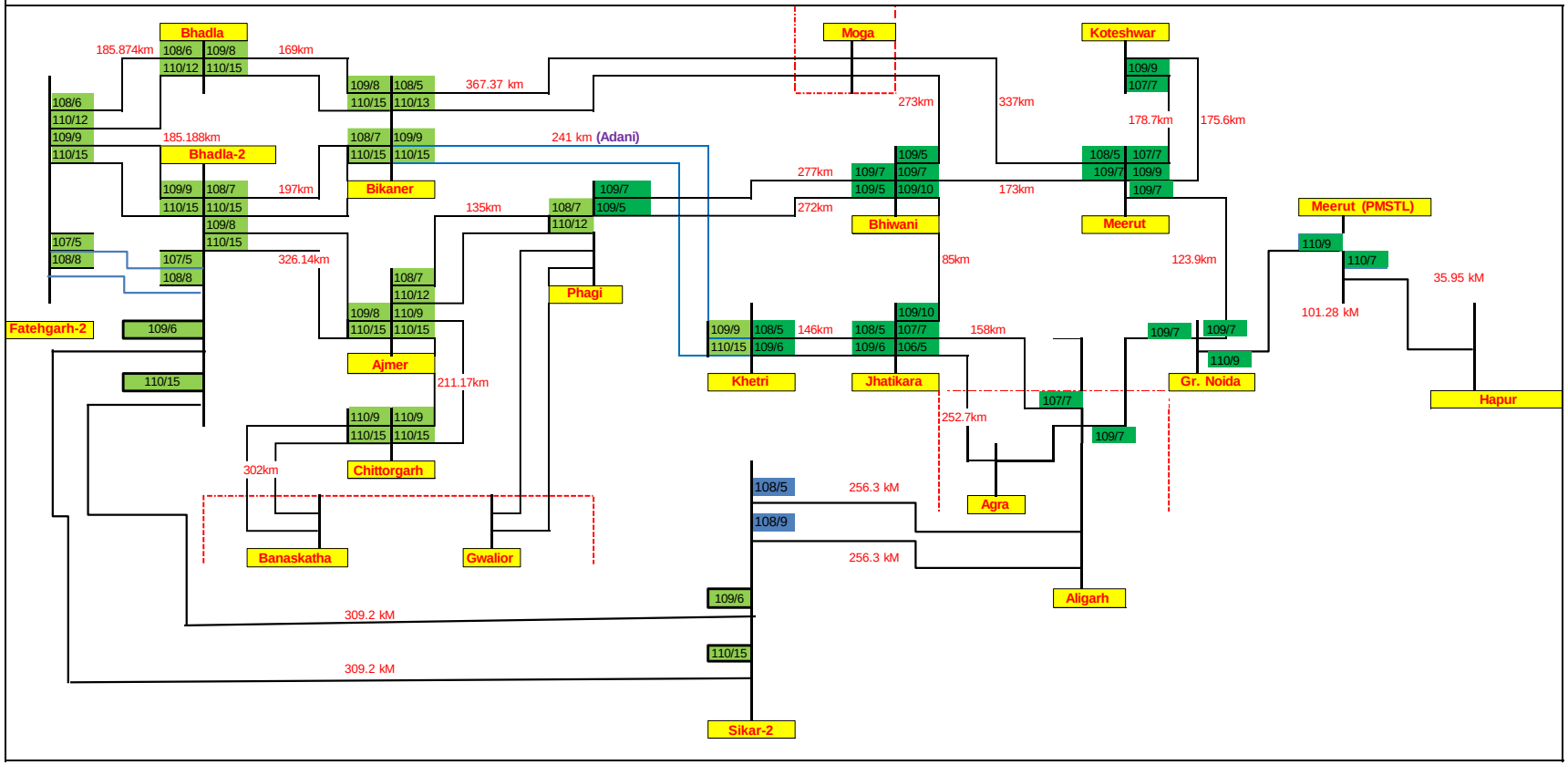
Description	Color coding
Power Grid NR-3 S/S	
Other region and other utility s/s	
Transmission Line under NR-3	
Transmission Line under Other region and utility	



765kV Network of UP with overvoltage stage-I setting



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



Annexure-B.I

Status of actions points recommended during previous PSC meetings (to be discussed in 57th PSC meeting)

S. No	Agenda	Remdial actions recommended during PSC meeting	Status of remdial action taken		
			55th PSC (20.12.2024)	56th PSC (20.01.2025)	57th PSC (20.02.2025)
1	Frequent multiple elements tripping at 220kV Kunihar, Baddi, Upperla Nangal complex and load loss event in HP control area	**51 PSC:** PSC Forum requested HP to complete the protection audit as per mentioned timelines (protection audit of 220kV Kunihar has been awarded and it would be completed within next 15-20 days. In next phase, by 15th September, protection audit of substations in downstream and upstream of 220kV Kunihar S/s would be completed.) and resolve the protection related issues. HP was also requested to share the reports of protection audit to NRPC & NRLDC after completion of audits.	Compliance report submitted by HPSEBL was discussed during the meeting. NRLDC representatibe highlighted that there are number on protection related non-compliance mentioned in 3rd party protection audit report. HPSEBL was requested to share the timeline for rectification of all the issues. HPSEBL represenatives were not present in the meeting. SLDC-HP was requested to further follow-up with HPSEBL for expedited corrective actions at their end. Protection audit of other remeianing stations (Baddi, Upperla Nangal etc) also need to be completetd on priority.	HPSEBL representative stated that they have applied for the PSDF for rectification of issues in this complex. Some observation 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.*	
2	Multiple elements tripping at 220kV Hissar(BBMB) 07th May 2024, 11:16 hrs	**51 PSC:** a) Expedite the implementation of differential protection in short lines to avoid undesired operation of distance protection.	HVPNL representative informed that availability of OPGW has been confirmed. Design team of HVPNL shall put up the case for purchase of differential relay. *PSC forum recommended HVPNL to expedite the implementation of differential protection in short lines.*	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. *PSC forum recommended HVPNL to expedite the implementation of differential protection in short lines and also share the expected timeline.*	
3	Multiple elements tripping at 400/220kV Akal (RS) on 08th Jun 2024, 19:53 hrs	**51 PSC:** a) Bus bar protection at 220kV bus at 400/220kV Akal shall be made operational at the earliest. b) Time synchronization of recording instruments (DR/EL) need to be ensured.	RVPNL representative stated that work hasn't completed yet 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 January 2025.	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. *PSC forum recommended RVPNL to expedite the process and make bus bar protection at Akal S/s healthy & operational at the earliest.*	
4	Multiple elements tripping at 400kV Sainj (HP), 400kV Parbati2 & Parbti3 (NHPC) Stations on 07th May 2024, 16:17 hrs	**51 PSC:** a) NHPC shall follow up with the relay engineer and taken necessary remedial actions to ensure proper operation of A/R scheme at Parbati2 end. b) NHPC and HPPTCL shall review the healthiness of PLCC at Parbati3 and Sainj end and take necessary actions to ensure their proper operation. c) Expedite the implementation of differential protection in 400kV Parbati2-Sainj line. d) Standardisation of recording instruments (DR/EL) need to be ensured.	NHPC representative informed that they will receive differential relay in January 2025 and laying of OPGW on 400kV Parbati2-Sainj line (length 700-800m) will take ~2 months(Feb25). Visit of GE engineer is also scheduled in January 2025. Representatives of Sainj HEP were not present in the meeting. *PSC forum recommended NHPC to expedite the process at their end and HPPTCL was requested to follow up with HPPCL for necessary actions required at Sainj HEP.*	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. *PSC forum recommended NHPC & HPPCL to take expeditious action at their end and ensure healthiness of protection system.*	
5	Multiple elements tripping at 400kV Khedar(RGTPS) Station at 10th May 2024, 19:35 hrs	**51 PSC:** a) Revised corrected protection settings of Main-2 Micome P4442 distance protection relay and A/R scheme at Khedar(RGTPS) end need to implemented at the earliest.	RGTPS representative informed that shutdown is planned in January 2025, issue will be resolved during that period. *PSC forum requested RGTPS & HVPNL to ensure the desired correction in logic of A/R function at Khedar TPS at the earliest.*	RGTPS representative informed that work is in process, and it will be completed by the end of this month i.e., January 2025 only. *PSC forum requested RGTPS to take necessary remedial action as per mentioned timeline and ensure healthiness of protection system.*	
6	Multiple elements tripping at 400kV Koteshwar(PG) on 17th May 2024, 17:21 hrs	**51 PSC:** a) 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.	POWERGRID(NR-1) representative informed that, materials have been received and work has been started. It will get completed by the end of January 2025. *PSC forum requested POWERGRID(NR-1) to expedite the process of implementation of differential protection at Koteshwar HEP*	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.	
7	Multiple elements tripping at 220kV Sarna (PS) on 04th May 2024, 07:10 hrs	**51 PSC:** a) Punjab shall expedite the commissioning of new bus scheme. B) POWERGRID shall revise the Z-4 time delay setting of Kishenpur lines at Sarna (PS) end as 160msec till bus bar get operational.	PSTCL representatives were not present in the meeting.	PSTCL representative informed that bus bar protection at 220kV Sarna will be commissioned by the end of March 2025. *PSC forum requested PSTCL to expedite the work related to implementation of bus bar protection at Sarna S/s.*	
8	Multiple elements tripping at 400/132kV Masoli(UP) on 29th May 2024, 15:57 hrs	**51 PSC:** a) Up shall implement the bus bar protection at 132kv level at 400/132kV Masoli S/s.	UPPTCL representative 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. *PSC forum requested UPPTCL to expedite the process of bus bar protection implementation at 400/132kV Masoli(UP) and such other stations.*	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.*	
9	Multiple elements tripping at 220kV KTPS (RVUN) on 21st June 2024, 11:37 hrs	**51 PSC:** a) Commissioning of bus coupler between 220kV Bus-3 & 5 need to be expedited.	RVUNL representatives were not present in the meeting.	RVUNL representative stated that work is at stage of tender processing. Necessary follow up actions are being taken. *PSC forum requested RVUNL for expeditious actions at their end.*	
10	Frequent tripping of 220 KV Anta(NT)-Sakatpura(RS) (RS) Ckt-1	**52 & 53 PSC:** RVPN was requested to expedite the process of relay replacement and rectification of issues related to A/R operation.	RVPNL representative informed that civil work has not been completed yet. Implementation of duplex panels will be started after completion of civil work. *PSC forum requested RVPNL to expedite the process.*	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. PSC forum requested RVPNL to expedite the actions at their end.	

11	Frequent tripping of 220 KV Khara(UP)-Saharanpur(PG) (UP) Ckt-1	**52 & 53 PSC:** UP was requested to expedite the process of relay replacement at Khara end. POWERGRID shall review and ensure the A/R operation at their end.	UPPTCL representative informed that 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. *PSC forum requested UPPTCL to expedite the replacement of relay at Khara(UP) end.*	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. *PSC forum requested UPPTCL to expedite the replacement of relay at Khara(UP) end.*	
12	Multiple elements tripping event at Patiala(PG)	**52 & 53 PSC:** POWERGRID was requested to expedite the process of commissioning of new bus bar scheme.	POWERGRID(NR-2) representative informed that status is same and implementation of new bus bar protection at Patiala(PG) will be completed by the end of January 2025. *PSC forum requested POWERGRID(NR-2) to expedite the process.*	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. *PSC forum requested POWERGRID(NR-2) to expedite the process.*	
13	Multiple elements tripping at 220kV Khodri HEP & Chibro HEP on 5th, 11th & 19th September 2024	**53 PSC:** a)Timely submission of disturbance recorder (DR) and event logger (EL) files need to be ensured. As per IEGC clause 37.2 (c), Disturbance Recorder (DR), station Event Logger (EL), Data Acquisition System (DAS) shall be submitted within 24 hrs of the event. b)HPPTCL shall taken necessary actions to rectify the protection related issue in 220kV Khdori-Majri ckt-2. c)OV protection needs to be disabled in 220kV lines at the earliest. d)Over frequency and over current protection operation in units at Khodri HEP need to be reviewed. e)A/R should be made operational in Sarsawan line at the earliest. f)UJVNL shall share the CPRI audit report and details of remedial action taken within one week. g)Replacement of Units breakers need to be expedited.	UJVUNL representative informed 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(Feb25). After this, bus bar protection will be made operational. HPSEBL representatives were not present in the meeting. *PSC forum recommended following actions to UJVUNL:* *•Expedite the necessary corrective actions to ensure all the protection compliance mentioned in CPRI audit report.* *•Submit the action plans w.r.t. all the desired remedial actions at Khodri HEP* *•HPSEBL shall take corrective actions to ensure proper operation of protection system in 220kV Khodri-Mazri ckt-2.*	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 it 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. 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.*	
14	Frequent tripping of 220 KV Nanauta(UP)-Saharanpur(PG) (UP) Ckt-1 & 220 KV Sarsawan(UP)-Khodri(UK) (UP) Ckt-1:	**54 PSC:** PSC forum requested UPPTCL to ensure resolution of issue with the Main-2 relay configuration at Nanauta(UP) & Sarsawan(UP) at the earliest.	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 in mnain-2 relay will be resolved during next available shutdown.	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). *PSC forum requested UPPTCL for expedited corrective actions.*	
15	Multiple elements tripping at 400/220kV Obra_A(UP) on 9th October 2024	**54 PSC Recommendations:** a)UPPTCL & Obra_A(UP) shall ensure the implementation of LBB protection at the earliest at 220kV side. b)GPS scheme shall be implemented at Obra_B(UP) by the **end of January 2025** and time sync of recording devices will be ensured.	UPPTCL representative informed that Bus bar protection relay is of electromechanical type, and it has to be replaced with numerical relay. Around 6-month (June25) time will be required for this work. Issue of time sync will be resolved by the end of January 2025.	UPPTCL representative informed that status is same. *PSC forum requested UPPTCL for expedited corrective actions.*	
16	Multiple elements tripping at 220/132kV Obra_A(UP) on 9th October 2024	**54 PSC Recommendations:** Commissioning and Implementation of numerical relays in 132kV ICT-1&2 at Obra_A(UP) need to be expedited. Timely commissioning of the same need to be ensured.	UPPTCL representative informed that Commissioning and Implementation of numerical relays in 132kV ICT-1&2 at Obra_A(UP) is expected to get completed by 1st week of February 2025.	UPPTCL representative informed that status is same. *PSC forum requested UPPTCL for expedited corrective actions.*	
17	Multiple elements tripping at 400/220kV Kashipur(Utt) on 10th October 2024	**54 PSC Recommendations:** a)PTCUL shall review the SPS scheme at 400/220kV Kashipur S/s. b)Overcurrent protection setting (IDMT) need to be revised in line with the approved protection philosophy.	PTCUL representaitve were not present in the meeting.	PTCUL representative informed that some correction in protection setting / protection coordination has been done. *PSC forum requested PTCUL to review the SPS scheme and submit in next PSC/OCC meeting.* PTCUL agreed to review the SPS scheme at Kashipur S/s.	
18	Multiple elements tripping at 220kV Dausa(RS) on 21st October 2024	**54 PSC Recommendations:** a)RVPNL will expedite the replacement of all the static relays at 220kV Dausa S/s with numerical relays. b)Time synchronization of all the recording instruments need to be ensured.	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.	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. RVPNL representative informed that time sync issue is not resolved yet. Resolution of time sync issue has also been taken up in parallel. *PSC forum requested RVPNL for expedited corrective actions.*	
19	Multiple elements tripping at 400kV Alwar(RS) on 30th October 2024	**54 PSC Recommendations:** RVPNL shall design a suitable SPS for 400/220kV Alwar S/s a propose the same in next OCC/PSC meeting for discussion.	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. NRLDC representative suggested to submit the proposed scheme by mail for preliminary review further it can be put up in OCC for discussion.	RVPNL representative stated that SPS shall be proposed in next OCC meeting.	
20	Frequent tripping of 220 KV Auraiya(NT)-Mehgaon(MP) (MPSEB) Ckt-1	**54 PSC Recommendations:** PSC forum recommended NTPC to take necessary actions to minimise the tripping and ensure proper operation of A/R in line	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.	NTPC representatives were not present in the meeting.	
21	Frequent tripping of 220 KV RAPS_A(NP)-Sakatpura (RS) (RS) Ckt-1 &2	**55 PSC Recommendations: E**xpeditious corrective actions to minimise frequent faults in line.	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 with in next 35-40 days. (by the end of january 2025)	RVPNL representative informed that 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.	
22	Frequent tripping of 400 KV Amritsar(PG)-Makhu(PS) (PSTCL) Ckt-1 & 400 KV Talwandi Saboo(PSG)-Nakodar (PSG) (PS) Ckt-1	**55 PSC Recommendations:** PSTCL was requested to plan replacement of porcelain insulators with polymer type.	*PSTCL was requested to plan replacement of porcelain insulators with polymer type.*	PSTCL representative informed that replacement of insulators of these lines are planned in next financial year (2025-26). *PSC forum requested PSTCL to for expeditious actions for insulators replacement.*	

23	Multiple element tripping event at 400kV Aligarh(UP) on 02nd November, 2024	**55 PSC Recommendations:** UPPTCL shall ensure the healthiness of carrier communication and A/R operation at Muradnagar_1(UP) end.	*UPPTCL shall ensure the healthiness of carrier communication and A/R operation at Muradnagar_1(UP) end.*	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. *PSC forum requested UPPTCL for expedited corrective actions.*	
24	Multiple element tripping event at 400/220kV Merta(RS) on 11th November, 2024	**55 PSC Recommendations:** 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.	*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.*	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. 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.*	
25	Multiple element tripping event at 400/220kV Hindaun(RS) on 16th November, 2024	**55 PSC Recommendations:** 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.	*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.*	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. *PSC forum requested RVPNL to review the TEED protection and ensure proper operation of protection system.*	
26	Multiple element tripping event at 220kV Pong(BB) on 06th November, 2024	**55 PSC Recommendations:** BBMB shall share the event analysis and details of remedial action taken within one week.	*BBMB shall share the event analysis and details of remedial action taken within one week.*	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. *PSC forum requested BBMB to ensure timely submission of DR/EL & tripping report*	
27	Frequent tripping of 400 KV Akal-Jodhpur (RS) Ckt-1	**56 PSC Recommendations:** RVPNL shall rectify A/R issue of main-I relay at Jodhpur end.		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.	
28	Multiple element tripping event at 400kV Jaisalmer(RS) at 12:13 hrs on 11th December, 2024	**56 PSC Recommendations:** a) RVPNL shall ensure the healthiness of protection system and their proper operation. b) Timely submission of disturbance recorder (DR) and event logger (EL) files need to be ensured.		RVPNL representative informed that 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.	
29	Multiple element tripping event at 220kV Bhiwani(BBMB) at 10:41 hrs on 13th December, 2024	**56 PSC Recommendations:** a) BBMB shall share the DR/EL & tripping details within one week. b) Timely submission of disturbance recorder (DR) and event logger (EL) files need to be ensured.		BBMB agreed to share all the details within 1-2 days.	
30	Multiple elements tripping at 220kV Mehalkalan(PS)on at 13:48 hrs on 27th November, 2024	**56 PSC Recommendations:** a) PSTCL shall share the DR/EL & tripping details within one week. b) Timely submission of disturbance recorder (DR) and event logger (EL) files need to be ensured.		PSTCL 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.	
31	Multiple elements tripping at 220kV CB Ganj(UP) at 15:56 hrs on 29th December, 2024	**56 PSC Recommendations:** a) UPPTCL shall sensitise the site engineer about important alarms and practice to attend those alarms on priority. b) Healthiness of protection system and their proper operation need to be ensured. c) Timely submission of disturbance recorder (DR) and event logger (EL) files need to be ensured.		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. UPPTCL representative stated that they have sensitised the site engineers in this regard. However, they will take further necessary actions.	
32	Multiple element tripping event at 400/220kV Bikaner(RS) at 18:05 hrs on 14th December, 2024	**56 PSC Recommendations:** a) RVPNL shall resolve the issue with the bus bar protection at Bikaner(RS) at the earliest. b) Healthiness of protection system and their proper operation need to be ensured. c) Timely submission of disturbance recorder (DR) and event logger (EL) files need to be ensured.		RVPNL representative agreed to taken necessary action on priority. RVPNL informed that Bus bar protection was not healthy during the event due to faulty FO cable (interconnecting cables).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.	
33	Multiple element tripping event at 220kV Dausa(RS) at 11:30 hrs on 29th December, 2024	**56 PSC Recommendations:** a) RVPNL shall expedite the replacement of static relays with numerical relay. b) Healthiness of protection system and their proper operation need to be ensured. c) Timely submission of disturbance recorder (DR) and event logger (EL) files need to be ensured.		RVPNL 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.	

Annexure-B.II

Grid Event summary for January 2025

S.No.	Category of Grid Incident/ Disturbance	Name of Elements (Tripped/Manually opened)	Affected Area	Owner/ Agency	Outage		Event (As reported)	Loss of generation / loss of load during the Grid Disturbance		Fault Clearance time (in ms)	Compliance of Protection Protocol/Standard		
	(GI-1 to GD-V)				Date	Time		Generation Loss(MW)	Load Loss (MW)		Flash Report Submission (Y/N)	DR/EL Submission (Y/N)	Detail Tripping Report Submission (Y/N)
1	GD-1	(i)210 MW Guru Gobind Singh TPS (Ropar) - UNIT 6 (ii)210 MW Guru Gobind Singh TPS (Ropar) - UNIT 3 (iii)210 MW Guru Gobind Singh TPS (Ropar) - UNIT 4	Punjab	PSTCL	6-Jan-25	09:32	i)220/132 KV Ropar (GGSTP) has double main bus system in 220KV and 132KV side. ii)During antecedent condition, 210 MW Guru Gobind Singh TPS (Ropar) - UNIT 3, Unit 4 and Unit 6 generating 180MW, 167MW and 176MW respectively. iii)As reported at 09:32 hrs, during the synchronization of the 210 MW Unit-5 at Guru Gobind Singh Thermal Power Station (Ropar), the R- phase limb of the 220 kV generator transformer circuit breaker for Unit-5 ruptured. This incident triggered the tripping of Units 3, 4, and 6, each with a capacity of 210 MW. Consequently, a blackout occurred at the 220 kV Guru Gobind Singh TPS substation. (Details of protection operation yet to be received). iv)As observed from PMU at Abdullapur (PG) S/s, R-N phase to earth fault was observed. Fault clearance time of 120 msec can be seen in the PMU. v)During this event, a total generation loss of 521MW was observed in Punjab control area . (As per SCADA). vi)As per SCADA, 225MW of change in demand is observed in Punjab control area.	225	521	120	Y(d)	N	N
2	GI-2	(i) 400 KV Fatehgarh_II(PG)-Fatehgarh Pooling (FBTL) (FBTL) Ckt-1	Rajasthan	FBTL	8-Jan-25	13:38	i)400KV Fatehgarh (Adani) pooling station has one and half breaker scheme with 400KV Fatehgarh (Adani) – Fatehgarh II Ckt 1 & 2, 400KV Fatehgarh (Adani) – Acme, 400KV Fatehgarh (Adani) – Fatehgarh PSS Ckt. 1 & 2. ii)As reported, at 13:38hrs, 400 KV Fatehgarh_II(PG)-Fatehgarh Pooling (FBTL) (FBTL) Ckt-1 tripped on R-Y phase to phase fault with fault distance of 45.8Km and fault current of 8.1KA from Fatehgarh (Adani) end. iii)As per PMU at Fatehgarh, R-Y phase to phase fault (voltage dipped upto 0.514 p.u.) is observed with fault clearing time of 80ms. After the fault clearance voltage increased upto .99 p.u. iv)As per PMU at Bassi (PG), a sharp drop in frequency is observed from 49.97 Hz to 49.83 Hz and frequency recovered to 49.99 Hz within 1 min. v)As per PMU, solar generation loss of approx., 719MW, 30MW, 218MW and 98MW are observed respectively at ASHPL (IP), AHEJ3 (IP), RSUPL (IP) and CSPJP (IP). vi)As per SCADA, dip in NR total solar generation of approx. 1450 MW is observed with change in Rajasthan solar generation of approx. 177 MW.	1450	0	80	Y	Y(d)	N (Partial detail received)
3	GI-2	(i)220 kV Akal – Bhainsara Ckt-1 & 2 (ii)400/220 KV 500 MVA ICT 1, 2 & 4 AT AKAL(RS) (iii)400/220 KV 315 MVA ICT 3 AT AKAL(RS) (iv)220 kV Akal(RS) BUS-1 & 2 (v)220 KV AKAL-GIRAL (vi)220KV AKAL-BARMER (vii)220 AKAL- AMARSAGAR (viii)220 AKAL- MADA (ix)220 AKAL- AKAL(SUZLON) ckt-1 & 2 (x)220 AKAL- RAJGARH (xi)220 AKAL- JAJIYA (xii)220 AKAL- BHU ckt-1 & 2 (xiii)220 AKAL- DANGRI ckt-1 & 2 (xiv)220 AKAL- MOOLANA (xv)220 AKAL- LALA	Rajasthan	RVPNL	9-Jan-25	23:35	i)400/220kV Akal(RS) has one and half breaker scheme at 400kV level and double main and transfer bus scheme at 220kV level. ii)During antecedent condition, 400/220 kV 500 MVA ICT-1 & ICT-2 were connected to 400kV bus-1 and 400/220 kV 315 MVA ICT-3 & 500 MVA ICT-4 were connected to 400kV bus-2. iii)As reported, at 23:35 hrs, Y-phase jumper of 220kV bus-1 of 220kV Akal-Bhensara Ckt-1 snapped which created bus fault on both 220kV buses at Akal(RS). iv)As per PMU at Bhadla(PG), Y-N phase to earth fault with delayed fault clearance time of 720 msec is observed. v)Bus bar protection is not in service at 220kV side of Akal S/s. Therefore, fault cleared with the operation of back up protection i.e., 400/220kV ICTs at Akal. All four ICTs tripped on O/C E/F protection operation. vi)Due to tripping of all four ICTs at Akal(RS), evacuation path lost for all the wind power plants connected at 220kV bus-1 & bus-2 at Akal(RS). On this, both 220kV buses became dead at Akal(RS) S/s. vii)During this event, dip in Rajasthan wind generation of approx. 523 MW is observed out of which approx. 232 MW recovered within 6 minutes. (As per SCADA). viii)As per SCADA, about 171MW demand change is observed in Rajasthan control area.	523	171	720	N (Partial detail received)	N (Partial detail received)	N (Partial detail received)
4	GI-2	(i)400/220 kV 250 MVA ICT 1 at Heerapura(RS) (ii)400/220 kV 250 MVA ICT 3 at Heerapura(RS)	Rajasthan	RVPNL	10-Jan-25	13:35	i)400/220KV Heerapura sub-station has one and half breaker scheme in the 400KV side and Double main & transfer scheme in the 220 KV side. ii)As reported at 13:35hrs, a kite thread fell on the 220KV side of the ICTs. As a result Bus- Bar protection operated on the 220KV side led to tripping 400/220 kV 250 MVA ICT 1 and 3 at Heerapura(RS). (exact reason and nature of protection operated yet to be shared). iii)As per PMU at Heerapura (RS), R-N fault (delayed fault clearance in R-ph) is observed with delayed fault clearing time of 320ms. iv)As per SCADA, change in demand of approx. 320MW in Rajasthan control area is observed.	0	320	320	N	N	N
5	GD-1	(i)400/220 KV 500 MVA ICT 1 AT AKAL(RS) (ii)400/220 KV 500 MVA ICT 2 AT AKAL(RS) (iii)400/220 KV 500 MVA ICT 3 AT AKAL(RS) (iv)400/220 KV 500 MVA ICT 4 AT AKAL(RS) (v)400/220 KV 500 MVA ICT 2 AT RAMGARH(RS) (vi)400 KV AKAL-JODHPUR (RS) CKT-1 (vii)400 KV AKAL-BARMER (RS) CKT-1 (viii)400 KV AKAL-JAISALMER (RS) CKT-1 (ix)400 KV AKAL-RAMGARH (RS) CKT-1 (x)400 KV AKAL-RAMGARH (RS) CKT-2 (xi)400 KV AKAL-KANKANI (RS) CKT-1	Rajasthan	RVPNL	12-Jan-25	06:31	i)400/220kV Akal(RS) has one and half breaker scheme at 400kV level and double main and transfer bus scheme at 220kV level. ii)During antecedent condition, 400/220 kV 500 MVA ICT-1 & ICT-2 were connected to 400kV bus-1 and 400/220 kV 315 MVA ICT-3 & 500 MVA ICT-4 were connected to 400kV bus-2. iii)As reported, at 06:31 hrs, B-N fault occurred on 400 KV Akal-Barmer (RS) Ckt, fault distance was 99.62KM and fault current was 2.42 KA from Barmer end. iv)However, as observed from PMU at Bhadla (PG) S/s, B-N fault was observed and subsequently it converted to Y-B-N double phase to earth fault. Delayed fault clearance time of 2120 msec can be seen in the PMU. v)On this fault, line tripped from Barmer end but breaker of Akal end got stuck due to issue in SF6 gas pressure. Due to non opening of breaker of Akal end, LBB protection would have operated. vi)However, all the 400kV lines and 400/220kV ICTs at Akal tripped during the event. Exact details of protection operation not received yet from SLDC-Rajasthan. vii)Due to tripping of all four ICTs at Akal(RS), evacuation path lost for all the wind power plants connected at 220kV bus-1 & bus-2 at Akal(RS). On this, both 400 and 220kV buses became dead at Akal(RS) S/s. viii)During this event, a dip in Rajasthan wind generation of approx. 340 MW is observed which recovered completely within 5 minutes. (As per SCADA). ix)As per SCADA, 206MW of change in demand is observed in Rajasthan control area.	340	206	2120	N	N (Partial details received)	N (Partial details received)
6	GD-1	1) 220 KV AHEJ4L PSS 2 HB_FGRAH_FBTL (AHEJ4L)-Adani RenewPark_SL_FGARH_FBTL (AREPRL) (AHEJ4L) Ckt	Rajasthan	AHEJ4L, AREPRL	13-Jan-25	14:04	i)Generation of 220 KV AHEJ4L PSS 2 (ASPS2) (IP) station evacuates through 220 KV AHEJ4L PSS 2 HB_FGRAH_FBTL (AHEJ4L)-Adani RenewPark_SL_FGARH_FBTL (AREPRL) (AHEJ4L) Ckt. During antecedent condition, 220 KV AHEJ4L PSS 2 (ASPS2) (IP) was generating approx. 280 MW (as per PMU). ii)As reported, at 14:04hrs, 220 KV AHEJ4L PSS 2 HB_FGRAH_FBTL (AHEJ4L)-Adani RenewPark_SL_FGARH_FBTL (AREPRL) (AHEJ4L) Ckt tripped on R-Y phase to phase fault with fault distance of 14km and fault current of 6.7kA from Adani Fatehgarh Solar Park end. During inspection, broken insulator was found at 220 KV AHEJ4L PSS 2 (ASPS2) (IP) gantry. iii)Due to tripping of 220 KV AHEJ4L PSS 2 HB_FGRAH_FBTL (AHEJ4L)-Adani RenewPark_SL_FGARH_FBTL (AREPRL) (AHEJ4L) Ckt, 220 KV AHEJ4L PSS 2 (ASPS2) (IP) S/s lost its connectivity from grid and blackout occurred at 220 KV AHEJ4L PSS 2 (ASPS2) (IP) S/s. iv)As per PMU at 400kV Adani Fatehgarh(IP), R-Y phase to phase fault (voltage dipped upto 0.823 p.u.) is observed with fault clearing time of 120ms. v)As per PMU, solar generation loss of approx. 280 MW was observed at 220 KV AHEJ4L PSS 2 (ASPS2) (IP).	280	0	120	N	N	N
7	GD-1	1) 220 KV Bhadla_2 (PG)-RSDCL(PSS4)_SL_BHD2_PG (RSDCL) Ckt 2) 220 KV Nokhra SL_BHD2 (NTPC)-Bhadla_2 (PG) (NTPC_NOKHRA) Ckt 3) 220/33 kV 100 MVA ICT 1 at Nokhra SL_BHD2 (NTPC) 4) 220/33 kV 100 MVA ICT 2 at Nokhra SL_BHD2 (NTPC) 5) 220/33 kV 100 MVA ICT 3 at Nokhra SL_BHD2 (NTPC)	Rajasthan	PGCIL, RSDCL, NTPC	15-Jan-25	13:13	i)Generation of 220kV Nokhra (IP) and 220kV RSDCL-4(IP) stations evacuate through 220 KV Nokhra SL_BHD2 (NTPC)-Bhadla_2 (PG) (NTPC_NOKHRA) Ckt and 220 KV Bhadla_2 (PG)-RSDCL(PSS4)_SL_BHD2_PG (RSDCL) Ckt respectively. ii)During antecedent condition, 220kV Nokhra (IP) and 220kV RSDCL-4(IP) were generating approx. 295 MW and 178 MW respectively (as per PMU). iii)As reported, at 13:13hrs, 220 KV Bhadla_2 (PG)-RSDCL(PSS4)_SL_BHD2_PG (RSDCL) Ckt tripped on B-N phase to earth fault with fault distance of 1.3km and fault current of 23.4kA from Bhadla2(PG) end. During inspection it was found that jumper snapped out at tower location no. 8. iv)During the same time, 220 KV Nokhra SL_BHD2 (NTPC)-Bhadla_2 (PG) (NTPC_NOKHRA) Ckt along with 220/33 kV 100 MVA ICT 1, 2 and 3 at Nokhra SL_BHD2 (NTPC) also tripped. Line tripped from Nokhra(NTPC) end only (exact reason of tripping and nature of protection operated yet to be shared). v)Due to tripping of 220 KV Nokhra SL_BHD2 (NTPC)-Bhadla_2 (PG) (NTPC_NOKHRA) Ckt and 220 KV Bhadla_2 (PG)-RSDCL(PSS4)_SL_BHD2_PG (RSDCL) Ckt , 220kV Nokhra (IP) and 220kV RSDCL-4(IP) S/s lost their connectivity from grid and blackout occurred at 220kV Nokhra (IP) and 220kV RSDCL-4(IP) S/s. vi)As per PMU at 220kV Nokhra(NTPC), B-N phase to earth fault (voltage dipped upto 0.269 p.u.) is observed with fault clearing time of 80ms. vii)As per PMU, solar generation loss of approx. 295 MW at Nokhra(IP) and 178 MW at RSDCL-4(IP) were observed.	473	0	80	N (Partial details received)	N (Partial details received)	N (Partial details received)
8	GD-1	i) 220 KV Anta(NT)-Sakatpura(RS) (RS) Ckt-1 ii) 220 KV SAWAIMADHOPUR(RS)- Anta(NT) (PG) CKT-1	Rajasthan	NTPC, RVPNL &PGCIL	22-Jan-25	09:13	i)Generation of 220kV Anta station evacuate through 220 KV Anta(NT)-Sakatpura(RS) (RS) Ckt-1, 220 KV SAWAIMADHOPUR(RS)- Anta(NT) (PG) CKT-1, 220 KV ANTA(NT)-BHILWARA(RS) (PG) CKT-1 & 2, 220 KV LALSOTE(RS)-Anta(NT) (PG) CKT-1 and 220 KV RAPS_C(NP)-ANTA(NT) (PG) CKT-1 respectively. ii)During antecedent condition, GT-I, II & III, 220 KV ANTA(NT)-BHILWARA(RS) (PG) CKT-1 & 2, 220 KV RAPS_C(NP)-ANTA(NT) (PG) CKT-1 were under shutdown respectively (as per PMU). iii)As reported, at 09:13hrs, 220 KV Anta(NT)-Sakatpura(RS) (RS) Ckt-1 tripped on B-N phase to earth fault with fault distance of 54.5km and fault current of 1.07kA from Anta end(Z2 Operated). During the inspection it was found that B-Phase CT of 220 KV Anta(NT)-Sakatpura(RS) (RS) Ckt-1 failed on Sakatpura end . iv)Again at 10:10 hrs, 220 KV SAWAIMADHOPUR(RS)- Anta(NT) (PG) CKT-1 which was carrying 52MW load tripped due to high voltage (details of tripping awaited). And this led to the blackout of 220KV Anta substation. v)As per PMU at 400KV Kota(PG), B-N phase to earth fault (voltage dipped upto 0.71 p.u.) is observed with fault clearing time of 120ms. vi)As per PMU, solar generation loss of approx. 38 MW at 09:13 hrs and 54 MW at 10:10 hrs occurred in Anta was observed.	54	0	120	N (Partial details received)	N (Partial details received)	N (Partial details received)
9	GD-1	i) 220 KV Fatehabad(PG)-Hukmawali (HV) (HVPNL) Ckt-1 ii) 220 KV Fatehabad(PG)-Hukmawali (HV) (HVPNL) Ckt-2 iii) 220 kV HUKMAWALI(HV)-CHORMAR(HV) CKT-1 iv) 220 kV HUKMAWALI(HV)-CHORMAR(HV) CKT-2	Haryana	HVPNL & PGCIL	23-Jan-25	06:09	i)220/132/33KV HUKMAWALI S/stn sub-station has double main bus scheme in all voltage level. ii)During antecedent condition, 220 KV Fatehabad(PG)-Hukmawali (HV) (HVPNL) Ckt-1, 220 KV Fatehabad(PG)-Hukmawali (HV) (HVPNL) Ckt-2, and 220 kV HUKMAWALI(HV)-CHORMAR(HV) CKT-1 were carrying 27MW, 28MW and 19MW load respectively. iii)As reported at 06:09hrs, B-phase CT of 220 kV HUKMAWALI(HV)-CHORMAR(HV) CKT-1 exploded and thereby led to Bus bar protection operation. This resulted in tripping of all the elements connected to 220KV Bus bar. As a result, the Sub-station lost its connectivity to the Grid and Blackout occurred. iv)As per DR and EL of 220 KV Fatehabad(PG)-Hukmawali (HV) (HVPNL) Ckt-1 at 220KV Fatehabad, the line tripped due to Main-1, Zone-2 protection operation. The fault current in B phase was 6.8KA and Y phase was 7.4KA. v)As per PMU at 400 Fatehabad (PG), B-N fault converted to Y-B-N fault is observed with delayed fault clearing time of 400ms. vi)As per SCADA, no change in demand in Haryana control area is observed.	0	0	400	Y(d)	Y(d)	N
10	GI-1	i) 220 KV BTPSL_SL_BIK2_PG-Bikaner_2 (PBTSL) (BANDERWALA_TPSL) Ckt-1	Rajasthan	RVPNL & PGCIL	24-Jan-25	16:38	i)Generation of 220kV Tata Power Saurya Banderwala evacuate through 220 KV BTPSL_SL_BIK2_PG-Bikaner_2 (PBTSL) (BANDERWALA_TPSL) Ckt. ii)During antecedent condition, 220 KV BTPSL_SL_BIK2_PG-Bikaner_2 (PBTSL) (BANDERWALA_TPSL) Ckt was evacuating 126MW of load (as per PMU). iii)As reported, at 16:38hrs, 220 KV BTPSL_SL_BIK2_PG-Bikaner_2 (PBTSL) (BANDERWALA_TPSL) Ckt tripped on B-N phase to earth fault. (exact reason of tripping and nature of protection operated yet to be shared). Due to tripping of the evacuation path, the sub-station lost its connectivity from grid and blackout occurred at 220 kV Tata Power Saurya Banderwala S/S. iv)As per PMU at TPSB, B-N phase to earth fault (voltage dipped upto 0.02 p.u.) is observed with unsuccessful A/R operation is observed. v)As per PMU, solar generation loss of approx. 126MW of Generation loss had occurred in TPSB and 269 MW of change in NR Solar generation was observed.	269	0	1200	N (Partial details received)	N (Partial details received)	N (Partial details received)
11	GI-2	(i)400/220 kV 500 MVA ICT 1 at Jehta_Hardoi Road (UP) (ii)400/220 kV 500 MVA ICT 2 at Jehta_Hardoi Road (UP) (iii)220/132kV 200 MVA ICT-1 at Jehta(UP) (iv)220/132kV 200 MVA ICT-2 at Jehta(UP) (v)220kV Jehta-Hardoi road (UP) ckt-1 (vi)220kV Jehta-Hardoi road (UP) ckt-2 (vii)220kV Jehta-Mallawan (UP) ckt-1 (viii)220kV Jehta-Mallawan (UP) ckt-2 (ix)220kV Bus coupler at Jehta(UP)	Uttar Pradesh	UPPTCL	29-Jan-25	12:09	i)400/220/132KV Jehta S/stn sub-station has double main bus scheme in all voltage level. ii)During antecedent condition, 400/220 kV 500 MVA ICT-1 & ICT-2 were connected to 400kV bus-1 and bus-2 respectively carrying 107MW of load each. 220/132KV ICT-3 and ICT-4 were carrying 35MW load each. iii)As reported at 12:09 hrs, 400/220KV ICT -1 and ICT-2 tripped due to Bus Bar protection. This led to further tripping of 220/132KV ICT-3 and ICT-4 downstream along with tripping of both 220KV Bus-I and Bus-II. As a result, all the elements connected to 220KV Bus Bar tripped. iv)DR and EL submitted by SLDC for 400/220KV ICT-1 and 2, shows Bus Bar protection operation. However as per PMU no fault was observed. Reason of operation of bus bar protection need to be shared. v)As per SCADA, 252MW of change in demand is observed in Rajasthan control area.	0	252	NA	Y	Y	Y

Sr No	Element Name	Outage Date	Outage Time	Reason
1	220 KV RAPS_A(NP)-Sakatpura(RS) (RS) Ckt-1	08-Jan-25	00:58	Phase to earth fault R-N. As per PMU, R-N fault occured, no auto-reclosing is observed.
		20-Jan-25	01:09	Phase to earth fault R-N. As per PMU, no fault is observed ar the reported time, but R-N fault occurred at 01:05 hrs, no auto-reclosing is observed.
		20-Jan-25	03:32	Phase to earth fault R-N. As per PMU, R-N fault occured, no auto-reclosing is observed.
		20-Jan-25	06:53	Phase to earth fault R-N. As per PMU, R-N fault occured, no auto-reclosing is observed.
		22-Jan-25	09:13	Failure of CT. As per PMU, B-N fault occured, no auto-reclosing is observed.
		23-Jan-25	03:24	Phase to earth fault R-N. As per PMU, R-N fault occured, no auto-reclosing is observed.
		26-Jan-25	06:18	Phase to earth fault R-N. As per PMU, R-N fault occured, no auto-reclosing is observed.
		30-Jan-25	04:07	Phase to earth fault R-N. As per PMU, R-N fault occured, no auto-reclosing is observed.
2	220 KV Agra(PG)-Bharatpur(RS) (PG) Ckt-1	01-Jan-25	01:48	Phase to earth fault Y-N. As per PMU, Y-N fault and unsuccessful auto-reclosing observed.
		03-Jan-25	07:19	Phase to earth fault B-N. As per PMU, B-N fault and unsuccessful auto-reclosing observed.
		21-Jan-25	05:19	Phase to earth fault R-N. As per PMU, no fault is observed ar the reported time, but R-N fault occurred at 05:15 hrs, no auto-reclosing is observed.
		22-Jan-25	04:58	Phase to earth fault Y-N. As per PMU, no fault is observed ar the reported time, but Y-N fault occurred at 04:55 hrs, no auto-reclosing is observed.
		23-Jan-25	04:43	Phase to earth fault B-N. As per PMU, B-N fault and unsuccessful auto-reclosing observed.
3	400 KV Anpara_B(UPUN)-Sarnath(UP) (UP) Ckt-2	06-Jan-25	02:37	Phase to earth fault R-N. As per PMU, R-N fault occured, no auto-reclosing is observed.
		06-Jan-25	06:25	Phase to Phase Fault R-Y. As per PMU, R-Y fault is observed.
		14-Jan-25	15:48	Earth fault. As per PMU, R-Y fault is observed.
4	400 KV Noida Sec 148-Noida Sec 123 (UP) Ckt-1	06-Jan-25	21:25	Phase to earth fault B-N. As per PMU, no fault is observed ar the reported time, but B-N fault occurred at 21:18 hrs, no auto-reclosing is observed.
		10-Jan-25	06:53	Phase to earth fault B-N. As per PMU, B-N fault occured, no auto-reclosing is observed.
		16-Jan-25	00:23	Phase to earth fault B-N. As per PMU, As per PMU, no fault is observed ar the reported time, but B-N fault occurred at 00:13 hrs, no auto-reclosing is observed.
5	132 KV Dehar(BB)-Kangoo(HP) (HPPTCL) Ckt-1	01-Jan-25	16:10	Phase to earth fault B-N. As per PMU, no fault is observed.
		19-Jan-25	14:54	Phase to Phase Fault R-Y. As per PMU, R-Y fault is observed.
		20-Jan-25	23:48	Phase to earth fault Y-N. As per PMU, R-N fault occured, no auto-reclosing is observed.
6	220 KV RAPS_A(NP)-Sakatpura(RS) (RS) Ckt-2	03-Jan-25	06:28	Phase to earth fault R-N. As per PMU, R-N fault occured, no auto-reclosing is observed.
		26-Jan-25	00:15	Phase to earth fault R-N. As per PMU, R-N fault occured, no auto-reclosing is observed.
		26-Jan-25	02:02	Phase to earth fault R-N. As per PMU, R-N fault occured, no auto-reclosing is observed.
7	220 KV Sohawal(PG)-Barabanki(UP) (UP) Ckt-1	06-Jan-25	03:37	Phase to earth fault B-N. As per PMU, no fault is observed at the reported time, but Y-N fault occurred at 03:49 hrs, no auto-reclosing is observed.
		25-Jan-25	15:20	Phase to earth fault R-N. As per PMU, R-Y fault is observed.
		25-Jan-25	17:52	PLCC maloperation. As per PMU, no fault is observed.
8	400 KV Merta-Ratangarh (RS) Ckt-1	04-Jan-25	18:48	Phase to earth fault R-N. As per PMU, B-N fault occured, no auto-reclosing is observed (Phase sequence issue).
		22-Jan-25	07:02	Phase to earth fault R-N. As per PMU, B-N fault occured, no auto-reclosing is observed (Phase sequence issue).
		28-Jan-25	01:21	Phase to earth fault B-N. As per PMU, Y-N fault occured, no auto-reclosing is observed (Phase sequence issue).
9	400 KV Mohanlalganj (PGYTL)-Unnao(UP) (PGYTL) Ckt-1	06-Jan-25	02:02	Phase to earth fault R-N. As per PMU, R-N fault occured, no auto-reclosing is observed.
		06-Jan-25	03:49	Phase to earth fault B-N. As per PMU, Y-N fault occured, no auto-reclosing is observed (Phase sequence issue).
		18-Jan-25	01:23	Over Voltage. As per PMU, no fault is observed.

Annexure-B.IV

Grid Event to be discussed in 57th PSC Meeting

S.No.	Category of Grid Incident/ Disturbance	Name of Elements (Tripped/Manually opened)	Affected Area	Owner/ Agency	Outage		Event (As reported)	Loss of generation / loss of load during the Grid Disturbance		Fault Clearance time (in ms)	Points of discussion
	(GI-I to GD-V)				Date	Time		Generation Loss(MW)	Load Loss (MW)		
1	GD-1	(i)210 MW Guru Gobind Singh TPS (Ropar) - UNIT 6 (ii)210 MW Guru Gobind Singh TPS (Ropar) - UNIT 3 (iii)210 MW Guru Gobind Singh TPS (Ropar) - UNIT 4	Punjab	PSTCL	6-Jan-25	09:32	i)220/132 KV Ropar (GGSTP) has double main bus system in 220KV and 132KV side. ii)During antecedent condition, 210 MW Guru Gobind Singh TPS (Ropar) - UNIT 3, Unit 4 and Unit 6 generating 180MW, 167MW and 176MW respectively. iii)As reported at 09:32 hrs, during the synchronization of the 210 MW Unit-5 at Guru Gobind Singh Thermal Power Station (Ropar), the R- phase limb of the 220 kV generator transformer circuit breaker for Unit-5 ruptured. This incident triggered the tripping of Units 3, 4, and 6, each with a capacity of 210 MW. Consequently, a blackout occurred at the 220 kV Guru Gobind Singh TPS substation. (Details of protection operation yet to be received). iv)As observed from PMU at Abdullapur (PG) S/s, R-N phase to earth fault was observed. Fault clearance time of 120 msec can be seen in the PMU. v)During this event, a total generation loss of 521MW was observed in Punjab control area . (As per SCADA). vi)As per SCADA, 225MW of change in demand is observed in Punjab control area.	225	521	120	Details analysis of the event and remedial action taken details.
2	GI-2	(i)220 kV Akal – Bhainsara Ckt-1 (ii)220 kV Akal – Bhainsara Ckt-2 (iii)400/220 KV 500 MVA ICT 1 AT AKAL(RS) (iv)400/220 KV 500 MVA ICT 2 AT AKAL(RS) (v)400/220 KV 500 MVA ICT 3 AT AKAL(RS) (vi)400/220 KV 500 MVA ICT 4 AT AKAL(RS) (vii)220 kV Akal(RS) BUS-1 (viii)220 kV Akal(RS) BUS-2 (ix)220 KV AKAL-GIRAL (x)220KV AKAL-BARMER (xi)220 AKAL- AMARSAGAR (xii)220 AKAL- MADA (xiii)220 AKAL- AKAL(SUZLON) ckt-1 (xiv)220 AKAL- AKAL(SUZLON) ckt-2 (xv)220 AKAL- RAJGARH (xvi)220 AKAL- JAJIYA (xvii)220 AKAL- BHU ckt-1 (xviii)220 AKAL- BHU ckt-2 (xix)220 AKAL- DANGRI ckt-1 (xx)220 AKAL- DANGRI ckt-2 (xxi)220 AKAL- MOOLANA (xxii)220 AKAL- LALA	Rajasthan	RVPNL	9-Jan-25	23:35	i)400/220kV Akal(RS) has one and half breaker scheme at 400kV level and double main and transfer bus scheme at 220kV level. ii)During antecedent condition, 400/220 kV 500 MVA ICT-1 & ICT-2 were connected to 400kV bus-1 and 400/220 kV 315 MVA ICT-3 & 500 MVA ICT-4 were connected to 400kV bus-2. iii)As reported, at 23:35 hrs, Y-phase jumper of 220kV bus-1 of 220kV Akal-Bhensara Ckt-1 snapped which created bus fault on both 220kV buses at Akal(RS). iv)As per PMU at Bhadla(PG), Y-N phase to earth fault with delayed fault clearance time of 720 msec is observed. v)Bus bar protection is not in service at 220kV side of Akal S/s. Therefore, fault cleared with the operation of back up protection i.e., 400/220kV ICTs at Akal. All four ICTs tripped on O/C E/F protection operation. vi)Due to tripping of all four ICTs at Akal(RS), evacuation path lost for all the wind power plants connected at 220kV bus-1 & bus-2 at Akal(RS). On this, both 220kV buses became dead at Akal(RS) S/s. vii)During this event, dip in Rajasthan wind generation of approx. 523 MW is observed out of which approx. 232 MW recovered within 6 minutes. (As per SCADA). viii)As per SCADA, about 171MW demand change is observed in Rajasthan control area.	523	171	720	Details analysis of the event and remedial action taken details.
3	GI-2	(i)400/220 kV 250 MVA ICT 1 at Heerapura(RS) (ii)400/220 kV 250 MVA ICT 3 at Heerapura(RS)	Rajasthan	RVPNL	10-01-2025	13:35:00	i)400/220KV Heerapura sub-station has one and half breaker scheme in the 400KV side and Double main & transfer scheme in the 220 KV side. ii)As reported at 13:35hrs, a kite thread fell on the 220KV side of the ICTs. As a result Bus- Bar protection operated on the 220KV side led to tripping 400/220 kV 250 MVA ICT 1 and 3 at Heerapura(RS). (exact reason and nature of protection operated yet to be shared). iii)As per PMU at Heerapura (RS), R-N fault (delayed fault clearance in R-ph) is observed with delayed fault clearing time of 320ms. iv)As per SCADA, change in demand of approx. 320MW in Rajasthan control area is observed.	0	320	320	Details analysis of the event and remedial action taken details.
4	GD-1	(i)400/220 KV 500 MVA ICT 1 AT AKAL(RS) (ii)400/220 KV 500 MVA ICT 2 AT AKAL(RS) (iii)400/220 KV 500 MVA ICT 3 AT AKAL(RS) (iv)400/220 KV 500 MVA ICT 4 AT AKAL(RS) (v)400/220 KV 500 MVA ICT 2 AT RAMGARH(RS) (vi)400 KV AKAL-JODHPUR (RS) CKT-1 (vii)400 KV AKAL-BARMER (RS) CKT-1 (viii)400 KV AKAL-JAISALMER (RS) CKT-1 (ix)400 KV AKAL-RAMGARH (RS) CKT-1 (x)400 KV AKAL-RAMGARH (RS) CKT-2 (xi)400 KV AKAL-KANKANI (RS) CKT-1	Rajasthan	RVPNL	12-01-2025	06:31:00	i)400/220kV Akal(RS) has one and half breaker scheme at 400kV level and double main and transfer bus scheme at 220kV level. ii)During antecedent condition, 400/220 kV 500 MVA ICT-1 & ICT-2 were connected to 400kV bus-1 and 400/220 kV 315 MVA ICT-3 & 500 MVA ICT-4 were connected to 400kV bus-2. iii)As reported, at 06:31 hrs, B-N fault occurred on 400 KV Akal-Barmer (RS) Ckt, fault distance was 99.62KM and fault current was 2.42 KA from Barmer end. iv)However, as observed from PMU at Bhadla (PG) S/s, B-N fault was observed and subsequently it converted to Y-B-N double phase to earth fault. Delayed fault clearance time of 2120 msec can be seen in the PMU. v)On this fault, line tripped from Barmer end but breaker of Akal end got stuck due to issue in SF6 gas pressure. Due to non opening of breaker of Akal end, LBB protection would have operated. vi)However, all the 400kV lines and 400/220kV ICTs at Akal tripped during the event. Exact details of protection operation not received yet from SLDC-Rajasthan. vii)Due to tripping of all four ICTs at Akal(RS), evacuation path lost for all the wind power plants connected at 220kV bus-1 & bus-2 at Akal(RS). On this, both 400 and 220kV buses became dead at Akal(RS) S/s. viii)During this event, a dip in Rajasthan wind generation of approx. 340 MW is observed which recovered completely within 5 minutes. (As per SCADA). ix)As per SCADA, 206MW of change in demand is observed in Rajasthan control area.	340	206	2120	Details analysis of the event and remedial action taken details.
5	GD-1	1) 220 KV Bhadla_2 (PG)-RSDCL(PSS4)_SL_BHD2_PG (RSDCL) Ckt 2) 220 KV Nokhra SL_BHD2 (NTPC)-Bhadla_2 (PG) (NTPC_NOKHRA) Ckt 3) 220/33 kV 100 MVA ICT 1 at Nokhra SL_BHD2 (NTPC) 4) 220/33 kV 100 MVA ICT 2 at Nokhra SL_BHD2 (NTPC) 5) 220/33 kV 100 MVA ICT 3 at Nokhra SL_BHD2 (NTPC)	Rajasthan	PGCIL, RSDCL, NTPC	14-Jan-25	13:13	i)Generation of 220kV Nokhra (IP) and 220kV RSDCL-4(IP) stations evacuate through 220 KV Nokhra SL_BHD2 (NTPC)-Bhadla_2 (PG) (NTPC_NOKHRA) Ckt and 220 KV Bhadla_2 (PG)-RSDCL(PSS4)_SL_BHD2_PG (RSDCL) Ckt respectively. ii)During antecedent condition, 220kV Nokhra (IP) and 220kV RSDCL-4(IP) were generating approx. 295 MW and 178 MW respectively (as per PMU). iii)As reported, at 13:13hrs, 220 KV Bhadla_2 (PG)-RSDCL(PSS4)_SL_BHD2_PG (RSDCL) Ckt tripped on B-N phase to earth fault with fault distance of 1.3km and fault current of 23.4kA from Bhadla2(PG) end. During inspection it was found that jumper snapped out at tower location no. 8. iv)During the same time, 220 KV Nokhra SL_BHD2 (NTPC)-Bhadla_2 (PG) (NTPC_NOKHRA) Ckt along with 220/33 kV 100 MVA ICT 1, 2 and 3 at Nokhra SL_BHD2 (NTPC) also tripped. Line tripped from Nokhra(NTPC) end only (exact reason of tripping and nature of protection operated yet to be shared). v)Due to tripping of 220 KV Nokhra SL_BHD2 (NTPC)-Bhadla_2 (PG) (NTPC_NOKHRA) Ckt and 220 KV Bhadla_2 (PG)-RSDCL(PSS4)_SL_BHD2_PG (RSDCL) Ckt , 220kV Nokhra (IP) and 220kV RSDCL-4(IP) S/s lost their connectivity from grid and blackout occurred at 220kV Nokhra (IP) and 220kV RSDCL-4(IP) S/s. vi)As per PMU at 220kV Nokhra(NTPC), B-N phase to earth fault (voltage dipped upto 0.269 p.u.) is observed with fault clearing time of 80ms. vii)As per PMU, solar generation loss of approx. 295 MW at Nokhra(IP) and 178 MW at RSDCL-4(IP) were observed.	473	0	80	Details analysis of the event and remedial action taken details.
6	GD-1	i) 220 KV Fatehabad(PG)-Hukmawali (HV) (HVPNL) Ckt-1 ii) 220 KV Fatehabad(PG)-Hukmawali (HV) (HVPNL) Ckt-2 iii) 220 kV HUKMAWALI(HV)-CHORMAR(HV) CKT-1 iv) 220 kV HUKMAWALI(HV)-CHORMAR(HV) CKT-2	Haryana	HVPNL & PGCIL	23-Jan-25	06:09	i)220/132/33KV HUKMAWALI S/stn sub-station has double main bus scheme in all voltage level. ii)During antecedent condition, 220 KV Fatehabad(PG)-Hukmawali (HV) (HVPNL) Ckt-1, 220 KV Fatehabad(PG)-Hukmawali (HV) (HVPNL) Ckt-2, and 220 kV HUKMAWALI(HV)-CHORMAR(HV) CKT-1 were carrying 27MW, 28MW and 19MW load respectively. iii)As reported at 06:09hrs, B-phase CT of 220 kV HUKMAWALI(HV)-CHORMAR(HV) CKT-1 exploded and thereby led to Bus bar protection operation. This resulted in tripping of all the elements connected to 220KV Bus bar. As a result, the Sub-station lost its connectivity to the Grid and Blackout occurred. iv)As per DR and EL of 220 KV Fatehabad(PG)-Hukmawali (HV) (HVPNL) Ckt-1 at 220KV Fatehabad, the line tripped due to Main-1, Zone-2 protection operation. The fault current in B phase was 6.8KA and Y phase was 7.4KA. v)As per PMU at 400 Fatehabad (PG), B-N fault converted to Y-B-N fault is observed with delayed fault clearing time of 400ms. vi)As per SCADA, no change in demand in Haryana control area is observed.	0	0	400	Details analysis of the event and remedial action taken details.
7	GD-1	i) 220 KV Agra(PG)-Kirawali(UP) (PG) Ckt-1 ii) 220 KV Auraiya(NT)-Sikandra(UP) (PG) Ckt-1 iii) 220 kV Sikandra - Agra(UP) Ckt-1 iv) 220 kV Sikandra - Agra(UP) Ckt-2	Uttar Pradesh	UPPTCL, POWERGRID	23-Jan-25	04:29	i) At 04:29 hrs, multiple elements tripped at 220kV Sikandra(UP). ii) As reported by POWERGRID, Y-N fault at ~95km from Agra(PG) end was observed. iii) During the event, all the 220kV lines connected at 220kV Sikandra tripped and complete station got blackout. iv) As per SCADA, change in UP demand of ~72 MW was observed.	0	60		Details analysis of the event and remedial action taken details.
8	GI-2	(i)400/220 kV 500 MVA ICT 1 at Jehta_Hardoi Road (UP) (ii)400/220 kV 500 MVA ICT 2 at Jehta_Hardoi Road (UP) (iii)220/132kV 200 MVA ICT-1 at Jehta(UP) (iv)220/132kV 200 MVA ICT-2 at Jehta(UP) (v)220kV Jehta-Hardoi road (UP) ckt-1 (vi)220kV Jehta-Hardoi road (UP) ckt-2 (vii)220kV Jehta-Mallawan (UP) ckt-1 (viii)220kV Jehta-Mallawan (UP) ckt-2 (ix)220kV Bus coupler at Jehta(UP)	Uttar Pradesh	UPPTCL	29-Jan-25	12:09	i)400/220/132KV Jehta S/stn sub-station has double main bus scheme in all voltage level. ii)During antecedent condition, 400/220 kV 500 MVA ICT-1 & ICT-2 were connected to 400kV bus-1 and bus-2 respectively carrying 107MW of load each. 220/132KV ICT-3 and ICT-4 were carrying 35MW load each. iii)As reported at 12:09 hrs, 400/220KV ICT -1 and ICT-2 tripped due to Bus Bar protection. This led to further tripping of 220/132KV ICT-3 and ICT-4 downstream along with tripping of both 220KV Bus-I and Bus-II. As a result, all the elements connected to 220KV Bus Bar tripped. iv)DR and EL submitted by SLDC for 400/220KV ICT-1 and 2, shows Bus Bar protection operation. However as per PMU no fault was observed. Reason of operation of bus bar protection need to be shared. v)As per SCADA, 252MW of change in demand is observed in Rajasthan control area.	0	252	NA	Details analysis of the event and remedial action taken details.

Utilities are requested to prepare detailed analysis report and present the event details during 57th PSC meeting of following grid events (Events involving more than one utility may be jointly prepared and presented):

Multiple element tripping event at 220/132kV Ropar(GGSTP)

At 09:32 hrs on 06th January, 2025

Tripped Elements

S. No	Name of Elements	Outage Time	Revival Time	Reason of tripping
1.	210 MW Guru Gobind Singh TPS (Ropar) - UNIT 6	09:32 hrs	18:50 hrs	R-N fault during synchronization of 210MW Guru Gobind Singh TPS (Ropar) - UNIT 5
2.	210 MW Guru Gobind Singh TPS (Ropar) - UNIT 3		11:35 hrs (08.01.25)	
3.	210 MW Guru Gobind Singh TPS (Ropar) - UNIT 4		18:15 hrs	

Brief details of the event

i) 220/132 KV Ropar (GGSTP) has double main bus system in 220KV and 132KV side.

ii) During antecedent condition, 210 MW Guru Gobind Singh TPS (Ropar) - UNIT 3, Unit 4 and Unit 6 were generating approx. 180MW, 167MW and 176MW respectively.

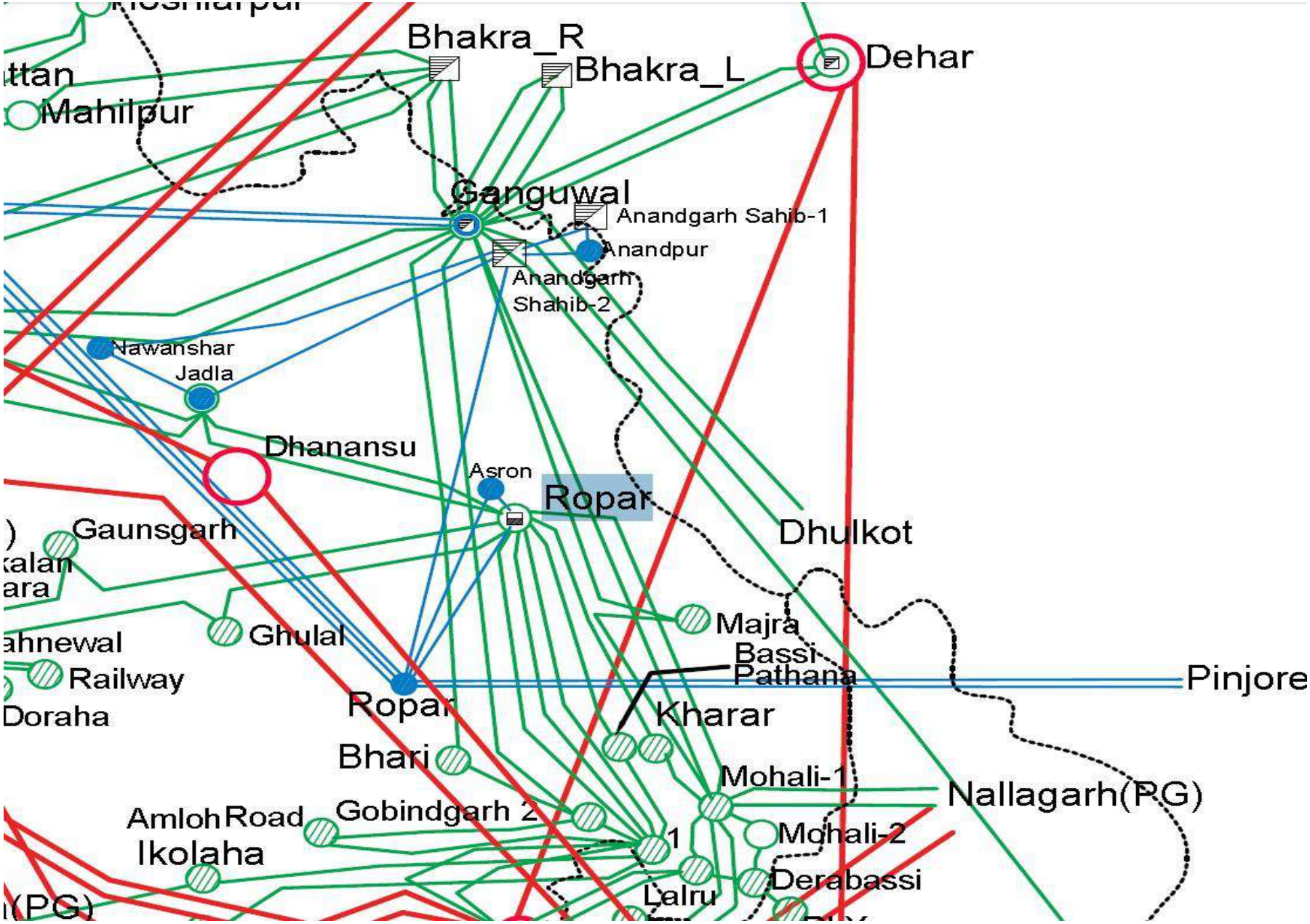
iii) As reported, at 09:32 hrs, during the synchronization of the 210 MW Unit-5 at Guru Gobind Singh Thermal Power Station (Ropar), the R- phase limb of the 220 kV generator transformer circuit breaker for Unit-5 ruptured. This incident triggered the tripping of Units 3, 4, and 6, each with a capacity of 210 MW. Consequently, a blackout occurred at the 220 kV Guru Gobind Singh TPS substation. (Details of protection operation yet to be received).

iv) As per PMU at Abdullapur (PG) S/s, R-N phase to earth fault with fault clearing time of 120ms was observed.

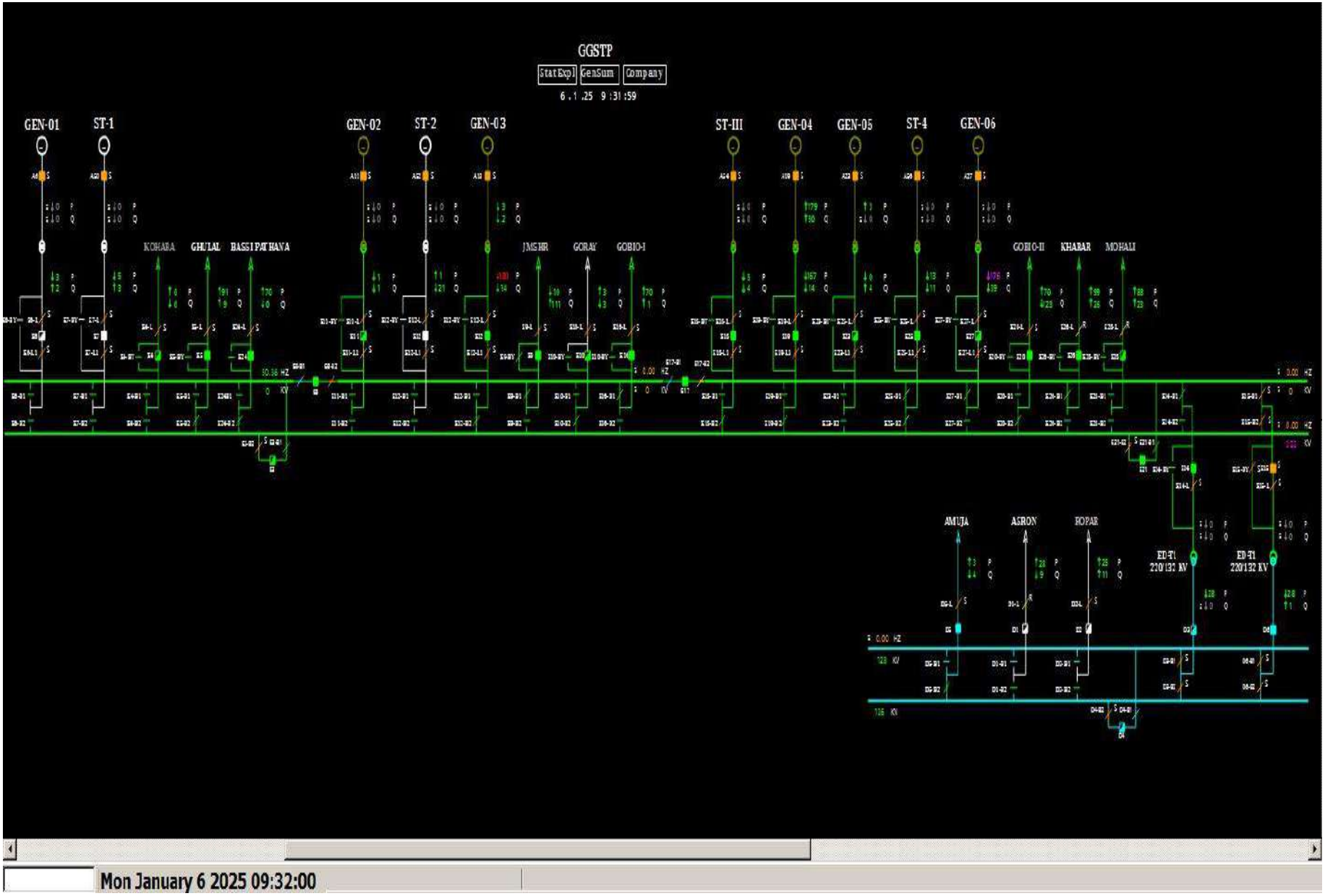
v) As per SCADA, total generation loss of approx. 521MW was observed in Punjab control area.

vi) As per SCADA, change in demand of approx. 225MW is observed in Punjab control area.

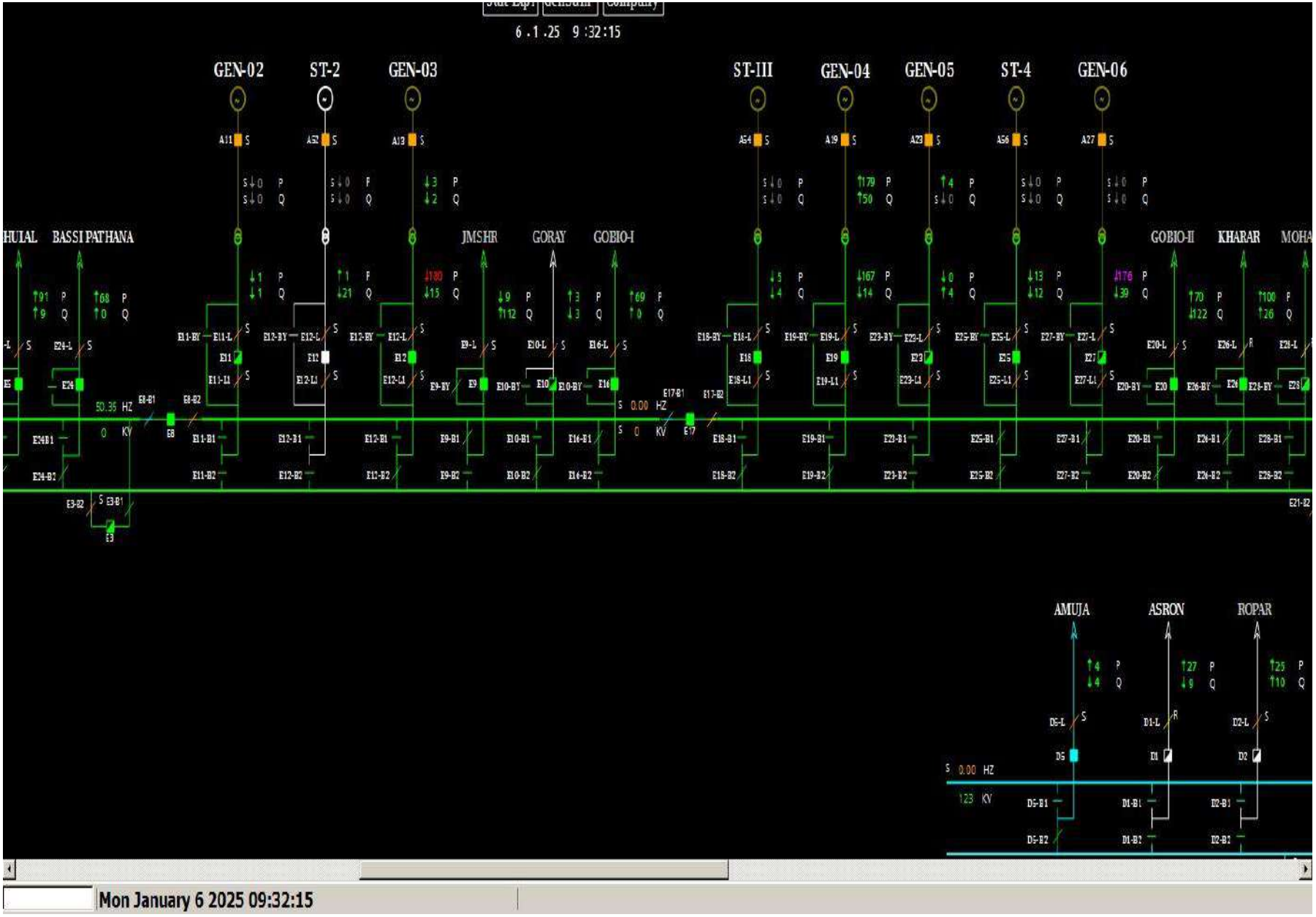
Network Diagram



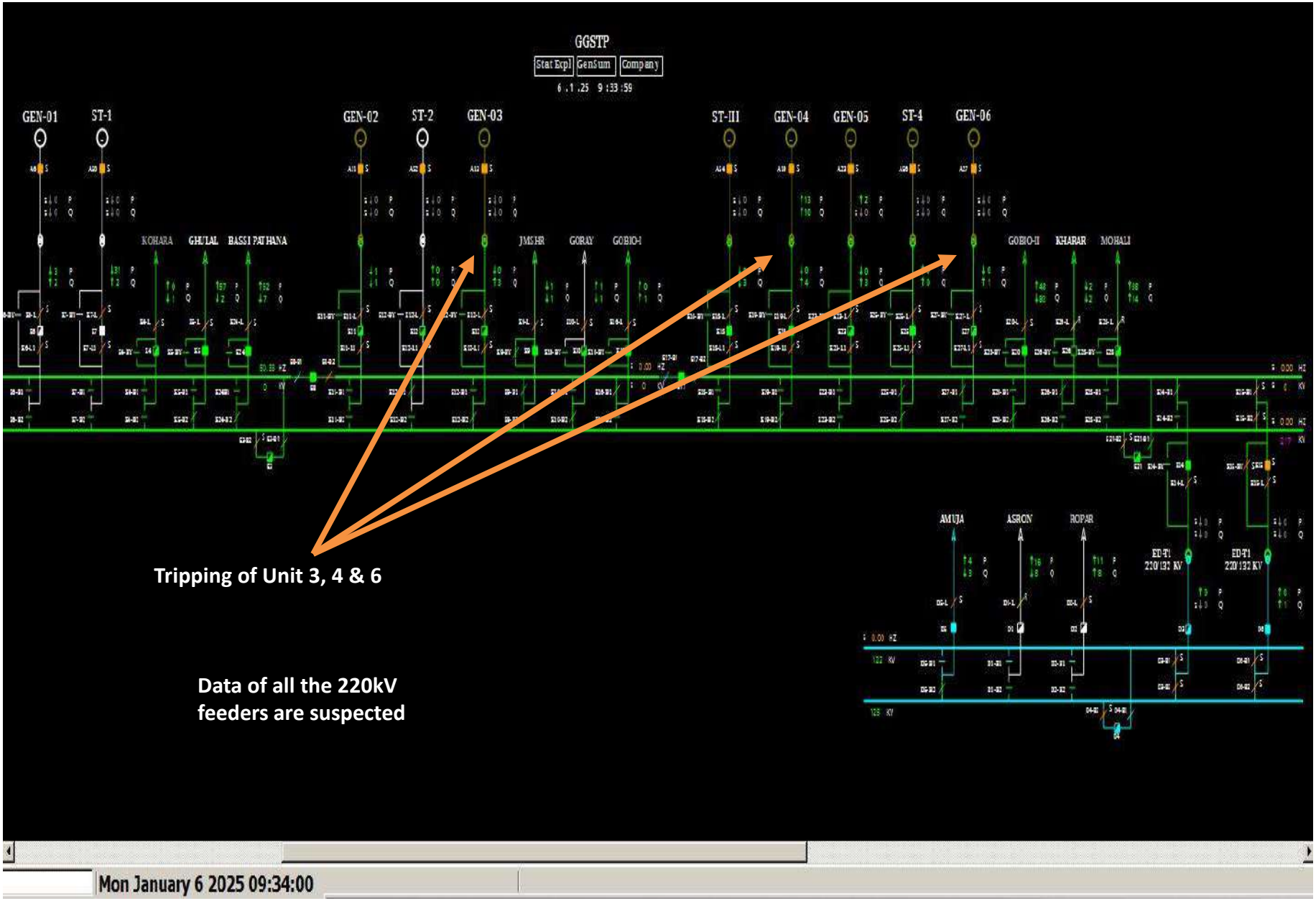
SLD of 220/132kV Ropar TPS(PS) before the event



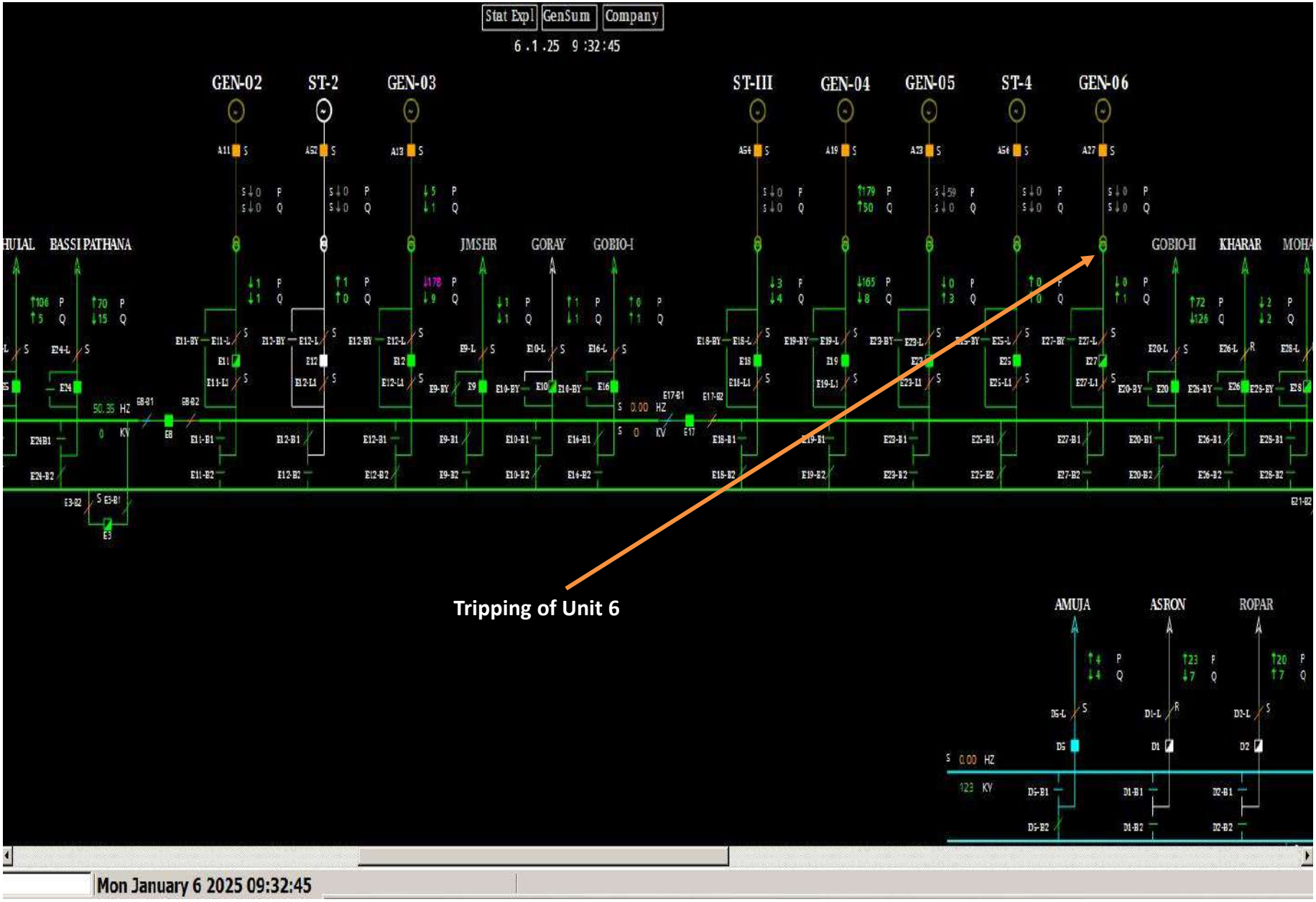
SLD of 220/132kV Ropar TPS(PS) (zoom) before the event



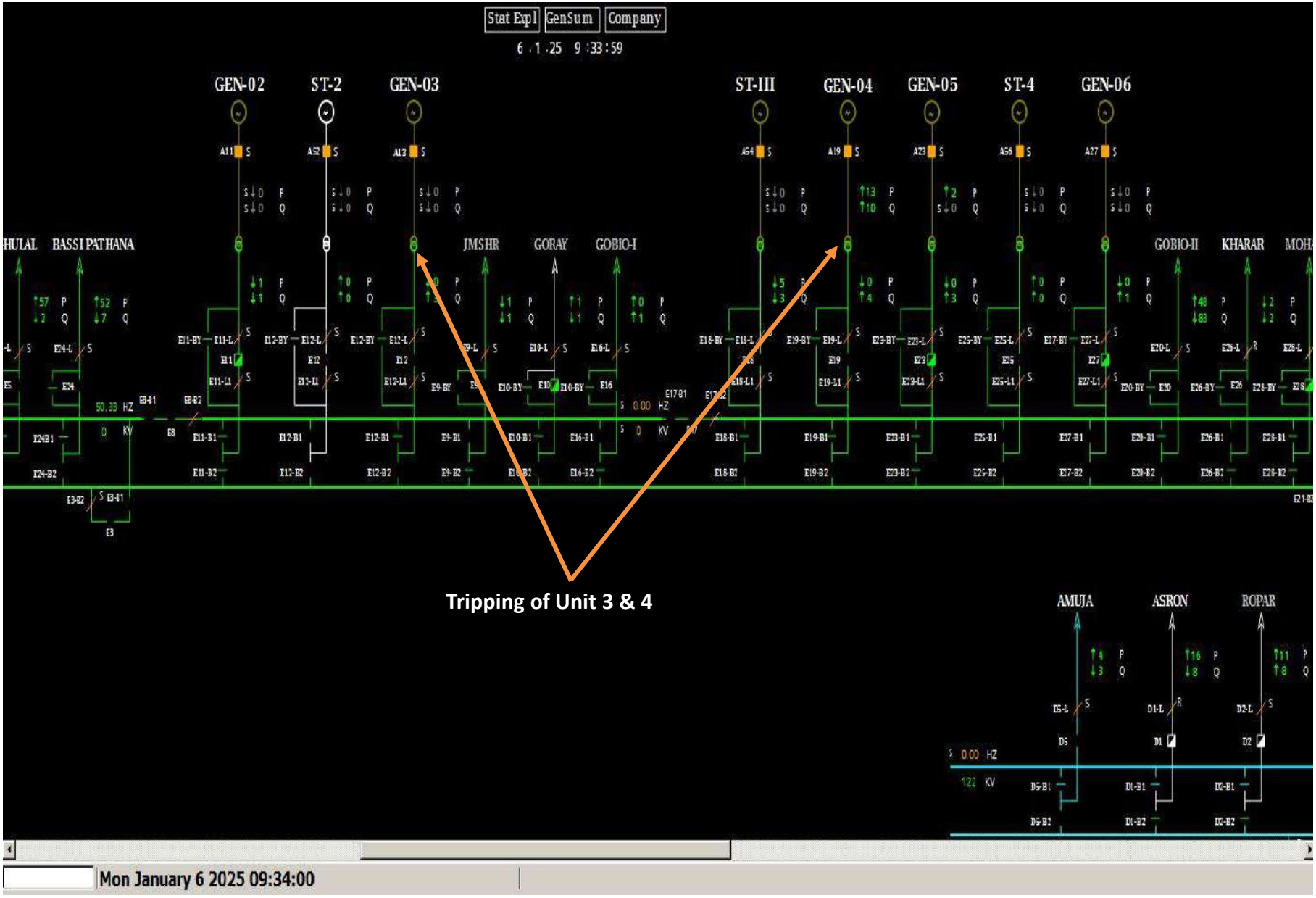
SLD of 220/132kV Ropar TPS(PS) after the event



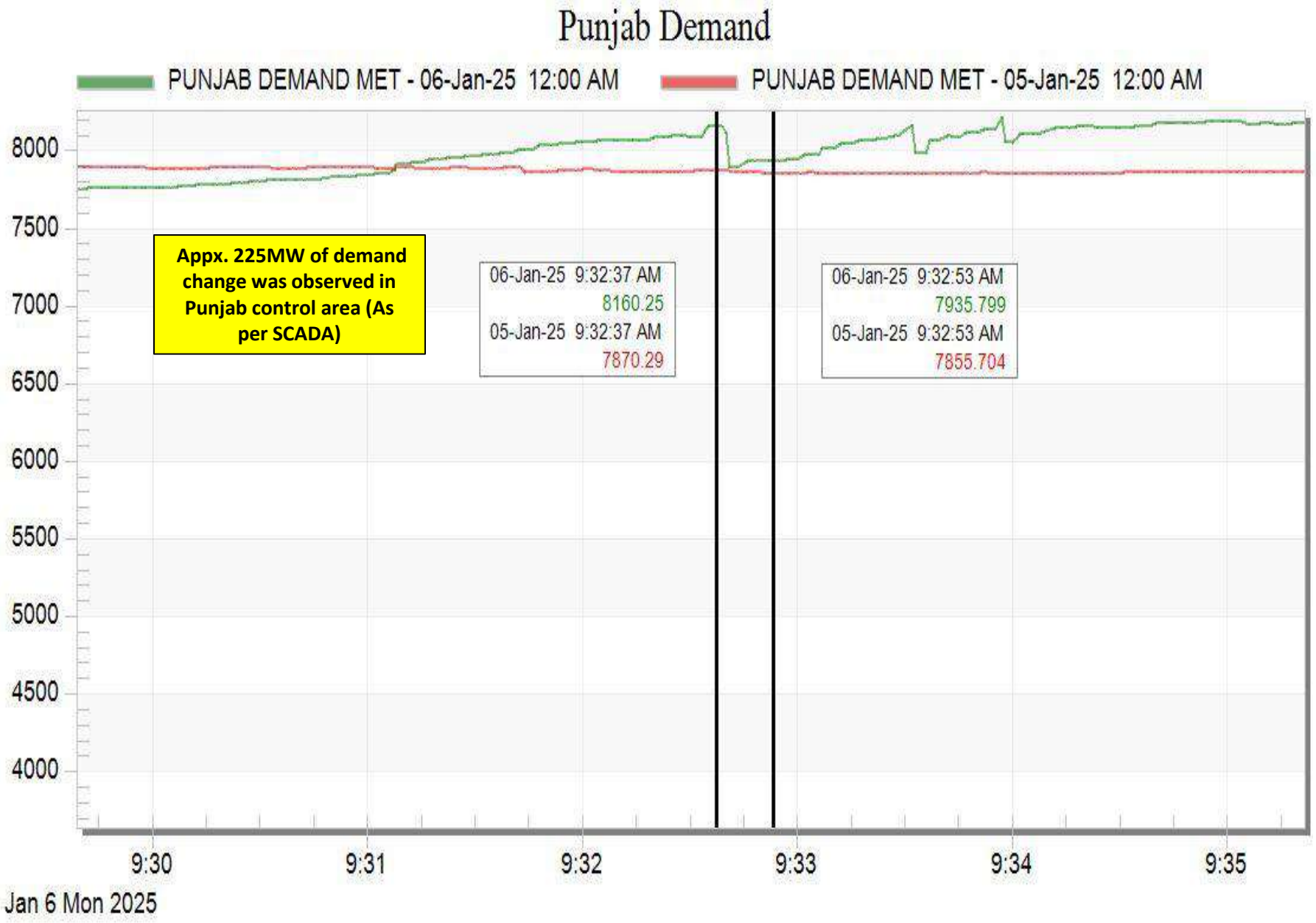
SLD of 220/132kV Ropar TPS(PS) zoom after the event



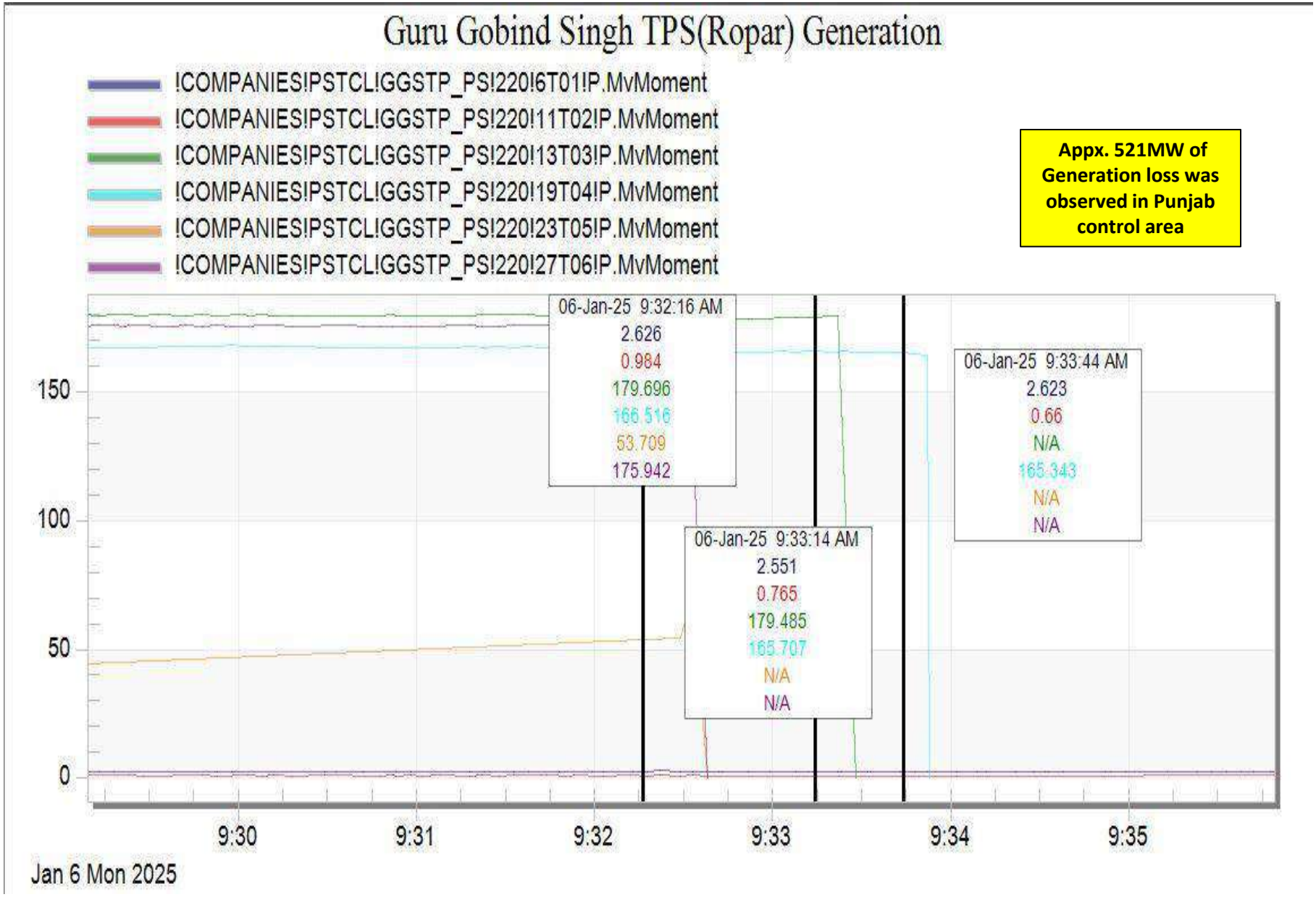
SLD of 220/132kV Ropar TPS(PS) (zoom) after the event



Punjab Demand during the event



Ropar (GGSTP) Generation during the event



PMU Plot of frequency at Abdullapur(PG)

09:32 hrs/06-Jan-25

PMU Plot of phase voltage magnitude at Abdullapur(PG)

09:32 hrs/06-Jan-25

Points for Discussion

i) Sequence of protection operation needs to be shared.

ii) Bus section wise arrangement of elements at Ropar GGSTPS(PS) need to be shared.

iii) SCADA status of the breakers and isolators were incorrect during the event and SCADA data of 220kV feeders after the event was also suspected. Availability and healthiness of SCADA data need to be ensured.

iv) DR/EL (.dat/.cfg file) of all tripped elements along with detailed tripping report and remedial action taken report need to be shared.

v) Trippings at Ropar(GGSTP) (PS) S/s are not recorded in SCADA SOE. Availability of SCADA SOE data needs to be ensured.

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

At 23:35 hrs on 09th January, 2025

Tripped Elements

S. No	Name of Elements	Outage Time	Revival Time	Reason of tripping
1.	220 kV Akal – Bhainsara Ckt-1	23:35 hrs		Jumper of the line Isolator snapped
2.	220 kV Akal – Bhainsara Ckt-2			Tripped due to 220KV Bus Bar Protection operation.
3.	400/220 kV 500 MVA ICT 1		01:40 hrs	
4.	400/220 kV 500 MVA ICT 2		01:41 hrs	
5.	400/220 kV 500 MVA ICT 3		02:03 hrs	
6.	400/220 kV 500 MVA ICT 4		02:06 hrs	
7.	220 kV Akal(RS) BUS-1		01:40 hrs	
8.	220 kV Akal(RS) BUS-2		01:40 hrs	
9.	220 KV AKAL-GIRAL			
10.	220KV AKAL-BARMER		01:23 hrs	
11.	220 AKAL- AMARSAGAR		01:25 hrs	
12.	220 AKAL- MADA		01:56 hrs	
13.	220AKAL-AKAL(SUZLON) ckt-1		01:32 hrs	
14.	220AKAL-AKAL(SUZLON) ckt-2		02:27 hrs	
15.	220 AKAL- RAJGARH		02:17 hrs	
16.	220 AKAL- JAJIYA		02:17 hrs	
17.	220 AKAL- BHU ckt-1		02:12 hrs	
18.	220 AKAL- BHU ckt-2		02:12 hrs	
19.	220 AKAL- DANGRI ckt-1		01:50 hrs	
20.	220 AKAL- DANGRI ckt-2		01:53 hrs	
21.	220 AKAL- MOOLANA		02:10 hrs	
22.	220 AKAL- LALA		02:07 hrs	

Brief details of the event

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

ii) During antecedent condition, 400/220 kV 500 MVA ICT-1 & ICT-2 were connected to 400kV bus-1 and 400/220 kV 315 MVA ICT-3 & 500 MVA ICT-4 were connected to 400kV bus-2 at Akal(RS).

iii) As reported, at 23:35 hrs, B-phase jumper of line and 220kV Bus-2 isolator snapped of 220kV Akal-Bhensara Ckt-1 which created bus fault on both 220kV buses at Akal(RS).

iv) Bus bar protection is not in service at 220kV side of Akal S/s. Therefore, fault cleared with the operation of back up O/C E/F protection operation of 400/220kV ICTs at Akal(RS).

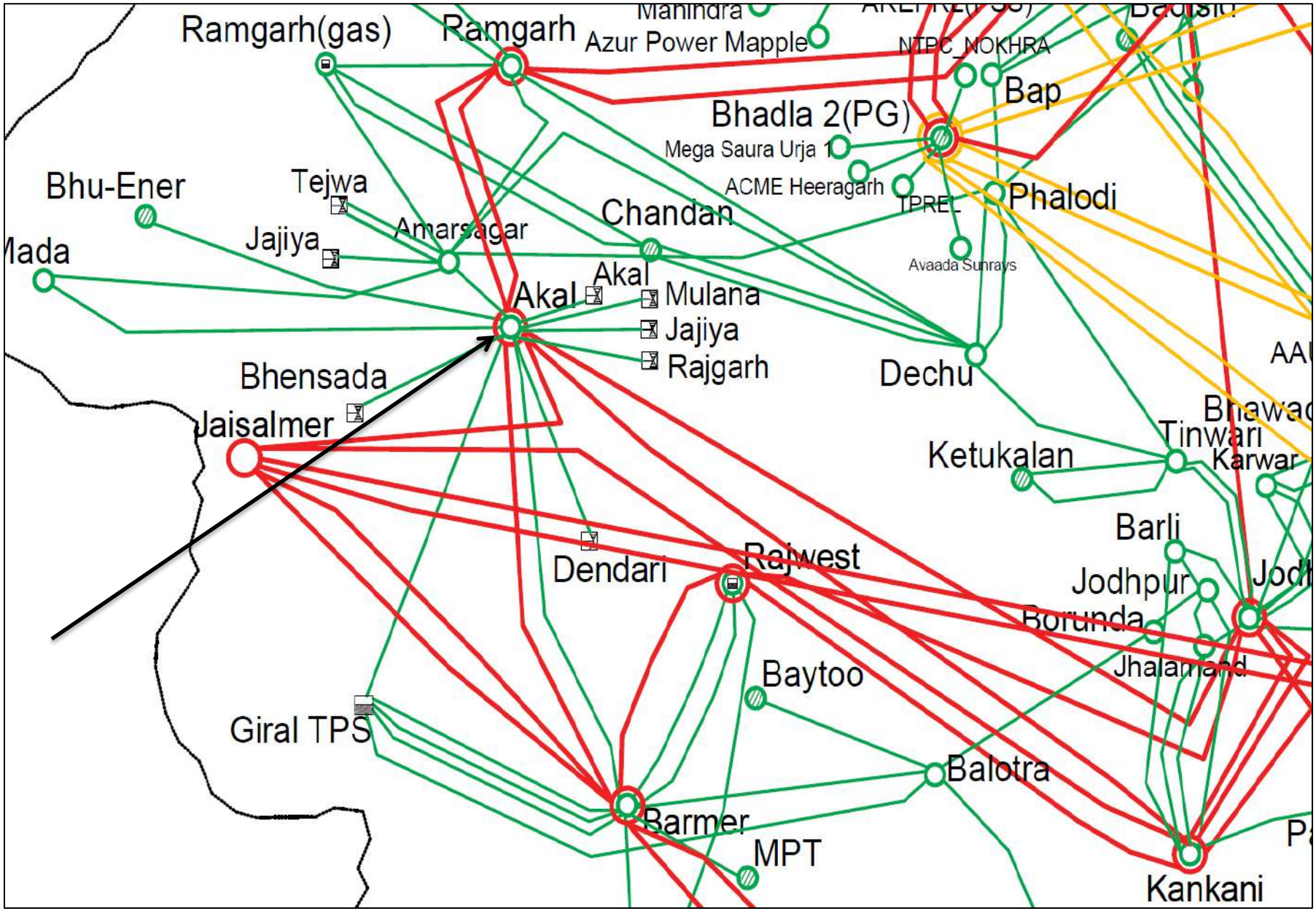
v) Due to tripping of all four ICTs at Akal(RS), evacuation path lost for all the wind power plants connected at 220kV bus-1 & bus-2 at Akal(RS). On this, both 220kV buses became dead at Akal(RS) S/s.

vi) As per PMU at Bhadla(PG), Y-N phase to earth fault with delayed fault clearance time of 720 msec is observed (Phase sequence issue observed).

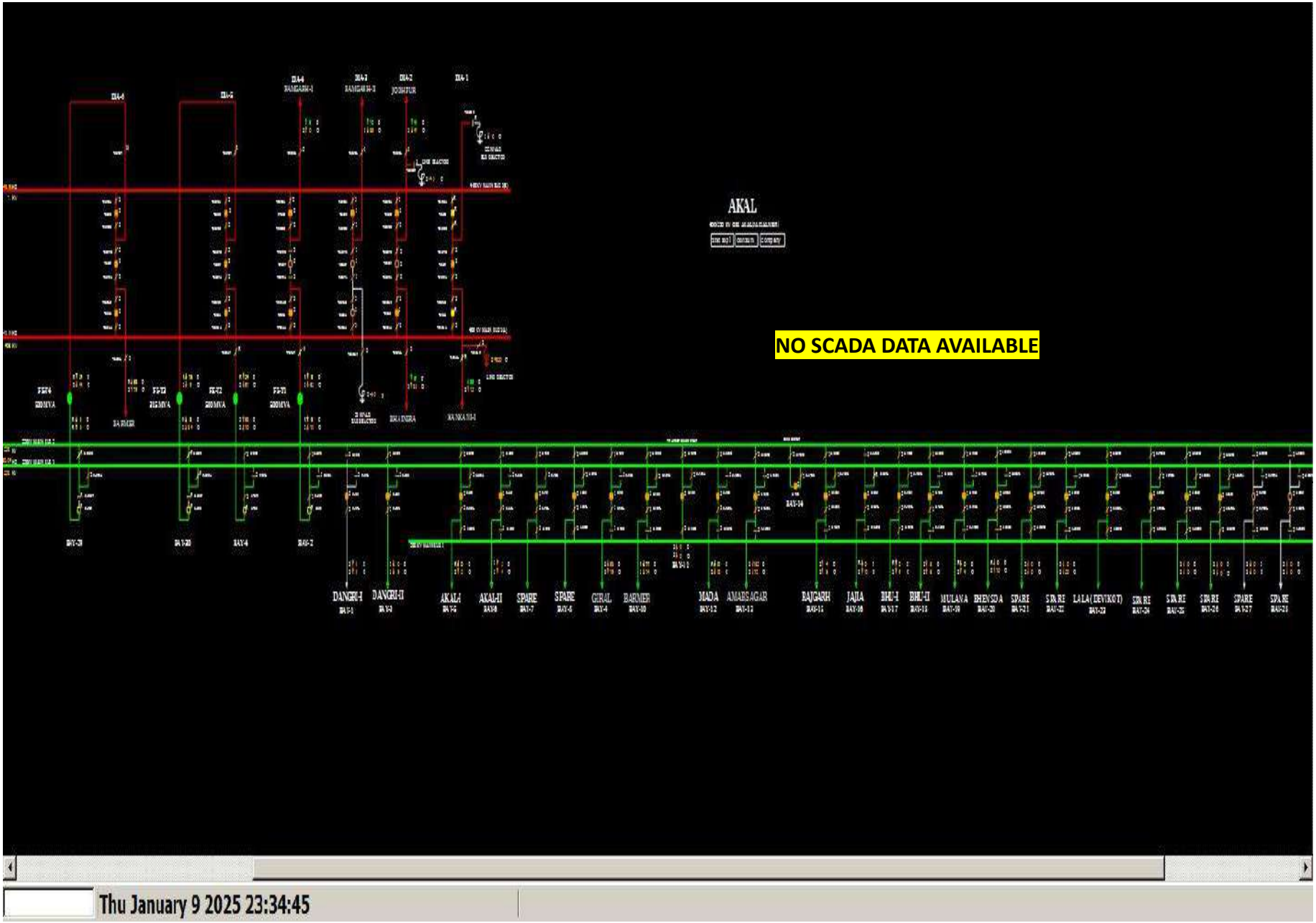
vii) As per SCADA, dip in Rajasthan wind generation of approx. 523 MW is observed out of which approx. 232 MW recovered within 6 minutes.

viii) As per SCADA, change in demand of approx. 171MW is observed in Rajasthan control area.

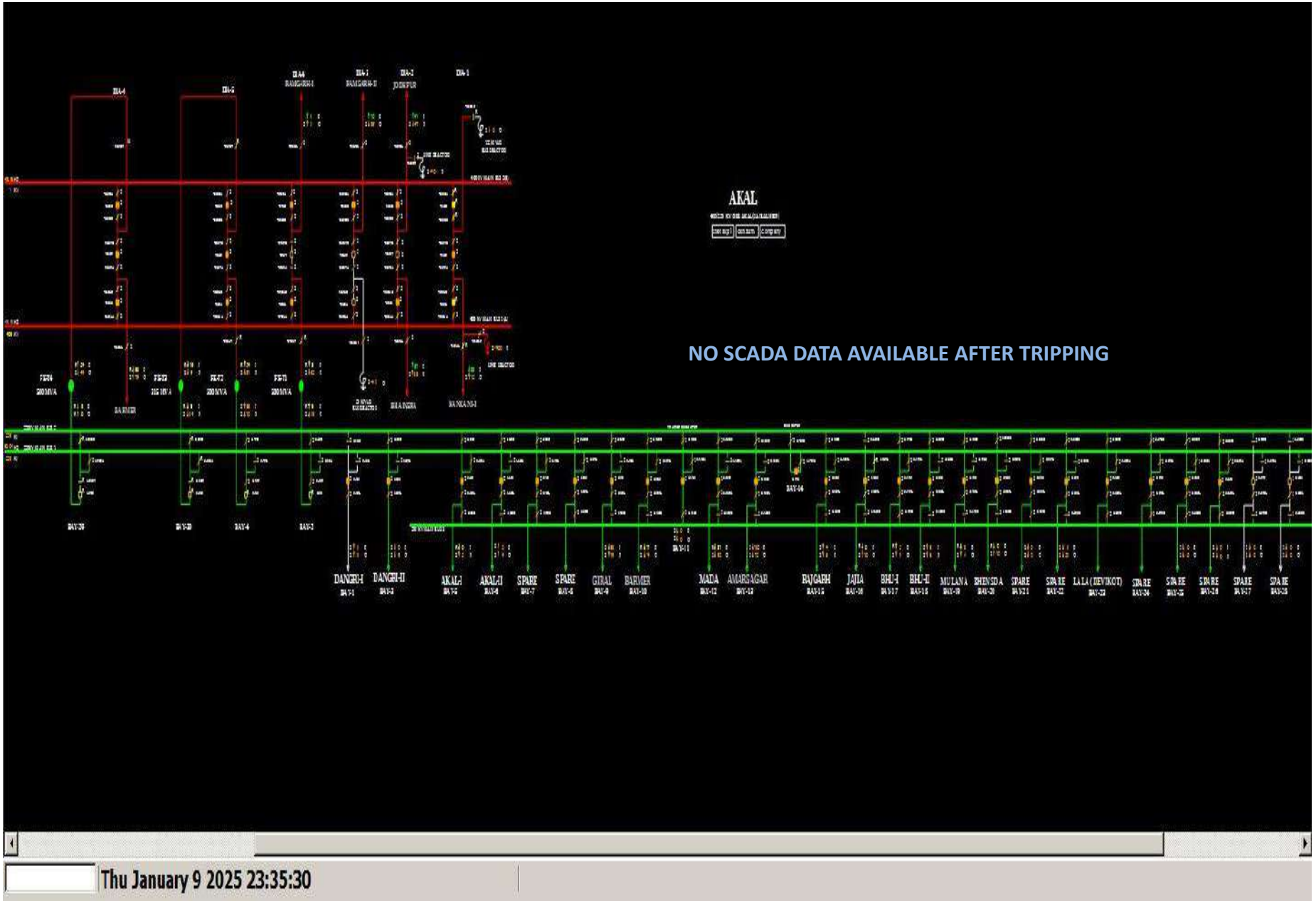
Network Diagram



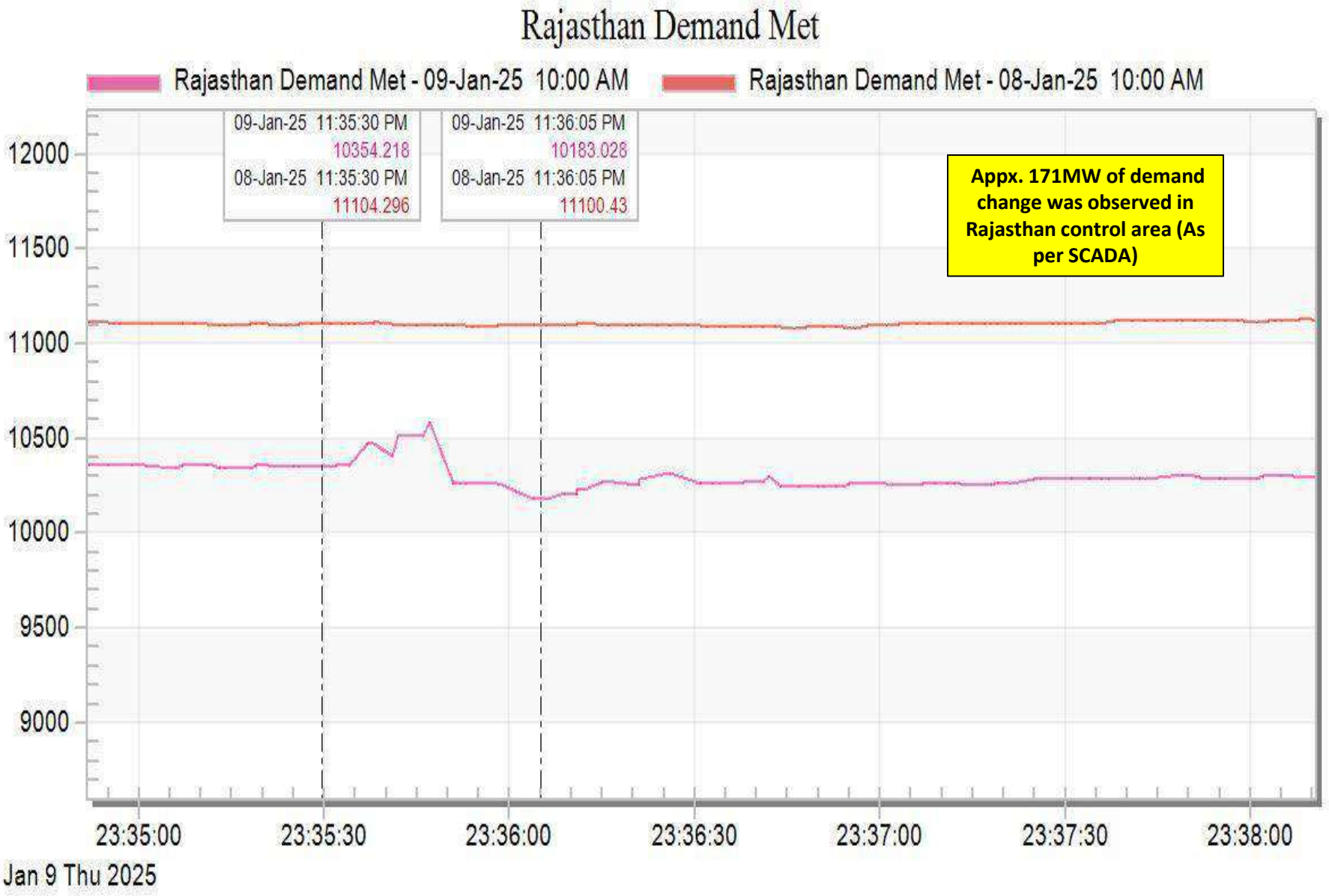
SLD of 400/220kV Akal(RS) before the event



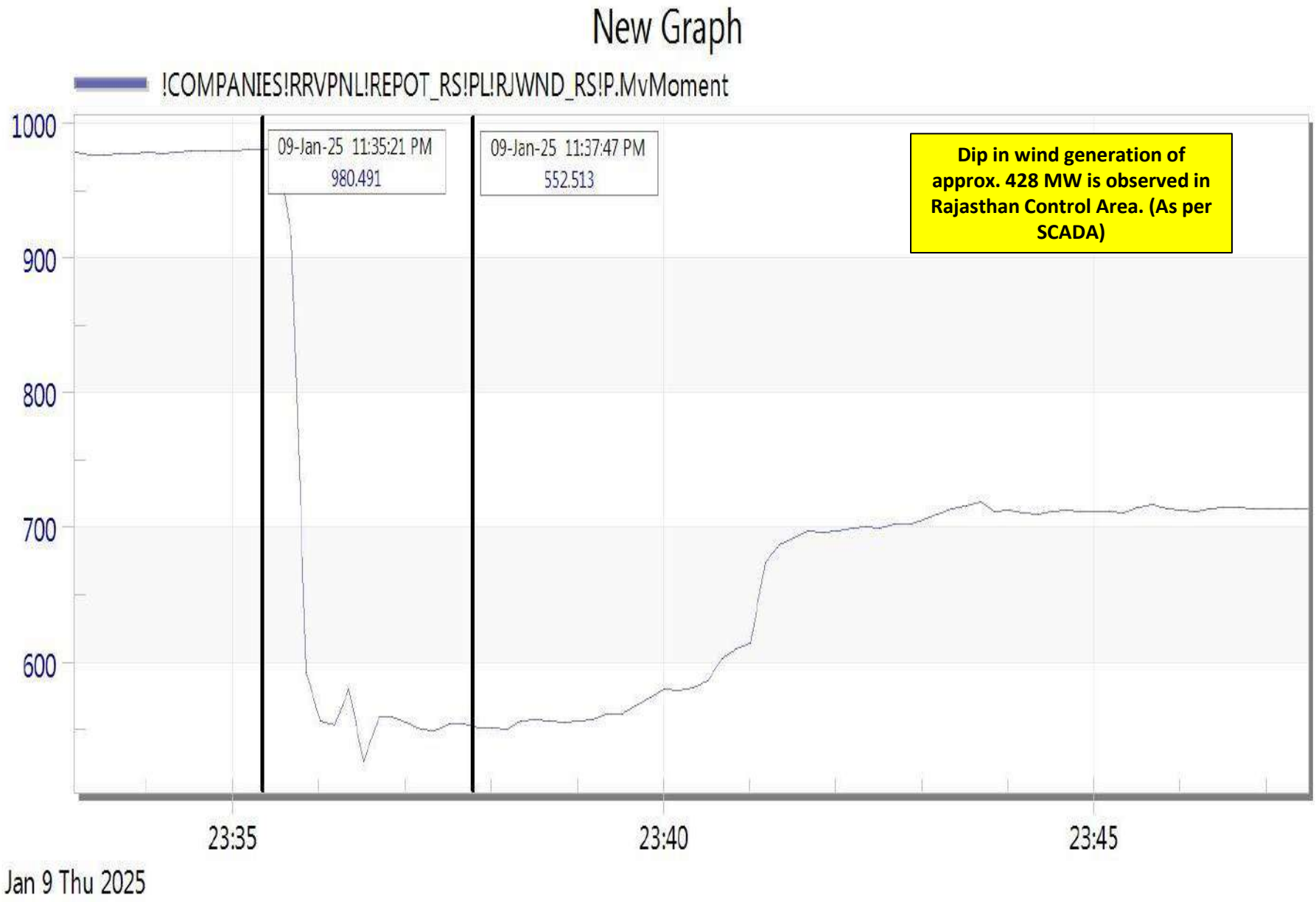
SLD of 400/220kV Akal(RS) after the event



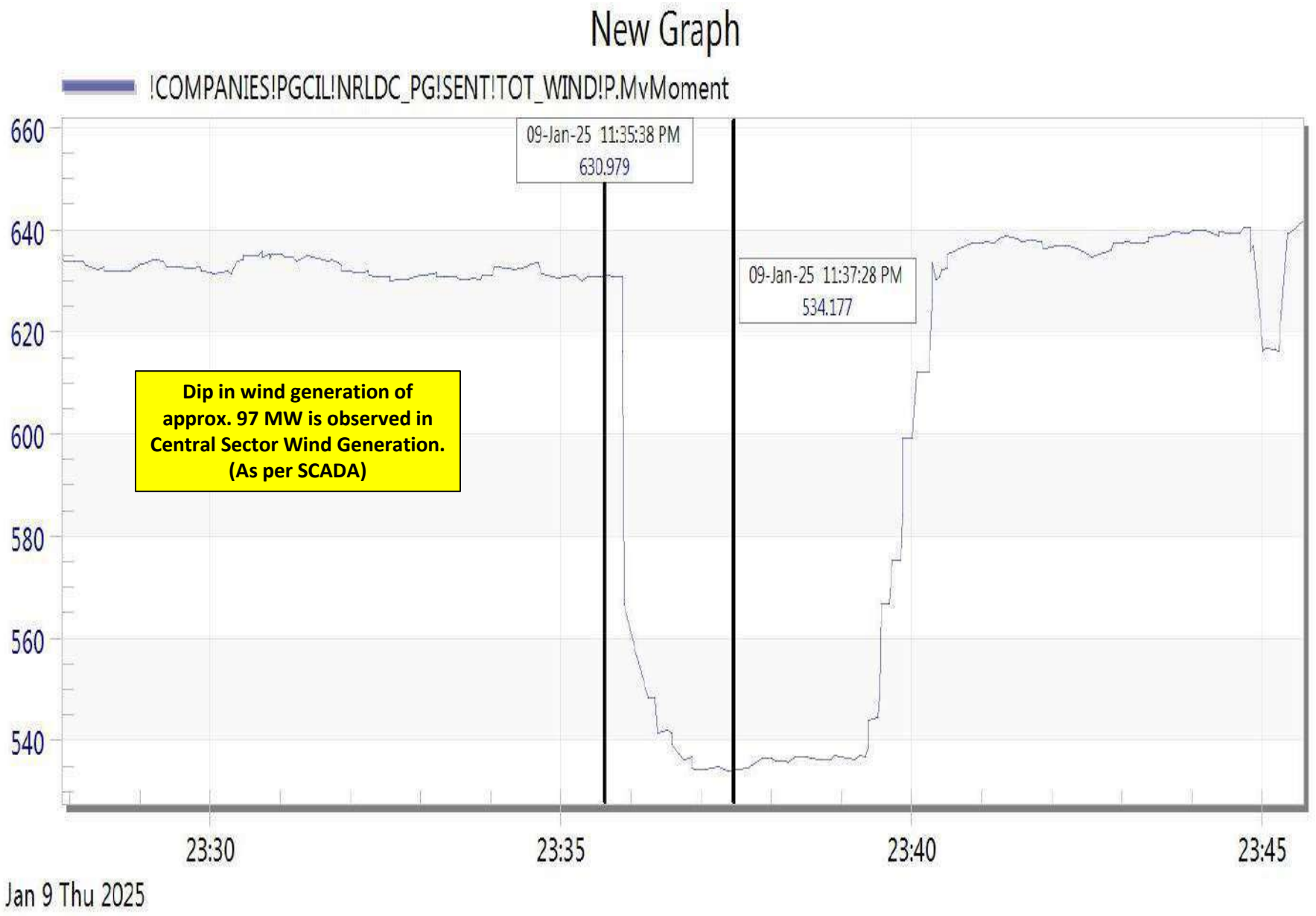
Rajasthan Demand during the event



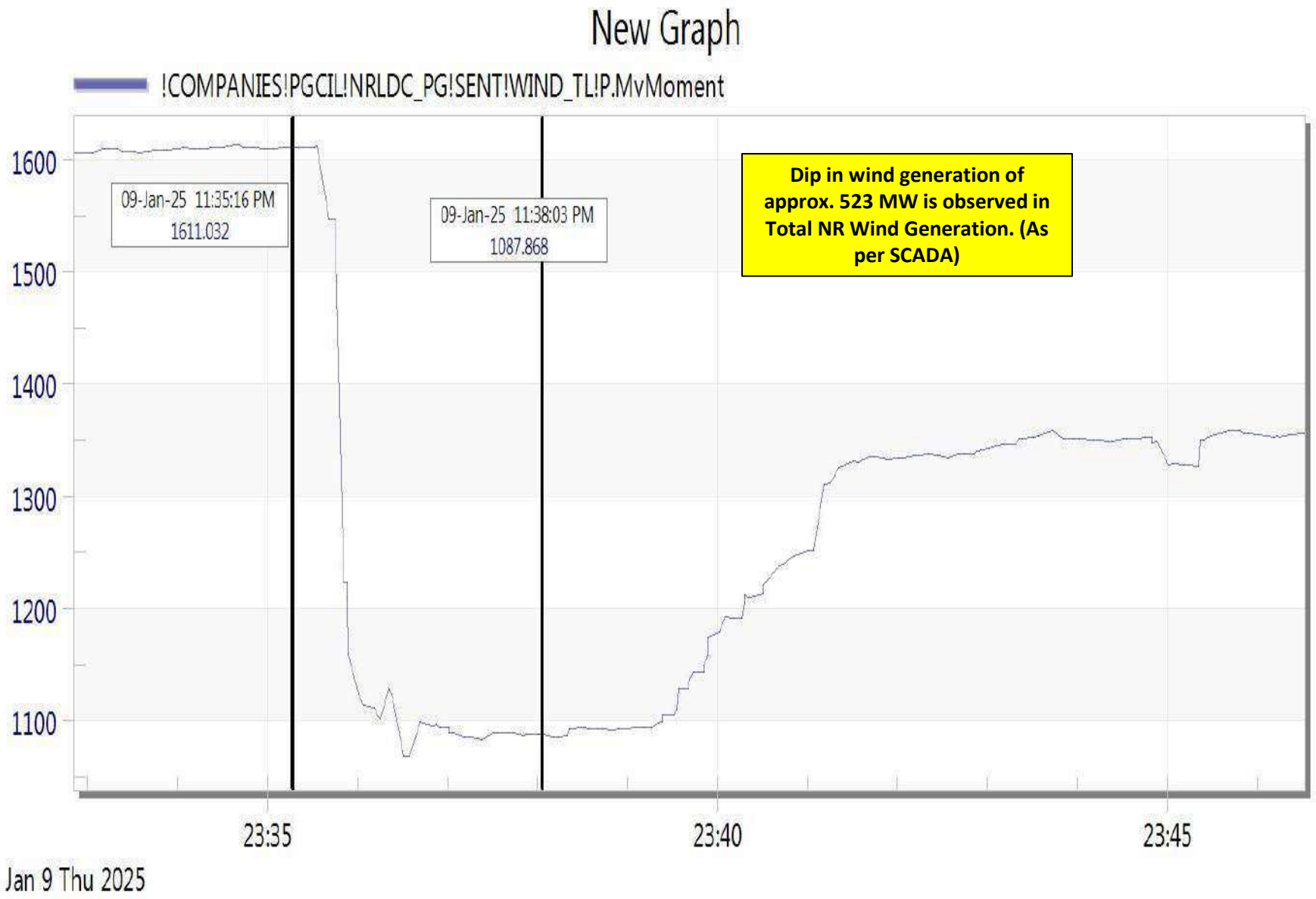
Rajasthan Wind Generation during the event



ISTS Wind Generation during the event

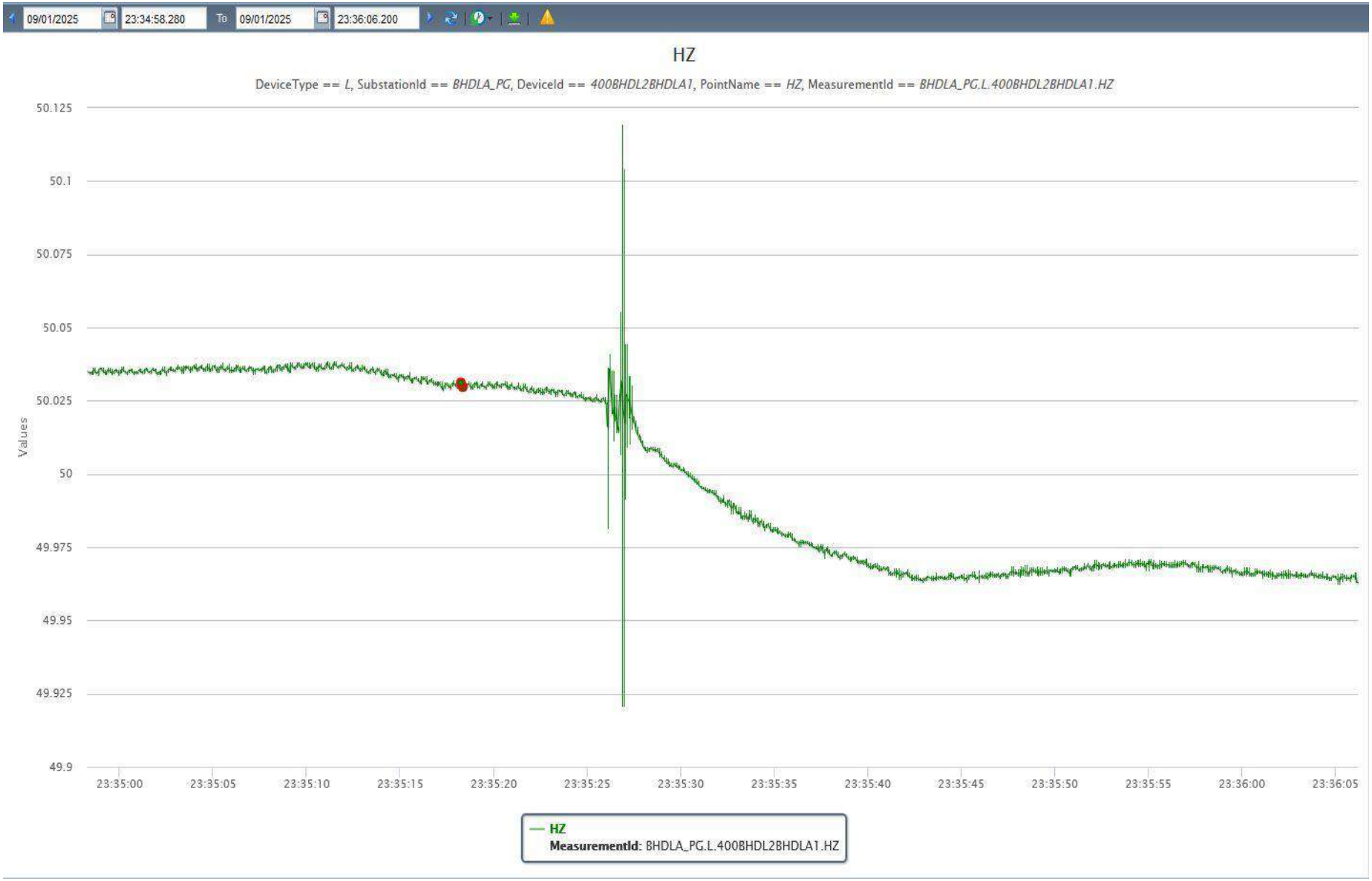


NR Wind Generation during the event



PMU Plot of frequency at Bhadla(PG)

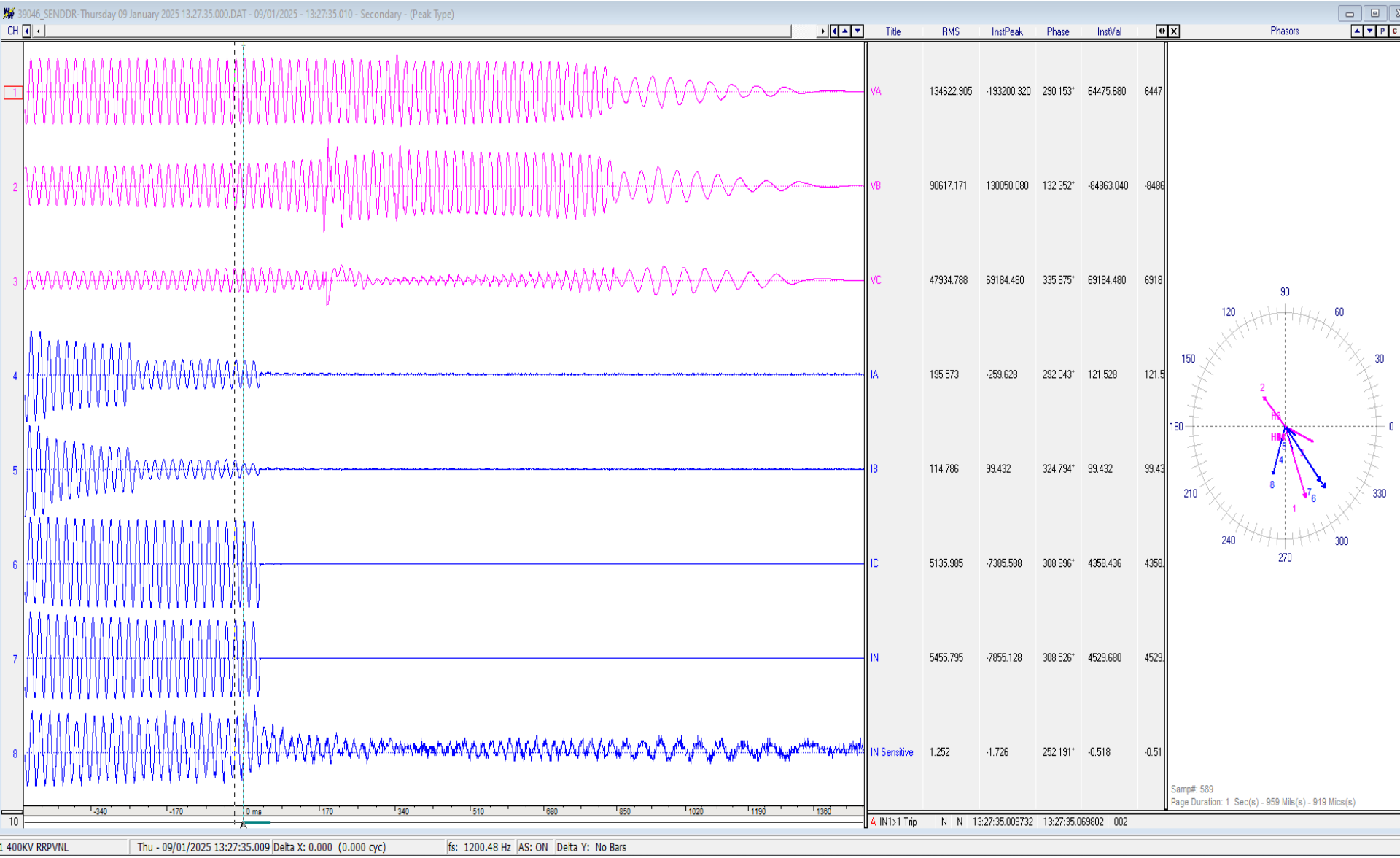
23:35 hrs/09-Jan-25



PMU Plot of phase voltage magnitude at Bhadla(PG)

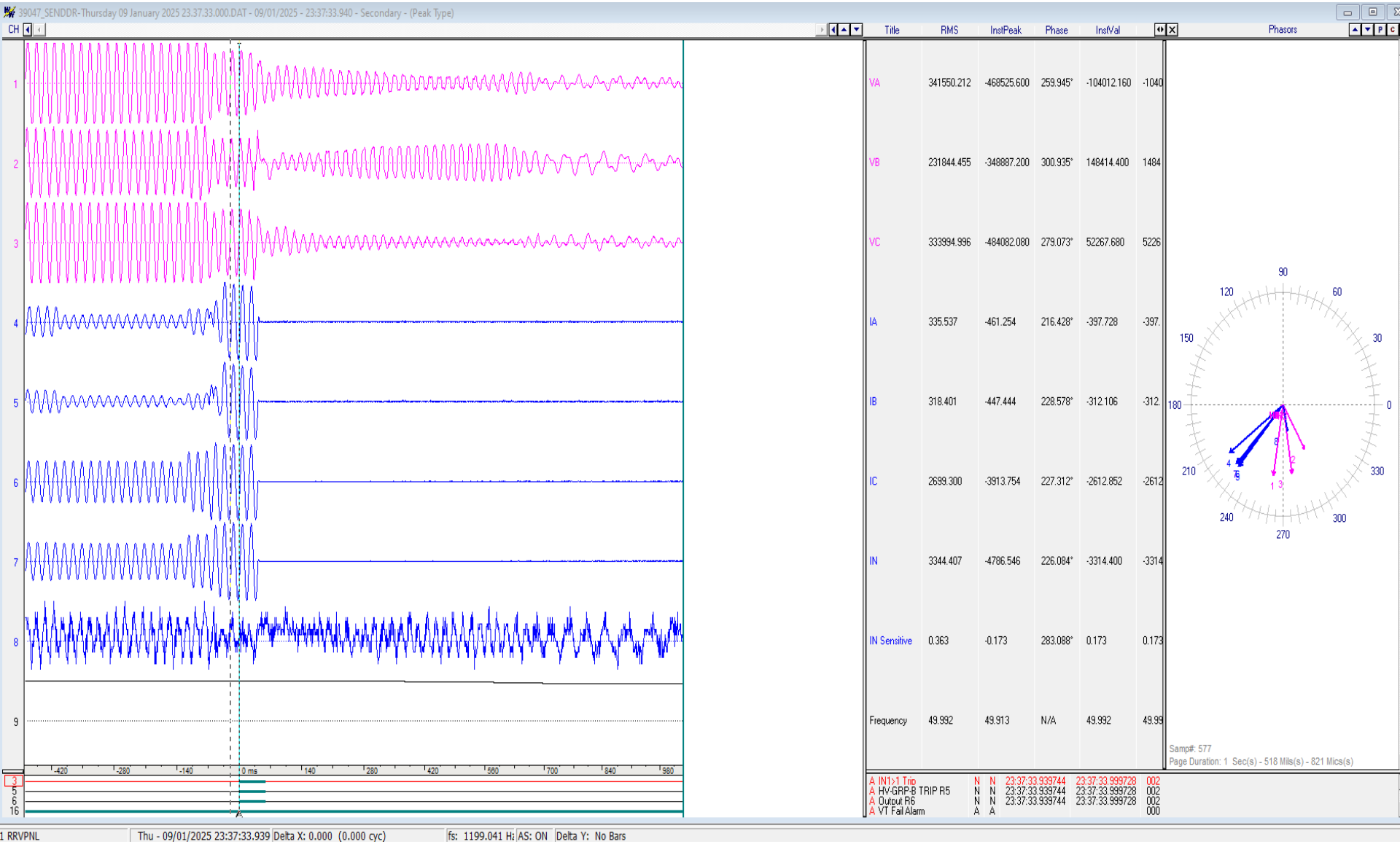
23:35 hrs/09-Jan-25

DR of 400/220 kV 500 MVA ICT-1 at Akal(RS)



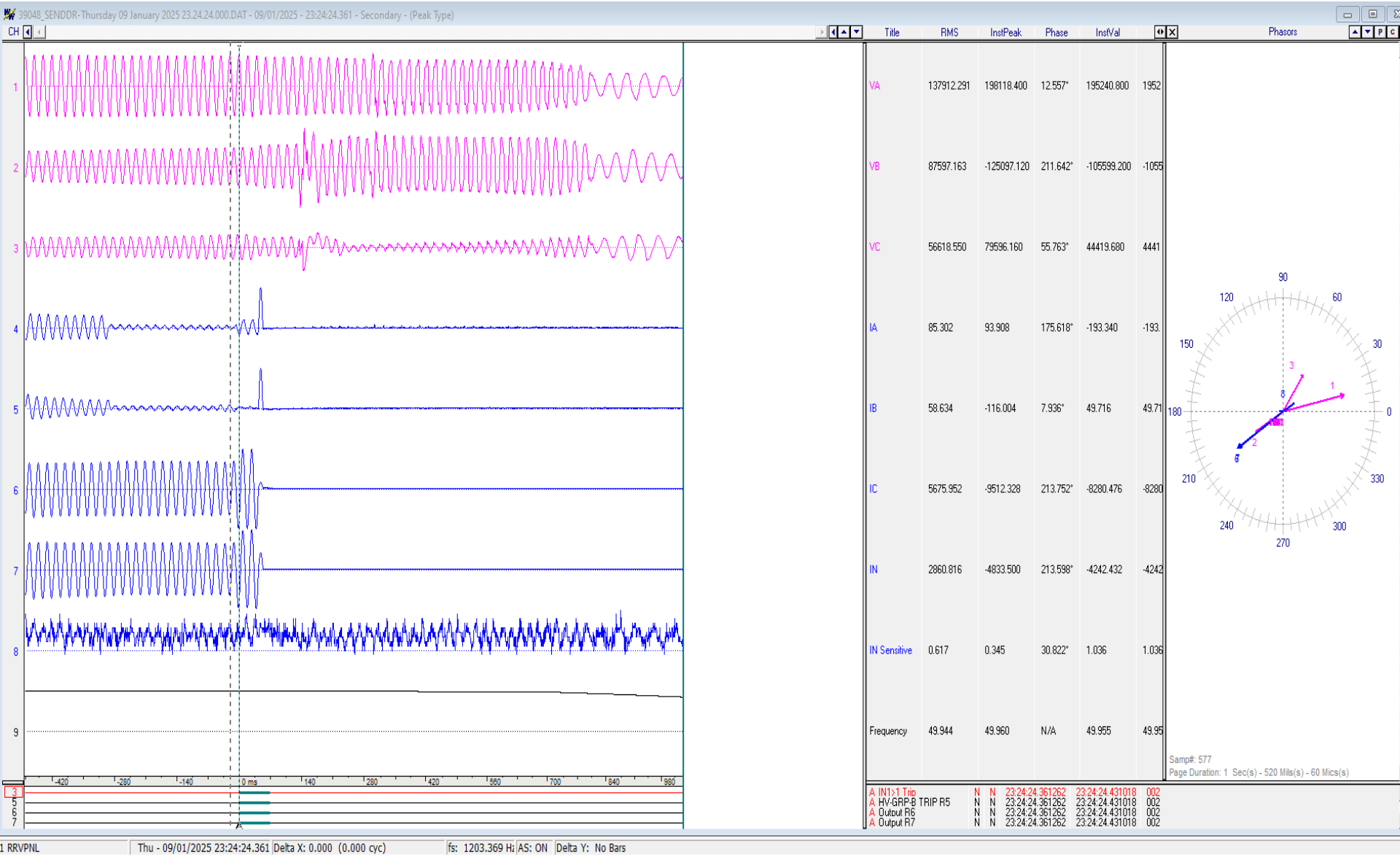
- ✓ B-N fault; Fault current: Ib=~5.135kA
- ✓ Over-current earth-fault protection operated.

DR of 400/220 kV 315 MVA ICT-3 at Akal(RS)



- ✓ B-N fault; Fault current: Ib=~2.699kA
- ✓ Over-current earth-fault protection operated.

DR of 400/220 kV 500 MVA ICT-4 at Akal(RS)



- ✓ B-N fault; Fault current: Ib=~5.676kA
- ✓ Over-current earth-fault protection operated.

Points for Discussion

i) Reason for delayed fault clearance needs to be shared.

ii) Phase sequence issue need to be resolved at Akal(RS)/Bhadla(PG).

iii) SCADA data was frozen during the event. Availability and healthiness of SCADA data need to be ensured.

iv) DR/EL (.dat/.cfg file) of all tripped elements along with detailed tripping report and remedial action taken report need to be shared.

v) Trippings at Akal(RS) S/s are not recorded in SCADA SOE. Availability of SCADA SOE data needs to be ensured.

vi) Restoration of bus bar protection at 220kV Akal need to be expedited.

57th PSC Meeting -20th Feb., 2025

Presentation of RVPN

By-
1. D.K. Jain,Superintending Engineer (Prot.Engg.) RVPN, Jaipur.
2. Vijay Pal Yadav, Executive Engineer(MPT&S) RVPN, Alwar.
3. Manish Sharma, AEN O/o SE(MPT&S) RVPN, Jodhpur.

Annex-B.IV_Grid Events Analysis Jan25

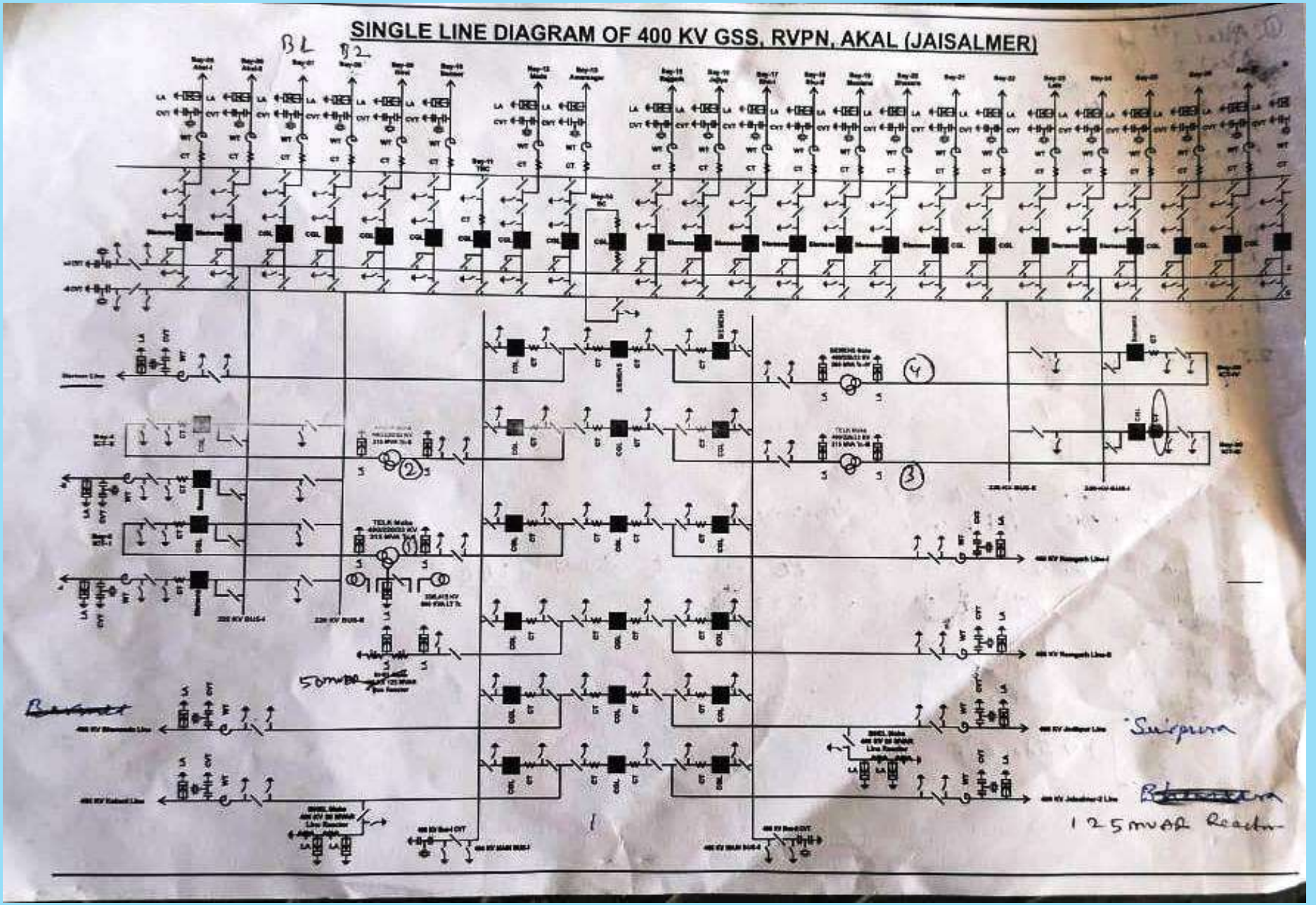
S.No.-2, GI-2, Dated 09th Jan., 2025 at 23.35 Hrs. at 400 kV GSS RVPN,Akal (Jaisalmer)

220 kV System at 400 kV GSS, RVPN, Akal

Bus Arrangement:- Two Main and One Transfer Bus (30 nos, bays)

1. 220 kV RVPN lines/circuits (05 nos.)
   i. 220 kV S/C Amarsagar line
   ii. 220 kV S/C Barmer line
   iii. 220 kV S/C Giral LTPS line
   iv. 220 kV D/C Jaisalmer2 line (Circuit-I)
   v. 220 kV D/C Jaisalmer2 line (Circuit-I)
2. 220 kV Wind Developer lines (12 nos. from Pooling stations of RE)
   Akal (Suzlon)-l & II ,Dangri I & II, Bhu I & II, Rajgarh, Jajiya, Mada, Lala, Moolana
3. One B/C and One TBC
4. 400/220 kV TFR I.C bays (4 nos.)
5. 25 MVAR 220 kV bus reactor
6. Spare Bays (6 nos.)

SINGLE LINE DIAGRAM OF 400 KV GSS, RVPN, AKAL (JAISALMER)



S.No	Incident took place	Point of discussion
S.No.2 GI-2	As reported, at 23:35 hrs, Y-phase jumper of 220kV bus-1 of 220kV Akal-Bhensara Ckt-1 snapped which created bus fault on both 220kV buses at Akal(RS). As per PMU at Bhadla(PG), Y-N phase to earth fault with delayed fault clearance time of 720 msec is observed. Bus bar protection is not in service at 220kV side of Akal S/s. Therefore, fault cleared with the operation of back up protection i.e., 400/220kV ICTs at Akal. All four ICTs tripped on O/C E/F protection operation.	Details analysis of the event and remedial action taken details.

S.No	Name of Equipment/ Line	Trip Time/ Trip Date	Relay Indication AKAL	Relay Indication OTHER END	Remark
1.	220 kV Akal-Bhensara- 1 (57 kM)	23.35/ 09.01.2025	Z4 became active for 1-2 cycle only, (i.e. for less than 160 ms) No Breaker Trip	Z2 trip	JUMPER BETWEEN CB &ISOLATOR SNAPPED FROM ISOLATOR CLAMP AND CREATED BUS FAULT ON “C- PHASE TO GROUND)
2.	220 kV Akal-Bhensara-2 (57 kM)	23.35/ 09.01.2025	Z4 trip	No trip	
3.	220 kV Akal-Amarsagar (66 kM)	23.35/ 09.01.2025	Z4 became active for 1-2 cycle only, (i.e. for less than 160 ms) No Breaker Trip	Z2 trip	
4.	220 kV Akal-Barmer (134 kM)	23.35/ 09.01.2025	Z4 became active for 1-2 cycle only, (i.e. for less than 160 ms) No Breaker Trip	Z2 , C-Ph ,154.6 Km	
5.	220 kV Akal-Giral (102 kM)	23.35/ 09.01.2025	Z4 became active for 1-2 cycle only, (i.e. for less than 160 ms) No Breaker Trip		
6.	400/220 kV 500 MVA ICT-1	23.35/ 09.01.2025	E/F on IV	Inter trip with IV	
7.	400/220 kV 500 MVA ICT-2	23.35/ 09.01.2025	E/F on IV	Inter trip with IV	
8.	400/220 kV 315 MVA ICT-3	23.35/ 09.01.2025	E/F on IV	Inter trip with IV	
9.	400/220 kV 500 MVA ICT-4	23.35/ 09.01.2025	E/F on IV	Inter trip with IV	
	Remaining lines not tripped from Akal end being RE (Wind) Power Line				

Analysis & Remedial Measures

Analysis:-

(i) The CB of 220 kV Akal-Bhainsda line at Akal GSS was in Lockout condition hence not opened at fault, LBB relay also operated for re-trip after 100 ms but the said CB not tripped.

(ii) LBB relay supposed to provide further trip command to Busbar scheme but unfortunately at the time of fault the 220 kV Busbar protection scheme was under blocked condition because of PU error, FO cable issue, SCADA integration issue of PU etc.Hence, tripping of all local CB could not be matured thruogh busbar protection scheme.

Remedial Measures:-

(i) The CB of 220 kV Akal-Bhainsda-I line at Akal GSS attended.

(ii) 220 kV Busbar protection scheme at 400 kV GSS Akal has been made operative on dated 15.02.2025 and in healthy condition.

500 MVA ICT-I: Time duration: 0.699 s

Thursday 09 January 2025 13:27:35.099 : Fault Recorded
Thursday 09 January 2025 13:27:35.073 : Output Contacts1
Thursday 09 January 2025 13:27:35.072 : I> BlockStart OFF
Thursday 09 January 2025 13:27:35.072 : IN1>1 Trip OFF
Thursday 09 January 2025 13:27:35.072 : I>1 Start C OFF
Thursday 09 January 2025 13:27:35.072 : I>1 Start OFF
Thursday 09 January 2025 13:27:35.072 : Trip Command In OFF
Thursday 09 January 2025 13:27:35.072 : Start N OFF
Thursday 09 January 2025 13:27:35.072 : IN/SEF>Blk Start OFF
Thursday 09 January 2025 13:27:35.072 : IN1>1 Start OFF
Thursday 09 January 2025 13:27:35.072 : Any Start OFF
Thursday 09 January 2025 13:27:35.012 : IN1>1 Trip ON
Thursday 09 January 2025 13:27:35.012 : Trip Command In ON
Thursday 09 January 2025 13:27:35.012 : Output Contacts1
Thursday 09 January 2025 13:27:34.373 : IN1>1 Start ON
Thursday 09 January 2025 13:27:34.373 : Start N ON
Thursday 09 January 2025 13:27:34.373 : IN/SEF>Blk Start ON
Thursday 09 January 2025 13:27:34.372 : I>1 Start ON
Thursday 09 January 2025 13:27:34.372 : I>1 Start C ON
Thursday 09 January 2025 13:27:34.372 : I> BlockStart ON
Thursday 09 January 2025 13:27:34.372 : Any Start ON

500 MVA ICT-II: Time duration: 0.700 s

Wednesday 08 January 2025 16:41:22.724 : Indication Reset
Wednesday 08 January 2025 14:43:13.165 : Fault Recorded
Wednesday 08 January 2025 14:43:13.139 : IN1>1 Trip OFF
Wednesday 08 January 2025 14:43:13.139 : Trip Command In O
Wednesday 08 January 2025 14:43:13.139 : I> BlockStart OFF
Wednesday 08 January 2025 14:43:13.139 : I>1 Start C OFF
Wednesday 08 January 2025 14:43:13.139 : I>1 Start OFF
Wednesday 08 January 2025 14:43:13.139 : IN/SEF>Blk Start OF
Wednesday 08 January 2025 14:43:13.139 : Output Contacts1
Wednesday 08 January 2025 14:43:13.139 : Start N OFF
Wednesday 08 January 2025 14:43:13.139 : IN1>1 Start OFF
Wednesday 08 January 2025 14:43:13.139 : Any Start OFF
Wednesday 08 January 2025 14:43:13.079 : IN1>1 Trip ON
Wednesday 08 January 2025 14:43:13.079 : Trip Command In O
Wednesday 08 January 2025 14:43:13.079 : Output Contacts1
Wednesday 08 January 2025 14:43:12.439 : Any Start ON
Wednesday 08 January 2025 14:43:12.439 : I>1 Start ON
Wednesday 08 January 2025 14:43:12.439 : I>1 Start C ON
Wednesday 08 January 2025 14:43:12.439 : I> BlockStart ON
Wednesday 08 January 2025 14:43:12.439 : IN/SEF>Blk Start ON
Wednesday 08 January 2025 14:43:12.439 : Start N ON
Wednesday 08 January 2025 14:43:12.439 : IN1>1 Start ON

315 MVA ICT-III: Time duration: 0.789 s

Thursday 09 January 2025 23:37:34.039	: Fault Recorded
Thursday 09 January 2025 23:37:34.003	: IN1>1 Start OFF
Thursday 09 January 2025 23:37:34.003	: Virtual Output 7 OFF
Thursday 09 January 2025 23:37:34.003	: Trip Command In OFF
Thursday 09 January 2025 23:37:34.003	: Any Start OFF
Thursday 09 January 2025 23:37:34.003	: Output Contacts1
Thursday 09 January 2025 23:37:34.003	: IN/SEF>Blk Start OFF
Thursday 09 January 2025 23:37:34.003	: Start N OFF
Thursday 09 January 2025 23:37:34.002	: I>1 Start OFF
Thursday 09 January 2025 23:37:34.002	: I>1 Start C OFF
Thursday 09 January 2025 23:37:34.002	: IN1>1 Trip OFF
Thursday 09 January 2025 23:37:34.002	: I> BlockStart OFF
Thursday 09 January 2025 23:37:33.943	: Trip Command In ON
Thursday 09 January 2025 23:37:33.943	: Virtual Output 7 ON
Thursday 09 January 2025 23:37:33.943	: Output Contacts1
Thursday 09 January 2025 23:37:33.942	: IN1>1 Trip ON
Thursday 09 January 2025 23:37:33.153	: Any Start ON
Thursday 09 January 2025 23:37:33.153	: I>1 Start ON
Thursday 09 January 2025 23:37:33.153	: I>1 Start C ON
Thursday 09 January 2025 23:37:33.153	: I> BlockStart ON
Thursday 09 January 2025 23:37:33.153	: IN/SEF>Blk Start ON
Thursday 09 January 2025 23:37:33.153	: Start N ON
Thursday 09 January 2025 23:37:33.153	: IN1>1 Start ON

500 MVA ICT-IV: Time duration: 0.680 s

Thursday 09 January 2025 23:24:24.460	: Fault Recorded
Thursday 09 January 2025 23:24:24.435	: Output Contacts1
Thursday 09 January 2025 23:24:24.434	: Virtual Output 1 OF
Thursday 09 January 2025 23:24:24.434	: Trip Command In O
Thursday 09 January 2025 23:24:24.434	: IN1>1 Trip OFF
Thursday 09 January 2025 23:24:24.434	: IN1>1 Start OFF
Thursday 09 January 2025 23:24:24.434	: IN/SEF>Blk Start OF
Thursday 09 January 2025 23:24:24.434	: Start N OFF
Thursday 09 January 2025 23:24:24.434	: Any Start OFF
Thursday 09 January 2025 23:24:24.423	: I>1 Start C OFF
Thursday 09 January 2025 23:24:24.423	: I>1 Start OFF
Thursday 09 January 2025 23:24:24.423	: I> BlockStart OFF
Thursday 09 January 2025 23:24:24.364	: Virtual Output 1 ON
Thursday 09 January 2025 23:24:24.364	: Output Contacts1
Thursday 09 January 2025 23:24:24.363	: IN1>1 Trip ON
Thursday 09 January 2025 23:24:24.363	: Trip Command In O
Thursday 09 January 2025 23:24:23.683	: Any Start ON
Thursday 09 January 2025 23:24:23.683	: I>1 Start ON
Thursday 09 January 2025 23:24:23.683	: I>1 Start C ON
Thursday 09 January 2025 23:24:23.683	: I> BlockStart ON
Thursday 09 January 2025 23:24:23.683	: IN/SEF>Blk Start ON
Thursday 09 January 2025 23:24:23.683	: Start N ON
Thursday 09 January 2025 23:24:23.683	: IN1>1 Start ON

Multiple element tripping event at 400/220KV Heerapura(RS)

At 13:35 hrs on 10th January, 2025

Tripped Elements

S. No	Name of Elements	Outage Time	Revival Time	Reason of tripping
1.	400/220 kV 250 MVA ICT 1 at Heerapura(RS)	13:35 hrs	14:15 hrs	Bus-Bar protection operated.
2.	400/220 kV 250 MVA ICT 3 at Heerapura(RS)		14:18 hrs	

Brief details of the event

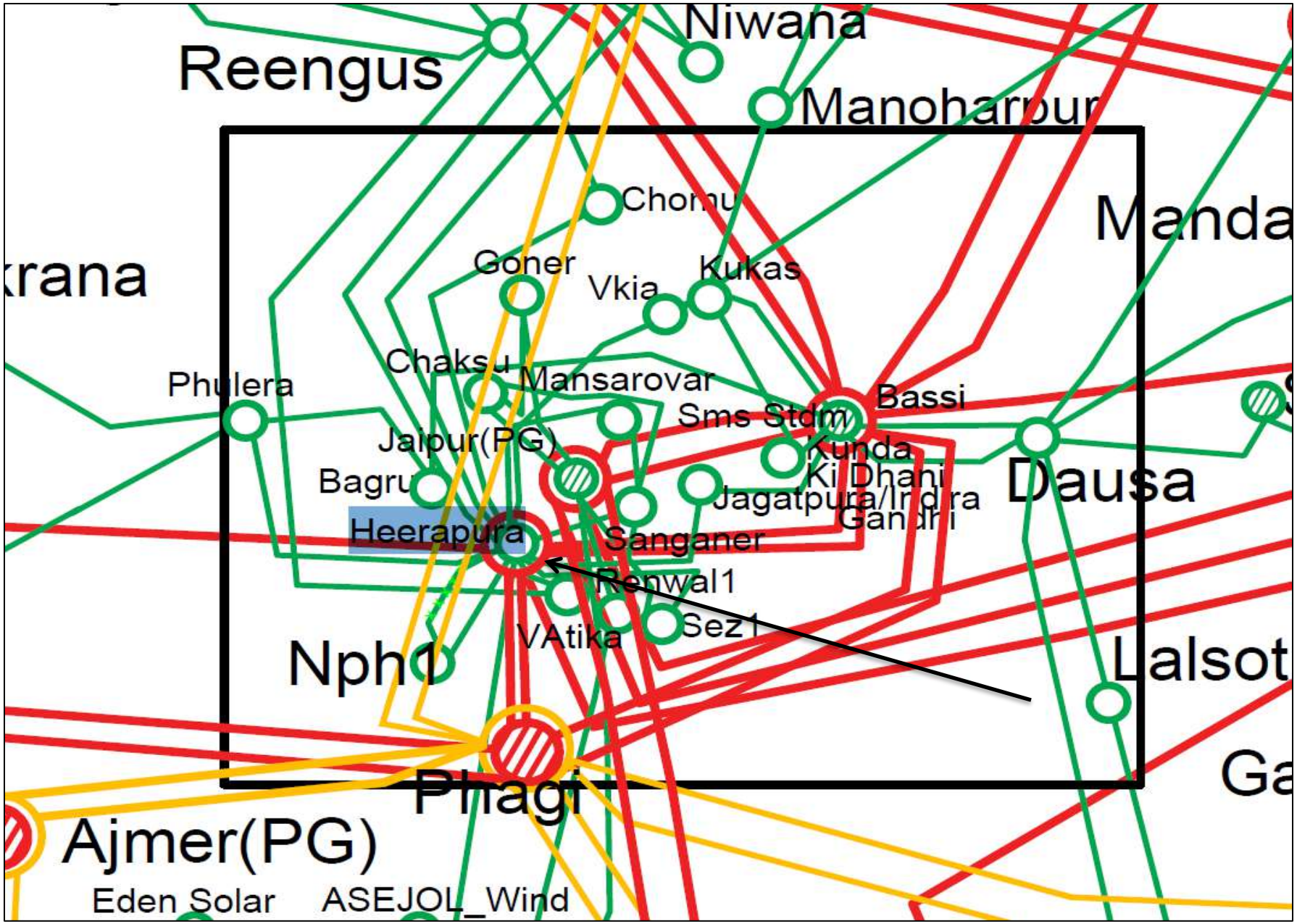
i) 400/220KV Heerapura(RS) S/s has one and half breaker scheme in the 400KV side and double main & transfer scheme in the 220 KV side.

ii) As reported at 13:35hrs, a kite thread fell on the 220KV side of the ICTs. As a result Bus- Bar protection operated on the 220KV side led to tripping 400/220 kV 250 MVA ICT 1 and 3 at Heerapura(RS). (exact reason and nature of protection operated yet to be shared).

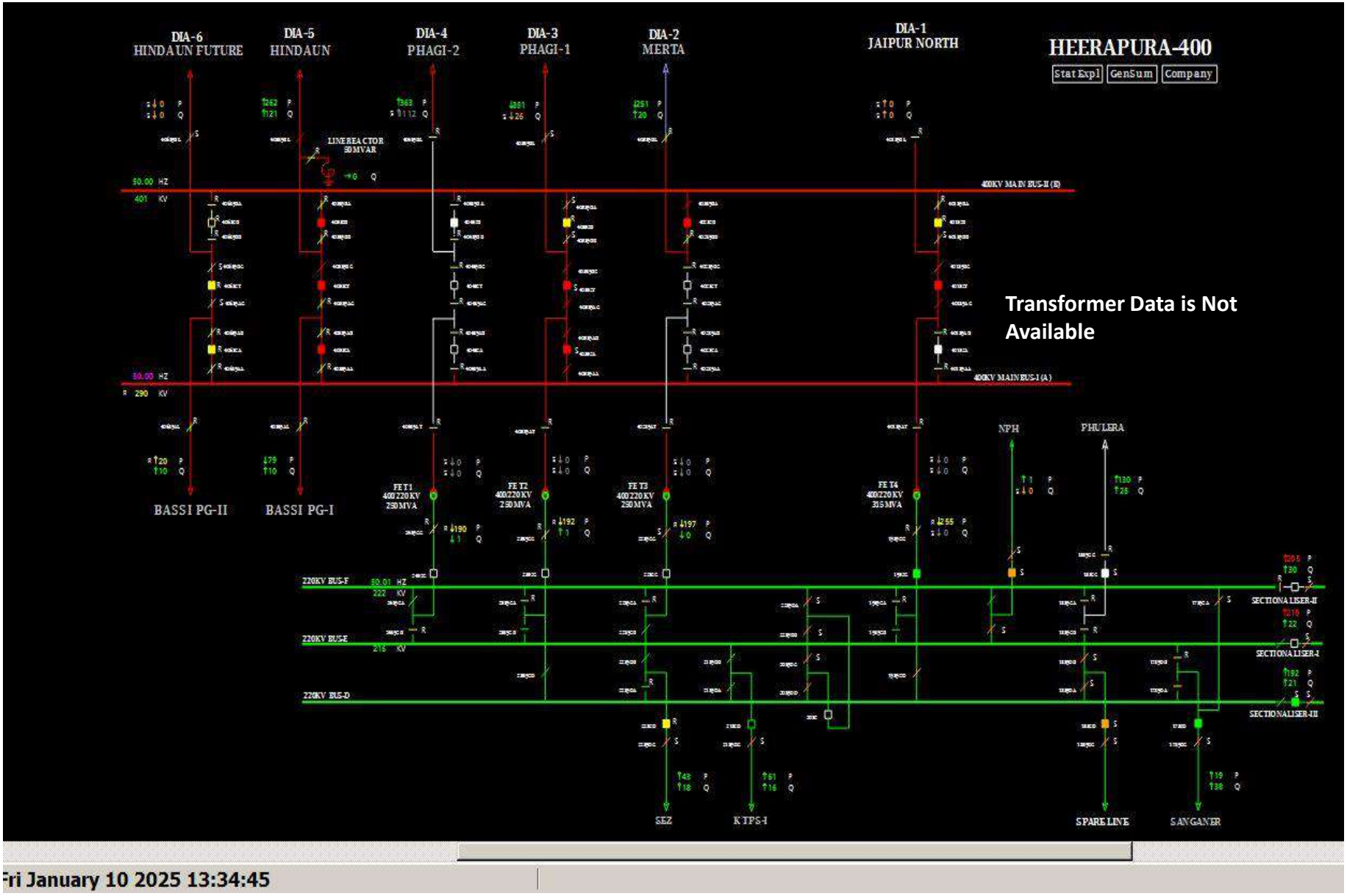
iii) As per PMU at Heerapura (RS), R-N fault is observed with delayed fault clearing time of 320ms.

iv) As per SCADA, change in demand of approx. 320MW in Rajasthan control area is observed.

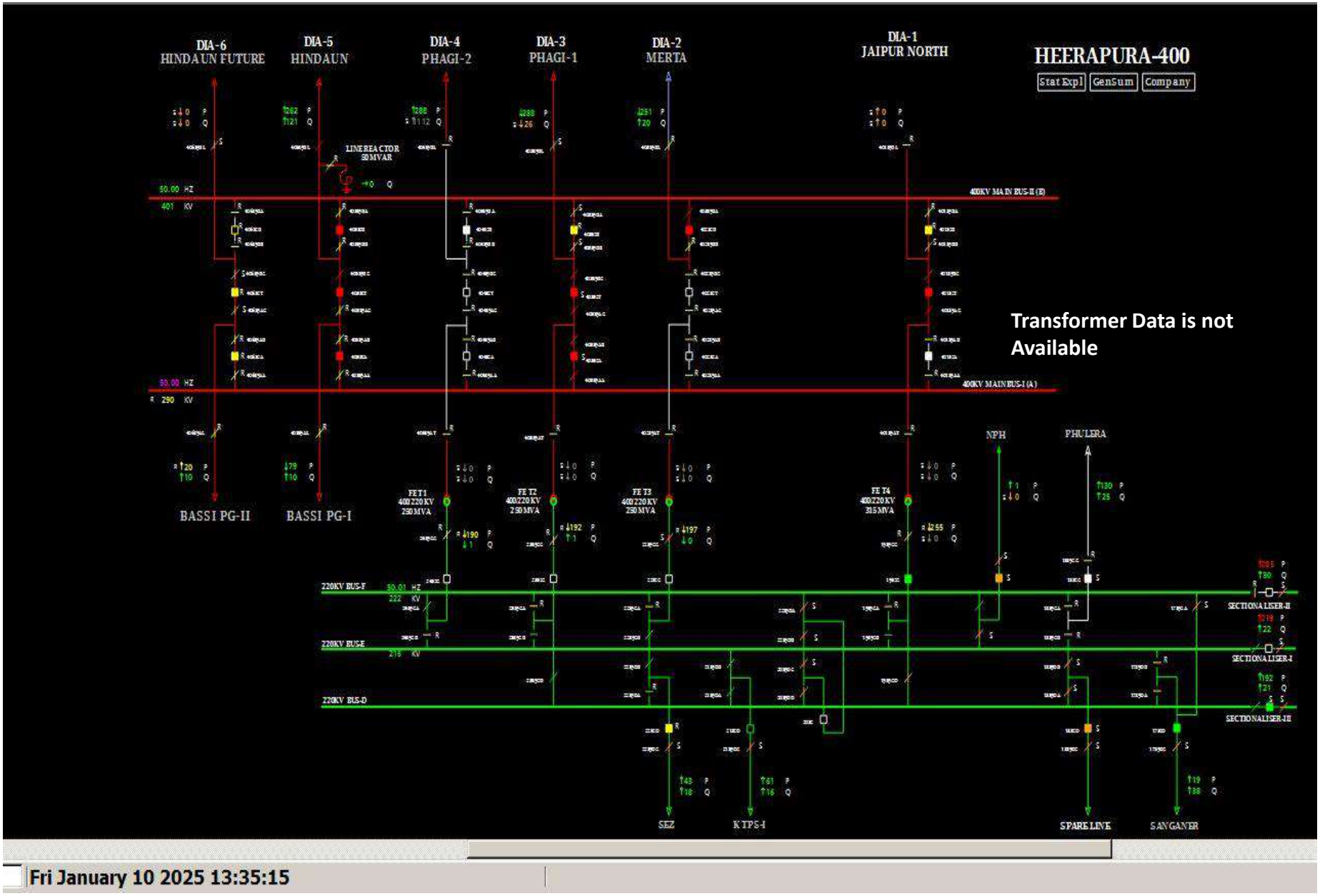
Network Diagram before the event



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

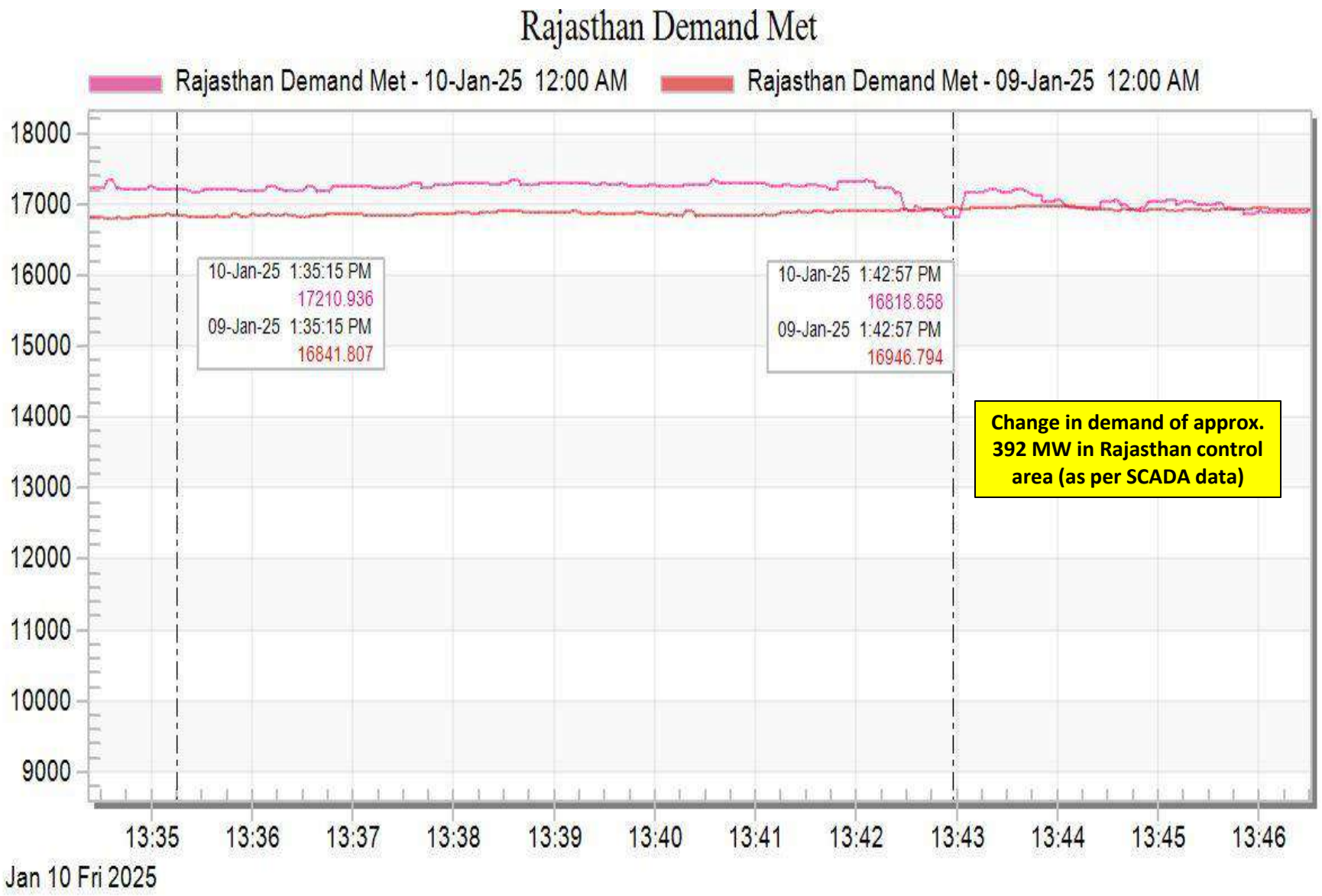


SLD of 400/220kV Heerapura(RS) after the event



Fri January 10 2025 13:35:15

Rajasthan demand during the event



PMU Plot of frequency at Heerapura(RS)

13:34hrs/10-Jan-25

PMU Plot of phase voltage magnitude at Heerapura(RS)

13:34hrs/10-Jan-25

Points for Discussion

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

ii) The exact nature of protection operated during tripping of 400/220kV ICTs need to be shared.

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

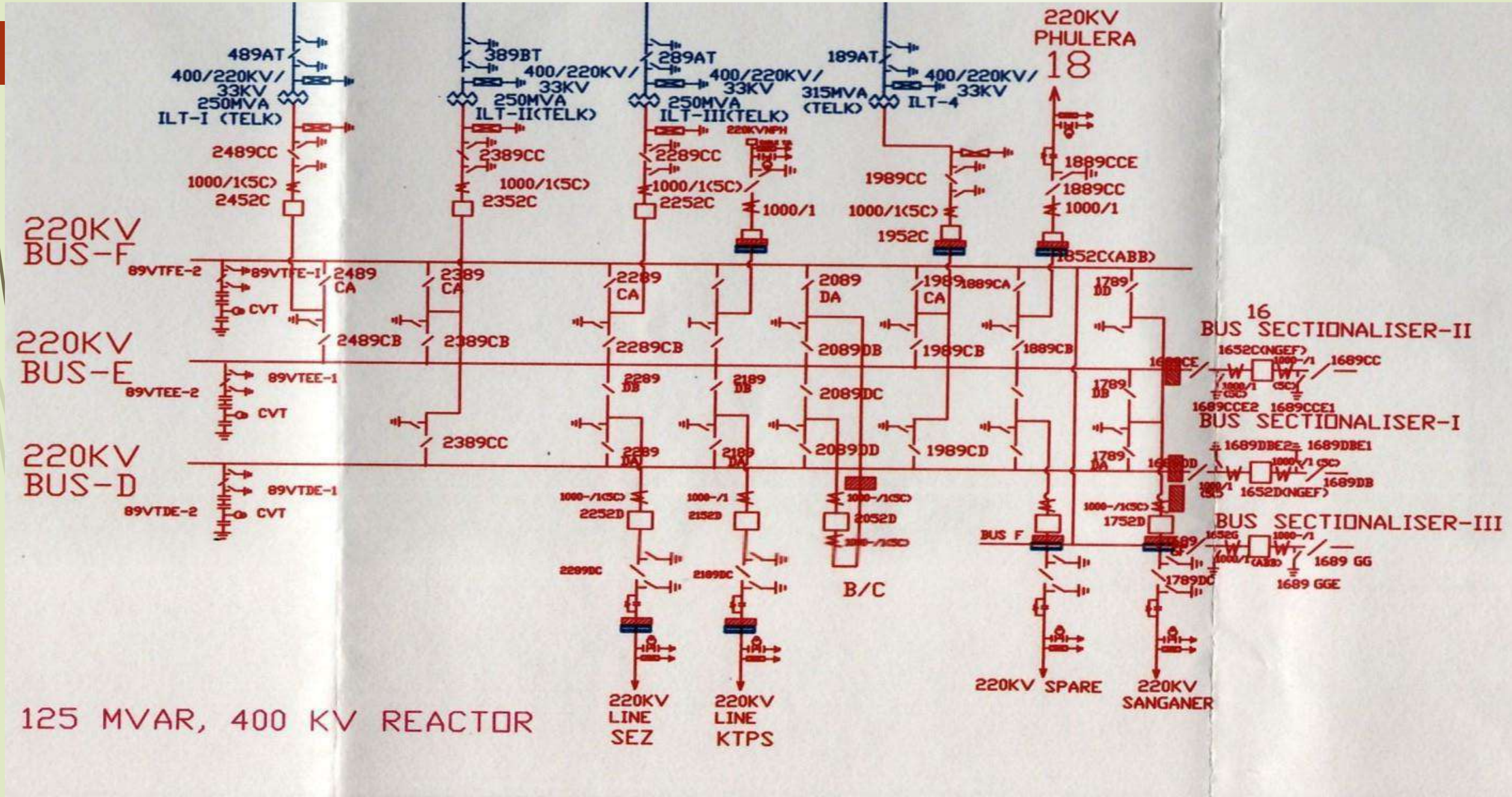
iv) DR/EL along with tripping report for each element need to be shared from both the ends.

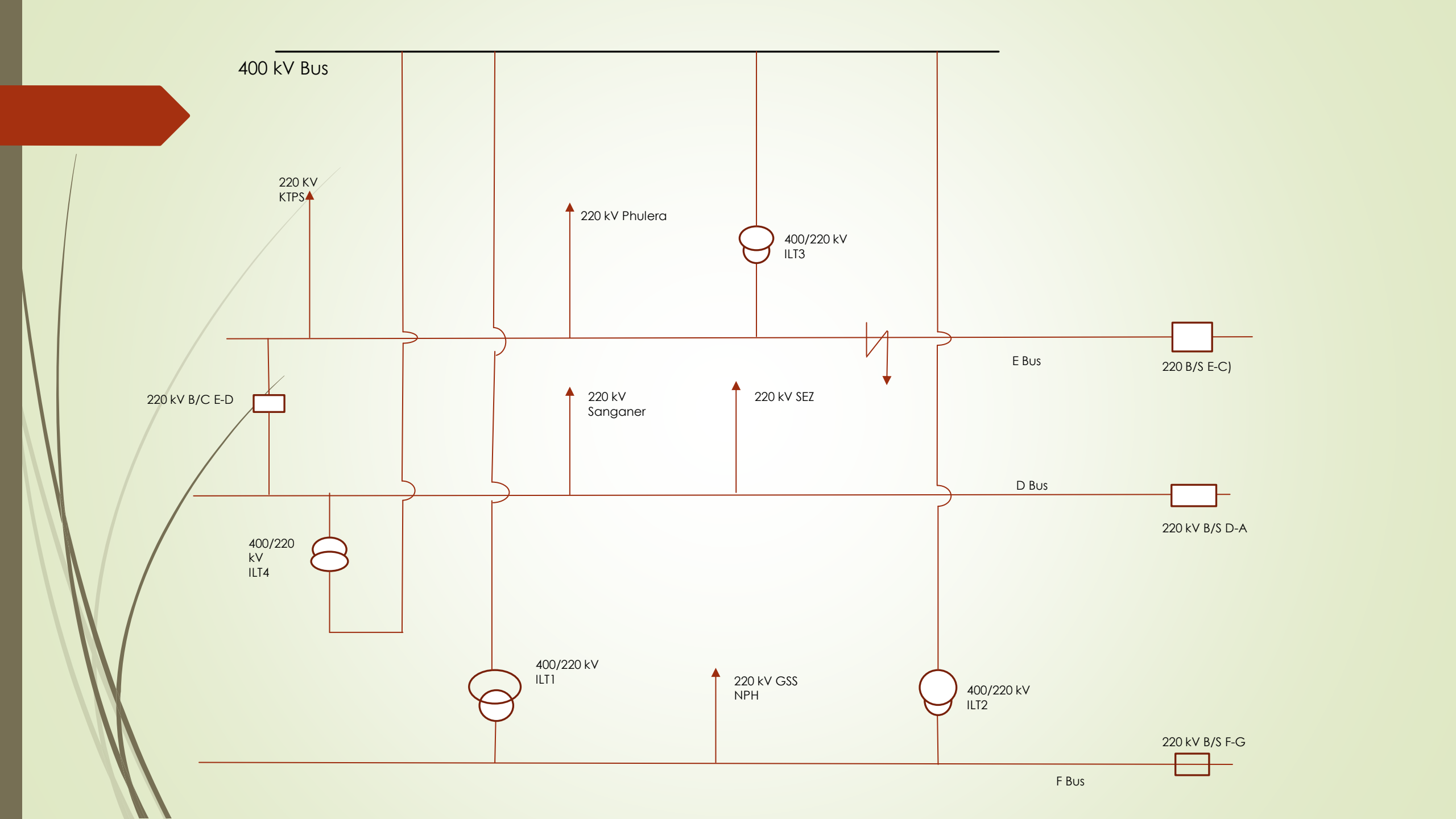
v) Remedial action taken report to be shared.

RAJASTHAN RAJYA VIDYUT PRASARAN NIGAM LTD. (RRVPNL)

Tripping report of event occurred at 400 kV GSS Heerapura on date 10.01.2025 at 13:35 HRS.

SLD for 220 kV Bus at 400 kV GSS Heerapura




400 kV Bus
220 KV
KTPS
220 kV Phulera
400/220 kV
ILT3
E Bus
220 B/S E-C)
220 kV B/C E-D
220 kV
Sanganer
220 kV SEZ
D Bus
220 kV B/S D-A
400/220
kV
ILT4
400/220 kV
ILT1
220 kV GSS
NPH
400/220 kV
ILT2
220 kV B/S F-G
F Bus

Tripping Event were as following:

- Bus Bar protection on 220 kV Side operated at 13:35 HRS dt. 10.01.2025 which tripped following feeders/transformers at 400 kV GSS Heerapura.
- **220 kv BUSBAr prot.scheme relay indication**:

  1. Bus Bar Protection E-Bus 87E(EB),
  2. B/B prot.CHK zone 87CH (Ch A & Ch B),
  3. B/B prot.tripped 209-6E.

- 220 kV Heerapura-KTPS LINE :- Tripped on B/B prot
- 220 kV Buscoupler (E-D):- Tripped on B/B prot.
- 220 kV Heerapura-Phulera Line :- Tripped on B/B prot
- 220 kV Bus sectionalizer E to C
- 400 kV Side of 400/220 kV 250 MVA, ILT-3 :- inter trip from LV Side.
- 220 kV side of 400/220 kV 250 MVA, ILT-3 :- Tripped on B/B prot.

Tripping Event were as following:-

- **400 kV Side of 400/220 kV 250 MVA, ILT-I** :- o/c prot. C-phase,50C/67 CX,286
- **220 kV side of 400/220 kV 250 MVA, ILT-I** :- 386 (intertrip)
- **400 kV Side of 400/220 kV 250 MVA, ILT-2** :- o/c prot. C-phase,50C/67 CX,286
- **220 kV side of 400/220 kV 250 MVA, ILT-2** :- 386 (intertrip)

Tripping Analysis as per available record-

1. There was fault due to falling of kite thread on 220 kV "E"-Bus at 400 kV GSS Heerapura
2. BUS bar protection relay operated which caused tripping on following feeders/transformers.
   (a) 220 kV Heerapura - KTPS LINE
   (b) 220 kV Heerapura - Phulera Line
   (c) 220 kV side of 400/220 kV 250 MVA ILT-3,
   (d 220 kV Bus-coupler (E-D)
   (e) 220 kV Bus sectionalizer E to C
3. As it was a nearby fault. it was caused tripping on 400/132 kV ,250 MVA ILT-1 & 400/132 kV ,250 MVA ILT2 on instantaneous OC relay.
4. 400/132 kV ,315 MVA ILT-4 which was on "D" Bus , 220 kV SEZ and 220 kV sanganer remained in circuit.

Tripping Analysis as per available record-

5. Due to all relays were electromechanical type relay on 220 kV BUS Sectionalizer, Bus Bar protection Scheme, Bus Coupler and ILTs. So No Data available in relays.

Remedial action taken-

1. O/C & EF Electromechanical relays on all 03 Nos. 220 kV BUS Sectionalizer, 01 No. 220 kV Bus Coupler, 04 Nos. on 400 kV Side of all 400/220 kV ILTs have been retrofitted by Numerical Relays.
2. Remaining Electromechanical/ static relays & schemes will be retrofitted in phase manner as per availability of relays and shutdown at the earliest.

Thanks

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

At 06:31 hrs on 12th January, 2025

Tripped Elements

S. No	Name of Elements	Outage Time	Revival Time	Reason of tripping
1.	400/220 kV 500 MVA ICT 1 at Akal(RS)	06:31 hrs	09:42 hrs	B-N phase to earth fault converted into Y-B-N two phase to earth fault. B-N fault on 400kV Akal-Barmer ckt
2.	400/220 kV 500 MVA ICT 2 at Akal(RS)		10:35 hrs	
3.	400/220 kV 315 MVA ICT 3 at Akal(RS)		10:47 hrs	
4.	400/220 kV 500 MVA ICT 4 at Akal(RS)		10:48 hrs	
5.	400/220 KV 500 MVA ICT 2 AT RAMGARH(RS)			
6.	400 KV Akal-Jaisalmer (RS) Ckt-1		10:13 hrs	
7.	400 KV Akal-Kankani (RS) Ckt-1		10:45 hrs	
8.	400 KV Akal-Ramgarh (RS) Ckt-1		09:55 hrs	
9.	400 KV Akal-Ramgarh (RS) Ckt-2		10:04 hrs	
10.	400 KV Akal-Jodhpur (RS) Ckt-1		10:46 hrs	
11.	400 KV Akal-Barmer (RS) Ckt-1		17:01 hrs	

Brief details of the event

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

ii) During antecedent condition, 400/220 kV 500 MVA ICT-1 & ICT-2 were connected to 400kV bus-1 and 400/220 kV 315 MVA ICT-3 & 500 MVA ICT-4 were connected to 400kV bus-2.

iii) As reported, at 06:31 hrs, B-N fault occurred on 400 KV Akal-Barmer (RS) Ckt, fault distance was 99.62KM and fault current was 2.42 KA from Barmer end.

iv) However, as observed from PMU at Bhadla (PG) S/s, B-N fault was observed and subsequently it converted to Y-B-N double phase to earth fault (Phase sequence issue). Delayed fault clearance time of 2120 msec can be seen in the PMU.

v) On this fault, line tripped from Barmer end but breaker of Akal end got stuck due to issue in SF6 gas pressure. Due to non opening of breaker of Akal end, LBB protection would have operated.

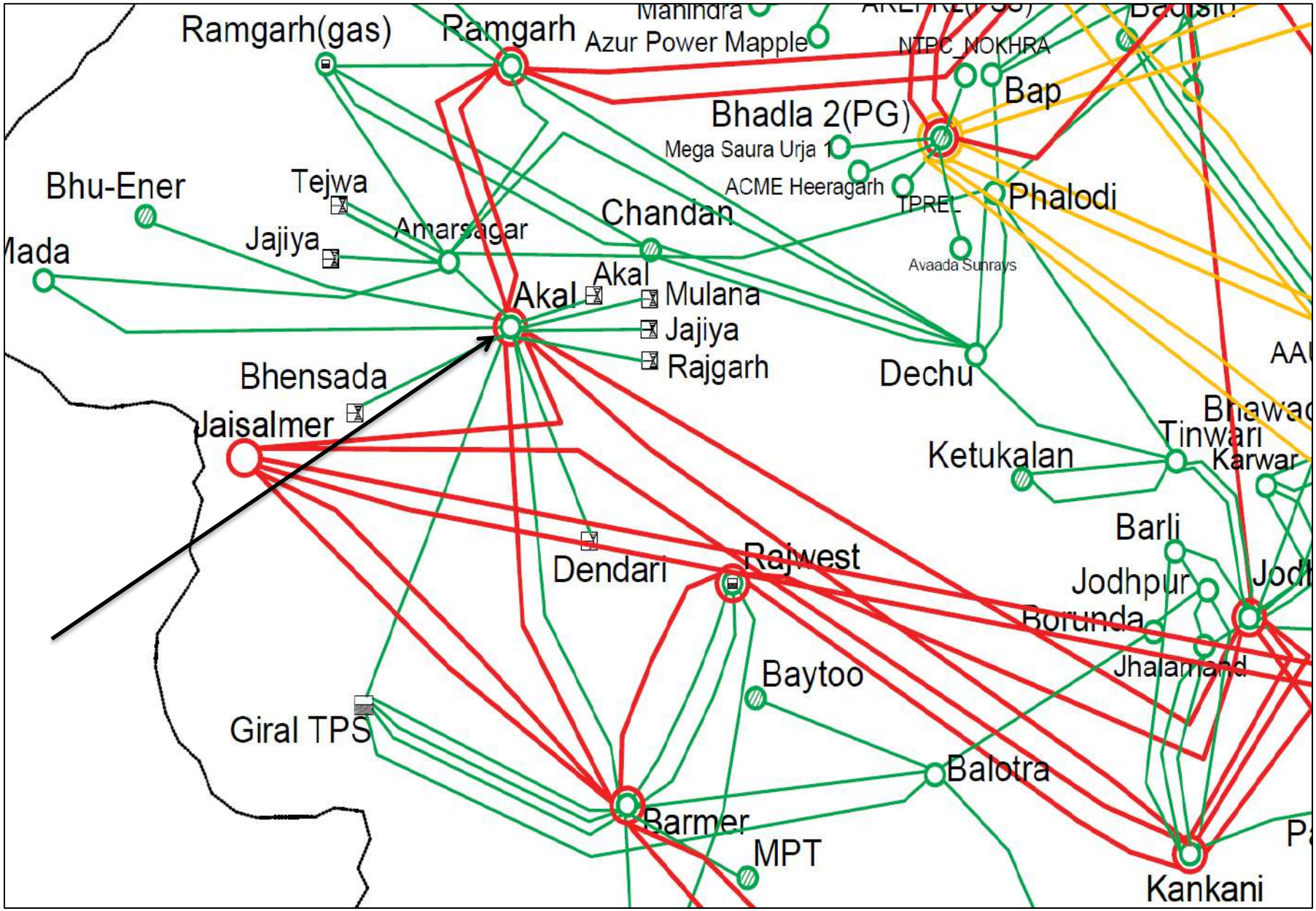
vi) However, all the 400kV lines and 400/220kV ICTs at Akal tripped during the event. Exact details of protection operation not received yet from SLDC-Rajasthan.

vii) Due to tripping of all four ICTs at Akal(RS), evacuation path lost for all the wind power plants connected at 220kV bus-1 & bus-2 at Akal(RS). On this, both 400 and 220kV buses became dead at Akal(RS) S/s.

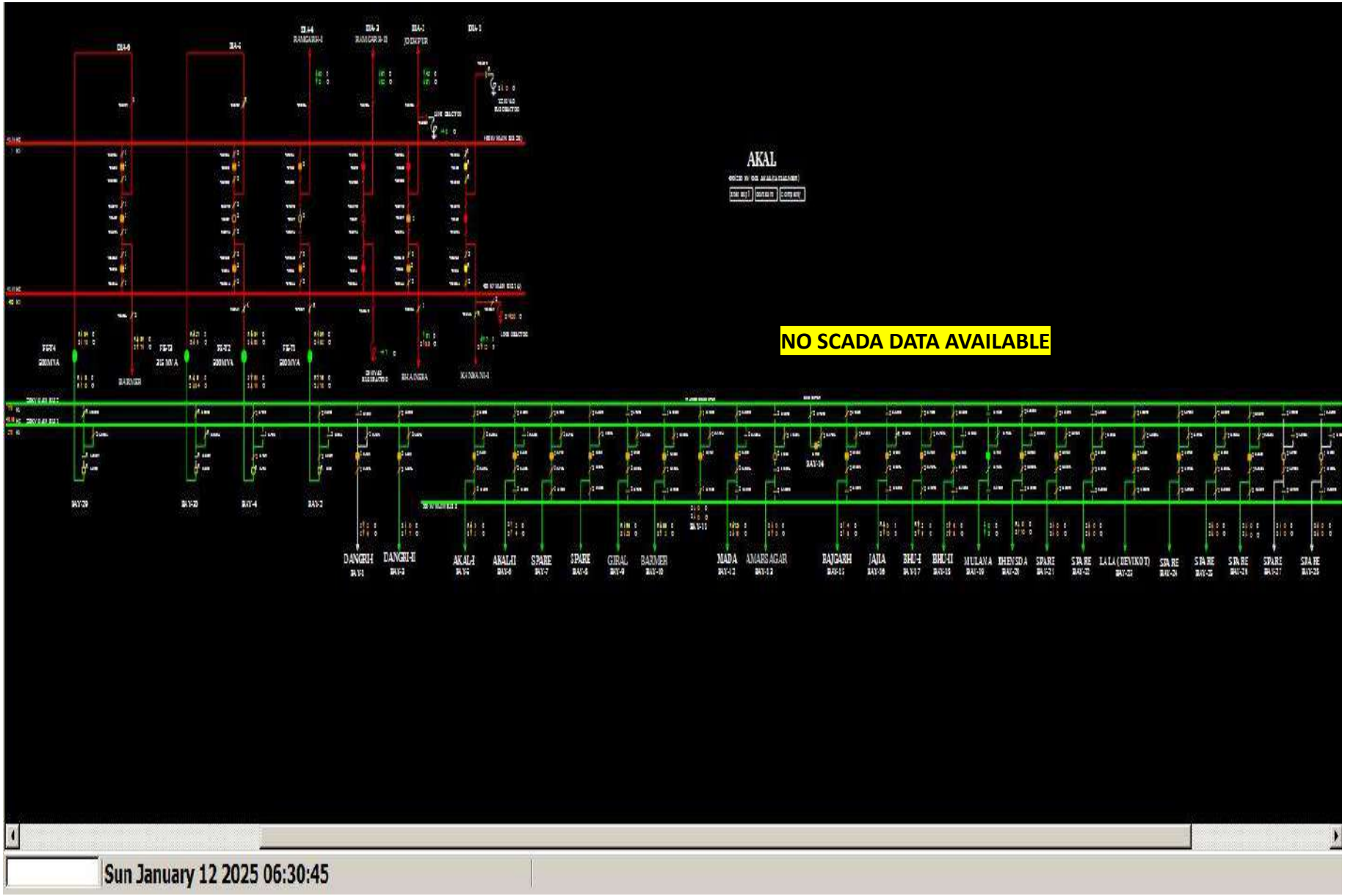
viii) During this event, a dip in Rajasthan wind generation of approx. 340 MW is observed which recovered completely within 5 minutes. (As per SCADA).

ix) As per SCADA, 206MW of change in demand is observed in Rajasthan control area.

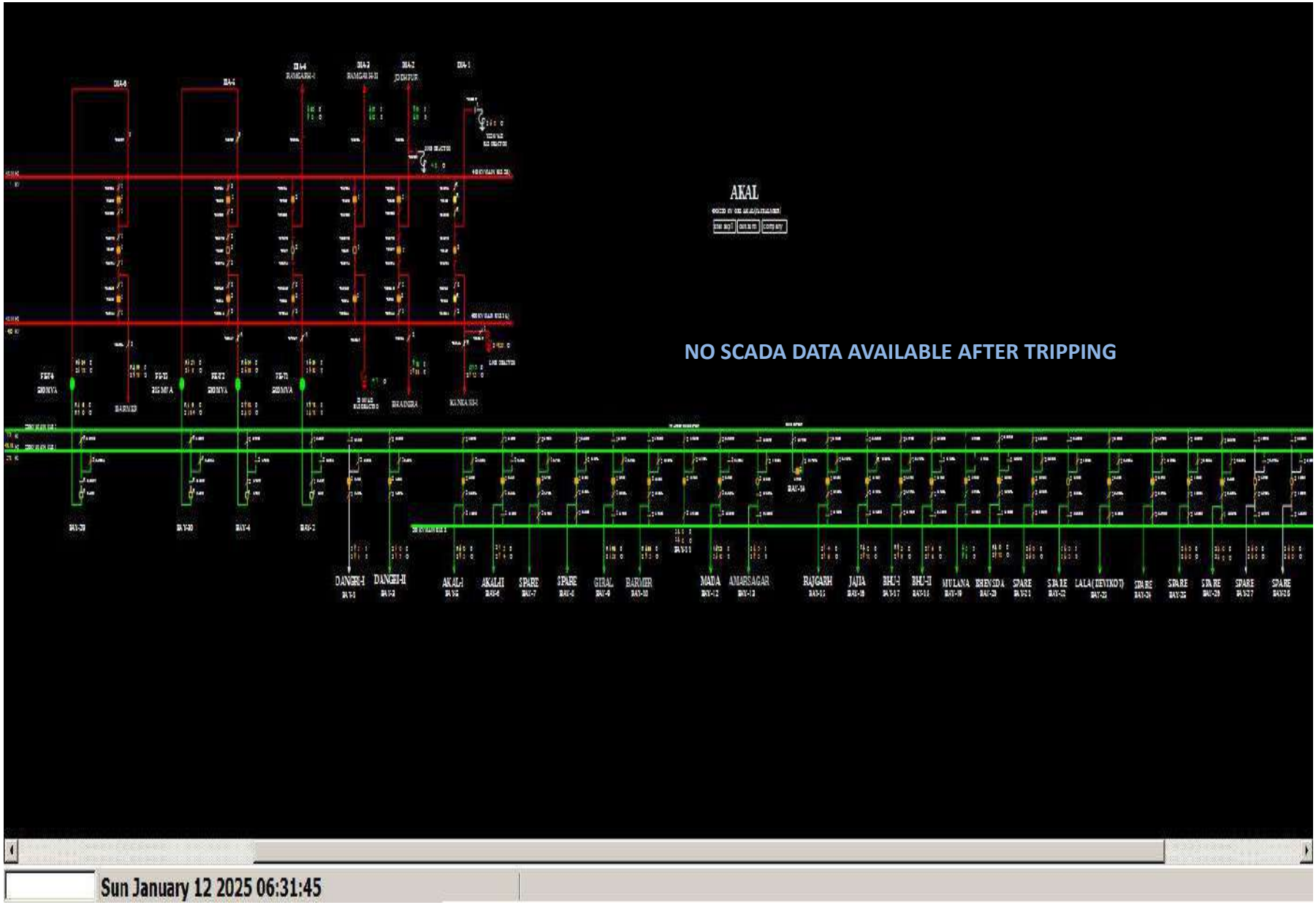
Network Diagram



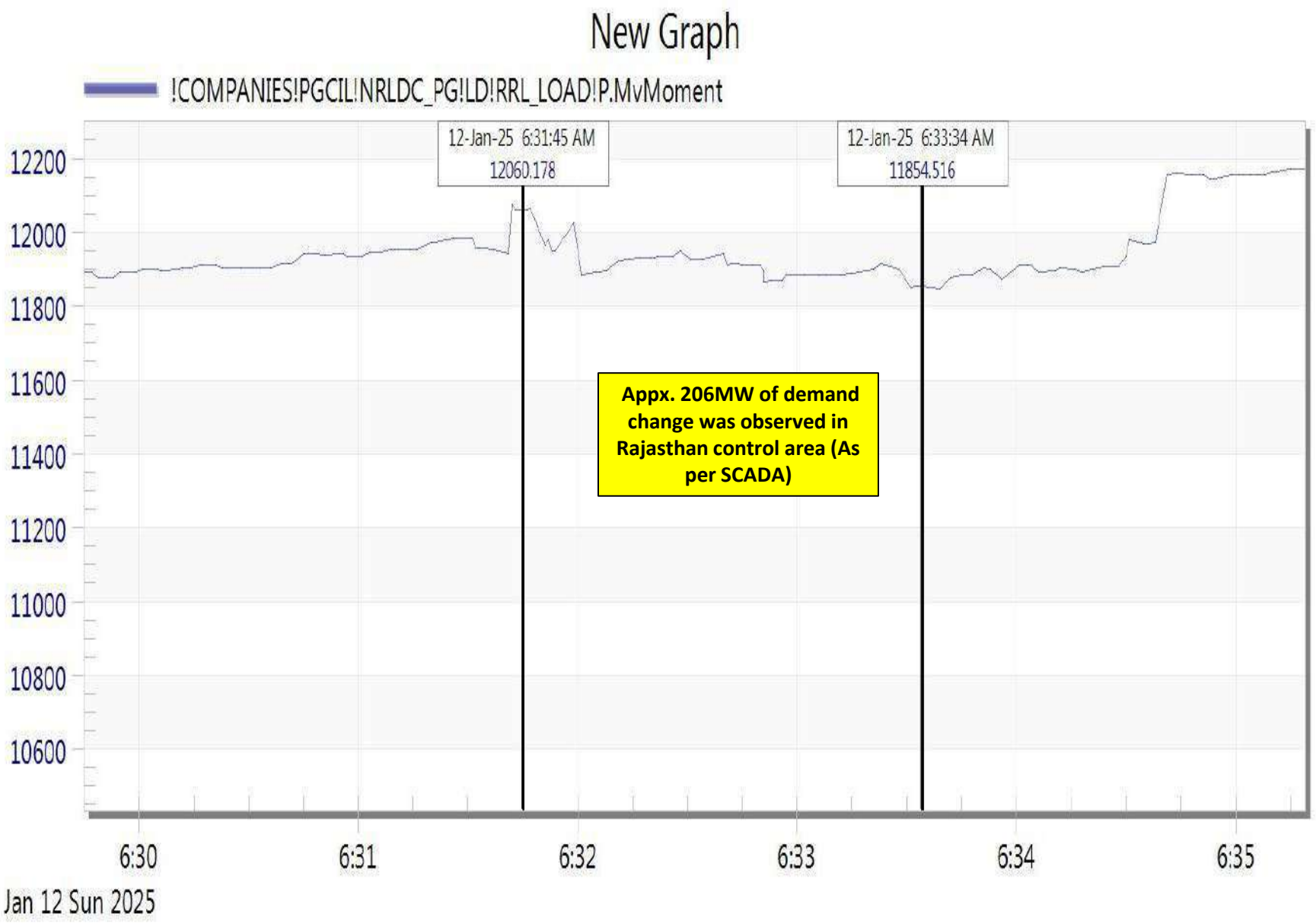
SLD of 400/220kV Akal(RS) before the event



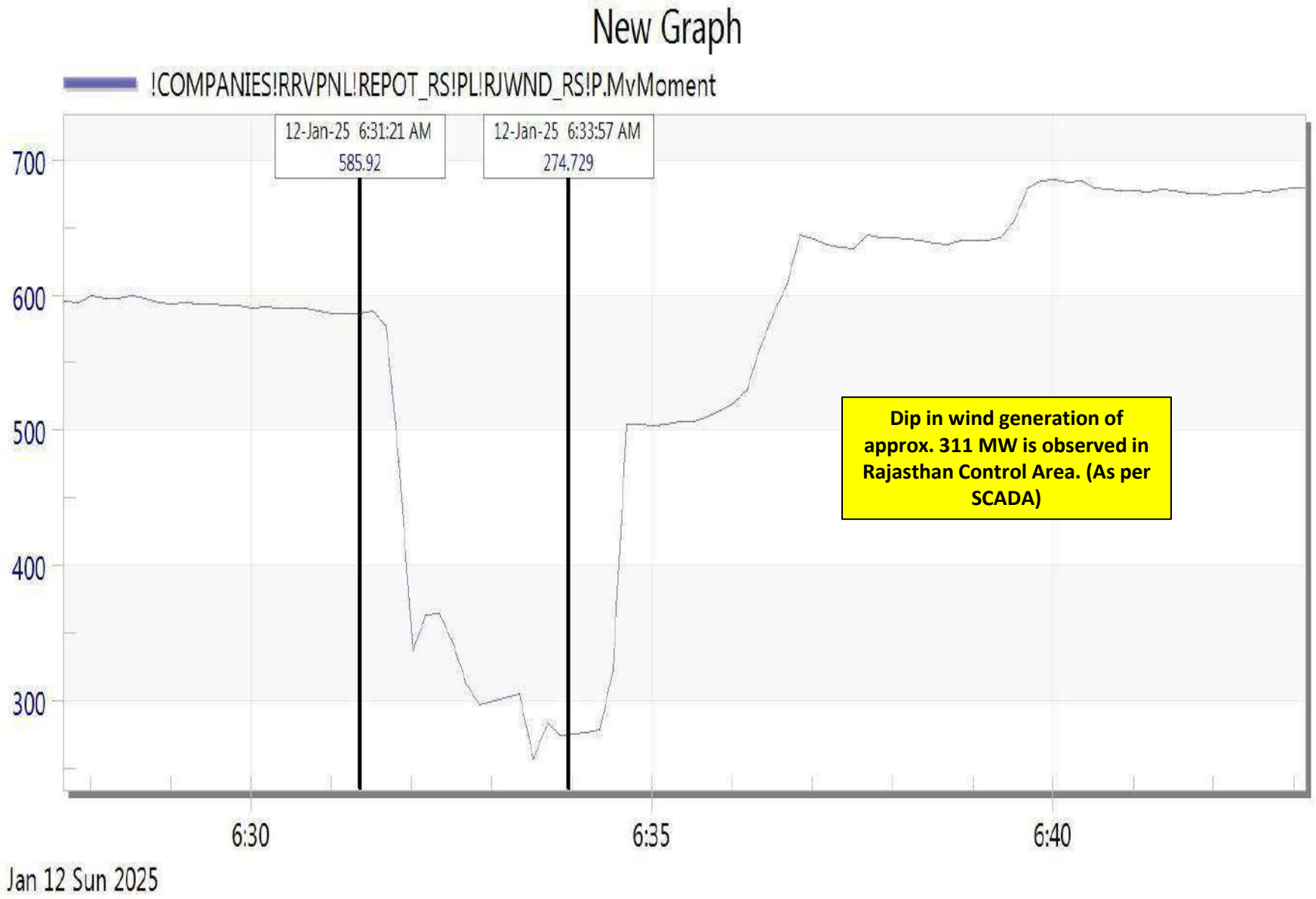
SLD of 400/220kV Akal(RS) after the event



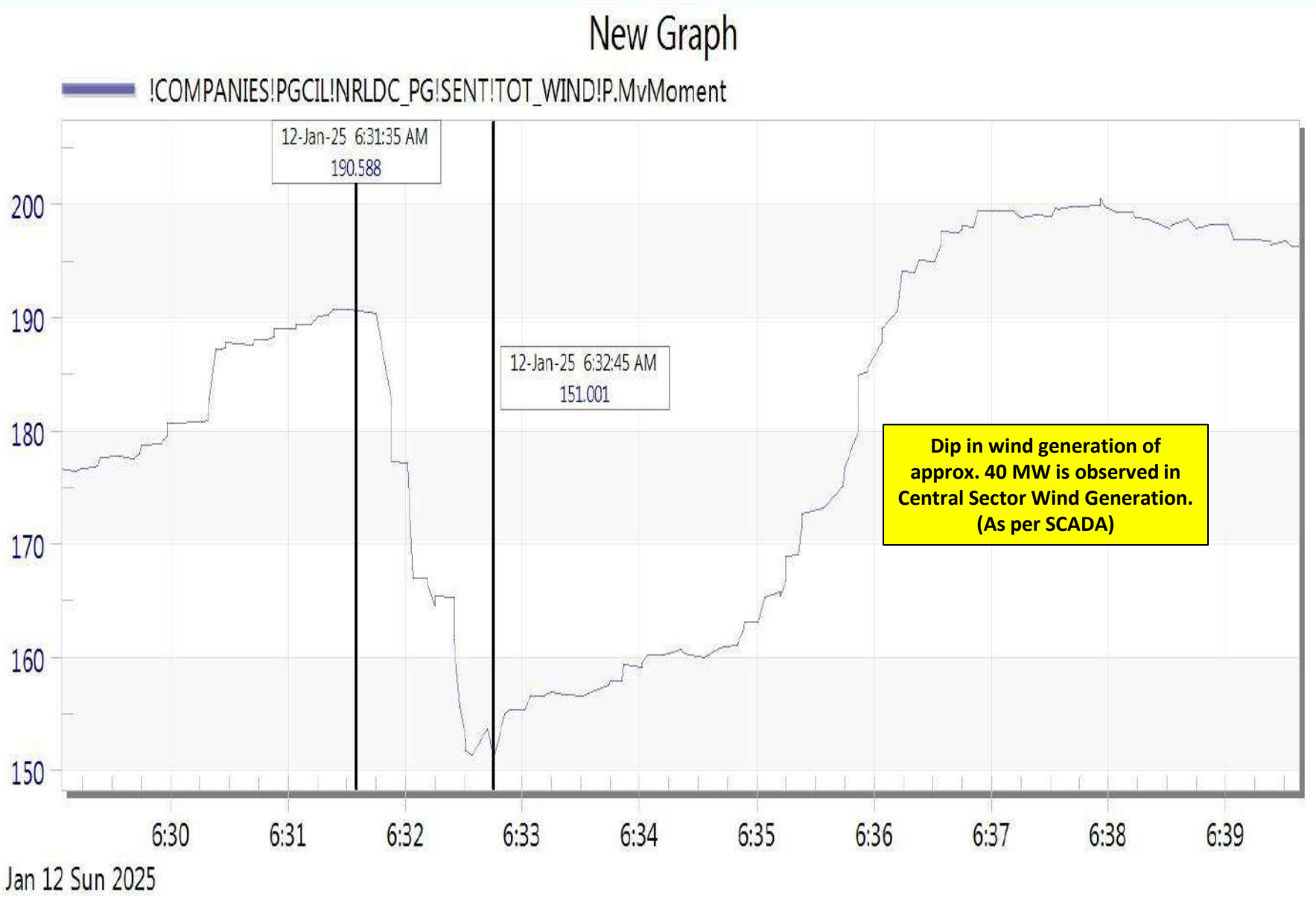
Rajasthan Demand during the event



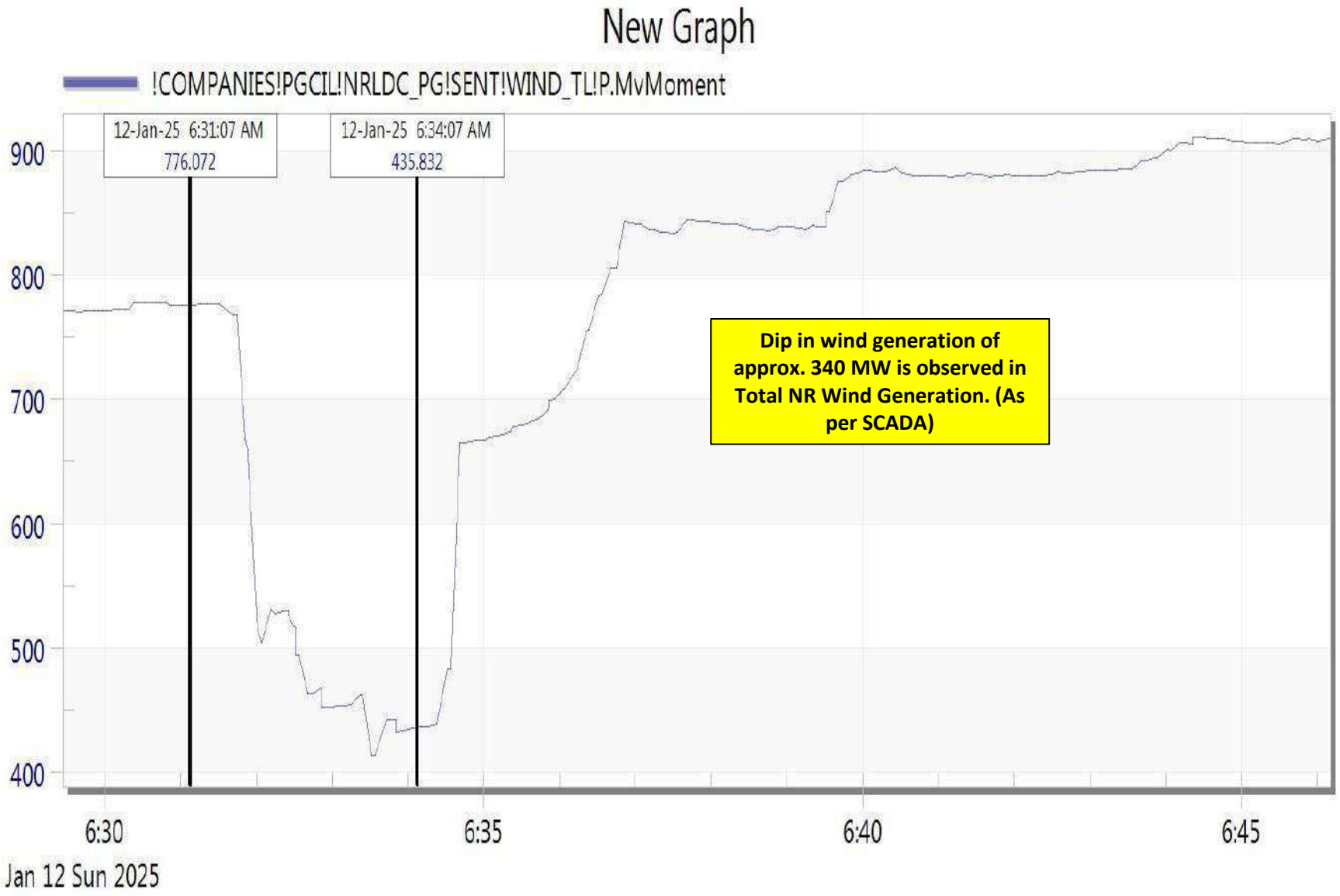
Rajasthan Wind Generation during the event



ISTS Wind Generation during the event



NR Wind Generation during the event



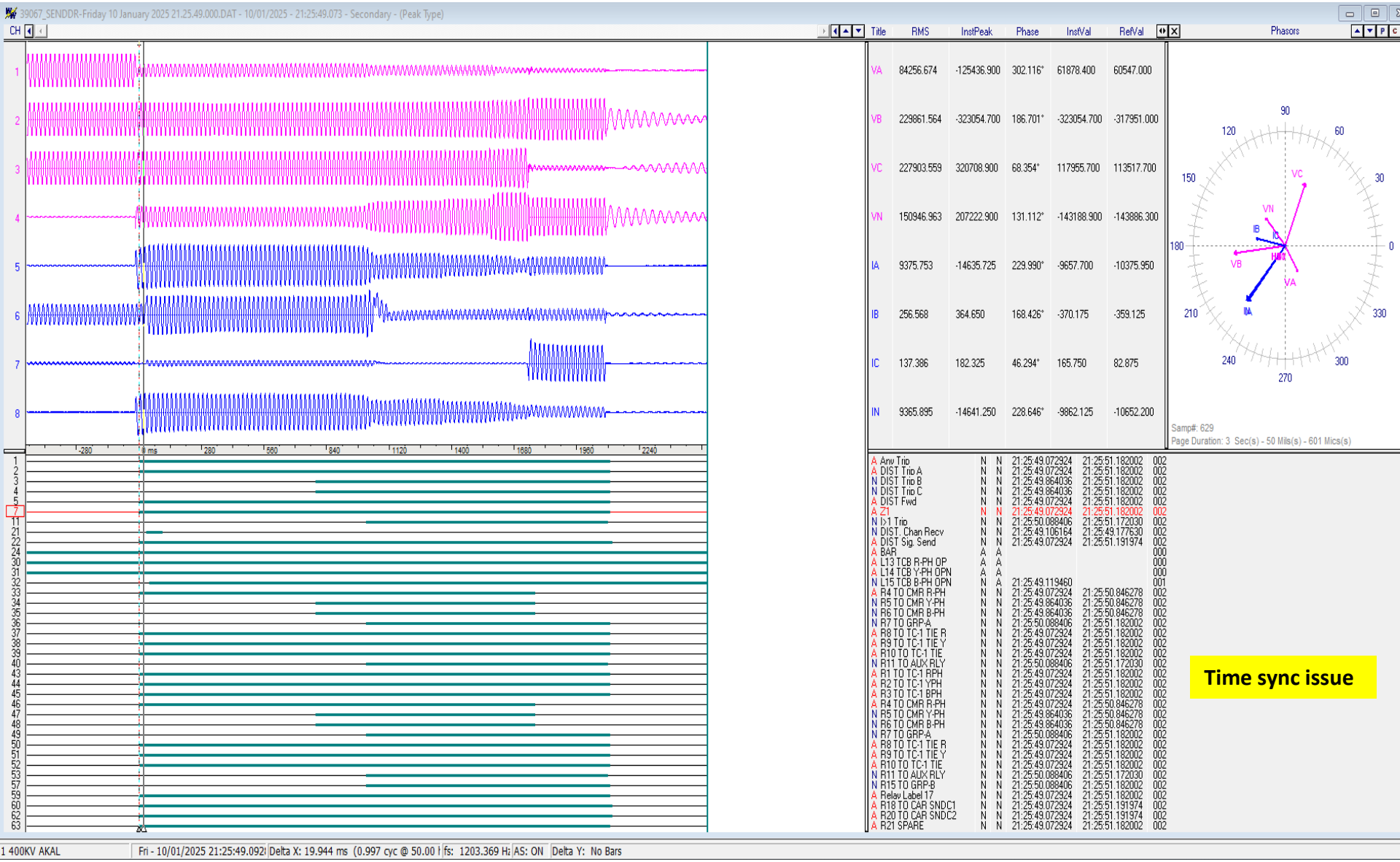
PMU Plot of frequency at Bhadla(PG)

06:31 hrs/12-Jan-25

PMU Plot of phase voltage magnitude at Bhadla(PG)

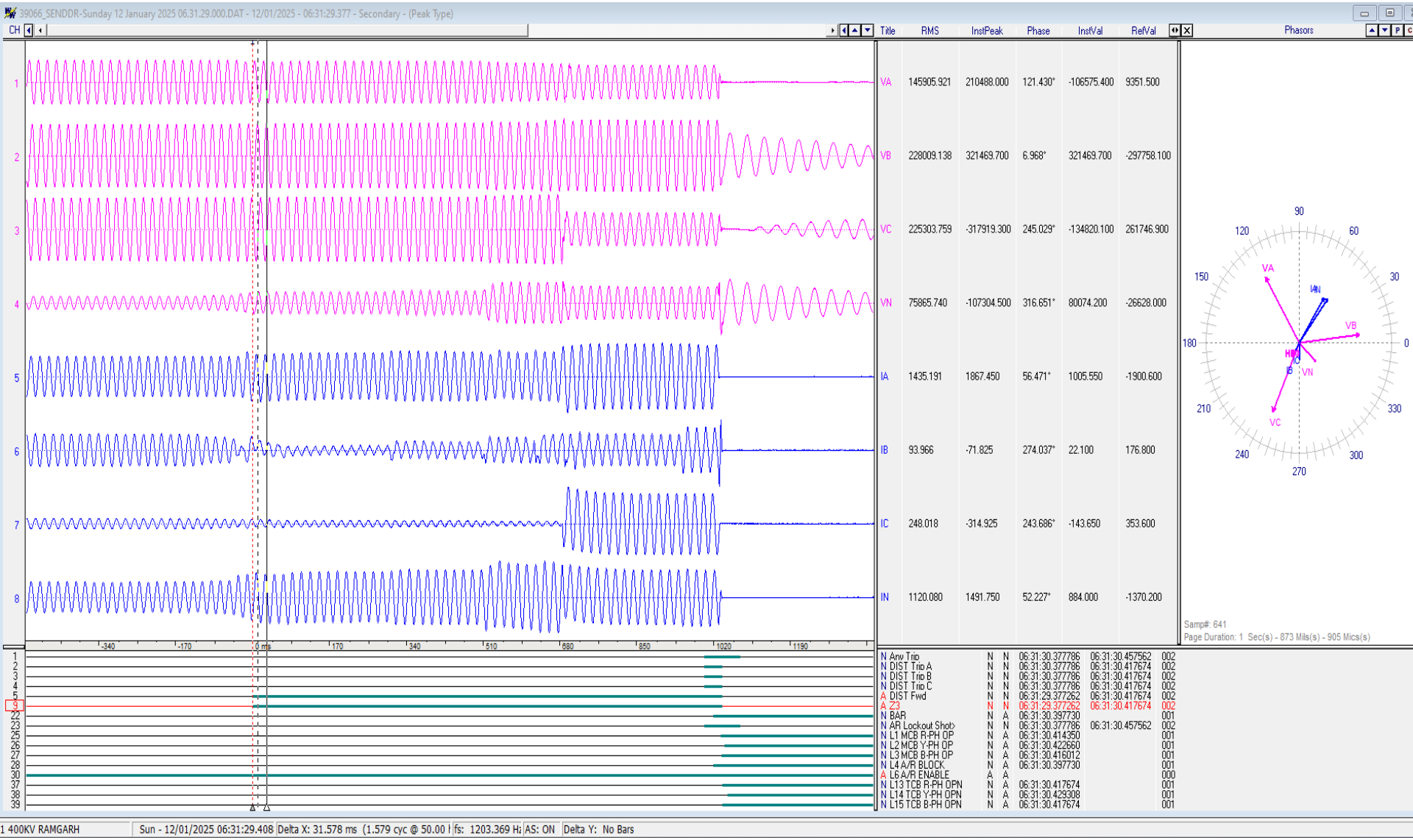
06:31 hrs/12-Jan-25

DR of 400 KV Akal (end)-Barmer Ckt



- ✓ R-N fault (~9.375kA) converted to R-B-N fault; fault sensed in zone-1
- ✓ Fault clearing time=~2108ms

DR of 400 KV Akal (end)-Ramgarh (RS) Ckt-1



- ✓ R-N fault (~1.435kA) converted to R-B-N fault; fault sensed in zone-3
- ✓ Fault clearing time=~1040ms

Points for Discussion

i) Reason for delayed fault clearance needs to be shared.

ii) Phase sequence issue at Akal(RS)/ Bhadla(PG) need to be resolved.

iii) Time sync issue in DR at Akal end need to be resolved at the earliest.

iv) Details of protection operation and sequent of the tripping need to be shared.

v) Why did LBB protection not operate after stuck of Akal side breaker of Akal-Barmer line?

vi) SCADA data was frozen during the event. Availability and healthiness of SCADA data need to be ensured.

vii) DR/EL (.dat/.cfg file) of all tripped elements along with detailed tripping report and remedial action taken report need to be shared.

viii) Tripping at Akal(RS) S/s are not recorded in SCADA SOE. Availability of SCADA SOE data needs to be ensured.

57th PSC Meeting -20th Feb., 2025

Presentation of RVPN

By-
1. D.K. Jain,Superintending Engineer (Prot.Engg.) RVPN, Jaipur.
2. Vijay Pal Yadav, Executive Engineer(MPT&S) RVPN, Alwar.
3. Manish Sharma, AEN O/o SE(MPT&S) RVPN, Jodhpur.

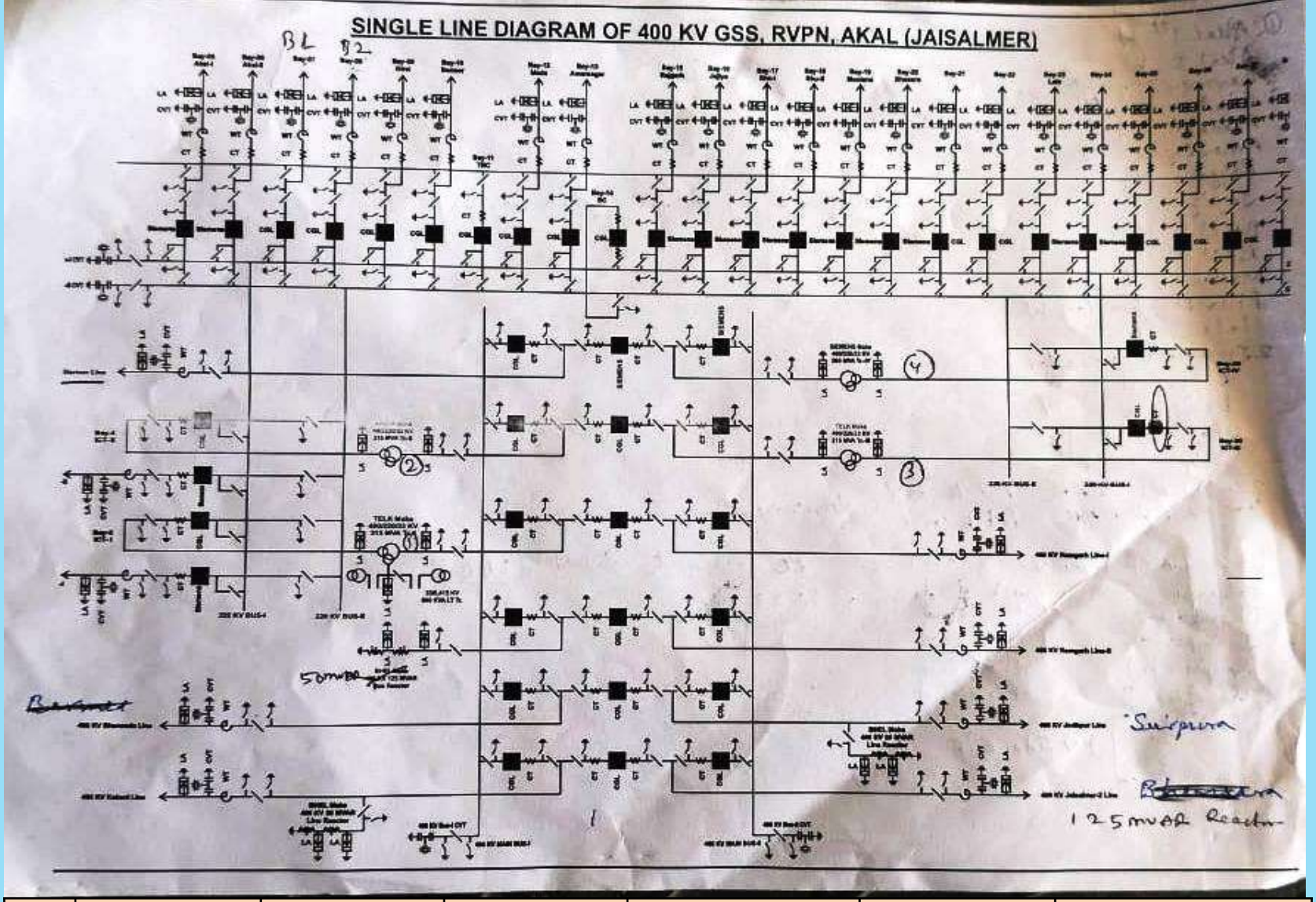
Annex-B.IV_Grid Events Analysis Jan25

S.No.-4, GD-1, Dated 12th Jan., 2025 at 06.31 Hrs. at 400 kV GSS RVPN,Akal (Jaisalmer)

400 kV system at 400 kV GSS, RVPN, Akal

Bus Arrangement:- One and Half Breaker Scheme

1. 400/220 kV GSS, Akal is the largest GSS of RVPN constructed in Year 2010 for integration of Wind Power Generation from Jaisalmer district and presently 2209.7 MW capacity WPP are directly connected at 220 kV voltage level.
2. There 06 nos. 400 kV dia. having 18 Nos of 400 kV bays.
   - I. 400 kV lines / circuits (06 nos.)
     - i. 400 kV S/C Jodhpur (Surpura) line (Twin moose)
     - ii. 400 kV S/C Barmer line (Twin moose)
     - iii. 400 kV D/C Ramgarh line (Circuit-1) (Twin moose)
     - iv. 400 kV D/C Ramgarh line (Circuit-2) (Twin moose)
     - v. 400 kV S/C Kankani line (Quad moose)
     - vi. 400 kV S/C Jaisalmer2 line (Quad moose)
   - II. 400/220 kV Transformer (4 nos. transformers of agg. 1845 MVA capacity)
     - i. 400/220 kV, 500 MVA Transformer-1
     - ii. 400/220 kV, 500 MVA Transformer-2
     - iii. 400/220 kV, 315MVA Transformer-3
     - iv. 400/220 kV, 500 MVA Transformer-4
   - III. 400 kV bus /line reactors
     - i. 125 MVAR, 400 kV bus reactor
     - ii. 50 MVAR, 400 kV bus reactor
     - iii. 3 nos. line reactors each of capacity 50 MVAR



	Dia-6	Dia-5	Dia-4	Dia-3	Dia-2	Dia-1
BUS-II	500 MVA ICT-IV	315 MVA ICT-III	400 kV Ramgarh-I	400 kV Ramgarh-II	400 kV Jodhpur	125 MVAR BUS Reactor
BUS-I	400 kV Barmer	500 MVA ICT-II	500 MVA ICT-I	50 MVAR BUS Reactor	400 kV Bhainsda (Jaisalmer2)	400 kV Kanakani

S.No	Incident took place	Point of discussion
S.No.4 GD-1	During antecedent condition, 400/220 kV 500 MVA ICT-1 & ICT-2 were connected to 400kV bus-1 and 400/220 kV 315 MVA ICT-3 & 500 MVA ICT-4 were connected to 400kV bus-2. As reported, at 06:31 hrs, B-N fault occurred on 400 KV Akal-Barmer (RS) Ckt, fault distance was 99.62KM and fault current was 2.42 KA from Barmer end. However, as observed from PMU at Bhadla (PG) S/s, B-N fault was observed and subsequently it converted to Y-B-N double phase to earth fault. Delayed fault clearance time of 2120 msec can be seen in the PMU. On this fault, line tripped from Barmer end but breaker of Akal end got stuck due to issue in SF6 gas pressure. Due to non opening of breaker of Akal end, LBB protection would have operated. However, all the 400kV lines and 400/220kV ICTs at Akal tripped during the event. During this event, a dip in Rajasthan wind generation of approx. 340 MW is observed which recovered completely within 5 minutes. (As per SCADA).As per SCADA, 206MW of change in demand is observed in Rajasthan control area.	Details analysis of the event and remedial action taken details.

S. NO.	NAME OF EQUIPMENT	Trip Time/ Trip Date	Relay Indication AKAL	Indication at Other end
1	400 kV AKAL-BARMER LINE (134 kM)	06:31 / 12.01.2025	R -PHASE,Z1,DIST-15.38KM, IA-9.210KA	R-PHASE,Z1,Dist-99.62KM, IA-2.422 KA (1.108 s & 1.029 s)
2	400 kV AKAL –JODHPUR LINE (224.6 kM)	06:31 / 12.01.2025	NO TRIP	R-PHASE, Z2, DIST-281.4KM, IA-1.178KA
3	400 KV AKAL - RAMGARH -1 LINE (99 kM)	06:31 / 12.01.2025	NO TRIP	R YB PHASE, Z3, DIST-148.61 KM, IA-1.92KA,IC-2.40KA (1.080 s)
4	400 KV AKAL - RAMGARH -2 LINE (99 kM)	06:31 / 12.01.2025	NO TRIP	R YB PHASE, Z3, DIST-149.28 KM, IA-1.99KA,IC-2.01KA (1.080 s)
5	400 KV AKAL – KANKANI LINE (223 kM)	06:31 / 12.01.2025	NO TRIP	Dist. Prot. Scheme Zone-2 R Phase, Distance 217.500 KM,
6	400 KV AKAL – JAISALMER2 LINE (53 kM)	06:31 / 12.01.2025	NO TRIP	Zero Potential (DT Received)
7	400/200 KV , 500 MVA, ICT-I, AT AKAL	06:31 / 12.01.2025	E/F, R-Ph, HV side, (1.060 s)	IV SIDE- INTER TRIP
8	400/200 KV , 500 MVA, ICT-II, AT AKAL	06:31 / 12.01.2025	E/F, R-Ph, HV side, (1.068 s)	
9	400/200 KV , 315 MVA, ICT-III, AT AKAL	06:31 / 12.01.2025	E/F, R-Ph, HV side, (1.603s)	
10	400/200 KV , 500 MVA, ICTIV, AT AKAL	06:31 / 12.01.2025	E/F, R-Ph, HV side, (0.995 s)	

Analysis & Remedial Measures

Analysis:-

Fault:-R-Ph Disc insulator broken at loc No. 45 of 400 kV Barmer line, conductor lay down. After elapse of nearly 730 ms the fault converted into R-B-N fault as per DR of 400 kV Ramgarh-I&II line . These line were tripped on Z3 fault with time delay of 1 sec.

Pre Fault Condition:-

(i) Due to defective compressor of Main CB of 400 kV Akal Barmer Line , air pressure not maintained & CB lockout condition occurred. Consequently Main CB not tripped during fault and only Tie CB tripped.
(ii) At the time of fault the 400 kV Busbar protection scheme (in built LBB feature) was under blocked condition because of PU error, FO cable issue, SCADA integration issue of PU etc.Hence,LBB operation could not be matured and lines from other end tripped and all trasformers tripped on E/F.

Remedial Measure:-

(i) The Main CB is attended and now healthy.
(ii) Now, 400 kV Busbar protection scheme at 400 kV GSS Akal has been made operative on dated 14.02.2025 and in healthy condition.

Analysis & Remedial Measures

Query Raised by NRPC:-

Delayed fault clearance time of 2120 msec was seen in the PMU of Bhadla (PG) S/s.

Reply of RVPN:-

(i) DR/Event available in M-1 & M-2 Distance Relays of 400 Akal-Barmer Line at Akal end shows operation of power swing and took nearly 2120 ms and satisfies the above query.

(ii) All 400 kV lines were tripped in less than 1.2 s from other end (as shown earlier).

(iii)Later on fault was continuously being fed from existing 4 nos. 400/220/kV Power transformers and these took time of operation as per B/U relay employing 3 sec NI curve and nearly took further 1 s to isolate the fault. Hence it may be established here that fault clearance time is nearly 2120 ms. The source for power transformer were from the 220 kV Lines viz Amarsagar,Giral,Bhainsda-I/II,Barmer (other lines were from RE)

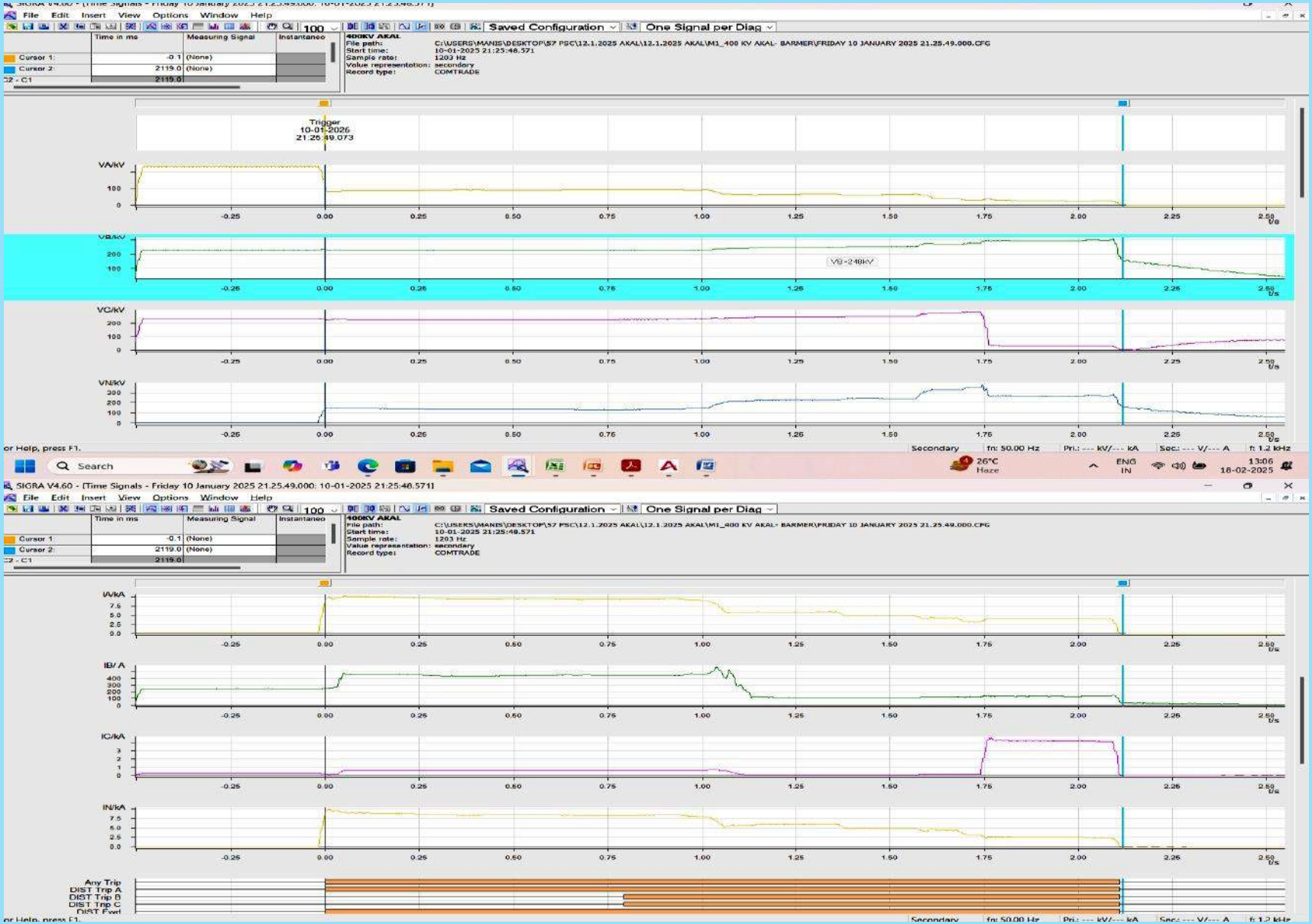
400 kV Akal Barmer (M-1) P442 Event:- Total fault duration=2.180 sec

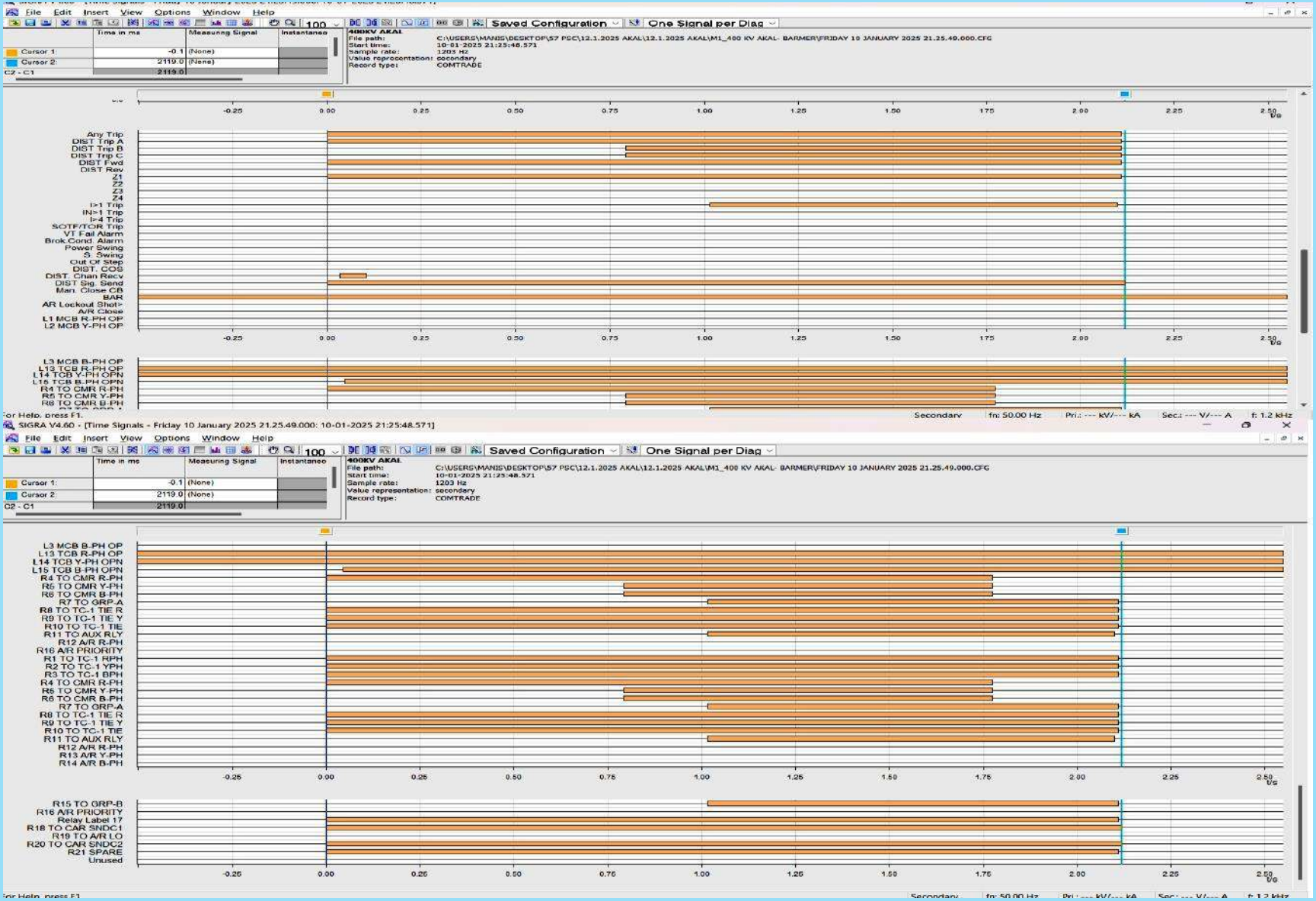
Friday 10 January 2025 21:25:51.182 : Any Trip OFF
Friday 10 January 2025 21:25:51.182 : Z1 OFF
Friday 10 January 2025 21:25:51.182 : DIST Trip C OFF
Friday 10 January 2025 21:25:51.182 : Any Int. Trip OFF
Friday 10 January 2025 21:25:51.182 : DIST Fwd OFF
Friday 10 January 2025 21:25:51.182 : DIST Trip A OFF
Friday 10 January 2025 21:25:51.182 : DIST Trip B OFF
Friday 10 January 2025 21:25:51.182 : Any Start OFF
Friday 10 January 2025 21:25:51.182 : Any Int. Trip A OFF
Friday 10 January 2025 21:25:51.182 : Any Trip B OFF
Friday 10 January 2025 21:25:51.182 : Any Trip C OFF
Friday 10 January 2025 21:25:51.182 : 3P Trip OFF
Friday 10 January 2025 21:25:51.182 : Any Trip A OFF
Friday 10 January 2025 21:25:51.182 : Any Int. Trip A OFF
Friday 10 January 2025 21:25:51.182 : Any Int. Trip B OFF
Friday 10 January 2025 21:25:51.182 : Any Int. Trip C OFF
Friday 10 January 2025 21:25:51.177 : Any Pole Dead ON
Friday 10 January 2025 21:25:51.172 : I>1 Start OFF
Friday 10 January 2025 21:25:51.172 : I> Start Any C OFF
Friday 10 January 2025 21:25:51.172 : I>1 Trip OFF
Friday 10 January 2025 21:25:51.172 : I> Start Any A OFF
Friday 10 January 2025 21:25:50.846 : DIST Start C ON
Friday 10 January 2025 21:25:50.829 : I> Start Any C ON
Friday 10 January 2025 21:25:50.121 : I>4 Start OFF
Friday 10 January 2025 21:25:50.121 : I>3 Start OFF
Friday 10 January 2025 21:25:50.088 : I>1 Trip ON
Friday 10 January 2025 21:25:49.864 : DIST Trip C ON
Friday 10 January 2025 21:25:49.864 : DIST Trip B ON
Friday 10 January 2025 21:25:49.340 : Logic Inputs 1
Friday 10 January 2025 21:25:49.177 : DIST UNB CR OFF
Friday 10 January 2025 21:25:49.177 : DEF UNB CR OFF
Friday 10 January 2025 21:25:49.172 : Logic Inputs 1
Friday 10 January 2025 21:25:49.114 : Logic Inputs 1
Friday 10 January 2025 21:25:49.106 : DEF UNB CR ON
Friday 10 January 2025 21:25:49.106 : DIST UNB CR ON
Friday 10 January 2025 21:25:49.101 : Logic Inputs 1
Friday 10 January 2025 21:25:49.088 : I>1 Start ON
Friday 10 January 2025 21:25:49.075 : I>4 Start ON
Friday 10 January 2025 21:25:49.075 : I>3 Start ON
Friday 10 January 2025 21:25:49.073 : Any Int. Trip B ON
Friday 10 January 2025 21:25:49.073 : Any Int. Trip A ON
Friday 10 January 2025 21:25:49.073 : Any Trip A ON
Friday 10 January 2025 21:25:49.073 : Any Int. Trip C ON
Friday 10 January 2025 21:25:49.073 : DIST Trip A ON
Friday 10 January 2025 21:25:49.073 : Z1 ON
Friday 10 January 2025 21:25:49.073 : Any Trip ON
Friday 10 January 2025 21:25:49.073 : DIST Fwd ON
Friday 10 January 2025 21:25:49.073 : Virtual Output 1 ON
Friday 10 January 2025 21:25:49.073 : Any Trip C ON
Friday 10 January 2025 21:25:49.073 : Any Int. Trip ON
Friday 10 January 2025 21:25:49.073 : Any Trip B ON
Friday 10 January 2025 21:25:49.073 : DIST Sig. Send ON
Friday 10 January 2025 21:25:49.073 : 3P Trip ON
Friday 10 January 2025 21:25:49.070 : DIST Start A ON
Friday 10 January 2025 21:25:49.070 : Dist Start N ON
Friday 10 January 2025 21:25:49.070 : Any Start ON
Friday 10 January 2025 21:25:49.064 : I> Start Any A ON

400 kV Akal-Barmer(M2) REL670 Event:- Fault Duration: 2.012 s

Events List

Channel Number	Name	Status	Time
22	PHS-STFWL1	On	1/12/2025 7:06:26:517 AM
25	PHS-STFWPE	On	1/12/2025 7:06:26:517 AM
1	TRIP	On	1/12/2025 7:06:26:520 AM
2	TRIP-R	On	1/12/2025 7:06:26:520 AM
7	ZM01-TRIP	On	1/12/2025 7:06:26:520 AM
8	ZM01-START	On	1/12/2025 7:06:26:520 AM
10	ZM02-START	On	1/12/2025 7:06:26:520 AM
12	ZM03-START	On	1/12/2025 7:06:26:520 AM
84	CARR_SEND	On	1/12/2025 7:06:26:520 AM
81	TR_R_MAIN_CB	On	1/12/2025 7:06:26:523 AM
85	TR_R_TBC_CB	On	1/12/2025 7:06:26:523 AM
37	CARR REC CH-2	On	1/12/2025 7:06:26:547 AM
36	CARR REC CH-1	On	1/12/2025 7:06:26:551 AM
46	TIE CB Bph OP	On	1/12/2025 7:06:26:560 AM
18	ZCOM-TRIP	On	1/12/2025 7:06:26:601 AM
36	CARR REC CH-1	Off	1/12/2025 7:06:26:611 AM
37	CARR REC CH-2	Off	1/12/2025 7:06:26:619 AM
18	ZCOM-TRIP	Off	1/12/2025 7:06:26:649 AM
43	AR BLOCK	On	1/12/2025 7:06:26:787 AM
3	TRIP-Y	On	1/12/2025 7:06:26:823 AM
4	TRIP-B	On	1/12/2025 7:06:26:823 AM
9	ZM02-TRIP	On	1/12/2025 7:06:26:823 AM
82	TR_Y_MAIN_CB	On	1/12/2025 7:06:26:826 AM
83	TR_B_MAIN_CB	On	1/12/2025 7:06:26:826 AM
86	TR_Y_TBC_CB	On	1/12/2025 7:06:26:826 AM
87	TR_B_TBC_CB	On	1/12/2025 7:06:26:826 AM
11	ZM03-TRIP	On	1/12/2025 7:06:27:321 AM
24	PHS-STFWL3	On	1/12/2025 7:06:28:275 AM
22	PHS-STFWL1	Off	1/12/2025 7:06:28:620 AM
1	TRIP	Off	1/12/2025 7:06:28:623 AM
2	TRIP-R	Off	1/12/2025 7:06:28:623 AM
3	TRIP-Y	Off	1/12/2025 7:06:28:623 AM
4	TRIP-B	Off	1/12/2025 7:06:28:623 AM
7	ZM01-TRIP	Off	1/12/2025 7:06:28:623 AM
8	ZM01-START	Off	1/12/2025 7:06:28:623 AM
9	ZM02-TRIP	Off	1/12/2025 7:06:28:623 AM
10	ZM02-START	Off	1/12/2025 7:06:28:623 AM
11	ZM03-TRIP	Off	1/12/2025 7:06:28:623 AM
12	ZM03-START	Off	1/12/2025 7:06:28:623 AM
24	PHS-STFWL3	Off	1/12/2025 7:06:28:623 AM
25	PHS-STFWPE	Off	1/12/2025 7:06:28:623 AM
84	CARR_SEND	Off	1/12/2025 7:06:28:623 AM
26	PSB-OPTD	On	1/12/2025 7:06:28:626 AM
32	L1 FUSE FAIL	On	1/12/2025 7:06:28:626 AM
81	TR_R_MAIN_CB	Off	1/12/2025 7:06:28:626 AM
82	TR_Y_MAIN_CB	Off	1/12/2025 7:06:28:626 AM
83	TR_B_MAIN_CB	Off	1/12/2025 7:06:28:626 AM
85	TR_R_TBC_CB	Off	1/12/2025 7:06:28:626 AM
86	TR_Y_TBC_CB	Off	1/12/2025 7:06:28:626 AM
87	TR_B_TBC_CB	Off	1/12/2025 7:06:28:626 AM
26	PSB-OPTD	Off	1/12/2025 7:06:28:629 AM
32	L1 FUSE FAIL	Off	1/12/2025 7:06:28:629 AM


File Edit Insert View Options Window Help
Saved Configuration
One Signal per Diag
Time in ms
Measuring Signal
Instantaneo
Cursor 1: -0.1 (None)
Cursor 2: 2119.0 (None)
C2 - C1 2119.0
400KV AKAL
File path: C:\USERS\MANIS\DESKTOP\57 PSC\12.1.2025 AKAL\12.1.2025 AKAL\M1_400 KV AKAL- BARMER\FRIDAY 10 JANUARY 2025 21.25.49.000.CFG
Start time: 10-01-2025 21:25:48.571
Sample rate: 1203 Hz
Value representation: secondary
Record type: COMTRADE
Trigger
10-01-2026
21:25:49.073
VA/kV
VB/kV
VB-248kV
VC/kV
VN/kV
Secondary
fn: 50.00 Hz
Pri.: --- kV/--- kA
Sec.: --- V/--- A
f: 1.2 kHz
Search
26°C
Haze
ENG
IN
13:06
18-02-2025
SIGRA V4.60 - (Time Signals - Friday 10 January 2025 21.25.49.000: 10-01-2025 21:25:48.5711
IA/kA
IB/ A
IC/kA
IN/kA
Any Trip
DIST Trip A
DIST Trip B
DIST Trip C
DIST Fwd


File Edit Insert View Options Window Help
Saved Configuration
One Signal per Diag
Time in ms
Measuring Signal
Instantaneo
Cursor 1: -0.1 (None)
Cursor 2: 2119.0 (None)
C2 - C1 2119.0
400KV AKAL
File path: C:\USERS\MANIS\DESKTOP\57 PSC\12.1.2025 AKAL\12.1.2025 AKAL\M1_400 KV AKAL- BARMER\FRIDAY 10 JANUARY 2025 21.25.49.000.CFG
Start time: 10-01-2025 21:25:48.571
Sample rate: 1203 Hz
Value representation: secondary
Record type: COMTRADE
Any Trip
DIST Trip A
DIST Trip B
DIST Trip C
DIST Fwd
DIST Rev
Z1
Z2
Z3
Z4
I>1 Trip
IN>1 Trip
I>4 Trip
SOTF/TOR Trip
VT Fail Alarm
Brok.Cond. Alarm
Power Swing
S. Swing
Out Of Step
DIST. COS
DIST. Chan Recv
DIST Sig. Send
Man. Close CB
BAR
AR Lockout Shot-
A/R Close
L1 MCB R-PH OP
L2 MCB Y-PH OP
L3 MCB B-PH OP
L13 TCB R-PH OP
L14 TCB Y-PH OPN
L15 TCB B-PH OPN
R4 TO CMR R-PH
R5 TO CMR Y-PH
R6 TO CMR B-PH
-0.25 0.00 0.25 0.50 0.75 1.00 1.25 1.50 1.75 2.00 2.25 2.50
Secondary fn: 50.00 Hz Pri.: --- kV/--- kA Sec.: --- V/--- A f: 1.2 kHz
SIGRA V4.60 - [Time Signals - Friday 10 January 2025 21.25.49.000: 10-01-2025 21:25:48.571]
R7 TO GRP-A
R8 TO TC-1 TIE R
R9 TO TC-1 TIE Y
R10 TO TC-1 TIE
R11 TO AUX RLY
R12 A/R R-PH
R16 A/R PRIORITY
R1 TO TC-1 RPH
R2 TO TC-1 YPH
R3 TO TC-1 BPH
R13 A/R Y-PH
R14 A/R B-PH
R15 TO GRP-B
Relay Label 17
R18 TO CAR SNDC1
R19 TO A/R LO
R20 TO CAR SNDC2
R21 SPARE
Unused

500 MVA ICT-I Events:- 400 kV Total fault duration=1.060 sec

Sunday 12 January 2025 05:58:46.189 : Fault Recorded
Sunday 12 January 2025 05:58:46.168 : IN1>1 Start OFF
Sunday 12 January 2025 05:58:46.168 : Trip Command In OFF
Sunday 12 January 2025 05:58:46.168 : IN1>1 Trip OFF
Sunday 12 January 2025 05:58:46.168 : Any Start OFF
Sunday 12 January 2025 05:58:46.168 : Output Contacts1
Sunday 12 January 2025 05:58:46.168 : IN/SEF>Blk Start OFF
Sunday 12 January 2025 05:58:46.168 : Start N OFF
Sunday 12 January 2025 05:58:46.158 : I> BlockStart OFF
Sunday 12 January 2025 05:58:46.157 : I>1 Start A OFF
Sunday 12 January 2025 05:58:46.157 : I>1 Start OFF
Sunday 12 January 2025 05:58:46.108 : IN1>1 Trip ON
Sunday 12 January 2025 05:58:46.108 : Trip Command In ON
Sunday 12 January 2025 05:58:46.108 : Output Contacts1
Sunday 12 January 2025 05:58:46.088 : I>1 Start A ON
Sunday 12 January 2025 05:58:46.088 : I>1 Start ON
Sunday 12 January 2025 05:58:46.088 : I> BlockStart ON
Sunday 12 January 2025 05:58:45.390 : I>1 Start A OFF
Sunday 12 January 2025 05:58:45.390 : I>1 Start OFF
Sunday 12 January 2025 05:58:45.390 : I> BlockStart OFF
Sunday 12 January 2025 05:58:45.140 : I>1 Start A ON
Sunday 12 January 2025 05:58:45.140 : I>1 Start ON
Sunday 12 January 2025 05:58:45.140 : I> BlockStart ON
Sunday 12 January 2025 05:58:45.120 : Any Start ON
Sunday 12 January 2025 05:58:45.120 : IN1>1 Start ON
Sunday 12 January 2025 05:58:45.120 : IN/SEF>Blk Start ON
Sunday 12 January 2025 05:58:45.120 : Start N ON

500 MVA ICT-II Events:- 400 kV Total fault duration=1.068 sec

Friday 10 January 2025 20:25:50.179 : Fault Recorded
Friday 10 January 2025 20:25:50.149 : Any Start OFF
Friday 10 January 2025 20:25:50.149 : IN1>1 Start OFF
Friday 10 January 2025 20:25:50.149 : Start N OFF
Friday 10 January 2025 20:25:50.149 : Output Contacts1
Friday 10 January 2025 20:25:50.149 : IN/SEF>Blk Start OFF
Friday 10 January 2025 20:25:50.148 : IN1>1 Trip OFF
Friday 10 January 2025 20:25:50.148 : Trip Command In OFF
Friday 10 January 2025 20:25:50.138 : I>1 Start A OFF
Friday 10 January 2025 20:25:50.138 : I>1 Start OFF
Friday 10 January 2025 20:25:50.138 : I> BlockStart OFF
Friday 10 January 2025 20:25:50.089 : Trip Command In ON
Friday 10 January 2025 20:25:50.089 : Output Contacts1
Friday 10 January 2025 20:25:50.088 : IN1>1 Trip ON
Friday 10 January 2025 20:25:50.078 : I>1 Start A ON
Friday 10 January 2025 20:25:50.078 : I>1 Start ON
Friday 10 January 2025 20:25:50.078 : I> BlockStart ON
Friday 10 January 2025 20:25:49.390 : I>1 Start A OFF
Friday 10 January 2025 20:25:49.390 : I>1 Start OFF
Friday 10 January 2025 20:25:49.390 : I> BlockStart OFF
Friday 10 January 2025 20:25:49.131 : I>1 Start A ON
Friday 10 January 2025 20:25:49.131 : I>1 Start ON
Friday 10 January 2025 20:25:49.131 : I> BlockStart ON
Friday 10 January 2025 20:25:49.111 : Any Start ON
Friday 10 January 2025 20:25:49.111 : IN1>1 Start ON
Friday 10 January 2025 20:25:49.111 : IN/SEF>Blk Start ON
Friday 10 January 2025 20:25:49.111 : Start N ON

500 MVA ICT-III Events:- 400 kV Total fault duration=1.613 sec

Friday 10 January 2025 14:55:46.039 : F out of Range OFF
Friday 10 January 2025 14:55:45.726 : F out of Range ON
Friday 10 January 2025 14:55:44.639 : Fault Recorded
Friday 10 January 2025 14:55:44.613 : Output Contacts1
Friday 10 January 2025 14:55:44.612 : Virtual Output 7 OFF
Friday 10 January 2025 14:55:44.612 : Trip Command In OFF
Friday 10 January 2025 14:55:44.612 : IN1>1 Trip OFF
Friday 10 January 2025 14:55:44.612 : IN1>1 Start OFF
Friday 10 January 2025 14:55:44.612 : IN/SEF>Blk Start OFF
Friday 10 January 2025 14:55:44.612 : Start N OFF
Friday 10 January 2025 14:55:44.612 : Any Start OFF
Friday 10 January 2025 14:55:44.602 : I>1 Start B OFF
Friday 10 January 2025 14:55:44.602 : I>1 Start OFF
Friday 10 January 2025 14:55:44.602 : I> BlockStart OFF
Friday 10 January 2025 14:55:44.553 : Output Contacts1
Friday 10 January 2025 14:55:44.552 : IN1>1 Trip ON
Friday 10 January 2025 14:55:44.552 : Trip Command In ON
Friday 10 January 2025 14:55:44.552 : Virtual Output 7 ON
Friday 10 January 2025 14:55:44.123 : I>1 Start B ON
Friday 10 January 2025 14:55:44.123 : I>1 Start ON
Friday 10 January 2025 14:55:44.123 : I> BlockStart ON
Friday 10 January 2025 14:55:43.026 : Any Start ON
Friday 10 January 2025 14:55:43.026 : IN1>1 Start ON
Friday 10 January 2025 14:55:43.026 : IN/SEF>Blk Start ON
Friday 10 January 2025 14:55:43.026 : Start N ON

500 MVA ICT-IV Events:- 400 kV Total fault duration=0.995 sec

Friday 10 January 2025 21:25:50.378 : Fault Recorded
Friday 10 January 2025 21:25:50.352 : Output Contacts1
Friday 10 January 2025 21:25:50.351 : Virtual Output 1 OFF
Friday 10 January 2025 21:25:50.351 : Trip Command In OFF
Friday 10 January 2025 21:25:50.351 : IN1>1 Trip OFF
Friday 10 January 2025 21:25:50.351 : IN1>1 Start OFF
Friday 10 January 2025 21:25:50.351 : IN/SEF>Blk Start OFF
Friday 10 January 2025 21:25:50.351 : Start N OFF
Friday 10 January 2025 21:25:50.351 : Any Start OFF
Friday 10 January 2025 21:25:50.292 : Output Contacts1
Friday 10 January 2025 21:25:50.291 : IN1>1 Trip ON
Friday 10 January 2025 21:25:50.291 : Trip Command In ON
Friday 10 January 2025 21:25:50.291 : Virtual Output 1 ON
Friday 10 January 2025 21:25:49.653 : I> BlockStart OFF
Friday 10 January 2025 21:25:49.652 : I>1 Start A OFF
Friday 10 January 2025 21:25:49.652 : I>1 Start OFF
Friday 10 January 2025 21:25:49.413 : I>1 Start A ON
Friday 10 January 2025 21:25:49.413 : I>1 Start A ON
Friday 10 January 2025 21:25:49.413 : I> BlockStart ON
Friday 10 January 2025 21:25:49.413 : I>1 Start ON
Friday 10 January 2025 21:25:49.383 : Any Start ON
Friday 10 January 2025 21:25:49.383 : IN1>1 Start ON
Friday 10 January 2025 21:25:49.383 : IN/SEF>Blk Start ON
Friday 10 January 2025 21:25:49.383 : Start N ON
Friday 10 January 2025 21:25:35.423 : SNTP Failure ON

400 kV Barmer-Akal at Barmer End:- Duration 1.029s

Sunday 12 January 2025 05:28:37.578 : All Pole Dead OFF	Sunday 12 January 2025 05:28:36.537 : Virtual Output 7 OFF
Sunday 12 January 2025 05:28:37.575 : CB Aux C OFF	Sunday 12 January 2025 05:28:36.537 : 1P Trip OFF
Sunday 12 January 2025 05:28:37.575 : Logic Inputs 1	Sunday 12 January 2025 05:28:36.537 : Output Contacts1
Sunday 12 January 2025 05:28:37.573 : Logic Inputs 1	Sunday 12 January 2025 05:28:36.537 : Any Int. Trip A OFF
Sunday 12 January 2025 05:28:37.570 : Logic Inputs 1	Sunday 12 January 2025 05:28:36.537 : Any Trip A OFF
Sunday 12 January 2025 05:28:37.561 : A/R Lockout ON	Sunday 12 January 2025 05:28:36.516 : DIST Sig. Send OFF
Sunday 12 January 2025 05:28:37.556 : Z2 ON	Sunday 12 January 2025 05:28:36.516 : Output Contacts1
Sunday 12 January 2025 05:28:37.555 : A/R Close OFF	Sunday 12 January 2025 05:28:36.508 : Virtual Output 6 OFF
Sunday 12 January 2025 05:28:37.555 : Output Contacts1	Sunday 12 January 2025 05:28:36.506 : DIST Trip A OFF
Sunday 12 January 2025 05:28:37.555 : Logic Inputs 1	Sunday 12 January 2025 05:28:36.506 : DIST Fwd OFF
Sunday 12 January 2025 05:28:37.553 : DIST Start A ON	Sunday 12 January 2025 05:28:36.506 : Any Start OFF
Sunday 12 January 2025 05:28:37.553 : DIST Fwd ON	Sunday 12 January 2025 05:28:36.506 : Z1 OFF
Sunday 12 January 2025 05:28:37.553 : Virtual Output 6 ON	Sunday 12 January 2025 05:28:36.506 : Virtual Output 2 OFF
Sunday 12 January 2025 05:28:37.553 : Dist Start N ON	Sunday 12 January 2025 05:28:36.506 : DIST Start A OFF
Sunday 12 January 2025 05:28:37.551 : Any Start ON	Sunday 12 January 2025 05:28:36.506 : Dist Start N OFF
Sunday 12 January 2025 05:28:37.551 : I>1 Start ON	Sunday 12 January 2025 05:28:36.504 : All Pole Dead OFF
Sunday 12 January 2025 05:28:37.548 : Virtual Output10 ON	Sunday 12 January 2025 05:28:36.501 : CB Aux A OFF
Sunday 12 January 2025 05:28:37.548 : Output Contacts1	Sunday 12 January 2025 05:28:36.498 : I> Start Any A OFF
Sunday 12 January 2025 05:28:37.548 : Virtual Output11 ON	Sunday 12 January 2025 05:28:36.498 : I>1 Start OFF
Sunday 12 January 2025 05:28:37.544 : Logic Inputs 1	Sunday 12 January 2025 05:28:36.496 : Logic Inputs 1
Sunday 12 January 2025 05:28:37.543 : Logic Inputs 1	Sunday 12 January 2025 05:28:36.488 : I>1 Start ON
Sunday 12 January 2025 05:28:37.531 : Virtual Output 8 OFF	Sunday 12 January 2025 05:28:36.488 : Logic Inputs 1
Sunday 12 January 2025 05:28:37.531 : DIST UNB CR OFF	Sunday 12 January 2025 05:28:36.481 : Virtual Output 8 ON
Sunday 12 January 2025 05:28:37.528 : I> Start Any A ON	Sunday 12 January 2025 05:28:36.481 : DIST UNB CR ON
Sunday 12 January 2025 05:28:37.526 : Logic Inputs 1	Sunday 12 January 2025 05:28:36.476 : Logic Inputs 1
Sunday 12 January 2025 05:28:37.510 : All Pole Dead ON	Sunday 12 January 2025 05:28:36.465 : I>1 Start OFF
Sunday 12 January 2025 05:28:37.506 : CB Aux A ON	Sunday 12 January 2025 05:28:36.462 : I> Start Any A ON
Sunday 12 January 2025 05:28:37.501 : Logic Inputs 1	Sunday 12 January 2025 05:28:36.462 : I>1 Start ON
Sunday 12 January 2025 05:28:37.456 : TOR Enable ON	Sunday 12 January 2025 05:28:36.458 : DIST Sig. Send ON
Sunday 12 January 2025 05:28:37.455 : Virtual Output 5 OFF	Sunday 12 January 2025 05:28:36.458 : DIST Fwd ON
Sunday 12 January 2025 05:28:37.455 : A/R 1P In Prog OFF	Sunday 12 January 2025 05:28:36.458 : DIST Trip A ON
Sunday 12 January 2025 05:28:37.455 : A/R Close ON	Sunday 12 January 2025 05:28:36.458 : AR Discrim. ON
Sunday 12 January 2025 05:28:37.455 : A/R Reclaim ON	Sunday 12 January 2025 05:28:36.458 : Any Int. Trip ON
Sunday 12 January 2025 05:28:37.455 : Output Contacts1	Sunday 12 January 2025 05:28:36.458 : A/R 1P In Prog ON
Sunday 12 January 2025 05:28:37.455 : A/R Force Sync. ON	Sunday 12 January 2025 05:28:36.458 : Virtual Output 5 ON
Sunday 12 January 2025 05:28:37.455 : AR Discrim. OFF	Sunday 12 January 2025 05:28:36.458 : Z1 ON
Sunday 12 January 2025 05:28:36.704 : Virtual Output 8 ON	Sunday 12 January 2025 05:28:36.458 : Virtual Output 2 ON
Sunday 12 January 2025 05:28:36.704 : DIST UNB CR ON	Sunday 12 January 2025 05:28:36.458 : 1P Trip ON
Sunday 12 January 2025 05:28:36.699 : Logic Inputs 1	Sunday 12 January 2025 05:28:36.458 : Output Contacts1
Sunday 12 January 2025 05:28:36.682 : Fault Recorded	Sunday 12 January 2025 05:28:36.458 : Any Trip A ON
Sunday 12 January 2025 05:28:36.674 : Virtual Output 8 OFF	Sunday 12 January 2025 05:28:36.458 : Any Trip ON
Sunday 12 January 2025 05:28:36.674 : DIST UNB CR OFF	Sunday 12 January 2025 05:28:36.458 : Virtual Output 7 ON
Sunday 12 January 2025 05:28:36.669 : Logic Inputs 1	Sunday 12 January 2025 05:28:36.458 : Any Int. Trip A ON
Sunday 12 January 2025 05:28:36.582 : Logic Inputs 1	Sunday 12 January 2025 05:28:36.456 : Any Start ON
Sunday 12 January 2025 05:28:36.577 : Output Contacts1	Sunday 12 January 2025 05:28:36.456 : DIST Start A ON
Sunday 12 January 2025 05:28:36.537 : Any Trip OFF	Sunday 12 January 2025 05:28:36.456 : Dist Start N ON
Sunday 12 January 2025 05:28:36.537 : A/R Trip 3P ON	Sunday 12 January 2025 05:28:36.449 : Virtual Output 6 ON
Sunday 12 January 2025 05:28:36.537 : Any Int. Trip OFF	

DIGSI - [Trip Log - 000384 / 12/01/2025 06:32:58.327 - AEN MPTS BMR 21112019 / 400 KV BMR- AKAL LINE M- / 7SA522 V4.7 Var/7SA522 V04.]

File Edit Paste Device View Options Window Help

Number	Indication	Value	Date and time	Initiator	Caus
00301	Power System fault	384 - ON	12.01.2025 06:32:58.327		
00302	Fault Event	400 - ON	12.01.2025 06:32:58.327		
03682	Distance Pickup L1E	ON	0 ms		
03701	Distance Loop L1E selected forward	ON	0 ms		
01335	Earth fault protection Trip is blocked	ON	6 ms		
04006	>Dis.Tele. Carrier RECEPTION Channel 1	ON	8 ms		
03802	Distance TRIP command - Only Phase L1	ON	8 ms		
02844	AR 1st cycle running	ON	8 ms		
02801	AR: Auto-reclose in progress	ON	8 ms		
04010	>Dis.Tele. Carrier RECEPTION Channel 2	ON	9 ms		
00533	Primary fault current IL1	2.43 kA	9 ms		
03671	Distance PICKED UP	OFF	31 ms		
03701	Distance Loop L1E selected forward	OFF	31 ms		
02839	AR dead time after 1pole trip running	ON	31 ms		
00591	Single pole open detected in L1	ON	39 ms		
01123	Fault Locator Loop L1E	ON	5 ms		
01117	Flt Locator: secondary RESISTANCE	2.18 Ohm	5 ms		
01118	Flt Locator: secondary REACTANCE	18.29 Ohm	5 ms		
01114	Flt Locator: primary RESISTANCE	3.96 Ohm	5 ms		
01115	Flt Locator: primary REACTANCE	33.26 Ohm	5 ms		
01119	Flt Locator: Distance to fault	100.5 km	5 ms		
01120	Flt Locator: Distance [%] to fault	81.2 %	5 ms		
00511	Relay GENERAL TRIP command	OFF	105 ms		
01335	Earth fault protection Trip is blocked	OFF	115 ms		
04006	>Dis.Tele. Carrier RECEPTION Channel 1	ON	230 ms		
04010	>Dis.Tele. Carrier RECEPTION Channel 2	ON	593 ms		
02851	AR: Close command	ON	1031 ms		
02784	AR: Auto-reclose is not ready	ON	1031 ms		
00590	Line closure detected	ON	1058 ms		
00591	Single pole open detected in L1	OFF	1058 ms		
00302	Fault Event	401 - ON	12.01.2025 06:32:59.390		
04282	SOTF-O/C Pickup L1	ON	1064 ms		
04295	SOTF-O/C TRIP command L123	ON	1064 ms		
00536	Relay Definitive TRIP	ON	1064 ms		
00533	Primary fault current IL1	2.68 kA	1068 ms		
00534	Primary fault current IL2	0.29 kA	1068 ms		
00535	Primary fault current IL3	0.16 kA	1068 ms		
03682	Distance Pickup L1E	ON	1074 ms		
03701	Distance Loop L1E selected forward	ON	1074 ms		
01335	Earth fault protection Trip is blocked	ON	1075 ms		
03652	Distance is BLOCKED	ON	1076 ms		
03671	Distance PICKED UP	OFF	1079 ms		
03701	Distance Loop L1E selected forward	OFF	1079 ms		
00590	Line closure detected	OFF	1108 ms		

Press F1 for Help.

Type here to search

400 kV Ramgarh-Akal-I & II Events: Z3 operated Duration 1.080 s

Sunday 12 January 2025 06:31:30.457 : Any Int. Trip OFF
Sunday 12 January 2025 06:31:30.457 : Any Trip OFF
Sunday 12 January 2025 06:31:30.457 : Any Int. Trip A OFF
Sunday 12 January 2025 06:31:30.457 : AR Lockout Shot> OFF
Sunday 12 January 2025 06:31:30.457 : Virtual Output 4 OFF
Sunday 12 January 2025 06:31:30.457 : General Alarm OFF
Sunday 12 January 2025 06:31:30.457 : Any Int. Trip B OFF
Sunday 12 January 2025 06:31:30.457 : Any Trip C OFF
Sunday 12 January 2025 06:31:30.457 : 3P Trip OFF
Sunday 12 January 2025 06:31:30.457 : Output Contacts1
Sunday 12 January 2025 06:31:30.457 : Any Int. Trip C OFF
Sunday 12 January 2025 06:31:30.457 : Any Trip A OFF
Sunday 12 January 2025 06:31:30.457 : Any Trip B OFF
Sunday 12 January 2025 06:31:30.441 : Dist Start N OFF
Sunday 12 January 2025 06:31:30.426 : All Pole Dead ON
Sunday 12 January 2025 06:31:30.424 : Logic Inputs 1
Sunday 12 January 2025 06:31:30.422 : Virtual Output 9 ON
Sunday 12 January 2025 06:31:30.422 : CB Aux B ON
Sunday 12 January 2025 06:31:30.419 : Dist Start N ON
Sunday 12 January 2025 06:31:30.418 : DIST Trip B OFF
Sunday 12 January 2025 06:31:30.418 : DIST Trip C OFF
Sunday 12 January 2025 06:31:30.418 : Virtual Output16 OFF
Sunday 12 January 2025 06:31:30.418 : Virtual Output14 OFF
Sunday 12 January 2025 06:31:30.418 : Any Start OFF
Sunday 12 January 2025 06:31:30.418 : DIST Fwd OFF
Sunday 12 January 2025 06:31:30.418 : DIST Trip A OFF
Sunday 12 January 2025 06:31:30.418 : Any Pole Dead ON
Sunday 12 January 2025 06:31:30.418 : Output Contacts1
Sunday 12 January 2025 06:31:30.418 : Logic Inputs 1
Sunday 12 January 2025 06:31:30.418 : Z3 OFF
Sunday 12 January 2025 06:31:30.418 : DIST Start A OFF
Sunday 12 January 2025 06:31:30.418 : DIST Start C OFF
Sunday 12 January 2025 06:31:30.418 : Dist Start N OFF
Sunday 12 January 2025 06:31:30.416 : Virtual Output10 ON
Sunday 12 January 2025 06:31:30.416 : CB Aux C ON
Sunday 12 January 2025 06:31:30.414 : Virtual Output 8 ON
Sunday 12 January 2025 06:31:30.414 : CB Aux A ON
Sunday 12 January 2025 06:31:30.413 : Logic Inputs 1
Sunday 12 January 2025 06:31:30.411 : Logic Inputs 1
Sunday 12 January 2025 06:31:30.409 : Output Contacts1
Sunday 12 January 2025 06:31:30.409 : Logic Inputs 1
Sunday 12 January 2025 06:31:30.393 : Logic Inputs 1
Sunday 12 January 2025 06:31:30.378 : DIST Trip B ON
Sunday 12 January 2025 06:31:30.378 : Virtual Output14 ON
Sunday 12 January 2025 06:31:30.378 : Virtual Output16 ON
Sunday 12 January 2025 06:31:30.378 : DIST Trip C ON
Sunday 12 January 2025 06:31:30.378 : DIST Trip A ON

Sunday 12 January 2025 06:31:30.378 : Virtual Output 4 ON
Sunday 12 January 2025 06:31:30.378 : AR Lockout Shot> ON
Sunday 12 January 2025 06:31:30.378 : Any Int. Trip ON
Sunday 12 January 2025 06:31:30.378 : General Alarm ON
Sunday 12 January 2025 06:31:30.378 : Any Trip C ON
Sunday 12 January 2025 06:31:30.378 : Any Trip B ON
Sunday 12 January 2025 06:31:30.378 : Output Contacts1
Sunday 12 January 2025 06:31:30.378 : 3P Trip ON
Sunday 12 January 2025 06:31:30.378 : Any Trip A ON
Sunday 12 January 2025 06:31:30.378 : Any Int. Trip A ON
Sunday 12 January 2025 06:31:30.378 : Any Trip ON
Sunday 12 January 2025 06:31:30.378 : Any Int. Trip C ON
Sunday 12 January 2025 06:31:30.378 : Any Int. Trip B ON
Sunday 12 January 2025 06:31:30.112 : DIST Start C ON
Sunday 12 January 2025 06:31:29.680 : A/R Trip 3P ON
Sunday 12 January 2025 06:31:29.680 : A/R Lockout ON
Sunday 12 January 2025 06:31:29.377 : DIST Fwd ON
Sunday 12 January 2025 06:31:29.377 : Any Start ON
Sunday 12 January 2025 06:31:29.377 : DIST Start A ON
Sunday 12 January 2025 06:31:29.377 : Z3 ON
Sunday 12 January 2025 06:31:29.377 : Dist Start N ONSunday 12 January 2025 06:31:30.409 : Logic Inputs 1
Sunday 12 January 2025 06:31:30.393 : Logic Inputs 1
Sunday 12 January 2025 06:31:30.378 : DIST Trip B ON
Sunday 12 January 2025 06:31:30.378 : Virtual Output14 ON
Sunday 12 January 2025 06:31:30.378 : Virtual Output16 ON
Sunday 12 January 2025 06:31:30.378 : DIST Trip C ON
Sunday 12 January 2025 06:31:30.378 : DIST Trip A ON
Sunday 12 January 2025 06:31:30.378 : Virtual Output 4 ON
Sunday 12 January 2025 06:31:30.378 : AR Lockout Shot> ON
Sunday 12 January 2025 06:31:30.378 : Any Int. Trip ON
Sunday 12 January 2025 06:31:30.378 : General Alarm ON
Sunday 12 January 2025 06:31:30.378 : Any Trip C ON
Sunday 12 January 2025 06:31:30.378 : Any Trip B ON
Sunday 12 January 2025 06:31:30.378 : Output Contacts1
Sunday 12 January 2025 06:31:30.378 : 3P Trip ON
Sunday 12 January 2025 06:31:30.378 : Any Trip A ON
Sunday 12 January 2025 06:31:30.378 : Any Int. Trip A ON
Sunday 12 January 2025 06:31:30.378 : Any Trip ON
Sunday 12 January 2025 06:31:30.378 : Any Int. Trip C ON
Sunday 12 January 2025 06:31:30.378 : Any Int. Trip B ON
Sunday 12 January 2025 06:31:30.112 : DIST Start C ON
Sunday 12 January 2025 06:31:29.680 : A/R Trip 3P ON
Sunday 12 January 2025 06:31:29.680 : A/R Lockout ON
Sunday 12 January 2025 06:31:29.377 : DIST Fwd ON
Sunday 12 January 2025 06:31:29.377 : Any Start ON
Sunday 12 January 2025 06:31:29.377 : DIST Start A ON
Sunday 12 January 2025 06:31:29.377 : Z3 ON
Sunday 12 January 2025 06:31:29.377 : Dist Start N ON

Multiple element tripping event at 220/132/33KV Hukamawali (HS)

At 06:09 hrs on 23rd January, 2025

Tripped Elements

S. No	Name of Elements	Outage Time	Revival Time	Reason of tripping
1.	220 KV Fatehabad(PG)-Hukmawali (HV) (HVPNL) Ckt-1	06:09 hrs	08:09 hrs	B-N fault converted to Y-B-N fault due to explosion of B phase CT of 220 kV HUKMAWALI(HV)-CHORMAR(HV) CKT-1 at HUKMAWALI end.
2.	220 KV Fatehabad(PG)-Hukmawali (HV) (HVPNL) Ckt-2		07:50 hrs	
3.	220 kV HUKMAWALI(HV)-CHORMAR(HV) CKT-1			
4.	220 kV HUKMAWALI(HV)-CHORMAR(HV) CKT-2			

Brief details of the event

i) 220/132/33kV Hukmawali(HS) S/s has double main bus scheme in all voltage level.

ii) During antecedent condition, 220 KV Fatehabad(PG)-Hukmawali (HV) (HVPNL) Ckt-1, 220 KV Fatehabad(PG)-Hukmawali (HV) (HVPNL) Ckt-2, and 220 kV HUKMAWALI(HV)-CHORMAR(HV) CKT-1 were carrying 27MW, 28MW and 19MW respectively.

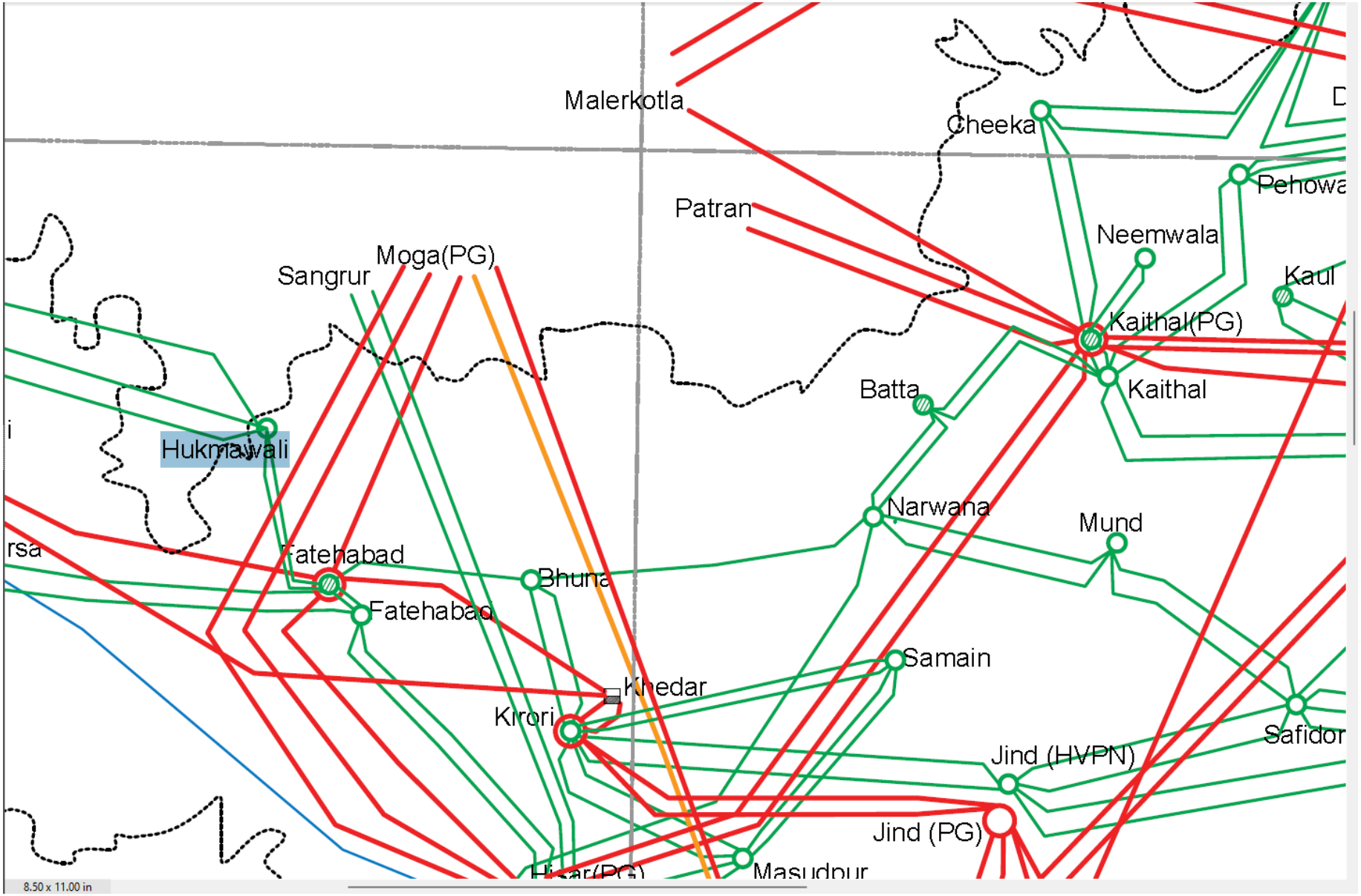
iii) As reported at 06:09hrs, B-phase CT of 220 kV HUKMAWALI(HV)-CHORMAR(HV) CKT-1 exploded and thereby led to Bus bar protection operation. This resulted in tripping of all the elements connected to 220KV Bus bar. As a result, the Sub-station lost its connectivity to the Grid and blackout occurred.

iv) As per DR at 220KV Fatehabad end of 220 KV Fatehabad(PG)-Hukmawali (HV) (HVPNL) Ckt-1 & 2, the lines tripped due to Zone-2 protection operation in Main-I relay.

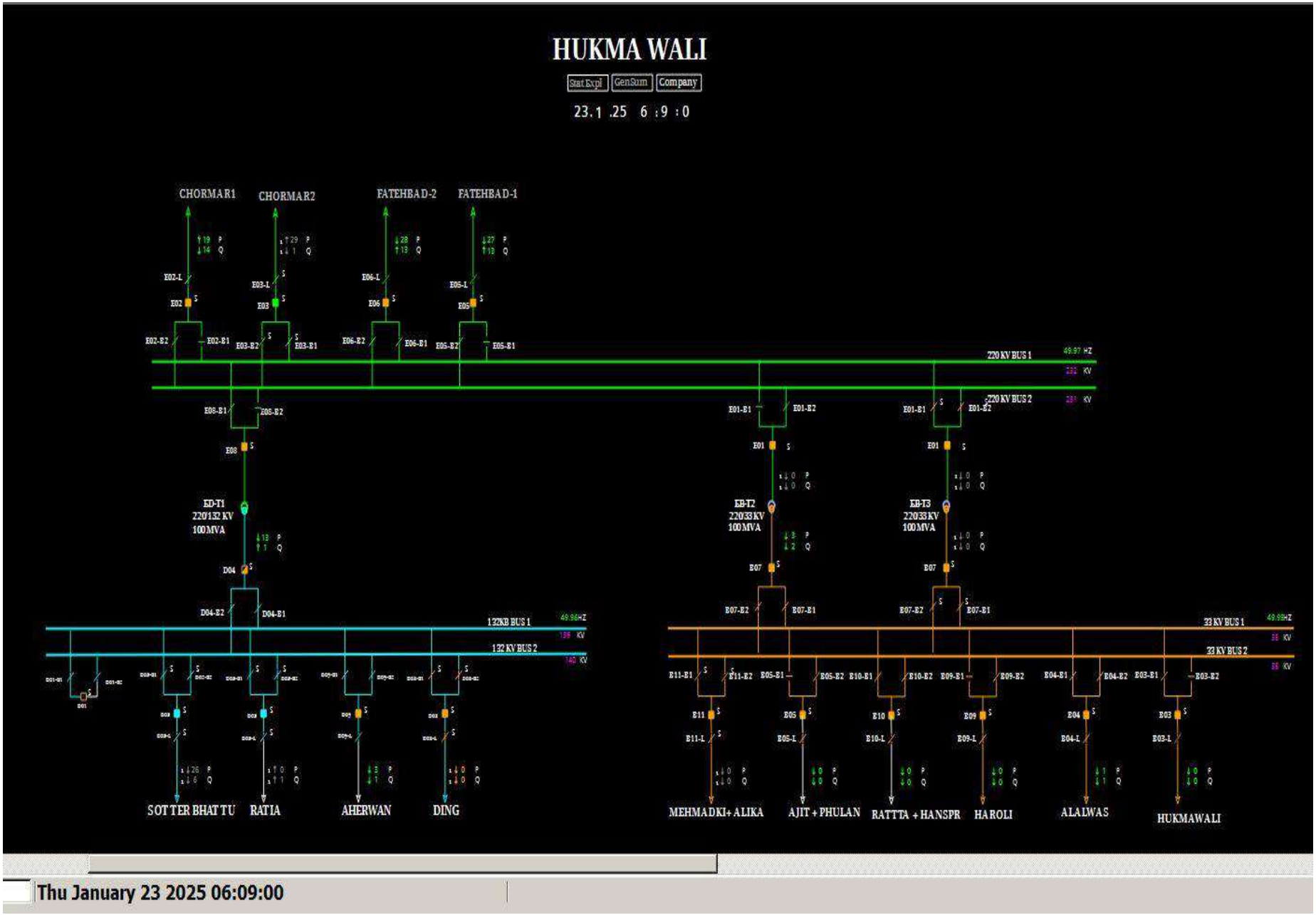
v) As per PMU at 400 Fatehabad (PG), B-N fault converted to Y-B-N fault is observed with delayed fault clearing time of 400ms.

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

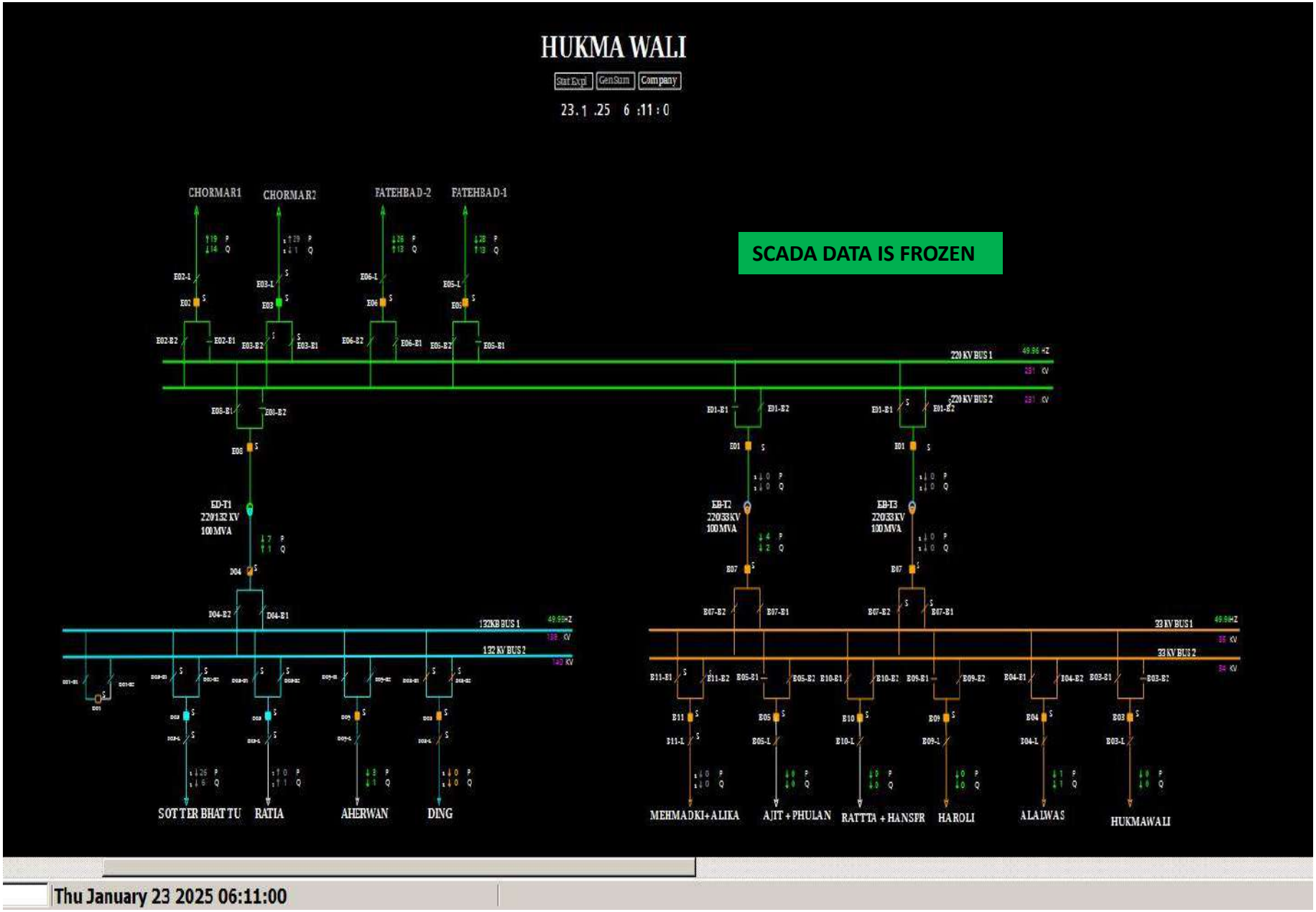
Network Diagram before the event



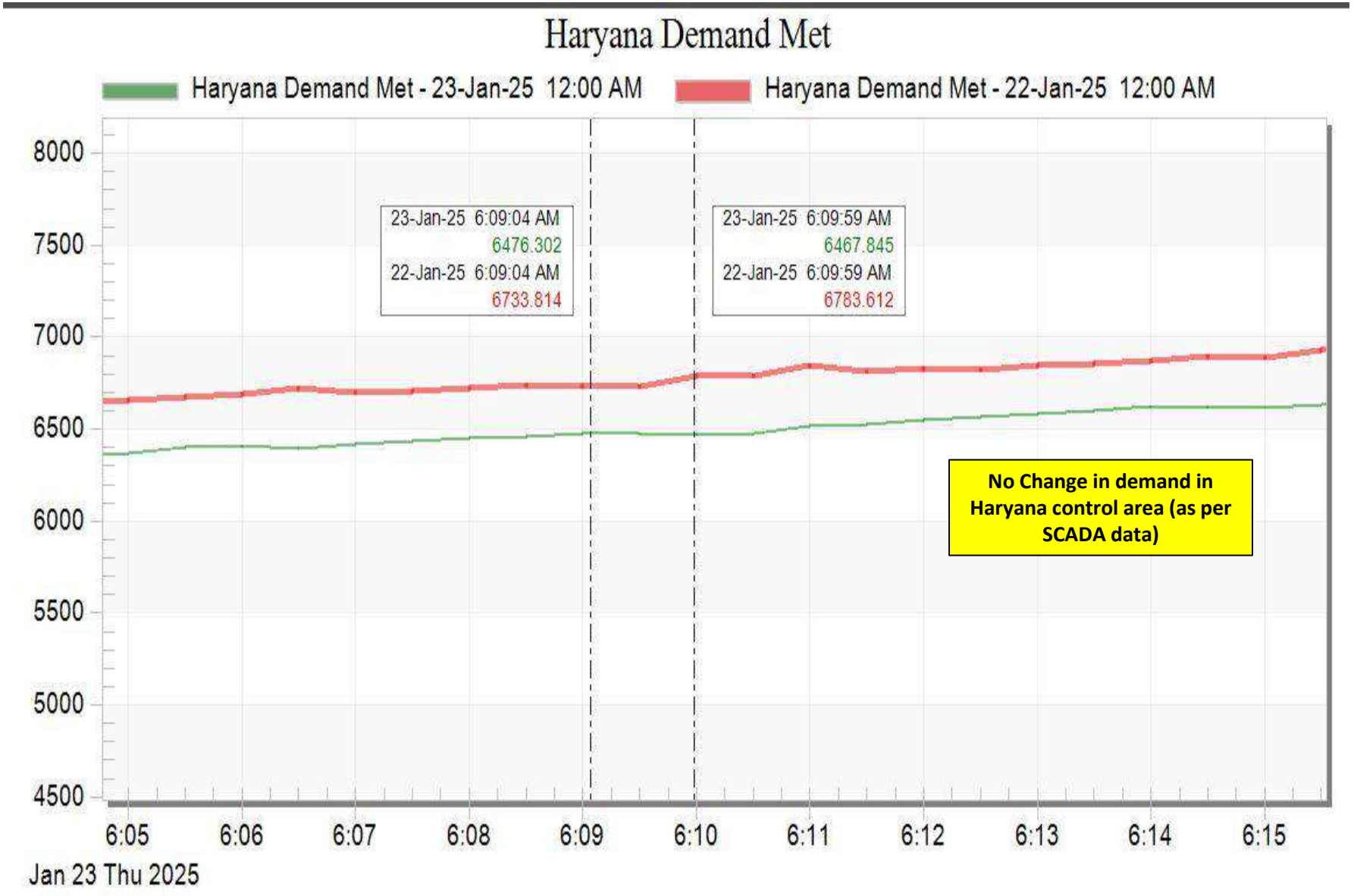
SLD of 220/132/33kV Hukmawali(HS) before the event



SLD of 220/132/33kV Hukmawali(HS) after the event



Haryana demand during the event



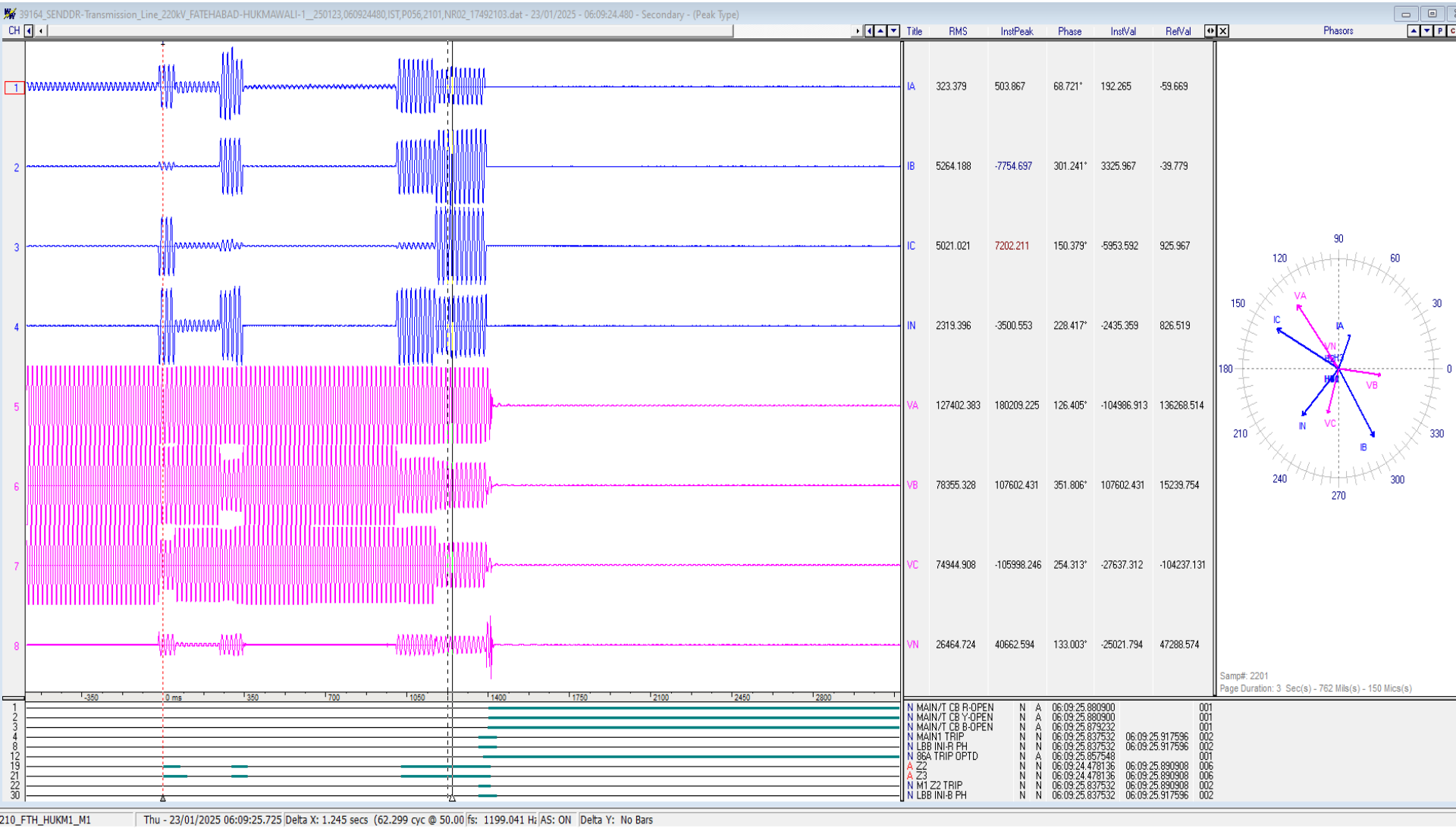
PMU Plot of frequency at Fatehabad(PG)

06:09hrs/23-Jan-25

PMU Plot of phase voltage magnitude at Fatehabad(PG)

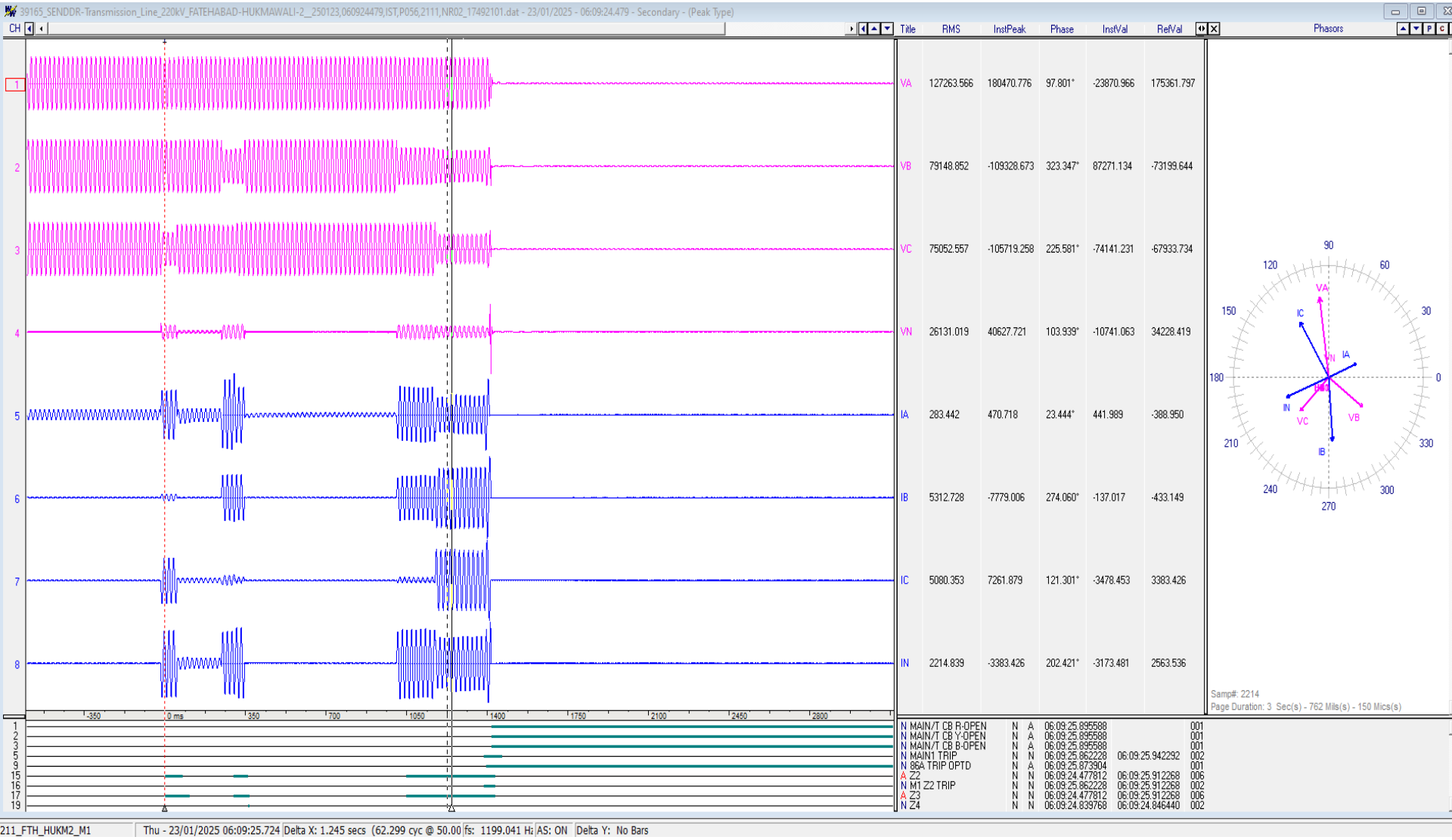
06:09hrs/23-Jan-25

DR of 220 KV Fatehabad(PG) (end)-Hukmawali (HV) (HVPNL) Ckt-1



- ✓ Y-N fault converted to Y-B-N fault is observed; zone-2 operated in Main-I
- ✓ Fault current: Iy=~5.26kA and Ib=~5.02kA
- ✓ Fault clearing time=~385ms

DR of 220 KV Fatehabad(PG) (end)-Hukmawali (HV) (HVPNL) Ckt-2



- ✓ Y-N fault converted to Y-B-N fault is observed; zone-2 operated in Main-I
- ✓ Fault current: Iy=~5.31kA and Ib=~5.08kA
- ✓ Fault clearing time=~385ms

SCADA SOE

Time	Station Name	Voltage	Element Name	Element Type	Element Status	Remarks
06:09:26	FATEHBAD	220kV	11HKMLI2	Circuit Breaker	App	
06:09:26	FATEHBAD	220kV	10HKMLI1	Circuit Breaker	App	
06:09:26	FATEHBAD	220kV	11HKMLI2	Circuit Breaker	Open	Tripping of Main CB of 220 KV Fatehabad(PG)-Hukmawali (HV) (HVPNL) Ckt-2
06:09:26	FATEHBAD	220kV	10HKMLI1	Circuit Breaker	Open	Tripping of Main CB of 220 KV Fatehabad(PG)-Hukmawali (HV) (HVPNL) Ckt-1

Points for Discussion

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

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

iii) SCADA data of 220/132/33kV Hukmawali(HS) was freezed during the event. Availability and healthiness of SCADA data need to be ensured.

iv) DR/EL along with tripping report for each element need to be shared from Haryana.

v) Remedial action taken report to be shared.

Report on multiple tripping occurred at 220 kV Sub-station Hukmawali on dated 23.01.2025

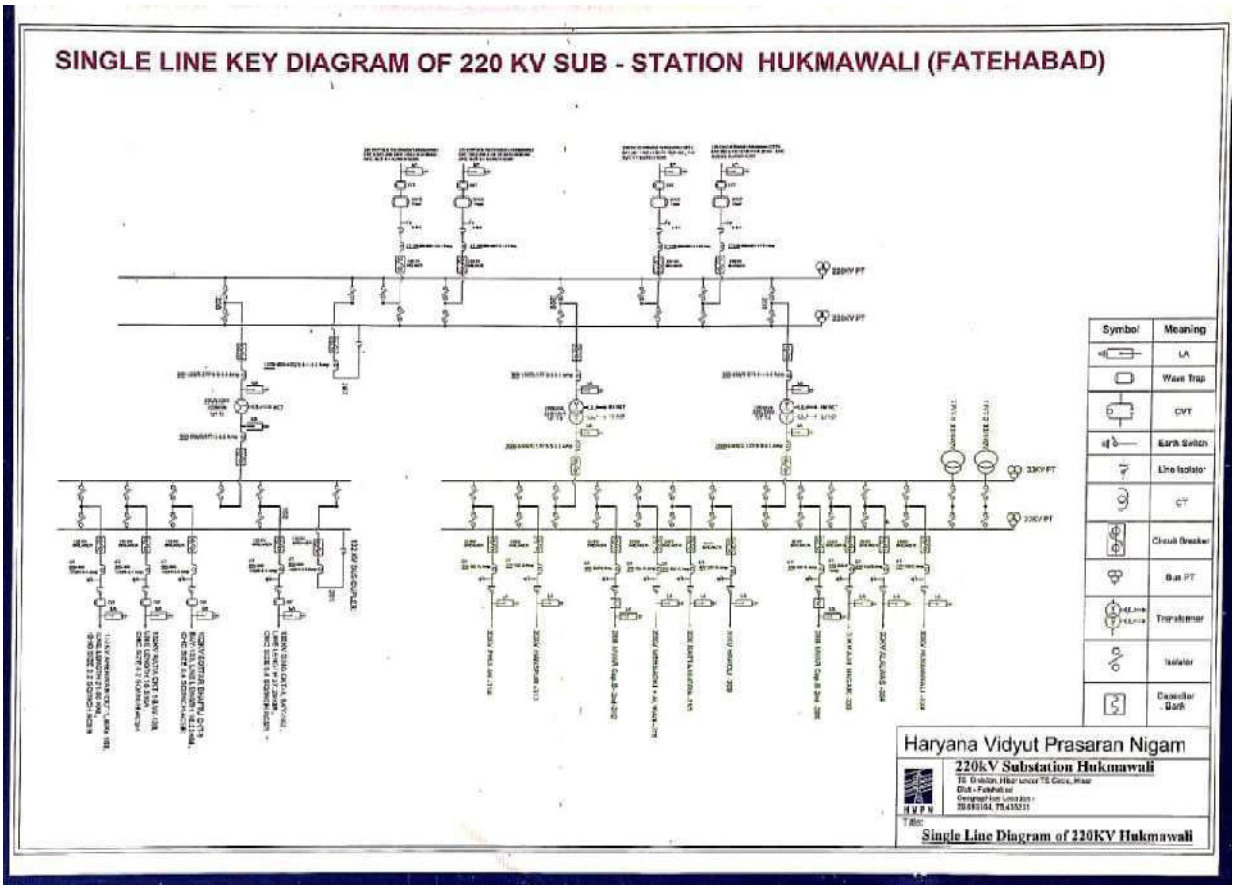
Description of Disturbance

At 06:09 Hrs on 23.01.2025, 01 No. 220 KV CT (B Phase) installed on 220 KV Hukmawali-Chormar Ckt. 01 got damaged with a heavy blast causing collateral damage to the adjoining Y-Phase 220 KV CT and Line Isolator of the same Ckt. Due to the heavy blast of B-Phase 220 KV CT, the Y-Phase 220 KV CT was completely damaged. The following elements were tripped.

Name of Tripped Elements: -

- 220 kV Hukmawali-Chormar Ckt No-1 (Both end)
- 220 kV Hukmawali-Chormar Ckt No-2 (Chormar end)
- 220 kV Hukmawali-PG Fatehabad Ckt 1 & 2 (Fatehabad end)

Single line Diagram



Name of Element	*Tripped from (Hrs)*	*Restoration (Hrs)*	*Relay Operated at Hukmawali End*	*Other End*
220 kV Hukmawali-Chormar CKT-1	06:09 Hrs dated 23.01.2025	22:40 Hrs dated 23.01.2025	DPR Main-1 Zone 1, Fault Dist. – 0.20 KM, Va=70.630 V, Vb=74.771 V, Vc=1.004 V, Ia=0.003 A, Ib=0.103 A, Ic=2.846 A	DPR Zone-Nil, Y-B phase to ground, fault distance NA, fault current NA.
220 kV Hukmawali-Chormar CKT-2	06:09 Hrs dated 23.01.2025	10:35 Hrs dated 23.01.2025	not tripped	DPR Zone-2 B phase to ground, fault distance 79.1 KM, fault current 0.9KA.
220 kV Hukmawali-PG Fatehabad CKT-1	06:09 Hrs dated 23.01.2025	08:09 Hrs dated 23.01.2025	not tripped	DPR Zone 2, YB-G fault Distance= 29.436KM, Fault current-5.245KA
220 kV Hukmawali-PG Fatehabad CKT-2	06:09 Hrs dated 23.01.2025	07:50 Hrs dated 23.01.2025	not tripped	DPR Zone 2, YB-G fault Dist. 29.268 KM, Fault current-6.936 KA

Antecedent Conditions:

1. 220 kV Bus Coupler was in operation and coupled 220 KV Bus 1 & 2.
2. No 220 kV lines & transformers at 220 kV S/Stn. Hukmawali were under shutdown/Breakdown.
3. The Transmission elements connected at 220 kV S/Stn. Hukmawali tabulated as under:

Sr. No.	220 kV Bus-1	220 kV Bus -2
1	220/132kV 100 MVA T-1	220/33kV 100 MVA T-2
2	220kV Hukmawali-Chormar Ckt 1	220/33kV 100 MVA T-3
3	220kV Hukmawali-PG Fatehabad Ckt 1	220kV Hukmawali-Chormar Ckt 2
4	-	220kV Hukmawali-PG Fatehabad Ckt-2

Analysis of tripping

1. At 06:09 Hrs on 23.01.2025, a heavy blast occurred with the damage of 02 No. 220 KV CTs (Y & B Phase) installed on 220 KV Hukmawali-Chormar Ckt. 01. This damage also resulted in collateral damage to the Line Isolator. As a result, the 220 KV Hukmawali-Chormar Ckt. 01 got tripped from both ends as per the relays mentioned above.
2. All other 220 KV Ckt's i.e. 220 KV Hukmawali-Chormar Ckt. 02, 220 KV Hukmawali-PGCIL Ckt. 01 & 02 got tripped from other end.
3. The Busbar protection at 220 KV S/Stn. Hukmawali failed to operate which led to the tripping of all elements from the other ends. The Busbar protection failed to operate due to the Dead-Zone alarm and general alarm which is due to the wrong isolator and breaker status on the busbar protection relay.
4. Consequently, due to the failure of Busbar protection at 220 KV S/Stn. Hukmawali end, all other Ckt's were tripped from other end in Zone-2.

Precautions: SSE must ensure the following: -

1. The isolator and breaker status are wrong on the busbar protection relay which is causing the Dead Zone alarm and general alarm, which is further leading to blocking of the Bus-bar protection. The isolator status and breaker status should be set right.
2. No Alarms on any of the protection relays should be ignored.
3. The isolator status and breaker status in the busbar protection should be checked regularly and after each isolator/breaker operation.

Note : Currently the busbar protection is working and is in Healthy Condition.

Multiple element tripping event at 220/132kV Agra Sikandra(UP)

At 04:29 hrs on 29th January, 2025

Tripped Elements

Sl. No.	Tripping Date / Time	Closing Date / Time	Name of Substation	C.B. No. with Direction (Code)	Type of Relay of Scheme	Flags of Indications Observed	F/L.KM.	TRIP VALUES		Analysis
								KV	AMP	
1	23.01.2025 04:26 Hrs	–	220KV S/S Sikandra	220KV Bus Bar	ERL	BZ1, Diff optd: Ph B, Trip-Bay-1 to Bay-13. BZ2, Diff optd: Ph B, Trip-Bay-1 to Bay-13.	–	–	BZ1: ICD1- 15.44KA, ICD2- 15.44 KA. BZ2: ICD1- 15.44KA, ICD2-15.44 KA	220KV Kirawali Line Y-Ph CT Jumper damaged and CT heavy leakage.
2	23.01.2025 04:26 Hrs	23.01.2025 21:55 Hrs		220 KV Agra-Kirawali	Siprotech 7SA611 GE	Fault-1(Time-04:26:00:507) - Dist PU, Dist Loop BG Forward, Single PH Trip, Z1 IL2-27.74KA. Fault-2(Time-04:26:00:721)- Dist PU, Dist Loop CA & CG , Z-4, IL3-18.95KA, Dist PU ABCG, Distance Selected loop BC Farward, Trip command phases ABC, Trip 3 ph in z-1 with multi-ph Flt, Relay trip Command ph A, Relay trip command ph B, IA-2.86KA, IB-27.74ka, Dist trip 3ph in z2, dist trip 3 ph in z4, Fault location invalid.				Y-Ph CT Jumper damaged and CT heavy leakage.
3	23.01.2025 04:26 Hrs	23.01.2025 05:02 Hrs		220KV Agra-I	Micom P442	**Trip by Busbar**	–	–	–	–
4	23.01.2025 04:26 Hrs	23.01.2025 05:02 Hrs		220KV Agra-II	Micom P442	**Trip by Busbar**	–	–	–	–
5	23.01.2025 04:26 Hrs	23.01.2025 07:55 Hrs		220KV Auraiya	Micom P442 Siprotech 7SA52	**Trip by Busbar**	–	–	–	–
6	23.01.2025 04:26 Hrs	23.01.2025 06:23 Hrs		220KV Saifai	Micom P442 Siprotech 7SA52	**Trip by Busbar**	–	–	–	–
7	23.01.2025 04:26 Hrs	23.01.2025 05:03 Hrs		100MVA T/F	Micom	**Trip by Busbar**	–	–	–	–
8	23.01.2025 04:26 Hrs	23.01.2025 05:42 Hrs		160MVA T/F-1	EE	**Trip by Busbar**	–	–	–	–
9	23.01.2025 04:26 Hrs	23.01.2025 05:42 Hrs		160MVA T/F-2	EE	**Trip by Busbar**	–	–	–	–
10	23.01.2025 04:26 Hrs	23.01.2025 05:42 Hrs		60MVA T/F-1	ABB	**Trip by Busbar**	–	–	–	–

Brief details of the event

i) 220/132kV Agra Sikandra(UP) S/s has double main and transfer bus scheme at 220kV level.

ii) During antecedent condition, 220kV Auraiya(NT)-Agra Sikandra(UP) Ckt, 220kV Saifai-Agra Sikandra(UP) Ckt, 220kV Kirawali- Agra Sikandra(UP) Ckt, 220/132kV 160MVA ICT 1 & 2 and 100MVA ICT 3 were connected to 220kV Bus-1 at Agra Sikandra(UP) and rest of the elements were connected to Bus-2.

iii) As reported at 04:29 hrs, Y-Ph CT of 220kV Kirawali- Agra Sikandra(UP) Ckt damaged and Y-Ph Line side jumper grounded. Distance protection relay operated in zone-1 and tripped the CB.

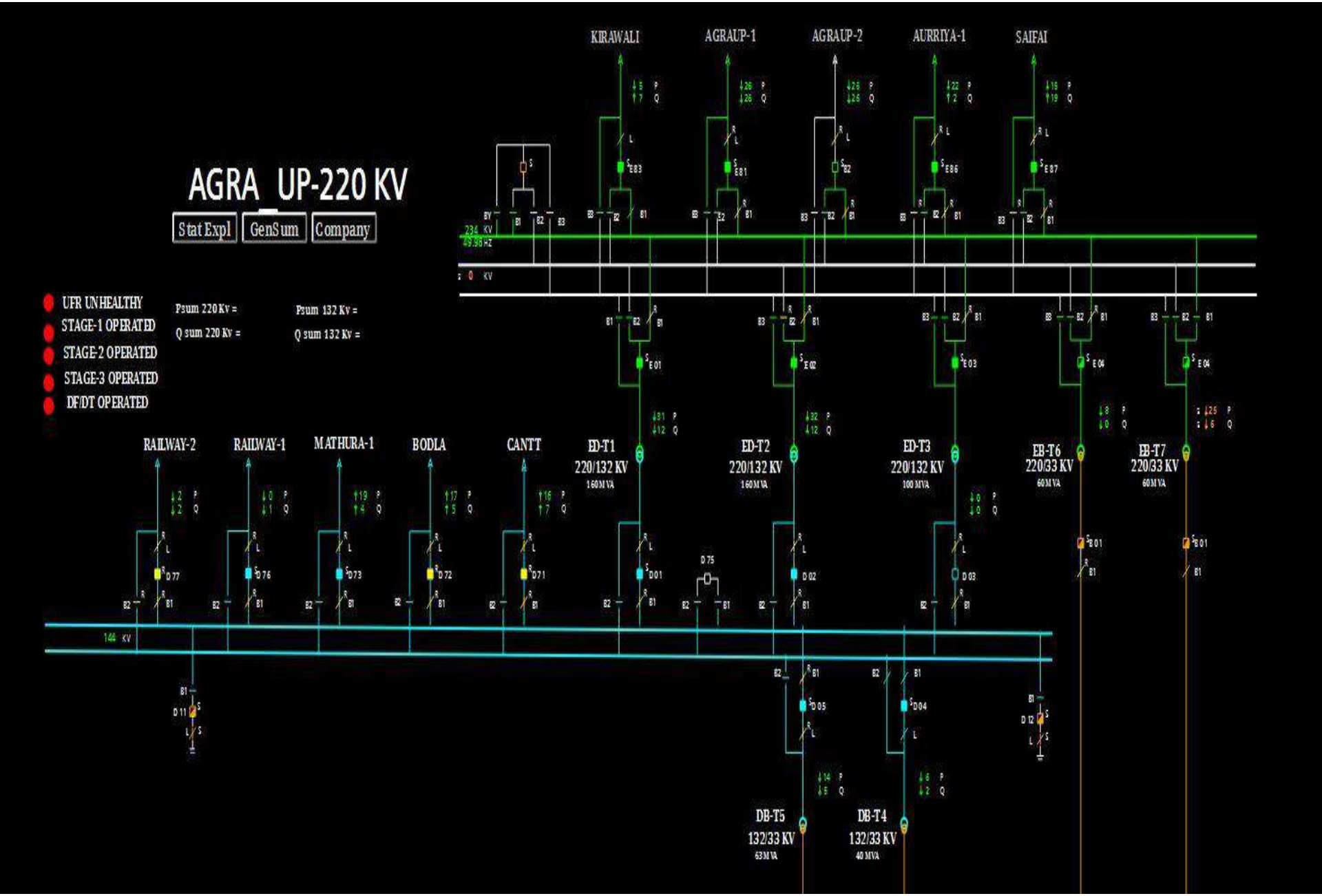
iv) At the same time, bus side Jumper of Y-Ph CT also failed and came in range of R and B-Phase hence bus bar relay operated and tripped Bus 1 elements.

v) Also, wrong status of isolator caused tripping of Bus 2 elements. This resulted complete tripping of 220kV Agra Sikandra(UP).

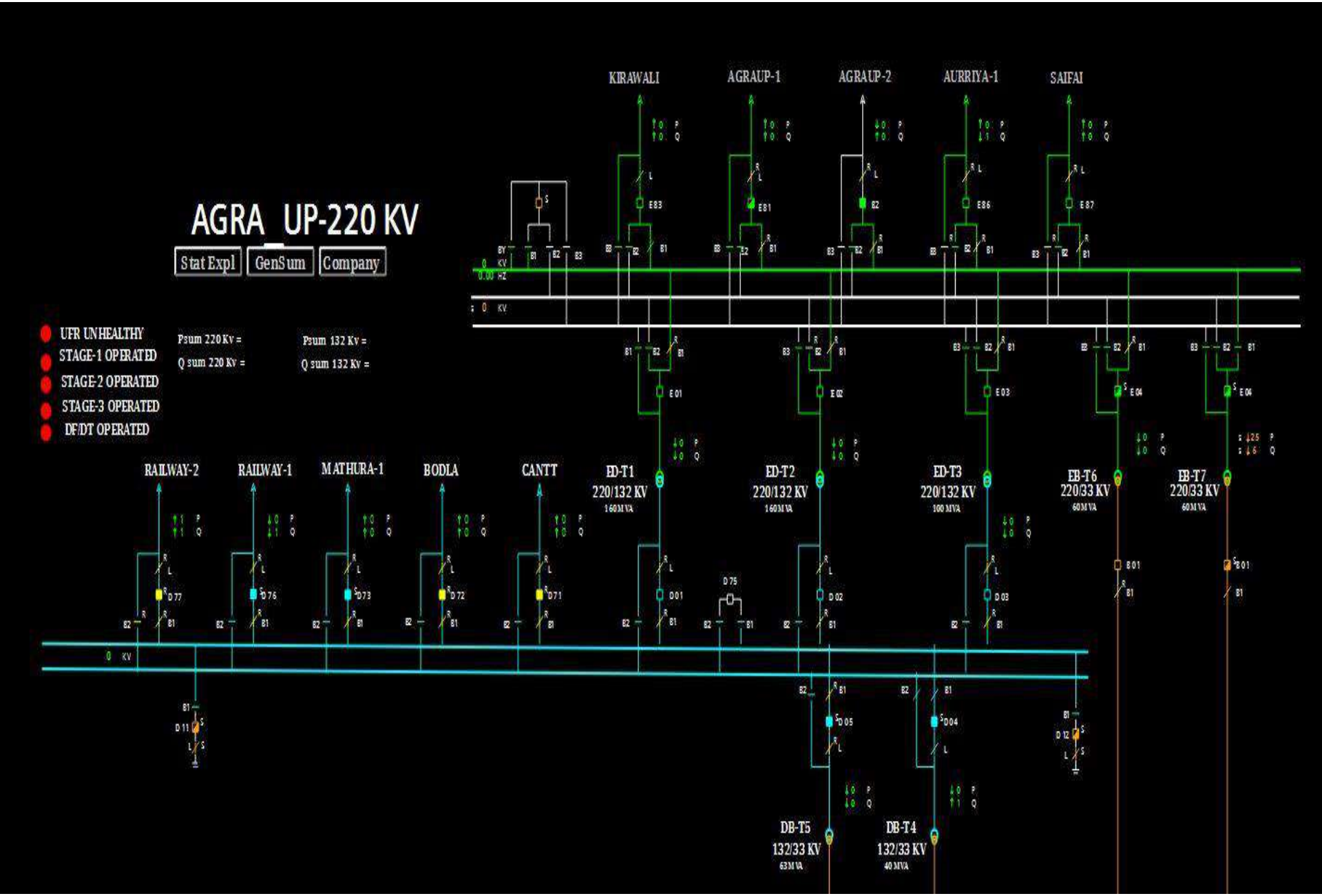
vi) As per PMU at Agra(PG), Y-N fault followed by B-N fault with fault clearing time of 80ms was observed.

vii) As per SCADA, change in demand of approx. 60MW is observed in UP control area.

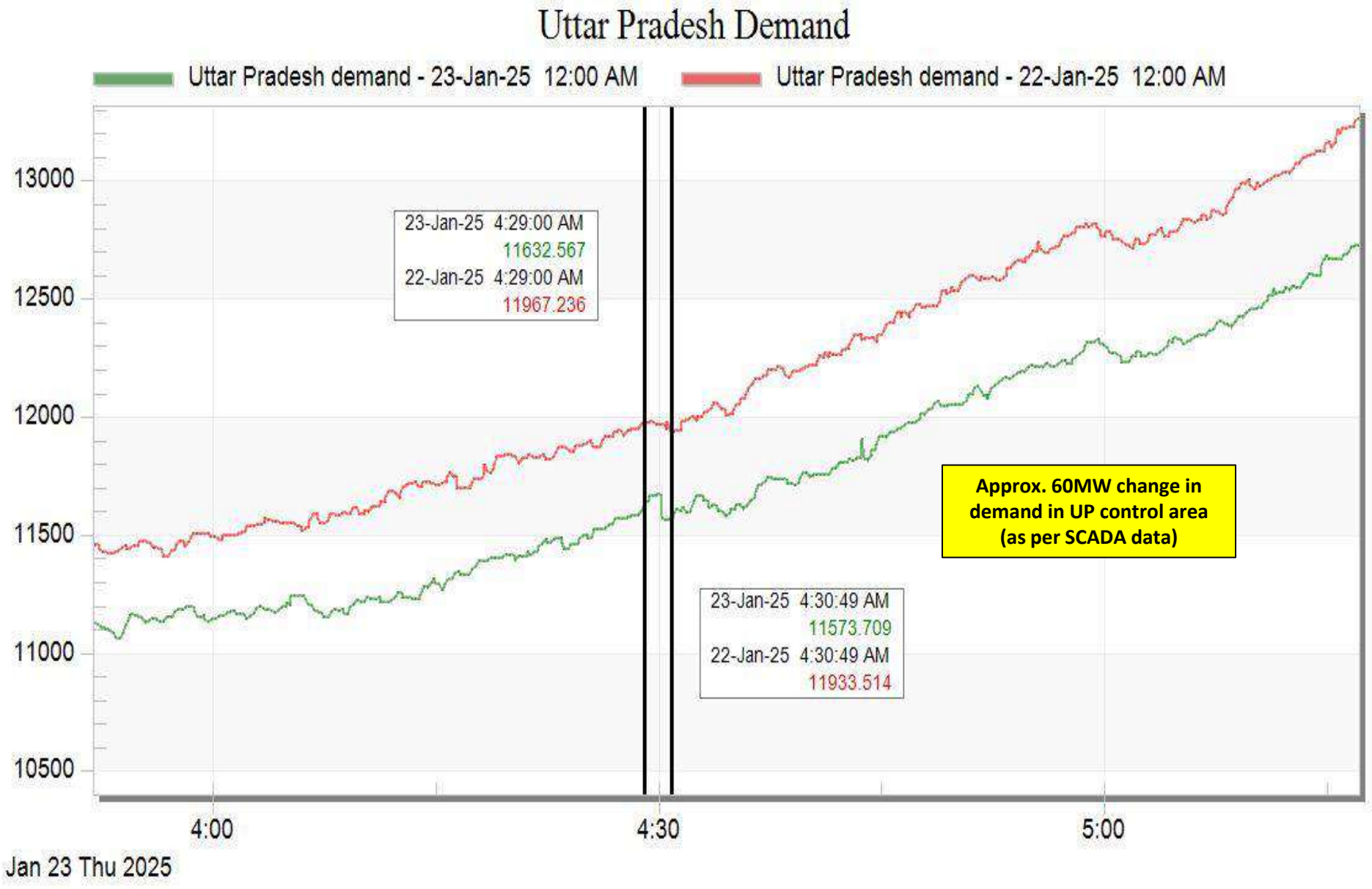
SLD of 220/132kV Agra Sikandra(UP) before the event



SLD of 220/132kV Agra Sikandra(UP) after the event



Uttar Pradesh demand during the event

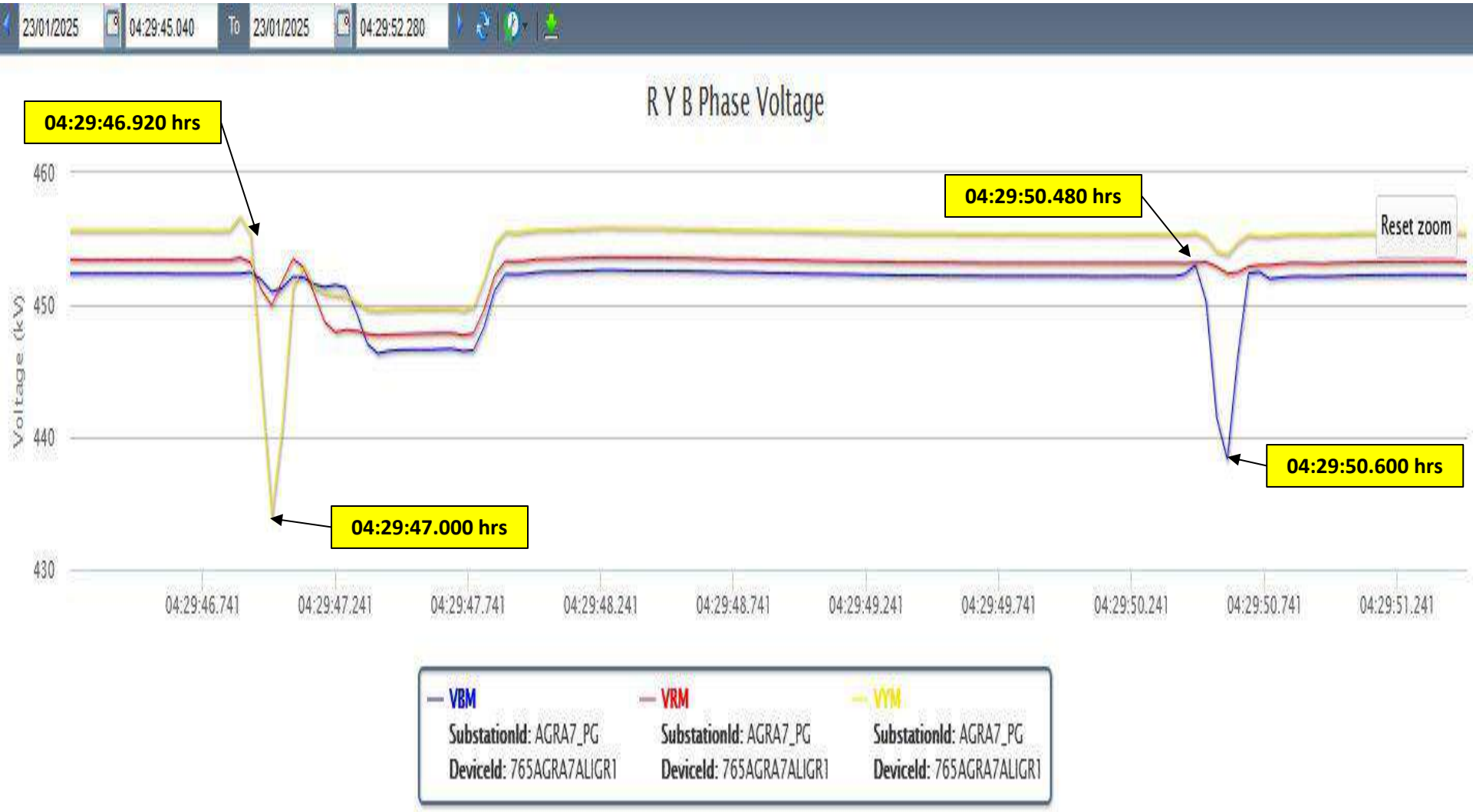


PMU Plot of frequency at Agra(PG)

04:29hrs/23-Jan-25

PMU Plot of phase voltage magnitude at Agra(PG)

04:29hrs/23-Jan-25



✓ Y-N fault followed by B-N fault was observed as per PMU

Points for Discussion

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

ii) Remedial action taken report need to be shared.

220KV Sub-Station Sikandra, Agra UPPTCL

23.01.2025, 04:26

220KV Kirawali line Tripped & 220 KV Bus Bar Protection operated Tripped all 220 KV Lines Auraiya line, Saifai line, Agra-I line, Agra-II Line & ICTs

220KV Kirawali line Tripped & 220 KV Bus Bar Protection operated Tripped all 220 KV Lines Auraiya line, Saifai line, Agra-I line, Agra-II Line & ICTs

- **Date & Time of event**: 23.01.2025 at 04:26 hrs
- **Sub-Station affected**: 220KV S/S Sikandra, Agra
- **Date & Time of restoration**:

220KV bus-I	05:02hrs , 23.01.2025
220KV Kirawali	21:55hrs, 23.01.2025
220KV Agra-I	05:02hrs, 23.01.2025
220KV Agra-II	05:02hrs, 23.01.2025
220KV Auraiya	07:55hrs, 23.01.2025
220KV Saifai	06:23hrs, 23.01.2025

Antecedents condition

- In antecedents condition loading as follows:

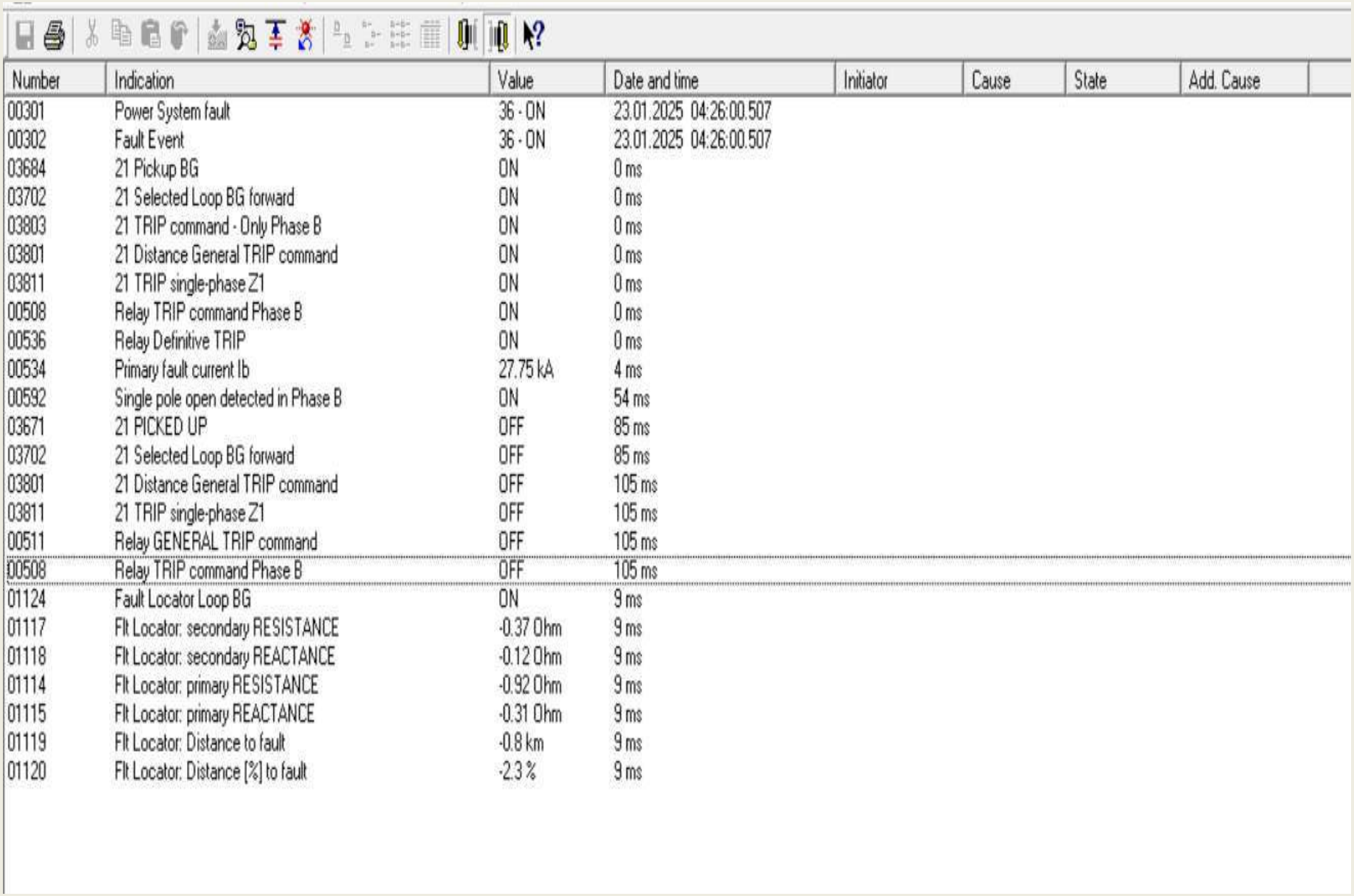
220KV Sikandra-Kirawali	38.38MW
220KV Agra(4)-Agra(2) ckt 1	38.38MW
220KV Agra(4)-Agra(2) ckt 2	14.06MW
220KV Sikandra-Auraiya	22.42MW
220KV Sikandra-Saifai	15.58MW

REPORT

FAULT ANALYSIS STATEMENT OF PROTECTIVE GEARS 220 KV FOR THE M/O -JANUARY-2025

Sl. No.	Tripping Date / Time	Closing Date / Time	Name of Substation	C.B. No. with Direction (Code)	Type of Relay of Scheme	Flags of Indications Observed	F/L.KM.	TRIP VALUES		Analysis
								KV	AMP	
1	23.01.2025 04:26 Hrs	–	220KV S/S Sikandra	220KV Bus Bar	ERL	BZ1, Diff optd: Ph B, Trip-Bay-1 to Bay-13. BZ2, Diff optd: Ph B, Trip-Bay-1 to Bay-13.	–	–	BZ1: ICD1- 15.44KA, ICD2- 15.44 KA. BZ2: ICD1- 15.44KA, ICD2-15.44 KA	220KV Kirawali Line Y-Ph CT Jumper damaged and CT heavy leakage.
2	23.01.2025 04:26 Hrs	23.01.2025 21:55 Hrs		220 KV Agra-Kirawali	Siprotech 7SA611 GE	Fault-1(Time-04:26:00:507) - Dist PU, Dist Loop BG Forward, Single PH Trip, Z1 IL2-27.74KA. Fault-2(Time-04:26:00:721)- Dist PU, Dist Loop CA & CG , Z-4, IL3-18.95KA, Dist PU ABCG, Distance Selected loop BC Farward, Trip command phases ABC, Trip 3 ph in z-1 with multi-ph Flt, Relay trip Command ph A, Relay trip command ph B, IA-2.86KA, IB-27.74ka, Dist trip 3ph in z2, dist trip 3 ph in z4, Fault location invalid.				Y-Ph CT Jumper damaged and CT heavy leakage.
3	23.01.2025 04:26 Hrs	23.01.2025 05:02 Hrs		220KV Agra-I	Micom P442	**Trip by Busbar**	–	–	–	–
4	23.01.2025 04:26 Hrs	23.01.2025 05:02 Hrs		220KV Agra-II	Micom P442	**Trip by Busbar**	–	–	–	–
5	23.01.2025 04:26 Hrs	23.01.2025 07:55 Hrs		220KV Auraiya	Micom P442 Siprotech 7SA52	**Trip by Busbar**	–	–	–	–
6	23.01.2025 04:26 Hrs	23.01.2025 06:23 Hrs		220KV Saifai	Micom P442 Siprotech 7SA52	**Trip by Busbar**	–	–	–	–
7	23.01.2025 04:26 Hrs	23.01.2025 05:03 Hrs		100MVA T/F	Micom	**Trip by Busbar**	–	–	–	–
8	23.01.2025 04:26 Hrs	23.01.2025 05:42 Hrs		160MVA T/F-1	EE	**Trip by Busbar**	–	–	–	–
9	23.01.2025 04:26 Hrs	23.01.2025 05:42 Hrs		160MVA T/F-2	EE	**Trip by Busbar**	–	–	–	–
10	23.01.2025 04:26 Hrs	23.01.2025 05:42 Hrs		60MVA T/F-1	ABB	**Trip by Busbar**	–	–	–	–

SOE OF 220KV SIKANDRA KIRAWALI LINE ON WHICH Y-PH CT WAS DAMAGED

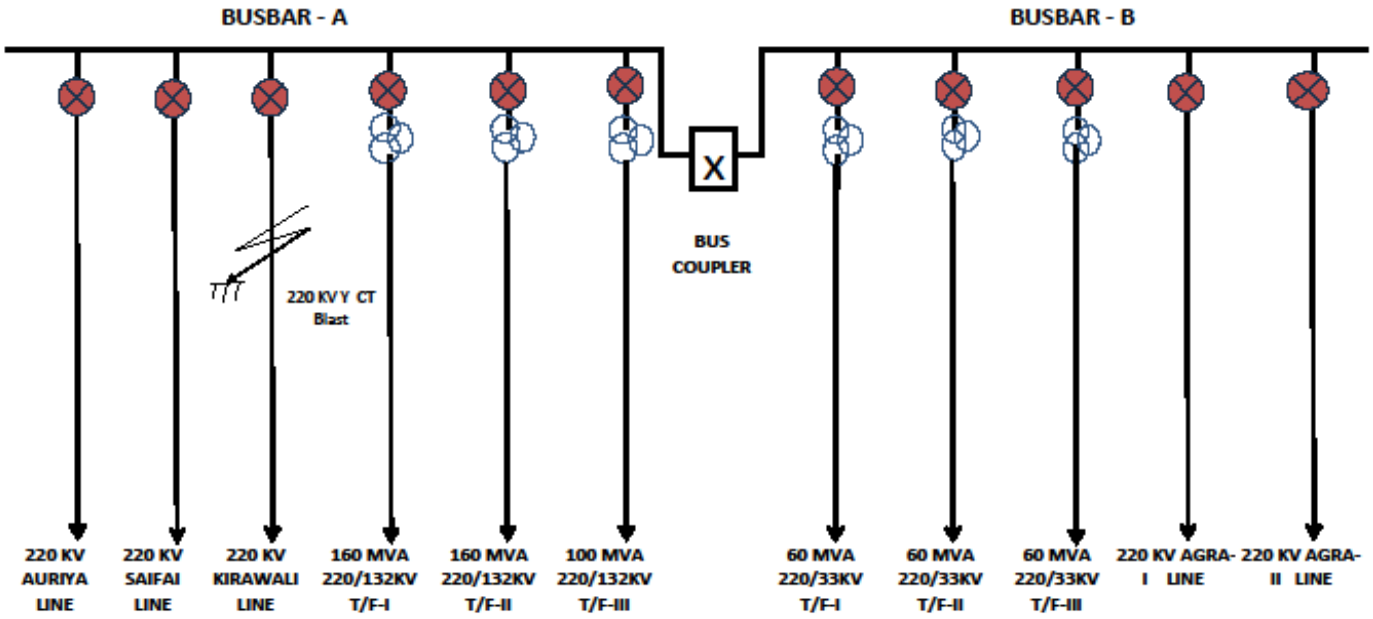


Number	Indication	Value	Date and time	Initiator	Cause	State	Add. Cause
00301	Power System fault	36 - ON	23.01.2025 04:26:00.507				
00302	Fault Event	36 - ON	23.01.2025 04:26:00.507				
03684	21 Pickup BG	ON	0 ms				
03702	21 Selected Loop BG forward	ON	0 ms				
03803	21 TRIP command - Only Phase B	ON	0 ms				
03801	21 Distance General TRIP command	ON	0 ms				
03811	21 TRIP single-phase Z1	ON	0 ms				
00508	Relay TRIP command Phase B	ON	0 ms				
00536	Relay Definitive TRIP	ON	0 ms				
00534	Primary fault current Ib	27.75 kA	4 ms				
00592	Single pole open detected in Phase B	ON	54 ms				
03671	21 PICKED UP	OFF	85 ms				
03702	21 Selected Loop BG forward	OFF	85 ms				
03801	21 Distance General TRIP command	OFF	105 ms				
03811	21 TRIP single-phase Z1	OFF	105 ms				
00511	Relay GENERAL TRIP command	OFF	105 ms				
00508	Relay TRIP command Phase B	OFF	105 ms				
01124	Fault Locator Loop BG	ON	9 ms				
01117	Flt Locator: secondary RESISTANCE	-0.37 Ohm	9 ms				
01118	Flt Locator: secondary REACTANCE	-0.12 Ohm	9 ms				
01114	Flt Locator: primary RESISTANCE	-0.92 Ohm	9 ms				
01115	Flt Locator: primary REACTANCE	-0.31 Ohm	9 ms				
01119	Flt Locator: Distance to fault	-0.8 km	9 ms				
01120	Flt Locator: Distance [%] to fault	-2.3 %	9 ms				

SOE OF 220KV SIKANDRA KIRAWALI LINE ON WHICH Y-PH CT WAS DAMAGED

Number	Indication	Value	Date and time	Initiator	Cause	State	Add. Cause
00301	Power System fault	37 - ON	23.01.2025 04:26:00.721				
00302	Fault Event	37 - ON	23.01.2025 04:26:00.721				
03682	21 Pickup AG	ON	0 ms				
03707	21 Selected Loop AG reverse	ON	0 ms				
03690	21 Pickup CAG	ON	126 ms				
03712	21 Selected Loop CA reverse	ON	134 ms				
03703	21 Selected Loop CG forward	ON	164 ms				
03804	21 TRIP command - Only Phase C	ON	164 ms				
03801	21 Distance General TRIP command	ON	164 ms				
03811	21 TRIP single-phase Z1	ON	164 ms				
00509	Relay TRIP command Phase C	ON	164 ms				
00535	Primary fault current Ic	18.95 kA	168 ms				
03694	21 Pickup ABCG	ON	174 ms				
03705	21 Selected Loop BC forward	ON	174 ms				
03805	21 TRIP command Phases ABC	ON	174 ms				
03824	21 TRIP 3phase in Z1 with multi-ph Flt.	ON	174 ms				
00507	Relay TRIP command Phase A	ON	174 ms				
00508	Relay TRIP command Phase B	ON	174 ms				
03811	21 TRIP single-phase Z1	OFF	174 ms				
00533	Primary fault current Ia	2.86 kA	178 ms				
00534	Primary fault current Ib	27.74 kA	178 ms				
03817	21 TRIP 3phase in Z2	ON	355 ms				
03821	21 TRIP 3phase in Z4	ON	450 ms				
03671	21 PICKED UP	OFF	616 ms				
03707	21 Selected Loop AG reverse	OFF	616 ms				
03703	21 Selected Loop CG forward	OFF	616 ms				
03705	21 Selected Loop BC forward	OFF	616 ms				
03712	21 Selected Loop CA reverse	OFF	616 ms				
03801	21 Distance General TRIP command	OFF	616 ms				
03824	21 TRIP 3phase in Z1 with multi-ph Flt.	OFF	616 ms				
03817	21 TRIP 3phase in Z2	OFF	616 ms				
03821	21 TRIP 3phase in Z4	OFF	616 ms				
00511	Relay GENERAL TRIP command	OFF	616 ms				
00507	Relay TRIP command Phase A	OFF	616 ms				
00508	Relay TRIP command Phase B	OFF	616 ms				
00509	Relay TRIP command Phase C	OFF	616 ms				
01132	Fault location invalid	ON	661 ms				

Single Line Diagram of 220 kV Sikandra Sub-Station



EVENT LOG OF 220KV BUS BAR RELAY

cspc - [Report Index]

System[S] View[V] View Panel[D] Report Management[R] Operate[P] Window[W] Help[H]

CPU1Report Index[CSC150]	CPU2Report Index[CSC150]
2025-01-29 11:55:17.098	2025-01-29 11:55:17.098
2025-01-29 11:55:15.712	2025-01-29 11:55:15.712
2025-01-28 17:21:44.336	2025-01-28 17:21:44.338
2025-01-28 17:07:40.252	2025-01-28 17:07:40.252
2025-01-28 17:07:38.961	2025-01-28 17:07:38.962
2025-01-28 09:47:35.953	2025-01-28 09:47:35.951
2025-01-27 18:42:17.209	2025-01-27 18:42:17.208

Equipment Na...	Event Name	Event Time	Params	Recor...	Source Address
CSC150	BZ1 Diff Op: PhB	2025-01-23 04:21:23.905	10.125 10.125 Trip Bay1 Trip Bay2 Trip Bay3 Trip Bay4 Trip Bay5 Trip Bay6 Trip Bay7 Trip Bay8 Trip Bay9 Trip Bay10 Trip Bay11 Trip Bay12 Trip Bay13	25	CPU 2
CSC150	BZ2 Diff Op: PhB	2025-01-23 04:21:23.905	10.125 10.125 Trip Bay1 Trip Bay2 Trip Bay3 Trip Bay4 Trip Bay5 Trip Bay6 Trip Bay7 Trip Bay8 Trip Bay9 Trip Bay10 Trip Bay11 Trip Bay12 Trip Bay13	25	CPU 2
CSC150	Diff Startup	2025-01-23 04:21:23.98		24	CPU 2
CSC150	BZ1 Diff Op: PhB	2025-01-23 04:21:23.110	15.750 15.750 Trip Bay1 Trip Bay2 Trip Bay3 Trip Bay4 Trip Bay5 Trip Bay6 Trip Bay7 Trip Bay8 Trip Bay9 Trip Bay10 Trip Bay11 Trip Bay12 Trip Bay13	24	CPU 2
CSC150	BZ2 Diff Op: PhB	2025-01-23 04:21:23.110	15.750 15.750 Trip Bay1 Trip Bay2 Trip Bay3 Trip Bay4 Trip Bay5 Trip Bay6 Trip Bay7 Trip Bay8 Trip Bay9 Trip Bay10 Trip Bay11 Trip Bay12 Trip Bay13	24	CPU 2
CSC150	CBF Startup	2025-01-23 04:21:23.161		24	CPU 2
CSC150	BZ1 Diff Op: PhA	2025-01-23 04:21:23.314	1.688 1.688 Trip Bay1 Trip Bay2 Trip Bay3 Trip Bay4 Trip Bay5 Trip Bay6 Trip Bay7 Trip Bay8 Trip Bay9 Trip Bay10 Trip Bay11 Trip Bay12 Trip Bay13	24	CPU 2
CSC150	BZ2 Diff Op: PhA	2025-01-23 04:21:23.314	1.688 1.688 Trip Bay1 Trip Bay2 Trip Bay3 Trip Bay4 Trip Bay5 Trip Bay6 Trip Bay7 Trip Bay8 Trip Bay9 Trip Bay10 Trip Bay11 Trip Bay12 Trip Bay13	24	CPU 2
CSC150	CBF Retrip	2025-01-23 04:21:23.410	Trip Bay5	24	CPU 2
CSC150	BZ1 Diff Op: PhC	2025-01-23 04:21:23.467	1.492 1.492 Trip Bay1 Trip Bay2 Trip Bay3 Trip Bay4 Trip Bay5 Trip Bay6 Trip Bay7 Trip Bay8 Trip Bay9 Trip Bay10 Trip Bay11 Trip Bay12 Trip Bay13	24	CPU 2
CSC150	BZ2 Diff Op: PhC	2025-01-23 04:21:23.467	1.492 1.492 Trip Bay1 Trip Bay2 Trip Bay3 Trip Bay4 Trip Bay5 Trip Bay6 Trip Bay7 Trip Bay8 Trip Bay9 Trip Bay10 Trip Bay11 Trip Bay12 Trip Bay13	24	CPU 2
CSC150	BZ1 CBF Op	2025-01-23 04:21:23.509	Trip Bay1 Trip Bay2 Trip Bay3 Trip Bay4 Trip Bay5 Trip Bay6 Trip Bay7 Trip Bay8 Trip Bay9 Trip Bay10 Trip Bay11 Trip Bay12 Trip Bay13	24	CPU 2
CSC150	BZ2 CBF Op	2025-01-23 04:21:23.509	Trip Bay1 Trip Bay2 Trip Bay3 Trip Bay4 Trip Bay5 Trip Bay6 Trip Bay7 Trip Bay8 Trip Bay9 Trip Bay10 Trip Bay11 Trip Bay12 Trip Bay13	24	CPU 2
CSC150	BZ1 CBF Op	2025-01-23 04:21:23.509	Trip Bay1 Trip Bay2 Trip Bay3 Trip Bay4 Trip Bay5 Trip Bay6 Trip Bay7 Trip Bay8 Trip Bay9 Trip Bay10 Trip Bay11 Trip Bay12 Trip Bay13	24	CPU 2
CSC150	BZ2 CBF Op	2025-01-23 04:21:23.509	Trip Bay1 Trip Bay2 Trip Bay3 Trip Bay4 Trip Bay5 Trip Bay6 Trip Bay7 Trip Bay8 Trip Bay9 Trip Bay10 Trip Bay11 Trip Bay12 Trip Bay13	24	CPU 2

Ready | Processing Record...[CPU2 : No.25] | RX:383544 Bytes | TX:5022 Bytes

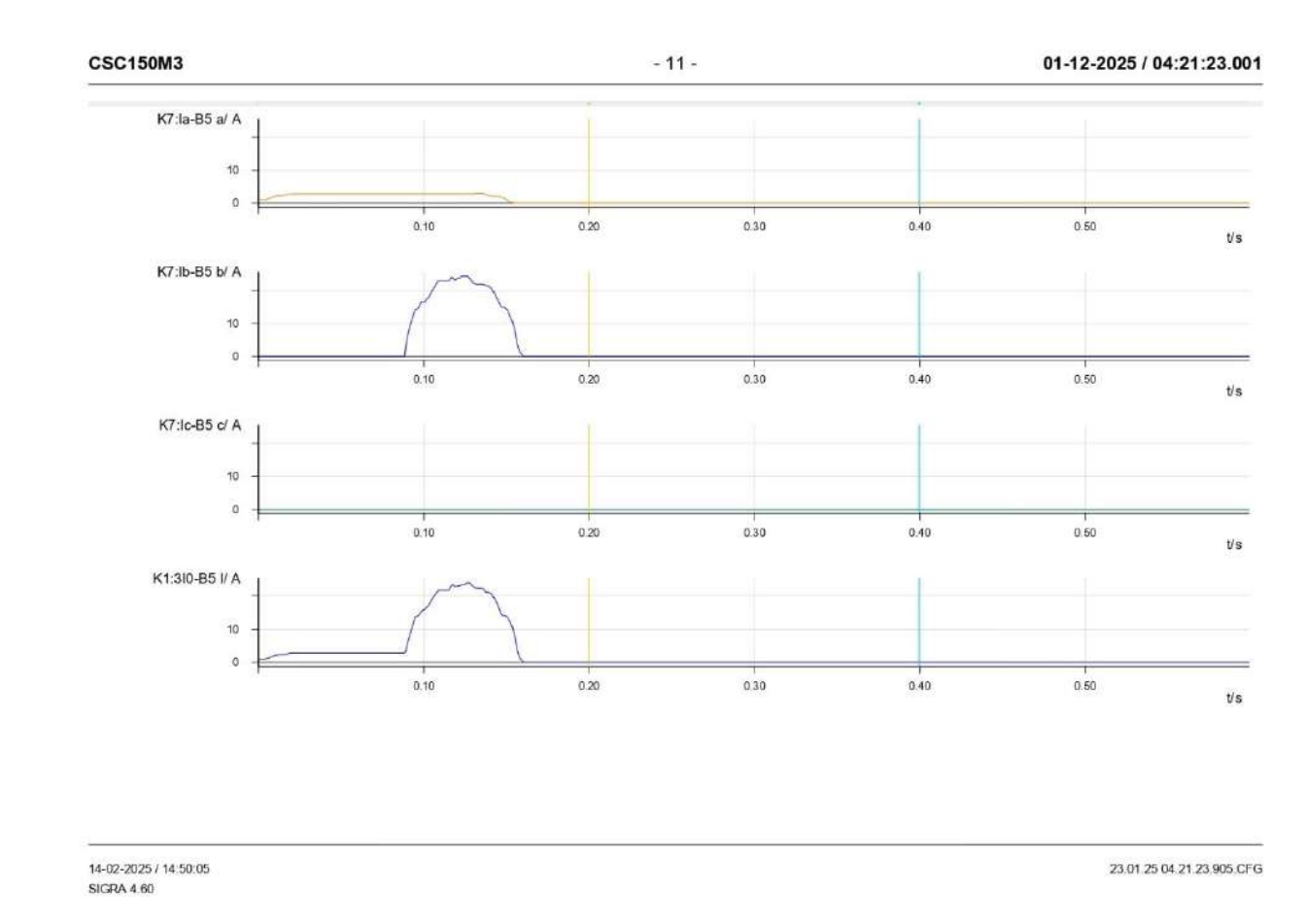
15°C Haze | Search | ENG IN | 10:04 15-02-2025

DR OF 220KV BUS BAR RELAY

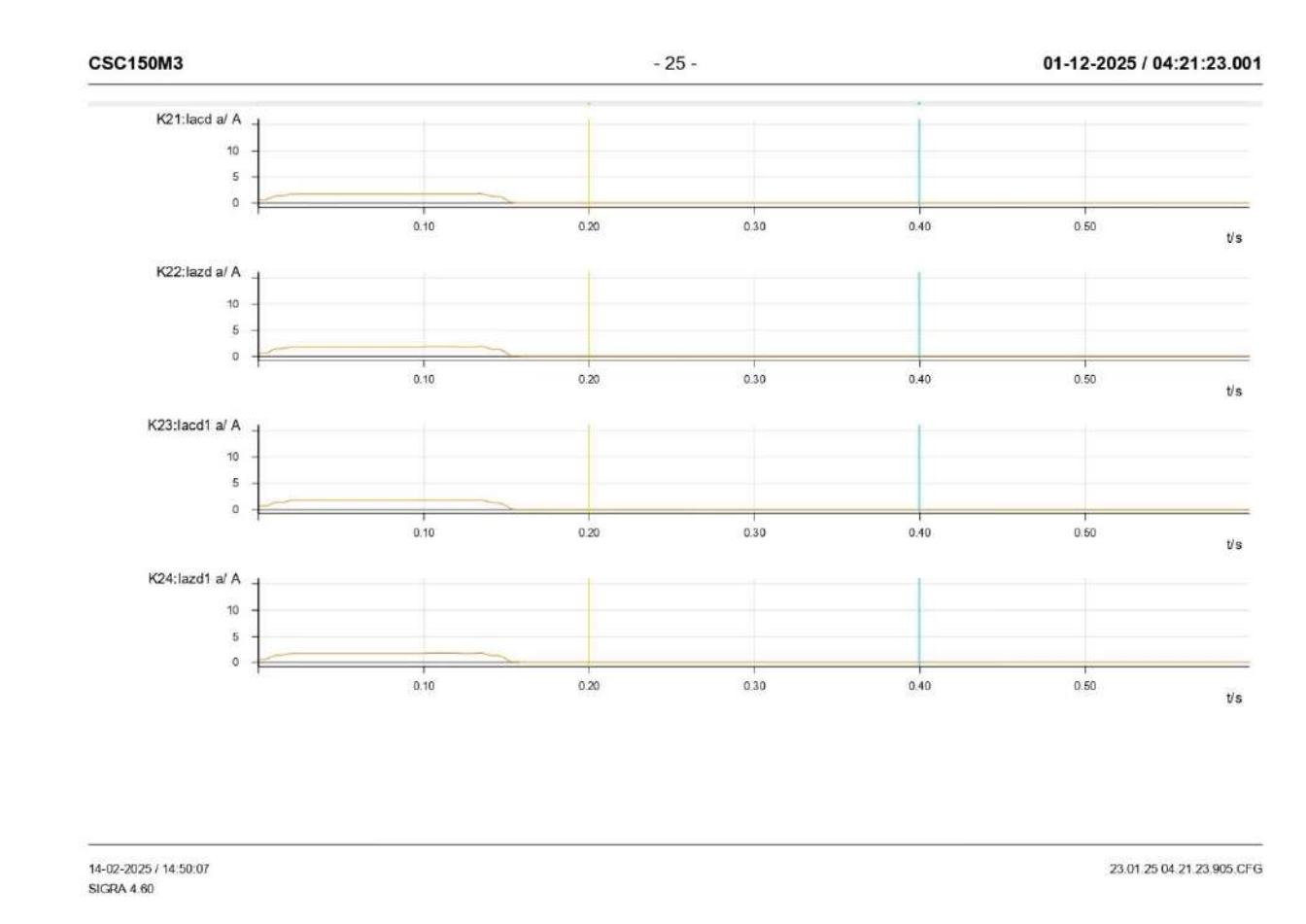
CSC150M3

File path: C:\USERS\OMICR\ONEDRIVE\DESKTOP\BUS BAR DR\23.01.25 4.21.23.905\23.01.25 04.21.23.905.CFG
Start time: 01-12-2025 04:21:23.001
Sample rate: 1200 Hz
Value representation: secondary
Record type: COMTRADE

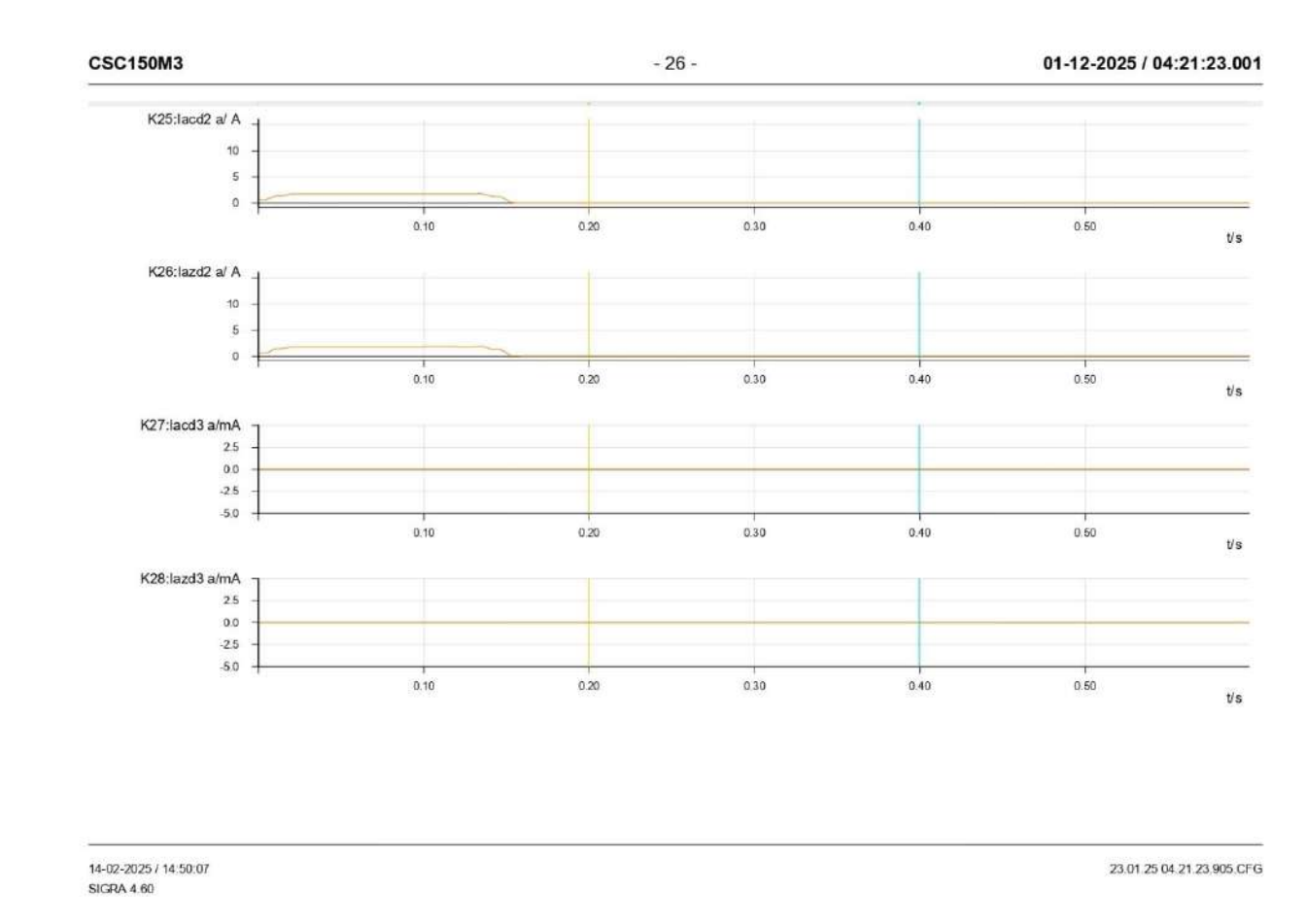
DR OF 220KV BUS BAR RELAY



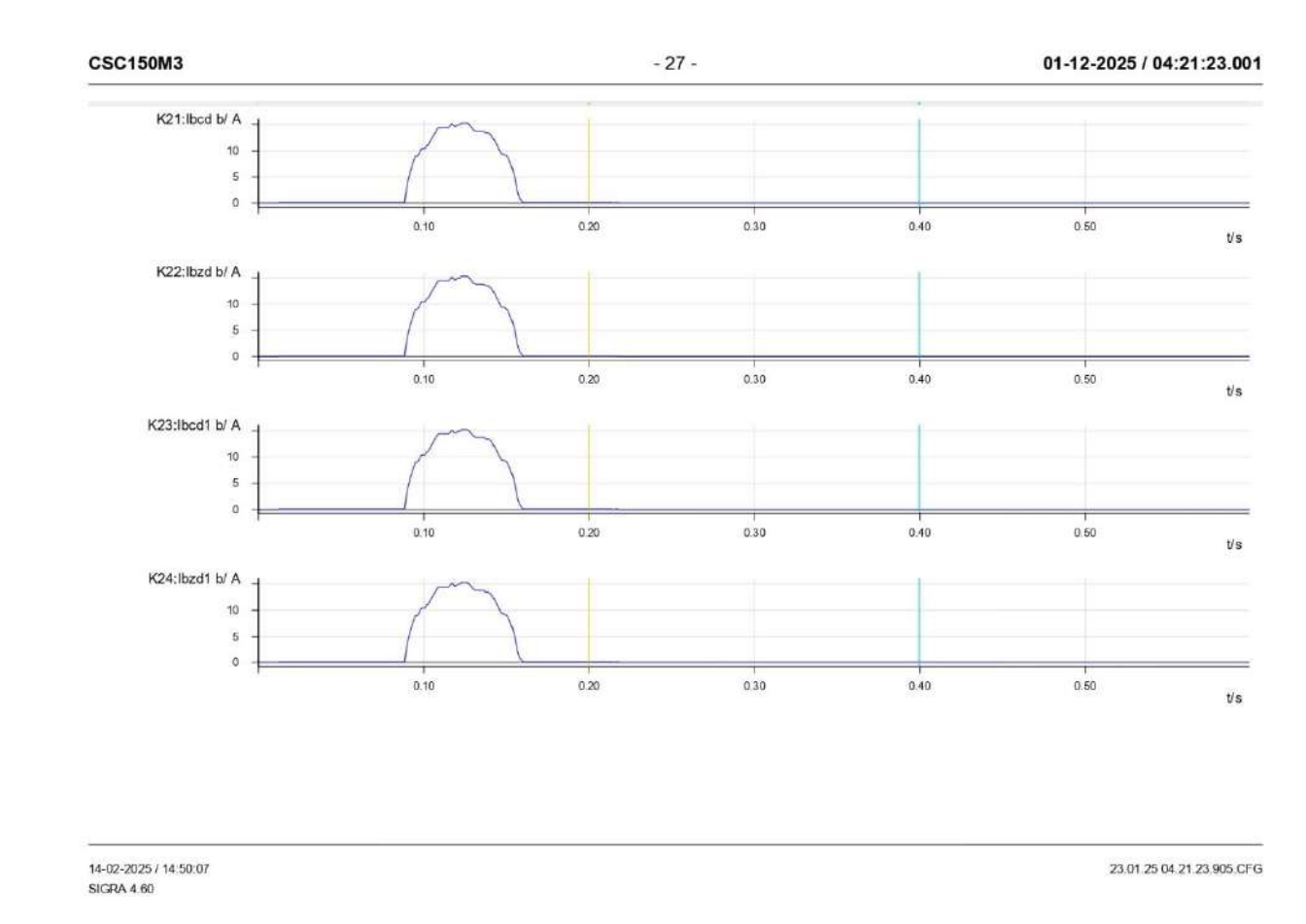
DR OF 220KV BUS BAR RELAY



DR OF 220KV BUS BAR RELAY



DR OF 220KV BUS BAR RELAY



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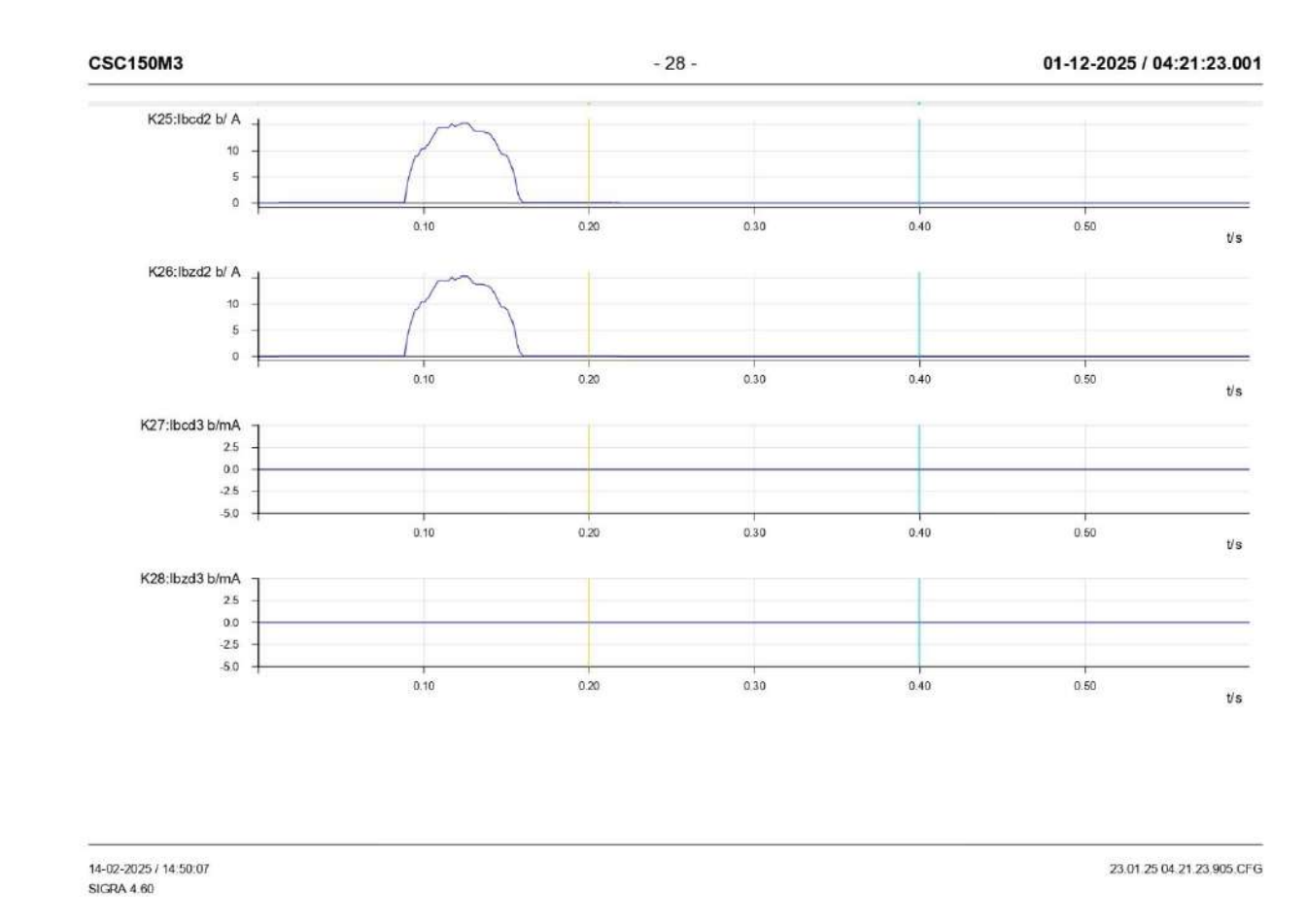
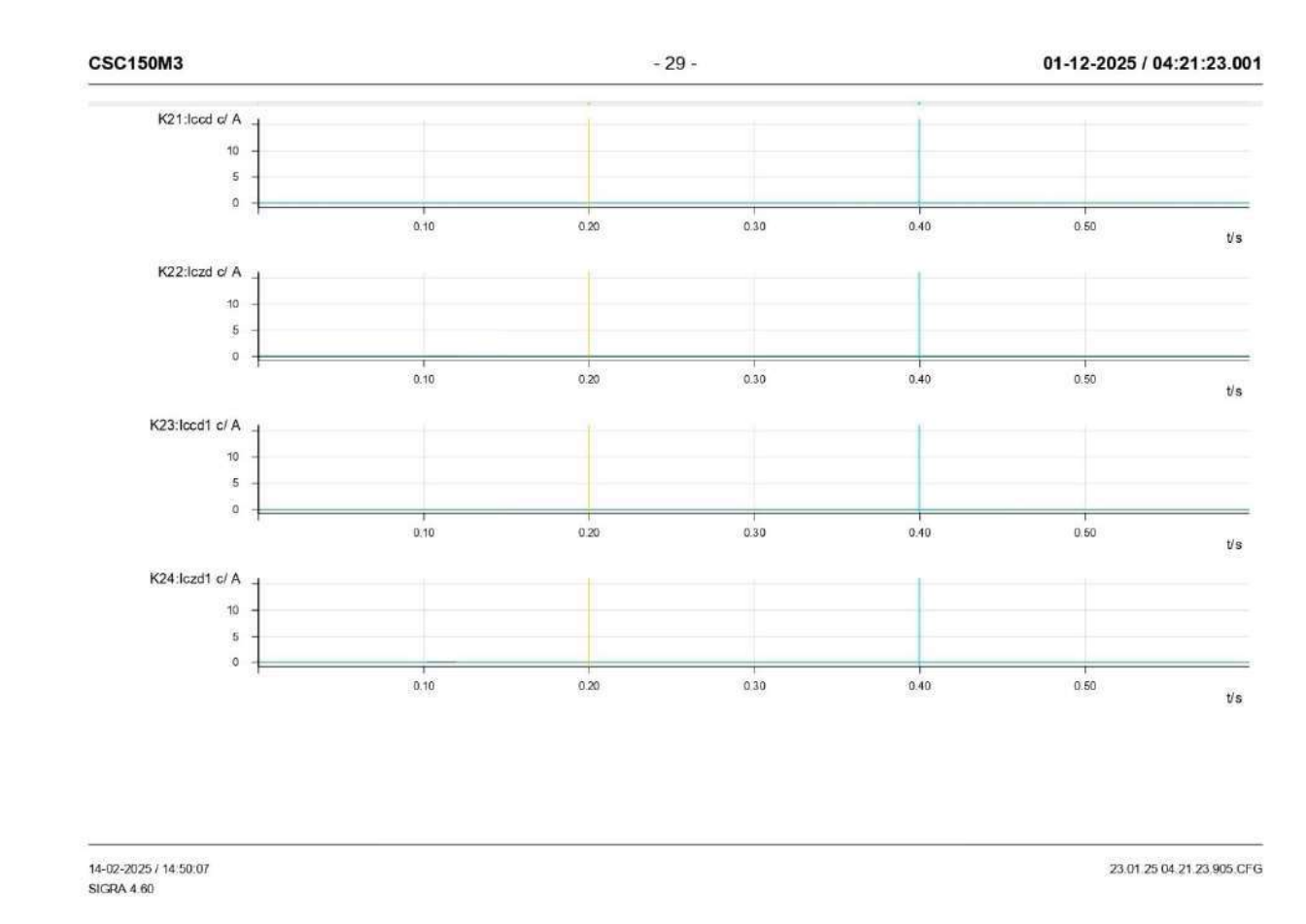
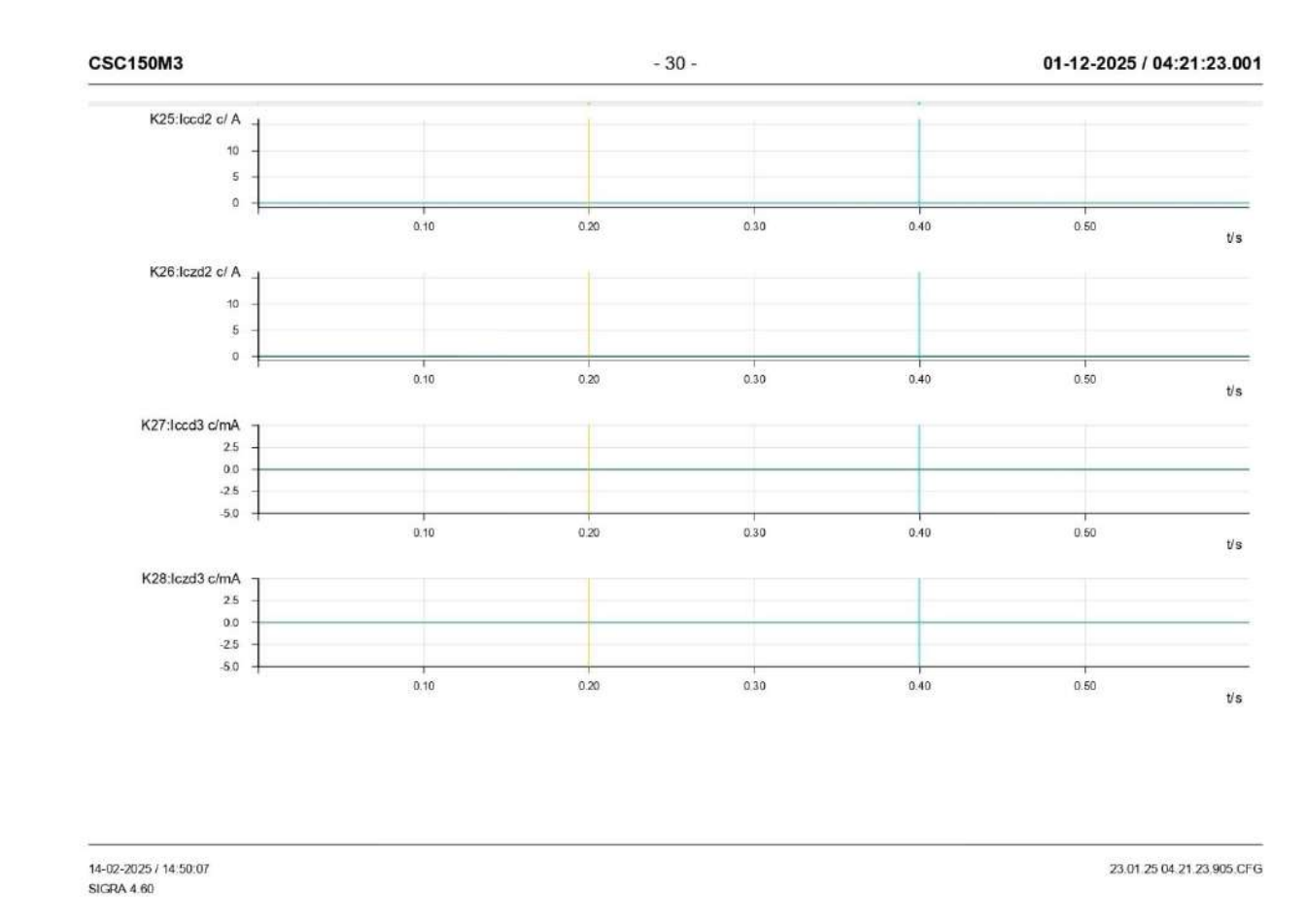


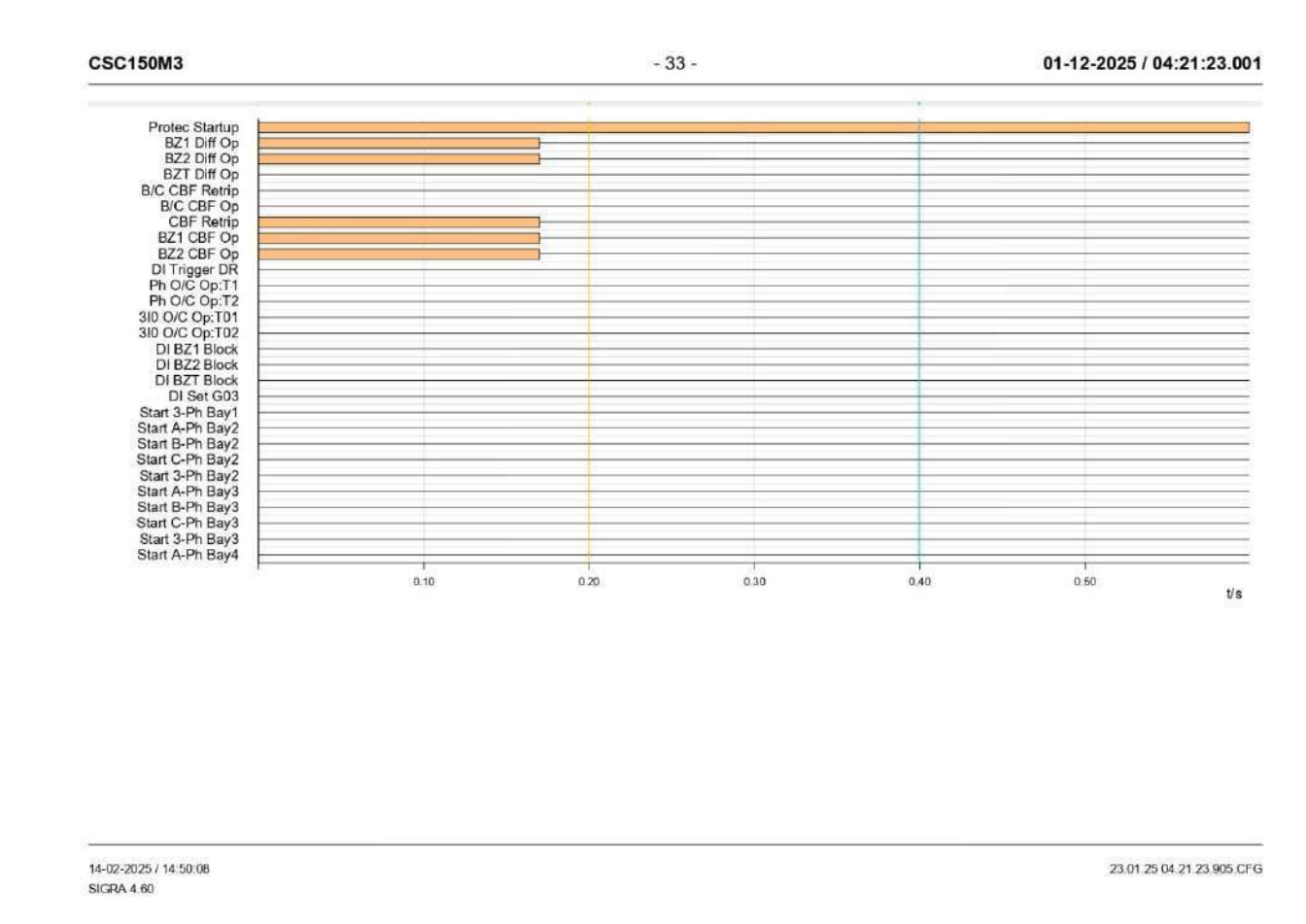
DR OF 220KV BUS BAR RELAY



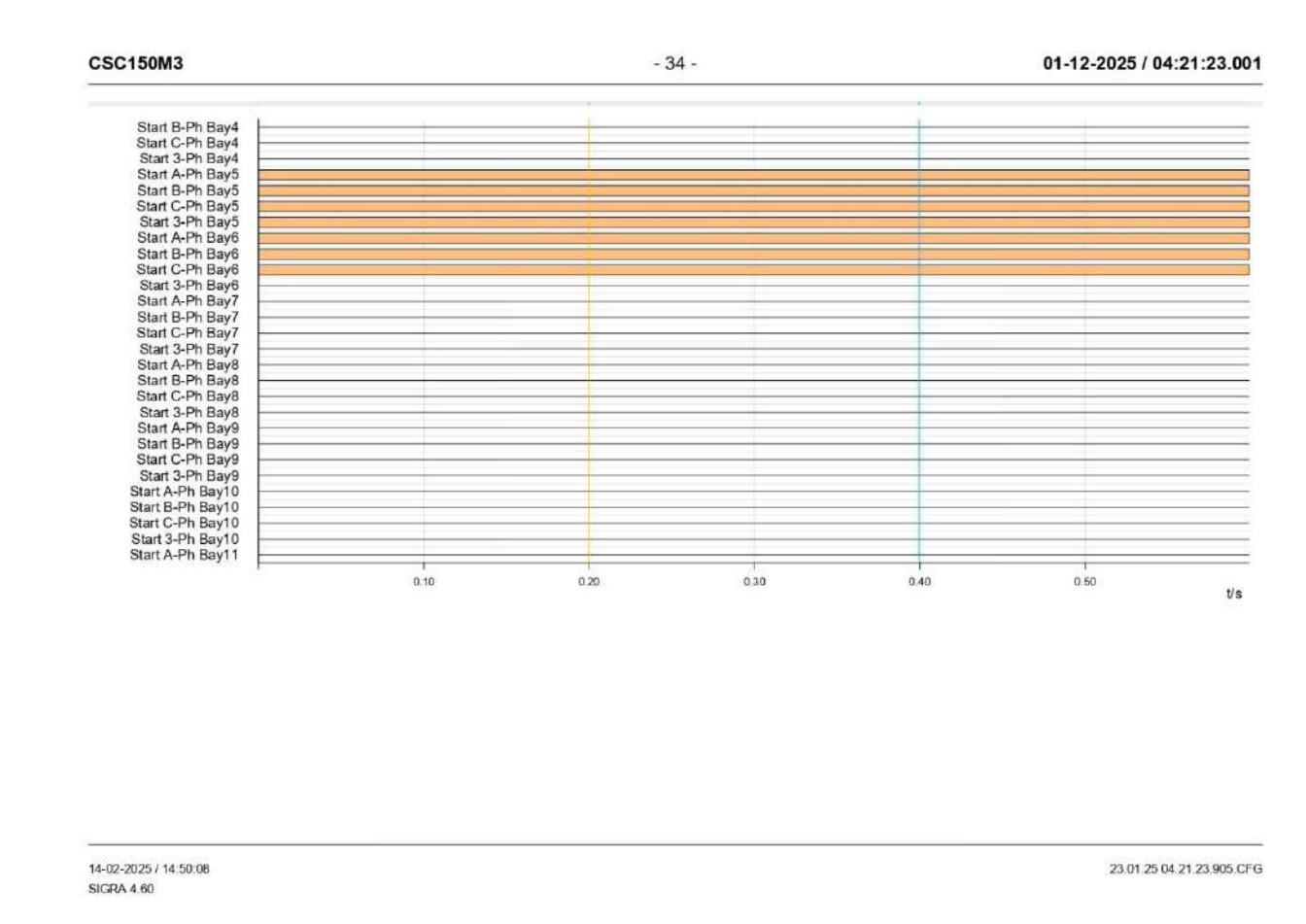
DR OF 220KV BUS BAR RELAY



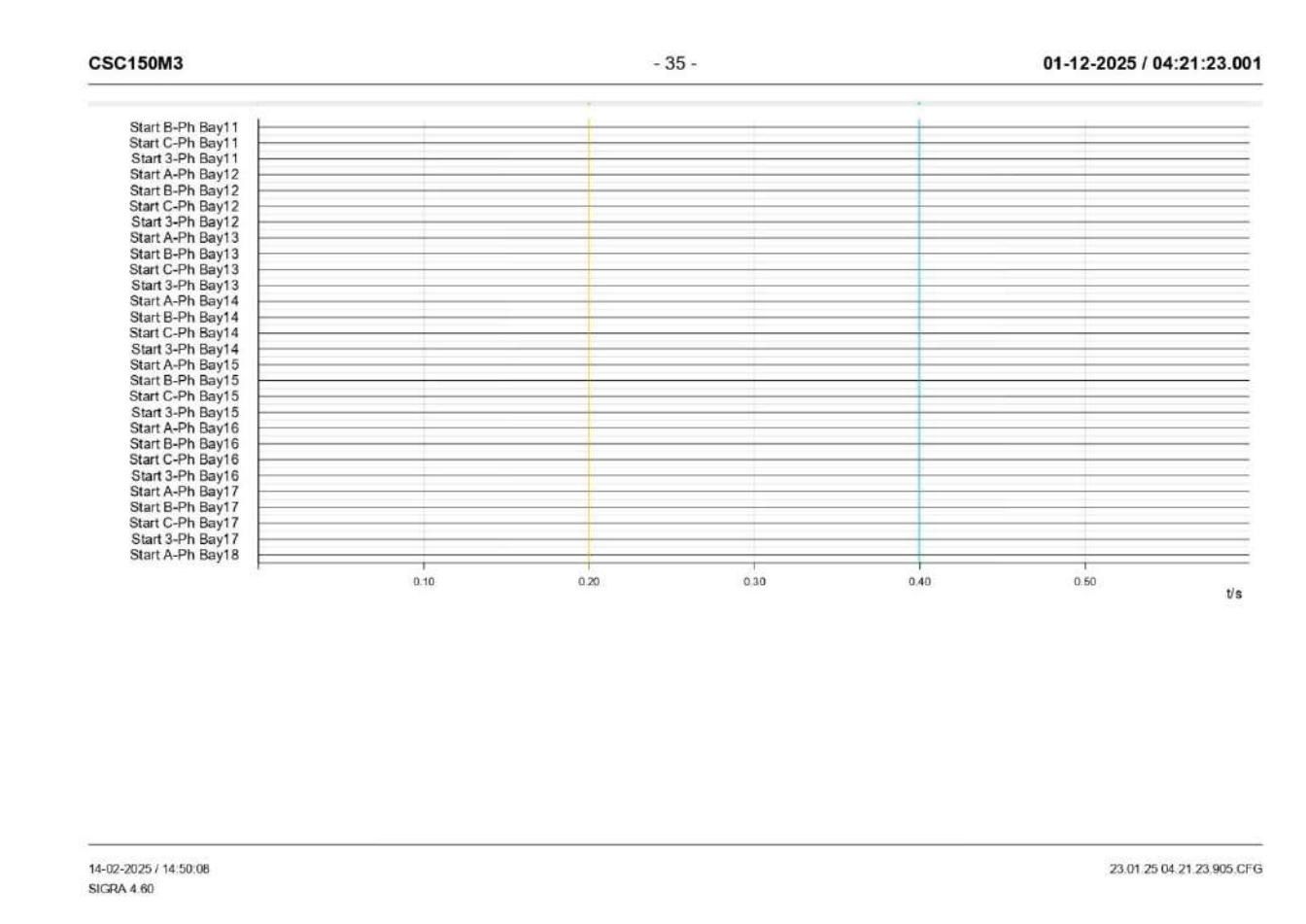
DR OF 220KV BUS BAR RELAY



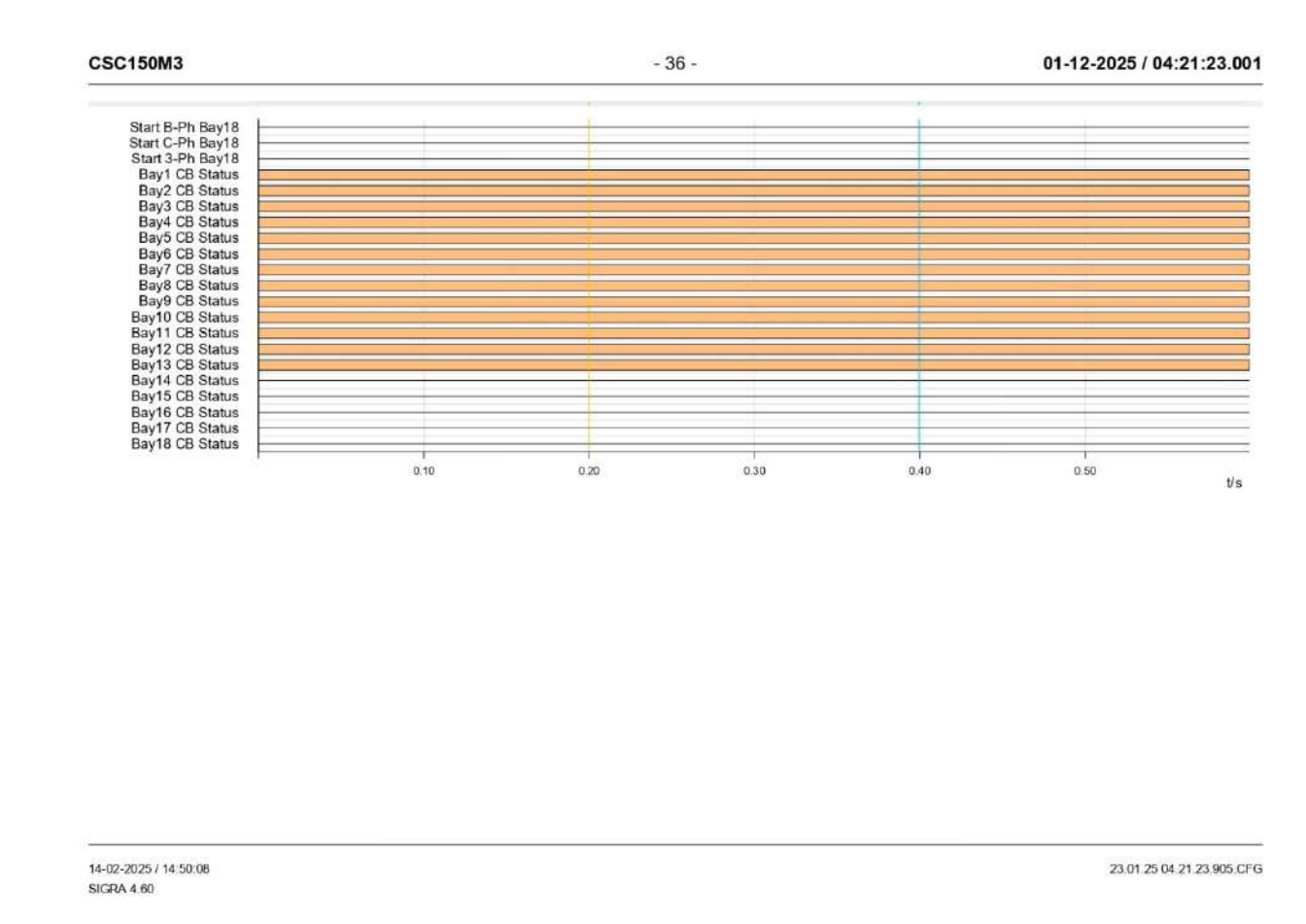
DR OF 220KV BUS BAR RELAY



DR OF 220KV BUS BAR RELAY



DR OF 220KV BUS BAR RELAY

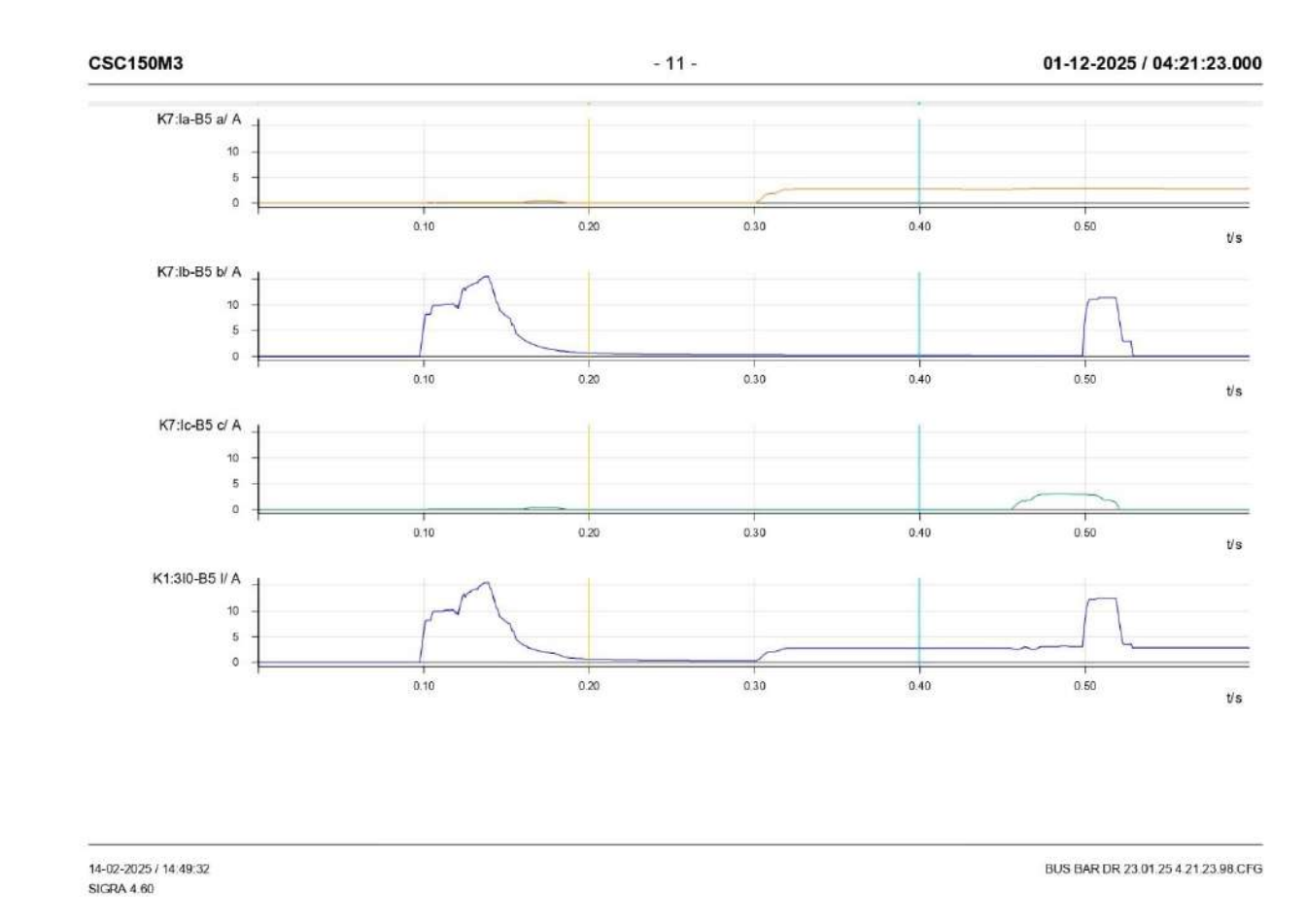


DR OF 220KV BUS BAR RELAY

CSC150M3

File path: C:\USERS\OMICR\ONEDRIVE\DESKTOP\BUS BAR DR\23.01.25 4.21.23.98\BUS BAR DR 23.01.25 4.21.23.98.CFG
Start time: 01-12-2025 04:21:23.000
Sample rate: 1200 Hz
Value representation: secondary
Record type: COMTRADE

DR OF 220KV BUS BAR RELAY



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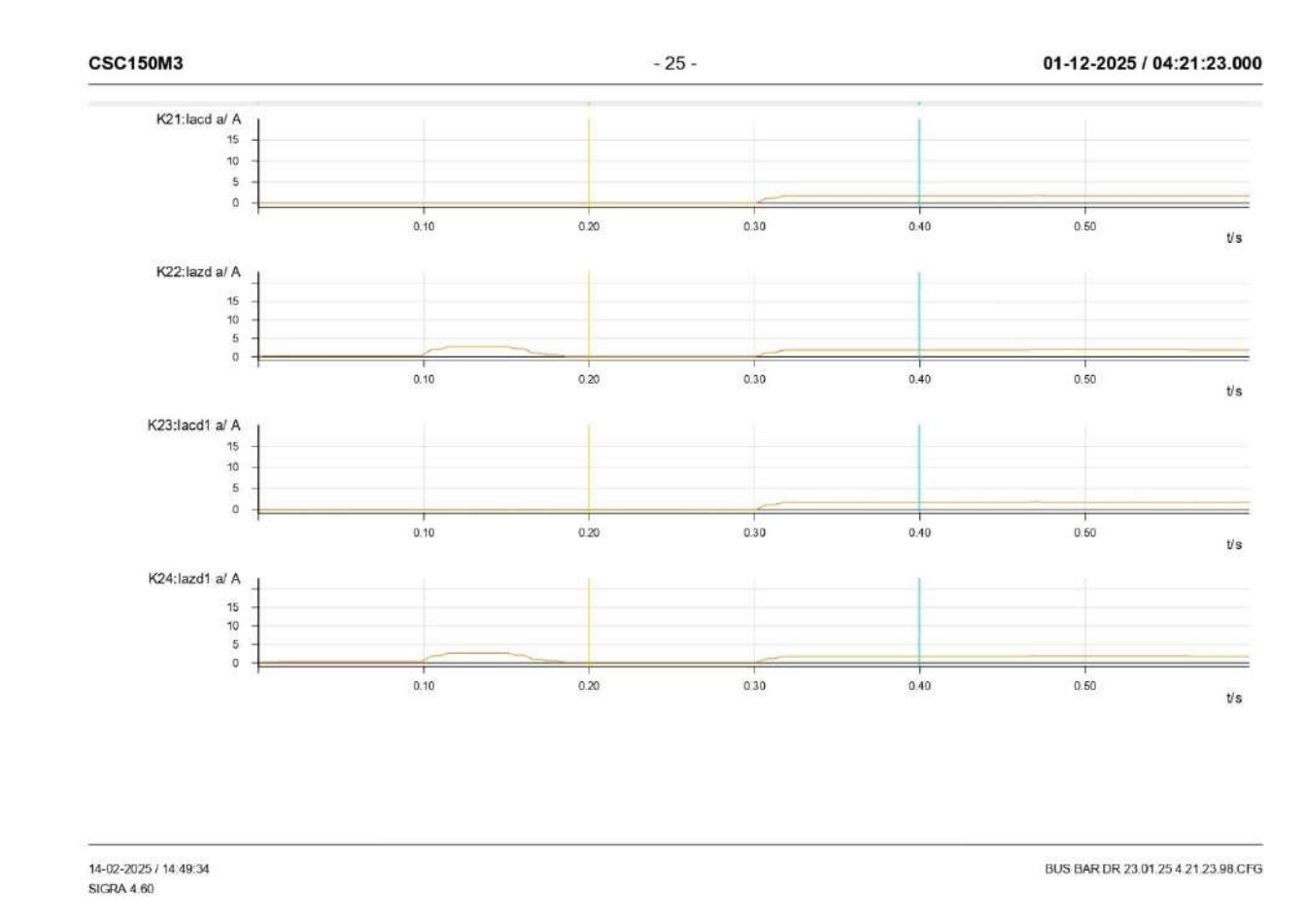

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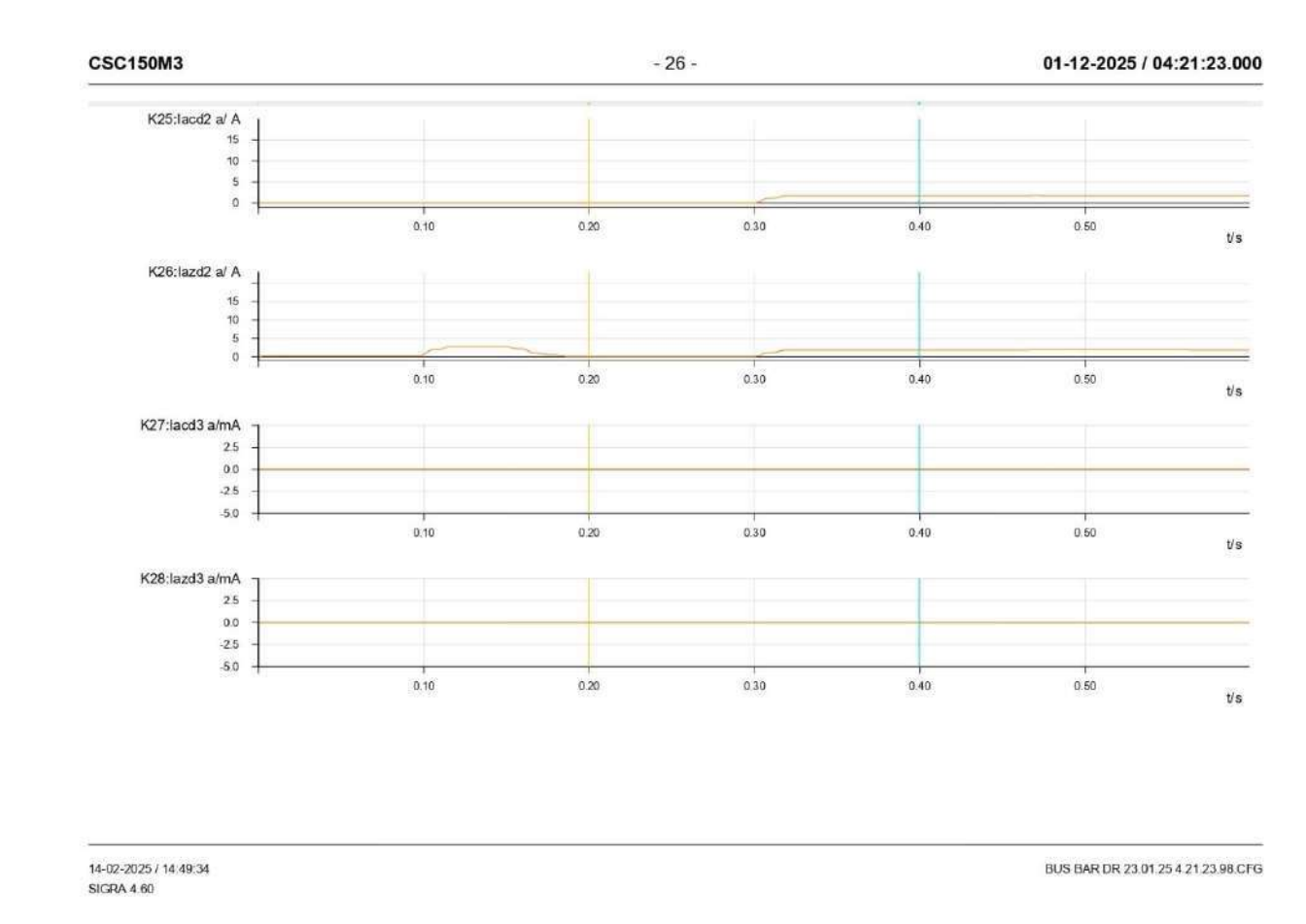

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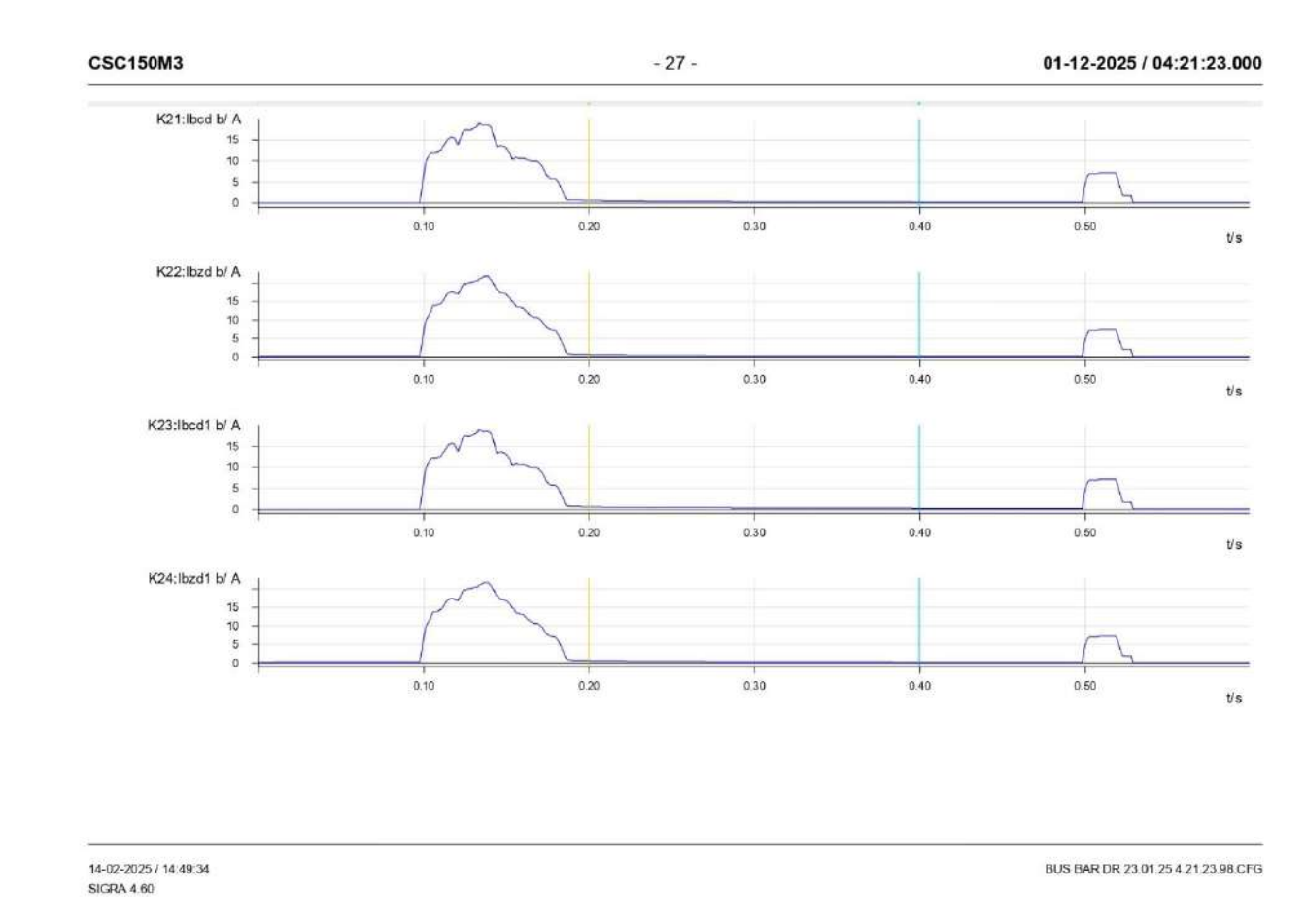

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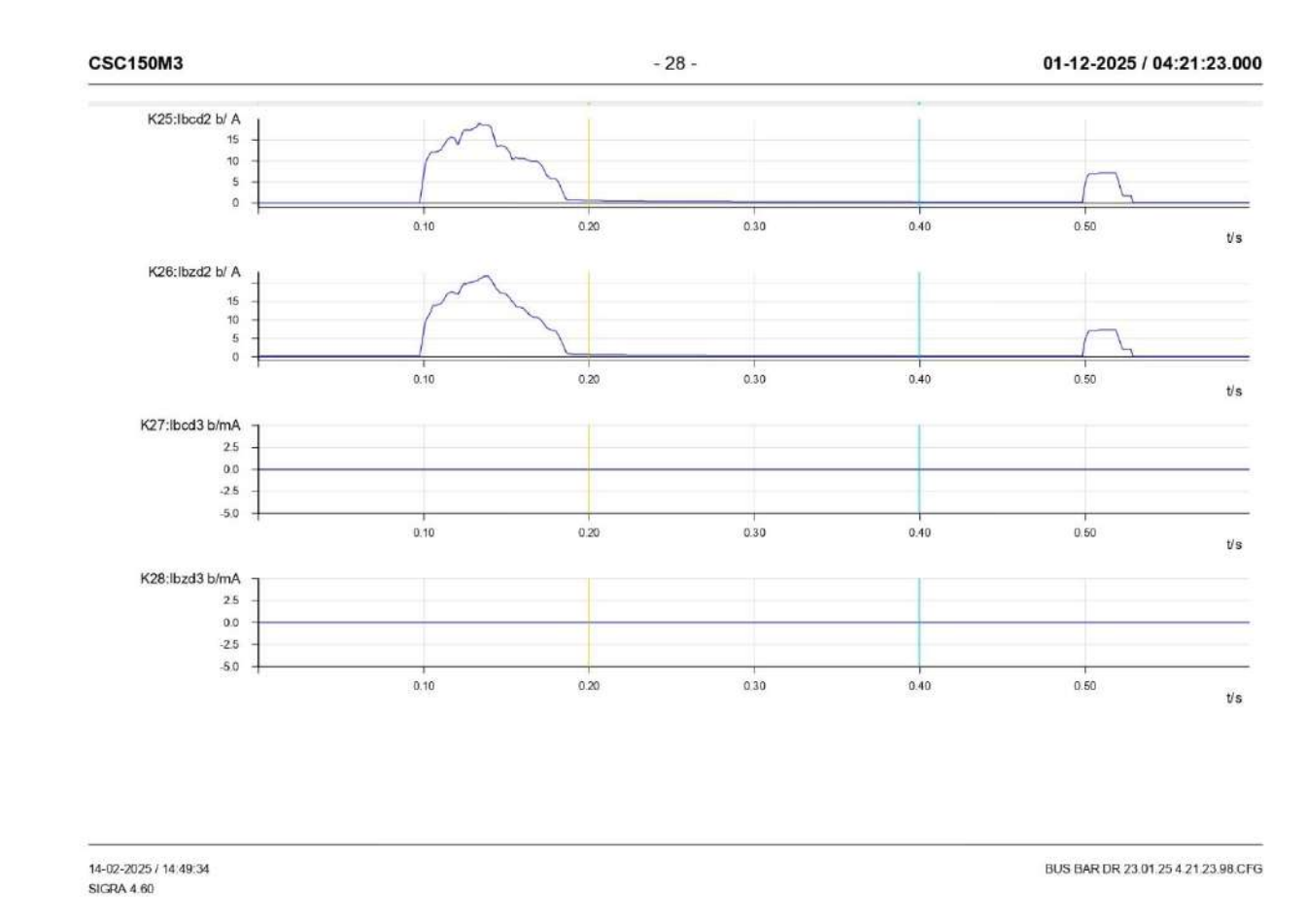

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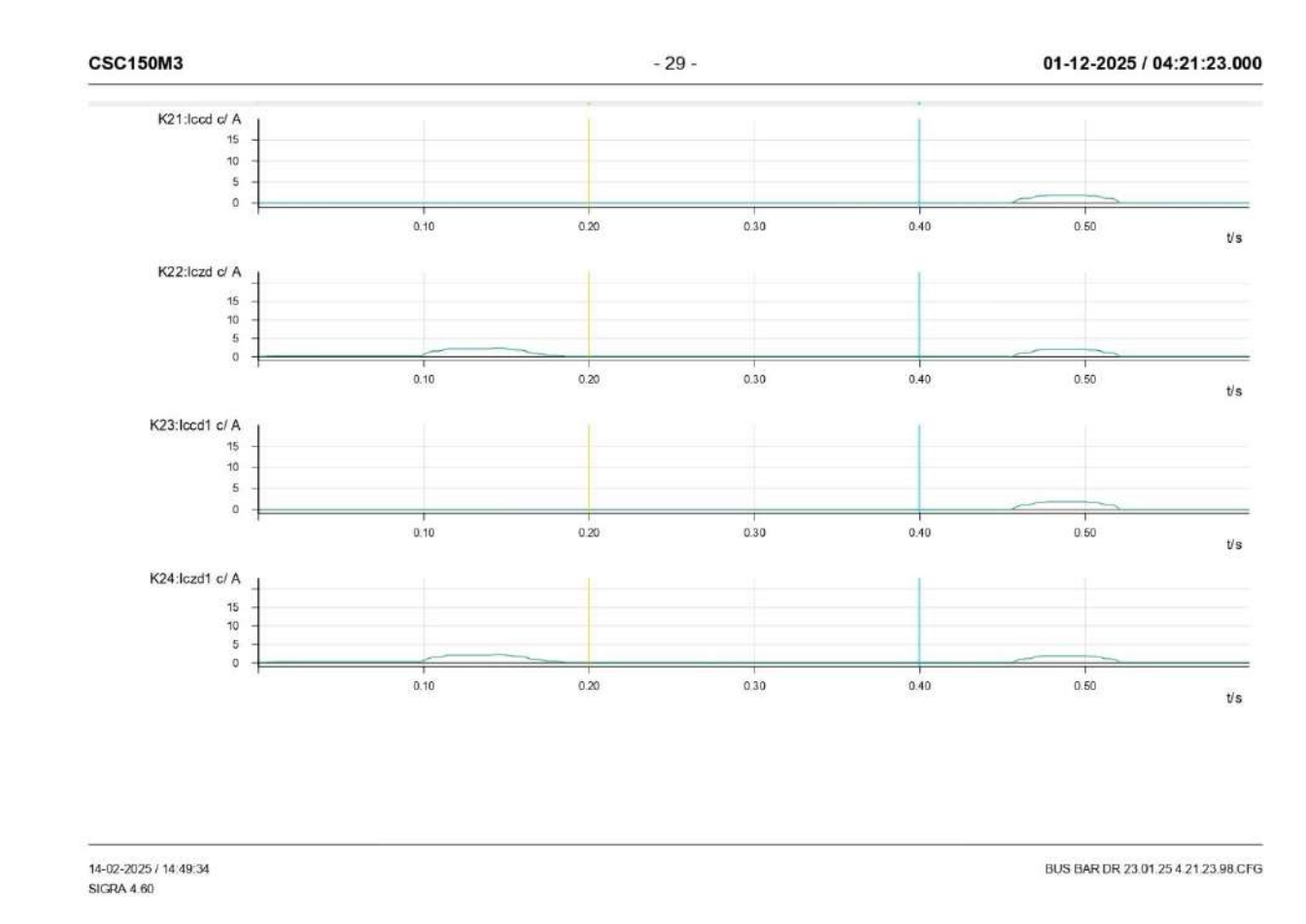
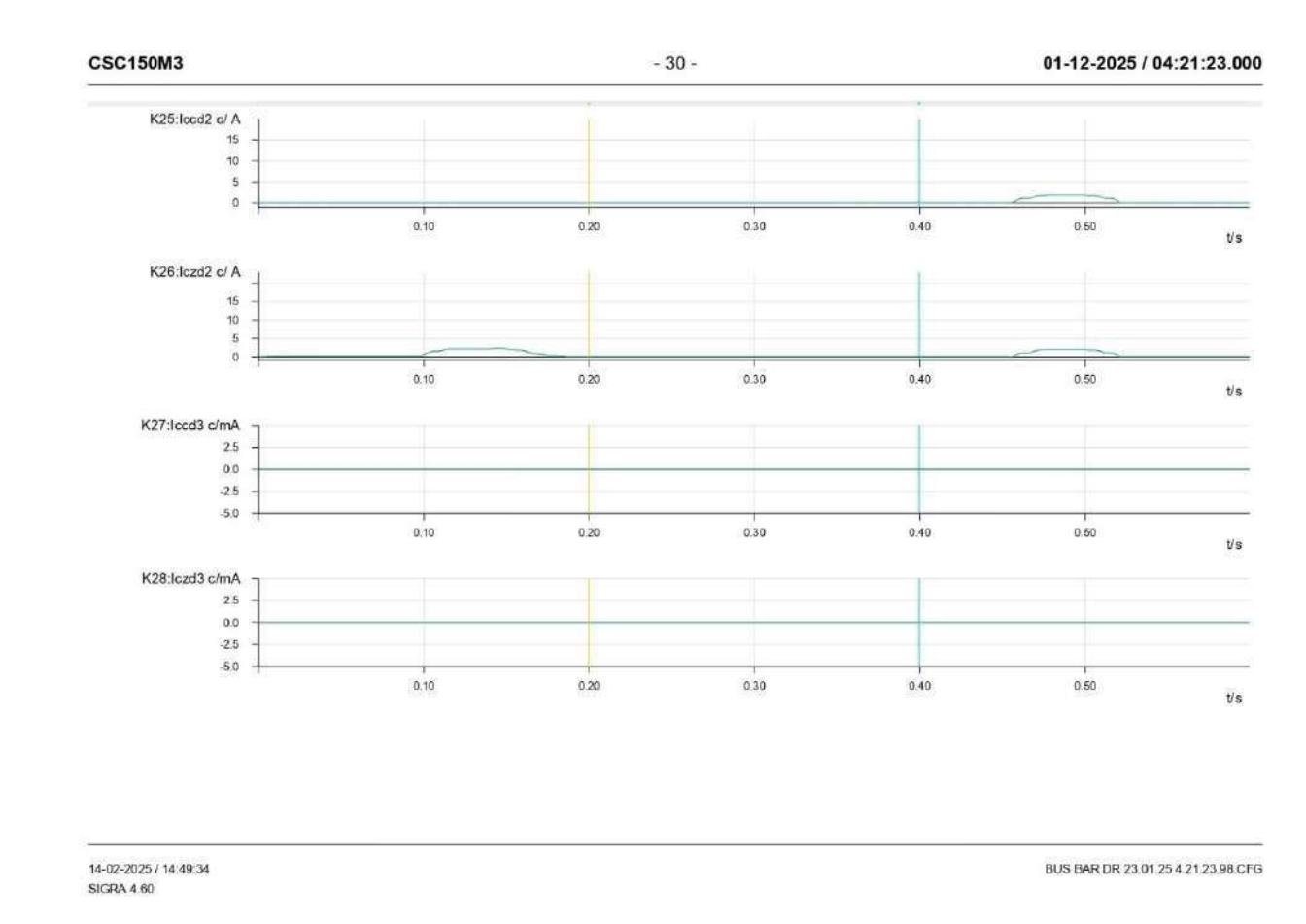
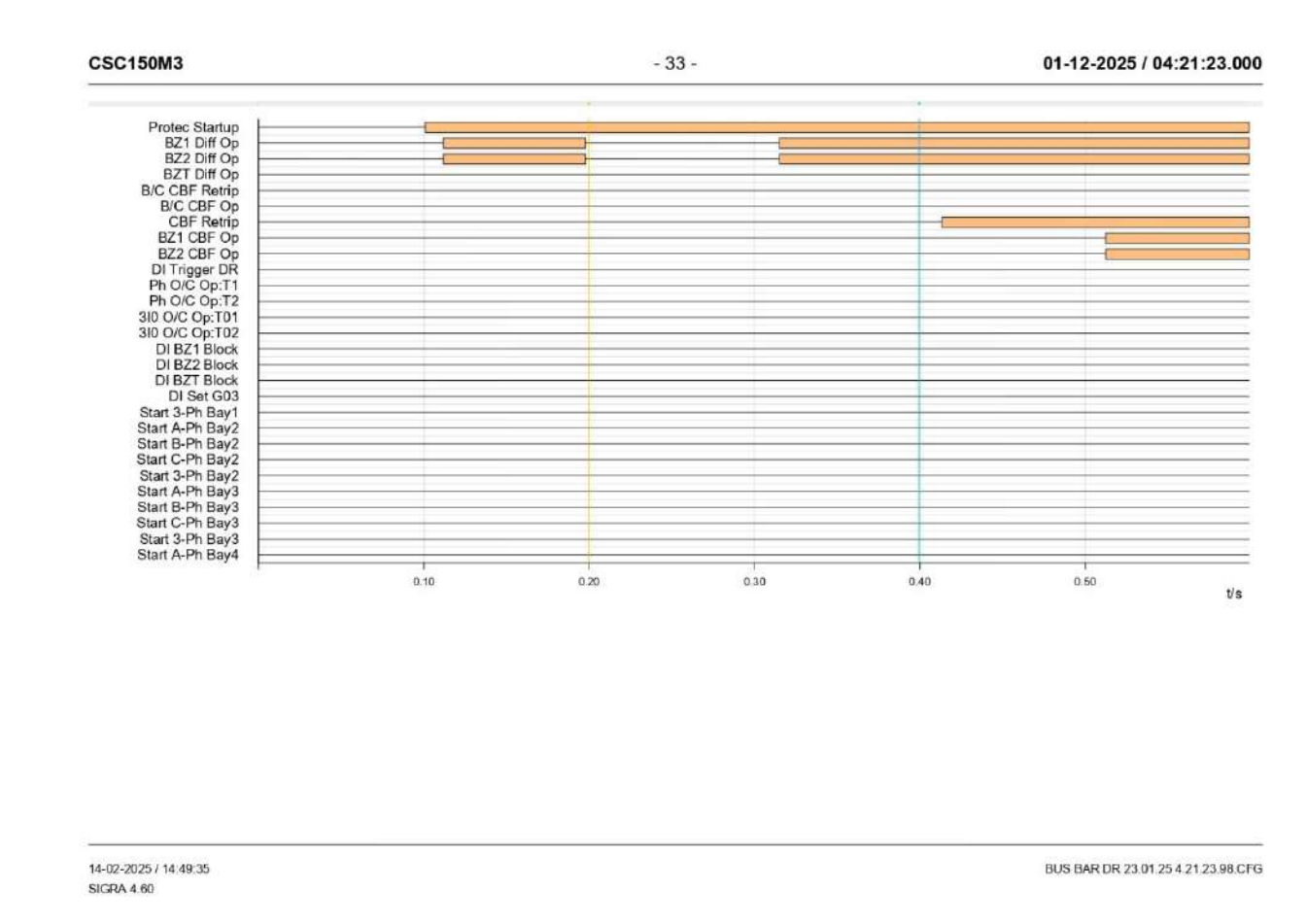


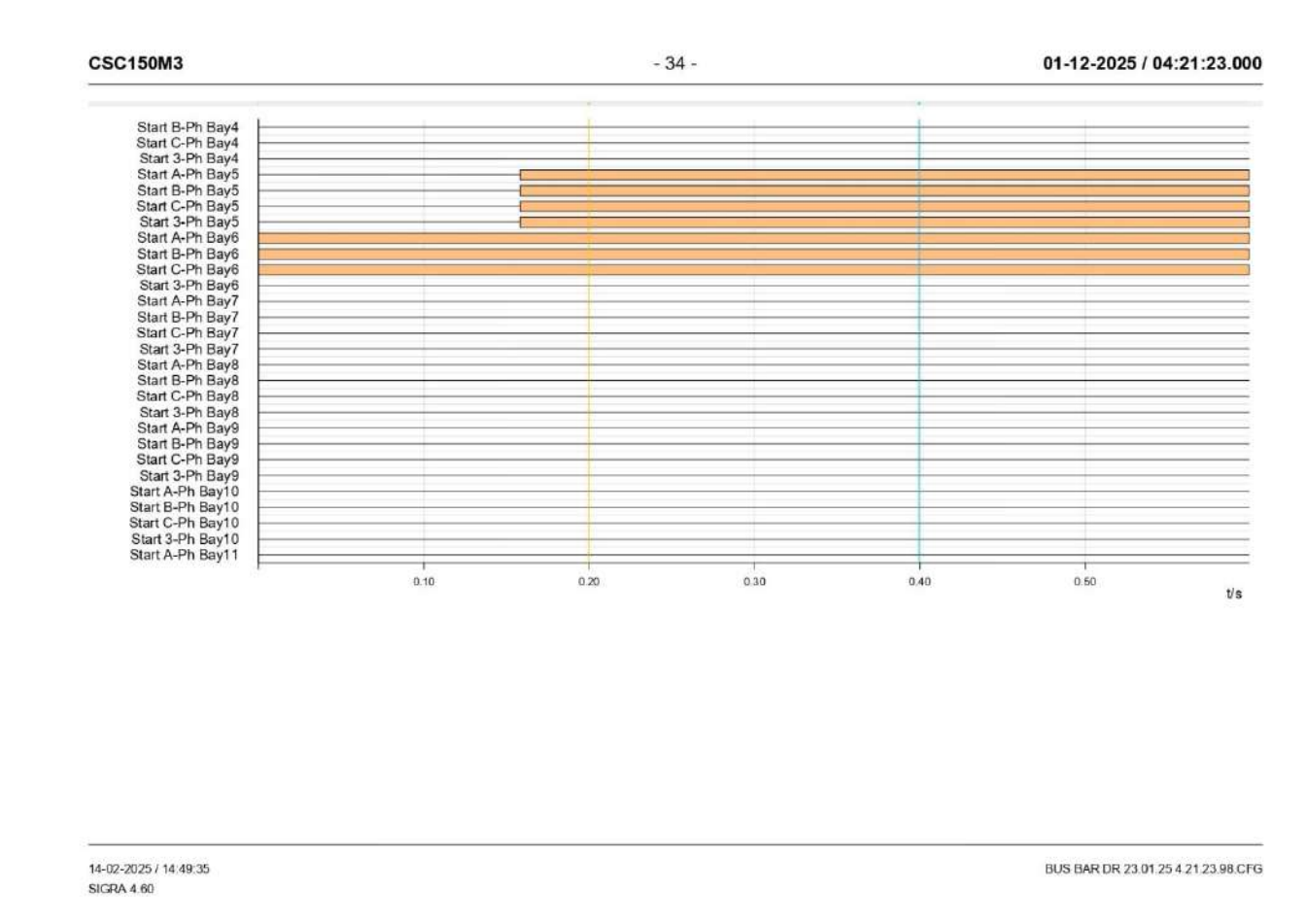
DR OF 220KV BUS BAR RELAY



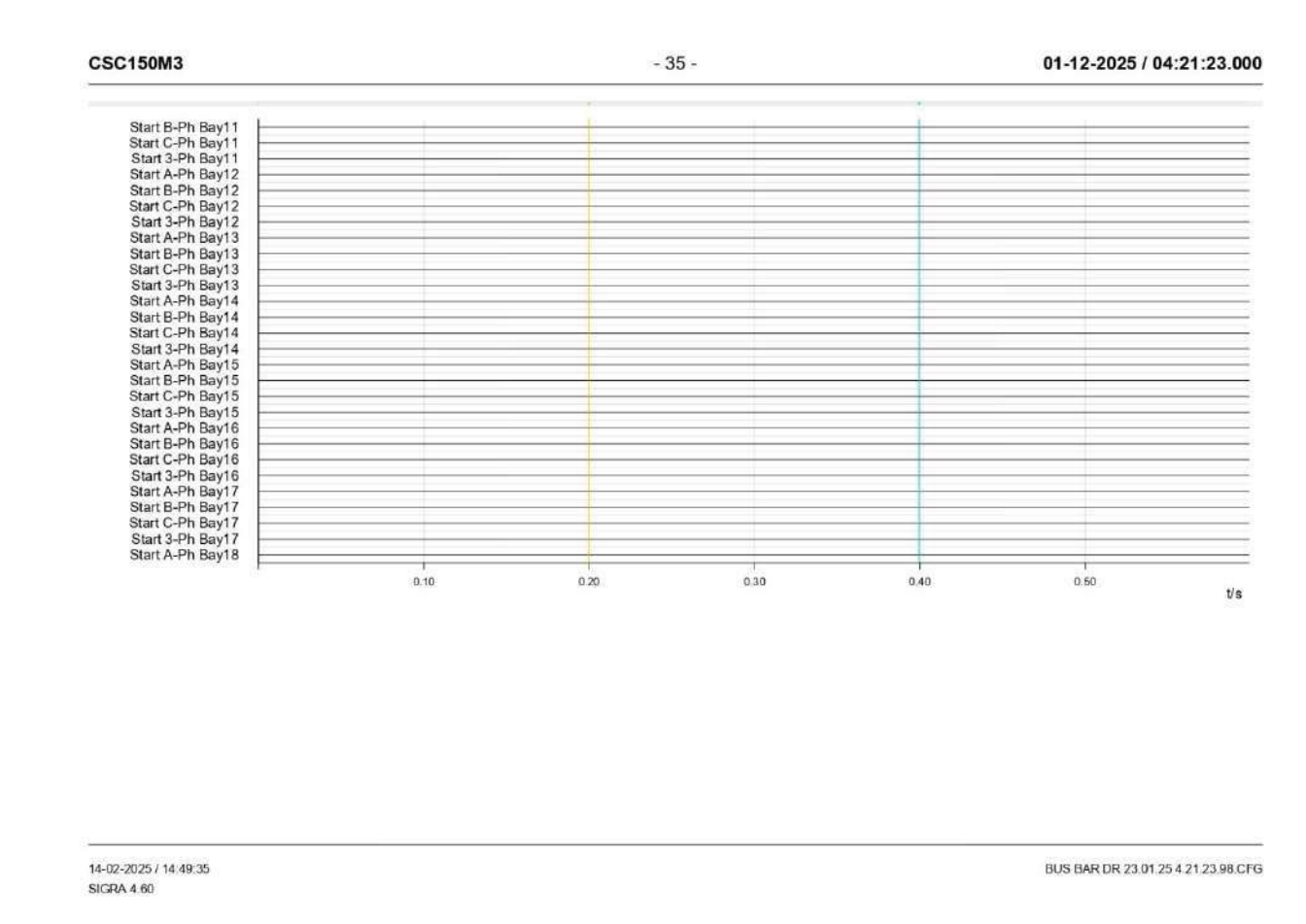
DR OF 220KV BUS BAR RELAY



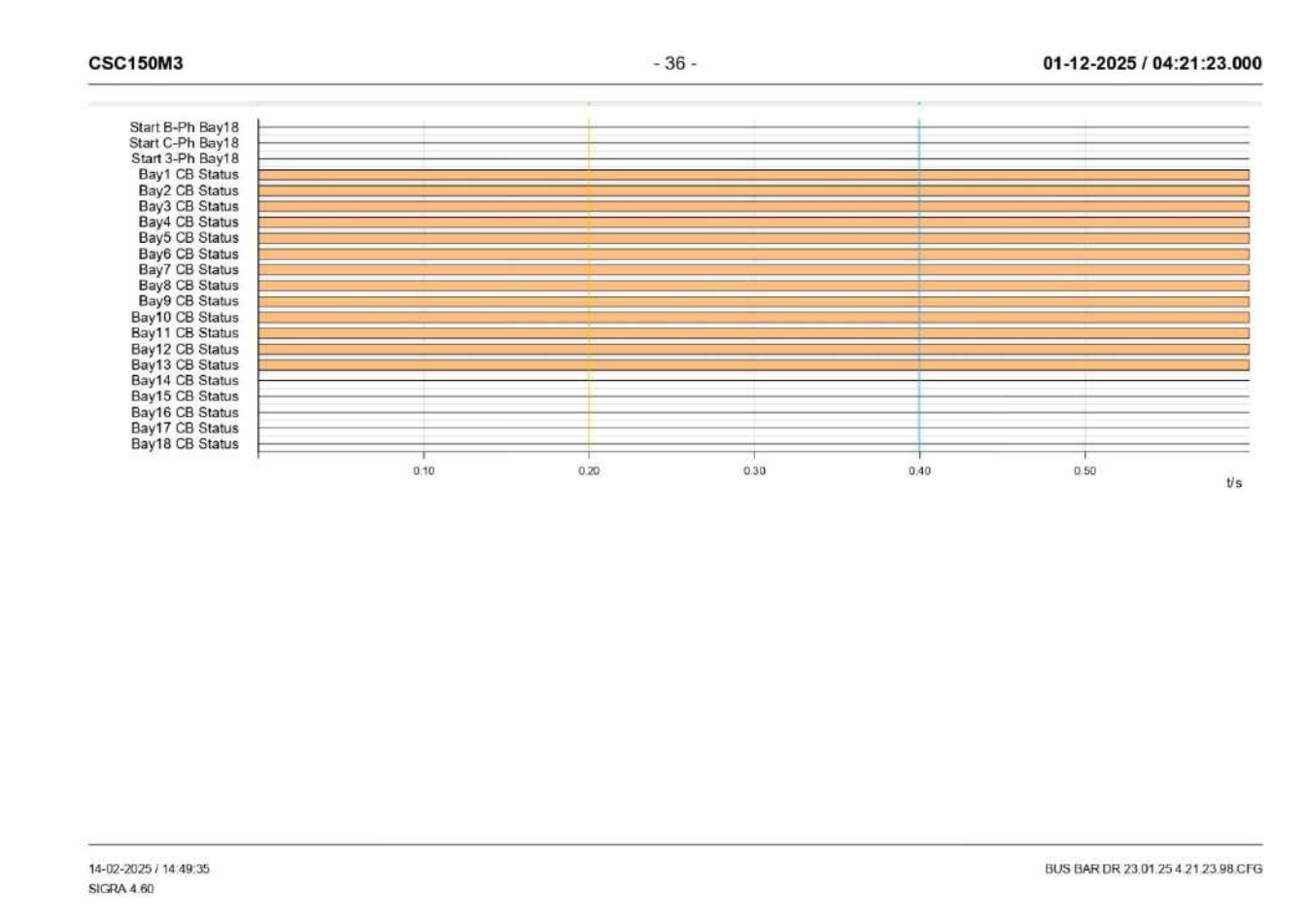
DR OF 220KV BUS BAR RELAY



DR OF 220KV BUS BAR RELAY



DR OF 220KV BUS BAR RELAY



Events Description

Pre-Event Bus Arrangement:

- **Load on Bus A-** 220 KV Auriya, 220 KV Saifai,220 KV Kirawali Lines & 160 MVA T/F-1, 160 MVA T/F-2 & 100 MVA T/F
- **Load on Bus B-** 220 KV Agra1, 220 KV Agra 2, 60 MVA T/F-1, 60 MVA T/F-2 & 60 MVA T/F-3
- Bus coupler was in circuit.

On dated 23/01/2025,04:26 hrs, following events occurred.

1- 220 Kirawali line Y ph CT damaged with heavy blast.

2- Busbar relay operated and tripped all elements on both bus.

Following elements tripped -

220 KV Auriya, 220 KV Saifai,220 KV Kirawali, 220 KV Agra1, 220 KV Agra 2,160 MVA T/F-1, 160 MVA T/F-2 , 100 MVA T/F, 60 MVA T/F-1, 60 MVA T/F-2 & 60 MVA T/F-3

Reason of Busbar relay operated at 220kV Sikandra :-

1. 220kV Sikandra-Kirawali line Y-Ph CT damaged and Y-Ph Line side jumper grounded. Distance protection relay operated in zone-1 and tripped the CB.
2. At the same time, bus side Jumper of Y-PH CT failed and came in range of R and B-Phase hence bus bar relay operated and tripped Bus A elements. Also, wrong status of isolator caused tripping of Bus B elements. This resulted complete tripping of 220kV system.

Remedial Measures Taken

1. Shutdown was taken for replacement of damaged CT of 220KV Sikandra Kirawali Line.
2. Status of isolator Bus A & Bus B busbar relay thoroughly checked and & set right accordingly Bus A and Bus B.

THANK YOU.

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

At 12:09 hrs on 29th January, 2025

Tripped Elements

S. No	Name of Elements	Outage Time	Revival Time	Reason of tripping
1.	400/220 kV 500 MVA ICT 1 at Jehta_Hardoi Road (UP)	12:09 hrs	13:02 hrs	Due to Bus Bar protection operation.
2.	400/220 kV 500 MVA ICT 2 at Jehta_Hardoi Road (UP)		13:00 hrs	
3.	220/132kV 200 MVA ICT-3 at Jehta (UP)		13:44 hrs	
4.	220/132kV 200 MVA ICT-4 at Jehta(UP)		13:15 hrs	
5.	220kV Jehta-Hardoi Road (UP) ckt-1		12:58 hrs	
6.	220kV Jehta-Hardoi road (UP) ckt-2		12:58 hrs	
7.	220kV Jehta-Mallawan (UP) ckt-1		13:09 hrs	
8.	220kV Jehta-Mallawan (UP) ckt-2		13:09 hrs	
9.	220kV Bus coupler at Jehta(UP)			

Brief details of the event

i) 400/220/132KV Jehta(UP) S/s has double main bus scheme in all voltage level.

ii) During antecedent condition, 400/220 kV 500 MVA ICT-1 & ICT-2 at Jehta(UP) were connected to 400kV bus-1 and bus-2 respectively and were carrying approx. 107MW each. 220/132KV ICT-3 and ICT-4 were carrying approx. 35MW each.

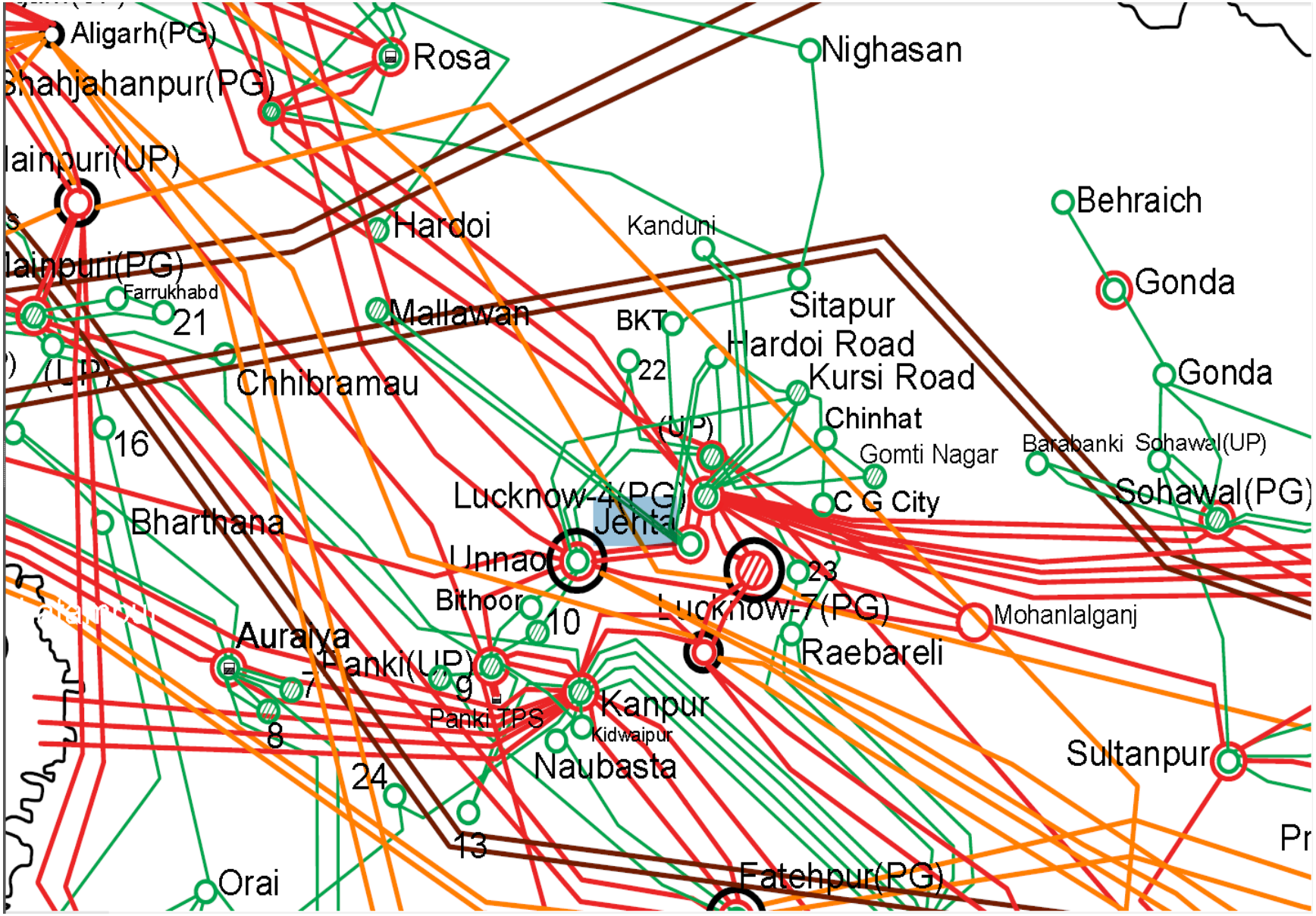
iii) As reported at 12:09 hrs, 400/220KV ICT -1 and ICT-2 at Jehta(UP) tripped due to Bus Bar protection operation. This led to further tripping of 220/132KV ICT-3 and ICT-4 downstream along with tripping of both 220KV Bus-I and Bus-II at Jehta(UP). As a result, all the elements connected to both the 220KV Buses tripped.

iv) As per DR of 400/220KV ICT-1 and 2 at Jehta (UP), 96 relay operated.

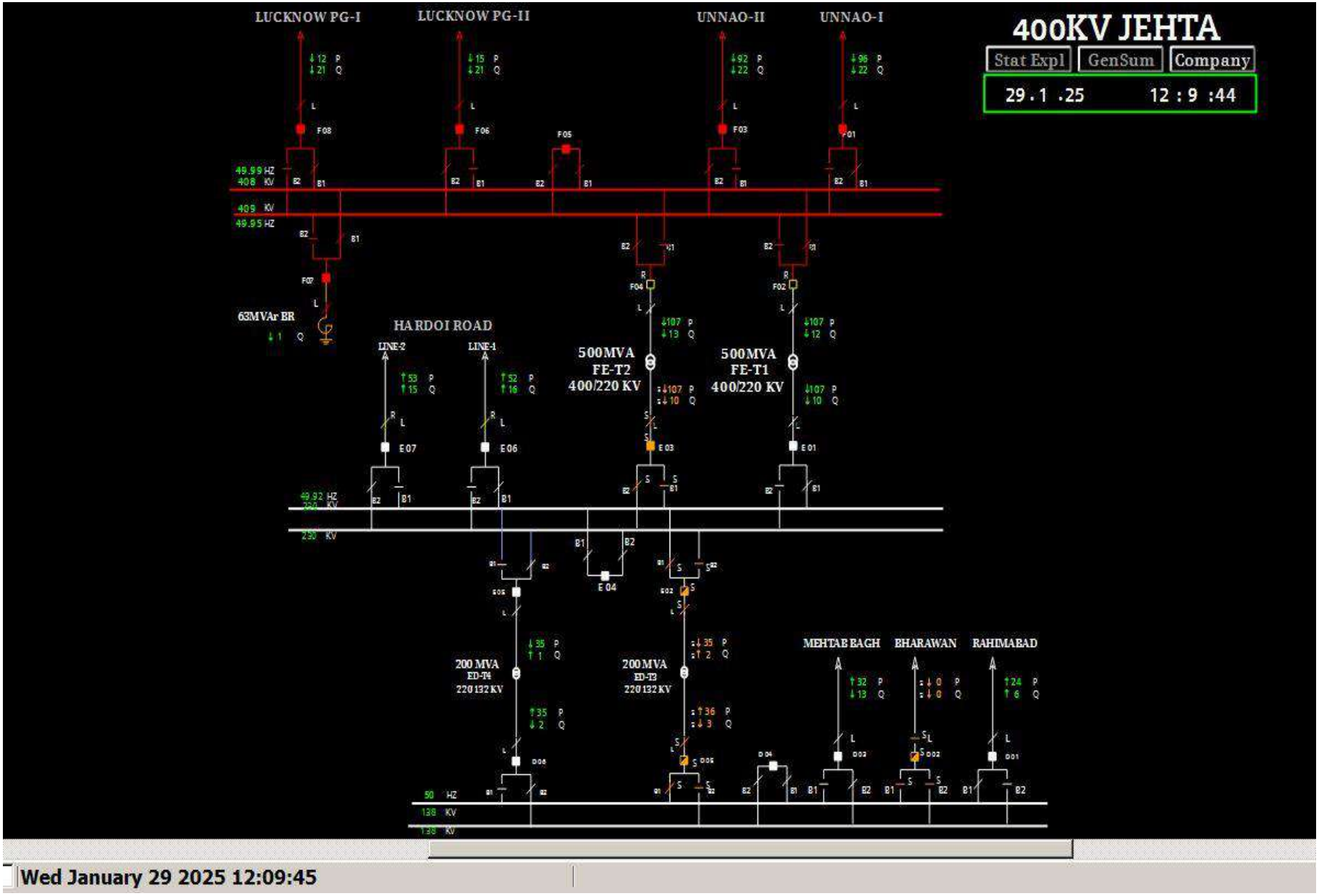
v) As per PMU at Unnao(UP), no fault was observed in the system.

vi) As per SCADA, change in demand of approx. 252MW is observed in UP control area.

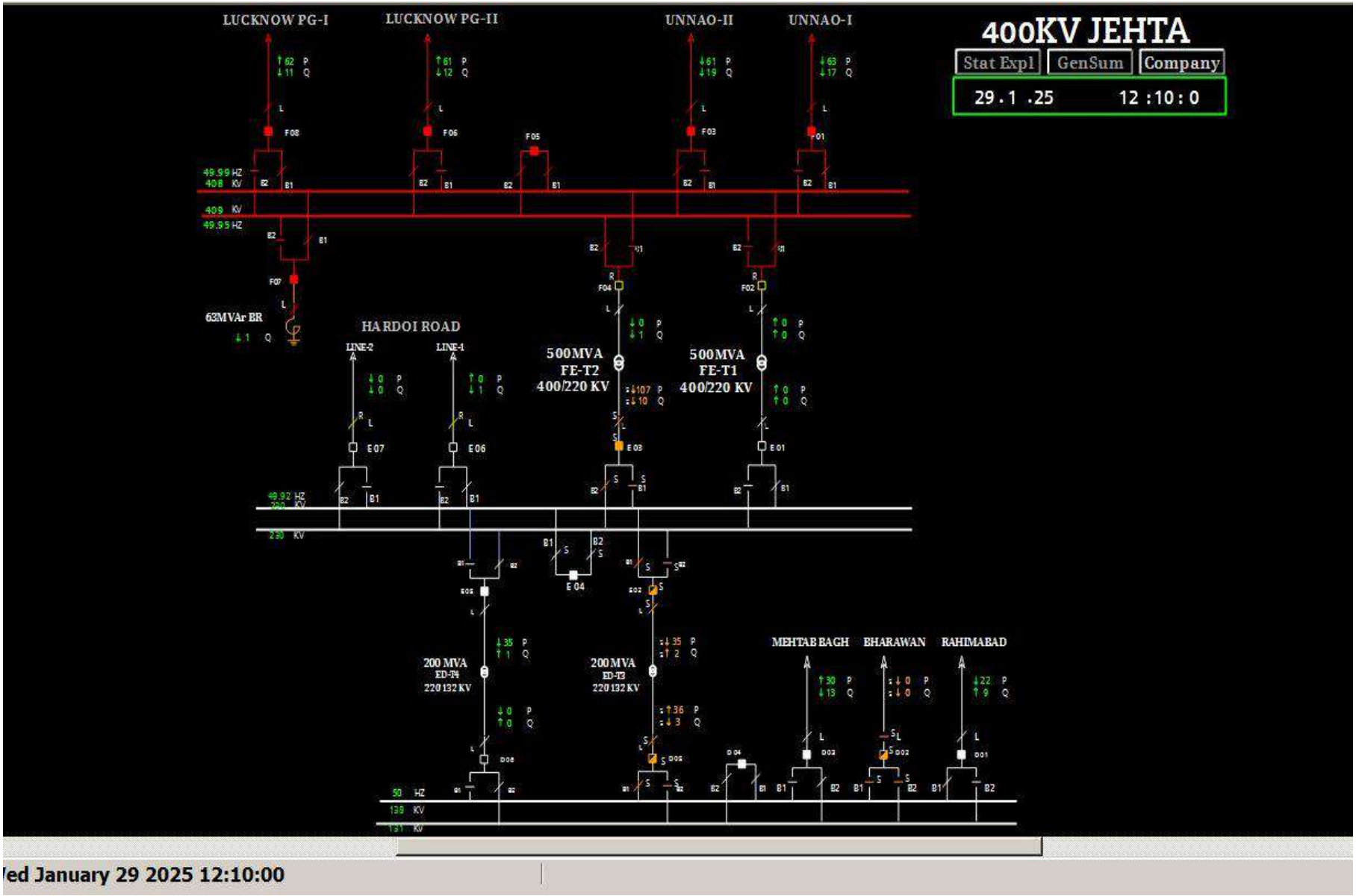
Network Diagram before the event



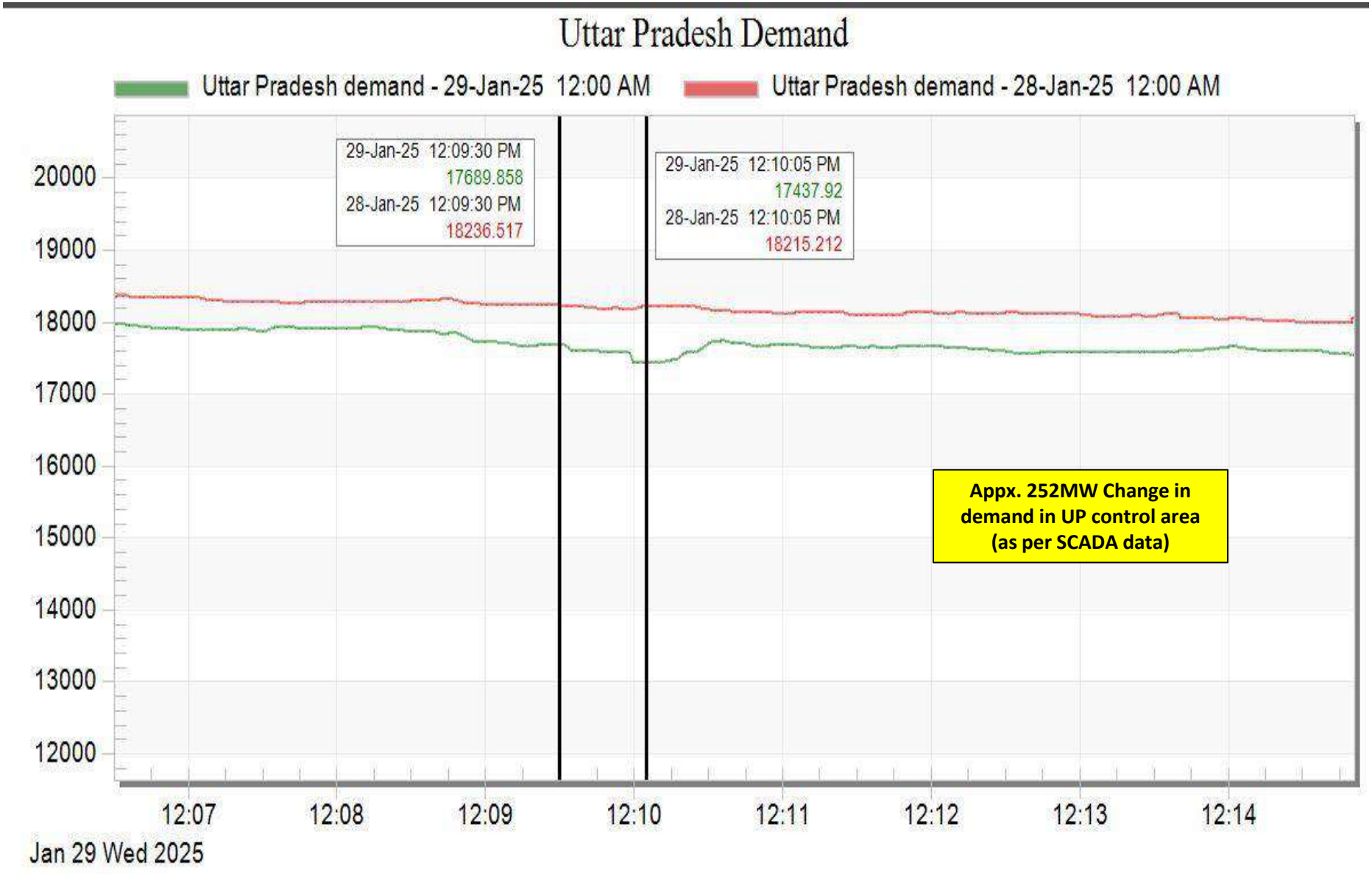
SLD of 400/220kV Jehta(UP) before the event



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

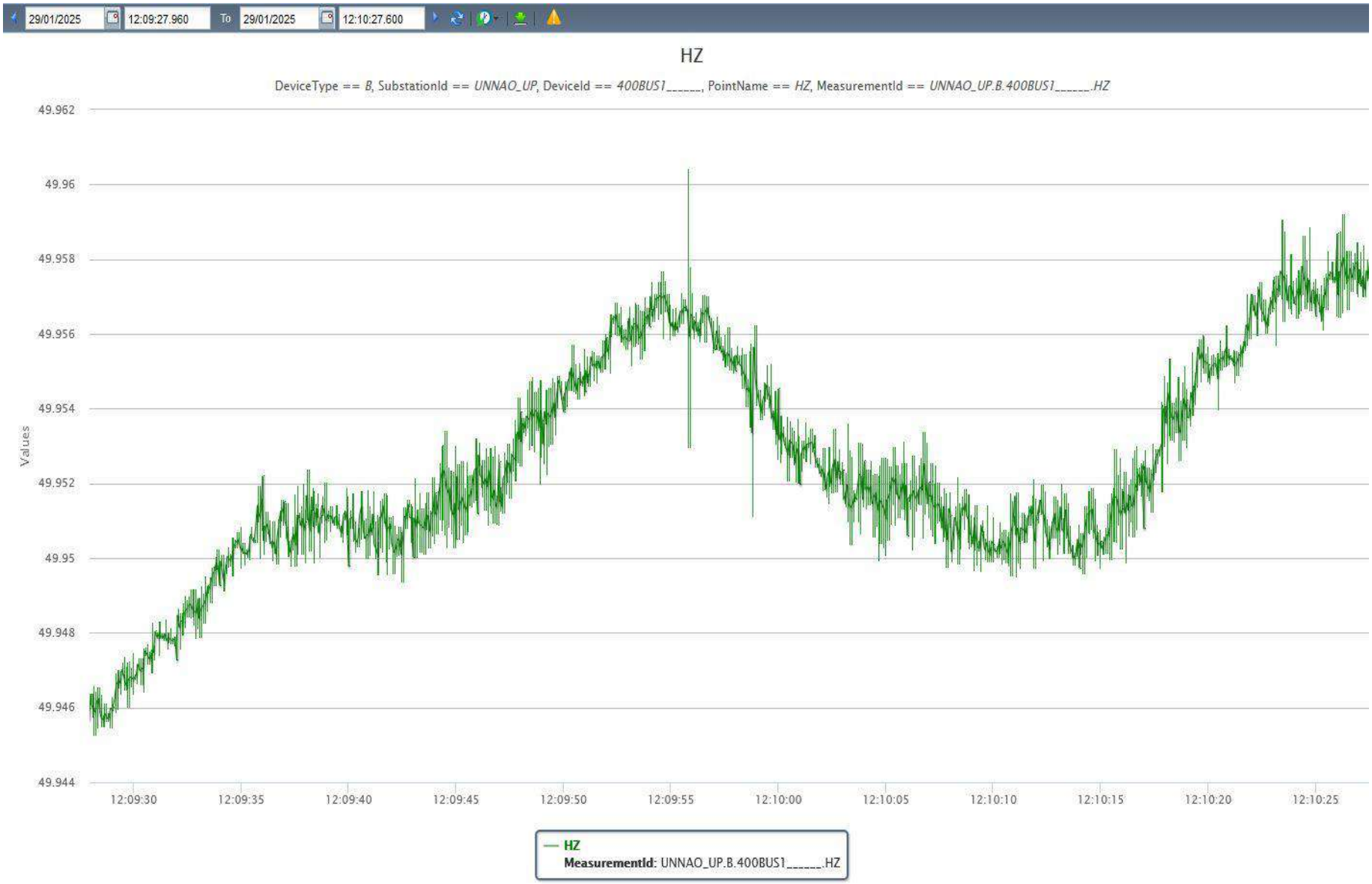


Uttar Pradesh demand during the event



PMU Plot of frequency at Unnao(UP)

12:09hrs/29-Jan-25

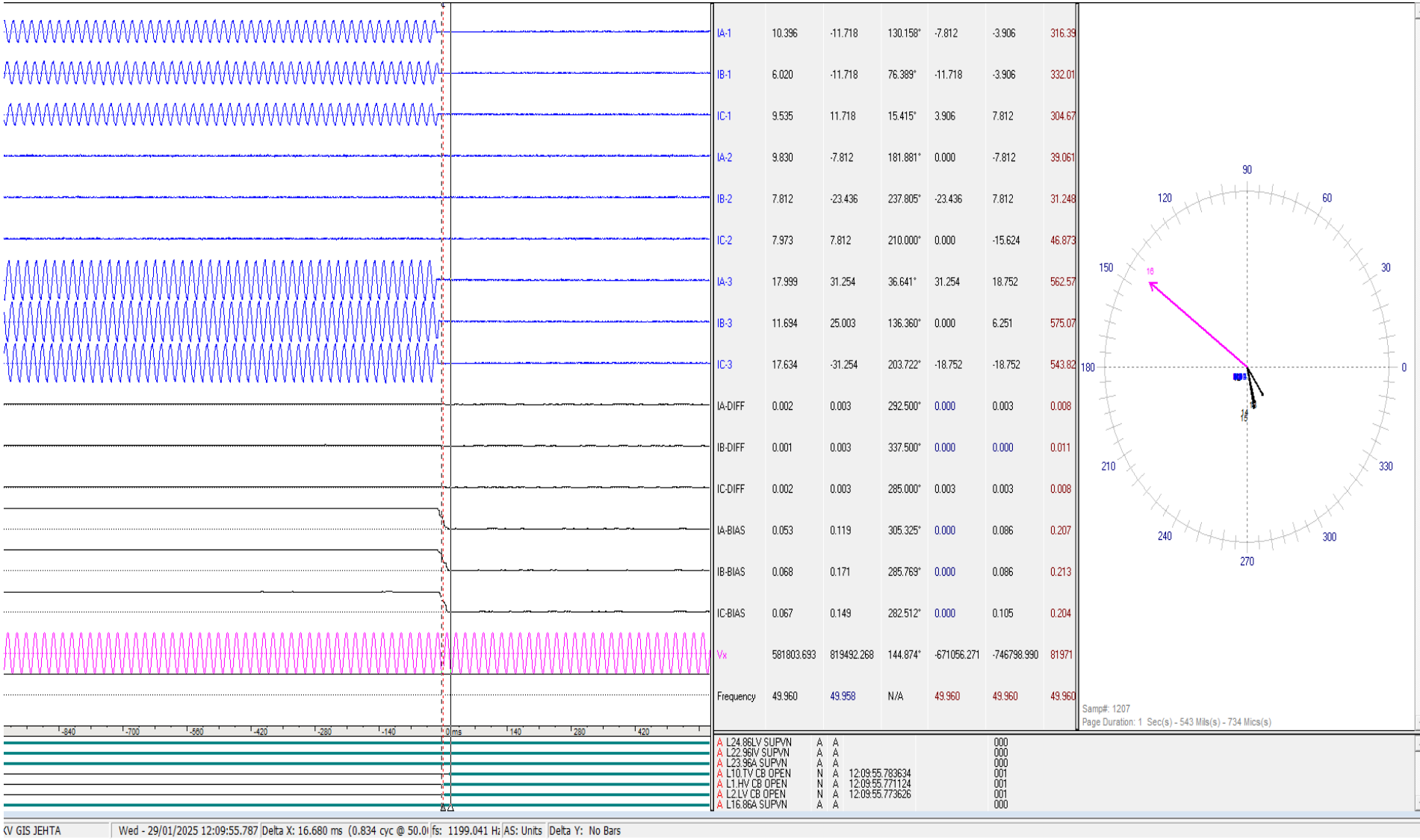


PMU Plot of phase voltage magnitude at Unnao(UP)

12:09hrs/29-Jan-25

- ✓ No fault was observed as per PMU

DR of 400-220 kV 500 MVA ICT 1 at Jehta(UP)

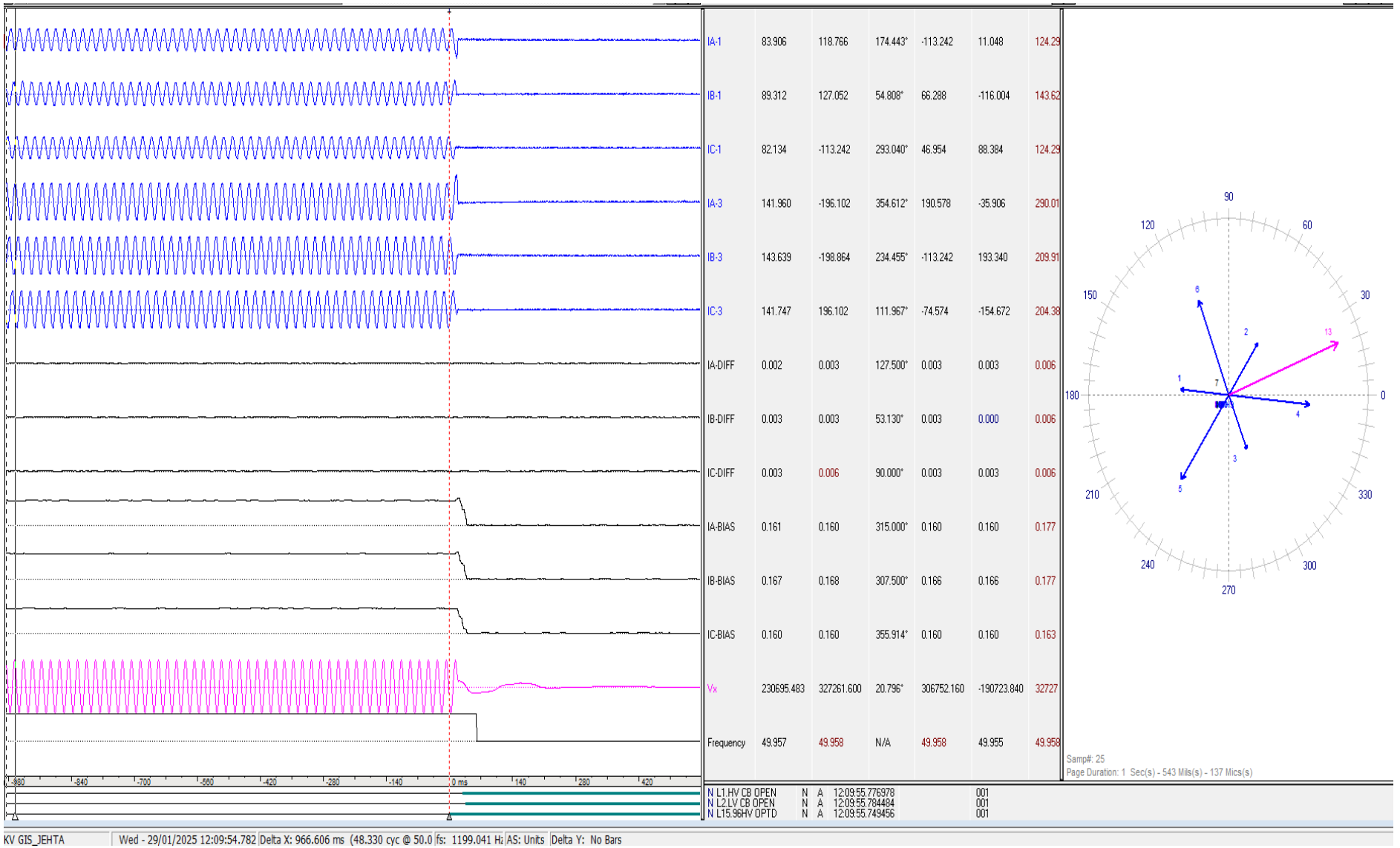


IA-1	10.396	-11.718	130.158°	-7.812	-3.906	316.39
IB-1	6.020	-11.718	76.389°	-11.718	-3.906	332.01
IC-1	9.535	11.718	15.415°	3.906	7.812	304.67
IA-2	9.830	-7.812	181.881°	0.000	-7.812	39.061
IB-2	7.812	-23.436	237.805°	-23.436	7.812	31.248
IC-2	7.973	7.812	210.000°	0.000	-15.624	46.873
IA-3	17.999	31.254	36.641°	31.254	18.752	562.57
IB-3	11.694	25.003	136.360°	0.000	6.251	575.07
IC-3	17.634	-31.254	203.722°	-18.752	-18.752	543.82
IA-DIFF	0.002	0.003	292.500°	0.000	0.003	0.008
IB-DIFF	0.001	0.003	337.500°	0.000	0.000	0.011
IC-DIFF	0.002	0.003	285.000°	0.003	0.003	0.008
IA-BIAS	0.053	0.119	305.325°	0.000	0.086	0.207
IB-BIAS	0.068	0.171	285.769°	0.000	0.086	0.213
IC-BIAS	0.067	0.149	282.512°	0.000	0.105	0.204
Vx	581803.693	819492.268	144.874°	-671056.271	-746798.990	81971
Frequency	49.960	49.958	N/A	49.960	49.960	49.960

A L24.86LV SUPVN	A	A			000
A L22.96IV SUPVN	A	A			000
A L23.96A SUPVN	A	A			000
A L10.TV CB OPEN	N	A	12:09:55.783634		001
A L1.HV CB OPEN	N	A	12:09:55.771124		001
A L2.LV CB OPEN	N	A	12:09:55.773626		001
A L16.86A SUPVN	A	A			000

- ✓ 96 relay operated

DR of 400-220 kV 500 MVA ICT 2 at Jehta(UP)



- ✓ 96 relay operated

SCADA SOE

Time	Station Name	Voltage	Element Name	Element Type	Element Status	Remarks
12:09:55,762	ZEHTA_UP	220kV	E_05(HATRS)	Circuit Breaker	Open	Tripping of main CB of 220/132KV ICT4 on 220KV side
12:09:55,764	ZEHTA_UP	220kV	E_09(AGRA2-1)	Circuit Breaker	Open	
12:09:55,772	ZEHTA_UP	132kV	D_52(T4)	Circuit Breaker	Open	
12:09:55,886	ZEHTA_UP	220kV	E_07(T1)	Circuit Breaker	Open	Tripping of main CB of 220kV Jehta-Hardoi road (UP) ckt-2
12:10:13,074	ZEHTA_UP	220kV	E_51(T3)	Circuit Breaker	Open	
12:10:33,000	ZEHTA_UP	220kV	E_02(T4)	Circuit Breaker	Open	Tripping of main CB of 220/132KV ICT3 on 220KV side
12:10:44,060	ZEHTA_UP	220kV	E_12(T2)	Circuit Breaker	Open	

Points for Discussion

i) Exact nature of protection operation and sequence of the 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.

400KV GIS JEHTA Sub-Station, UPPTCL

29.01.2025, 12:09

TRIPPING OF 500MVA ICT-1&2, 200MVA ICT-1&2, 220KV JEHTA-HARDOI ROAD CKT-1&2, JEHTA-MALLAWAN CKT-1&2, 220KV BUS COUPLER.

400KV GIS JEHTA : TRIPPING OF 500MVA ICT-1&2, 200MVA ICT-1&2, 220KV JEHTA-HARDOI ROAD CKT-1&2, JEHTA-MALLAWAN CKT-1&2, 220KV BUS COUPLER ON 29.01.2025

- **Date & Time of event**: 29.01.2025 at 12:09 hrs
- **Sub-Station affected**: 400KV JEHTA
- **Date & Time of restoration**:

  220KV JEHTA-HARDOI ROAD CKT-1&2 AT 12:58

  220KV JEHTA-MALLAWAN CKT-1&2 AT 12:58

  500MVA ICT-1 AT 13:02

  500MVA ICT-2 AT 13:00

  200MVA ICT-1 AT 13:44

  200MVA ICT-2 AT 13:15

Antecedent condition

- **WEATHER INFORMATION - CLEAR**
- **FREQUENCY - 49.95Hz**
- **LOAD**

  500MVA ICT-1 - 111MW

  500 MVA ICT-2 - 111 MW

  220 KV JEHTA-HARDOI ROAD CKT-1 - 54 MW

  220 KV JEHTA-HARDOI ROAD CKT-1 - 53 MW

  200 MVA ICT-1 - 35 MW

  200 MVA ICT-2 - 35 MW

  220 KV JEHTA- MALLAWAN CKT-1 - 43 MW

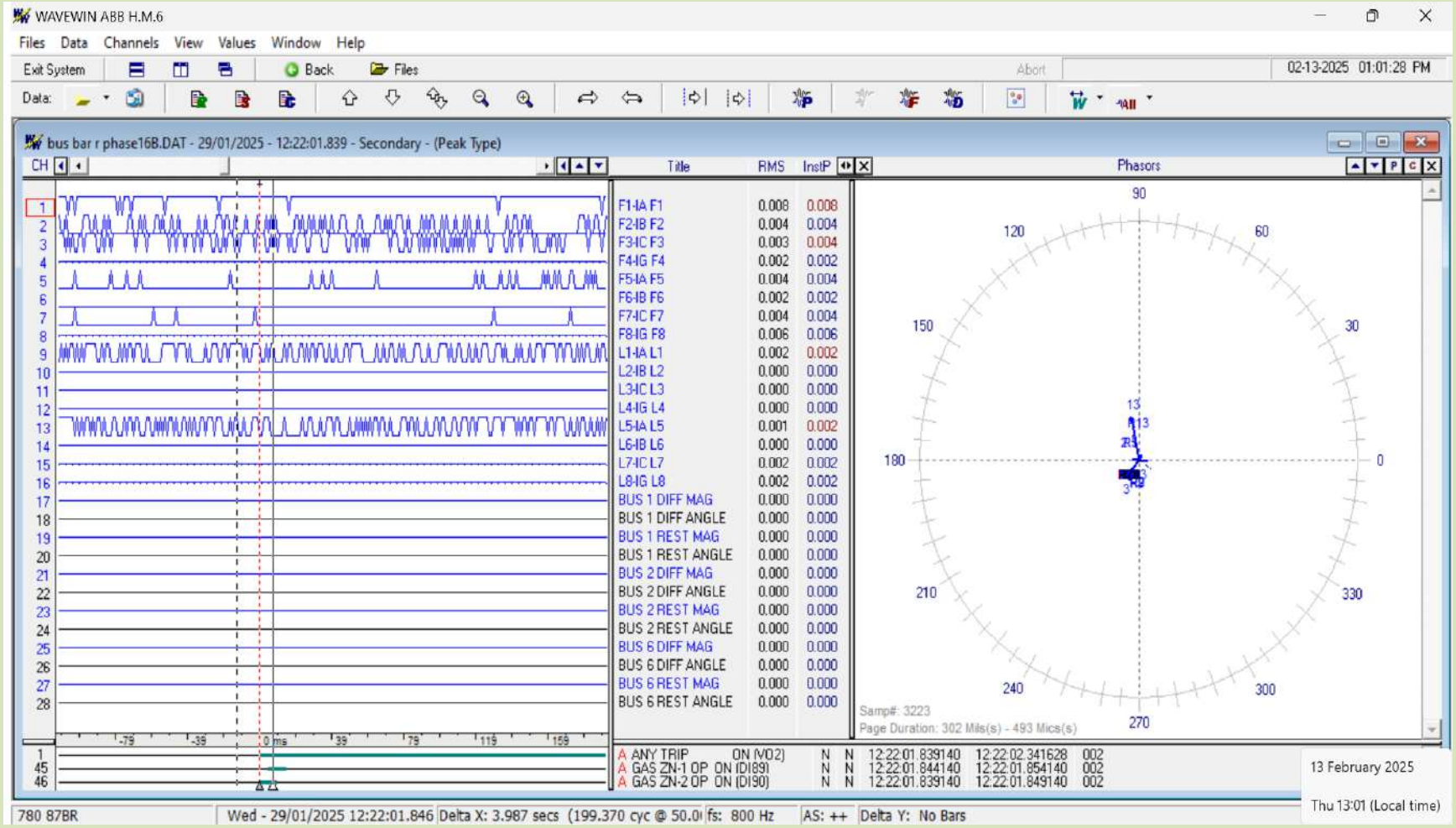
  220 KV JEHTA- MALLAWAN CKT-2 - 42 MW

DETAIL OF TRIPPING

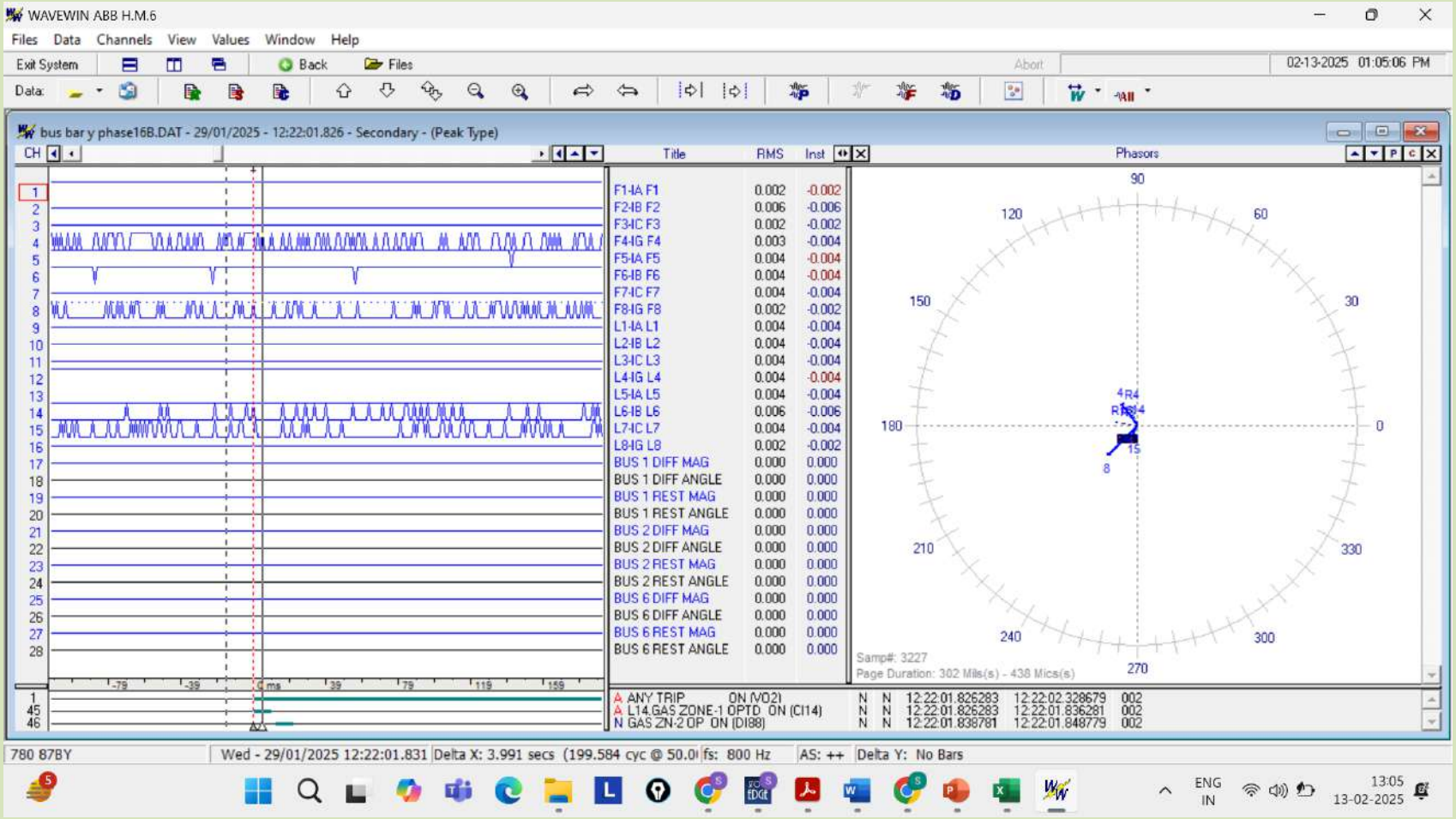
TRIPPING AT JEHTA FOR THE MONTH OF JANUARY 2025

SL. NO.	NAME OF SUB-STATION	AFFECTED ELEMENT	TRIPPING DATE/ TIME	CLOSING DATE/ TIME	FLAGS OBSERVED THIS END RELAY FLAGS	ANALYSIS
1	2	3	4	5	6	8
1	400KV JEHTA	500MVA ICT-1	29.01.2025 12:09	29.01.2025 13:02	96 OPTD	
2		500MVA ICT-2	29.01.2025 12:09	29.01.2025 13:00	96 OPTD	
3		200MVA ICT-1	29.01.2025 12:09	29.01.2025 13:44	96 OPTD	
4		200MVA ICT-2	29.01.2025 12:09	29.01.2025 13:15	96 OPTD	
5		220KV JEHTA-HARDOI ROAD CKT-1	29.01.2025 12:09	29.01.2025 12:58	96 OPTD	
6		220KV JEHTA-HARDOI ROAD CKT-2	29.01.2025 12:09	29.01.2025 12:58	96 OPTD	
7		220KV JEHTA-MALLAWAN CKT-1	29.01.2025 12:09	29.01.2025 13:09	96 OPTD	
8		220KV JEHTA- MALLAWAN CKT-2	29.01.2025 12:09	29.01.2025 13:09	96 OPTD	
9		220KV BUS COUPLER	29.01.2025 12:09		96 OPTD	

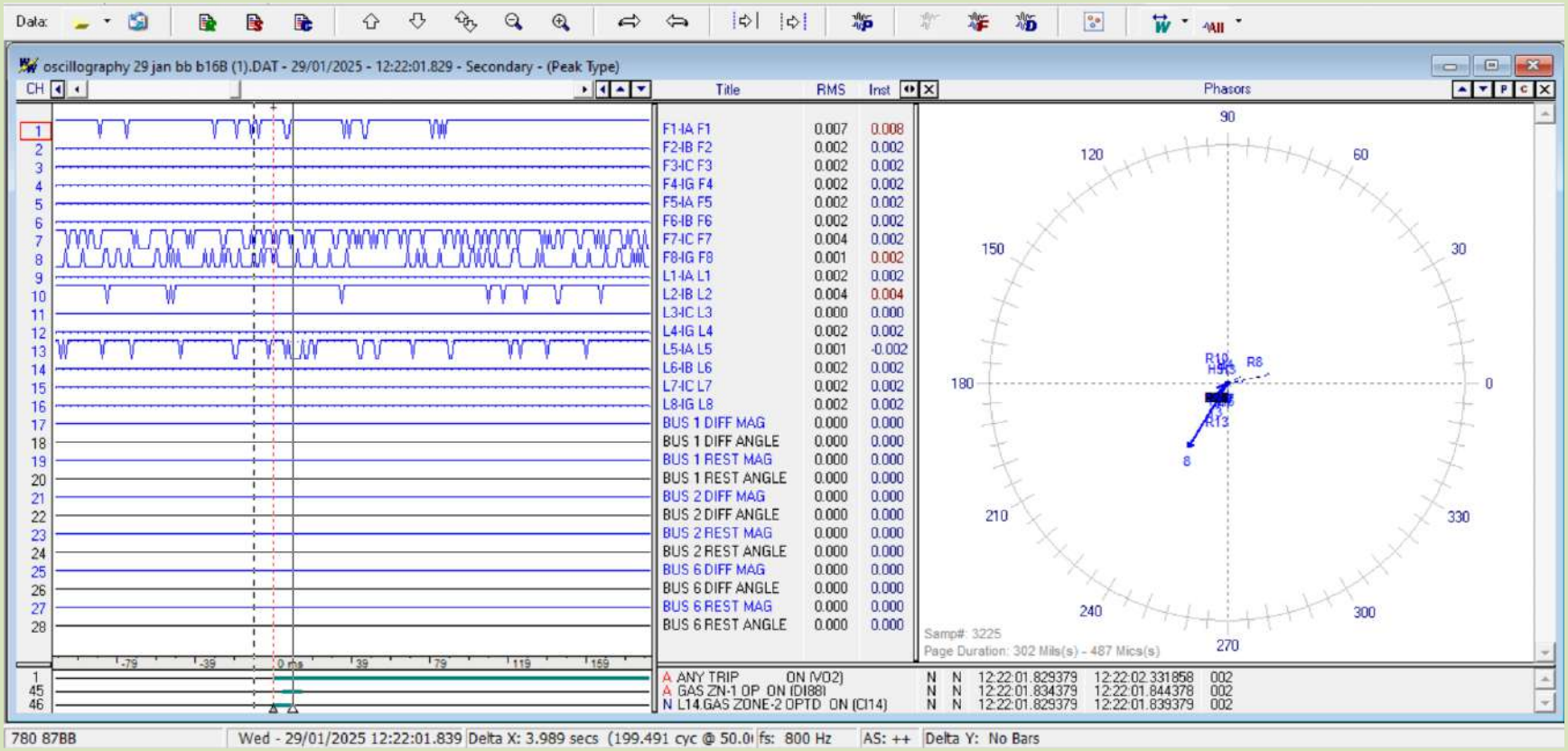
DR OF 220 KV BUS BAR R PHASE



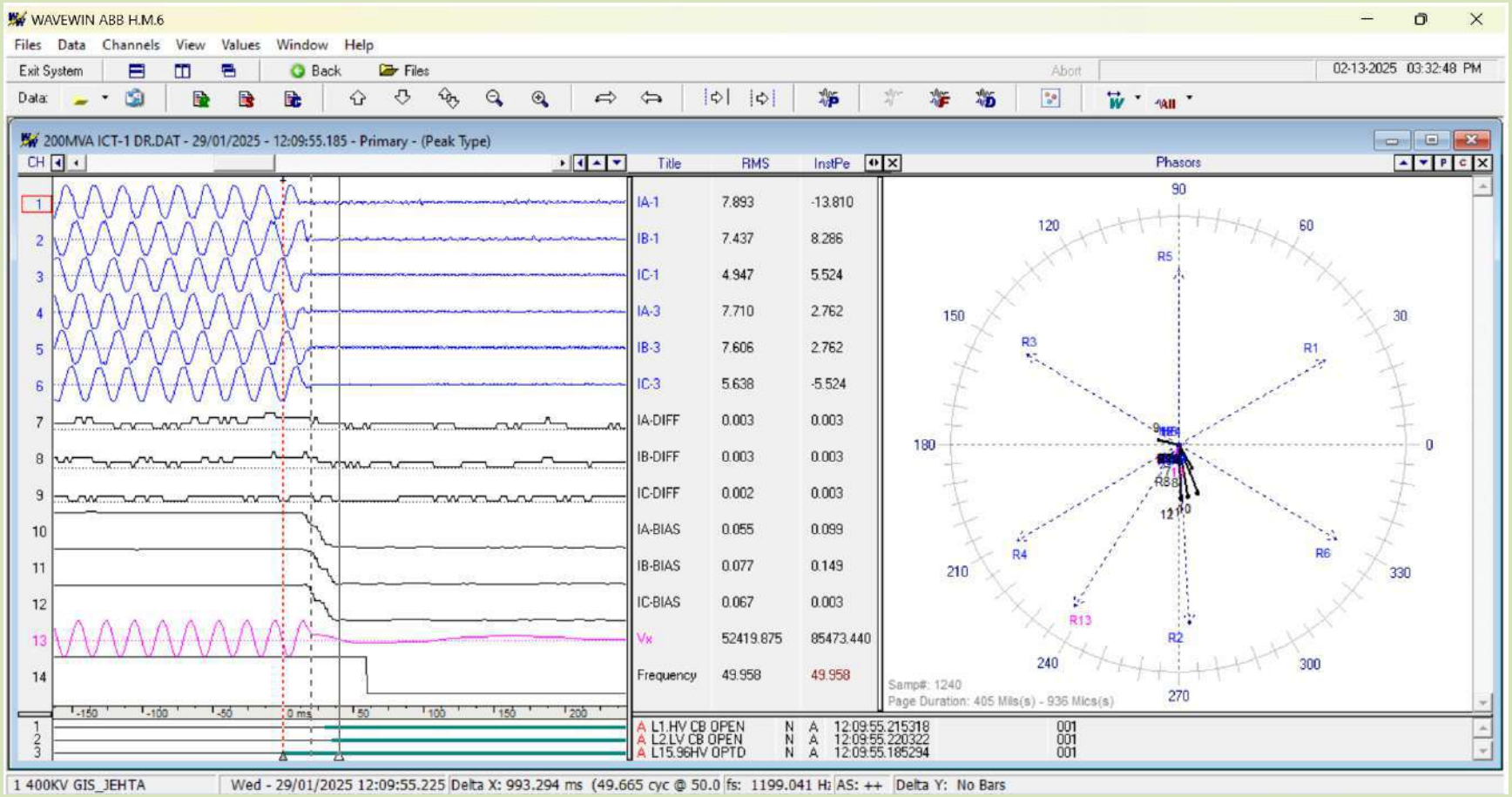
DR OF 220 KV BUS BAR Y PHASE



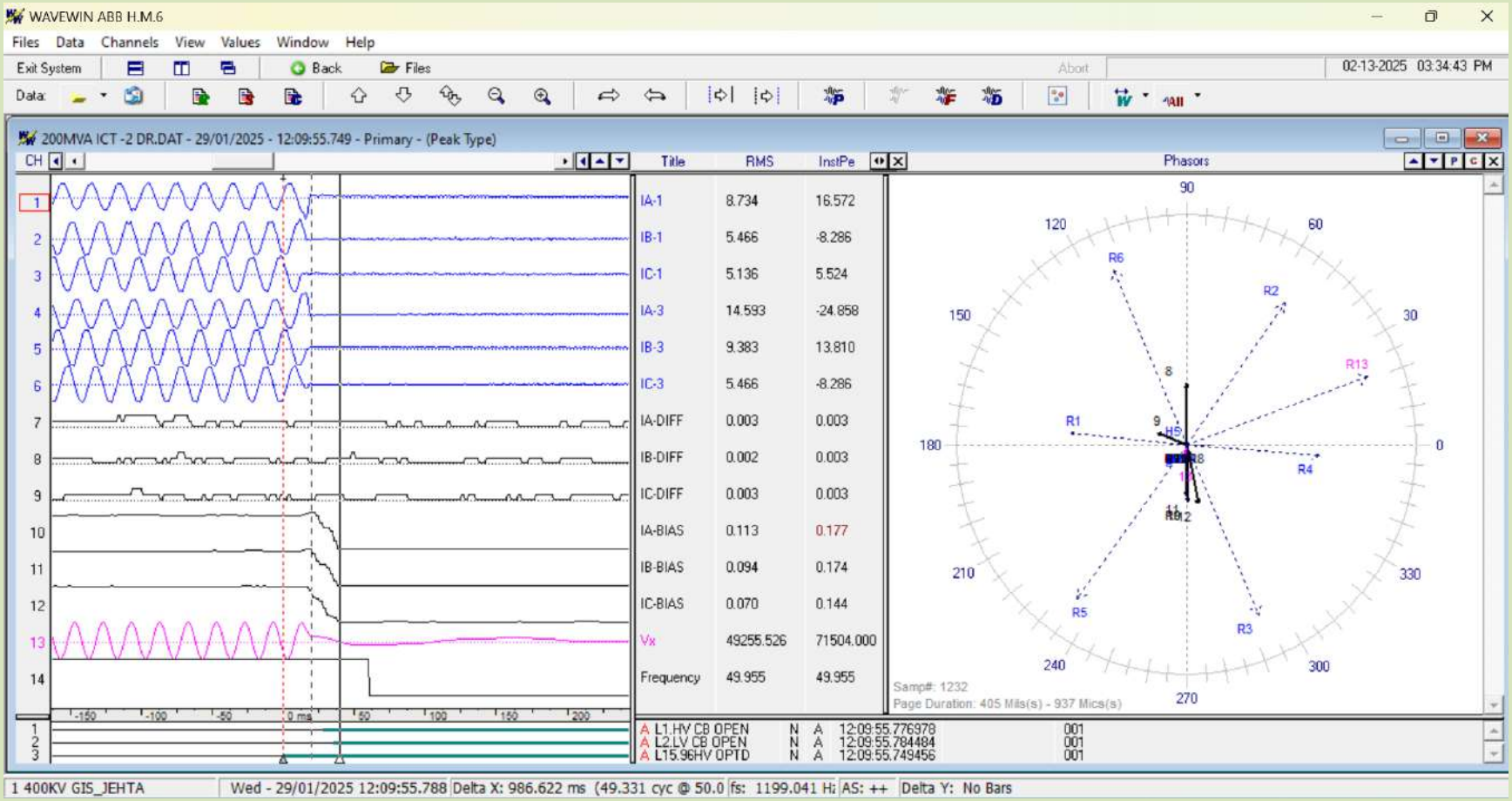
DR OF 220 KV BUS BAR B PHASE



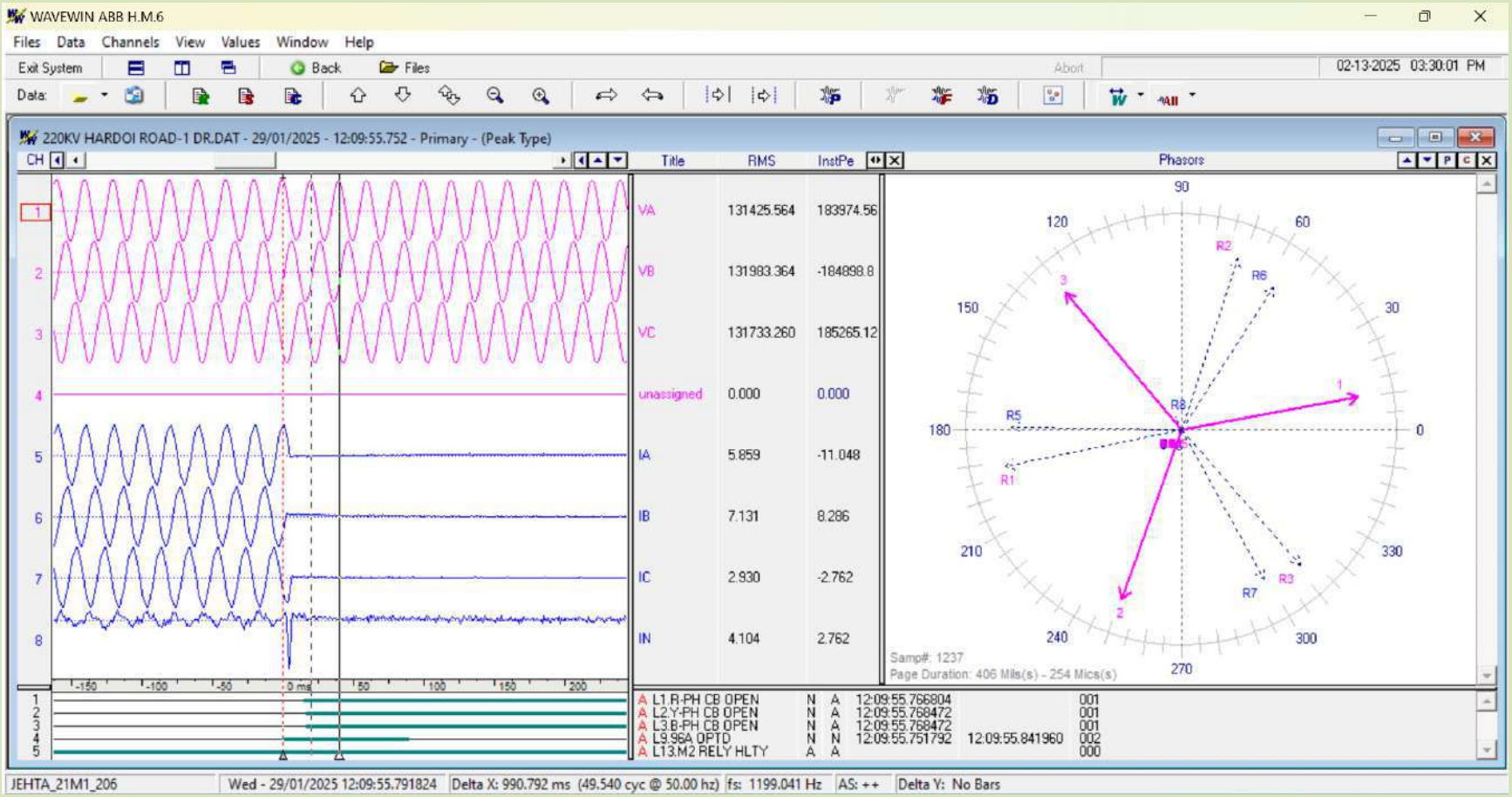
DR OF 200 MVA ICT-1



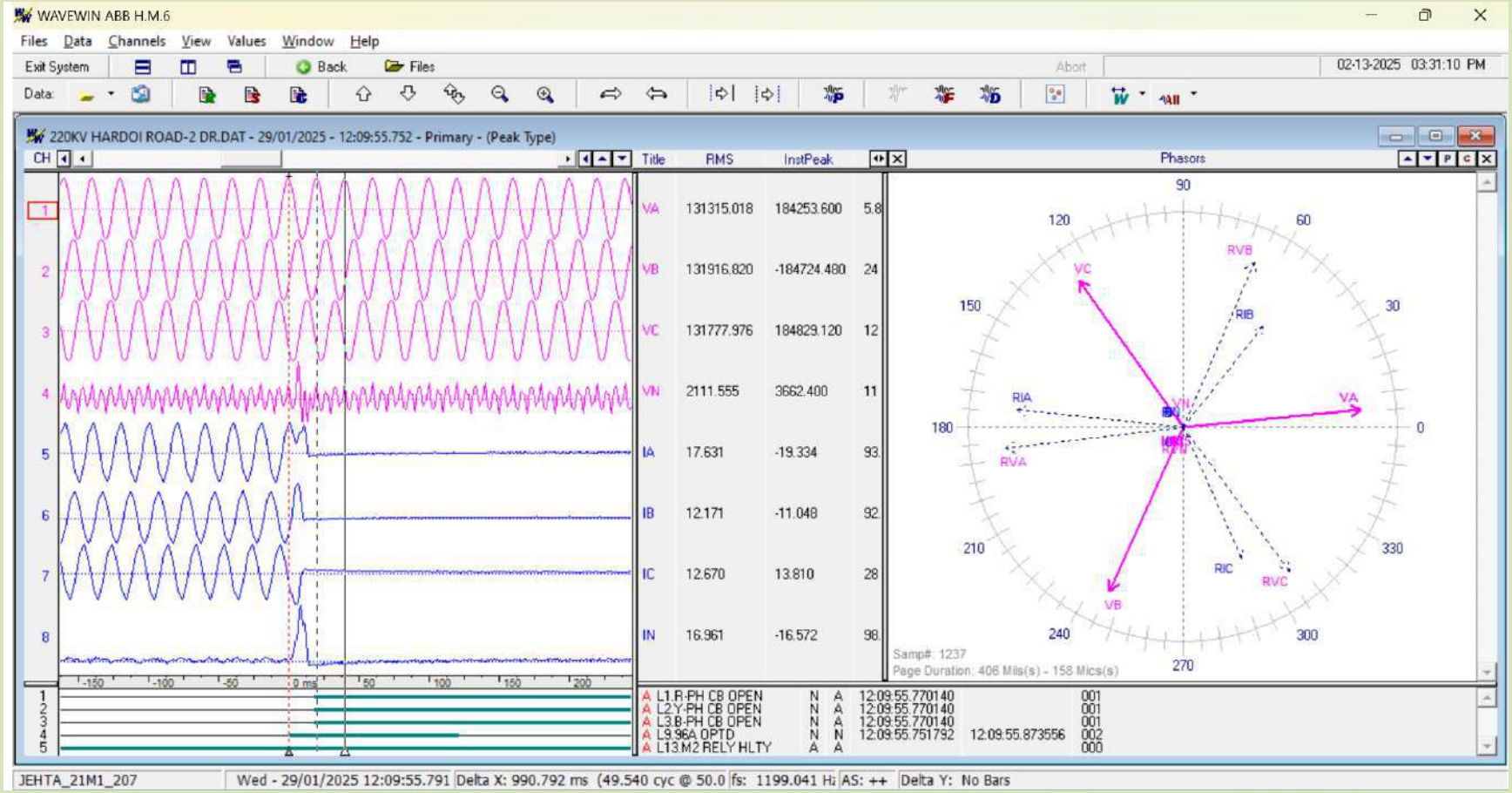
DR OF 200 MVA ICT-2



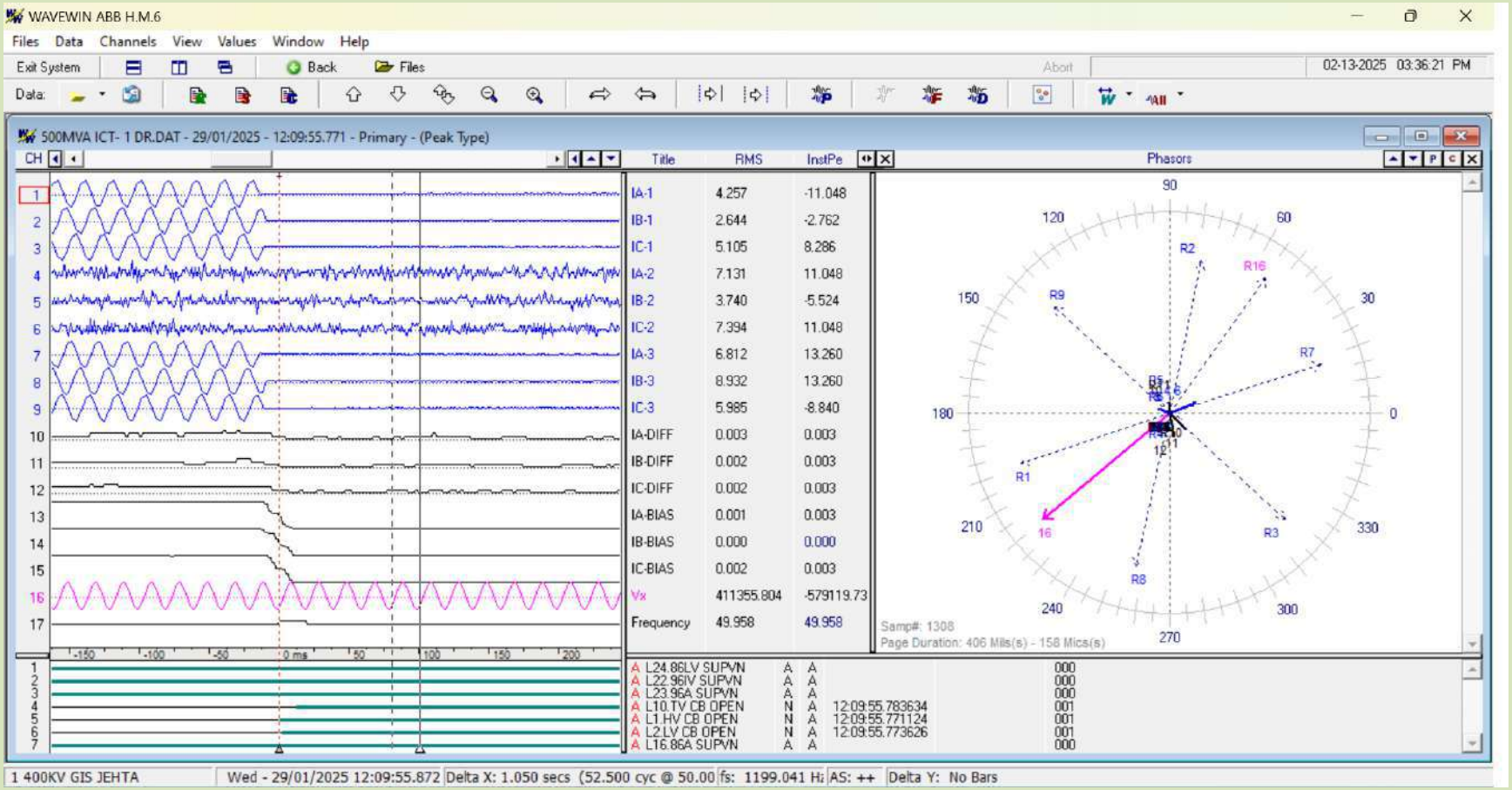
DR OF 220KV JEHTA-HARDOI ROAD -1



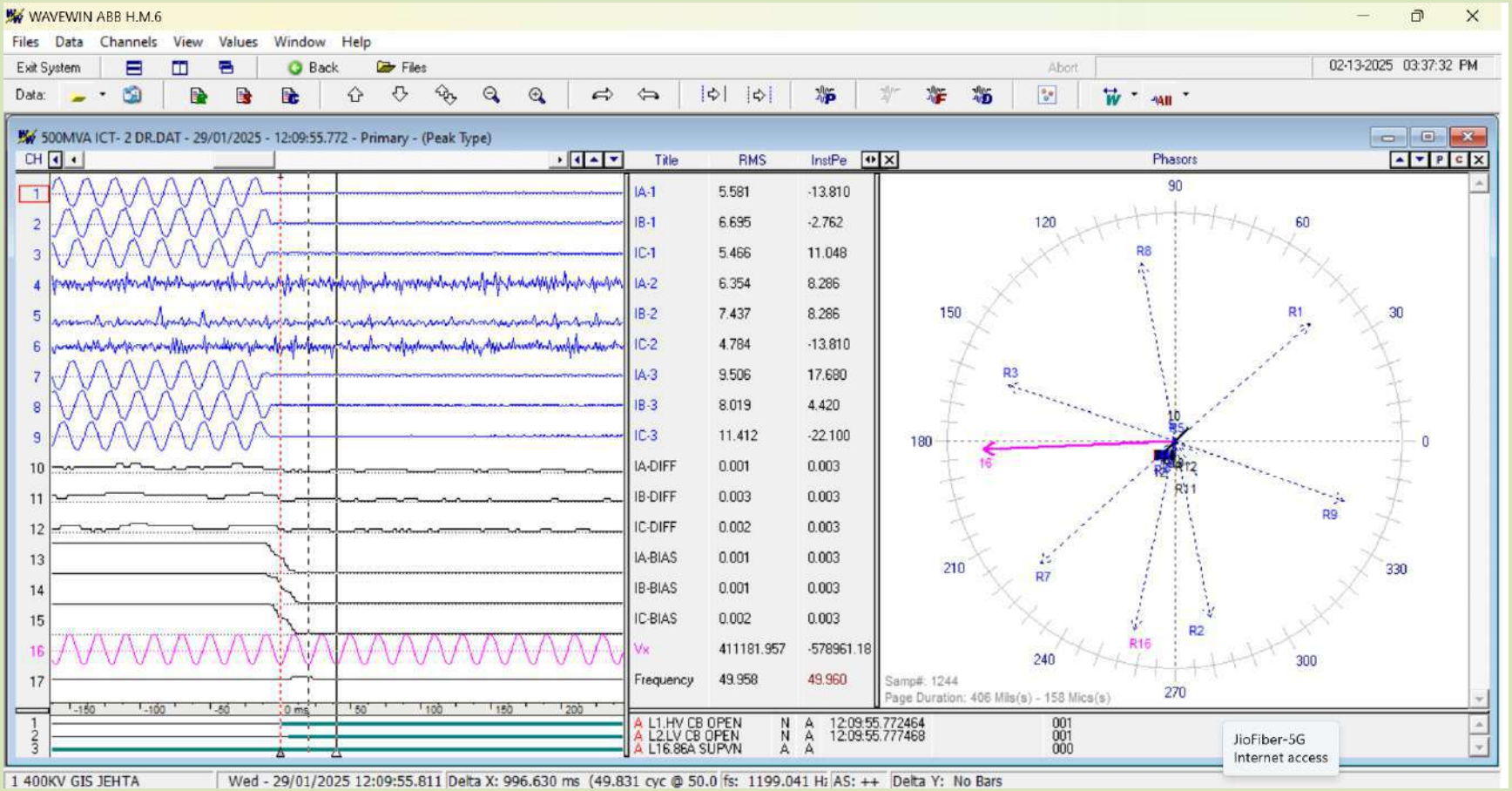
DR OF 220KV JEHTA-HARDOI ROAD -2



DR OF 500MVA ICT-1



DR OF 500MVA ICT-2



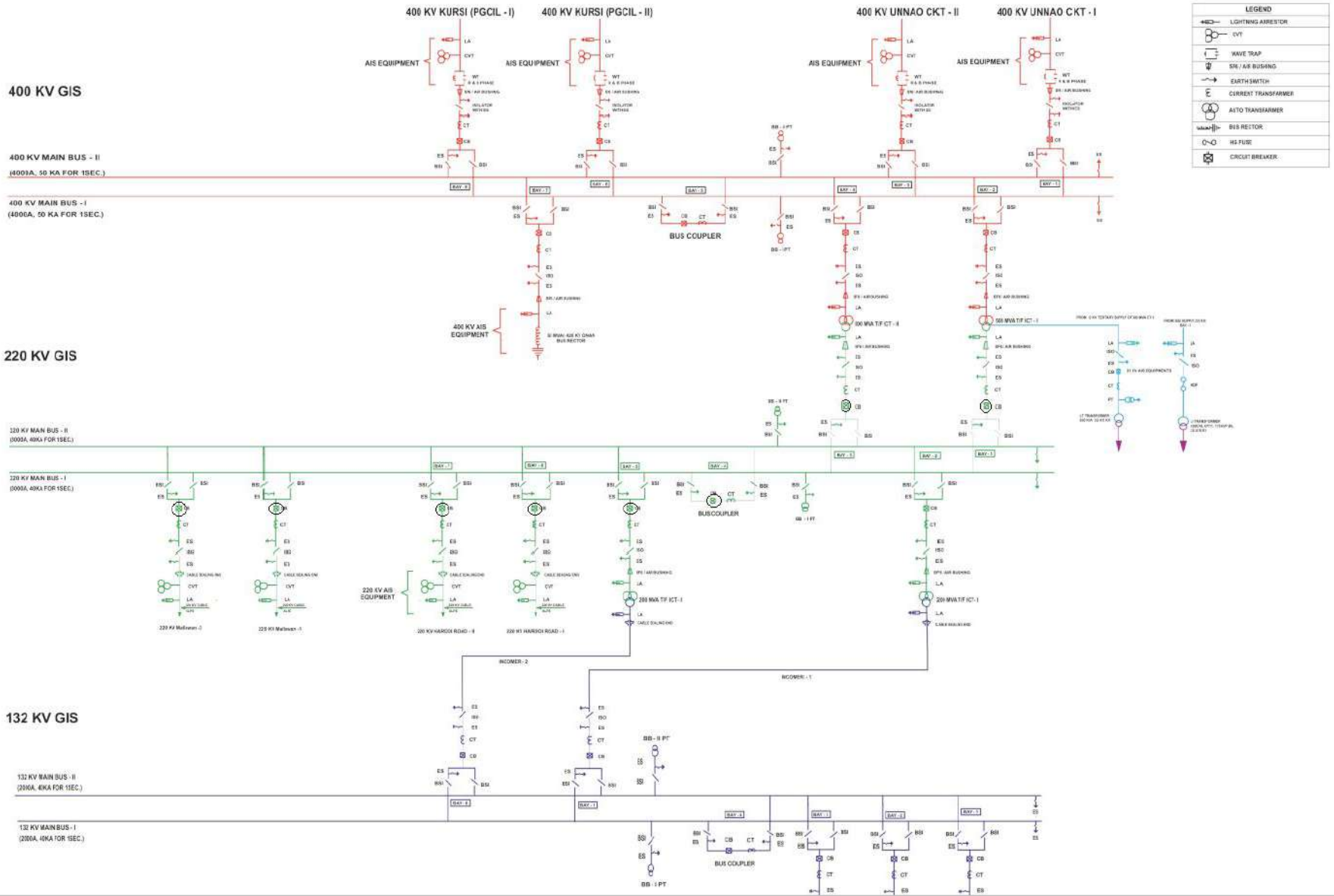
BUS BAR EVENTS

File Name: C:\Users\Public\Documents\GE Power Management\URPC\Data\Device Files\Quick Connect Device\20171101_
Date / Time of Last Clear: Wednesday, November 01, 2017 21:00:10 Events Since Last Clear: 4866417
Shown Number of Events: 1024

Event Number	Date/Time	Cause
4866331	Jan 29 2025 12:12:23.726882	RESET OP(PUSHBUTTON)
4866330	Jan 29 2025 12:09:56.231606	ANY TRIP Off (VO2)
4866329	Jan 29 2025 12:09:55.798754	BC OPN On (DI35)
4866328	Jan 29 2025 12:09:55.793836	BC ON Z2 Off (DI8)
4866327	Jan 29 2025 12:09:55.793836	BC ON Z1 Off (DI7)
4866326	Jan 29 2025 12:09:55.791253	FICT2 OPN On (DI45)
4866325	Jan 29 2025 12:09:55.788753	HAR2 OPN On (DI41)
4866324	Jan 29 2025 12:09:55.788753	2ICT2 OPN On (DI37)
4866323	Jan 29 2025 12:09:55.788753	5ICT2 OPN On (DI33)
4866322	Jan 29 2025 12:09:55.788753	2ICT1 OPN On (DI31)
4866321	Jan 29 2025 12:09:55.783836	5ICT1 OPN On (DI29)
4866320	Jan 29 2025 12:09:55.781255	FICT1 OPN On (DI43)
4866319	Jan 29 2025 12:09:55.781255	HAR1 OPN On (DI39)
4866318	Jan 29 2025 12:09:55.778748	2ICT2 ON Z2 Off (DI10)
4866317	Jan 29 2025 12:09:55.778748	5ICT2 ON Z2 Off (DI6)
4866316	Jan 29 2025 12:09:55.776250	MALLA2 ON Z2 Off (DI18)
4866315	Jan 29 2025 12:09:55.776250	HAR2 ON Z2 Off (DI14)
4866314	Jan 29 2025 12:09:55.776250	2ICT1 ON Z1 Off (DI3)
4866313	Jan 29 2025 12:09:55.773828	5ICT1 ON Z1 Off (DI1)
4866312	Jan 29 2025 12:09:55.771244	MALLA1 ON Z1 Off (DI15)
4866311	Jan 29 2025 12:09:55.771244	HAR1 ON Z1 Off (DI11)
4866310	Jan 29 2025 12:09:55.738720	FUT ICT1 TRIP Off (CO36)
4866309	Jan 29 2025 12:09:55.738720	HARDOI1 TRIP Off (CO34)
4866308	Jan 29 2025 12:09:55.738720	BC TRIP Off (CO32)
4866307	Jan 29 2025 12:09:55.738720	2ICT1 TRIP Off (CO30)
4866306	Jan 29 2025 12:09:55.738720	5ICT1 TRIP Off (CO29)
4866305	Jan 29 2025 12:09:55.738720	Z1 BB/LBB/GAS CHAMB Off (VO19)
4866304	Jan 29 2025 12:09:55.736215	GAS ZN-1 OP Off (DI88)
4866303	Jan 29 2025 12:09:55.736215	GAS ZN-2 OP Off (DO30)
4866302	Jan 29 2025 12:09:55.736215	HARDOI2 TRIP Off (CO35)
4866301	Jan 29 2025 12:09:55.736215	2ICT2 TRIP Off (CO33)
4866300	Jan 29 2025 12:09:55.736215	5ICT2 TRIP Off (CO31)
4866299	Jan 29 2025 12:09:55.736215	FUT ICT2 TRIP Off (CO2)
4866298	Jan 29 2025 12:09:55.736215	Z2 BB/LBB/GAS CHAMB Off (VO20)
4866297	Jan 29 2025 12:09:55.731211	FUT ICT1 TRIP Closed (CO36)
4866296	Jan 29 2025 12:09:55.731211	HARDOI1 TRIP Closed (CO34)
4866295	Jan 29 2025 12:09:55.731211	2ICT1 TRIP Closed (CO30)
4866294	Jan 29 2025 12:09:55.731211	5ICT1 TRIP Closed (CO29)
4866293	Jan 29 2025 12:09:55.731211	Z1 BB/LBB/GAS CHAMB On (VO19)
4866292	Jan 29 2025 12:09:55.728708	GAS ZN-1 OP On (DI88)
4866291	Jan 29 2025 12:09:55.728708	GAS ZN-2 OP On (DO30)
4866290	Jan 29 2025 12:09:55.728708	HARDOI2 TRIP Closed (CO35)
4866289	Jan 29 2025 12:09:55.728708	2ICT2 TRIP Closed (CO33)
4866288	Jan 29 2025 12:09:55.728708	BC TRIP Closed (CO32)
4866287	Jan 29 2025 12:09:55.728708	5ICT2 TRIP Closed (CO31)
4866286	Jan 29 2025 12:09:55.728708	FUT ICT2 TRIP Closed (CO2)
4866285	Jan 29 2025 12:09:55.728708	OSCILLOGRAPHY TRIG'D
4866284	Jan 29 2025 12:09:55.728708	Z2 BB/LBB/GAS CHAMB On (VO20)
4866283	Jan 29 2025 12:09:55.728708	ANY TRIP On (VO2)
4866282	Jan 29 2025 12:09:55.728363	L14.GAS ZONE-2 OPTD Off (CI14)
4866281	Jan 29 2025 12:09:55.720861	L14.GAS ZONE-2 OPTD On (CI14)

SLD

SINGLE LINE DIAGRAM OF 400/220/132 KV GIS SUB STATION - JEHTA



Events Description

- On 29.01.2025, morning, ‘DC Earth fault operated flag’ was observed on DCDB-1 and DCDB-2. Positive ground to earth was observed on measurement.
- At 12:09 hrs on the same date, during maintenance personnel was trying to trace out the DC problem using DC earth fault detector kit, 220KV Bus bar 1&2 tripped at 400/220/132KV GIS Jehta S/S due to a loose contact wire.
- DR and event record of all the elements were analysed and found that the tripping was due to false activation of binary input of Gas zone 1 optd and gas zone 2 optd.
- Gas pressure of all the elements were physically checked and it was found to be OK .
- A damaged wire was found in bay 2 i.e. 200 MVA ICT-1(HV Side) circuit breaker, which was then attended to and the DC problem was resolved.

Remedial Measures Taken

- Damaged wire was attended to and the DC problem was resolved.

Thank you

Annexure-B.V

S. No.	Name of Transmission Element Tripped	Owner/ Utility	Outage		Load Loss/ Gen. Loss	Brief Reason (As reported)	Category as per CEA Grid standards	# Fault Clearance Time (>100 ms for 400 kV and 160 ms for 220 kV)	*FIR Furnished (YES/NO)	DR/EL provided in 24 hrs (YES/NO)	Other Protection Issues and Non Compliance (inference from PMU, utility details)	Suggestive measures	Remarks
			Date	Time									
1	220 KV Auraiya(NT)-Malanpur(MP) (PG) Ckt-1	POWERGRID	03-Jan-25	05:55	Nil	Phase to earth fault R-N	NA	80 msec	NO	NO	NA	DR/EL needs to be shared	As per PMU (Unnao UP). B-N phase to earth fault occurred.
2	132 KV Rihand(UP)-Garwa(JS) (UP) Ckt-1	UPPTCL	05-Jan-25	00:09	Nil	Phase to earth fault Y-N	NA	NA	Yes (After 24 hours)	YES	NA		As per PMU (Unchahar NTPC), voltage dip is observed in all three phases. As per DR (Rihand UP), Y-N phase to earth fault occurred. Fault distance was 43.7 km (42.8%) from Rihand (UP) end.
3	400 KV Allahabad-Sasaram (PG) Ckt-1	POWERGRID	07-Jan-25	00:32	Nil	Phase to earth fault B-N	NA	80 msec	Yes (After 24 hours)	NO	NA	DR/EL needs to be shared	As per PMU (Allahabad PG), B-N phase to earth fault followed by B-N phase to earth fault within reclaim time occurred. As reported, B-ph porcelain insulator de-capped at Loc.no-530 & B-ph cross Arm bend at Loc.No.-531.
4	800 KV HVDC Kurukshetra(PG) Pole-1	POWERGRID	09-Jan-25	19:36	Nil	Pole-1 blocked due to CIB card failure at Kurukshetra.	NA	NA	Yes (After 24 hours)	Yes (After 24 hours)	NA		As per PMU (Kurukshetra PG), fluctuation in voltage is observed. As reported, Pole-1 blocked on Converter differential protection Operated due to maloperation of DCCT sensor (Idc) at Kurukshetra end .
5	400 KV Gorakhpur(PG)-Motihari(BS) (PG) Ckt-2	POWERGRID	21-Jan-25	00:40	Nil	Phase to earth fault Y-N	NA	80 msec	Yes	NO	NA	DR/EL needs to be shared	As per PMU (Kanpur PG). Y-N phase to earth fault with unsuccessful A/R occurred

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

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

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

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

Reporting of Violation of Regulation for various issues for above tripping

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

Sr. No.	Scheme Name	Responsible agency for conducting Mock Test exercise	Date of review of SPS	Last date on which Mock testing carried out	Tentaitve schedule of SPS Mock testing during 2024-25	Remarks
1	SPS for WR-NR corridor - 765kV Agra-Gwalior D/C	POWERGRID/NRLDC		12-03-2024		
2	SPS for contingency due to tripping of HVDC Mundra-Mahendergarh	ADANI/NRLDC				
3	SPS for high capacity 400 kV Muzaffarpur-Gorakhpur D/C Inter-regional tie-line related contingency	POWERGRID/NRLDC				
4	SPS for 1500 MW HVDC Rihand-Dadri Bipole related contingency	POWERGRID/NRLDC				
5	System Protection Scheme (SPS) for HVDC Balia-Bhiwadi Bipole	POWERGRID/NRLDC				
6	SPS for contingency due to tripping of multiple lines at Dadri(NTPC)	NTPC				
7	SPS for reliable evacuation of power from NJPS, Rampur, Sawra Kuddu, Baspa, Sorang, Naitwar Mori and Karcham Wangtoo HEP	SJVN/HPPTCL/JSW/NRLDC			counducted on 19-12-2024	
8	SPS for Reliable Evacuation of Ropar Generation	Punjab				
9	SPS for Reliable Evacuation of Rosa Generation	Uttar Pradesh		07-05-2022	counducted on 20-04-2024	
10	SPS for contingency due to tripping of evacuating lines from Narora Atomic Power Station	NAPS				
11	SPS for evacuation of Kawai TPS, Kalisindh TPS generation complex	Rajasthan				
12	SPS for evacuation of Anpara Generation Complex	Uttar Pradesh		06-07-2020		
13	SPS for evacuation of Lalitpur TPS Generation	Uttar Pradesh		14-07-2018	counducted on 21.05.2024	
14	SPS for Reliable Evacuation of Bara TPS Generation	Uttar Pradesh				
15	SPS for Lahal Generation	Himachal Pradesh		08-07-2020		
16	SPS for Transformers at Ballabhgarh (PG) substation	POWERGRID				
17	SPS for Transformers at Maharanibagh (PG) substation	POWERGRID				
18	SPS for Transformers at Mandola (PG) substation	POWERGRID				
19	SPS for Transformers at Bamnauli (DTL) Substation	Delhi				
20	SPS for Transformers at Moradabad (UPPTCL) Substation	Uttar Pradesh			counducted on 20-04-2024	
21	SPS for Transformers at Muradnagar (UPPTCL) Substation	Uttar Pradesh		07-02-2023	counducted on 20-04-2024	
22	SPS for Transformers at Muzaffarnagar(UPPTCL) Substation	Uttar Pradesh			counducted on 20-04-2024	
23	SPS for Transformers at Greater Noida(UPPTCL) Substation	Uttar Pradesh			SPS Unhealthy	
24	SPS for Transformers at Agra (UPPTCL) Substation	Uttar Pradesh		12-07-2023		
25	SPS for Transformers at 400kV Sarojininagar (UPPTCL) Substation	Uttar Pradesh		17-05-2023		
26	SPS for Transformers at 220kV Sarojininagar (UPPTCL) Substation	Uttar Pradesh		18-05-2022		
27	SPS for Transformers at 400kV Unnao (UPPTCL) Substation	Uttar Pradesh		19-05-2023	SPS Unhealthy	
28	SPS for Transformers at 220kV Unnao (UPPTCL) Substation	Uttar Pradesh				
29	SPS for Transformers at 400kV Sultanpur (UPPTCL) Substation	Uttar Pradesh			SPS Unhealthy	
30	SPS for Transformers at 400kV Bareilly (UPPTCL) Substation	Uttar Pradesh				
31	SPS for Transformers at 400kV Azamgarh (UPPTCL) Substation	Uttar Pradesh		14-05-2023	counducted on 06-05-2024	
32	SPS for Transformers at 400kV Mau (UPPTCL) Substation	Uttar Pradesh		17-01-2019	counducted on 27-04-2024	
33	SPS for Transformers at 400kV Gorakhpur (UPPTCL) Substation	Uttar Pradesh		14-05-2023	counducted on 27-04-2024	
34	SPS for Transformers at 400kV Sarnath (UPPTCL) Substation	Uttar Pradesh		19-05-2023	counducted on 23-05-2024	
35	SPS for Transformer at 400kV Rajpura (PSTCL) Substation	Punjab				
36	SPS for Transformers at 400kV Mundka (DTL) Substation	Delhi		19-06-2023		
37	SPS for Transformers at 400kV Deepalpur (JKTPL) Substation	Haryana				
38	SPS for Transformers at 400kV Ajmer (RVPN) Substation	Rajasthan			Condcuted on 10.09.2024	
39	SPS for Transformers at 400kV Merta (RVPN) Substation	Rajasthan			Condcuted on 12.09.2024	
40	SPS for Transformers at 400kV Chittorgarh (RVPN) Substation	Rajasthan			Condcuted on 31.08.2024 & 05.09.2024	
41	SPS for Transformers at 400kV Jodhpur (RVPN) Substation	Rajasthan			Condcuted on 24.09.2024	
42	SPS for Transformers at 400kV Bhadla (RVPN) Substation	Rajasthan			Condcuted on 27.09.2024	
43	SPS for Transformers at 400kV Ratangarh (RVPN) Substation	Rajasthan			Condcuted on 20.09.2024	
44	SPS for Transformers at 400kV Nehtaur(UPPTCL) Substation	Uttar Pradesh		05-07-2022		
45	SPS for Transformers at Obra TPS	Uttar Pradesh			counducted on 20-05-2024	
46	SPS for Transformers at 400KV Kashipur (PTCUL) substation	Uttarakhand		03-09-2023	Septemeber 2024	
47	SPS for Transformers at 400KV Fatehgarh Solar Park (AREPRL)	ADANI				
48	SPS to relive transmission congestion in RE complex (Bhadla2)	POWERGRID				
49	SPS for Transformers at 400kV Bikaner (RVPN) Substation	Rajasthan			Condcuted on 26.09.2024	
50	SPS for Transformers at 400kV Bawana (DTL) Substation	Delhi		06-09-2023		
51	SPS for Transformers at 400kV Bhilwara (RVPN) Substation	Rajasthan			Condcuted on 09.07.2024 & 10.07.2024	
52	SPS for Transformers at 400kV Hinduan (RVPN) Substation	Rajasthan			Condcuted on 26.09.2024	
53	SPS for Transformers at 400kV Suratgarh (RVPN) Substation	Rajasthan				During frequent actual operation of SPS scheme. All alarm & tripping status found OK

Annexure-B.VII

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

Deepak Kumar

Tue 04-Feb-25 17:04

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

1 attachments (23 KB)

Revised Schedule for Site Visit.xlsx;

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

Dear Sirs,

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

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

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

Thank you.

Regards,

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

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

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

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

Thu 8/29/2024 7:29 PM

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

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

5 attachments (9 MB)

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

Dear Sir,

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

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

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

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

15	Dhanonda	ON	-	OFF

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

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

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

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

Thanks and Regards,

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

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

Sir,

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

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

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

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

Subject- Regarding SPS of HVDC Mundra-Mahendargarh line

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

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

Sangeet

(Sangeeta)
Superintending Engineer (R&A)

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

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

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

(Sangeeta)
Superintending Engineer (R&A)

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

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

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

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

Subject: - Regarding SPS of HVDC Mundra-Mahendargarh.

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

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

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

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

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

(A) In Maximum Load Condition:-

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

(B) In Average Load Condition :-

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

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

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

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

(A). In Maximum Load Condition :-

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

(B). In Average Load Condition :-

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

Submitted for information and necessary action

(Nikhil Kumar)
Superintending Engineer

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

Copy forwarded to the following for information and necessary action :

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

(Nikhil Kumar)
Superintending Engineer

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

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

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

Sub :- SPS related to HVDC Mundra-Mahendargarh.

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

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

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

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

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

(Pramod Kumar Mishra)
Superintending Engineer

No. 82 /ETCC-MT/ Dated/– 30/05/24

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

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

(Pramod Kumar Mishra)
Superintending Engineer

SK/SENew/NewEngLetter01

Rajasthan Details

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

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

Email **Control Room CONTROL ROOM SLDC**

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

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

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

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

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

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

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

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

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

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

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

Regards
XEN/TS Division
HVPNL Rewari.

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

Sir,

Please see the attachments.

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

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

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

Fri 8/30/2024 12:44 PM

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

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

2 attachments (209 KB)

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

Sir,

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

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

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

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

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

This is for information & further necessary action please.

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

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

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

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

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

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

Regards
XEN/TS Division
HVPNL Rewari.

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

Sir,

Please see the attachments.

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

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

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HARYANA VIDYUT PRASARAN NIGAM LIMITED

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

To

The Executive Engineer,
LDPC, HVPNL,
Panipat.

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

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

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

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

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

This is for kind information and necessary action please.

Executive Engineer,
Transmission System Division,
HVPNL, Bhiwani

CC to:

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

Delhi Details

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

SLDC, DELHI <sldcmintoroad@gmail.com>

Wed 8/28/2024 3:48 PM

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

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

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

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

Regards,
SLDC Delhi

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

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

Punjab Details

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

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

Nodal officers details

Control Area	Station Name	Nodal Person (SPS, communication system)	Contact details	Email Id
Rajasthan	220/132kV Alwar	Sh. Vijaypal Yadav XEN (Prot.) Ms. Pooja Verma AEN (Comm)	9413361407 9413375366	xen.prot.alwar@rvpn.co.in aen.comm.alwar@rvpn.co.in
	220/132kV Ratangarh	Sh. Mukesh Somra AEN (MPT&S) , Sh. Dharmender Singh (Comm.)	9414061442 9413383246	aen.mpt&s.rtg@rvpn.co.in aen.comm.ratangarh@rvpn.co.in
	220/132kV Bhilwara	Sh. Madhusudan Sharma, AEN (SLDC-comm Sh. Suresh Garg, XEN (MPT&S)	9413383176 9414061424	aen.subsldc.bhl@rvpn.co.in xen.mpts.bhl@rvpn.co.in
	220/132kV Merta	Mukesh Kumar (AEN Prot.) Mahip Singh (Aen) Comm)	7734806466 9413362995	aen.prot.mertacity@RVPN.CO.IN aen.comm.merta@RVPN.CO.IN
BBMB	400/220kV Bhiwani(BBMB)			
POWERGRID	400/220kV Hissar(PG)			
	Bhiwani(PG)			
	400/220kV Bahadurgarh(PG)			
Haryana	400/220kV Dhanonda	Gautam / SSE, 400kV Dhanonda	9313472669	dhanonda400kv@gmail.com
	220kV Lulahir	Er. Subhash Chander	9416373135	sse220kvlulaahir@hvpn.org.in
	220kV Rewari	Er. Kavinder Yadav	9315315649	sse220kvrwr@hvpn.org.in
	132kV Charkhi Dadri	Vivek Sangwan	9034459489	sse132kvdadri@hvpn.org.in
Punjab	220/66kV Gobindgarh	Er. Harwinder Singh	96461-18184	ae-220kvg1-mgg@pstcl.org
	220/66kV Laltokalan	Er. Supinder Singh	96461-24495	sse-pm-lalton@pstcl.org
	220/66kV Malerkotla	Er. Sanju Bala	96461-64007	sse-pm-mlrk@pstcl.org
UP	Shamli	Er. Krishna Nand	9412756631	eeetdshamli@upptcl.org,
	400kV Muradnagar	Er. D.S. Sengar	9412748666	ee400mrd2@upptcl.org
Delhi	400/220kV Bamnauli			
	400/220kV Mandola			