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

दिनांक: 08.05.2025

सेवा में
As per attached list of Members and Other invitees

विषय: संरक्षण उप-समिति की 59 वीं बैठक की कार्यवृत्त |
Subject: Minutes for 59th Protection Sub-Committee Meeting.

संरक्षण उप-समिति की **59 वीं बैठक, दिनांक 23.04.2025 को 10:30 बजे** से **एनआरपीसी सचिवालय, कटवारिया सराय, नई दिल्ली** में आयोजित की गयी थी | उक्त बैठक की कार्यवृत्त संलग्न है। यह उत्तर क्षेत्रीय विद्युत् समिति की वेबसाइट (http://164.100.60.165/) पर भी उपलब्ध है |

The **59th meeting** of Protection Sub-Committee was held on **23.04.2025** at **10:30 Hrs** at **NRPC Secretariat, Katwaria Sarai, New Delhi**. The minutes of the meeting is attached herewith. The same is also available on NRPC website (http://164.100.60.165/).

Signed by Lokesh Agrawal
Date: 08-05-2025 13:38:15
(लोकेश अग्रवाल)
(Lokesh Agrawal)
सहायक-निदेशक (संरक्षण)

Contents

Minutes of
59th Meeting of Protection Sub-Committee (PSC) of
Northern Regional Power Committee

Date and time of meeting : ***23.04.2025 10.30 Hrs.***

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

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

Part-A: NRPC

A.1. Confirmation of minutes of 58th meeting of Protection Sub-Committee

A.1.1 AEE (P), NRPC apprised that 58th PSC meeting was held on 26.03.2025. Minutes of the meeting were issued vide letter dtd. 11.04.2025. No comment has been received as of now.

Decision taken by Forum:

Forum approved the minutes of 58th PSC meeting as issued.

A.2. Status of action taken on decisions of 58th Protection Sub-Committee meeting (agenda by NRPC Secretariat)

A.2.1 Status of action taken on the decisions of 58th PSC meeting were informed to the Forum.

A.2.2 Concerned utilities submitted the status of action taken.

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 AEE (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 **March-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 AEE (P):

i. Some Utilities have not submitted data for March-2025.

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

A.3.4 **Following utilities were found non-compliant as indices were not received even on date of meeting:**

i. **NTPC (Anta, Auriya, Dadri, Koldam, Rihand, Singrauli)**
ii. **BBMB**
iii. **THDC (Koteshwar)**
iv. **NPCIL (RAP-B, NAP-1,2)**
v. **UJVNL (Khodri, Chibro, Vyasi)**
vi. **HPSEBL (Hamirpur circle)**
vii. **NTPC Green Energy Limited**
viii. **Azure Power India Pvt. Ltd.**
ix. **UT of Ladakh**
x. **UT of Chandigarh**
xi. **IndiGrid**
xii. **POWERLINK**
xiii. **NRSS 36 (Tata Power)**
xiv. **RE plants mentioned in Annexure-A.II**

A.3.5 NTPC Green Energy Limited submitted that protection performance indices of RE plants were sent to NTPC authorities for further sharing to NRPC. However, the same has not been received at NRPC Secretariat as of now.

A.3.6 MS, NRPC stated that agenda may be discussed in the RE Sub-Committee meeting. CGM, NRLDC was also of the same view.

A.3.7 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.3.8 UPPTCL representative informed that there was tripping of 400kV Aligarh - Muradnagar line on pole discrepancy relay operation because BCU Relay A/R command could not reach due to wiring issue which led to operation of circuit breakers (main & tie) on pole discrepancy. The wiring problem has now been rectified.

A.3.9 Regarding tripping of 400 KV Agra Fatehabad Ckt – II on PLCC maloperation, he informed that DT was received at Agra due to card defect in PLCC channel-1 of other end which will get replaced in 15 days possibly.

A.3.10 Regarding tripping of 220kV Jawaharpur-kasganj line, UPSLDC representative informed that on 18.03.2025, Kasganj has done relay testing and auto recloser was found working properly. After that there has not been any operation of A/R unsuccess.

A.3.11 Regarding, unsuccessful A/R operation on 765kV Obra C - Unnao line, UPSLDC representative informed that testing has been done on 18.04.2025 and nothing abnormal was found. Relay has been kept under observation as of now.

A.3.12 POWERGRID NR-2 representative informed that ICT tripped on operation of differential protection due to external flashover on tertiary side caused by animal (Cat). He added that insulation has now been provided on tertiary to avoid intrusion of such foreign particles.

A.3.13 SLDCs were directed to share the compiled data of all utilities (GENCOs, & TRANSCOs) under their jurisdiction. They may take regular follow ups with other utilities who are not members of NRPC and arrange the protection performance indices.

A.3.14 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 with respect to protection chapter added newly in the IEGC.

A.3.15 Further, it was also highlighted that IEGC 2023 has given responsibility to RPCs for receiving indices from all utilities however, all utilities are not members of NRPC. SLDCs have been requested in earlier PSC meetings to follow up with concerned utilities of states which are not NRPC members and to send compiled indices to NRPC.

Decision of the Forum:

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.

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

A.4.1 AEE (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. Status of annual audit plan is enclosed as **Annexure- A.IV**.

A.4.3 Further, who have submitted the audit plan was requested to submit the audit report and compliance status.

Decision of the Forum:

Utilities other than non-compliant were asked to submit report and compliance status within one month of completion of audit, latest by 30.04.2025.

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

A.5.1 AEE (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, 57th & 58th PSC meeting.

A.5.3 Audit plan submitted by utilities were presented. Status of submitted annual audit plans is enclosed as **Annexure- A.V**.

A.5.4 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. **MEJA Urja Nigam Ltd.**
vii. **Adani Power Rajasthan Limited**
viii. **Adani Energy Solution Limited**
ix. **Tata Power Renewable Energy Ltd.**
x. **UT of J&K**
xi. **UT of Ladakh**
xii. **UT of Chandigarh**
xiii. **ADHPL**
xiv. **POWERLINK**
xv. **NRSS 36**
xvi. **UPJVNL**
xvii. **Barsingar Plant (Rajasthan Control Area)**
xviii. **RE plants mentioned in Annexure-A.V.**

A.5.5 Concerned were requested to submit the audit plan at the earliest. MS, NRPC reiterated that internal audit plan may be submitted tentatively.

A.5.6 PSTCL, PTCUL, APCPL, HPGCL and J&K representative ensured to arrange the internal protection audit plan after the meeting.

A.5.7 POWERGRID representative informed that internal audit of its TBCB projects is done by POWERGRID itself. Internal audit plans of TBCB projects have also been submitted along with plan of POWERGRID mentioning as name of substation for a particular project.

A.5.8 Rajasthan SLDC representative informed that 220 KV Dhorimanna-Rajwest Line & 400 KV ANTA - CHABRA II lines are under RVPN. Therefore, there is no need to mention these lines separately. He was requested to arrange the internal protection audit plan for Barsingsar plant.

Decision of the Forum:

Non-compliant utilities 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 AEE (P), NRPC apprised that as clause 15 of IEGC 2023:

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

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

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

i. **NPCIL (except NAPS)**
ii. **HVPNL**
iii. **RVPNL**
iv. **PSTCL**
v. **HPGCL**
vi. **UPRVUNL (OBRA C, Panki)**
vii. **UJVNL (except Dharasu)**
viii. **PSPCL (RSD)**
ix. **HPSEBL (except Kunihar, Baddi, Upera Nangla)**
x. **Aravali Power Company Pvt. Ltd**
xi. **Tata Power Renewable Energy Ltd.**
xii. **UT of J&K**
xiii. **UT of Ladakh**
xiv. **UT of Chandigarh**
xv. **POWERLINK**
xvi. **NRSS 36**
xvii. **Ghatampur TPS**
xviii. **Khara (UPJVNL)**
xix. **Barsingsar plant**

xx. **RE plants as mentioned in Annexure-A.VI.**

A.6.4 RVPN representative informed that approval has been taken from the higher authorities for third party audit to be done by other utilities. He added that RVUNL, HVPN, POWERGRID, Adani have been considered for conducting third party protection audit of the RVPN substations.

A.6.5 As per discussion of the last PSC meeting, Forum asked RVPN not to engage RVUNL for conducting third party protection audit of the RVPN substations as both falls under same ministry.

A.6.6 HVPN representative also informed that higher management has given clearance to conduct third party protection audit by other state utilities.

A.6.7 J&K SLDC representative informed that J&K is going to engage POWERGRID for the third party protection audit of its substation.

A.6.8 HPSEBL representative informed that third party protection audit have been completed of Baddi, Kunihar and Upperla Nangal substations. For remaining, the matter is being taken up. He was requested to share the audit reports for Kunihar and Upperla Nangal substations.

A.6.9 APCPL representative informed that CPRI is likely to be finalized as third-party protection auditor.

Decision of the Forum:

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

A.7.1 AEE (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 submitted the internal audit report based on the audit done at their substations:

S.N.	Utility	Stations
1	SJVN	NJHPS, RHPS
2	RVPN	220kV Substations Bhadla, Basani, Aau,Amarsagar, Badisid, Balotra, BAP, Bhinmal, Kanasar, Phalodi, Ramgarh, Reodar, Sirohi, Hamirgarh, PPS4 Nokh, RSDCL-I, RSDCL-II, Sawa
3	RPSCL	400/220kV Switchyard
4	UPRVUNL	Obra A & B
5	Others	WUPPTCL, Alaknanda Hydro Power Company Limited, Ghatampur Thermal Power Station

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

S.N.	Utility	Stations
1	Meja Urja Nigam Private Limited	400kV Switchyard of MUNPL, Prayagraj
2	PPGCL	765/400kV Substation
3	RE Plant	Ayana Renewable Power One Pvt. Ltd at Bikaner
4	Others	WUPPTCL, SEUPPTCL

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

S.N.	Utility	Stations
1	UPRVUNL	BTPS, CTPS Parichha, (internal audit)
2	KWHEP (JSW)	Compliance action status of KWHEP (external audit)
3	Others	WUPPTCL (internal)

A.7.6 **The above submitted reports are 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.

A.7.8 AEE (P), NRPC highlighted that in internal protection audit report of RHPS (SJVN), there is setting of Id min as .03 pu. However, as per finalized philosophy, setting is 0.2

pu as default or If tap range is -X% to +Y%, then (X+Y)% may be kept as setting. Accordingly, this setting may be reviewed by SJVN.

A.7.9 AEE (P), NRPC highlighted that in case of parallel lines, both voltage and time grading need to be done for stage -1 settings as per the decision of the committee of Over voltage protection setting. However, it was observed that there is only voltage grading in the NJHPS (SJVN) as per the submitted internal protection audit report. In view of decision of the committee, time grading may also be done by NJHPS.

A.7.10 Similarly, as per the 3rd party protection audit report of Meja Urja Nigam Private Limited, both voltage and time grading need to be reviewed for stage -1 over voltage settings.

A.7.11 AEE (P), NRPC highlighted that in submitted internal protection audit reports of RVPN, settings were not mentioned in the reports of Bhadla, Basani, Aau, Badisid, BAP, Bhinmal, Kanasar, Phalodi, Reodar, Sirohi, RSDCL-I, RSDCL-II.

A.7.12 AEE (P), NRPC highlighted that as per audit report of RVPN, max. ratio of 2nd harmonic to fundamental harmonic dif. current in % is 20 in the reactor setting of 220kV Substation Amarsagar which may be reviewed to align with finalized protection philosophy. He added that SOTF is disabled in the substation which is not as per the finalized protection philosophy.

A.7.13 He added that in 220kV Substation Balotra, zone -4-time setting has been kept as 160msec in case of bus bar operational. Forum recommended to review the same.

A.7.14 AEE (P), NRPC highlighted that auto reclosure is not enabled at 220kV PPS4 Nokh. Transformer over current and earth fault protection settings are not as per finalized protection philosophy for transformers commissioned at 220kV Hamirgarh Substation.

A.7.15 AEE (P), NRPC highlighted that max. ratio of 5th harmonic to fundamental harmonic dif. current in % is 35 at transformer -1 of 220kV Substation Sawa which may be reviewed to align with finalized protection philosophy.

A.7.16 AEE (P), NRPC mentioned that as per the submitted internal audit report of RPSCL, max. ratio of 5th harmonic to fundamental harmonic dif. current in % is 35 of ICTs

which may be reviewed to align with finalized protection philosophy.

A.7.17 AEE (P), NRPC highlighted that as per the internal protection audit report of Ghatampur TPS, the broken conductor setting is 60sec. deviating from the finalized protection philosophy. Forum recommended that tripping on broken conductor is allowed for radial line. However, in this case time setting is high which may be also decreased. Further AEE (P), NRPC mentioned that 2nd & 5th Harmonic ratio settings for line reactor on Agra line are required to be reviewed.

A.7.18 AEE (P), NRPC highlighted that over current protection settings are enabled on the 400kV lines in the audit report of Obra A & B. However, over current protection is to be kept disabled.

A.7.19 AEE (P), NRPC mentioned that protection settings are not included in the submitted audit reports of Alaknanda and WUPPTCL.

A.7.20 RVUN representative was of view that applicability of finalized protection philosophy in all cases might not be feasible. There may be slight changes in the adopted protection setting depending upon the case.

A.7.21 Further, submitted compliance/ action plan on recommendation of audit were apprised.

A.7.22 EE (P), NRPC suggested that measurement of earth resistance may be done timely and regularly by utilities.

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. 220kV Bus Bar Protection disable for Busbar protection retrofitting work at 400/220kV Lucknow Substation (agenda by POWERGRID, NR-3)

A.8.1 POWERGRID vide mail dated 09.04.2025 has informed that existing 220kV B/B relay,

(Make RADHA) retrofitting work is planned with the Decentralised CU/PU GE scheme at 400kV Substation Lucknow.

A.8.2 220kV B/B (All zone) shall be out of service till the complete retrofitting work of LBB & B/B. (Tentative schedule:08/05/2025)

A.8.3 As per NRPC protection guideline reverse zone is being adopted as 160ms for all distance relay at 220kV BUS.

A.8.4 RVPN representative suggested that in this scenario, over current protection may be enabled at bus coupler to protect unwanted tripping of feeders of other bus during bus fault. TMS may be calculated accordingly.

A.8.5 UPPTCL representative also supported the same and suggested to keep time setting less than 160msec for operation of bus coupler on over current.

A.8.6 POWERGRID NR-3 representative informed that there is no separate over current protection in bus coupler. POWERGRID NR-2 representative highlighted that over current protection on bus coupler is generally not enabled because whenever there is shifting of bus then bus coupler may get tripped and there might be damage of isolator.

A.8.7 AGEL representative shared the above view. Although, he added that after proper coordination in the settings including directional power flow, over current protection may be enabled on bus coupler.

A.8.8 CGM, NRLDC conveyed that POWREGRID may explore the option for over current protection on bus coupler.

A.8.9 Accordingly, Forum approved the proposal of keeping reverse zone time setting as 160ms for all distance relay at 220kV BUS and suggested POWERGRID to keep over current protection enable on bus coupler with time setting less than 160msec till the retrofitting work of LBB & B/B get completed.

Decision of the Forum:

Forum approved the proposal of keeping reverse zone time setting as 160ms for all distance relay at 220kV BUS and suggested POWERGRID to explore the provision for keeping over current protection enable on bus coupler with time setting less than 160msec till the retrofitting work of LBB & B/B get completed.

A.9. Review of Standard protection philosophy to be adopted in various cases (agenda by POWERGRID Nr-3)

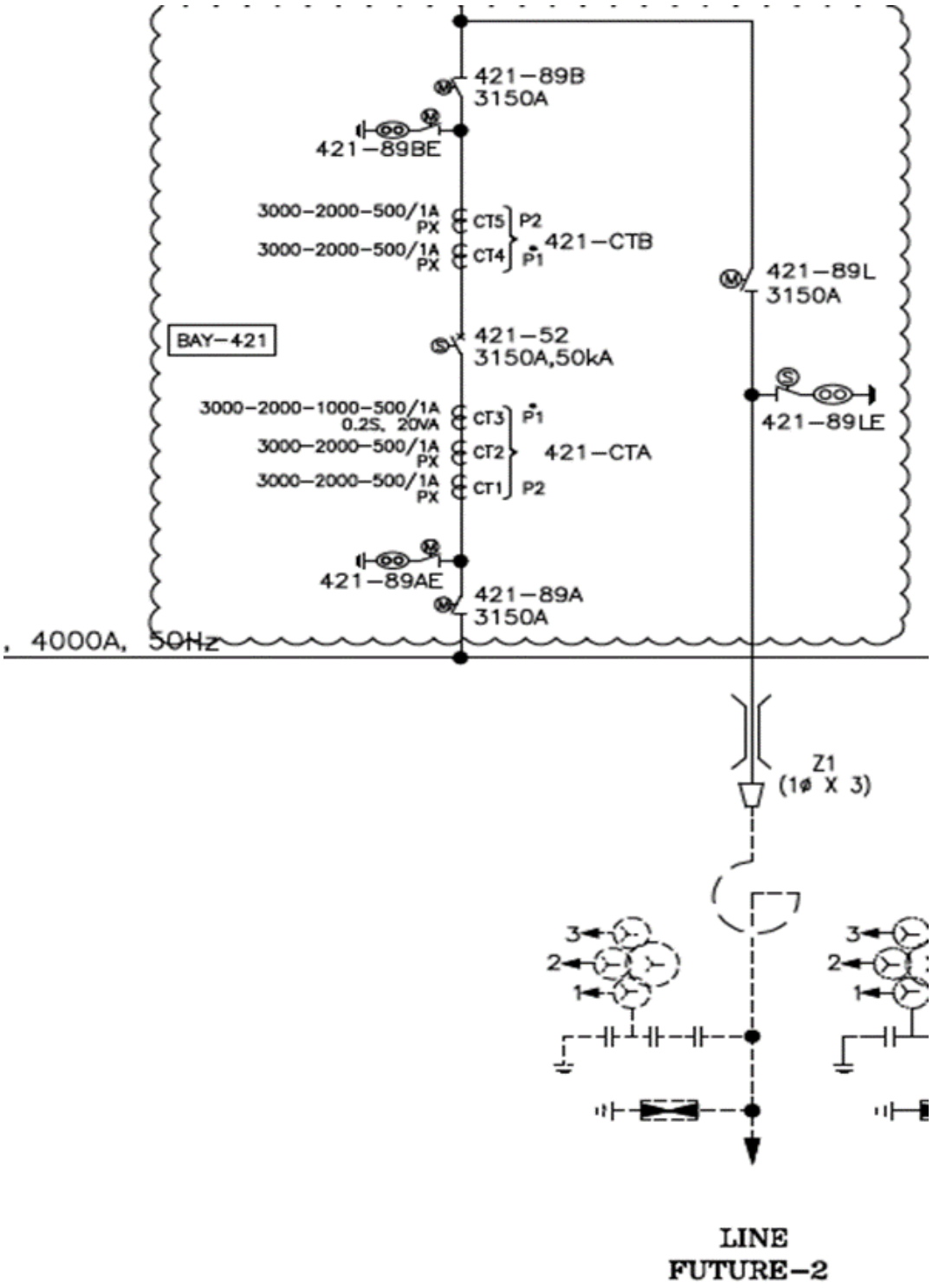
A.9.1 POWERGRID NR-3 representative submitted that protection philosophy may be reviewed and standardised for various cases as per below-

a. Protection setting for idle charging or Anti-theft charging of transmission line (765kV, 400kV and 220kV)

b. Protection settings for idle charge of future bay up to **LA** (Lightning arrestor) in case of GIS (Gas insulated S/S) or AIS

I. Future Bay equipped with all standard protection (Main-I, Main-II, LBB and BCU)

II. Future Bay equipped with LBB & BCU protection.



c. Protection settings of connected transmission line element, ICT and Bus Reactor in case of Bus Bar out of service due to retrofitting work.

A.9.2 AESL representative mentioned that time setting of zone-2 of distance relay may be kept as instantaneous. HVPN representative supported the same.

A.9.3 NRLDC representative also conveyed the above and commented that over voltage protection settings may be kept at lower level.

A.9.4 In case of Protection settings for idle charge of future bay up to LA (Lightning arrestor), UPPTCL representative conveyed that distance relay would be needed for protection. HVPN representative mentioned that overcurrent protection may be kept with definite time because of such short line distance relay protection are not much accurate. RVUN representative highlighted that any phase over current protection would be better.

A.9.5 MS, NRPC stated that inputs from all the members may be sought via mail after the meeting and the agenda may be discussed in the next PSC meeting.

A.9.6 CGM, NRLDC was of view that Protection philosophy may be reviewed after some period of time. MS, NRPC was also of the same view and recommended that philosophy may be reviewed after every six months.

Decision of the Forum:

Forum decided to discuss the agenda in the next PSC meeting after taking written views of utilities.

A.10. Implementation of SPS for ICTs at POWERGRID Substations (agenda by POWERGRID NR-1)

A.10.1 POWERGRID representative apprised that during the high-demand period last year, the transmission system was frequently heavily loaded and became N-1 non-compliant on several occasions. This year, from May to September, demand in the Northern Region is expected to be even higher than last year.

A.10.2 To address N-1 non-compliance, CTUIL and CEA are planning new transmission systems. However, some approved elements will take time for commissioning, which may lead to overloading of the existing network.

A.10.3 Based on last years' experience, ICTs at the following substations became N-1 non-compliant during the summer peak:

Bassi, Sikar, Jaipur South, Kankroli, Kotputli, Neemrana, Bhiwadi, Bhiwani

A.10.4 He further added that in the 229th and 230th OCC meeting, it was decided that SPS should be implemented at these substations to prevent grid disturbances during the upcoming summer peak.

A.10.5 To implement the SPS, state utilities in Rajasthan and Haryana are required to provide feeder details for tripping on operation of SPS at these substations.

A.10.6 He submitted that only tripping of 220 kV feeders is possible at this stage; tripping below 220 kV cannot be implemented currently due to time constraints.

A.10.7 Accordingly, POWERGRID requested the following actions from the Forum:

1. State utilities in Haryana and Rajasthan to identify and submit feeder details for SPS implementation at the above substations.
2. NRLDC to provide the SPS logic for these substations.
3. NRLDC to conduct study to determine the SPS tripping scheme and the quantum of load to be relieved.

A.10.8 NRLDC representative conveyed that as per discussion held in 230th OCC meeting, Rajasthan SLDC representative are supposed to present input on this proposal in this meeting. Rajasthan SLDC has to submit the load feeder details for finalization of SPS logic.

A.10.9 Rajasthan SLDC representative submitted that SLDC will share the details of feeder that may be tripped for SPS operation taking care of sensitive feeder and avoiding cascade tripping. He also submitted that joint study with NRLDC is required for determination of the same. There is need to know the no. of stages of the SPSs.

A.10.10 CGM, NRLDC stated that feeder identification along with load relief may be provided by Rajasthan SLDC for proposed SPSs. NRLDC will further review and do study on the same. He supported that joint study may be done by Rajasthan SLDC and NRLDC.

A.10.11 MS, NRPC asked the tentative timeline for SPS implementation.

A.10.12 Rajasthan SLDC representative ensured to submit the feeder details within 10 days. After that NRLDC and Rajasthan SLDC may have joint studies.

A.10.13 POWERGRID representative conveyed that execution of all these SPSs may be done in one week after finalization of logic.

A.10.14 MS, NRPC directed to complete the implementation of mentioned SPSs latest by 10.05.2025

A.10.15 NRLDC representative asked Rajasthan SLDC to plan the SPS for Heerapura and Deedwana if commissioning of new ICT gets delayed by end of May, 2025. Forum was also of the same view.

Decision of the Forum:

Forum directed Rajasthan SLDC to submit the feeder details to NRLDC within 10 days for the SPSs at mentioned locations. Rajasthan SLDC may also plan the SPS for Heerapura and Deedwana if commissioning of new ICT gets delayed by end of May, 2025.

Part-B: Agenda by NRLDC

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

B.1.1 As per 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 59th 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.

During 58th PSC meeting, HPSEBL representative stated that protection audit at Baddi and Upperla Nangal is completed on 20th March 2025 by POWERGRID. Audit reports are awaited.

During 59th PSC meeting, HPSEBL representative stated that status is same and as major work is of relay replacement, they will need PSDF fund for rectification of issues.

NRLDC representative highlighted that it is necessary to complete the work before summer in view of increase in tripping.

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.

During 58th PSC meeting, HVPNL representative informed that no further update is there in this regard and matter is pending at Head Office level.

During 59th PSC meeting, HVPNL representative informed that tendering is in process. Exact timeline will be shared in next PSC.

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

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

iii. Multiple elements tripping at 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 take 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.

During 58th PSC meeting, NHPC representatives were not present due to ongoing commissioning activity in Parbati-II Project, as communicated. However, vide mail dt. 26.03.2025, NHPC informed that as per LOA, OPGW work shall be completed by Dec'2025. GE engineer visited Parbati-II site, however it is observed during commissioning that there is communication issue with the supplied line differential relay. The relay has been sent to OEM's premisses for

rectification. After rectification of the same, the relay can be installed. The same is expected to be completed by May'2025.

During 59th PSC meeting, relay will be purchased by 15th May 2025, but they will be commissioned after OPGW work is completed.

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

iv. 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 for 400kV Koteshwar(PG)-Koteshwar(TH) D/C.

During 58th PSC meeting, THDC representative informed that differential protection scheme on 400kV Koteshwar(PG)-Tehri(TH) D/C has not been implemented yet.

During 59th PSC meeting, POWERGID(NR-1) representative informed that different tender was issued for 400kV Koteshwar(PG)-Tehri(TH) D/C which got cancelled and hence retendering is in progress. This will need at least 6 months to complete the work. However, during shutdown they have implemented and tested carried-aided DEF protection operation which will take care of faults in the meantime.

PSC Forum requested POWERGID to expedite the work related to implementation of differential protection scheme on 400kV Koteshwar(PG)-Tehri(TH) D/C.

v. 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.

During 58th PSC meeting, PSTCL representative informed that status is same and materials are under inspection.

During 59th PSC meeting, material inspection is done and installation process has started. Bus bar protection at 220kV Sarna will be commissioned within 1 month.

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

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

vi. 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 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.

During 58th PSC meeting, RVUNL representative stated that status is same and work is at stage of tender processing (administrative process delay).

During 59th PSC meeting, RVUNL representative stated that tender bid has been opened and techno-commercial evaluation is in progress.

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

PSC Forum requested RVUNL for expeditious actions at their end.

vii. 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.

During 58th PSC meeting, RVPNL representative informed that work is delayed due to unavailability of shutdown on 27th and 28th February 2025, next shutdown is planned during May 2025.

During 59th PSC meeting, RVPNL representative informed that A/R will be enabled in the old panel subject to shutdown availability, otherwise as civil work is almost completed at Sakatpura S/s, new panel will be installed in new control room by end of May 2025.

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

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

viii. 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, SLDC UP 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. SLDC UP may review the same.

SLDC UP 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, SLDC UP 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, SLDC UP 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, SLDC UP 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, SLDC UP 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.

During 58th PSC meeting, SLDC UP representative informed that relay replacement in unit-1 will get completed on 30th March 2025 followed by unit-2 & 3 within next 6 months.

During 59th PSC meeting, SLDC UP representative informed that relay replacement in unit-1 is completed on 30th March 2025. The same in unit-2 & 3 will be done within next 6 months.

NRLDC representative requested UP for expeditious completion of work.

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

ix. Multiple elements tripping event at Patiala(PG) on 19th July 2024, 18:50 hrs

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

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

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

During 56th PSC meeting, POWERGRID(NR-2) representative 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.

During 58th PSC meeting, POWERGRID(NR-2) representatives were not present.

During 59th PSC meeting, POWERGRID(NR-2) representative informed that implementation of bus bar protection at Patiala (PG) will be completed by May 2025.

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

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

PSC 53 recommendation:

- Timely submission of disturbance recorder (DR) and event logger (EL) files need to be ensured. As per IEGC clause 37.2 (c), Disturbance Recorder (DR), station Event Logger (EL), Data Acquisition System (DAS) shall be submitted within 24 hrs of the event.
- HPPTCL shall take necessary actions to rectify the protection related issue in 220kV Khdori-Majri ckt-2.
- Over Voltage 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 has already been 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.

During 58th PSC meeting, UJVUNL representative informed that GE team has denied the scope of work. Hence open tender will be issued to resolve the A/R issue in relay.

During 59th PSC meeting, UJVUNL representative informed that open tender process is in progress and it will take at least 4-5 months to complete the work.

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.

xi. 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.

During 58th PSC meeting, UPPTCL representative informed that time sync issue and bus bar relay replacement both the works will be addressed by ABB engineers and work is further delayed due to delay in visit.

During 59th PSC meeting, UPPTCL representative informed that work is further delayed due to delay in visit by ABB engineers.

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

PSC Forum requested UPPTCL for expedited corrective actions.

xii. 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).

During 58th PSC meeting, UPPTCL representative informed that Commissioning and Implementation of numerical relays in 132kV ICT-1&2 at Obra_A(UP) will be addressed by ABB engineers and work is further delayed due to delay in visit.

During 59th PSC meeting, UPPTCL representative informed that work is further delayed due to delay in visit by ABB engineers.

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

PSC Forum requested UPPTCL for expedited corrective actions.

xiii. 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.

During 58th PSC meeting, RVPNL representative informed that one relay is already replaced on 27th February 2025. One relay will be replaced on 28th March 2025 and other one will be replaced during shutdown in April 2025. Rest 2 relays are under procurement stage.

During 59th PSC meeting, RVPNL representative informed that total three relays are replaced till now. In rest two elements one relay (Main-I/II) is numerical and other one is static. In those 2 static relays DR extraction facility is made available through Main-I/II numerical relay till they are replaced.

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

PSC Forum requested RVPNL for expedited corrective actions.

xiv. 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.

During 58th PSC meeting, RVPNL representative informed that 6 bird-guards need to be installed and some broken earth wires need to be attended further in 220kV RAPS_A(NP)- Sakatpura (RS) (RS) Ckt-1. Work is almost completed in 220kV RAPS_A(NP)- Sakatpura (RS) (RS) Ckt-2, however, some newly installed insulators failed due to manufacturing defect which are being replaced. Work in 220kV RAPS_B(NP)- Sakatpura (RS) (RS) Ckt will also be completed soon depending on shutdown availability.

During 59th PSC meeting, RVPNL representative informed that work in 220kV RAPS_A(NP)- Sakatpura (RS) (RS) Ckt-1 & 2 is complete except some broken earth wires need to be attended. It was also stated that 10-20km from Sakatpura end of 220kV RAPS_A(NP)- Sakatpura (RS) (RS) Ckt-1 & 2 passes through forest area and faults are often of transient nature. A/R is disabled at RAPS_A end although it is enabled at Sakatpura end. Communication from RVPNL is sent to RAPS_A to enable A/R and replace CB at RAPS_A end if any issue is there, but no reply is received so far. Work in 220kV RAPS_B(NP)- Sakatpura (RS) (RS) Ckt is in progress.

PSC Forum requested NPCIL to enable A/R at RAPS_A end of 220kV RAPS_A(NP)- Sakatpura (RS) (RS) Ckt-1 & 2. RVPNL is also requested for expedited corrective actions at their end.

xv. 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 representative informed that status is same.

During 58th PSC meeting, PSTCL representative informed that insulator replacement will be completed before next winter season 2025.

During 59th PSC meeting, PSTCL representative 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 requested PSTCL to for expeditious actions for insulators replacement.

xvi. 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.

During 58th PSC meeting, UPPTCL representative informed that allotment order

is yet to get issued. Work will get completed after allotment is done.

During 59th PSC meeting, UPPTCL representative informed that carrier cabinet is to be installed at both Aligarh(UP) and Muradnagar_1(UP) end, but they are yet not allotted.

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 requested UPPTCL for expedited corrective actions.

xvii. ***Frequent tripping of 220 KV Agra(PG)-Bharatpur(RS) (PG) Ckt-1***

PSC 57 recommendation:

Impedance measurement and distance relay settings of the line need to be reviewed before summer (high demand period).

During 58th PSC meeting, RVPNL informed that anti-fog disc and bird-guard installation is in progress. POWERGRID (NR-3) informed that impedance measurement and distance relay settings review will be done in the next available shutdown.

During 59th PSC meeting, RVPNL informed that insulator disc replacement is almost done. Two towers need to be changed due to less ground clearance. POWERGRID (NR-3) informed that impedance measurement and distance relay settings review is done and settings are corrected.

PSC Forum requested RVPNL for expedited corrective actions.

xviii. ***Frequent tripping of 400 KV Anpara_B(UPUN)-Sarnath(UP) (UP) Ckt-2***

PSC 57 recommendation:

Healthiness of carrier communication needs to be reviewed.

During 58th PSC meeting, UPPTCL informed that only one carrier cabinet is in working condition among the two MAIN-I and MAIN-II carrier cabinet, hence cross-wiring could not be done. Another carrier cabinet will be made healthy for redundancy.

During 59th PSC meeting, UPPTCL informed that one carrier cabinet is needed and requirement/demand for the same is already placed. It will be installed once allotted.

PSC Forum requested UPPTCL for expedited corrective actions.

xix. ***Frequent tripping of 400 KV Noida Sec 148-Noida Sec 123 (UP) Ckt-1***

PSC 57 recommendation:

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

b) Time sync issue need to be addressed.

c) Issue in A/R non-operation need to be resolved.

During 58th PSC meeting, UPPTCL representative informed time sync issue is attended. A/R non-operation issue is resolved at Noida Sec 148 end and it will be resolved at Noida Sec 123 end within 1.5 months.

During 59th PSC meetings, UPPTCL representative informed that A/R non-operation issue is yet to be resolved at Noida Sec 123 end and it is delayed due to delay in visit by GE engineers. If work gets delayed further, then it will be attended by third party during SAS (automation) work at another substation.

PSC Forum requested UPPTCL to take necessary follow up actions for expeditious completion of work.

xx. ***Frequent tripping of 400 KV Merta-Ratangarh (RS) Ckt-1***

PSC 57 recommendation:

a) DR standardization need to be checked (DR time window of ~800ms is not as per standard).

b) Phase sequence issue need to be resolved.

c) Status of A/R operation at Ratangarh end need to be reviewed.

During 58th PSC meeting, RVPNL informed that DR time window is made as per standard. Status of A/R operation at Ratangarh end couldn't be reviewed due to shutdown unavailability and will be attended in next available shutdown.

During 59th PSC meeting, RVPNL informed that they have applied for shutdown on 19th and 20th May 2025. One relay replacement and review of A/R operation will be done during shutdown.

PSC Forum requested RVPNL for expedited corrective actions.

xxi. ***Multiple elements tripping at 220/132kV Ropar(PS) on 06th January, 2025***

PSC 57 recommendation:

PSTCL need to share the DR/EL & tripping details within one week.

During 58th PSC meeting, PSPCL representative informed that DR/EL could not be extracted due to software issue.

During 59th PSC meeting, PSPCL representative was not present.

PSC Forum requested PSTCL to share detailed report along with observations and remedial action taken.

xxii. ***Multiple elements tripping at 400/220KV Heerapura(RS) on 10th January, 2025***

PSC 57 recommendation:

a) Instantaneous OC relay (High set) settings of ICTs at Heerapura(RS) may be reviewed.

b) Replacement of remaining electromechanical/ static relays & schemes with numerical relay need to be expedited at Heerapura(RS).

During 58th PSC meeting, RVPNL representative informed that already 8 static/ electromechanical relays are replaced with numerical relays. Remaining relays are also being replaced in phased manner, but it will take time as relays of whole substation including busbar relay need to be replaced.

During 59th PSC meeting, RVPNL representative informed that all electromechanical/ static relays are replaced with numerical relays except busbar relay.

PSC forum requested RVPNL to share the timeline of replacement of relays and take expedited corrective actions at their end.

xxiii. ***Frequent tripping of 220 KV Debari(RS)-RAPS_A(NP) (RS) Ckt-1***

PSC 58 recommendation: Expeditious corrective actions to minimise frequent faults in line.

During 58th PSC meeting, RVPNL representative informed that this line is almost 200km long and total no. of location is 450. There is issue in almost 1300 string insulators and it will take at least 3-4 months to complete the whole work subject to shutdown availability. Some work has already been done during February 2025 and tripping has also reduced since then.

During 59th PSC meeting, RVPNL representative informed that complete line need refurbishment which will require long shutdown. For now, insulator disc replacement is being done as and when shutdown opportunity is there.

PSC Forum requested RVPNL to take expeditious corrective action to minimise frequent faults in line.

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

B.2.1 A total of **14** grid events occurred in the month of **March 2025** of which **08** are of GD-1 category, **04** are of GI-2 Category and **02** are of GI-1 Category. The tripping report of all the events have been issued from NRLDC. A list of all these events is attached at **Annexure-B.II**.

B.2.2 Maximum delayed clearance of fault observed in event of multiple elements tripping at 400kV Parbati_3(NH) and 400kV Sainj HEP(HP) at 14:46 hrs on 16th March, 2025 (As per PMU at Nallagarh(PG), two consecutive R-N phase to earth fault is observed with delayed fault clearing time of 1240 ms and 1040 ms respectively)

B.2.3 Delayed clearance of fault (more than 100ms for 400kV and 160ms for 220kV system) observed in total 06 events out of 14 grid events occurred in the month. In 05 (no.s) 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 March 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 detailed 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.

B.2.6 ***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

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

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

a) Frequent elements tripping during March 2025:

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

S. NO.	Element Name	No. of forced outages	Utility/ SLDC
1	220 KV Badarpur(NT)-Alwar MIA(RS) (RS) Ckt-1	9	NTPC/Raj
2	220 KV Nara(UP)-Roorkee(UK) (UP) Ckt-1	4	UP/UK
3	220 KV RAPS_A(NP)-Sakatpura(RS) (RS) Ckt-1	4	NPCIL/Raj
4	220 KV RAPS_A(NP)-Sakatpura(RS) (RS) Ckt-2	4	NPCIL/Raj
5	220 KV RAPS_B(NP)-Sakatpura(RS) (RS) Ckt-1	4	NPCIL/Raj
6	220/33 kV 150 MVA ICT 2 at ABCRenewRJ01 SL_BHD2_PG	3	ABCRenew
7	400 KV Bareilly-Unnao (UP) Ckt-1	3	UP
8	400 KV Merta-Kankani (RS) Ckt-1	3	Raj
9	400 KV Suratgarh(RVUN)-Ratangarh(RS) (RS) Ckt-1	3	Raj
10	400/220 kV 240 MVA ICT 3 at Obra_B(UP)	3	UP
11	400/33 kV 150 MVA ICT 1 at Renew SuryaRavi SL_BKN_PG (RSRPL)	3	RSRPL

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 Badarpur(NT)-Alwar MIA(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 9 number of times in March 2025. RVPNL representative stated that this line is idly charged (charged in two sections). Fault incidents occurred due to conductor theft cases. RVPNL proposed to form a committee to decommission this line in order to avoid unnecessary conductor theft.

- **220 KV Nara(UP)-Roorkee(UK) (UP) Ckt-1:** NRLDC representative raised concern over frequent incidents of faults. It was further highlighted that the line tripped 4 number of times in March 2025 and in one case delayed clearance of fault is observed. UPPTCL representative informed that this line is radial and fault cleared in zone-2 from Nara end.

- **220 KV RAPS_A(NP)-Sakatpura(RS) (RS) Ckt-1 & 2:** NRLDC representative raised concern over frequent incidents of faults and non-operation of A/R. It was further highlighted that the lines tripped 4 number of times each in March 2025 and in one case delayed clearance of fault is observed in Ckt-1. RVPNL representative stated that A/R is disabled at RAPS_A end although it is enabled at Sakatpura end. Communication from RVPNL is sent to RAPS_A to enable A/R and replace CB at RAPS_A end if any issue is there, but no reply is received so far. PSC Forum requested RVPNL to also analyse reason of delayed clearance.

- **220 KV RAPS_B(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 4 number of times in March 2025 and in two cases

delayed clearance of fault is observed. RVPNL representative stated that work of installation of bird guard throughout the line, replacement of earth wire throughout the line and replacement of damaged disc insulators are in progress. PSC Forum requested RVPNL to also analyse reason of delayed clearance.

- **400 KV Bareilly-Unnao (UP) 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 3 number of times in March 2025. UPPTCL representative stated that carrier was unhealthy in both the channels. Issue is resolved from Unnao end. Testing will be done at Bareilly end during shutdown.

- **400 KV Merta-Kankani (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 3 number of times in March 2025. PSC Forum requested RVPNL to review A/R operation at both the ends.

- **400/220 kV 240 MVA ICT 3 at Obra_B(UP):** NRLDC representative raised concern over frequent incidents of tripping (ICT tripped 3 times in March 2025) and asked to share exact nature of protection operated. UPPTCL stated that ICT tripped on directional over-current protection operation. There was problem in transformer bushing (more tan-delta); bushing is already replaced.

B.3.4 Representatives from ABCRenewRJ01 SL_BHD2_PG and Renew Surya Ravi SL_BKN_PG (RSRPL) were not present in the meeting.

B.3.5 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.3.6 The list of major tripping events occurred during March 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.3.7 Utilities were requested to prepare detailed analysis report and present the event details during 59th 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 220KV Dasuya(PS) at 14:32 hrs on 10th March, 2025

Discussion during the meeting:

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

- 220kV Dasuya(PS) has double main bus scheme.
- As reported at 14:32hrs, B-ph conductor of 220 KV Dasuya(PS)-Jalandhar(BB) Ckt-2 broken due to damage of insulator string and fell on 220kV bus-2.

- As per PMU at Jalandhar(PG), B-N fault with delayed clearance of ~560msec is observed.
- Fault was not cleared in time from Dasuya end. (Exact details w.r.t. bus bar protection at Dausya end yet to be received.)
- Line connected to 220kV Bus-2 i.e., 220 KV Dasuya(PS)-Jalandhar(PG) (PG) Ckt-1, 220 KV Sarna(PS)-Dasuya(PS) (PG) Ckt-2 and 220 KV Pong(BB)-Dasuya(PS) (BBMB) Ckt-2 tripped from remoted end. As reported, 220kV bus coupler at Dasuya(PS) also tripped.
- As per SCADA, change in demand of approx. 100 MW is observed in Punjab control area.
- **Major observations:**
  - Exact location and nature of fault need to be shared.
  - Reason of delayed clearance of fault need to be shared.
  - DR/EL of all the tripped elements from both the end and details of protection operation need to be shared.
  - SCADA data was not healthy at Dasuya(PS) and Pong(BBMB). Tripping of all the elements is also not recorded in SCADA SOE. Availability and healthiness of SCADA data need to be ensured.
  - Remedial action taken report needs to be shared.

PSTCL representative informed that they will share DR/EL & tripping details within one week.

PSC Forum Recommendations:

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

B. Multiple elements tripping at 220/132/33kV Baraut(UP) at 01:06 hrs on 12th March, 2025

Discussion during the meeting:

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

- 220/132/33KV Baraut(UP) S/s has single main and transfer bus scheme in all voltage levels.
- As reported at 01:06 hrs, R-ph CT of 220 KV Baghpat(PG)-Baraut(UP) (UP) Ckt-1 got damaged which further led to bus bar protection operation at 220kV Baraut(UP). As a result, all the elements connected to 220KV Bus tripped and complete blackout occurred at 220/132/33kV Baraut(UP) S/s.
- However, as per DR at Baghpat(PG) end of 220 KV Baghpat(PG)-Baraut(UP) (UP) Ckt-1, R-N fault (Ir=~7.71kA) converted to R-Y-N fault (Ir=~14.48kA, Iy=~15.87kA) was observed in 220 KV Baghpat(PG)-Baraut(UP) (UP) Ckt-1 and fault was cleared in zone-2 from Baghpat(PG) end with fault clearing time of =~440ms.
- As per DR at Baghpat(PG) end of 220 KV Baghpat(PG)-Baraut(UP) (UP) Ckt-2, R-N fault (Ir=~8.53kA) was observed in 220 KV Baghpat(PG)-Baraut(UP) (UP) Ckt-2 and fault was sensed in zone-2 at Baghpat(PG) end with fault clearing time of =~240ms.
- As per SCADA SOE, 220 KV Baghpat(PG)-Shamli(UP) (UP) Ckt also tripped during the same time (exact reason of tripping yet to be shared).
- As per PMU at Meerut(PG), R-N phase to ground fault converted to R-Y-N double phase to ground fault with delayed fault clearing time of 440ms was observed.
- As per SCADA, change in demand of approx. 40MW is observed in Uttar Pradesh control area..
- **Major observations:**
  - Reason of delayed clearance of fault need to be shared.
  - Exact reason of tripping of 220 KV Baghpat(PG)-Shamli(UP) (UP) Ckt need to be shared.
  - DR/EL (.dat/.cfg file) of all tripped elements along with detailed tripping report need to be shared from UP end.
  - Remedial action taken report need to be shared.

ii. UPPTCL representative informed the following:

- R-phase CT of 220KV Baraut-Baghpat (PG)-I line got damage and R-phase Jumper came in range with the Y-phase CT clamp head, thereby fault converted from Single-phase to Phase fault.
- This CT damage resulted operating current Iop = 10.16A and restraining current Irest = 18.402A in the Bus-Bar relay causing Bus-Bar operation.
- Disturbance record of Busbar protection was closely examined to validate the delay in fault clearance as stated by NRLDC, Following points were observed.
- Busbar relay itself operated after approximately 140ms. owing the fact that restraining current was significantly high.
- After issuance of tripping command the fault got cleared within 3 cycles. One more spike of current was observed in R phase of bay-7 i.e Baghpat PG-I at 250ms which shows that the line was probably still charge from remote end and tripped in zone-2 instead of DT receive at remote end.
- **As remedial action taken, UPPTCL has initiated a program for checking the healthiness of old and vulnerable CTs which includes TAN DELTA and partial discharge test on CTs.**

PSC Forum Recommendations:

- *Members may ensure regular checking and healthiness of protection system to avoid any unwanted tripping in future.*
- *DT scheme of 220 KV Baghpat(PG)-Shamli(UP) (UP) Ckt need to be checked during earliest available shutdown.*

C. Multiple elements tripping at 220/66/33kV Delhi Rohtak Road(BB) at 18:34 hrs on 14th March, 2025

Discussion during the meeting:

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

- 220/66/33kV Delhi Rohtak Road(BB) S/s has double main bus arrangement at 220kV level.

- During antecedent condition, incoming power at Delhi Rohtak Road(BB) through 220 KV Delhi RR(BB)-Narela(DV) (BBMB) D/C was approx. 17 MW each (as per SCADA) which was supplying load of Delhi Rohtak Road(BB) S/s.
- As reported, at 18:34hrs, 220 KV Delhi RR(BB)-Narela(DV) (BBMB) Ckt-1 tripped on R-B phase to phase fault with following relay indications: fault distance of 1.185km and fault current of Ir=~2.587kA and Ib=~2.523kA from Delhi RR(BB) end and fault distance of 17.59 km and fault current of Ir=~3.841kA and Ib=~3.878kA from Narela(DV) end. During patrolling, a kite string was found tangled between R and B phases at tower loc. no. 1069A, which was later removed.
- During the same time, 220 KV Delhi RR(BB)-Narela(DV) (BBMB) Ckt-2 also tripped from Narela end only with following relay indications : fault distance of 17.59 km and fault current of Ir=~3.841kA and Ib=~3.878kA from Narela(DV) end (exact reason of fault yet not shared). During patrolling, nothing abnormal was found.
- Due to tripping of 220 KV Delhi RR(BB)-Narela(DV) (BBMB) D/C, complete blackout occurred at 220/66/33kV Delhi Rohtak Road(BB) S/s.
- As per PMU at Mandaula(PG), R-B phase to phase fault with fault clearing time of 80 ms is observed.
- As per SCADA, change in demand of approx. 30 MW is observed in Delhi control area.
- **Major observations:**
  - Exact reason of fault in 220 KV Delhi RR(BB)-Narela(DV) (BBMB) Ckt-2 need to be shared.
  - DR/EL need to be shared from both the ends for each element.
  - Remedial action taken report to be shared.

ii. BBMB representative informed the following:

- During antecedent condi□on, 220 KV Delhi RR(BB)-Narela(DV) (BBMB) D/C was supplying load to Delhi Rohtak Road(BB) S/s.
- From DTL Narela Sub-station to R. Rd. Delhi BBMb Sub-station, there are 2 Nos. 220kV circuits of line length 22km each.

- On dated 14.03.2025 at 18:34 hrs, there was Ph-A to Ph-C fault (kite string found) on 220 kV Narela-R/R Ckt.-1 which was cleared from both ends within 100ms. During patrolling, a kite string was found tangled between R and B phases at tower loc. no. 1069A, which was later re-moved.
- 220 KV Delhi RR(BB)-Narela(DV) (BBMB) Ckt-1 tripped on R-B phase to phase fault with following relay indica□ons: At RR Delhi BBMB end: Fault distance-1.185km, Fault current: Ir=~2.587kA & Ib=~2.523kA and At DTL Narela end: Fault distance-17.59 km, Fault current: Ir=~3.841kA and Ib=~3.878kA**.**
- As pe the DR & events of DP schemes at DTL Narela end, the fault was in Zone-2 from Narela end which was cleared immediately by Z-2 carrier aided trip.
- As pe the DR & events of DP schemes at BBMB RR Delhi end, the fault was in Zone -1 from Delhi end.
- During the same time, 220 KV Delhi RR(BB)-Narela(DV) (BBMB) Ckt-2 also tripped from Narela end only with following relay indica□ons :Fault distance- 17.59 km, Fault current- Ir=~3.841kA and Ib=~3.878kA. During patrolling, nothing abnormal was found.
- The distance protection relay (Main-1) provided on other circuit i.e. 220kV Narela-R/R Ckt.-2 sensed the fault in Z-2 and same was reset within 70 msec after tripping of 220 kV Narela-R/R Ckt.-1 from both ends.
- Similarly, the distance protection relay (Main-2) provided on 220kV Narela-R/R Ckt.-2 sensed the fault in Z-2 initially and same was reset within 70 msec after tripping of 220 kV Narela-R/R Ckt.-1 from both ends. However Main-2 DP relay picked up in Zone 1 after 15msec of Z-2 reset which is unreasonable whilst Main 1 DP relay performed correctly after Zone 2 reset and didn't pick up in any zone.
- Due to tripping of 220 KV Delhi RR(BB)-Narela(DV) (BBMB) D/C, com-plete blackout occurred at 220/66/33kV Delhi Rohtak Road(BB) S/s as these two circuits are only source of power.
- **As remedial action taken, DR of the fault was transplayed on Main-1 & 2 relay of 220kV DTL Narela-R/R Ckt-2 and it was observed that**

Main-1 relay didn't pick up Zone-1 whereas Main-2 relay picked Zone-1 on same fault during transplay. It was inferred that Main-2 relay operation on such faults is not reliable. As such the said relay has been kept out of service and being replaced with a new relay.

PSC Forum Recommendations:

- *Resistive reach settings of zones need to be reviewed.*
- *Instead of keeping Main-2 relay out of service, it can be kept in service with zone-1 settings of 100 msec until it is being replaced by new relay.*

D. Multiple elements tripping at 400kV Parbati_3(NH) and 400kV Sainj HEP(HP) at 14:46 hrs on 16th March, 2025

Discussion during the meeting:

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

- Total generated power of Sainj HEP(HP), Parbati_2(NH) and Parbati_3(NH) evacuates through 400 kV Parbati_2(NH)- Banala(PG) (PKTCL) Ckt and 400 kV Parbati_3(NH)- Banala(PG) (PKTCL) Ckt via 400 KV Parbati_2(NH)-Sainj(HP) (PKTCL) Ckt and 400 KV Parbati_3(NH)-Sainj(HP) (PKTCL) Ckt.
- During antecedent condition, no generation was there at 400kV Parbati_2(NH), 400kV Parbati_3(NH) and 400kV Sainj HEP(HP).
- As reported, at 14:46hrs, 400 KV Parbati_3(NH)- Banala(PG) (PKTCL) Ckt tripped from Banala(PG) end only on R-N phase to earth fault with fault distance of 6.9km and fault current of 5.545kA from Banala(PG) end (exact reason of fault yet to be shared).
- As further reported, 400 KV Parbati_2(NH)-Sainj(HP) (PKTCL) Ckt also tripped at the same time from Sainj end only (exact reason of tripping yet to be shared).
- Due to tripping of both 400 KV Parbati_3(NH)- Banala(PG) (PKTCL) Ckt and 400 KV Parbati_2(NH)-Sainj(HP) (PKTCL) Ckt, complete blackout occurred at 400kV Parbati_3(NH) and 400kV Sainj HEP(HP) S/s.

- As per PMU at Nallagarh(PG), two consecutive R-N phase to earth fault is observed with delayed fault clearing time of 1240 ms and 1040 ms respectively.
- As per SCADA, no generation loss is observed at 400kV Parbati_2(NH), 400kV Parbati_3(NH) and 400kV Sainj HEP(HP) as there was no generation at either of them.
- **Major observations:**
  - Exact reason of fault need to be analyzed.
  - Exact reason of tripping of 400 KV Parbati_2(NH)-Sainj(HP) (PKTCL) Ckt need to be shared.
  - Reason of delayed clearance of fault need to be shared.
  - DR/EL (.dat/.cfg file) along with tripping report need to be shared for each element from both the ends.
  - Remedial action taken report to be shared.

iii. NHPC representative informed the following:

- CB at Parbati_3(NH) end of 400 KV Parbati_3(NH)- Banala(PG) (PKTCL) Ckt remains closed as there was no source (no generation at Parbati_3) relay didn't sensed.
- 400 KV Parbati_2(NH)-Sainj(HP) (PKTCL) Ckt also tripped at the same time from Sainj end only as under-voltage operated at Sainj end.

PSC Forum Recommendations:

- *SLDC HP needs to ensure under-voltage at Sainj end of* 400 KV *Parbati_2(NH)-Sainj(HP) (PKTCL) Ckt is disabled.*
- *DR needs to be submitted from Sainj end of* 400 KV *Parbati_2(NH)-Sainj(HP) (PKTCL) Ckt and Banala end of 400 KV Parbati_3(NH)- Banala(PG) (PKTCL) Ckt.*

E. Multiple elements tripping at 400kV AGE25L & 220kV Nokhra(IP) at 10:00 hrs on 18th March, 2025

Discussion during the meeting:

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

- Generation of 220kV Nokhra (IP) and 400kV AGE25L stations evacuate through 220 KV Nokhra SL_BHD2 (NTPC)-Bhadla_2 (PG) (NTPC_NOKHRA) Ckt and 400 KV AGE25L SL_BHD2_PG-Bhadla_2 (PG) (AGE25L) Ckt-1 respectively.
- During antecedent condition, 220kV Nokhra (IP) and 400kV AGE25L were generating approx. 262 MW and 488 MW respectively (as per PMU).
- As reported, at 09:59:46hrs Y-Phase CT of 405-52 bay at AGE25L RE station failed and it triggered Transformer Differential protection of main CB 404-52 and Tie CB 405-52 opened on Bus-Bar Zone-1 protection.
- At 09:59:47 hrs, 400 KV AGE25L SL_BHD2_PG-Bhadla_2 (PG) (AGE25L) Ckt-1 tripped on R- Phase line differential protection. During inspection at site, spark in R-phase CVT was found and the same was replaced.
- As per PMU at 400kV Bhadla2(PG), Y-N fault cleared in 240msec followed by permanent R-N fault is observed is observed with fault clearing time of 80ms.
- At the same time, 400/220kV 500MVA ICT-6 at Bhadla2(PG) and 220 KV NOKHRA SL_BHD2 (NTPC)-BHADLA_2 (PG) (NTPC_NOKHRA) CKT-1 also tripped. The reason for the same is yet to be received.
- As per PMU, solar generation loss of approx. 487 MW at AGE25L(IP) and 262 MW at Nokra(IP) were observed.
- As per SCADA, total Generation loss of 1035MW was observed in NR region.
- **Major observations:**
  - Exact reason of tripping and nature of protection operated in 400/220 KV 500 MVA ICT 6 at Bhadla_2 (PG) and 220 KV Nokhra SL_BHD2 (NTPC)-Bhadla_2 (PG) (NTPC_Nokhra) Ckt-1 need to be shared.
  - DR/EL along with tripping report need to be shared from both the ends.
  - Remedial action taken report to be shared.

ii. ADANI representative informed the following:

- At around 09:59:46 Hrs., There was a flashover in the 400kV Bay No 405 in the Y-phase CT of Transformer-2 Tie Bay. Due to the flashover there was tripping of TR-2 and Busbar Differential protection of Bus-1. Subsequent to the fault there was operation of 400kV Busbar differential protection also.
- The Transformer-2 Tie Bay CT-B Y phase CT (Mehru Make) Failure triggered a sequence of protection operations, ensuring controlled isolation of the fault.
    - Opening of Main CB 404-52 operation of Transformer Differential Protection.
    - Opening of Tie CB 405-52 on operation of Busbar Zone-1 Protection.
- A detailed root cause analysis is required to determine the exact reason of the CT failure which has been conveyed to the OEM.
- It is also observed that 400kV Line was tripped on operation of R-Phase Line differential protection after 1.3sec of above incident.
- The detailed checking of switchyard and Line side carried out, however apparently nothing was found abnormal.
- At evening 17:45 Hrs. there was spark observed in R-Phase CVT of line-1. Hence, emergency shutdown was availed and CVT was replaced with new one.
- With above observation it can be concluded that during the incident-1 there might be tracking in the R-Ph CVT which might led to the development of differential in R-phase caused to the operation of R-phase Line Differential protection.
- **As remedial action taken,**
    - **Faulty CT was removed and new CT was installed in 405 Tie Bay under restoration work.**
    - **Line-1 R-phase CVT was replaced after found sparking after taking emergency shutdown.**

- **Healthiness of associated equipment in Transformer-2 Tie Bay was verified and inspection and assessment of damaged CT was initiated.**

iii. POWERGRID representative informed the following:

- 400/220 KV 500 MVA ICT 6 AT BHADLA_2 (PG) tripped during the same time due to differential protection operation due to maloperation of CT (Issue in CT reading) which is replaced now.

iv. NTPC representative informed the following:

220 KV NOKHRA SL_BHD2 (NTPC)-BHADLA_2 (PG) (NOKHRA) CKT-1 tripped on over-voltage protection operation at Nokhra end.

PSC Forum Recommendations:

- *NTPC need to ensure over-voltage is disabled at Nokhra end of 220kV Nokhra-Bhadla2 Ckt.*
- *Members may ensure healthiness of protection system to avoid any unwanted tripping in future.*

F. Multiple elements tripping at 220kV Azure 34 & 220kV Azure Maple (IP) at 13:43 hrs on 31st March, 2025

Discussion during the meeting:

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

- Generation of 220kV Azure Maple(IP) station evacuates through 220 KV Bhadla(PG)-Azure Maple PSS SL_BHD_PG (APMPL) (APMPL) Ckt-1 which was generating approx. 290 MW (as per PMU). Similarly, 220kV Azure 34(IP) station evacuates through 220 KV BHADLA(PG)-AZURE POWER 34 SOLAR(APTFL) (APTFL) CKT-1 which was generating 132MW (as per PMU).

- As reported, at 13:43hrs, 220 KV Bhadla(PG)-Azure Maple PSS SL_BHD_PG (APMPL) (APMPL) Ckt-1 tripped on R-N phase to earth fault due to differential protection operation on account of tree fell on the line.
- At the same time 130 MVA 220/33KV ICT at 220kv Azure 34 also tripped on account of Differential relay protection (exact reason yet to be shared)
- Due to tripping of 220 KV Bhadla(PG)-Azure Maple PSS SL_BHD_PG (APMPL) (APMPL) Ckt-1 and 130 MVA 220/33KV ICT1 at Azure34, Azure Maple(IP) and Azure 34 S/s lost its connectivity from grid and blackout occurred at 220kV Azure Maple(IP) and 220kV Azure 34(IP) S/s.
- As per PMU at Bhadla(PG), R-N phase to earth fault (voltage dipped upto 0.95 p.u.) is observed with fault clearing time of 160ms. After the fault clearance voltage increased upto 1.04 p.u.
- As per PMU at Bassi(PG), a sharp drop in frequency is observed from 49.90 Hz to 49.82 Hz and frequency recovered to 49.91 Hz within 1 min.
- As per SCADA, dip in NR total solar generation of approx. 802 MW is observed.
- As per SCADA, solar generation loss of approx. 290MW at Azure Maple, 132MW at Azure34, 115MW at TPREL and 115MW at AHEJ4L RE stations were observed. Drop in generation of TPREL and AHEJ4L is suspected due to LVRT non-compliance. Details is yet to be received from RE stations.
- As per DR (Bhadla end) of 220 KV Bhadla(PG)-Azure Maple PSS SL_BHD_PG (APMPL) (APMPL) Ckt-1, R-N phase to earth fault (~7.3kA) with unsuccessful A/R operation is observed. 3-ph A/R was observed instead of 1-ph A/R.
- **Major observations:**
  - Exact reason of tripping of 130 MVA 220/33KV ICT at 220kv Azure 34 need to be shared.
  - Details of RE generation loss and reason of the same need to be shared from RE plants and Rajasthan.
  - DR/EL of Azure34 end also need to be shared.

- Remedial action taken report to be shared.

***Azure representative was not present during the meeting*.**

PSC Forum Recommendations:

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

B.3.8 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 March'25 (agenda by NRLDC)

B.4.1 A total of 10 inter-regional lines tripping occurred in the month of March 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 reason for DT received at Orai end of 765 KV Orai-Jabalpur (PG) Ckt-2. POWERGRID representative stated that master trip relay operated at Jabalpur end resulting into opening of feeder and rise in voltage at Jabalpur end. Line tripped on over-voltage stage-1 protection operation at Jabalpur end and DT received at Orai end.

B.4.3 In 220 KV Ranpur(RS)-Bhanpura(MP) (RS) Ckt-1, RVPNL representative stated that there was issue in CVT, CVT was replaced.

B.4.4 NPCIL representative was not present during the meeting.

Decision of the Forum

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 March, 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. Further In compliance with IEGC clause 16.3, users shall also share the detailed report of SPS operation in their respective control area within 3 days of its operation. Presently, no such report is being received.

B.5.5 In this regard, communication has already been sent to constituents through NRLDC letter dated 01.05.2024, 21.02.2025 & 05.03.2025 and continuous follow up is being done in OCC & PSC meeting since May 2024.

B.5.6 Mock testing of most of the SPS has been conducted in FY 2024-25, however it is pending at some of the stations / complex shown in table below:

Not conducted Mock Testing of SPS in 2024-25

Sr. No.	Scheme Name	Control Area	Remarks	Date of Last Mock testing conducted
1	SPS for contingency due to tripping of HVDC Mundra-Mahendergarh	ADANI	Not healthy. Review is being done at OCC/PSC forum	
2	System Protection Scheme (SPS) for HVDC Balia-Bhiwadi Bipole	POWERGRID	Schedule not received. Review of SPS is needed.	
3	SPS for high capacity 400 kV Muzaffarpur-Gorakhpur D/C Inter-regional tie-line related contingency	POWERGRID	Schedule not received. Review of SPS is needed.	
4	SPS for Reliable Evacuation of Ropar Generation	Punjab	Schedule not received	
5	SPS for contingency due to tripping of evacuating lines from Narora Atomic Power Station	NAPS	Schedule not received	
6	SPS for Lahal Generation	Himachal Pradesh	Schedule not received	08-07-2020
7	SPS for evacuation of Kawai TPS, Kalisindh TPS generation complex	Rajasthan	Partially conducted on 14-03-2025. Complete exercise needs to be conducted.	

8	SPS for Transformers at Ballabhgarh (PG) substation	POWERGRID	Not in service, Review is being done in OCC/PSC forum	
9	SPS for Transformers at Maharanibagh (PG) substation	POWERGRID	Not in service, Review is being done in OCC/PSC forum	
10	SPS for Transformers at Mandola (PG) substation	POWERGRID	Not in service, Review is being done in OCC/PSC forum	
11	SPS for Transformers at Bamnauli (DTL) Substation	Delhi	Schedule not received; Review is being done at OCC/PSC forum	
12	SPS for Transformers at 400kV Deepalpur (JKTPL) Substation	INDIGRID	Schedule not received	
13	SPS for Transformers at 400kV Unnao (UPPTCL) Substation	Uttar Pradesh	SPS Unhealthy	19-05-2023

B.5.7 In view of the above, utilities were requested to conduct the mock testing of pending SPS (mentioned in above table) by the end of April 2025 month through NRLDC letter dated 04.04.2025.

B.5.8 Representatives from PSPCL, NPCIL, SLDC HP and INDIGRID were not present during the meeting.

B.5.9 RVPNL representative informed that mock testing of “SPS for evacuation of Kawai TPS, Kalisindh TPS generation complex” will be conducted within 1 month.

B.5.10 POWERGRID representative informed that “SPS for Transformers at Ballabhgarh(PG) substation” is not required now as ICTs of 315 MVA are replaced by 500 MVA and may be reviewed.

B.5.11 DTL representative informed that “SPS for Transformers at Bamnauli (DTL) Substation” is not required now and may be reviewed.

B.5.12 NRLDC representative asked the status of “SPS for Transformers at 400kV Unnao (UPPTCL) Substation” (SPS was unhealthy). SLDC UP representative informed that work is under progress and it will be completed within 15 days.

B.5.13 Concerned constituents/ utilities were requested to share the tentative schedule plan for

conducting mock testing of SPS in their respective control area during 2025-26 in format attached as **Annexure-B.VI.** Update in this regard is received from Rajasthan and UP till now.

B.5.14 Further, in view of changes in network connectivity, network augmentation and load flow, review of some of the major SPS is needed. Major SPS whose review is needed are:

a) SPS for high capacity 400 kV Muzaffarpur-Gorakhpur D/C Inter-regional tie-line related contingency

b) System Protection Scheme (SPS) for HVDC Balia-Bhiwadi Bipole

B.5.15 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. UPPTCL representative informed that “SPS for Transformers at 400kV Sultanpur (UPPTCL) Substation” and “SPS for Transformers at Greater Noida (UPPTCL) Substation” are not required now and may be reviewed.

Decision of the Forum

PSC Forum requested members to conduct the mock testing of SPS in their respective control area, share the tentative schedule of mock testing of SPS and share the report after conducting mock test.

B.6 Protection related issues in J&K control area (agenda by NRLDC)

a) Frequent tripping events in J&K(UT) control area (multiple events of load loss)

Frequent events of multiple elements tripping leading to load loss have been observed in J&K (UT) control area. Majorly affected substation are 220kV Ziankote, Barn, Mirbazar, Jammu(Gladini) & Pampore and 400kV Baglihar. Details of tripping

events occurred at aforementioned sub stations during period of Jan'24-Mar'25 are enclosed in **Annexure-B.VII**. Such frequent grid events are very detrimental to the safety and security of the state grid as well as to that of regional and national grid.

PSC Forum requested J&K to take expeditious action at their end to minimise this kind of events in future.

b) Protection non-compliance in J&K control area

During analysis of the grid events occurred in J&K control area based on the available data, following protection related issue are observed:

i. Non-operation of A/R during single phase to earth fault. During 46th PSC meeting J&K stated that ''in next financial year, work of installation of OPGW in all the transmission lines will be started. Follow-up actions are being done regarding the same. OPGW work will be followed by installation of PLCC''. However, no further update received from J&K.

ii. Issue related protection settings in transmission elements. Protection system are also not well coordinated with remote substations. Unwanted trippings of the elements are also observed. Hence, reviewing protection settings of transmission elements at J&K(UT) substations and ensuring its proper coordination with the nearby substation is need to be ensured.

PSC Forum requested J&K to share the details of actions taken to address aforementioned issues. Also share status of follow-up actions taken/to be taken in this regard.

c) Non submission of Disturbance recorder (DR), Event logger (EL) and tripping reports of Tripping events

It is to be noted that as per the IEGC provision under clause 37.2 (c), tripping report along with DR/EL has to be furnished within 24 hrs of the occurrence of the event and detail report of the event is to be submitted within a week of event. However, no

DR/EL & tripping report of any event have been received from J&K control area for any of the grid event till date. Data submission status for period of Jan'24-Mar'25 is attached as **Annexure-B.VIII**. Field data is very much important for complete analysis of the grid events.

DR/EL of all the tripping shall be uploaded on Web Based Tripping Monitoring System **"https://postda.nrldc.in/Account/Login.aspx"** within 24 hours of the events as per IEGC clause 37.2(c) and clause 15.3 of CEA grid standard.

PSC Forum requested J&K to note the above and advise the concerned for timely submission of the DR/EL & tripping details in future.

B.7 Maloperation of protection system at 400/220kV Jaisalmer (RS) in Rajasthan control area (agenda by NRLDC)

B.7.1 Frequent events of multiple elements tripping at 400/220kV Jaisalmer (RS) S/s have been observed in recent past, raising concern over the stability and reliability of the system.

B.7.2 On 02.04.2025, at 17:26 hrs, all the 400kV elements connected to 400 KV Jaisalmer (RS) - Bus 2 tripped due to B Phase CB pole of 125 MVAR Bus Reactor No 1 at 400 KV Jaisalmer (RS) damaged/ blast causing operation of LBB relay. As Jaisalmer (RS) has one and half breaker scheme at 400kV level, elements should not have tripped due to LBB operation. However, as reported, all the tie CB also tripped along with Main CBs at Bus-II on LBB operation.

B.7.3 On 07.04.2025, at 23:21 hrs, 400 KV Jaisalmer (RS)-M/s Renew Hans urja pvt Ltd (RS) (Renew Hans urja pvt Ltd) Ckt tripped during testing of 400kV Main Bus-I at Jaisalmer (RS).

B.7.4 Again, on 09.04.2025, at 00:00 hrs, all the 400kV elements connected to 400 KV Jaisalmer (RS) - Bus 2 tripped during Bus stability testing of 400kV Main Bus -II at Jaisalmer (RS).

B.7.5 Maloperation of protection system during testing work highlights the issue of non-standard practice during testing work. In this regard, communication has already been sent to Rajasthan through NRLDC letter dated 09.04.2025 and this issue has already been highlighted many times during OCC & PSC Forums and utilities have been requested to ensure that standard operating procedure are followed during any testing work at site.

B.7.6 In view of this, Forum requested SLDC-RS / RVPNL to share the details w.r.t. the grid event and remedial action taken to avoid such events in future. RVPNL informed that during 1st event, wiring issues were there in LBB protection RVPNL also ensured that these types of maloperation issues in next two events will be taken care of in near future.

Decision of the Forum

Forum directed Rajasthan SLDC/RVPN to share the details w.r.t. the grid event and remedial action taken to avoid such events in future.

B.8 Healthiness of protection system and protection settings in line with the NRPC Protection Philosophy in Rajasthan Control area (agenda by NRLDC)

B.8.1 Frequent tripping of 400kV lines in Rajasthan RE complex have been observed in recent past. List of the tripping events is mentioned in the below table:

S. No	Name of the element	Tripping Date & time	Reason of tripping
1.	400 KV Bhadla-Jodhpur (RS) Ckt-1	12:44 hrs, 02.04.2025	B-N phase to earth fault
2.	400 KV Bhadla-Ramgarh (RS) Ckt-2	14:24 hrs, 06.04.2025	B-N phase to earth fault
3.	400 KV Bikaner-Merta (RS) Ckt-1	21:00 hrs, 06.04.2025	B-N phase to earth fault
4.	400 KV Merta-Kankani (RS) Ckt-1	21:02 hrs, 06.04.2025	R-N phase to earth fault
5.	400 KV Bikaner-Merta (RS) Ckt-1	11:53 hrs, 07.04.2025	B-N phase to earth fault
6.	400 KV Bikaner-Bhadla (RS) Ckt-1	12:33 hrs, 07.04.2025	R-N phase to earth fault
7.	400 KV Bhadla-Ramgarh (RS) Ckt-2	13:48 hrs, 07.04.2025	Y-N phase to earth fault

B.8.2 From the above tripping incidents, it is evident that most of the tripping occurred during peak solar hours. Outage of multiple elements may further affect the loading of other

lines and may lead into cascade tripping in the complex. Therefore, frequent tripping of lines in RE complex during solar hours affects the security and reliability of the complex. It is also suspected that phase overcurrent protection has been kept enabled in 400kV transmission lines in Rajasthan control area which is not desired and non-compliance of NRPC protection philosophy. It may also lead to unwanted tripping of transmission lines.

Decision of the Forum

Forum requested SLDC-RS / RVPNL to share the reason and analysis of tripping incidents and share the details of remedial action taken to avoid such tripping incidents specifically in RE complex. Further, it was also requested to disable the phase overcurrent protection in transmission lines if it is kept enabled.

B.9 Corrective action for healthiness of 500kV Mundra-Mahindergarh SPS (agenda by NRLDC)

B.9.1 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.9.2 Further, NRLDC in coordination with NLDC conducted an online discussion meeting with concerned stakeholders (SLDCs, ADANI, POWERGRID) on 12th August 2024, for further remedial actions required to make this SPS healthy.

B.9.3 Following actions were decided during the meeting:

i. POWERGRID, ADANI and concerned states were requested to identify the issue in communication links and take expeditious actions to make 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.9.4 Load end details have been received from UP, Haryana, Punjab Rajasthan & Delhi. Details and communications are attached as **Annexure-B.IX**.

B.9.5 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.9.6 Details of nodal officer of different substation involved in SPS scheme has already been shared with ADANI team for coordination and further remedial actions.

B.9.7 During 53rd PSC meeting, ADANI was requested to coordinate with the respective states to rectify the issues in the SPS system and share the status of remedial action taken / planned to be taken. Desired remedial actions need to be expedited.

B.9.8 ADANI agreed for the same and stated that update would be given within 01 week. However, no detail received yet from ADANI.

B.9.9 During discussion in 54th PSC meeting also there was no further update received from ADANI team.

B.9.10 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.9.11 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.9.12 States representative assured to provide all necessary coordination from their end.

B.9.13 During 56th PSC meeting, ADANI was requested to apprise the forum about the present status of remedial actions.

B.9.14 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.9.15 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.9.16 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.9.17 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.

B.9.18 During 58th PSC meeting, ADANI representative shared the observations made by COMTEL engineers and informed that it would at least require 6 months to complete the work.

B.9.19 NRLDC CGM (SO) highlighted that in view of envisaged growth in demand in next summer season, it is important to ensure rectification of issues and healthiness of SPS.

B.9.20 ADANI representative further informed that cost implication in this case is estimated as approx. Rs. 1.5 Cr. Till now they conducted technical assessment and made cost estimation. He submitted to allow the cost recovery of this under ADDCAP. MS, NRPC conveyed that Adani may bring the separate agenda for approval of cost recovery mode with proper justification. Adani representative mentioned that he will look into the regulatory aspect and will present accordingly.

B.9.21 During 59th PSC meeting, ADANI representative informed that they are doing discussions with ULDC for allocation of necessary links between locations. They have also initiated internal approval for placing necessary orders to the partner for execution of upgradation activity. They are expecting to complete the execution within 4-5 months in collaboration with all the stakeholders from respective utilities and ULDC team. Communication from ATIL in this regard is also sent to NRLDC through letter dated 10th April 2025.

Decision of the Forum

Forum emphasized the importance of 500kV Mundra-Mahindergarh SPS and its healthiness is important to ensure rectification of issues in SPS system before summer 2025. State representatives were also requested to coordinate with the ADANI team and also ensure incorporation of identified revised feeders for load relief in SPS. Desired remedial actions need to be expedited.

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

C.1.1 AEE (P), NRPC mentioned that NRLDC has submitted the list of FTCs allowed in month of March-2025. The same may be found on NRPC website: http://164.100.60.165/meetings/prsub.html

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

final approval of settings.

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

i. POWERGRID
ii. PBTSL
iii. PRTL
iv. UPSLDC
v. RVPNL
vi. PTCUL
vii. HVPNL

C.1.4 Forum approved the above proposed FTC settings.

C.1.5 However, none of the settings was put up by following utilities:

i. Gorbea_SPL
ii. SJVNGEL_BKN2
iii. NHPC
iv. Renew Surya Jyoti Private Limited
v. Neemba_SPRVPL
vi. NPCIL
vii. Nokh Solar Power Plant NTPC Limited
viii. POWERGRID (settings for 1 element not submitted)
ix. RVPNL (settings of 1 element not submitted)

C.1.6 Further, UPSLDC submitted settings for FTC allowed at UPSLDC level in March, 2025 for final approval of settings. The same was also discussed. AEE (P), NRPC highlighted that differential, overcurrent & earth fault protection settings need to reviewed to align with finalized protection philosophy of NRPC for transformers that have been given FTC by UPSLDC on its SLDC level. Over excitation protection may also be kept as per the capability curve provided by OEM or as per finalized protection philosophy.

B. February 2025 & January 2025.

C.1.7 UPSLDC also submitted the settings of FTCs allowed by NRLDC and UPSLDC in month of February-2025 & January -2025 for final approval of settings. Forum approved the proposed settings for the element given FTC by NRLDC. However, to align with finalized protection philosophy, Forum recommended UPSLDC to review the protection settings of transformers for which FTC was allowed at SLDC level.

C. August 2024 & November 2024

C.1.8 THDC submitted the settings of FTCs allowed by NRLDC for Tehri Pumped Storage Project (PSP) vide mail dated 15.04.2025 for final approval of settings of Unit-5, 6 and Transmission line-3. Forum approved the proposed FTC settings**.**

C.1.9 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.1.10 MS, NRPC stated that utilities should take approval as procedure has been approved by Forum only and it is requirement of IEGC 2023.

C.1.11 These all submitted settings are available at NRPC website: http://164.100.60.165/meetings/prsub.html

Decision of the Forum:

After detailed deliberation, following was decided as below-

1) *Forum approved the proposed protection settings of the elements of POWERGRID, PBTSL, PRTL, RVPNL, PTCUL, HVPNL and UPSLDC for which FTC was allowed at NRLDC level in March, 2025.*

2) *Forum approved the proposed protection settings of the elements of UPSLDC for which FTC was allowed at NRLDC level in January, 2025.*

3) *Forum requested UPSLDC to review the proposed protection settings of elements for which FTC was allowed at SLDC level in the months of January, February and March, 2025 to align with finalized protection philosophy of NRPC.*

4) *Forum approved the proposed protection settings of THDC for Unit-5, 6 and Transmission line-3 for which FTC was allowed by NRLDC.*

5) *Concerned members who have not submitted the agenda were requested to put up agenda timely for approval of settings.*

*****

Members of Protection Sub-Committee (FY 25-26)

S. No.	NRPC Member Organization	Designation	Email-ID
1	Member (GO&D), CEA	Director, NPC Division	skdotancea@nic.in
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4	PGCIL	GM	gunjan.agrawal@powergrid.in
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21	HVPNL	Chief Engineer (TS)	cetspkl@hvpn.org.in
22	RRVPNL	CE (M&P)	ce.mps@rvpn.co.in
23	UPPTCL*	Managing Director	md@upptcl.org
24	PTCUL	SE(T&C)	setandchld@gmail.com
25	PSTCL	Chief Engineer (P&M)	ce-pm@pstcl.org
26	HPPTCL*	Managing Director	md.tcl@hpmail.in
27	IPGCL	DGM (Protection)	arif.ipgcl@gmail.com
28	HPGCL	SE/M&T RGTPP	semt.rgtpp@hpgcl.org.in
29	RRVUNL*	CMD	cmd@rrvun.com
30	UPRVUNL	Chief Engineer, (L-2)	ce.ppmm@uprvunl.org
31	UJVNL*	Managing Director	mdujvnl@ujvnl.com
32	HPPCL*	Managing Director	md@hppcl.in
33	PSPCL	Chief Engineer/GHTP	ce-ghtp@pspcl.in
34	DHBVN	Managing Director	md@dhbvn.org.in
35	Ajmer Vidyut Vitran Nigam Ltd.	Managing Director	MD.AVVNL@RAJASTHAN.GOV.IN
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41	Apraava Energy Private Limited*	GM-Electrical	navin.chaturvedi@apraava.com
42	Talwandi Sabo Power Ltd. *	COO	Vibhav.Agarwal@vedanta.co.in
43	Nabha Power Limited*	CEO	sk.narang@larsentoubro.com
44	MEIL Anpara Energy Ltd	COO & WTD, Executive Director	anandkumar.singh@meilanparapower.com arun.tholia@meilanparapower.com
45	Rosa Power Supply Company Ltd	GM-ELECTRICAL	Kesarinandan.pandey@reliancegroupindia.com
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48	Adani Power Rajasthan Limited*	GM	Ashish.Baviskar@adani.com
49	JSW Energy Ltd. (KWHEP)*	Head Regulatory & Power Sales	jyotiprakash.panda@jsw.in
50	Transition Cleantech Services Private Limited*	Deputy Manager	kswamidoss@evrenenergy.com
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52	UT of Ladakh*	Chief Engineer, LPDD	cepdladakh@gmail.com
53	UT of Chandigarh	Executive Engineer	elop2-chd@nic.in
54	Tata Power Delhi Distribution Limited*	HOG-PMG	sandeep.k@tatapowerddl.com
55	Gurgaon Palwal Transmission Limited*	Head Regulatory	Lokendra.Ranawat@indigrid.com
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58	NTPC Green Energy Limited*	CEO, Sr. Mgr	rajivgupta@ntpc.co.in, sandeepdahiya@ntpc.co.in
59	Azure Power India Pvt. Limited*	CEO	sunil.gupta@azurepower.com
60	Avaada Energy Private Limited*	CEO	kishor.nair@avaada.com
61	Adani Green Energy Limited	AVP	sanjay.bhatt@adani.com

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

List of Members of Rnenewable Energy Sub-committee

S. No.	Members of RE Sub-committiee	Representative Email ID
1	Ministy of New and Renewable Energy	anindya.parira@nic.in;
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3	Northern Regional Load Despatch Center	somara.lakra@grid-india.in;
4	Central Transmission Utility	Kashish@powergrid.in;
5	Powergrid Corporation of India Ltd.	saroj.mishra@powergrid.in; yashpal@powergrid.in
6	Rajasthan Rajya Vidyut Prasaran Nigam Ltd.	se.pp@rvpn.co.in;
7	Rajasthan State Load Despatch Center	se.ldrvpnl@rvpn.co.in;
8	Solar Energy Corporation of India	sanjaysharma@seci.co.in; vkumar@seci.co.in;
9	National Solar Energy Federation of India	ankur.kumar@nsefi.in; ceooffice@nsefi.in;
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15	Adani Hybrid Energy Jaisalmer Two Ltd.	
16	Adani Hybrid Energy Jaisalmer Three Ltd.	
17	Adani Hybrid Energy Jaisalmer Four Ltd.	
18	Adani Renewable Energy (RJ) limited Rawara	
19	Adani Solar Energy Jaisalmer One Pvt. Ltd._450MW (Solar)	
20	Adani Solar Enegry Four Private Limited	
21	Adani Solar Energy Jaisalmer Two Private Limited	kailash.nagora@adani.com;
22	Adani Solar Energy Jaisalmer Two Private Limited Project Two	sanjay.bhatt@adani.com;
23	SB ENERGY FOUR PRIVATE LIMTED, Bhadla	
24	SB Energy Six Private Limited, Bhadla	
25	Adani Solar Enegry Jodhpur Two Limited, Rawara	
26	Adept Renewable Technologies Pvt. Ltd.	
27	Adani Solar Energy RJ Two Pvt. Ltd. (Devikot)	
28	Adani Solar Energy RJ Two Pvt. Ltd. (Phalodi)	
29	Adani Green Energy 19 Limited	

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32	AMP Energy Green Six Pvt. Ltd.	vbhattacharya@ampenergyindia.com;
33	Amplus Ages Private Limited	manish.tak@amplussolar.com;
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35	Avaada sunce energy Pvt limited	
36	Avaada Sunrays Pvt. Ltd.	
37	Avaada Sustainable RJ Pvt. Ltd.	
38	Ayana Renewable Power Three Private Limited	Venkatraman@ayanapower.com;
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42	Azure Maple Pvt. Ltd.	sourin.nandi@azurepower.com;
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50	Mega Surya Urja Pvt. Ltd. (MSUPL)	msupl_250mw_ists@mahindra.com;
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53	SINGRAULI SOLAR	
54	Anta Solar	
55	Unchahar Solar	
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57	NTPC Kolayat_400kV	
58	Nedan Solar NTPC	
59	NTPC Nokhra_300MW	
60	One Volt energy Pvt. Ltd.	amarjeet.thakur@amplussolar.com;
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62	RENEW SOLAR POWER Pvt. Ltd. Bhadla	
63	ReNew Solar Urja Private Limited	
64	Renew Sun Bright Pvt. Ltd. (RSBPL)	
65	Renew Sun Waves Private Limited (RSEJ4L)	
66	Renew Surya Partap Pvt. Ltd.	
67	Renew Surya Ravi Pvt. Ltd.	
68	Renew Surya Roshni Pvt. Ltd.	
69	Renew Surya Vihan Pvt. Ltd.	
70	Renew Surya Ayaan Pvt. Ltd.	
71	RENEW SOLAR POWER Pvt. Ltd. Bikaner	

72	Rising Sun Energy-K Pvt. Ltd.	tushar.gahlot@risingsunenergy.in;
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74	Tata Power Green Energy Ltd. (TPGEL)	vinod.kumar@tatapower.com;
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79	TRANSITION ENERGY SERVICES PRIVATE LIMITED	kak@evrenenergy.com;
80	Transition Green Energy Private Limited	
81	Transition Sustainable Energy Services Private Limited	

Address List of ISTS Transmission Licensees (other than NRPC members)

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2	NRSS-XXIX Transmission Ltd		
3	Parbati Koldam Transmission Company Limited		
4	Patran Transmission Company Ltd		
5	NRSS-XXXI(B) Transmission Ltd	SEKURA	neeraj.verma@energy-sel.com
6	NRSS XXXVI Transmission Ltd	TATA POWER	rajnishmehrotra@tatapower.com
7	AD Hydro Power Limited	-	sumitgarg@lnjbhilwara.com
8	Aravali Power Company Private Limited		amit.hooda01@apcpl.co.in
9	POWERLINKS TRANSMISSION LIMITED (PTL)	-	sandeep.shukla@tatapower.com
10	Adani Transmission India Limited	ADANI	Sunil.Raval@adani.com
11	Bikaner Khetri Transmission Limited		

Annexure-P

59th Protection Sub-Committee Meeting on 23.04.2025 (10:30 AM)				
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1	V.K. Singh	MS, NRPC	NRPC	ms-nrpc@nic.in
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16	Anuj Kumar	EE	UPSLDC	eera@upsldc.org
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18	P.K. Mishra	SE (T&C)	UPPTCL	setncmrt@upptcl.org
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Status of action taken on decisions of 58th PSC

S.N.	Agenda No.	Agenda	Decision of 58th PSC	Status of action Taken
1	A.2	ATR A.11 Review of Distance Protection Requirement Philosophy for Renewable plants having one evacuation line (agenda by Adani Green Energy Limited)	Forum recommended for constitution of Committee under Chairmanship of SE (Protection), NRPC having members from NRLDC, NLDC, POWERGRID, Large RE Developers, RE rich states (Rajasthan & Uttar Pradesh) to prepare a draft protection philosophy for RE.	Nominations have been asked from the concerned vide letter dated 22.04.2025.
		A.15 Training on Electrical Protection of Power System for officials of NRPC Constituents (agenda by NRPC Secretariat)	A letter may be sent to POWERGRID to share the schedule for training.	Letter dated 22.04.2025 has been sent to POWERGRID to share the batch wise training program schedule. POWERGRID has shared the batch wise training program schedule.
2	A.3	Submission of protection performance indices	i.Non-compliant utilities were asked to submit the Protection performance	i. Status of reporting of indices has been taken as an agenda.

		along with reason and corrective action taken for indices less than unity to NRPC Secretariat on monthly basis (agenda by NRPC Secretariat)	indices timely by 7th day of month element wise along with corrective action taken for indices less than unity.	ii. HPPCL representative ensured to submit the reason and corrective action taken for indices less than unity after the meeting. HPPCL representative informed that data has not been received from concerned site and member from the site was not present in the meeting.
3	A.5	Annual protection audit plan for FY 2025-26 (agenda by NRPC Secretariat)	Non-compliant utilities were asked to submit annual audit plan 2025-26 without any further delay. Other utilities were asked to submit report and compliance status within one month of completion of audit.	Some utilities have submitted audit report. Same was discussed in agenda.

Status of action taken on decisions of 58th PSC

4	A.6	Third-party protection audit plan (agenda by NRPC Secretariat)	Forum directed utilities to submit the third-party protection audit plan. Subsequently, the audit reports along with compliance status may be submitted to NRPC Secretariat within one month of completion of audit. Letter may be sent by NRPC Secretariat to NPC Division, CEA for taking up matter of protection auditor certification with NPTI.	Some utilities have submitted audit report. Same was discussed in agenda. Regarding protection auditor certification, agenda has been submitted for discussion in upcoming NPC meeting.
5	B.7	Corrective action for healthiness of 500kV Mundra-Mahindergarh SPS (agenda by NRLDC)	Forum emphasized the importance of 500kV Mundra-Mahindergarh SPS and its healthiness is important to ensure rectification of issues in SPS system before summer 2025. State representatives were also requested to coordinate with the ADANI team and also ensure incorporation of identified revised feeders for load	Agenda was discussed.

			relief in SPS. Desired remedial actions need to be expedited.	
6	C.1	First Time Charging of transmission lines/Bays/Transformer/Reactor etc. by NRLDC in month of February-2025	MS, NRPC stated that mail may be sent to all concerned members who have not sent the agenda for final approval of protection settings	A mail dated 15.04.2025 was sent to concerned for submitting agenda timely for final approval of protection settings of the element after its FTC.

Status of perfomance indices report of March 2025 (Last date of submission 07.04.2025)							
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	04.04.2025	NR-1	No	NA
			Yes	15.04.2025	NR-2	Yes	Yes
			Yes	07.04.2025	NR-3	No	NA
2	NTPC	Central Generating Company			Anta		
					Auriya		
					Dadri		
					Koldam		
					Rihand		
					Singrauli		
			Yes	05.04.2025	Unchahar	No	NA
			Yes	02.04.2025	Tanda	No	NA
3	BBMB		Yes	02.05.2025		No	NA
4	THDC		Yes	03.04.2025	Tehri	No	NA
					Koteshwar		
5	SJVN		Yes	07.04.2025	RHPS	No	NA
			Yes	08.04.2025	NJHPS	No	NA
6	NHPC		Yes	07.04.2025		Yes	Yes
7	NPCIL		Yes	17.04.2025	RAPS-A	NO	NA
					RAPS-B		
			Yes	05.04.2025	RAPS-C(5&6)	Yes	No
					NAPS-1&2		
8	DTL	State Transmission Utility	Yes	08.04.2025		NO	NA
9	HVPNL		Yes	03.04.2025		No	NA
10	RRVPNL		Yes	16.04.2025		Yes	Yes
11	UPPTCL		Yes	03.04.2025	Meerut Circle	No	NA
			Yes	07.04.2025	Agra Circle	Yes	Yes
			Yes	03.04.2025	Jhansi Circle	No	NA
			Yes	07.04.2025	Prayagraj Circle	No	NA
			Yes	07.04.2025	Gorakhpur Circle	No	NA
			Yes	07.04.2025	Lucknow Circle	No	NA
12	PTCUL		Yes	05.04.2025		No	NA
13	PSTCL		Yes	22.04.2025		Yes	No
14	HPPTCL		Yes	05.04.2025		No	NA
15	IPGCL	State Generating Company	Yes	05.04.2025	PPS-I	No	NA
			Yes	05.04.2025	PPS-III, Bawana	Yes	Yes
16	HPGCL		Yes	07.04.2025	RGTPP (Khedar)	No	NA
17	RRVUNL		Yes	07.04.2025	KTPS	No	NA
			Yes	07.04.2025	CSCTPP Chhabra	No	NA
			Yes	02.04.2025	RGTPP, Ramgarh	No	NA
			Yes	07.04.2025	Ctpp,Chhabra	No	NA
			Yes	07.04.2025	DCCPP, Dholpur	No	NA
			Yes	07.04.2025	kATPP, Jhalawar	No	NA
			Yes	07.04.2025	STPS Suratgarh	No	NA
			Yes	07.04.2025	SSCTPS Suratgarh	No	NA
18	UPRVUNL		Yes	07.04.2025	Parichha B (220 kV)	No	NA
			Yes	02.04.2025	Parichha C (400 kV)	No	NA
			Yes	10.04.2025	DTPS Anpara	No	NA
			Yes	07.04.2025	Obra A & B	No	NA
			Yes	07.04.2025	Obra C	Yes	Yes
			Yes	07.04.2025	Harduaganj 400 kV	No	NA
			Yes	08.04.2025	Ghatampur 765 kV	No	NA
			Yes	07.04.2025	Anpara-A&B	Yes	Yes
			Yes	07.04.2025	Panki TPS	No	NA
			Yes	07.04.2025	Jawaharpur	Yes	Yes
19	UJVNL		Yes	02.04.2025	Dharasu	No	NA
			Yes	02.04.2025	Tiloth	No	NA
					Khodri		
					Chibro		
					Vyasi		
20	HPPCL		Yes	07.04.2025	Kashang HEP	No	NA
			Yes	07.04.2025	Sawara Kuddu	No	NA
			Yes	07.04.2025	Sainj	No	NA
21	PSPCL	State Generating Company & State owned Distribution Company	Yes	01.04.2025	RSD	No	NA
			Yes	23.04.2025	GGSTPS, Rupnagar	No	NA
			Yes	07.04.2025	GVK Power Goindwal Shahib Ltd.	No	NA

			Yes	07.04.2025	GHSTPS, Lehra Mohabbat	No	NA
22	HPSEBL	Distribution company having Transmission connectivity ownership			Hamirpur Circle		
			Yes	05.04.2025	Shimla Circle	No	NA
23	Prayagraj Power Generation Co. Ltd.	IPP having more than 1000 MW installed capacity	Yes	02.04.2025		No	NA
24	Aravali Power Company Pvt. Ltd		Yes	10.04.2025		No	NA
25	Apraava Energy Private Limited		Yes	07.04.2025		No	NA
26	Talwandi Sabo Power Ltd.		Yes	21.04.2025		No	NA
27	Nabha Power Limited		Yes	01.04.2025		No	NA
28	MEIL Anpara Energy Ltd (Anpara-C)		Yes	03.04.2025		No	NA
29	Rosa Power Supply Company Ltd		Yes	01.04.2025		No	NA
30	Lalitpur Power Generation Company Ltd		Yes	04.04.2025		No	NA
31	MEJA Urja Nigam Ltd.		Yes	01.04.2025		No	NA
32	Adani Power Rajasthan Limited		Yes	04.04.2025		No	NA
33	JSW Energy Ltd. (KWHEP)		Yes	01.04.2025		No	NA
34	RENEW Power Pvt Ltd	RE Generating Company having more than 1000 MW installed capacity	Yes	08.04.2025		No	NA
35	NTPC Green Energy Limited						
36	Azure Power India Pvt. Ltd.						
37	Avaada Energy Private Limited		Yes	07.04.2025			
38	Adani Green Energy Limited		Yes	22.04.2025		No	NA
39	Tata Power Renewable Energy Ltd.	IPP having less than 1000 MW installed capacity (alphabetical rotaional basis)	Yes	02.04.2025		No	NA
40	UT of J&K	UT of Northern Region	Yes	22.04.2025		No	NA
41	UT of Ladakh						
42	UT of Chandigarh						
	ISTS Transmission Utilities						
43	INDIGRID						
44	POWERLINK						
45	ADHPL		Yes	07.04.2025		No	NA
46	NRSSXXXVI's Northern Region Transmission System	Tata Power					
47	Adani Transmission Limited	AESL	Yes	15.04.2025		No	NA
48	Bikaner Khetri Transmission Limited		Yes	15.04.2025		No	NA
49	Fatehgarh Bhadla Transmission Limited		Yes	15.04.2025		No	NA
50	Powergrid Sikar Transmission Limited	POWERGRID, NR-1	Yes	04.04.2025		No	NA
51	Powergrid Aligarh Sikar Transmission Limited		Yes	04.04.2025		No	NA
52	Powergrid Ajmer Phagi Transmission Limited		Yes	04.04.2025		No	NA
53	Powergrid Bikaner Transmission System Limited		Yes	04.04.2025		No	NA
54	Powergrid Khetri Transmission System Limited		Yes	04.04.2025		No	NA
55	Powergrid Ramgarh Transmission Limited		Yes	04.04.2025		No	NA
56	Powergrid Fatehgarh Transmission Limited		Yes	04.04.2025		No	NA
57	Powergrid Bhadla Transmission Limited		Yes	04.04.2025		No	NA
58	Powergrid Meerut Simbhavli Transmission Limited		Yes	04.04.2025		No	NA
59	Powergrid Kala Amb Transmission Limited	POWERGRID, NR-2	Yes	15.04.2025		No	NA
	State Utilities						
	Uttar Pradesh						
60	Vishnuprayag Hydro Electric Plant (J.P.)		Yes	01.04.2025		No	NA
61	Alaknanda Hydro Electric Plant (GVK)		Yes	07.04.2025		No	NA
62	Khara Power House (Khara)		Yes	15.04.2025		No	NA
63	WUPPTCL		Yes	01.04.2025		No	NA
64	SEUPPTCL		Yes	21.04.2025		No	NA
65	ATSCL	**AESL**	Yes	15.04.2025		No	NA
66	GTL	**AESL**	Yes	15.04.2025		No	NA
67	HPTSL	**AESL**	Yes	15.04.2025		No	NA
68	MTSCL	**AESL**	Yes	15.04.2025		No	NA
69	OCBTL	**AESL**	Yes	15.04.2025		No	NA
	Rajasthan						
70	Barsingsar Plant	**NLC**	Yes	15.04.2025		No	NA
	RE Utilities						
71	ABC Renewable Pvt. Ltd						
72	ACME Heeragarh powertech Pvt. Ltd						
73	ACME Chittorgarh Solar Energy Pvt Ltd						
74	Adani Hybrid Energy Jaisalmer One Ltd.						
75	Adani Hybrid Energy Jaisalmer Two Ltd.						
76	Adani Hybrid Energy Jaisalmer Three Ltd.						
77	Adani Hybrid Energy Jaisalmer Four Ltd.						

78	Adani Renewable Energy (RJ) limited Rawara						
79	Adani Solar Energy Jaisalmer One Pvt. Ltd._450MW (Solar)						
80	Adani Solar Enegry Four Private Limited						
81	Adani Solar Energy Jaisalmer Two Private Limited						
82	Project Two						
83	SB ENERGY FOUR PRIVATE LIMTED, Bhadla						
84	SB Energy Six Private Limited, Bhadla						
85	Adani Solar Enegry Jodhpur Two Limited, Rawara						
86	Adept Renewable Technologies Pvt. Ltd.						
87	Adani Solar Energy RJ Two Pvt. Ltd. (Devikot)						
88	Adani Solar Energy RJ Two Pvt. Ltd. (Phalodi)						
89	Adani Green Energy 19 Limited						
90	Altra Xergi Pvt. Ltd.		Yes	22.04.2025		No	NA
91	AMP Energy Green Five Pvt. Ltd.						
92	AMP Energy Green Six Pvt. Ltd.						
93	Amplus Ages Private Limited	AmPlus Solar	Yes	04.04.2025		No	NA
94	Avaada RJHN_240MW	Avaada	Yes	07.04.2025		No	NA
95	Avaada sunce energy Pvt limited		Yes	07.04.2025		No	NA
96	Avaada Sunrays Pvt. Ltd.		Yes	07.04.2025		No	NA
97	Avaada Sustainable RJ Pvt. Ltd.		Yes	07.04.2025		No	NA
98	Ayana Renewable Power Three Private Limited						
99	Ayaana Renewable Power One Pvt. Ltd.						
100	Azure Power Forty One Pvt limited						
101	Azure Power Forty Three Pvt. Ltd._RSS						
102	Azure Maple Pvt. Ltd.						
103	AZURE POWER INDIA Pvt. Ltd., Bhadla						
104	Azure Power Thirty Four Pvt. Ltd.						
105	Clean Solar Power (Jodhpur) Pvt. Ltd.						
106	Clean Solar Power (Bhadla) Pvt. Ltd						
107	Eden Renewable Cite Private Limited						
108	Grian Energy private limited	AmPlus Solar	Yes	04.04.2025		No	NA
109	Mahindra Renewable Private Limited						
110	Mega Surya Urja Pvt. Ltd. (MSUPL)						
111	AURAIYA Solar						
112	DADRI SOLAR						
113	SINGRAULI SOLAR						
114	Anta Solar						
115	Unchahar Solar						
116	NTPC Devikot Solar plant_240MW						
117	NTPC Kolayat_400kV						
118	Nedan Solar NTPC						
119	NTPC Nokhra_300MW						
120	One Volt energy Pvt. Ltd.	AmPlus Solar	Yes	04.04.2025		No	NA
121	ReNew Solar Energy (Jharkhand Three) Private Limited	RENEW	Yes	08.04.2025		No	NA
122	RENEW SOLAR POWER Pvt. Ltd. Bhadla		Yes	08.04.2025		No	NA
123	ReNew Solar Urja Private Limited						
124	Renew Sun Bright Pvt. Ltd. (RSBPL)		Yes	08.04.2025		No	NA
125	Renew Sun Waves Private Limited (RSEJ4L)						
126	Renew Surya Partap Pvt. Ltd.		Yes	08.04.2025		No	NA
127	Renew Surya Ravi Pvt. Ltd.		Yes	08.04.2025		Yes	yes
128	Renew Surya Roshni Pvt. Ltd.		Yes	08.04.2025		No	NA
129	Renew Surya Vihan Pvt. Ltd.		Yes	08.04.2025		No	NA
130	Renew Surya Ayaan Pvt. Ltd.		Yes	08.04.2025		No	NA
131	Renew Solar Photovoltaic Pvt Ltd		Yes	08.04.2025		No	NA
132	RENEW SOLAR POWER Pvt. Ltd. Bikaner						
133	Rising Sun Energy-K Pvt. Ltd.						
134	Serentica Renewables India 4 Private Limited						
135	Tata Power Green Energy Ltd. (TPGEL)						
136	Tata Power Renewable Energy Ltd. (TPREL)						
137	Thar Surya Pvt. Ltd.						
138	TP Surya Pvt. Ltd.						
139	Banderwala Solar Plant TP Surya Ltd.						
140	TRANSITION ENERGY SERVICES PRIVATE LIMITED						
141	Transition Green Energy Private Limited						
142	Transition Sustainable Energy Services Private Limited						

PERFORMANCE INDICES

Annexure-A.III

Name of utility: Electricity Test & Commissioning Circle - Agra (TSW-AGRA)

Month: MARCH-2025

S.N	Sub-station	Unit/equipment	Nc	Nf	Nu	Ni	Dependability index(D)	Security index(S)	Reliability index (R)	Remarks
1	220 KV Phoolbagh	60 MVA-I	1	0	0	0	1	1	1	
2	220 KV Sikandara	132 KV Sikandra Umari line-I	1	0	0	0	1	1	1	
3	220 KV Bithoor	220 kv Unnao line	1	0	0	0	1	1	1	
4	220 KV S/S Chhata	160 MVA TF -II	1	0	0	0	1	1	1	
5	400 KV S/ Mant Mathura	400 KV MURADNAGAR LINE	2	0	0	0	1	1	1	
		400 KV FATEHABAD-II LINE	1	0	0	0	1	1	1	
6	400 KV S/S Aligarh	400KV/220KV 500MVA ICT -3	2	0	0	0	1	1	1	
		400 KV Harduaganj Line	1	0	0	0	1	1	1	
		400 KV Muradnagar Line	0	0	1	1	_	0	0	BCU:- As per Event analyses of BCU Relay A/R command was issued at 400KV s/s Aligarh, but pole was not closed in given time. Due Pole discrepancy(PD) Brakers (Main & Tie) Were Tripped. (Trip & Close Date,time 19.03.2025, 01:00Hrs to 19.03.2025, 02:14Hrs)
		400KV/220KV 315MVA ICT -2	1	0	0	0	1	1	1	
7	220 KV S/S Kasganj	220 KV JTPS Line	1	0	0	0	1	1	1	
8	220 KV S/S Sikandra	60 MVA T/F - I	1	0	0	0	1	1	1	
9	400 KV S/S Agra	400 KV Fatehabad Ckt - II	0	0	1	1	0	0	0	PLCC Malfunctioning (Trip & Close Date,time 21.03.2025, 17:07Hrs to 21.03.2025, 19:22Hrs)
		TOTAL	**13**	**0**	**2**	**2**				
Dependability index (D) D=(Nc/(Nc+Nf))			1							
Security Index (S) S=(Nc/(Nc+Nu))			0.87							
Relibality Index (R) R=(Nc/(Nc+Ni))			0.87							

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

Arvind Kumar
Superientending Engineer

Protection performance indices Anpara A and B TPS for MARCH 2025

S.No.	Substation	Element name	Total number of tripping	Nc	Nf	Nu	Ni	Dependability Index (D)	Security Index(S)	Reliability Index(R)
1	400 KV ANPARA BTPS	Anpara Sarnath ckt2	2	2	0	1	1	1	0.666667	0.66666667
		Anpara-B-ANPARA D CKT-I	1	1	0	0	0	1	1	1

The Dependability Index defined as (D) = Nc/(Nc+Nf)

The Security Index defined as (S) = Nc/(Nc+Nu)

The Reliability Index defined as (R) = Nc/(Nc+Ni)

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

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

Nu is the number of unwanted operations.

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

*** PPI (Protection Performance indices) should be submitted only for tripped elements of any sub station (Example 1,2 & 3)**

*** In case of no tripping of any element in a sub station it is should be submitted as "Nil" (Example 4)**

*** In case of single tripping which is Nf or Nu, PPI will be "Zero" (Example 1)**

*** In case of PPI less than one, details for that tripping should be submitted seperately (Example "Remarks for less than one sheet")**

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	Anpara BTPS	Anpara-Sarnath ckt-2	06.03.2025 13:12:10 HR	U	DT received from sarnath end as per events report of PLCC	UPPTCL has planned to check Carrier communication in shut down proposed fron 09.04.2025

1500 MW Pragati Power Station – III (CCGT, Bawana)

REPORT FOR PERFORMANCE INDEX LESS THAN UNITY – MARCH 2025

Case: - Tripping of Generator Transformer GTGT # 4

(Dates of Incidence – 28.03.2025)

Nc (number of correct operations at internal power system fault) = 1

Nf (number of failures to operate at internal power system fault) = 0

Nu (number of unwanted operations) = 1

Ni (number of incorrect operations) = 1

Dependability Index (D) = 1

Security Index (S) = 0.5

Reliability Index (R) = 0.5

Reasons of Unwanted Operation:

- Tripping of GTGT # 4 due to operation of PRV Protection.
- TB of the PRV relay found shorted in the terminal box.

Corrective Action:

- The shorted TB set has been replaced with a new TB set.

Taken: YES

Arif Rahman

DGM (Protection)

PPS - III, Bawana

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	765/400/220kV jawaharpur	220kV Jawaharpur-kasganj line	01.03.2025, 8:38	U	During a single-phase transient fault, no Auto reclose operation recorded as carrier receive from remot end	An issue with the Kasganj end no autoreclose operation working properly inform to kasganj end to solve this problem

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	765 KV Obra CTPS	765kV Obra C - Unnao line	3/14/2025 14:54	U	During Single Phase to GND transient fault Auto Reclose did not operated	Shutdown has been planned and applied to identify the reason for non operation of AR from BCU
		765kV Obra C - Unnao line	3/20/2025 18:33	U	During Single Phase to GND transient fault Auto Reclose did not operated	Shutdown has been planned and applied to identify the reason for non operation of AR from BCU
2	400 KV Obra CTPS	nil	nil	nil	nil	nil

PROTECTION PERFORMANCES INDICES POWERGRID NR2_Mar'2025

ELEMENT CODE	EVENT NO.	ELEMENT NAME	OUTAGE	RESTORATION	category code	Fault details	Type of tripping	Maloperation another agencies
NR222045	6030530	220KV KHALSTI-PHYANG	3/26/2025 4:44	3/26/2025 6:26	SBBT	Line tripped due to 220kV Busbar-1 protection operation caused by GIS flashover in Bus Coupler bay at LEH	NC	
NR2ICT81	6030531	LEH 50 MVA ICT-1	3/26/2025 4:44	3/26/2025 6:34	SBBT	Line tripped due to 220kV Busbar-1 protection operation caused by GIS flashover in Bus Coupler bay at LEH	NC	
NR213201	6030463	132KV SEWA2 - HIRANAGAR -II	3/22/2025 19:13	3/23/2025 3:00	SBBU	Lines tripped due to Bus fault in 132KV bus at JKPTCL Station Hiranagar caused by failure of R-Ph CT 132kV ICT bay at Hiranagar(J&K). Due to above bus fault at Hiranagar, voltage in 132KV Sewa2-	NC	
NR213203	6030464	132KV SEWA2 - HIRANAGAR -I	3/22/2025 19:13	3/23/2025 2:46	SBBU	Lines tripped due to Bus fault in 132KV bus at JKPTCL Station Hiranagar caused by failure of R-Ph CT 132kV ICT bay at Hiranagar(J&K). Due to above bus fault at Hiranagar, voltage in 132KV Sewa2-	NC	
NR222006	6030215	220KV JALANDHAR-DASUYA-I	3/10/2025 14:31	3/10/2025 19:51	SBBU	Line tripped on B-N fault due to 220KV Bus fault in 220KV Bus 2 at PSTCL Substation Dasuya . resulting in outage of all feeders connected to Bus 2 at dasuya as per details :	NC	NF
NR222022	6030216	220KV SARNA-DASUYA-I	3/10/2025 14:31	3/10/2025 20:15	SBBU	Line tripped on B-N fault due to 220KV Bus fault in 220KV Bus 2 at PSTCL Substation Dasuya . resulting in outage of all feeders connected to Bus 2 at dasuya as per details : 1. Tripping of 220KV Bus Sectionaliser on operation of O/C protection. 2. Tripping of 220KV Jalandhar Dasuya ckt 1 at Dasuya End on operation of distance protection in Z4	NC	NF
NR240009	6030250	400KV CHAMERA2-KISHENPUR	3/12/2025 12:21	3/12/2025 14:13	SEFU	As reported by NHPC, Line remained charged from Kishenpur(PG) but tripped from Chamera2 (NHPC) due to malfunction of SF6 gas Control Circuit in their bay at NHPC Chamera . Bay at	NC	NU
NR2ICT88	6030085	CHANDIGARH 160 MVA ICT-I	3/5/2025 14:44	3/5/2025 16:58	SICT	ICT tripped on operation of differential protection due to external flashover on tertiary side caused by animal (Cat).	NU	
NR240008	6030441	400KV CHAMERA1-CHAMERA2	3/21/2025 20:33	3/21/2025 21:36	SRMU	Line tripped on B-N fault from Chamera1 (NHPC) only and remain charged from Chamera2(NHPC) due to operation of distance protection in Zone-2 from Chamera1(NHPC). FLR Chamera1= B- N Fault, Ib=1.9kA, FL=123.4kM. Fault was beyond line length, whereas Total Line Length= 36.16kM. The	NC	NU
NR240119	6030293	400KV PARBATI 3 (NHPC) - SAINJ (HPSEB) LILO PORTION	3/15/2025 5:38	3/15/2025 10:04	SRMU	Line tripped from Parbati 3 NHPC end on over voltage mal-operation and remained charged from Sainj (HP) end. Line was charged by NHPC Parbati 3 after checking the maloperation of over-voltage protection at Parbati3 (NHPC) end. The following Annexure has been attached for reference: 1.Parbati3(NHPC) end DR showing voltages in line and tripping from Parbati 3 NHPC end only due to OV relay malopertion.	NC	NU

	Total tripping including LNCC & successful autoreclosures	10
NC	Nc is the number of correct operations at internal power system faults	9
NF	Nf is the number of failures to operate at internal power system faults,	0
NU	Nu is the number of unwanted operations,	1
NI	Ni is the number of incorrect operations and is the sum of Nf and Nu	0
	The Dependability Index defined as $D = Nc/(Nc+Nf)$	100.00%
	The Security Index defined as $S = Nc/(Nc+Nu)$	90.00%
	The Reliability Index defined as $R = Nc/(Nc+Ni)$	100.00%

REPORTING OF PERFORMANCE INDICES FOR PROTECTION SYSTEM
NAME OF UTILITY: PUNJAB STATE TRANSMISSION CORPORATION LIMITED

Mar-25									
Sr. No.	Sub – Station	Unit (SPS/Line/ICT/GT/etc.	N_c	N_f	N_u	N_i	Dependability Index (D)	Security Index (S)	Reliability Index (R)
1	400 kV Makhu	400 KV Makhu Nakodar ckt 1	0	0	1	1	0	0	0
		400 KV Makhu Amritsar ckt 01	2	0	0	0	1	1	1
2	400 kV S/S Nakodar	400 kV Nakodar-Makhu ckt.I	0	0	1	1	0	0	0
3	Rajpura	400 KV Rajpura Dehar	1	0	0	0	1	1	1
4	Muktsar	400 kV Muktsar-Makhu ckt.II	1	0	0	0	1	1	1
		500 MVA ICT-1	0	0	1	1	0	0	0
5	Dhanansu	220 kV Dhanansu-Kohara	0	1	0	1	0	0	0
6	220 kV Lalton Kalan	220 Kv Lalton Kalan - PGCIL Ckt. 2	1	0	0	0	1	1	1
7	220 kV Kohara	220 Kv Kohara - Dhanansu	1	0	0	0	1	1	1
8	220kV Bassi Pathana	220kV RTP-Bassi line	1	0	0	0	1	1	1
9	220 KV S/S Alawalpur	100 MVA T/F T-5	1	0	0	0	1	1	1
		P T/F 220/66 T-4 100 MVA	1	0	0	0	1	1	1
		P T/F 220/66 T-7 100 MVA	1	0	0	0	1	1	1
		220 kV Alawalpur-Dasuya Line	1	0	0	0	1	1	1
		220kv Alawalpur BBMB Jal. Line	1	0	0	0	1	1	1
10	220 KV S/S Sultanpur	P/T/F T-1 220/132kV 100MVA	1	0	0	0	1	1	1
		P/T/F T-6 220/132kV 100MVA	1	0	0	0	1	1	1
		P/T/F T-7 220/132kV 100MVA	1	0	0	0	1	1	1
		220 kV Sultanpur-Jamsher Line	1	0	0	0	1	1	1
		220 kV Sultanpur-Patti Line	1	0	0	0	1	1	1
		220 kV Sultanpur-Chola Sahib Line	1	0	0	0	1	1	1
		220 kV Sultanpur-GVK Ckt-1 Line	1	0	0	0	1	1	1
		220 kV Sultanpur-GVK Ckt-2 Line	1	0	0	0	1	1	1
		220 kV Sultanpur-Badshahpur Line	1	0	0	0	1	1	1
11	220 kV S/s Rajla	P/T/F T-1 160 MVA	1	0	0	0	1	1	1
12	220KV Patti	220KV Sultanpur Circuit.	1	0	0	0	1	1	1
13	220 kV S/S Dasuya	220 kV Kartarpur Circuit No.-1	1	0	0	0	1	1	1
		220 kV Alawalpur Circuit	1	0	0	0	1	1	1
		220 kV Jalandhar Circuit No.-4	1	0	0	0	1	1	1
		220 kV Bus Coupler	1	0	0	0	1	1	1
14	220 kV Sub Station, Wadala Granthian	220/66 kV, 100 MVA PTF T3	2	0	0	0	1	1	1
15	220 KV S/S GNDTP Bathinda	220 KV GNDTP Bathinda-Lehra Ckt-2	1	0	0	0	1	1	1

16	220 KV S/S Kotkaror	220 KV Sadiq-Kotkaror Line	1	0	0	0	1	1	1
	PSTCL Overall		**31**	**1**	**3**	**4**	**0.97**	**0.91**	**0.89**

REPORTING OF PERFORMANCE INDICES FOR PROTECTION SYSTEM										
NAME OF UTILITY: PUNJAB STATE TRANSMISSION CORPORATION LIMITED										
Mar-25										
Sr. No.	Sub – Station	Unit (SPS/Line/ICT/GT/etc.	N_c	N_f	N_u	N_i	Dependability Index (D)	Security Index (S)	Reliability Index (R)	Remarks
1	400 kV Makhu	400 KV Makhu Nakodar ckt 1	0	0	1	1	0	0	0	
		400 KV Makhu Amritsar ckt 01	2	0	0	0	1	1	1	
400 kV Makhu			**2**	**0**	**1**	**1**	**1**	**1**	**1**	
2	400 kV S/S Nakodar	400 kV Nakodar-Makhu ckt.I	0	0	1	1	0	0	0	
400 kV S/S Nakodar			**0**	**0**	**1**	**1**	**0**	**0**	**0**	
3	Rajpura	400 KV Rajpura Dehar	1	0	0	0	1	1	1	
400 kV S/S Rajpura			**1**	**0**	**0**	**0**	**1**	**1**	**1**	
4	Muktsar	400 kV Muktsar-Makhu ckt.II	1	0	0	0	1	1	1	
		500 MVA ICT-1	0	0	1	1	0	0	0	
400 kV S/S Muktsar			**1**	**0**	**1**	**1**	**1**	**1**	**1**	
5	Dhanansu	220 kV Dhanansu-Kohara	0	1	0	1	0	0	0	
400 kV S/S Dhanansu			0	1	0	1	0	0	0	
6	220 kV Lalton Kalan	220 Kv Lalton Kalan - PGCIL Ckt. 2	1	0	0	0	1	1	1	
220 kV Lalton Kalan			**1**	**0**	**0**	**0**	**1**	**1**	**1**	
7	220 kV Kohara	220 Kv Kohara - Dhanansu	1	0	0	0	1	1	1	
220 kV Kohara			**1**	**0**	**0**	**0**	**1**	**1**	**1**	
8	220kV Bassi Pathana	220kV RTP-Bassi line	1	0	0	0	1	1	1	
220kV Bassi Pathana			**1**	**0**	**0**	**0**	**1**	**1**	**1**	
9	220 KV S/S Alawalpur	100 MVA T/F T-5	1	0	0	0	1	1	1	
		P T/F 220/66 T-4 100 MVA	1	0	0	0	1	1	1	
		P T/F 220/66 T-7 100 MVA	1	0	0	0	1	1	1	
		220 kV Alawalpur-Dasuya Line	1	0	0	0	1	1	1	
		220kv Alawalpur BBMB Jal. Line	1	0	0	0	1	1	1	
220 KV S/S Alawalpur			**5**	**0**	**0**	**0**	**5**	**5**	**5**	
10	220 KV S/S Sultanpur	P/T/F T-1 220/132kV 100MVA	1	0	0	0	1	1	1	
		P/T/F T-6 220/132kV 100MVA	1	0	0	0	1	1	1	
		P/T/F T-7 220/132kV 100MVA	1	0	0	0	1	1	1	
		220 kV Sultanpur-Jamsher Line	1	0	0	0	1	1	1	
		220 kV Sultanpur-Patti Line	1	0	0	0	1	1	1	
		220 kV Sultanpur-Chola Sahib Line	1	0	0	0	1	1	1	
		220 kV Sultanpur-GVK Ckt-1 Line	1	0	0	0	1	1	1	
		220 kV Sultanpur-GVK Ckt-2 Line	1	0	0	0	1	1	1	
		220 kV Sultanpur-Badshahpur Line	1	0	0	0	1	1	1	
220 KV S/S Sultanpur			**9**	**0**	**0**	**0**	**9**	**9**	**9**	
11	220 kV S/s Rajla	P/T/F T-1 160 MVA	1	0	0	0	1	1	1	
220 kV S/s Rajla			**1**	**0**	**0**	**0**	**1**	**1**	**1**	
12	220KV Patti	220KV Sultanpur Circuit.	1	0	0	0	1	1	1	
220KV Patti			**1**	**0**	**0**	**0**	**1**	**1**	**1**	
13	220 kV S/S Dasuya	220 kV Kartarpur Circuit No.-1	1	0	0	0	1	1	1	
		220 kV Alawalpur Circuit	1	0	0	0	1	1	1	
		220 kV Jalandhar Circuit No.-4	1	0	0	0	1	1	1	
		220 kV Bus Coupler	1	0	0	0	1	1	1	
220 kV Sub Station, Dasuya			**4**	**0**	**0**	**0**	**4**	**4**	**4**	

14	220 kV Sub Station, Wadala Granthian	220/66 kV, 100 MVA PTF T3	2	0	0	0	1	1	1	
220 kV Sub Station, Wadala Granthian			**2**	**0**	**0**	**0**	**1**	**1**	**1**	
15	220 KV S/S GNDTP Bathinda	220 KV GNDTP Bathinda-Lehra Ckt-2	1	0	0	0	1	1	1	
220 KV S/S GNDTP Bathinda			**1**	**0**	**0**	**0**	**1**	**1**	**1**	
16	220 KV S/S Kotkaror	220 KV Sadiq-Kotkaror Line	1	0	0	0	1	1	1	
220 KV S/S Kotkartor			**1**	**0**	**0**	**0**	**1**	**1**	**1**	

Tripping Details of March-2025

Punjab State Transmission Corporation Limited

S.N.	*Sub-Station*	*Unit (SPS/Line/ICT/GT/etc.)*	*Date on which Power System Fault occurred*	*Local End Indications*	*Remote End Indications*	*Remarks if any*
1	400 KV S/S Makhu	400 KV makhu Nakodar ckt 1	05.03.25 at 21:27	No indication	L2 to earth, Fault current-2.82KA, Fault distance-143.2 km	During discharging of 400 kV Amritsar ckt.I on OV
		400 KV Makhu Amritsar ckt 01	08.03.25 at 16:35	Zone-I, L1 to earth, Fault current-5.28KA, Fault distance-47km	L1 to earth, Fault current-10.8KA, Fault distance-18km	
		400 KV Makhu Amritsar ckt 01 (AUTO-RECLOSED)	09.03.25 at 17:22	Zone-I, L2 to earth, Fault current-18.74KA, Fault distance-0.8km	L2 to earth, Fault current-7.14KA, Fault distance-53.8km	
2	400 kV S/S Nakodar	400 kV Nakodar-Makhu ckt.I	05.03.25 at 21:27	Yph E/Fault Fault Current 2.82 Ka Distance 143.2 km	No indication	
3	400 kV S/S Rajpura	400 KV Rajpura Dehar	06.03.2025	Main 1:- Zone 1, R Phase, Fault location 84.94 Km., IA 3.478 kA, IB 130.4 A, IC 117.4 A, Main -2:- Fault Loop L1N Fault location 84.1 Km.	Main 1:- started phase AB, Over voltage V>1, Fault duration 60.03 ms., Fault location 44.2 Km., IA 348.8A, IB 137.2 A, IC 2.883 kA	
4	400 kV S/S Muktsar	400 kV Muktsar-Makhu ckt.II	09-03-2025 at 17.22 Hrs	Main-I-No indication, Main II- L2-N, distance-41.1 km, IL2=5.3 kA, In=5.1 kA (A/R)	Not tripped (No indication)	
5	400 kV S/S Dhanansu	500 MVA ICT-1	04-03-2024 at 12.23 Hrs	Master Trip		During 400kV bus bar 1 stability testing by scada relay engineer & Protection team,411 tie bay tripped & 410 bay is already under approved shutdown
		220 kV Dhanansu-Kohara	28.03.2025	Main 1 Dpr operated,Zone-2,Fault Current Ia-6.795 kA,Ib-319 A,Ic-704A,Distance-34.89 km	DPR R 6.068kA,Y 0A,B 0A, Zone 1	Due to R Y phase CT damage at Kohara end
6	220 Kv Lalton Kalan	220 Kv Lalton Kalan - PGCIL Ckt.2	27/3/2025 AT 15:54	Zone - 1, Fault Location - 1.6 Km, Y-Phase, Auto Reclose Blocked	Zone - 1, Y-Phase, Auto Reclose Blocked	
7	220 Kv Kohara	220 Kv Kohara - Dhanansu	28/3/2025 AT 6:23	Tripped due to operation of bus bar protection	Breaker not tripped	Blackout occurred at Kohara due to: 1) damage of R-phase CT of Kohara - Dhanansu line 2) Operation of bus bar protection
8	220 kv s/s Bassi pathana	220 KV RTP-Bassi	07.03.2025 at 22:10	DPR zone-1, B-phase-2032.38 A, Dist.-40.674 km,Breaker On, AR Operated	DPR Zone-1 B-phase-22.79 kA, Distance 3.725 km,Breaker off	
9	220 KV S/S Alawalpur	100 MVA T/F T-5	13.03.2025 at 16.05Hrs	REF and Differential		66 kV LA Damage
		P T/F 220/66 T-4 100 MVA	14.03.2025 at 21.18 Hrs	CB Manually Tripped		R phase 220kv Bus Bar LA Damage at 220kv S/s Alwalpur.
		P T/F 220/66 T-7 100 MVA	14.03.2025 at 21.18 Hrs	CB Manually Tripped		R phase 220kv Bus Bar LA Damage at 220kv S/s Alwalpur.
		220 kV Alawalpur-Dasuya Line	14.03.2025 at 21.18 Hrs	DPR AN Phase Zone 4, FL: -371m Fault resistance -402mohm	CB manually Tripped	R phase 220kv Bus Bar LA Damage at 220kv S/s Alwalpur.
		220kv Alawalpur BBMB Jal. Line	14.03.2025 at 21.18 Hrs	DPR AN Phase Zone 4, FL: -565m Fault resistance -822mohm	R phase Zone-2 Fault Current 9.5kA	R phase 220kv Bus Bar LA Damage at 220kv S/s Alwalpur.
10	220 KV S/S Sultanpur	P/T/F T-1 220/132kV 100MVA	22.03.2025 at 15.36Hrs	Bus Bar Protection Operated		B-ph CT Damage
		P/T/F T-6 220/132kV 100MVA	22.03.2025 at 15.36Hrs	Bus Bar Protection Operated		B-ph CT Damage
		P/T/F T-7 220/132kV 100MVA	22.03.2025 at 15.36Hrs	Bus Bar Protection Operated		B-ph CT Damage
		220 kV Sultanpur-Jamsher Line	22.03.2025 at 15.36Hrs	Master Operated No indication,Bus Bar Protection Operated	B-ph ,E/F, Z-2, Distance-34.91 km	B-ph CT Damage
		220 kV Sultanpur-Patti Line	22.03.2025 at 15.36Hrs	Master Operated No indication,Bus Bar Protection Operated	B-ph, O/C , Z-2, If-3250A	B-ph CT Damage
		220 kV Sultanpur-Chola Sahib Line	22.03.2025 at 15.36Hrs	ABC Trip,Z-1,Ia-553.3A,Ib-759.1A,Ic-3.466kA,Bus Bar Protection Operated	Breaker not tripped	B-ph CT Damage
		220 kV Sultanpur-GVK Ckt-1 Line	22.03.2025 at 15.36Hrs	IL 1-243.86A,IL-2-119.65 A, IL 3-2361.33A,Bus Bar Protection Operated		B-ph CT Damage
		220 kV Sultanpur-GVK Ckt-2 Line	22.03.2025 at 15.36Hrs	IL 1-305.5A,IL-2-500.84 A, IL 3-3315.03A,Bus Bar Protection Operated		B-ph CT Damage

Tripping Details of March-2025

Punjab State Transmission Corporation Limited

S.N.	Sub-Station	Unit (SPS/Line/ICT/GT/etc.)	Date on which Power System Fault occurred	Local End Indications	Remote End Indications	Remarks if any
		220 kV Sultanpur-Badshahpur Line	22.03.2025 at 15.36Hrs	ABC Trip,Ia-14.44A,Ib-13.05 A,Ic-20.80A,Bus Bar Protection Operated	ABC Trip, Z-2, Distance-38.23 km, Ia-486.6A, Ib-239.4A, Ic-2.722kA	B-ph CT Damage
11	220 kV S/s Rajla	P/T/F T-1 160 MVA	08.03.2025 at 14:02 Hrs	O/C		Tripped due to overloading condition as AP supply was given in single group. After discussing
12	220 kV S/s Patti	220 KV Patti- Sultanpur	22.03.2025 at 15.:04 Hrs.	B phase DPR Protection operated Zone-2, 86		220 KV CT flashed at Sultanpur. Line Charged As per instruction of PC Patiala
13	220 kV S/S Dasuya	220 kV Kartarpur Circuit No.-1	10.03.2025 at 14:42 Hrs	DPR M1 Z4 Ib-4.342 kA + MTR 86	Protection Trip + CB Auto Trip	Due to damaging of B-Ph Insulator String of 220 kV Jalandhar-4 Circuit & Conductor fallen on 20 kV Bus Bar No.-2
		220 kV Alawalpur Circuit	10.03.2025 at 14:42 Hrs	220 kV CB Manually Switched OFF	DPR M1 Z2 Ib-3.337 kA + MTR 86	Due to damaging of B-Ph Insulator String of 220 kV Jalandhar-4 Circuit & Conductor fallen on 20 kV Bus Bar No.-2
		220 kV Jalandhar-4 Circuit	10.03.2025 at 14:42 Hrs	220 kV CB Manually Switched OFF	DPR M1 Z2 Ib-3.456 kA + MTR 86 (Fault Location - 64.8 kM)	Due to damaging of B-Ph Insulator String of 220 kV Jalandhar-4 Circuit & Conductor fallen on 20 kV Bus Bar No.-2
		220 kV Bus Coupler	10.03.2025 at 14:42 Hrs	EF + MTR 86	-	Due to damaging of B-Ph Insulator String of 220 kV Jalandhar-4 Circuit & Conductor fallen on 20 kV Bus Bar No.-2
14	220 kV Sub Station, Wadala Granthian	220/66 kV, 100 MVA PTF T3	08.03.2025 at 13:23 Hrs.	Differential Relay + MTR 86		Due to defective CT Control Cable. PTF Energised as per instructions of PC Patiala
			31.03.2025 at 21:14 Hrs.	Differential Relay + MTR 86		Due to defective CT Control Cable. PTF Energised as per instructions of PC Patiala
15	220 KV S/S GNDTP Bathinda	220 KV GNDTP-Bathinda- Lehra Ckt-2	18-03-2025 at 13:15 Hrs	Indications :- Auto-Reclose, RN phase DPR Operated,Main-2, Dist- 1.5km, Zone-1, R phase-8362.33 A,Y phase 547.28A,B phase- 1070.05A, IN=9969.47 A	DPR main-1 ,Zone=3, Distance=31.28 km, R phase- 4.56K A,Y phase 531.3A, B phase- 1.078KA	Line charged at 17:12
16	220 KV S/S Kotkaror	220 KV Sadiq-Kotkaror Line	26-03-2025 at 12:33 Hrs	DPR operated, Auto Reclose Oprerated & Auto reclosed Blocked Main-1, Zone- 1 17.21 KM, Started phase:CN, Tripped phase:- ABC Main-1, Ia- 270.0 A, Ib- 349.7 A, Ic- 5.356 kA, Van:- 128.1 kV, Vbn:- 123.4 kV, Vcn:- 88.58 kV, Main-2, Zone-1 17.23 kM, Ia- 268.8 A, Ib- 350.1 A, Ic- 5.362 kA, Van:- 127.6 kV, Vbn:- 123.2 kV, Vcn:-. 88.96 kV	DPR operated, Auto Reclose Oprerated & Auto reclosed Blocked Main-1, Zone-1 23.24 KM, Started phase:CN, Tripped phase:- ABC, Main-1, Ia-260.2 A, Ib-325.7 A, Ic-2.917 kA, Van:-130.2 kV, Vbn:-129.8 kV, Vcn:- 81.55 kV, DRR Main-2, Zone-1 22.96 kM, Ia- 260.1A, Ib-325.8 A, Ic-2.923 kA, Van:-130.2 kV, Vbn:-129.5 kV, Vcn:-80.89 kV	Line charged at 18:10

न्यूक्लियर पॉवर कॉर्पोरेशन ऑफ इण्डिया लिमिटेड
(भारत सरकार का उद्यम)
राजस्थान परमाणु बिजलीघर–5 व 6
Nuclear Power Corporation of India Ltd.
(A Government of India Enterprise)
Rajasthan Atomic Power Station-5&6

डाक: अणुशक्ति, वाया: कोटा (राज.) PO: Anushakti–323303 Via: Kota (Raj.)
E-mail address: csgupta@npcil.co.in Mob: +919414185101, Phone (O): 01475-242244

No.रा.रा.सा RRS/इकाई Unit-5व6/व.त.अ.(वि.&उ.व क्षे.अभि.)STE(E&I and FE)/2025/S/65 दिनांक: 05.04.2025

Sub: - Reporting of Protection Performance Indices of 220KV & 400KV transmission lines emanating from RAPS-C(RAPS-5&6) for the month of March-2025.

1. RAPS-C to ANTA 220KV LINE: -

Dependability Index (D)	Security Index (S)	Reliability Index (R)	Remark
Nc = 0	Nc = 0	Nc =0	No outage reported.
Nf = 0	Nu = 0	Ni = 0	
D= Nc/Nc+Nf	S= Nc/Nc+Nu	R= Nc/Nc+Ni	
D= Not Applicable	S= Not Applicable	R= Not Applicable	

2. RAPS-C TO RAPS-B 220 KV LINE-1: -

Dependability Index (D)	Security Index (S)	Reliability Index (R)	Remark
Nc = 1	Nc = 1	Nc =1	Line CB of both end got opened due to fault in inter trip control cable.
Nf = 0	Nu = 1	Ni =1	
D= Nc/Nc+Nf	S= Nc/Nc+Nu	R= Nc/Nc+Ni	
D= 1	S= 0.5	R= 0.5	

3. RAPS-C TO RAPS-B 220 KV LINE-2: -

Dependability Index (D)	Security Index (S)	Reliability Index (R)	Remark
Nc = 0	Nc = 0	Nc =0	No outage reported.
Nf = 0	Nu = 0	Ni = 0	
D= Nc/Nc+Nf	S= Nc/Nc+Nu	R= Nc/Nc+Ni	
D= Not Applicable	S= Not Applicable	R= Not Applicable	

4. CHITTORGARH 400KV LINE: -

Dependability Index (D)	Security Index (S)	Reliability Index (R)	Remark
Nc = 0	Nc = 0	Nc = 0	No outage reported.
Nf = 0	Nu = 0	Ni = 0	
D= Nc/Nc+Nf	S= Nc/Nc+Nu	R= Nc/Nc+Ni	
D=Not Applicable	S= Not Applicable	R= Not Applicable	

5. KANKROLI 400KV LINE: -

Dependability Index (D)	Security Index (S)	Reliability Index (R)	Remark
Nc = 0	Nc = 0	Nc = 0	No outage reported.
Nf = 0	Nu = 0	Ni = 0	
D= Nc/Nc+Nf	S= Nc/Nc+Nu	R= Nc/Nc+Ni	
D=Not Applicable	S= Not Applicable	R= Not Applicable	

6. KOTA-1 400KV LINE: -

Dependability Index (D)	Security Index (S)	Reliability Index (R)	Remark
Nc = 0	Nc = 0	Nc =0	No outage reported.
Nf = 0	Nu = 0	Ni = 0	
D= Nc/Nc+Nf	S= Nc/Nc+Nu	R= Nc/Nc+Ni	
D= Not Applicable	S= Not Applicable	R= Not Applicable	

05.04.25

(डी.के श्रृंगी)
व.अ. (ई व आई)
TE (E&I) RAPS-5&6

5/4/25

चंद्र शेखर गुप्ता(C.S. Gupta)
व. त. अ. (वि.एवं उप.)
STE (E&I) RAPS-5&6

To,

SE (O), NRPC, New Delhi
seo-nrpc@nic.in

CC:

SD/CS for kind information please.
TSS/OS/MS
Sh. Ruchir v oza, ACE, HQ, NPCIL (rvoza@npcil.co.in)
STE (E&I)
FILE

Subhajit Roy

From: Subhajit Roy
Sent: 26 March 2025 10:36
To: NRLDC SO
Cc: NRLDC SO 2; nrldcoutage@grid-india.in; nrldc_hods_tech; mkagarwal@grid-india.in; 'Somara Lakra (सोमारा लाकरा)'; 'Mahavir Prasad Singh (महावीर प्रसाद सिंह)'; Navratan R; Aashish Bissa; Anindya Saha; Vivek Pandey; Brajesh Kumar - Asset Management; Kailash Chandra Pandey; Birendra Pandey; Nilesh Apte; Gagan Arora - Asset Management; Bharat Bahl
Subject: FW: Regarding Tripping details of ICTs at 400 kV Renew Surya Ravi Bikaner
Attachments: DR.rar

Dear Sir,

Greetings of the day.

We sincerely apologize the delay in reply.

This has reference to the tripping of 400/33kV 150MVA ICTs, occurred in **M/s Renew Surya Ravi Pvt Ltd** on 3rd, 8th & 11th of Mar'25. In view of the same, we have carried out in-depth analysis of the DR & EL fetched from relay during the incidents and accordingly corrective action has been implemented on 11th Mar'25. Pertaining details are as follows for your needful reference:

Analysis & RCA:

Past setting configuration for Earth-Fault (EF1 Derived) was based on measurement at HV Side Main CB CT (T1) terminal current (Ref: Fig.1).

Fig.1 Earth fault Setting : EF1 Derived choosing T1.

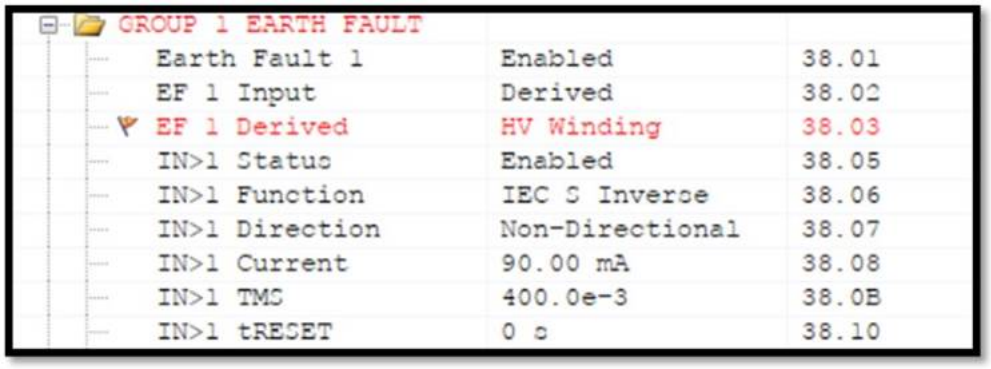
GROUP 1 EARTH FAULT		
Earth Fault 1	Enabled	38.01
EF 1 Input	Derived	38.02
EF 1 Derived	T1	38.03
IN>1 Status	Enabled	38.05
IN>1 Function	IEC S Inverse	38.06
IN>1 Direction	Non-Directional	38.07
IN>1 Current	90.00 mA	38.08
IN>1 TMS	400.0e-3	38.0B
IN>1 tRESET	0 s	38.10

Due to the above configuration, while analysing DR we have observed increase in B-Phase current of HV Side Main CT (T1) as soon as the Bus-Tie B-Phase has current zero as a result of which **In** current exceeds above pickup setting of 90mA. Once the derived **In** exceeds the 90mA, 'IN>1 function (E/F)' operates after time delay of TMS setting leading to trip of ICT. Similar phenomenon has been observed in each instances of tripping.

However, as we are having one and half busbar scheme, the above setting should have configuration of measurement in Vector Summation Current (Main+TIE CT) for earth-fault protection to avoid such unwanted tripping.

Corrective Action:

Presently, the configuration of Earth-Fault (EF1 Derived) has been changed to **"HV Winding"** instead of **T1** (Ref: Fig 2) and based on the same measurement shall be derived from HV summation current (Main+TIE CT).



Presently, we have kept the plant under observation and presume that there shall be no such tripping in future.

DR & EL for the three instance of tripping has been enclosed for your needful reference.

Regards,
Subhajit Roy | Senior Manager, SAM
T: +91 6291474316 / 7888243903
W: www.renew.com

From: NRLDC SO <nrldcso@grid-india.in>
Sent: 12 March 2025 14:05
To: Navratan R <navratan.r@renew.com>
Cc: NRLDC SO 2 <nrldcso2@grid-india.in>; NRLDC Outage <nrldcoutage@grid-india.in>; nrldc_hods_tech <nrldc_hods_tech@grid-india.in>; Manoj Kumar Agarwal (मनोज कुमार अग्रवाल) <mkagarwal@grid-india.in>; Somara Lakra (सोमारा लाकरा) <somara.lakra@grid-india.in>; Mahavir Prasad Singh (महावीर प्रसाद सिंह) <mahavir@grid-india.in>
Subject: Regarding Tripping details of ICTs at 400 kV Renew Surya Ravi Bikaner

Sir,
It is reported that 400/33 KV 150 MVA ICT 1 &2 AT RENEW SURYARAVI SL_BKN_PG (RSRPL) tripped at 14:51 hrs on 11.03.2025 due to Relay mal operation. Detailed reason for relay maloperation is still awaited.

With reference to our telephonic conversation, kindly provide the reason of relay maloperation as early as possible.

Thanks & Regards,

Control Room
Northern Regional Load Despatch Center (NRLDC)
Grid Controller of India Ltd. (Grid-India)

18-A, Saheed Jeet Singh Marg, Katwaria Sarai, New Delhi-110016
Ph. : 011-26519406, Hot Line: 20112151/52, M. - 08448167373

Follow Grid-India on:

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

Case-1 400KV Jaisalmer 2-Kakani line, 400KV Jaisalmer 2-Barmer Ckt. I line, 400KV Jaisalmer 2-Renew I line at 400KV GSS Jodhpur on 29.03.2025

No. of Unwanted operation – 3

Reason of unwanted operation –

Interruption occurred during testing of Bus Bar Protection scheme.

Corrective Action taken – YES

Employees were asked to work carefully.

Case-2 400/220 kV 500 MVA ICT-5 AT 400 KV GSS JAISALMER-II at 400 KV GSS Jaisalmer on 21.03.2025

No. of Unwanted operation – 1

Reason of unwanted operation –

Interruption due to incorrect voltage setting of Overflux relay (ICT has been recently commissioned)

Corrective Action taken – YES

Voltage setting corrected.

Case-3 220 KV Suratgarh-STPS Circuit- I, 220 KV Suratgarh-STPS Circuit- II, 220 KV Suratgarh-Bikaner Line, 220/132 KV 100 MVA AREVA, 220/132 KV 50 MVA TELK transformer at 220 KV GSS SURATGARH on 03.03.2025

No. of Unwanted operation – 5

Reason of unwanted operation –

BUS Bar protection operated during the wiring work of new 220/132 KV 160 MVA Transformer

Corrective Action taken – YES

Employees were asked to work carefully.

Case-4 220 KV Bhawad- Baithwasia Ckt-I at 220KV BHAWAD on 10.03.2025

No. of Unwanted operation – 1

Reason of unwanted operation –

Tripping occurred with Z2 and Z3 start due to wrong PSL.

Corrective Action taken – YES

PSL corrected.

Case-5 220 KV Khetri- Ratangarh II Line, 220KV Khetri- Chirawa Line, 220 KV B Bus Sectionalizer at 220 KV GSS KHETRI NAGAR on 15.03.2025

No. of Unwanted operation – 3

Reason of unwanted operation –

Due to wrong phase association since commissioning of Bus Bar Protection scheme in one feeder, which does not have source to feed the fault.

Corrective Action taken – YES

Phase association corrected.

Case-6 220 KV Pali- Bhilwara Line, 220 KV Pali- KANKANI Line, 220/132KV, 100mva T/F 1 & 2 at 220 KV GSS PALI on 25.03.2025

No. of Unwanted operation – 4

Reason of unwanted operation –

Due to wrong phase association since commissioning of Bus Bar Protection scheme in DFCC feeder, which does not have source to feed the fault.

Corrective Action taken – YES

Phase association corrected.

Case-7 220/132 KV 160 MVA TRF No. 2 at 220 KV GSS NIWANA on 18.03.2025 and 30.03.2025

No. of Unwanted operation – 2

Reason of unwanted operation –

4 nos. OSR relay (01main + 03 phase) defective.

Corrective Action taken – PARTIAL

Main OSR relay replaced and phase OSR relays put out of circuit and shall be replaced soon.

Case-8 220/132 KV,160 MVA TRF at 220KV GSS I G NAGAR on 21.03.2025

No. of Unwanted operation – 1

Reason of unwanted operation –

Valve remained closed due to wrong ‘CLOSE’ ‘OPEN’ marking, and PRV operated.

Corrective Action taken –YES

Valve opened and problem rectified.

Status of Internal Protection Audit Plan for FY 2024 -25									
S. No.	NRPC Member	Category	Status	Schedule submitted as per utility	Present Status Comlpeted (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		Tehri	Feb-25	28.02.2025	58	
5	SJVN		Received		RHPS, NJHPS	Mar-25	25-.03.2025	59	
6	NHPC		Received						
7	NPCIL								
8	Delhi SLDC	SLDC							
9	Haryana SLDC								
10	Rajasthan SLDC								
11	Uttar Pradesh SLDC		Ghatampur Thermal Power Station		Yes		25.02.2025	59	
			ALAKNANDA		Yes		Feb, 2025	59	
			Vishnuprayag		Yes		27.7.2024	52	
			WUPPTCL		Greater Noida, Sikandrabad, Dasna, Indirapuram, Nahtaur, ataur, hapur)		(25.03.2025)	59	
12	Uttarakhand SLDC								
13	Punjab SLDC								
14	Himachal Pradesh SLDC								
15	DTL	State Transmission Utility	Received						
16	HVPNL		Received		Mohana	Jan-25	17.1.2025	58	complied
17	RRVPNL		Received		220kV Substations Bhadla, Basani, Aau,Amarsagar, Badisid, Balotra, BAP, Bhinmal, Kanasar, Phalodi, Ramgarh, Reodar, Sirohi, Hamirgarh, PPS4 Nokh, RSDCL-I, RSDCL-II, Sawa			59	
					Ratangarh, Badnu, Bikaner, Chhatargarh, Gajner, Halasar, Goner, NPH, Sangnaer, SEZ, VKIA, Shri Dungargarh, Sujangarh, Tehendesar, Akal, Chittorgarh			58	Pending
					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		RGTPP (Khedar)	Jan-25	07.02.2025	58	Pending
24	RRVUNL		Received		CSCTPP, Chhabra	Dec-24	19.02.2025	58	
					DCCPP, Dholpur	Nov-24	19.02.2025	58	
					SSTPS, Suratgarh	Jan-25	06.02.2025	58	
					Ramgarh Gas Sutargarh Supercritical			56	Pending
25	UPRVUNL		Received (obra -B, Anpara-B,D switch yard, Harduganj-C,D,E))		Parichha BTPS	Jan-25	08.03.2025	58	
					Parichha CTPS	Feb-25	07.03.2025	58	
					Harduaganj, Anpara-B, C, D			57	Pending
					Obra A & B	Jan-Feb 2025	18.02.2025	59	
26	UJVNL		Received (Khodri, Chibro, Vyasi, Dharasu , Tiloth)		Dharasu			58	
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	24.07.2024	12.09.2024	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			Jan-25	11.02.2025	59	
37	Lalitpur Power Generation Company Ltd		Received		Yes	Oct-Nov 2024	30.11.2024	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)		300MW TPREL Chhayan	28.02.2025	11.03.2025	58	
					300MW TP Saurya Banderwala Solar Plant	01.03.2025	11.03.2025	58	
					225MW TPGEL and 110MW KSEB Solar Plant	28.02.2025	11.03.2025	58	
43	UT of J&K	UT of Northern Region							
44	UT of Ladakh								
45	UT of Chandigarh								
46	INDIGRID		Received						
47	ADHPL		Received		Completed	Mar-25	08.03.2025	58	issue taken up with HPPTCL

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-1,2,3)					
2	NTPC	Central Generating Company	Received					
3	BBMB		Received					
4	THDC		Received	Tehri- March, 2026 Koteshwar- December, 2025				
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, Alaknanda, GTL)	GTL- Jan'2026 & Feb'2026				
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)	Jan-March 2026				
19	PTCUL							
20	PSTCL							
21	HPPTCL		Received					
22	IPGCL	State Generating Company	Received (PPS-III, I)					
23	HPGCL							
24	RRVUNL		Received					
25	UPRVUNL		Received (Anpara B) Received (Obra A & B) Received (Anpara D) Received (Harduaganj) Received (Harduaganj D) Received (Harduaganj E) Received (Parichha) Received (Parichha Ext) Received (Obra C) Received (Jawaharpur)	Jun-25 Jan - March 2026 May-25 April -May 2025 April -May 2025 April -May 2025 May-25 Feb-26 Mar-26 Jul-25				
26	UJVNL		Received (Dharashu, Tiloth)					
27	HPPCL		Received (Kasheng HEP, Sawara Kuddu, Sainj)	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	Aug'25				
31	Aravali Power Company Pvt. Ltd							
32	Apraava Energy Private Limited		Received	May'25				
33	Talwandi Sabo Power Ltd.		Received	May'25				
34	Nabha Power Limited		Received	May'25				
35	MEIL Anpara Energy Ltd		Received	May'25				
36	Rosa Power Supply Company Ltd		Received	Jan'26				
37	Lalitpur Power Generation Company Ltd		Received	Oct - Nov 2025				
38	MEJA Urja Nigam Ltd.							
39	Adani Power Rajasthan Limited							
40	JSW Energy Ltd. (KWHEP)		Received	Nov-25 to Feb 26				
41	Tata Power Renewable Energy Ltd.	UT of Northern Region						
42	UT of J&K							
43	UT of Ladakh							
44	UT of Chandigarh							
	ISTS Transmission Utilities							
45	INDIGRID		Received	Aug-25 to March-26				
46	POWERLINK							
47	ADHPL							
48	NRSSXXXVI's Northern Region Transmission System							
49	Adani Transmission Limited							
50	Bikaner Khetri Transmission Limited							
51	Fatehgarh Bhadla Transmission Limited							
52	Powergrid Sikar Transmission Limited		Received	Sikar- August,25				
53	Powergrid Aligarh Sikar Transmission Limited		Received	Aligarh- April, 25 Sikar- August,25				
54	Powergrid Ajmer Phagi Transmission Limited		Received	March,2025				
55	Powergrid Bikaner Transmission System Limited		Received	Bikaner-II Feb,2025				
56	Powergrid Khetri Transmission System Limited		Received	Khetri-Feb,2025				
57	Powergrid Ramgarh Transmission Limited		Received	Fatehgarh-II Dec, 2025 Fatehgarh-III May, 2025				
58	Powergrid Fatehgarh Transmission Limited		Received	Fatehgarh-II Dec, 2025 Bhadla-II Jan, 2025				
59	Powergrid Bhadla Transmission Limited		Received	Fatehgarh-II Dec, 2025 Bhadla-II Jan, 2025				
60	Powergrid Meerut Simbhavli Transmission Limited		Received	Nov, 2025				
61	Powergrid Kala Amb Transmission Limited		Received	September, 2025				
	State Utilities							
	Uttar Pradesh							
62	Vishnuprayag Hydro Electric Plant (J.P.)		Received	Jun-25				
63	Alaknanda Hydro Electric Plant (GVK)		Received	Dec'25 -Mar'26				
64	Ghatampur TPS		Received	February, 26				
65	Khara Power House (Khara)							
66	WUPPTCL		Received	Oct-25				
67	SEUPPTCL		Received	Jan-26				
68	ATSCL							
69	GTL							
70	HPTSL							
71	MTSCL							
72	OCBTL		Received	Jan'2026				
	Rajasthan							
73	Barsingsar Plant							
	RE Utilities							
74	ABC Renewable Pvt. Ltd							
75	ACME Heeragarh powertech Pvt. Ltd		Received	Jun-25				
76	ACME Pholidi		Received	Jun-25				
77	ACME Deagarh		Received	Jun-25				
78	ACME Raisar		Received	Jun-25				
79	ACME Dhoulpar		Received	Jun-25				
80	ACME Chittorgarh Solar Energy Pvt Ltd							
81	Adani Hybrid Energy Jaisalmer One Ltd.		Received	Jul-25				
82	Adani Hybrid Energy Jaisalmer Two Ltd.		Received	Jul-25				
83	Adani Hybrid Energy Jaisalmer Three Ltd.		Received	Aug-25				
84	Adani Hybrid Energy Jaisalmer Four Ltd.		Received	Aug-25				
85	Adani Renewable Energy (RJ) limited Rawara		Received	Nov-25				
86	Adani Solar Energy Jaisalmer One Pvt. Ltd. 450MW (Solar)		Received	Oct-25				
87	Adani Solar Enegry Four Private Limited		Received	Nov-25				

88	Adani Solar Energy Jaisalmer Two Private Limited							
89	Adani Solar Energy Jaisalmer Two Private Limited Project Two							
90	SB ENERGY FOUR PRIVATE LIMTED, Bhadla		Received	Nov-25				
91	SB Energy Six Private Limited, Bhadla		Received	Oct-25				
92	Adani Solar Enegry Jodhpur Two Limited, Rawara		Received	Nov-25				
93	Adept Renewable Technologies Pvt. Ltd.							
94	Adani Solar Energy RJ Two Pvt. Ltd. (Devikot)		Received	Sep-25				
95	Adani Solar Energy RJ Two Pvt. Ltd. (Phalodi)		Received	Oct-25				
96	Adani Green Energy 19 Limited							
97	Altra Xergi Pvt. Ltd.							
98	AMP Energy Green Five Pvt. Ltd.							
99	AMP Energy Green Six Pvt. Ltd.							
100	Amplus Ages Private Limited							
101	Avaada RJHN_240MW							
102	Avaada sunce energy Pvt limited							
103	Avaada Sunrays Pvt. Ltd.							
104	Avaada Sustainable RJ Pvt. Ltd.							
105	Ayana Renewable Power Three Private Limited							
106	Ayaana Renewable Power One Pvt. Ltd.							
107	Azure Power Forty One Pvt limited							
108	Azure Power Forty Three Pvt. Ltd._RSS							
109	Azure Maple Pvt. Ltd.							
110	AZURE POWER INDIA Pvt. Ltd., Bhadla							
111	Azure Power Thirty Four Pvt. Ltd.							
112	Clean Solar Power (Jodhpur) Pvt. Ltd.							
113	Clean Solar Power (Bhadla) Pvt. Ltd							
114	Eden Renewable Cite Private Limited							
115	Grian Energy private limited							
116	Mahindra Renewable Private Limited							
117	Mega Surya Urja Pvt. Ltd. (MSUPL)							
118	AURAIYA Solar							
119	DADRI SOLAR							
120	SINGRAULI SOLAR							
121	Anta Solar							
122	Unchahar Solar							
123	NTPC Devikot Solar plant_240MW							
124	NTPC Kolayat_400kV							
125	Nedan Solar NTPC							
126	NTPC Nokhra_300MW							
127	One Volt energy Pvt. Ltd.							
128	ReNew Solar Energy (Jharkhand Three) Private Limited							
129	RENEW SOLAR POWER Pvt. Ltd. Bhadla							
130	ReNew Solar Urja Private Limited							
131	Renew Sun Bright Pvt. Ltd. (RSBPL)							
132	Renew Sun Waves Private Limited (RSEJ4L)							
133	Renew Surya Partap Pvt. Ltd.							
134	Renew Surya Ravi Pvt. Ltd.							
135	Renew Surya Roshni Pvt. Ltd.							
136	Renew Surya Vihan Pvt. Ltd.							
137	Renew Surya Ayaan Pvt. Ltd.							
138	Renew Solar Photovoltaic Pvt Ltd							
139	RENEW SOLAR POWER Pvt. Ltd. Bikaner							
140	Rising Sun Energy-K Pvt. Ltd.							
141	Serentica Renewables India 4 Private Limited							
142	Tata Power Green Energy Ltd. (TPGEL)							
143	Tata Power Renewable Energy Ltd. (TPREL)							
144	Thar Surya Pvt. Ltd.							
145	TP Surya Pvt. Ltd.							
146	Banderwala Solar Plant TP Surya Ltd.							
147	TRANSITION ENERGY SERVICES PRIVATE LIMITED							
148	Transition Green Energy Private Limited							
149	Transition Sustainable Energy Services Private Limited							

Status of 3rd Party Protection Audit Plan								
S. No.	NRPC Member	Category	Status	Schedule submitted as per utility	Present Status Comlpeted (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		Received (Tanda extension)	17.07.2025				
			Received (Tanda)	17.07.2025				
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		Obra-B	2026-27				
			Obra-C					
			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				
			Panki					
26	UJVNL		Dharasu		Completed in Nov, 2024		56	submitted
27	HPPCL		Swara Kuddu	2026				
			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	Kunihar	Conducted			55	
			Upper Nangal	Conducted				
			Baddi	Conducted				
30	Prayagrai Power Generation Co. Ltd.	IPP having more than 1000 MW installed capacity	Received	Dec-24	Januray 2025	08.01.2025	59	
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	* May 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.		Conducted		Completed in Oct, 2024	22.03.2025	59	
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	Tata Power Renewable Energy Ltd.	IPP having less than 1000 MW installed capacity (alphabetical rotaional basis)						
42	UT of J&K	UT of Northern Region						
43	UT of Ladakh							
44	UT of Chandigarh							
	ISTS Transmission Utilities							
45	INDIGRID		Received (PTCL)	FY 25-26				
			Received (NRSS 29)	FY 24-25				
46	POWERLINK							
47	ADHPL		Received	* September 2026				
48	NRSSXXXVI's Northern Region Transmission System							
49	Adani Transmission Limited		Received	400kV Mohindergarh SS- Q2 , FY 2025-26				
50	Bikaner Khetri Transmission Limited		Received	BKTL-Q3 , FY 2026-27				
51	Fatehgarh Bhadla Transmission Limited		Received	FBTL-Q3 , FY 2025-26				
52	Powergrid Sikar Transmission Limited							
53	Powergrid Aligarh Sikar Transmission Limited							
54	Powergrid Ajmer Phagi Transmission Limited							
55	Powergrid Bikaner Transmission System Limited							
56	Powergrid Khetri Transmission System Limited							
57	Powergrid Ramgarh Transmission Limited							
58	Powergrid Fatehgarh Transmission Limited							
59	Powergrid Bhadla Transmission Limited							
60	Powergrid Meerut Simbhavli Transmission Limited							
61	Powergrid Kala Amb Transmission Limited							
	State Utilities							
	Uttar Pradesh							
62	Vishnuprayag Hydro Electric Plant (J.P.)		Received	December, 2028				
63	Alaknanda Hydro Electric Plant (GVK)		Received	Mar-25				
64	Ghatampur TPS							
65	Khara Power House (Khara)							
66	WUPPTCL		Conducted		Completed		59	
67	SEUPPTCL		Completed on Oct 2024		Completed		59	
68	ATSCL		Received	ATSCL-Q1 , FY 2026-27				
69	GTL		Received	Q3 & Q4 , FY 2026-27				
70	HPTSL		Received	HPTSL- Q2 , FY 2026-27				
71	MTSCL		Received	MTSCL-Q4 , FY 2025-26				
72	OCBTL		Received	Q1 , FY 2025-26				
	Rajasthan							
73	Barsingsar Plant							
	RE Utilities							
74	ABC Renewable Pvt. Ltd							
75	ACME Heeragarh powertech Pvt. Ltd							
76	ACME Pholidi							
77	ACME Deagarh							
78	ACME Raisar							
79	ACME Dhoulpar							
80	ACME Chittorgarh Solar Energy Pvt Ltd							
81	Adani Hybrid Energy Jaisalmer One Ltd.							
82	Adani Hybrid Energy Jaisalmer Two Ltd.							
83	Adani Hybrid Energy Jaisalmer Three Ltd.							
84	Adani Hybrid Energy Jaisalmer Four Ltd.							
85	Adani Renewable Energy (RJ) limited Rawara							
86	Adani Solar Energy Jaisalmer One Pvt. Ltd._450MW (Solar)							
87	Adani Solar Enegry Four Private Limited							
88	Adani Solar Energy Jaisalmer Two Private Limited							

89	Adani Solar Energy Jaisalmer Two Private Limited Project Two							
90	SB ENERGY FOUR PRIVATE LIMTED, Bhadla							
91	SB Energy Six Private Limited, Bhadla							
92	Adani Solar Energy Jodhpur Two Limited, Rawara							
93	Adept Renewable Technologies Pvt. Ltd.							
94	Adani Solar Energy RJ Two Pvt. Ltd. (Devikot)							
95	Adani Solar Energy RJ Two Pvt. Ltd. (Phalodi)							
96	Adani Green Energy 19 Limited							
97	Altra Xergi Pvt. Ltd.							
98	AMP Energy Green Five Pvt. Ltd.							
99	AMP Energy Green Six Pvt. Ltd.							
100	Amplus Ages Private Limited							
101	Avaada RJHN 240MW							
102	Avaada sunce energy Pvt limited							
103	Avaada Sunrays Pvt. Ltd.							
104	Avaada Sustainable RJ Pvt. Ltd.							
105	Ayana Renewable Power Three Private Limited							
106	Ayaana Renewable Power One Pvt. Ltd.		Conducted		09.03.2025		59	
107	Azure Power Forty One Pvt limited							
108	Azure Power Forty Three Pvt. Ltd. RSS							
109	Azure Maple Pvt. Ltd.							
110	AZURE POWER INDIA Pvt. Ltd., Bhadla							
111	Azure Power Thirty Four Pvt. Ltd.							
112	Clean Solar Power (Jodhpur) Pvt. Ltd.							
113	Clean Solar Power (Bhadla) Pvt. Ltd							
114	Eden Renewable Cite Private Limited							
115	Grian Energy private limited							
116	Mahindra Renewable Private Limited							
117	Mega Surya Urja Pvt. Ltd. (MSUPL)							
118	AURAIYA Solar							
119	DADRI SOLAR							
120	SINGRAULI SOLAR							
121	Anta Solar							
122	Unchahar Solar							
123	NTPC Devikot Solar plant 240MW							
124	NTPC Kolayat 400kV							
125	Nedan Solar NTPC							
126	NTPC Nokhra 300MW							
127	One Volt energy Pvt. Ltd.							
128	ReNew Solar Energy (Jharkhand Three) Private Limited							
129	RENEW SOLAR POWER Pvt. Ltd. Bhadla							
130	ReNew Solar Urja Private Limited							
131	Renew Sun Bright Pvt. Ltd. (RSBPL)							
132	Renew Sun Waves Private Limited (RSEJ4L)							
133	Renew Surya Partap Pvt. Ltd.							
134	Renew Surya Ravi Pvt. Ltd.							
135	Renew Surya Roshni Pvt. Ltd.							
136	Renew Surya Vihan Pvt. Ltd.							
137	Renew Surya Ayaan Pvt. Ltd.							
138	Renew Solar Photovoltaic Pvt Ltd							
139	RENEW SOLAR POWER Pvt. Ltd. Bikaner							
140	Rising Sun Energy-K Pvt. Ltd.							
141	Serentica Renewables India 4 Private Limited							
142	Tata Power Green Energy Ltd. (TPGEL)							
143	Tata Power Renewable Energy Ltd. (TPREL)							
144	Thar Surya Pvt. Ltd.							
145	TP Surya Pvt. Ltd.							
146	Banderwala Solar Plant TP Surya Ltd.							
147	TRANSITION ENERGY SERVICES PRIVATE LIMITED							
148	Transition Green Energy Private Limited							
149	Transition Sustainable Energy Services Private Limited							
* Revised Schedule								

Annexure-B.I

Status of actions points recommended during previous PSC meetings (to be discussed in 59th PSC meeting)

S. No	Agenda	Remdial actions recommended during PSC meeting	Status of remdial action taken	
			58th PSC (26.03.2025)	59th PSC (23.04.2025)
1	Frequent multiple elements tripping at 220kV Kunihar, Baddi, Upperla Nangal complex and load loss event in HP control area	**51 PSC:** PSC Forum requested HP to complete the protection audit as per mentioned timelines (protection audit of 220kV Kunihar has been awarded and it would be completed within next 15-20 days. In next phase, by 15th September, protection audit of substations in downstream and upstream of 220kV Kunihar S/s would be completed.) and resolve the protection related issues. HP was also requested to share the reports of protection audit to NRPC & NRLDC after completion of audits.	HPSEBL representative stated that protection audit at Baddi and Upperla Nangal is completed on 20th March 2025 by POWERGRID. Audit reports are awaited. NRLDC representative highlighted that it is necessary to complete the work before summer in view of increase in tripping. HPSEBL replied that as major work is of relay replacement they will need PSDF fund for rectification of issues. *PSC forum requested HPSEBL to take expeditious actions at their 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 no further update is there in this regard and matter is pending at Head Office level. NRLDC representative requested HVPNL to expedite the process at their end. *PSC forum recommended HVPNL to expedite the implementation of differential protection in short lines and also share the expected timeline.*	
3	Multiple elements tripping at 400kV Sainj (HP), 400kV Parbati2 & Parbti3 (NHPC) Stations on 07th May 2024, 16:17 hrs	**51 PSC:** a) NHPC shall follow up with the relay engineer and taken necessary remedial actions to ensure proper operation of A/R scheme at Parbati2 end. b) NHPC and HPPTCL shall review the healthiness of PLCC at Parbati3 and Sainj end and take necessary actions to ensure their proper operation. c) Expedite the implementation of differential protection in 400kV Parbati2-Sainj line. d) Standardisation of recording instruments (DR/EL) need to be ensured.	NHPC representatives were not present due to ongoing commissioning activity in Parbati-II Project, as communicated. However, vide mail dt. 26.03.2025, NHPC informed that as per LOA, OPGW work shall be completed by Dec'2025. GE engineer visited Parbati-II site, however it is observed during commissioning that there is communication issue with the supplied line differential relay. The relay has been sent to OEM's premisses for rectification. After rectification of the same, the relay can be installed. The same is expected to be completed by May'2025. *PSC forum recommended NHPC & HPPCL to take expeditious action at their end and ensure healthiness of protection system.*	
4	Multiple elements tripping at 220kV Sarna (PS) on 04th May 2024, 07:10 hrs	**51 PSC:** a) Punjab shall expedite the commissioning of new bus scheme. B) POWERGRID shall revise the Z-4 time delay setting of Kishenpur lines at Sarna (PS) end as 160msec till bus bar get operational.	PSTCL representative informed that status is same and 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 requested PSTCL to expedite the work related to implementation of bus bar protection at Sarna S/s.*	
6	Multiple elements tripping at 220kV KTPS (RVUN) on 21st June 2024, 11:37 hrs	**51 PSC:** a) Commissioning of bus coupler between 220kV Bus-3 & 5 need to be expedited.	RVUNL representative stated that status is same and work is at stage of tender processing (administrative process delay). NRLDC representative requested RVPNL to expedite the tender and other followed action. *PSC forum requested RVUNL for expeditious actions at their end.*	
7	Frequent tripping of 220 KV Anta(NT)-Sakatpura(RS) (RS) Ckt-1	**52 & 53 PSC:** RVPN was requested to expedite the process of relay replacement and rectification of issues related to A/R operation.	RVPNL representative informed that work is delayed due to unavailability of shutdown on 27th and 28th February 2025, next shutdown is planned during May 2025. NRLDC representative requested RVPNL to take necessary follow-up actions to ensure expeditious completion of work. *PSC forum requested RVPNL to expedite the actions at their end.*	
8	Frequent tripping of 220 KV Khara(UP)-Saharanpur(PG) (UP) Ckt-1	**52 & 53 PSC:** UP was requested to expedite the process of relay replacement at Khara end. POWERGRID shall review and ensure the A/R operation at their end.	UPPTCL representative informed that relay replacement in unit-1 will get completed on 30th March 2025 followed by unit-2 & 3 within next 6 months. NRLDC representative requested UPPTCL for expeditious completion of work. *PSC forum requested UPPTCL to expedite the replacement of relay at Khara(UP) end.*	
9	Multiple elements tripping event at Patiala(PG)	**52 & 53 PSC:** POWERGRID was requested to expedite the process of commissioning of new bus bar scheme.	POWERGRID(NR-2) representatives were not present.	

10	Multiple elements tripping at 220kV Khodri HEP & Chibro HEP on 5th, 11th & 19th September 2024	**53 PSC:** a)Timely submission of disturbance recorder (DR) and event logger (EL) files need to be ensured. As per IEGC clause 37.2 (c), Disturbance Recorder (DR), station Event Logger (EL), Data Acquisition System (DAS) shall be submitted within 24 hrs of the event. b)HPPTCL shall taken necessary actions to rectify the protection related issue in 220kV Khdori-Majri ckt-2. c)OV protection needs to be disabled in 220kV lines at the earliest. d)Over frequency and over current protection operation in units at Khodri HEP need to be reviewed. e)A/R should be made operational in Sarsawan line at the earliest. f)UJVNL shall share the CPRI audit report and details of remedial action taken within one week. g)Replacement of Units breakers need to be expedited.	UJVUNL representative informed that GE team has denied the scope of work. Hence open tender will be issued to resolve the A/R issue in relay. *PSC forum requested UJVUNL & HPSEBL to take necessary remedial action at their end and ensure proper operation of protection system. UJVUNL shall expedite the action plan and HPSEBL shall review the protection setting of 220kV Khodri-Majri line-II.*	
11	Multiple elements tripping at 400/220kV Obra_A(UP) on 9th October 2024	**54 PSC Recommendations:** a)UPPTCL & Obra_A(UP) shall ensure the implementation of LBB protection at the earliest at 220kV side. b)GPS scheme shall be implemented at Obra_B(UP) by the **end of January 2025** and time sync of recording devices will be ensured.	UPPTCL representative informed that time sync issue and bus bar relay replacement both the works will be addressed by ABB engineers and work is further delayed due to delay in visit. NRLDC representative requested UPPTCL to take necessary follow up actions for expeditious completion of work. *PSC forum requested UPPTCL for expedited corrective actions.*	
12	Multiple elements tripping at 220/132kV Obra_A(UP) on 9th October 2024	**54 PSC Recommendations:** Commissioning and Implementation of numerical relays in 132kV ICT-1&2 at Obra_A(UP) need to be expedited. Timely commissioning of the same need to be ensured.	UPPTCL representative informed that Commissioning and Implementation of numerical relays in 132kV ICT-1&2 at Obra_A(UP) will be addressed by ABB engineers and work is further delayed due to delay in visit. NRLDC representative requested UPPTCL to take necessary follow up actions for expeditious completion of work. *PSC forum requested UPPTCL for expedited corrective actions.*	
14	Multiple elements tripping at 220kV Dausa(RS) on 21st October 2024 and on 29th December, 2024	**54 & 56 PSC Recommendations:** a) RVPNL will expedite the replacement of all the static relays at 220kV Dausa S/s with numerical relays. b) Time synchronization of all the recording instruments need to be ensured. c) Healthiness of protection system and their proper operation need to be ensured. d) Timely submission of disturbance recorder (DR) and event logger (EL) files need to be ensured.	RVPNL representative informed that one relay is already replaced on 27th February 2025. One relay will be replaced on 28th March 2025 and other one will be replaced during shutdown in April 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.*	
15	Frequent tripping of 220 KV RAPS_A(NP)-Sakatpura (RS) (RS) Ckt-1 &2	**55 PSC Recommendations: E**xpeditious corrective actions to minimise frequent faults in line.	RVPNL representative informed that 6 bird-guards need to be installed and some broken earth wires need to be attended further in 220kV RAPS_A(NP)- Sakatpura (RS) (RS) Ckt-1. Work is almost completed in 220kV RAPS_A(NP)- Sakatpura (RS) (RS) Ckt-2, however, some newly installed insulators failed due to manufacturing defect which are being replaced. Work in 220kV RAPS_B(NP)- Sakatpura (RS) (RS) Ckt will also be completed soon depending on shutdown availability. *PSC forum requested RVPNL for expedited corrective actions.*	
16	Frequent tripping of 400 KV Amritsar(PG)-Makhu(PS) (PSTCL) Ckt-1 & 400 KV Talwandi Saboo(PSG)-Nakodar (PSG) (PS) Ckt-1	**55 PSC Recommendations:** PSTCL was requested to plan replacement of porcelain insulators with polymer type.	PSTCL representative informed that insulator replacement will be completed before next winter season 2025. 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 requested PSTCL to for expeditious actions for insulators replacement.*	
17	Multiple element tripping event at 400kV Aligarh(UP) on 02nd November, 2024	**55 PSC Recommendations:** UPPTCL shall ensure the healthiness of carrier communication and A/R operation at Muradnagar_1(UP) end.	UPPTCL representative informed that allotment order is yet to get issued. Work will get completed after allotment is done. 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 requested UPPTCL for expedited corrective actions.*	
21	Frequent tripping of 220 KV Agra(PG)-Bharatpur(RS) (PG) Ckt-1	**57 PSC Recommendations:** Impedance measurement and distance relay settings of the line need to be reviewed before summer (high demand period).	RVPNL informed that anti-fog disc and bird-guard installation is in progress. POWERGRID (NR-3) informed that impedance measurement and distance relay settings review will be done in the next available shutdown. *PSC forum requested RVPNL and POWERGRID(NR-3) for expedited corrective actions.*	
22	Frequent tripping of 400 KV Anpara_B(UPUN)-Sarnath(UP) (UP) Ckt-2	**57 PSC Recommendations:** Healthiness of carrier communication need to be reviewed.	UPPTCL informed that only one carrier cabinet is in working condition among the two MAIN-I and MAIN-II carrier cabinet, hence cross-wiring could not be done. Another carrier cabinet will be made healthy for redundancy. *PSC forum requested UPPTCL for expedited corrective actions.*	
23	Frequent tripping of 400 KV Noida Sec 148-Noida Sec 123 (UP) Ckt-1	**57 PSC Recommendations:** a) Timely submission of disturbance recorder (DR) and event logger (EL) files need to be ensured. b) Time sync issue need to be addressed. c) Issue in A/R non-operation need to be resolved.	UPPTCL representative informed time sync issue is attended. A/R non-operation issue is resolved at Noida Sec 148 end and it will be resolved at Noida Sec 123 end within 1.5 months. *PSC forum requested UPPTCL to take necessary follow up actions for expeditious completion of work.*	

25	Frequent tripping of 400 KV Merta-Ratangarh (RS) Ckt-1	**57 PSC Recommendations:** a) DR standardization need to be checked (DR time window of ~800ms is not as per standard). b) Phase sequence issue need to be resolved. c) Status of A/R operation at Ratangarh end need to be reviewed.	RVPNL informed that DR time window is made as per standard. Status of A/R operation at Ratangarh end couldn't be reviewed due to shutdown unavailability and will be attended in next available shutdown. *PSC forum requested RVPNL for expedited corrective actions.*	
27	Multiple elements tripping at 220/132kV Ropar(PS) on 06th January, 2025	**57 PSC Recommendations:** PSTCL need to share the DR/EL & tripping details within one week	PSTCL representative informed that DR/EL could not be extracted due to software issue. *PSC forum requested PSTCL to share detailed report along with observations and remedial action taken.*	
28	Multiple elements tripping at 400/220KV Heerapura(RS) on 10th January, 2025	**57 PSC Recommendations:** a) Instantaneous OC relay (High set) settings of ICTs at Heerapura(RS) may be reviewed. b) Replacement of remaining electromechanical/ static relays & schemes with numerical relay need to be expedited at Heerapura(RS).	RVPNL representative informed that already 8 static/ electromechanical relays are replaced with numerical relays. Remaining relays are also being replaced in phased manner, but it will take time as relays of whole substation including busbar relay need to be replaced. *PSC forum requested RVPNL to share the timeline of replacement of relays and take expedited corrective actions at their end.*	
29	Frequent tripping of 220 KV Debari(RS)-RAPS_A(NP) (RS) Ckt-1	**58 PSC Recommendations: E**xpeditious corrective actions to minimise frequent faults in line.	RVPNL representative informed that this line is almost 200km long and total no. of location is 450. There is issue in almost 1300 string insulators and it will take at least 3-4 months to complete the whole work subject to shutdown availability. Some work has already been done during February 2025 and tripping has also reduced since then.	

Annexure-B.II

Grid Event summary for March 2025

S.No.	Category of Grid Incident/ Disturbance	Name of Elements (Tripped/Manually opened)	Affected Area	Owner/ Agency	Outage		Event (As reported)	Loss of generation / loss of load during the Grid Disturbance		Fault Clearance time (in ms)	Compliance of Protection Protocol/Standard		
	(GI-1 to GD-V)				Date	Time		Generation Loss(MW)	Load Loss (MW)		Flash Report Submission (Y/N)	DR/EL Submission (Y/N)	Detail Tripping Report Submission (Y/N)
1	GI-1	1) 220 KV Dasuya(PS)-Jalandhar(BB) (BBMB) Ckt-2 2) 220 KV Dasuya(PS)-Jalandhar(PG) (PG) Ckt-1 3) 220 KV Sarna(PS)-Dasuya(PS) (PG) Ckt-2 4) 220 KV Pong(BB)-Dasuya(PS) (BBMB) Ckt-2	Punjab	PSTCL, BBMB, PGCIL	10-Mar-25	14:32	i)220kV Dasuya(PS) has double main bus scheme. ii)As reported at 14:32hrs, B-ph conductor of 220 KV Dasuya(PS)-Jalandhar(BB) Ckt-2 broken due to damage of insulator string and fell on 220kV bus-2. iii)As per PMU at Jalandhar(PG), B-N fault with delayed clearance of ~560msec is observed. iv)Fault was not cleared in time from Dasuya end. (Exact details w.r.t. bus bar protection at Dausya end yet to be received.) v)Line connected to 220kV Bus-2 i.e., 220 KV Dasuya(PS)-Jalandhar(PG) (PG) Ckt-1, 220 KV Sarna(PS)-Dasuya(PS) (PG) Ckt-2 and 220 KV Pong(BB)-Dasuya(PS) (BBMB) Ckt-2 tripped from remoted end. As reported, 220kV bus coupler at Dasuya(PS) also tripped. vi)As per SCADA, change in demand of approx. 100 MW is observed in Puniab control area.	0	100	560	Y(d)	N (Partial detail received)	N (Partial detail received)
2	GI-2	1) 220kV Bikaner-Nokhra (RS) Ckt 2) 400/220 KV 315 MVA ICT 1 at Merta(RS) 3) 400/220 KV 315 MVA ICT 1 at Merta(RS) 4) 220kV Merta-Kuchera Ckt	Rajasthan	RVPNL	10-Mar-25	07:14	i)400/220KV Merta and Bikaner(RS) are connected to each other. Network diagram showing connectivity between Merta, Bikaner and VSLP plant is shown in attached in Annexure. ii)During antecedent condition, 220kV Merta-Makrana line was under open condition (as per instruction of SLDC-RS) and 220kV Merta-Jethana line was under tripped condition (line tripped on fault). 400/220kV 315 MVA ICT-1&2 at Bikaner(RS) and Merta(RS) were running at loading of 300MVA & 292MVA each respectively. 220/132kV Bikaner S/s was drawing power from VSLP generating station and 400/220kV Bikaner S/s (through D/C interconnector). iii)At 07:14 hrs, 135MW Unit-1 at VSLP tripped due to problem in PA fan. Due to this, the complete load of 220/132kV Bikaner S/s shifted on 220kV Bikaner(220kV)-Bikaner(400/220kV) interconnectors. Loading of interconnector-1&2 increased from 75MW & 31MW to 151MW & 68MW respectively. Eventually, 400/220kV 315MVA ICT-1&2 loading also increased (increased from 300MVA to 355MVA). iv)Due to increases in the loading of ICTs at Bikaner, SPS of ICTs at Bikaner operated and initiated tripping to 220kV Bikaner-Nokha which was carrying ~185MW. v)Further, load of Nokha shifted to 220kV Merta-Kuchera-Nokha after tripping of 220kV Bikaner-Nokha. This further led to overloading of 400/220kV 315MVA ICTs at Merta(RS). Loading of ICTs at Merta increased from 300MVA to 350MVA. vi)Further, 400/220kV 315MVA ICTs at Merta(RS) tripped due to ICT overcurrent protection operation due to overloading. At the same time, SPS of ICTs at Merta also operated and 220kV Merta-Kuchera line tipped. vii)As per PMU at Merta(RS), no fault in system is observed. viii)As per SCADA data change in Rajasthan demand of ~430MW is observed. However, as reported by SLDC-Rajasthan, load loss of ~480MW occurred in Rajasthan control area	0	480	NA	N (Partial detail received)	N (Partial detail received)	N (Partial detail received)
3	GI-2	1) 400/33 kV 150 MVA ICT 1 at Renew SuryaRavi SL_BKN_PG (RSRPL) 2) 400/33 kV 150 MVA ICT 2 at Renew SuryaRavi SL_BKN_PG (RSRPL)	Rajasthan	RSRPL (Renew)	11-Mar-25	14:51	i)Generation of 400kV Renew Surya Ravi (RSRPL) (IP) RE station evacuates through 400 KV Renew Surya Ravi SL_BKN_PG(RSRPL)-Bikaner(PG) Ckt via 400/33 kV 150 MVA ICT 1 and 2 at Renew Surya Ravi SL_BKN_PG (RSRPL). During antecedent condition, 400kV Renew Surya Ravi (RSRPL) (IP) RE station was generating approx. 275 MW (as per PMU). ii)As reported, at 14:51hrs, 400/33 kV 150 MVA ICT 1 at Renew Surya Ravi SL_BKN_PG (RSRPL) tripped due to maloperation of E/F relay (vector summation of current setting issue). As per DR/EL, E/F relay at ICT-1 operated. iii)During the same time, 400/33 kV 150 MVA ICT 2 at Renew Surya Ravi SL_BKN_PG (RSRPL) also tripped (exact reason and nature of protection operated yet to be shared). iv)Due to tripping of both 400/33 kV 150 MVA ICT 1 and 2 at Renew Surya Ravi SL_BKN_PG (RSRPL), 400kV Renew Surya Ravi (RSRPL) (IP) generation becomes zero due to loss of evacuation path. v)As per PMU, no fault is observed in the system. vi)As per PMU, solar generation loss of approx. 275 MW is observed at RSRPL(IP).	275	0	NA	N	N	N
4	GD-1	1) 220 KV Baghpat(PG)-Baraut(UP) (UP) Ckt-1 2) 220 KV Baghpat(PG)-Baraut(UP) (UP) Ckt-2 3) 220 KV Nirpura-Barauat(UP) Ckt 4) 220 KV Muradnagar_new-Baraut(UP) Ckt 5) 220/132kV 200MVA ICT-1 at Baraut(UP) 6) 220/132kV 200MVA ICT-2 at Baraut(UP) 7) 220/132kV 200MVA ICT-3 at Baraut(UP)	Uttar Pradesh	UPPTCL, PGCIL	12-Mar-25	01:06	i)220/132/33KV Baraut(UP) S/s has single main and transfer bus scheme in all voltage levels. ii)As reported at 01:06 hrs, R-ph CT of 220 KV Baghpat(PG)-Baraut(UP) (UP) Ckt-1 got damaged which further led to bus bar protection operation at 220kV Baraut(UP). As a result, all the elements connected to 220KV Bus tripped and complete blackout occurred at 220/132/33KV Baraut(UP) S/s. iii)However, as per DR at Baghpat(PG) end of 220 KV Baghpat(PG)-Baraut(UP) (UP) Ckt-1, R-N fault (Ir=~7.71kA) converted to R-Y-N fault (Ir=~14.48kA, Iy=~15.87kA) was observed in 220 KV Baghpat(PG)-Baraut(UP) (UP) Ckt-1 and fault was cleared in zone-2 from Baghpat(PG) end with fault clearing time of =~440ms. iv)As per DR at Baghpat(PG) end of 220 KV Baghpat(PG)-Baraut(UP) (UP) Ckt-2, R-N fault (Ir=~8.53kA) was observed in 220 KV Baghpat(PG)-Baraut(UP) (UP) Ckt-2 and fault was sensed in zone-2 at Baghpat(PG) end with fault clearing time of =~240ms. v)As per SCADA SOE, 220 KV Baghpat(PG)-Shamli(UP) (UP) Ckt also tripped during the same time (exact reason of tripping yet to be shared). vi)As per PMU at Meerut(PG), R-N phase to ground fault converted to R-Y-N double phase to ground fault with delayed fault clearing time of 440ms was observed. vii)As per SCADA, change in demand of approx. 40MW is observed in Uttar Pradesh control area.	0	40	440	Y(d)	N (Partial detail received)	N (Partial detail received)
5	GD-1	1) 220 KV Delhi RR(BB)-Narela(DV) (BBMB) Ckt-1 2) 220 KV Delhi RR(BB)-Narela(DV) (BBMB) Ckt-2	Delhi	DTL, BBMB	14-Mar-25	18:34	i)220/66/33kV Delhi Rohtak Road(BB) S/s has double main bus arrangement at 220kV level. ii)During antecedent condition, incoming power at Delhi Rohtak Road(BB) through 220 KV Delhi RR(BB)-Narela(DV) (BBMB) D/C was approx. 17 MW each (as per SCADA) which was supplying load of Delhi Rohtak Road(BB) S/s. iii)As reported, at 18:34hrs, 220 KV Delhi RR(BB)-Narela(DV) (BBMB) Ckt-1 tripped on R-B phase to phase fault with following relay indications: fault distance of 1.185km and fault current of Ir=~2.587kA and Ib=~2.523kA from Delhi RR(BB) end and fault distance of 17.59 km and fault current of Ir=~3.841kA and Ib=~3.878kA from Narela(DV) end. During patrolling, a kite string was found tangled between R and B phases at tower loc. no. 1069A, which was later removed. iv)During the same time, 220 KV Delhi RR(BB)-Narela(DV) (BBMB) Ckt-2 also tripped from Narela end only with following relay indications : fault distance of 17.59 km and fault current of Ir=~3.841kA and Ib=~3.878kA from Narela(DV) end (exact reason of fault yet not shared). During patrolling, nothing abnormal was found. v)Due to tripping of 220 KV Delhi RR(BB)-Narela(DV) (BBMB) D/C, complete blackout occurred at 220/66/33kV Delhi Rohtak Road(BB) S/s. vi)As per PMU at Mandaula(PG), R-B phase to phase fault with fault clearing time of 80 ms is observed. vii)As per SCADA, change in demand of approx. 30 MW is observed in Delhi control area.	0	30	80	Y(d)	N	N (Partial detail received)
6	GI-2	1) 800 kV HVDC Kurukshetra(PG) Pole-02 2) 800 kV HVDC Kurukshetra(PG) Pole-04	Haryana	PGCIL	15-Mar-25	17:19	i)During antecedent condition, 800 kV HVDC Kurukshetra(PG) Pole-1, 2, 3 & 4 were carrying approx. 250 MW each and hence total 1000 MW power was flowing from Champa to Kurukshetra. ii)As reported at 17:19 hrs, 800 kV HVDC Kurukshetra (PG) Pole-2 & 4 blocked due to commutation failure in Pole-2. (Exact reason of tripping need to be analyzed) iii)As 800 kV HVDC Kurukshetra(PG) Pole-2 and Pole-4 blocked, power flow of Pole-1 and Pole-2 shifted on Pole-3 and Pole-4. Hence, there was no reduction in power order. iv)As per PMU at Kurukshetra(PG), no fault was observed in the system. However, fluctuation in voltage was observed. v)As per SCADA, no change in demand of Harvana control area.	0	0	NA	Y(d)	Y(d)	Y(d)
7	GD-1	1) 400 KV Parbati_2(NH)-Sainj(HP) (PKTCL) Ckt 2) 400 KV Parbati_3(NH)- Banala(PG) (PKTCL) Ckt	Himachal Pradesh	HPPTCL, PGCIL, NHPC	16-Mar-25	14:46	i)Total generated power of Sainj HEP(HP), Parbati_2(NH) and Parbati_3(NH) evacuates through 400 kV Parbati_2(NH)- Banala(PG) (PKTCL) Ckt and 400 kV Parbati_3(NH)- Banala(PG) (PKTCL) Ckt via 400 KV Parbati_2(NH)-Sainj(HP) (PKTCL) Ckt and 400 KV Parbati_3(NH)-Sainj(HP) (PKTCL) Ckt. ii)During antecedent condition, no generation was there at 400kV Parbati_2(NH), 400kV Parbati_3(NH) and 400kV Sainj HEP(HP). iii)As reported, at 14:46hrs, 400 KV Parbati_3(NH)- Banala(PG) (PKTCL) Ckt tripped from Banala(PG) end only on R-N phase to earth fault with fault distance of 6.9km and fault current of 5.545kA from Banala(PG) end (exact reason of fault yet to be shared). iv)As further reported, 400 KV Parbati_2(NH)-Sainj(HP) (PKTCL) Ckt also tripped at the same time from Sainj end only (exact reason of tripping yet to be shared). v)Due to tripping of both 400 KV Parbati_3(NH)- Banala(PG) (PKTCL) Ckt and 400 KV Parbati_2(NH)-Sainj(HP) (PKTCL) Ckt, complete blackout occurred at 400kV Parbati_3(NH) and 400kV Sainj HEP(HP) S/s. vi)As per PMU at Nallagarh(PG), two consecutive R-N phase to earth fault is observed with delayed fault clearing time of 1240 ms and 1040 ms respectively. vii)As per SCADA, no generation loss is observed at 400kV Parbati_2(NH), 400kV Parbati_3(NH) and 400kV Sainj HEP(HP) as there was no generation at either of them.	0	0	1240	N (Partial details received)	N (Partial details received)	N (Partial details received)
8	GD-1	1) 400/220 KV 500 MVA ICT 6 AT BHADLA_2 (PG) 2) 220 KV NOKHRA SL_BHD2 (NTPC)-BHADLA_2 (PG) (NOKHRA) CKT-1 3) 400 KV AGE25L SL_BHD2_PG-Bhadla_2 (PG) (AGE25L) Ckt-1	Rajasthan	Adani Green, PGCIL and NTPC	18-Mar-25	10:00	i)Generation of 220kV Nokhra (IP) and 400kV AGE25L stations evacuate through 220 KV Nokhra SL_BHD2 (NTPC)-Bhadla_2 (PG) (NTPC_NOKHRA) Ckt and 400 KV AGE25L SL_BHD2_PG-Bhadla_2 (PG) (AGE25L) Ckt-1 respectively. ii)During antecedent condition, 220kV Nokhra (IP) and 400kV AGE25L were generating approx. 262 MW and 488 MW respectively (as per PMU). iii)As reported, at 09:59:46hrs Y-Phase CT of 405-52 bay at AGE25L RE station failed and it triggered Transformer Differential protection of main CB 404-52 and Tie CB 405-52 opened on Bus-Bar Zone-1 protection. iv)At 09:59:47 hrs, 400 KV AGE25L SL_BHD2_PG-Bhadla_2 (PG) (AGE25L) Ckt-1 tripped on R- Phase line differential protection. During inspection at site, spark in R-phase CVT was found and the same was replaced. v)As per PMU at 400kV Bhadla2(PG), Y-N fault cleared in 240msec followed by permanent R-N fault is observed is observed with fault clearing time of 80ms. vi)At the same time, 400/220kV 500MVA ICT-6 at Bhadla2(PG) and 220 KV NOKHRA SL_BHD2 (NTPC)-BHADLA_2 (PG) (NTPC_NOKHRA) CKT-1 also tripped. The reason for the same is yet to be received. vii)As per PMU, solar generation loss of approx. 487 MW at AGE25L(IP) and 262 MW at Nokra(IP) were observed. viii)As per SCADA, total Generation loss of 1035MW was observed in NR region.	1035	0	240	N (Partial details received)	N (Partial details received)	N (Partial details received)
9	GI-2	1) 800 kV HVDC Kurukshetra(PG) Pole-02 2) 800 kV HVDC Kurukshetra(PG) Pole-04	Haryana	PGCIL	19-Mar-25	19:13	i)During antecedent condition, 800kV HVDC Champa-Kurukshetra was carrying total 2578MW (Pole 01- 490 MW, Pole 02- 737MW, Pole 03- 716MW, Pole 04- 492MW). ii)As reported, at 19:13hrs Pole-2 and Pole-4 Tripped on T-Zone protection as Pole-2 protection was reading wrong values of DC current of parallel pole. Power shifted to remaining poles (Pole-1&3) and power order after the tripping were 1349 MW in Pole-1 and 1527 MW in Pole-3. iii)POWERGRID performed signal injection in control TB and affected lane was rebooted. The analog value of latched protection was found satisfactory. iv)As per PMU, fluctuation in voltage was observed. vi As per SCADA, no change in demand is observed in Harvana control area.	1035	0	NA	Y(d)	Y(d)	Y(d)
10	GD-1	1) 220 KV BHADLA_2 (PG)-AEGPL_SL_BHD2_PG (AMP ENERGY GREEN PRIVATE LIMITED) CKT	Rajasthan	PGCIL & Amp Energy	23-Mar-25	09:34	i)Generation of 220kV AEGPL(IP) stations evacuate through 220 KV BHADLA_2 (PG)-AEGPL_SL_BHD2_PG (AMP ENERGY GREEN PRIVATE LIMITED) CKT. ii)During antecedent condition, 220 KV BHADLA_2 (PG)-AEGPL_SL_BHD2_PG (AMP ENERGY GREEN PRIVATE LIMITED) CKT was generating approx. 230MW (as per PMU). iii)As reported, at 09:34hrs, 220 KV BHADLA_2 (PG)-AEGPL_SL_BHD2_PG (AMP ENERGY GREEN PRIVATE LIMITED) CKT tripped on B-N phase to earth fault. During the inspection it was found that there was cable failure in Feeder 5. iv)Due to tripping of 220 KV BHADLA_2 (PG)-AEGPL_SL_BHD2_PG (AMP ENERGY GREEN PRIVATE LIMITED) CKT , 220/33 KV, 150 MVA ICT-1 & 2 also tripped due to loss of evacuation path and 220KV AEGPL lost its connectivity from grid and blackout occurred in 220KV AEGPL S/s. v)As per PMU at 400kV Bhadla_2 S/s, no fault was observed. vi)As per PMU, solar generation loss of approx. 230 MW at AEGPL(IP) was observed.	230	0	NA	N (Partial details received)	N	N
11	GD-1	i)220 KV LEH(PG) - BUS 1 ii)220/66 KV 50 MVA ICT 1 AT LEH(PG) iii)220 KV KHALSTI-LEH (PG) CKT-1	Jammu & kashmir	JKPDD & PGCIL	26-Mar-25	04:44	i)220/66KV Leh has double main bus system. Nimmo Bazgo HEP is connected at 66kV level at 220/66kV Leh S/s. ii)During antecedent condition, 220 KV KHALSTI-LEH (PG) CKT-1 was carrying 12MW, while 220/66KV, 50MVA ICT-1 and ICT-2 were loaded 6 MW each. iii)As reported, at 04:44 hrs, 220KV Bus Bar protection operated due to flashover in GIS of Bus Coupler Bay resulting in outage of 220KV Khalsti-Leh Line & 220/66kV 50MVA ICT-1 at Leh (PG). Subsequently, 220KV Bus-2 and 220/66kV 50MVA ICT-2 also tripped (Details awaited). iv)Due to tripping of both the ICTs, the generator at Nimoo Bazgo HWP also tripped due to loss of evacuation path along with other 66KV feeders. This led to complete blackout of 220KV Leh substation. v)As per PMU, R-N phase to earth fault with fault clearance time of 120msec was observed. vi)As per SCADA, load loss of approx. 21 MW in J&K control area and generation loss of approx. 6 MW at Nimoo were observed.	6	21	120	Y(d)	N (Partial details received)	N (Partial details received)

S.No.	Category of Grid Incident/ Disturbance	Name of Elements (Tripped/Manually opened)	Affected Area	Owner/ Agency	Outage		Event (As reported)	Loss of generation / loss of load during the Grid Disturbance		Fault Clearance time (in ms)	Compliance of Protection Protocol/Standard		
	(GI-I to GD-V)				Date	Time		Generation Loss(MW)	Load Loss (MW)		Flash Report Submission (Y/N)	DR/EL Submission (Y/N)	Detail Tripping Report Submission (Y/N)
12	GD-1	i)220 KV Panchkula(PG)-Pinjore (HR) (HVPNL) Ckt-2 ii)220 KV Panchkula(PG)-Pinjore (HR) (HVPNL) Ckt-1 iii)220 KV Pinjore(HR)-Baddi (HP) (HVPNL) Ckt-1 iv)220 KV Pinjore(HR)-Baddi (HP) (HVPNL) Ckt-2	HP & Haryana	PGCIL , HVPNL & HPSEB	26-Mar-25	13:37	i)220kV Pinjore(HR) and 220KV Baddi S/s has double main bus arrangement at 220kV side. ii)During antecedent condition, 220 KV Panchkula (PG)-Pinjore (HR) (HVPNL) Ckt-1 & Ckt-2 were carrying 136MW each, while 220KV Pinjore – Baddi Ckt1 & 2 were carrying 125MW each. (As per SCADA). Further, 220/66kV Baddi(HP) S/s was operating in split mode and load of 220/66kV was being fed from 220KV Pinjore – Baddi Ckt-1 & 2 iii)As reported, at 13:37 hrs, 220 KV Panchkula(PG)-Pinjore (HR) (HVPNL) Ckt-2 tripped on R-N phase to earth fault. The fault location was 30KM from Panchkula end, Z-2 distance protection operated. The fault current as reported by POWERGRID was 4.2KA but as per the DR submitted fault current was 3.8KA. It is pertinent to mention that due to tripping of Ckt-2 all the load shifted on 220 KV Panchkula(PG)-Pinjore (HR) (HVPNL) Ckt-1. iv)Further at 13:42 hrs, 220 KV Panchkula(PG)-Pinjore (HR) (HVPNL) Ckt-1 was manually hand tripped due to heavy sparking on Bus Isolator 20589 at Panchkula end. v)With the outage of 220kV Panchkula-Pinjore D/C, 220kV Pinjore station became dead and load of Baddi(HP) also got affected. vi)As per PMU at Panchkula(PG), R-N phase to earth fault is observed with delayed fault clearing time of 240msec. vii)As per SCADA, change in demand of approx. 113MW is observed in HP control area respectively. No change in demand of Haryana control area observed.	0	113	360	N (Partial details received)	N (Partial details received)	N (Partial details received)
13	GI-1	i)220 KV SAHARANPUR(UP)-KHODRI(UK) (UP) CKT-1 ii)220 KV SARSAWAN(UP)-KHODRI(UK) (UP) CKT-1 iii)220 KV KHODRI(UK)-MAJRI(HP) (UK) CKT-1 iv)220 KV KHODRI(UK)-MAJRI(HP) (UK) CKT-2	UK & HP	HPSEB, UPPCL &PTCUL	28-Mar-25	07:31	i)220 Khodri Sub station has double main Bus Bar system with 4 * 60MW generating units. ii)During antecedent condition, 220 KV KHODRI(UK)-MAJRI(HP) (UK) CKT-1 and CKT-2 were carrying 82MW load each, while 220 KV SAHARANPUR (UP) – KHODRI (UK) (UP) was carrying 19MW load (as per SCADA). iii)As reported, at 07:31 hrs, Bus Bar protection operated due to R phase CB blast of Unit 1 at Khodri. Due to bus bar protection operation, 220kV ..... As per DR of 220 KV KHODRI(UK)-MAJRI(HP) (UK) CKT-1 and Ckt2, R-N phase to earth fault can be observed along with Z-4 distance protection operation from Khodri end. iv)As per PMU, R-N phase to earth fault was observed in the system with delayed fault clearance of 240 msec observed. v)As per Disturbance short report submitted by UP SLDC, 220 KV SAHARANPUR(UP)-KHODRI(UK) (UP) CKT-1 tripped on R-N, transient earth fault, Z-3 and the fault current is 1.9KA . vi)220 KV SARSAWAN(UP)-KHODRI(UK) (UP) CKT-1 tripped on Z-1, R-N fault, fault distance: 85.22KM from Sarsawan(UP) end. The line did not open from Sarsawan end. vii)Due to tripping of 220kV Khodri-Majri D/C which were only feeding source at 220kV side at Majri (HP), load of 220/132kV Majri(HP) got affected. viii)As per SCADA, change in demand and generation of approx. 90 MW and 96 MW respectively in Himachal and Uttarakhand control area were observed. However, SLDC Uttarakhand and SLDC Himachal informed generation loss of 75MW and load loss of 160MW.	90	160	240	Y(d)	N (Partial details received)	Y(d)
14	GD-1	i)220 KV Bhadla(PG)-Azure Maple PSS SL_BHD_PG (APMPL) Ckt-1 ii)220/33kV 130 MVA ICT1 at Azure 34	Rajasthan	PGCIL &Azure	31-Mar-25	13:43	i)Generation of 220kV Azure Maple(IP) station evacuates through 220 KV Bhadla(PG)-Azure Maple PSS SL_BHD_PG (APMPL) (APMPL) Ckt-1 which was generating approx. 290 MW (as per PMU). Similarly, 220kV Azure 34(IP) station evacuates through 220 KV BHADLA(PG)-AZURE POWER 34 SOLAR(APTFL) (APTFL) CKT-1 which was generating 132MW (as per PMU). ii)As reported, at 13:43hrs, 220 KV Bhadla(PG)-Azure Maple PSS SL_BHD_PG (APMPL) (APMPL) Ckt-1 tripped on R-N phase to earth fault due to differential protection operation on account of tree fell on the line. At the same time 130 MVA 220/33KV ICT at 220kv Azure 34 also tripped on account of Differential relay protection (exact reason yet to be shared) iii)Due to tripping of 220 KV Bhadla(PG)-Azure Maple PSS SL_BHD_PG (APMPL) (APMPL) Ckt-1 and 130 MVA 220/33KV ICT1 at Azure34, Azure Maple(IP) and Azure 34 S/s lost its connectivity from grid and blackout occurred at 220kV Azure Maple(IP) and 220kV Azure 34(IP) S/s. iv)As per PMU at Bhadla(PG), R-N phase to earth fault (voltage dipped upto 0.95 p.u.) is observed with fault clearing time of 160ms. After the fault clearance voltage increased upto 1.04 p.u. v)As per PMU at Bassi(PG), a sharp drop in frequency is observed from 49.90 Hz to 49.82 Hz and frequency recovered to 49.91 Hz within 1 min. vi)As per SCADA, dip in NR total solar generation of approx. 802 MW is observed. vii)As per SCADA, solar generation loss of approx. 290MW at Azure Mapple, 132MW at Azure34, 115MW at TPREL and 115MW at AHEJ4L RE stations were observed. Drop in generation of TPREL and AHEJ4L is suspected due to LVRT non-compliance. Details is yet to be received from RE stations. viii)As per DR (Bhadla end) of 220 KV Bhadla(PG)-Azure Maple PSS SL_BHD_PG (APMPL) (APMPL) Ckt-1, R-N phase to earth fault (~7.3kA) with unsuccessful A/R operation is observed. 3-ph A/R was observed instead of 1-ph A/R.	802	0	160	N (Partial details received)	N (Partial details received)	N (Partial details received)

Sr No	Element Name	Outage Date	Outage Time	Reason
1	220 KV Badarpur(NT)-Alwar MIA(RS) (RS) Ckt-1	11-Mar-25	12:08	Transient fault
		13-Mar-25	11:59	Phase to Ground Fault B-N
		14-Mar-25	11:13	Phase to earth fault B-N
		19-Mar-25	14:16	Transient fault
		20-Mar-25	10:04	Phase to earth fault B-N
		21-Mar-25	12:22	Transient fault
		22-Mar-25	03:59	Phase to Ground Fault B-N
		23-Mar-25	14:20	Transient fault
		26-Mar-25	13:40	Earth fault
2	220 KV Nara(UP)-Roorkee(UK) (UP) Ckt-1	11-Mar-25	17:40	Phase to earth fault R-N
		15-Mar-25	02:05	Phase to Phase Fault R-Y
		23-Mar-25	14:55	Transient fault
		23-Mar-25	14:57	Transient fault
3	220 KV RAPS_A(NP)-Sakatpura(RS) (RS) Ckt-1	08-Mar-25	03:16	Phase to earth fault R-N
		19-Mar-25	01:28	Transient fault
		29-Mar-25	04:40	Transient fault
		30-Mar-25	04:22	Transient fault
4	220 KV RAPS_A(NP)-Sakatpura(RS) (RS) Ckt-2	11-Mar-25	02:44	Phase to earth fault R-N
		19-Mar-25	01:28	Transient fault
		19-Mar-25	04:02	Transient fault
		19-Mar-25	05:59	Transient fault
5	220 KV RAPS_B(NP)-Sakatpura(RS) (RS) Ckt-1	08-Mar-25	05:19	Phase to earth fault R-N
		11-Mar-25	12:45	Phase to Ground Fault B-N
		16-Mar-25	04:32	Phase to earth fault R-N
		29-Mar-25	02:54	Transient fault
6	220/33 kV 150 MVA ICT 2 at ABCRenew_RJ01_SL_BHD2_PG	02-Mar-25	11:47	Operation of transformer protection
		03-Mar-25	13:06	Operation of transformer protection
		19-Mar-25	15:19	Phase to Ground Fault Y-N
7	400 KV Bareilly-Unnao (UP) Ckt-1	15-Mar-25	12:54	Phase to earth fault Y-N
		17-Mar-25	13:29	Phase to earth fault B-N
		21-Mar-25	02:31	Phase to Ground Fault R-N
8	400 KV Merta-Kankani (RS) Ckt-1	08-Mar-25	13:02	Phase to earth fault B-N
		08-Mar-25	14:36	Phase to earth fault B-N
		26-Mar-25	13:42	Phase to earth fault B-N
9	400 KV Suratgarh(RVUN)-Ratangarh(RS) (RS) Ckt-1	02-Mar-25	03:38	Phase to earth fault R-N
		29-Mar-25	02:31	Over Voltage
		29-Mar-25	20:59	Over Voltage
10	400/220 kV 240 MVA ICT 3 at Obra_B(UP)	14-Mar-25	12:02	Operation of transformer protection
		15-Mar-25	11:33	Operation of transformer protection
		26-Mar-25	11:11	Operation of transformer protection
11	400/33 kV 150 MVA ICT 1 at Renew SuryaRavi SL_BKN_PG (RSRPL)	03-Mar-25	09:37	Operation of transformer protection
		08-Mar-25	11:42	Operation of transformer protection
		11-Mar-25	14:51	Relay maloperation

Annexure-B.IV

Grid Events to be discussed in 59th PSC Meeting

S.No.	Category of Grid Incident/ Disturbance (GI-I to GD-V)	Name of Elements (Tripped/Manually opened)	Affected Area	Owner/ Agency	Outage		Event (As reported)	Loss of generation / loss of load during the Grid Disturbance		Fault Clearance time (in ms)	Points of discussion
					Date	Time		Generation Loss(MW)	Load Loss (MW)		
1	GI-1	1) 220 KV Dasuya(PS)-Jalandhar(BB) (BBMB) Ckt-2 2) 220 KV Dasuya(PS)-Jalandhar(PG) (PG) Ckt-1 3) 220 KV Sarna(PS)-Dasuya(PS) (PG) Ckt-2 4) 220 KV Pong(BB)-Dasuya(PS) (BBMB) Ckt-2	Punjab	PSTCL, BBMB, PGCIL	10-Mar-25	14:32	i)220kV Dasuya(PS) has double main bus scheme. ii)As reported at 14:32hrs, B-ph conductor of 220 KV Dasuya(PS)-Jalandhar(BB) Ckt-2 broken due to damage of insulator string and fell on 220kV bus-2. iii)As per PMU at Jalandhar(PG), B-N fault with delayed clearance of ~560msec is observed. iv)Fault was not cleared in time from Dasuya end. (Exact details w.r.t. bus bar protection at Dausya end yet to be received.) v)Line connected to 220kV Bus-2 i.e., 220 KV Dasuya(PS)-Jalandhar(PG) (PG) Ckt-1, 220 KV Sarna(PS)-Dasuya(PS) (PG) Ckt-2 and 220 KV Pong(BB)-Dasuya(PS) (BBMB) Ckt-2 tripped from remoted end. As reported, 220kV bus coupler at Dasuya(PS) also tripped. vi)As per SCADA, change in demand of approx. 100 MW is observed in Puniab control area.	0	100	560	Details analysis of the event and remedial action taken details.
2	GD-1	1) 220 KV Baghpat(PG)-Baraut(UP) (UP) Ckt-1 2) 220 KV Baghpat(PG)-Baraut(UP) (UP) Ckt-2 3) 220 KV Nirpura-Baraut(UP) Ckt 4) 220 KV Muradnagar_new-Baraut(UP) Ckt 5) 220/132kV 200MVA ICT-1 at Baraut(UP) 6) 220/132kV 200MVA ICT-2 at Baraut(UP) 7) 220/132kV 200MVA ICT-3 at Baraut(UP)	Uttar Pradesh	UPPTCL, PGCIL	12-Mar-25	01:06	i)220/132/33KV Baraut(UP) S/s has single main and transfer bus scheme in all voltage levels. ii)As reported at 01:06 hrs, R-ph CT of 220 KV Baghpat(PG)-Baraut(UP) (UP) Ckt-1 got damaged which further led to bus bar protection operation at 220kV Baraut(UP). As a result, all the elements connected to 220KV Bus tripped and complete blackout occurred at 220/132/33kV Baraut(UP) S/s. iii)However, as per DR at Baghpat(PG) end of 220 KV Baghpat(PG)-Barau(UP) (UP) Ckt-1, R-N fault (Ir=~7.71kA) converted to R-Y-N fault (Ir=~14.48kA, Iy=~15.87kA) was observed in 220 KV Baghpat(PG)-Baraut(UP) (UP) Ckt-1 and fault was cleared in zone-2 from Baghpat(PG) end with fault clearing time of =~440ms. iv)As per DR at Baghpat(PG) end of 220 KV Baghpat(PG)-Baraut(UP) (UP) Ckt-2, R-N fault (Ir=~8.53kA) was observed in 220 KV Baghpat(PG)-Baraut(UP) (UP) Ckt-2 and fault was sensed in zone-2 at Baghpat(PG) end with fault clearing time of =~240ms. v)As per SCADA SOE, 220 KV Baghpat(PG)-Shamli(UP) (UP) Ckt also tripped during the same time (exact reason of tripping yet to be shared). vi)As per PMU at Meerut(PG), R-N phase to ground fault converted to R-Y-N double phase to ground fault with delayed fault clearing time of 440ms was observed. vii)As per SCADA, change in demand of approx. 40MW is observed in Uttar Pradesh control area.	0	40	440	Details analysis of the event and remedial action taken details.
3	GD-1	1) 220 KV Delhi RR(BB)-Narela(DV) (BBMB) Ckt-1 2) 220 KV Delhi RR(BB)-Narela(DV) (BBMB) Ckt-2	Delhi	DTL, BBMB	14-Mar-25	18:34	i)220/66/33kV Delhi Rohtak Road(BB) S/s has double main bus arrangement at 220kV level. ii)During antecedent condition, incoming power at Delhi Rohtak Road(BB) through 220 KV Delhi RR(BB)-Narela(DV) (BBMB) D/C was approx. 17 MW each (as per SCADA) which was supplying load of Delhi Rohtak Road(BB) S/s. iii)As reported, at 18:34hrs, 220 KV Delhi RR(BB)-Narela(DV) (BBMB) Ckt-1 tripped on R-B phase to phase fault with following relay indications: fault distance of 1.185km and fault current of Ir=~2.587kA and Ib=~2.523kA from Delhi RR(BB) end and fault distance of 17.59 km and fault current of Ir=~3.841kA and Ib=~3.878kA from Narela(DV) end. During patrolling, a kite string was found tangled between R and B phases at tower loc. no. 1069A, which was later removed. iv)During the same time, 220 KV Delhi RR(BB)-Narela(DV) (BBMB) Ckt-2 also tripped from Narela end only with following relay indications : fault distance of 17.59 km and fault current of Ir=~3.841kA and Ib=~3.878kA from Narela(DV) end (exact reason of fault yet not shared). During patrolling, nothing abnormal was found. v)Due to tripping of 220 KV Delhi RR(BB)-Narela(DV) (BBMB) D/C, complete blackout occurred at 220/66/33kV Delhi Rohtak Road(BB) S/s. vi)As per PMU at Mandaula(PG), R-B phase to phase fault with fault clearing time of 80 ms is observed. vii)As per SCADA, change in demand of approx. 30 MW is observed in Delhi control area.	0	30	80	Details analysis of the event and remedial action taken details.
4	GD-1	1) 400 KV Parbati_2(NH)-Sainj(HP) (PKTCL) Ckt 2) 400 KV Parbati_3(NH)- Banala(PG) (PKTCL) Ckt	Himachal Pradesh	HPPTCL, PGCIL, NHPC	16-Mar-25	14:46	i)Total generated power of Sainj HEP(HP), Parbati_2(NH) and Parbati_3(NH) evacuates through 400 kV Parbati_2(NH)- Banala(PG) (PKTCL) Ckt and 400 kV Parbati_3(NH)- Banala(PG) (PKTCL) Ckt via 400 KV Parbati_2(NH)-Sainj(HP) (PKTCL) Ckt and 400 KV Parbati_3(NH)-Sainj(HP) (PKTCL) Ckt. ii)During antecedent condition, no generation was there at 400kV Parbati_2(NH), 400kV Parbati_3(NH) and 400kV Sainj HEP(HP). iii)As reported, at 14:46hrs, 400 KV Parbati_3(NH)- Banala(PG) (PKTCL) Ckt tripped from Banala(PG) end only on R-N phase to earth fault with fault distance of 6.9km and fault current of 5.545kA from Banala(PG) end (exact reason of fault yet to be shared). iv)As further reported, 400 KV Parbati_2(NH)-Sainj(HP) (PKTCL) Ckt also tripped at the same time from Sainj end only (exact reason of tripping yet to be shared). v)Due to tripping of both 400 KV Parbati_3(NH)- Banala(PG) (PKTCL) Ckt and 400 KV Parbati_2(NH)-Sainj(HP) (PKTCL) Ckt, complete blackout occurred at 400kV Parbati_3(NH) and 400kV Sainj HEP(HP) S/s. vi)As per PMU at Nallagarh(PG), two consecutive R-N phase to earth fault is observed with delayed fault clearing time of 1240 ms and 1040 ms respectively. vii)As per SCADA, no generation loss is observed at 400kV Parbati_2(NH), 400kV Parbati_3(NH) and 400kV Sainj HEP(HP) as there was no generation at either of them.	0	0	1240	Details analysis of the event and remedial action taken details.
5	GD-1	1) 400/220 KV 500 MVA ICT 6 AT BHADLA_2 (PG) 2) 220 KV NOKHRA SL_BHD2 (NTPC)-BHADLA_2 (PG) (NOKHRA) CKT-1 3) 400 KV AGE2SL SL_BHD2_PG-Bhadla_2 (PG) (AGE2SL) Ckt-1	Rajasthan	Adani Green, PGCIL and NTPC	18-Mar-25	10:00	i)Generation of 220kV Nokhra (IP) and 400kV AGE2SL stations evacuate through 220 KV Nokhra SL_BHD2 (NTPC)-Bhadla_2 (PG) (NTPC_NOKHRA) Ckt and 400 KV AGE2SL SL_BHD2_PG-Bhadla_2 (PG) (AGE2SL) Ckt-1 respectively. ii)During antecedent condition, 220kV Nokhra (IP) and 400kV AGE2SL were generating approx. 262 MW and 488 MW respectively (as per PMU). iii)As reported, at 09:59:46hrs Y-Phase CT of 405-52 bay at AGE2SL RE station failed and it triggered Transformer Differential protection of main CB 404-52 and Tie CB 405-52 opened on Bus-Bar Zone-1 protection. iv)At 09:59:47 hrs, 400 KV AGE2SL SL_BHD2_PG-Bhadla_2 (PG) (AGE2SL) Ckt-1 tripped on R- Phase line differential protection. During inspection at site, spark in R-phase CVT was found and the same was replaced. v)As per PMU at 400kV Bhadla2(PG), Y-N fault cleared in 240msec followed by permanent R-N fault is observed is observed with fault clearing time of 80ms. vi)At the same time, 400/220kV 500MVA ICT-6 at Bhadla2(PG) and 220 KV NOKHRA SL_BHD2 (NTPC)-BHADLA_2 (PG) (NTPC_NOKHRA) CKT-1 also tripped. The reason for the same is yet to be received. vii)As per PMU, solar generation loss of approx. 487 MW at AGE2SL(IP) and 262 MW at Nokra(IP) were observed. viii)As per SCADA, total Generation loss of 1035MW was observed in NR region.	1035	0	240	Details analysis of the event and remedial action taken details.
6	GD-1	i)220 KV Bhadla(PG)-Azure Maple PSS SL_BHD_PG (APMPL) Ckt-1 ii)220/33kV 130 MVA ICT-1 at Azure 34	Rajasthan	PGCIL &Azure	31-Mar-25	13:43	i)Generation of 220kV Azure Maple(IP) station evacuates through 220 KV Bhadla(PG)-Azure Maple PSS SL_BHD_PG (APMPL) (APMPL) Ckt-1 which was generating approx. 290 MW (as per PMU). Similarly, 220kV Azure 34(IP) station evacuates through 220 KV BHADLA(PG)-AZURE POWER 34 SOLAR(APTFL) (APTFL) CKT-1 which was generating 132MW (as per PMU). ii)As reported, at 13:43hrs, 220 KV Bhadla(PG)-Azure Maple PSS SL_BHD_PG (APMPL) (APMPL) Ckt-1 tripped on R-N phase to earth fault due to differential protection operation on account of tree fell on the line. At the same time 130 MVA 220/33KV ICT at 220kv Azure 34 also tripped on account of Differential relay protection (exact reason yet to be shared) iii)Due to tripping of 220 KV Bhadla(PG)-Azure Maple PSS SL_BHD_PG (APMPL) (APMPL) Ckt-1 and 130 MVA 220/33KV ICT1 at Azure34, Azure Maple(IP) and Azure 34 S/s lost its connectivity from grid and blackout occurred at 220kV Azure Maple(IP) and 220kV Azure 34(IP) S/s. iv)As per PMU at Bhadla(PG), R-N phase to earth fault (voltage dipped upto 0.95 p.u.) is observed with fault clearing time of 160ms. After the fault clearance voltage increased upto 1.04 p.u. v)As per PMU at Bassi(PG), a sharp drop in frequency is observed from 49.90 Hz to 49.82 Hz and frequency recovered to 49.91 Hz within 1 min. vi)As per SCADA, dip in NR total solar generation of approx. 802 MW is observed. vii)As per SCADA, solar generation loss of approx. 290MW at Azure Mapple, 132MW at Azure34, 115MW at TPREL and 115MW at AHEJ4L RE stations were observed. Drop in generation of TPREL and AHEJ4L is suspected due to LVRT non-compliance. Details is yet to be received from RE stations. viii)As per DR (Bhadla end) of 220 KV Bhadla(PG)-Azure Maple PSS SL_BHD_PG (APMPL) (APMPL) Ckt-1, R-N phase to earth fault (~7.3kA) with unsuccessful A/R operation is observed. 3-ph A/R was observed instead of 1-ph A/R.	802	0	160	Details analysis of the event and remedial action taken details.

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

Multiple element tripping event at 220KV Dasuya(PS)

At 14:32 hrs on 10.03.2025

Tripped Elements

S. No	Name of Elements	Outage Time	Revival Time	Reason of tripping
1.	220 KV Dasuya(PS)-Jalandhar(BB) (BBMB) Ckt-2	14:32 hrs	05:10 hrs, 11.03.2025	B phase conductor broken and fell on busbar no.2
2.	220 KV Dasuya(PS)-Jalandhar(PG) (PG) Ckt-1		19:51 hrs	Tripped from Jalandhar(PG) end
3.	220 KV Sarna(PS)-Dasuya(PS) (PG) Ckt-2		20:31 hrs	Tripped from Sarna end
4.	220 KV Pong(BB)-Dasuya(PS) (BBMB) Ckt-2		19:17 hrs	Tripped from Pong end

Brief details of the event

i) 220kV Dasuya(PS) has double main bus scheme.

ii) As reported at 14:32hrs, B-ph conductor of 220 KV Dasuya(PS)-Jalandhar(BB) Ckt-2 broken due to damage of insulator string and fell on 220kV bus-2.

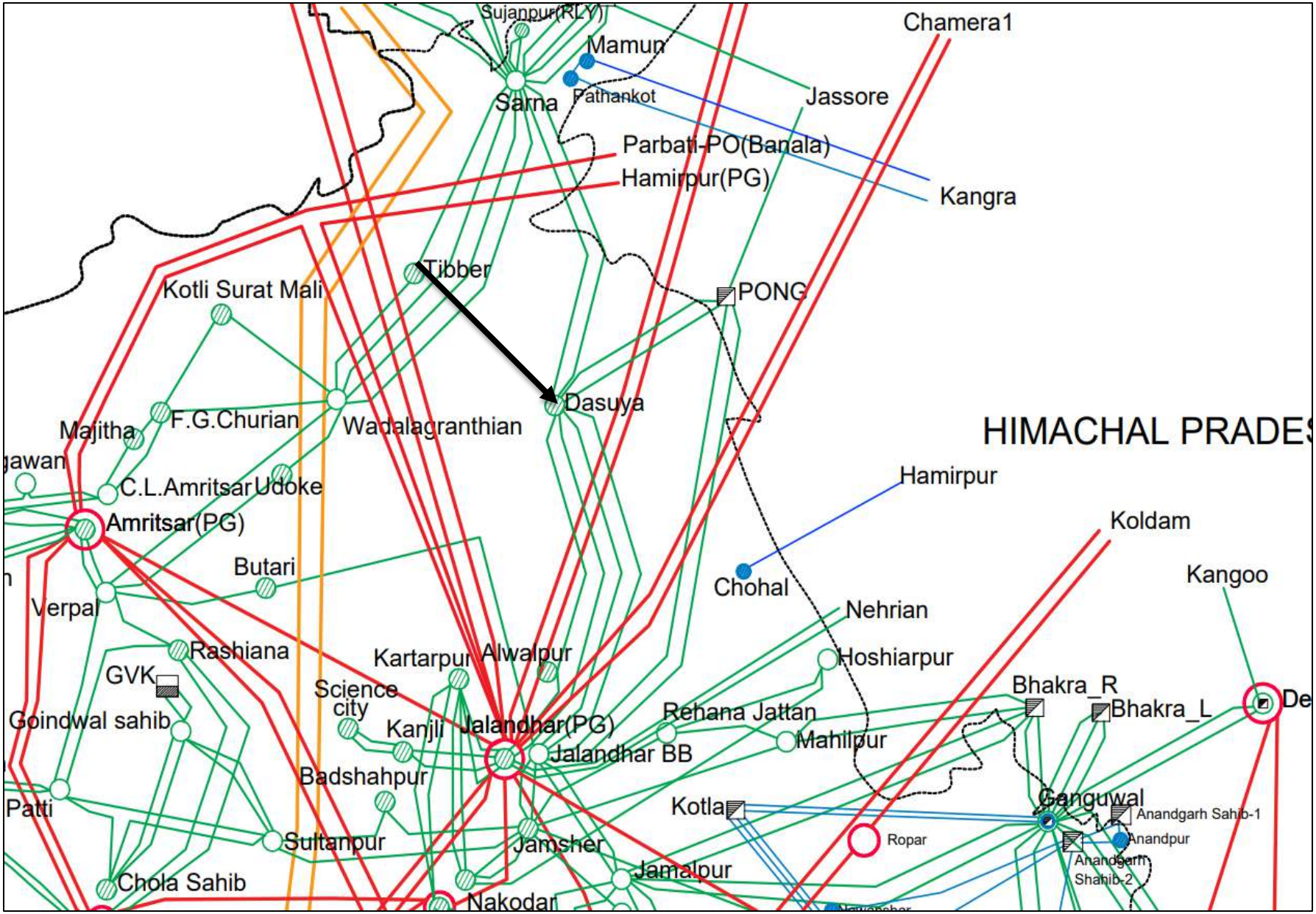
iii) As per PMU at Jalandhar(PG), B-N fault with delayed clearance of ~560msec is observed.

iv) Fault was not cleared in time from Dasuya end. (Exact details w.r.t. bus bar protection at Dausya end yet to be received.)

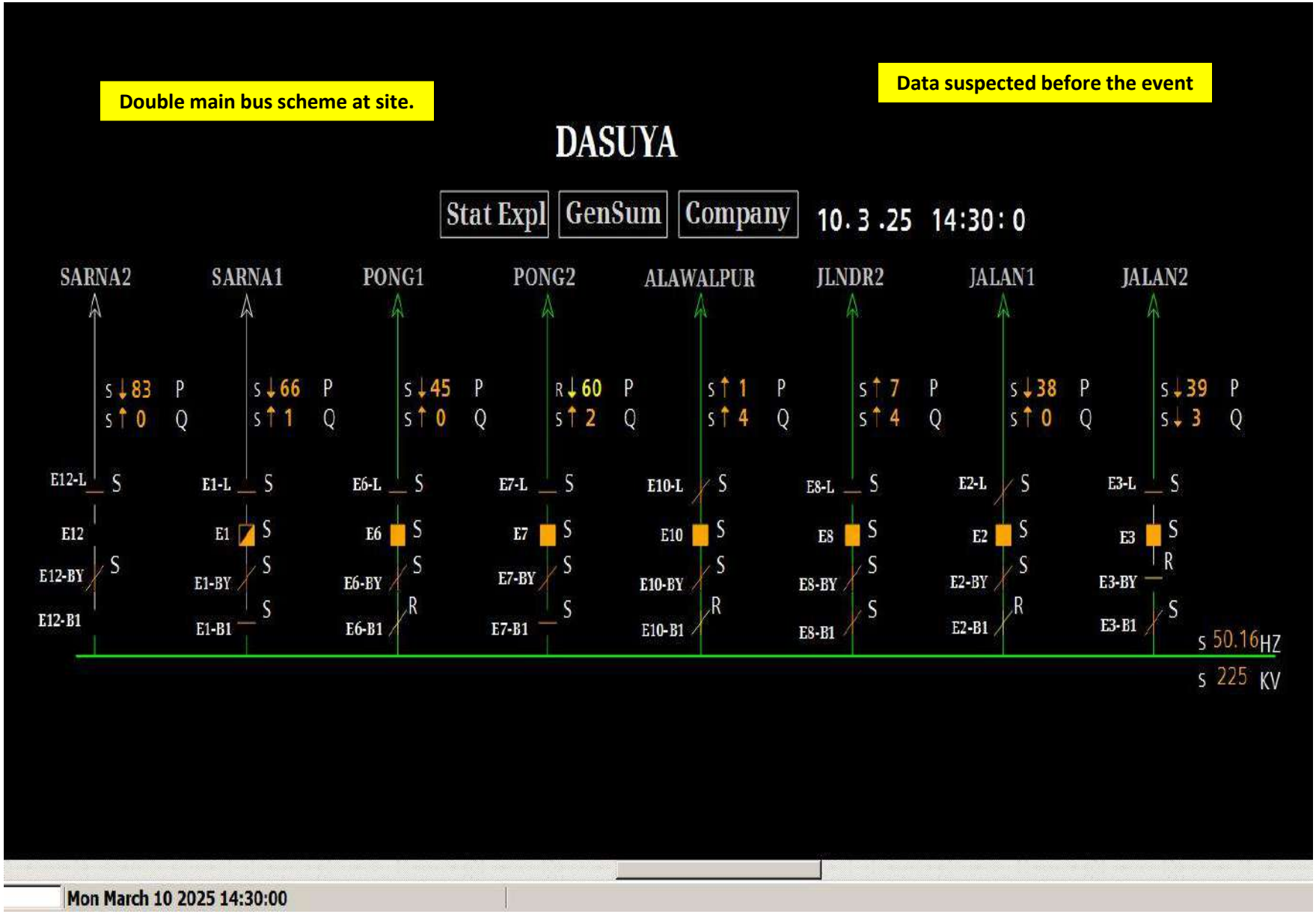
v) Line connected to 220kV Bus-2 i.e., 220 KV Dasuya(PS)-Jalandhar(PG) (PG) Ckt-1, 220 KV Sarna(PS)-Dasuya(PS) (PG) Ckt-2 and 220 KV Pong(BB)-Dasuya(PS) (BBMB) Ckt-2 tripped from remoted end. As reported, 220kV bus coupler at Dasuya(PS) also tripped.

vi) As per SCADA, change in demand of approx. 100 MW is observed in Punjab control area.

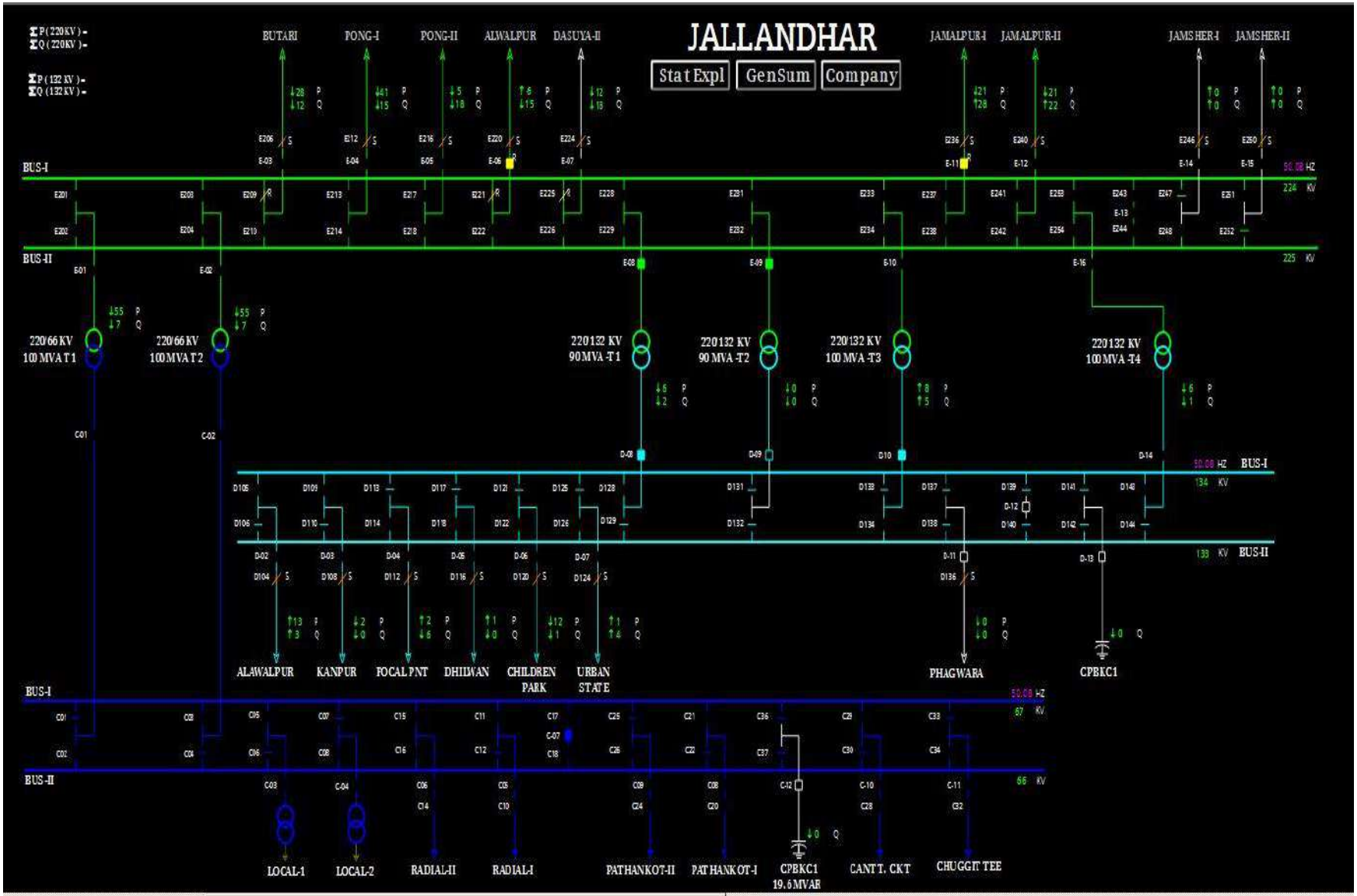
Network Diagram



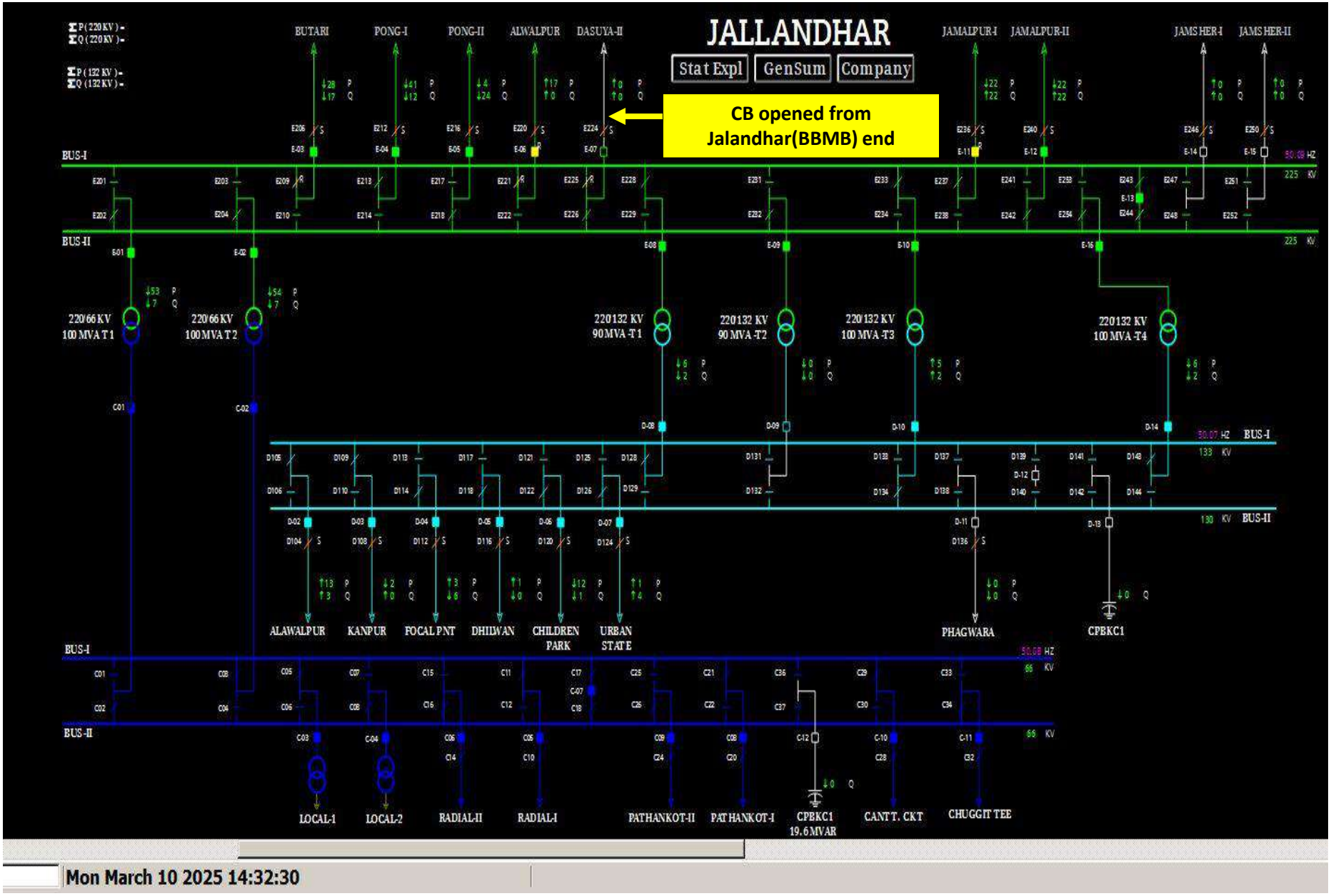
SLD of 220/132kV Dasuya(PS) before the event



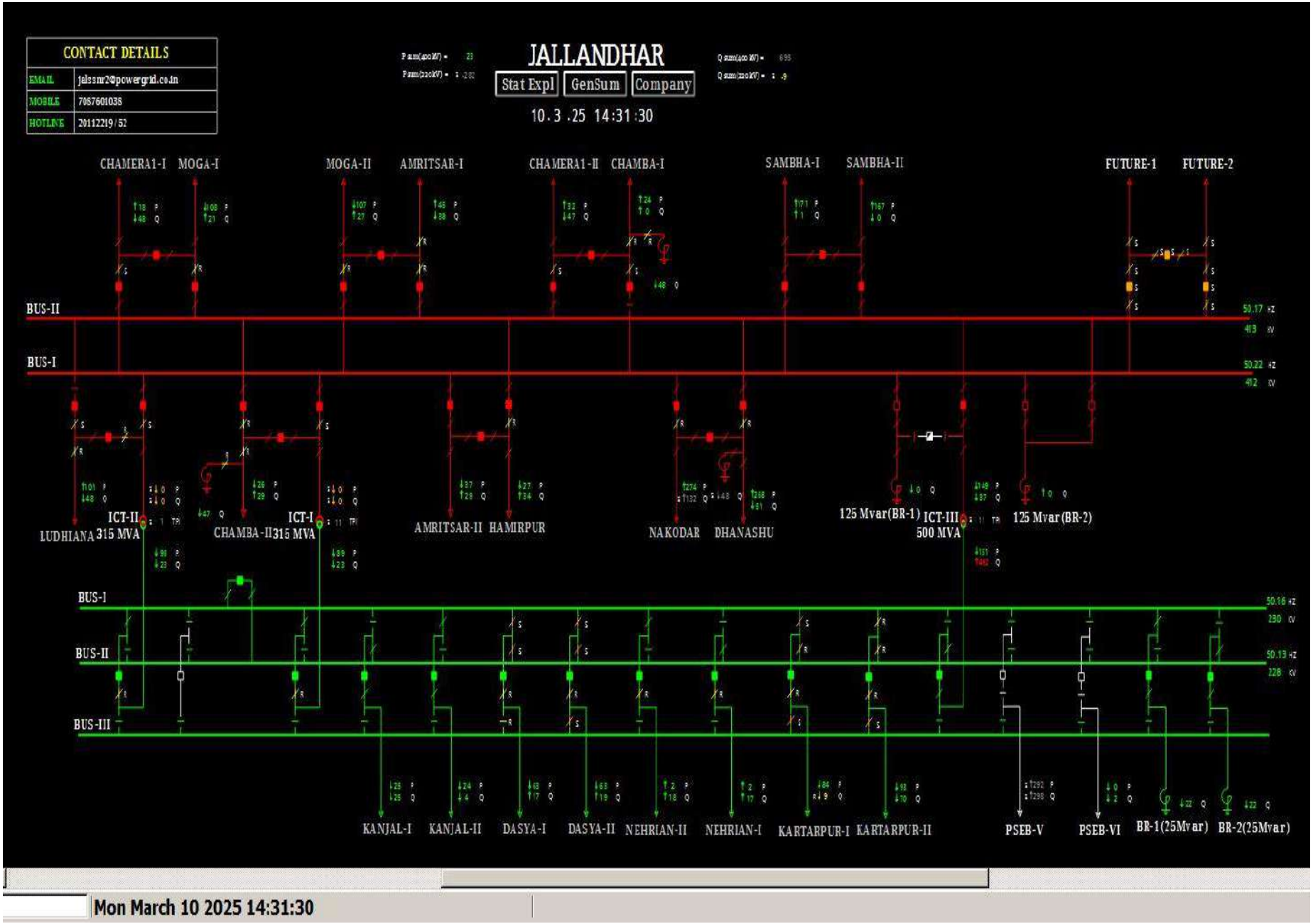
SLD of 220/132kV Jalandhar(BBMB) before the event



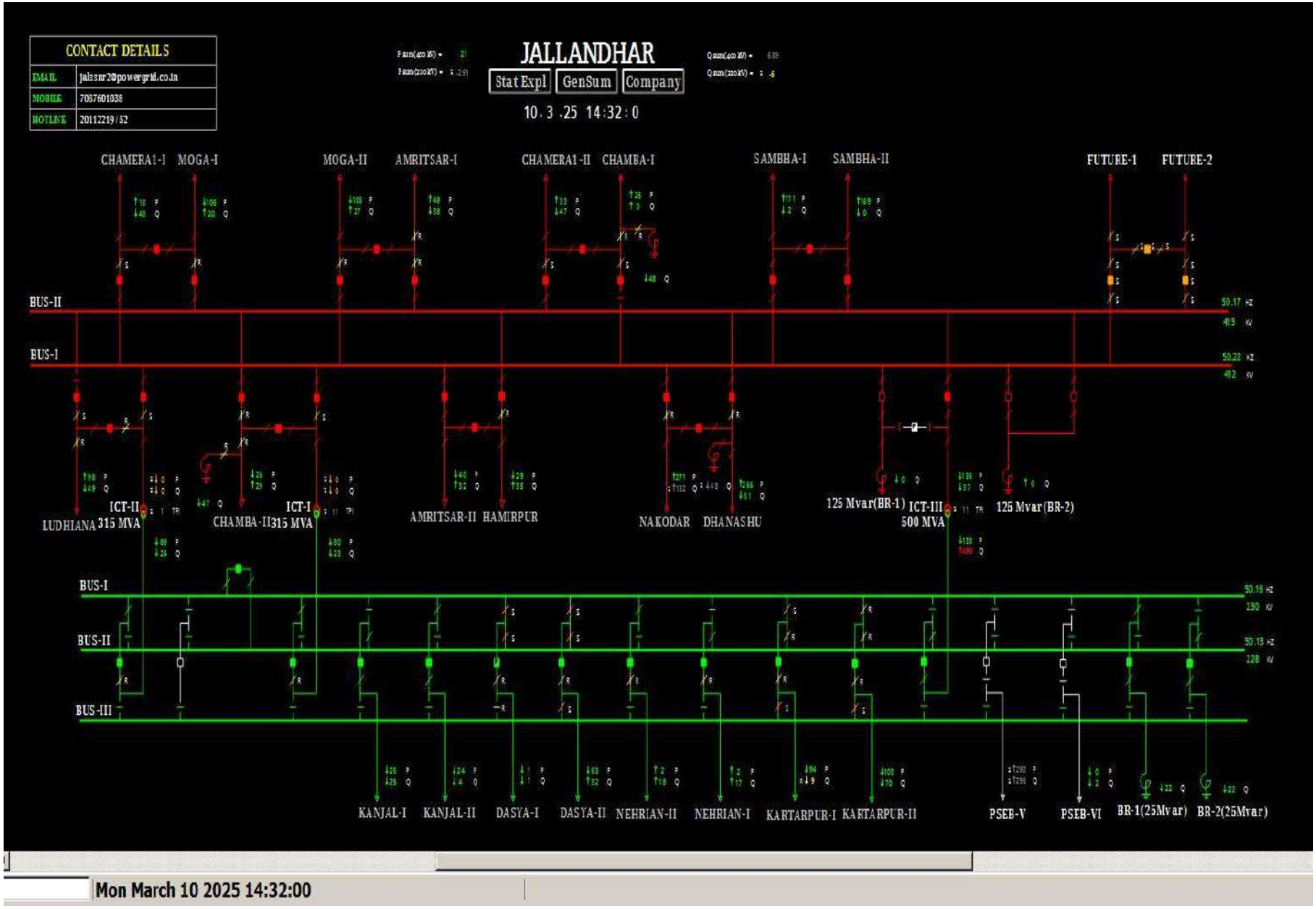
SLD of 220/132kV Jalandhar(BBMB) after the event



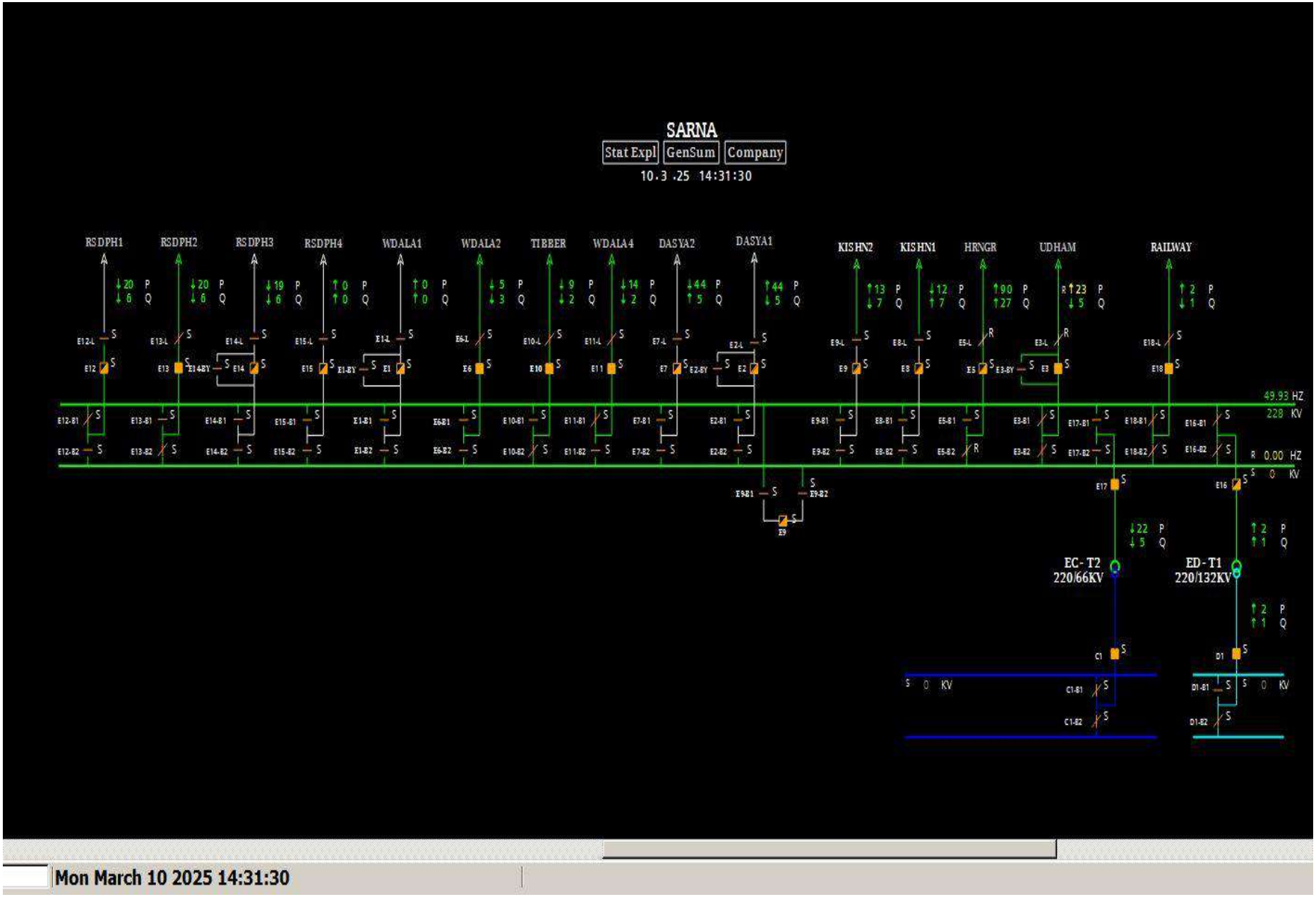
SLD of 220/132kV Jalandhar(PG) before the event



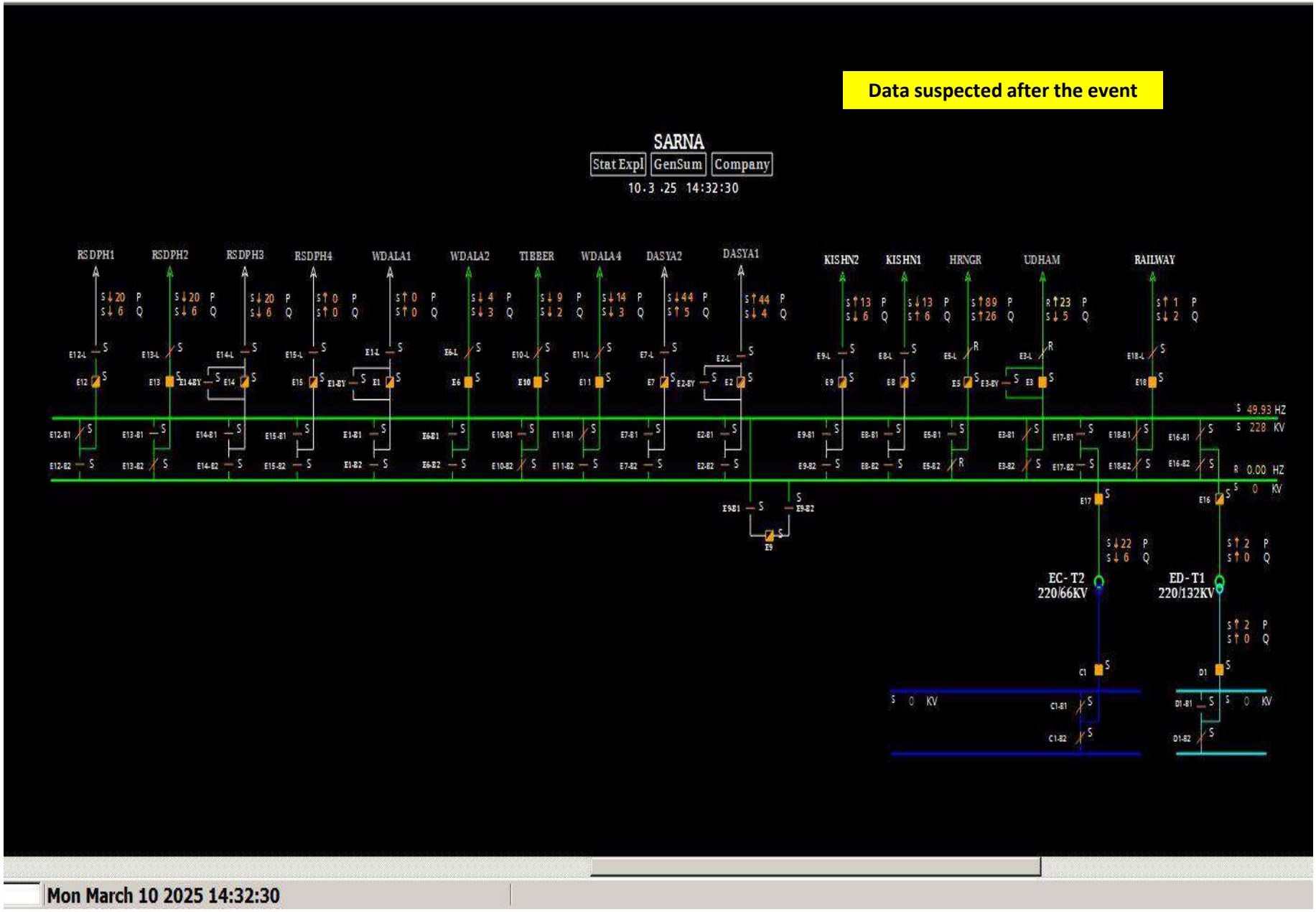
SLD of 220/132kV Jalandhar(PG) after the event



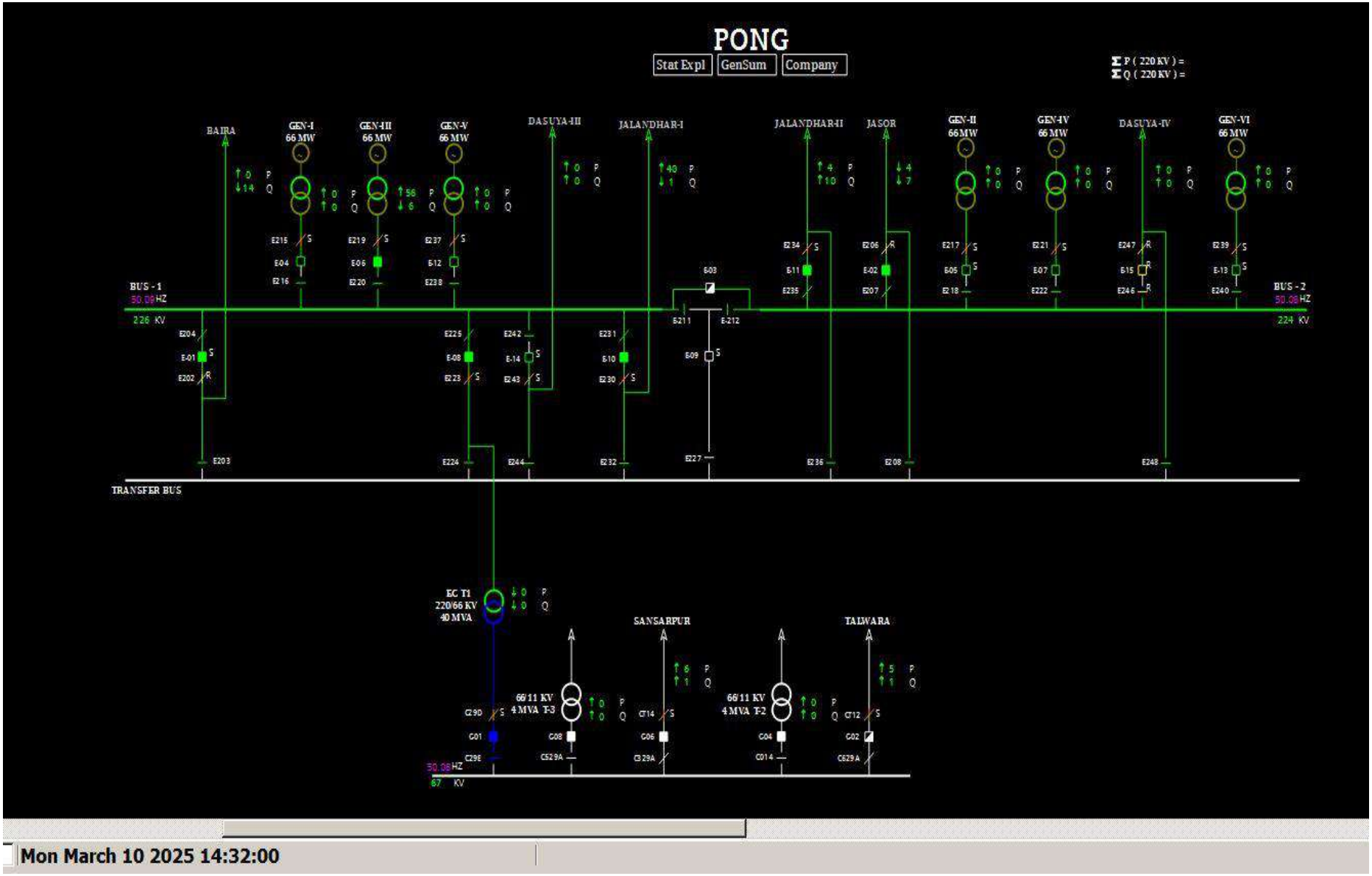
SLD of 220/132kV Sarna(PS) before the event



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

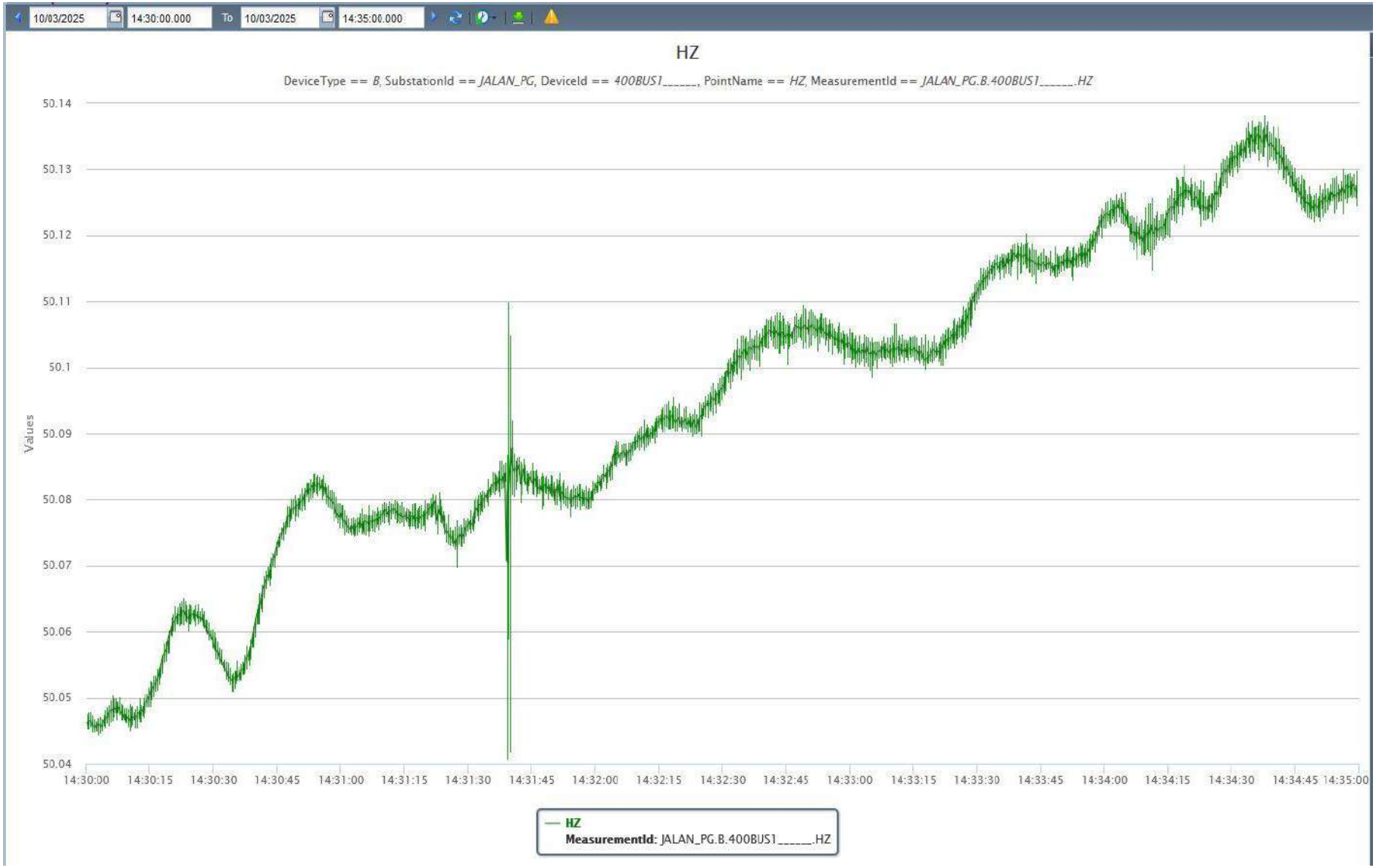


SLD of 220kV Pong(BBMB) after the event



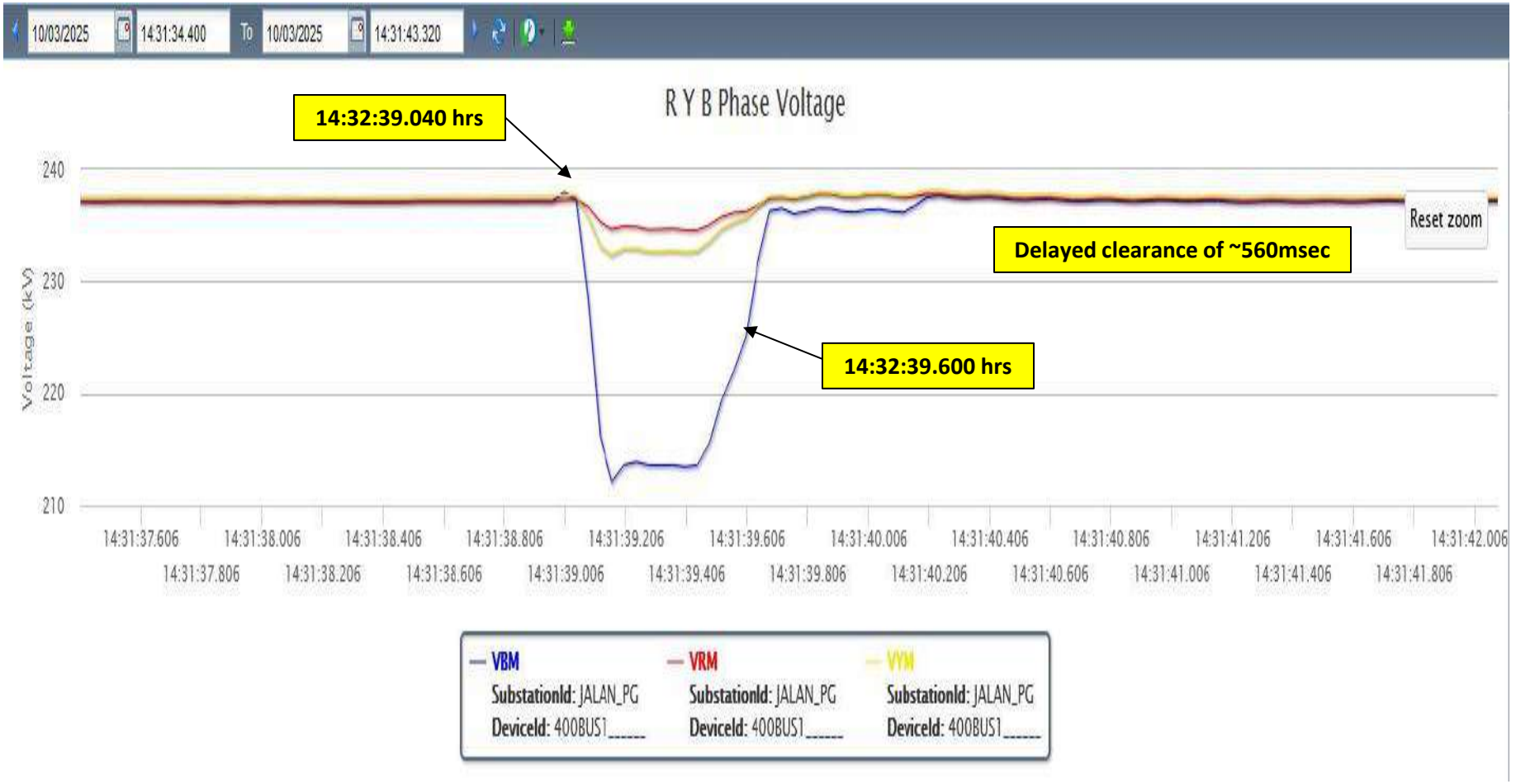
PMU Plot of frequency at Jalandhar(PG)

14:32 hrs/10-Mar-25

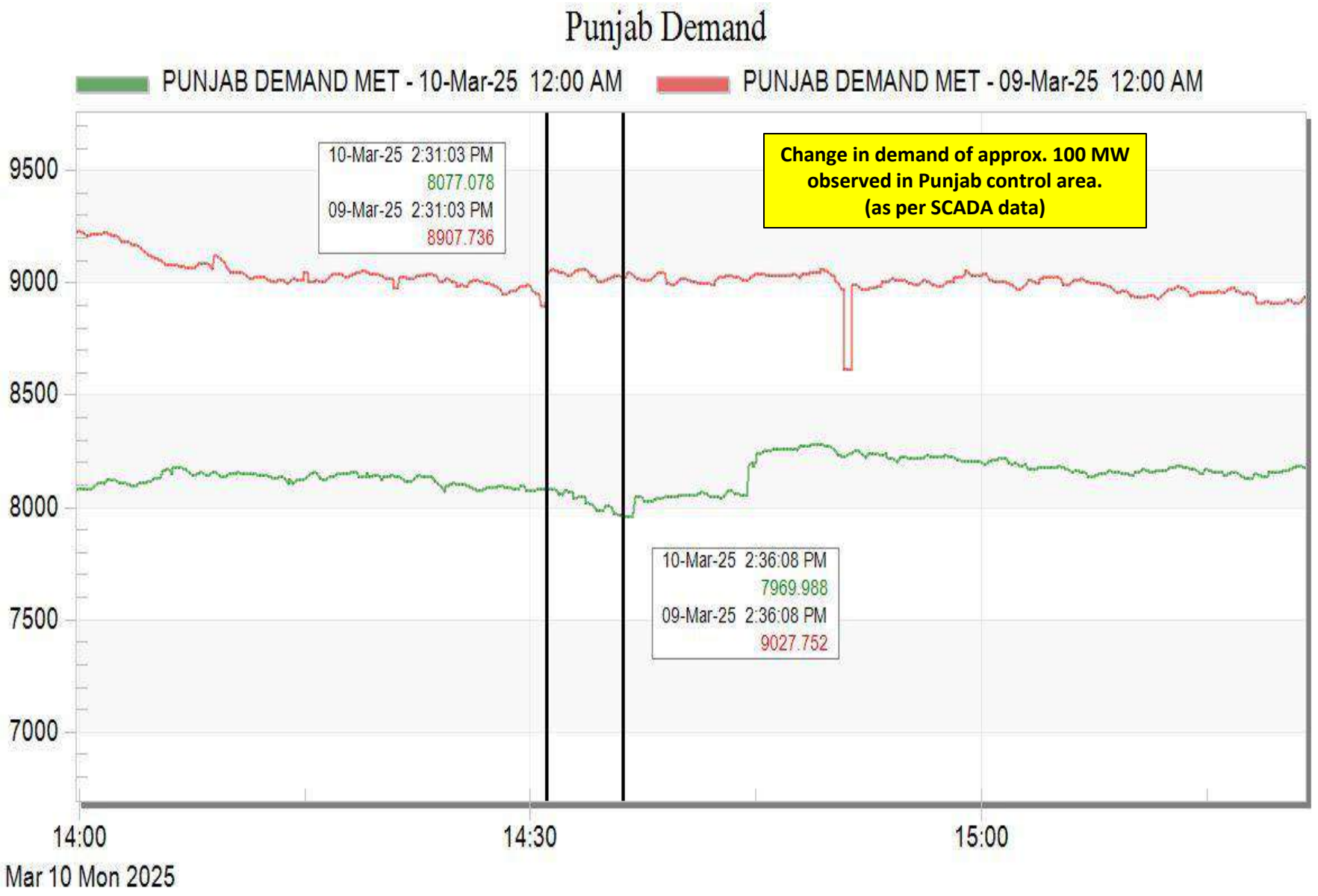


PMU Plot of phase voltage magnitude at Jalandhar(PG)

14:32 hrs/10-Mar-25



Punjab demand during the event



SCADA SOE

Time	Station Name	Votage(kV)	Element Name	Element Type	Element Status	Remarks
14:31:39,505	JLNDR_BB	220kV	7DASYA2	Circuit Breaker	Open	Line CB at Jalandhar(BB) end of 220kV Jalandhar(BB)-Dasuya ckt-2 opened
14:31:39,609	JALAN_PG	220kV	08DASYA1	Circuit Breaker	disturbe	

Points for Discussion

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

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

iii) DR/EL of all the tripped elements from both the end and details of protection operation need to be shared.

iv) SCADA data was not healthy at Dasuya(PS) and Pong(BBMB). Tripping of all the elements is also not recorded in SCADA SOE. Availability and healthiness of SCADA data need to be ensured.

v) Remedial action taken report needs to be shared.

Multiple element tripping event at 220/132/33kV Baraut(UP)

At 01:06 hrs on 12.03.2025

Tripped Elements

S. No	Name of Elements	Outage Time	Revival Time	Reason of tripping
1.	220 KV Baghpat(PG)-Baraut(UP) (UP) Ckt-1	01:06 hrs	19:49 hrs	Bus Bar protection operated at Baraut(UP)
2.	220 KV Baghpat(PG)-Baraut(UP) (UP) Ckt-2		09:20 hrs	
3.	220 KV Nirpura-Baraut(UP) Ckt			
4.	220 KV Muradnagar new-Baraut(UP) Ckt			
5.	220/132kV 200MVA ICT-1 at Baraut(UP)			
6.	220/132kV 200MVA ICT-2 at Baraut(UP)			
7.	220/132kV 200MVA ICT-3 at Baraut(UP)			

Brief details of the event

i) 220/132/33KV Baraut(UP) S/s has single main and transfer bus scheme in all voltage levels.

ii) As reported at 01:06 hrs, R-ph CT of 220 KV Baghpat(PG)-Baraut(UP) (UP) Ckt-1 got damaged which further led to bus bar protection operation at 220kV Baraut(UP). As a result, all the elements connected to 220KV Bus tripped and complete blackout occurred at 220/132/33kV Baraut(UP) S/s.

iii) However, as per DR at Baghpat(PG) end of 220 KV Baghpat(PG)-Baraut(UP) (UP) Ckt-1, R-N fault (Ir=~7.71kA) converted to R-Y-N fault (Ir=~14.48kA, Iy=~15.87kA) was observed in 220 KV Baghpat(PG)-Baraut(UP) (UP) Ckt-1 and fault was cleared in zone-2 from Baghpat(PG) end with fault clearing time of =~440ms.

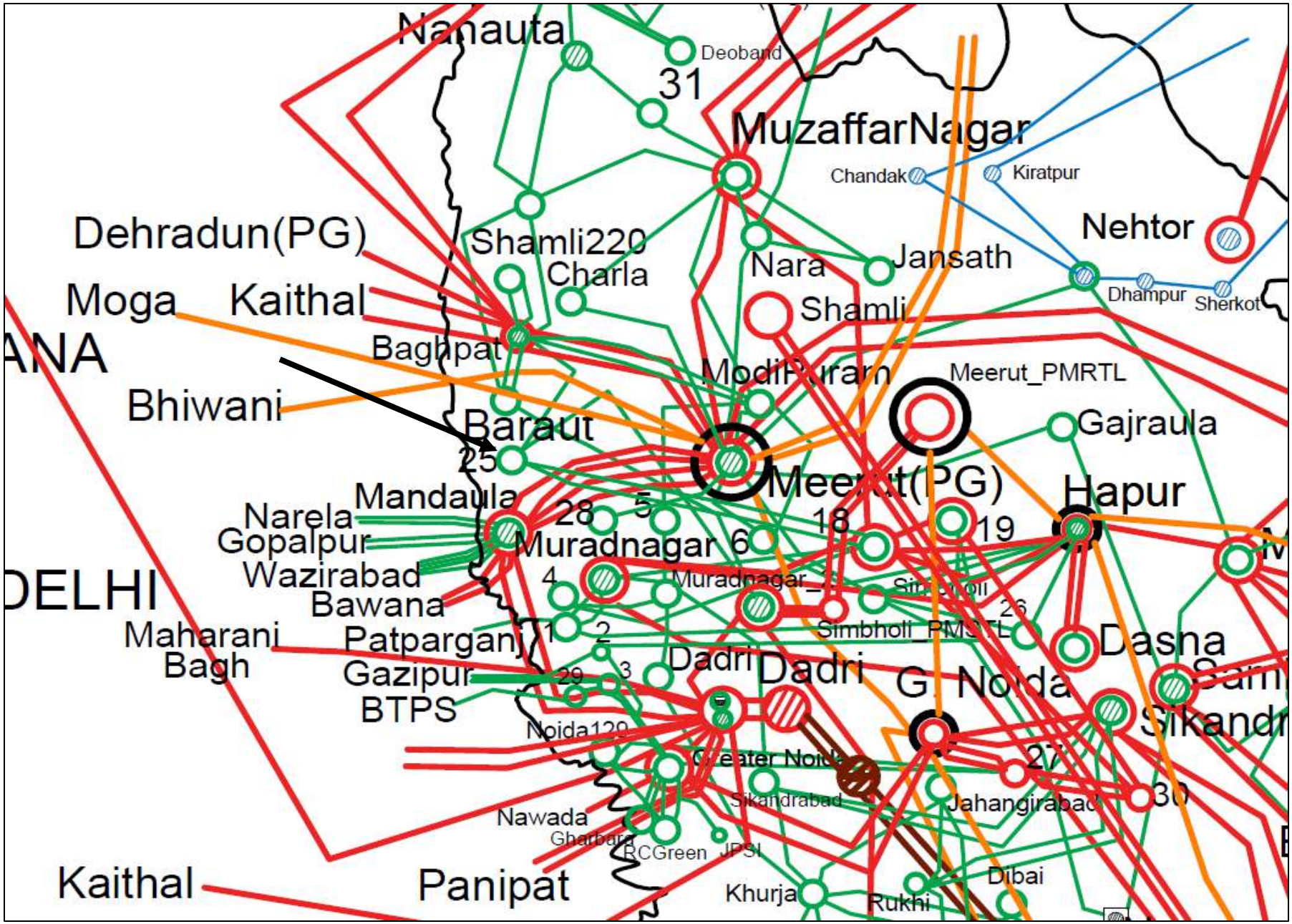
iv) As per DR at Baghpat(PG) end of 220 KV Baghpat(PG)-Baraut(UP) (UP) Ckt-2, R-N fault (Ir=~8.53kA) was observed in 220 KV Baghpat(PG)-Baraut(UP) (UP) Ckt-2 and fault was sensed in zone-2 at Baghpat(PG) end with fault clearing time of =~240ms.

v) As per SCADA SOE, 220 KV Baghpat(PG)-Shamli(UP) (UP) Ckt also tripped during the same time (exact reason of tripping yet to be shared).

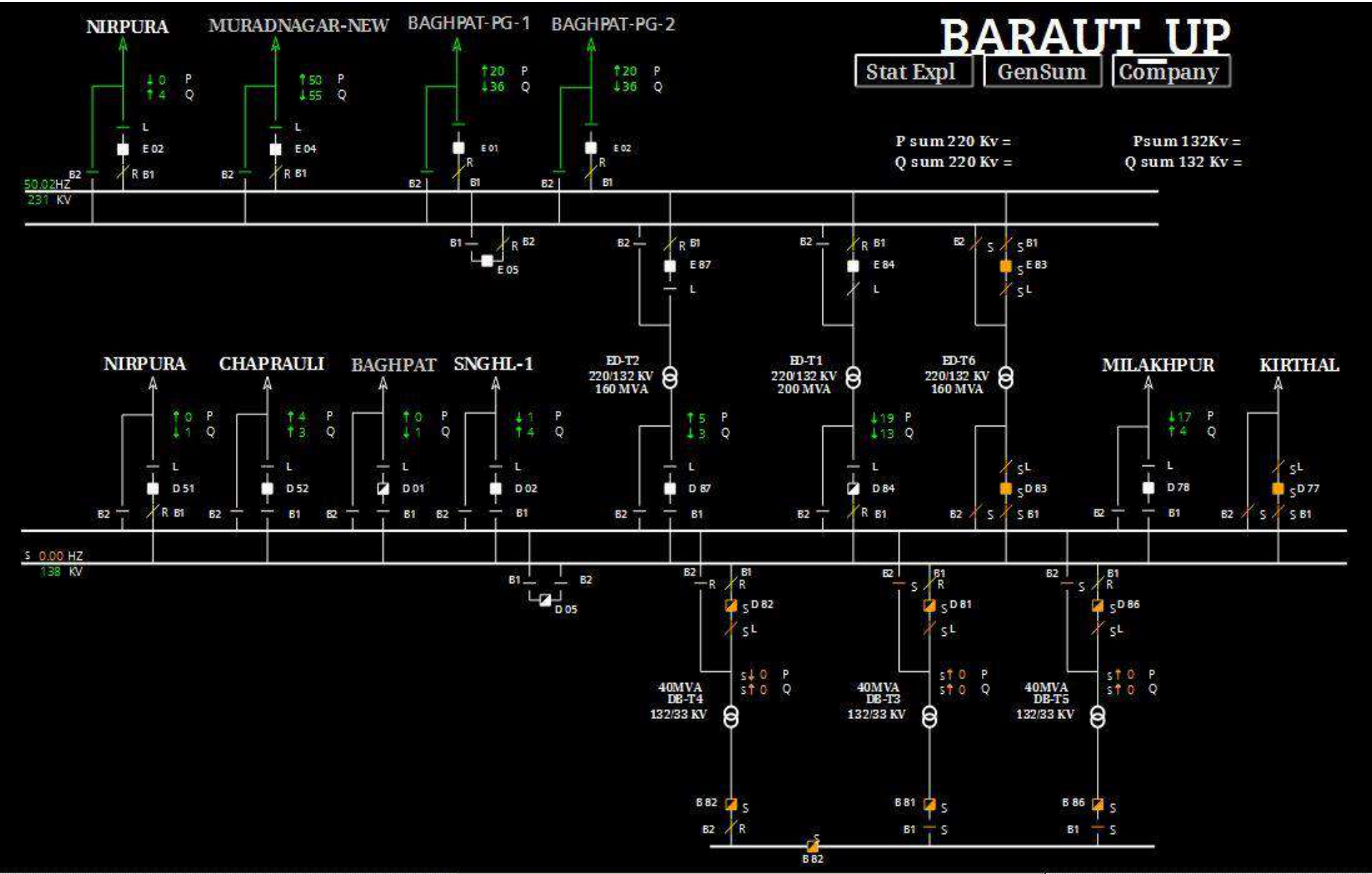
vi) As per PMU at Meerut(PG), R-N phase to ground fault converted to R-Y-N double phase to ground fault with delayed fault clearing time of 440ms was observed.

vii) As per SCADA, change in demand of approx. 40MW is observed in Uttar Pradesh control area.

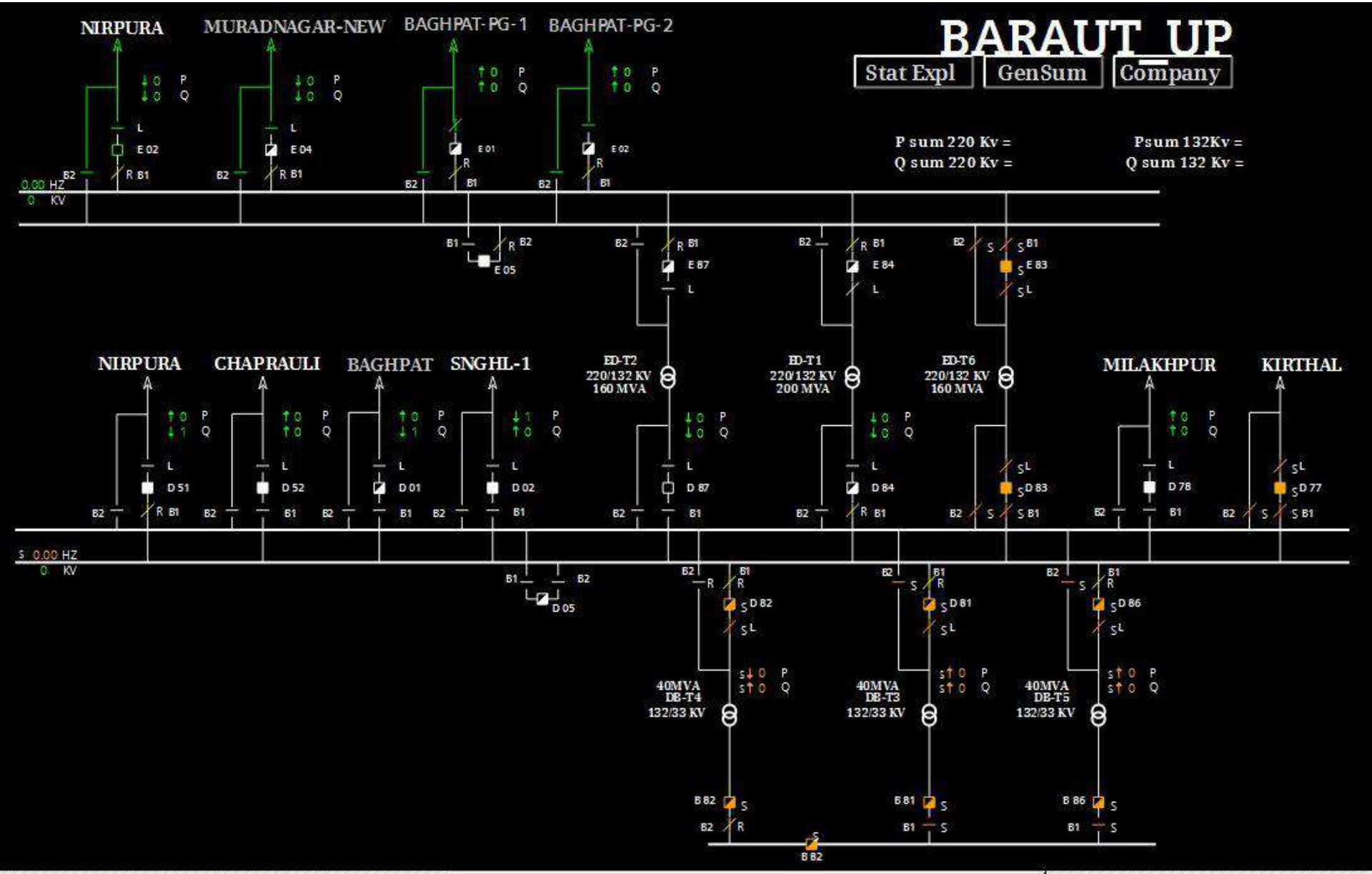
Network Diagram before the event



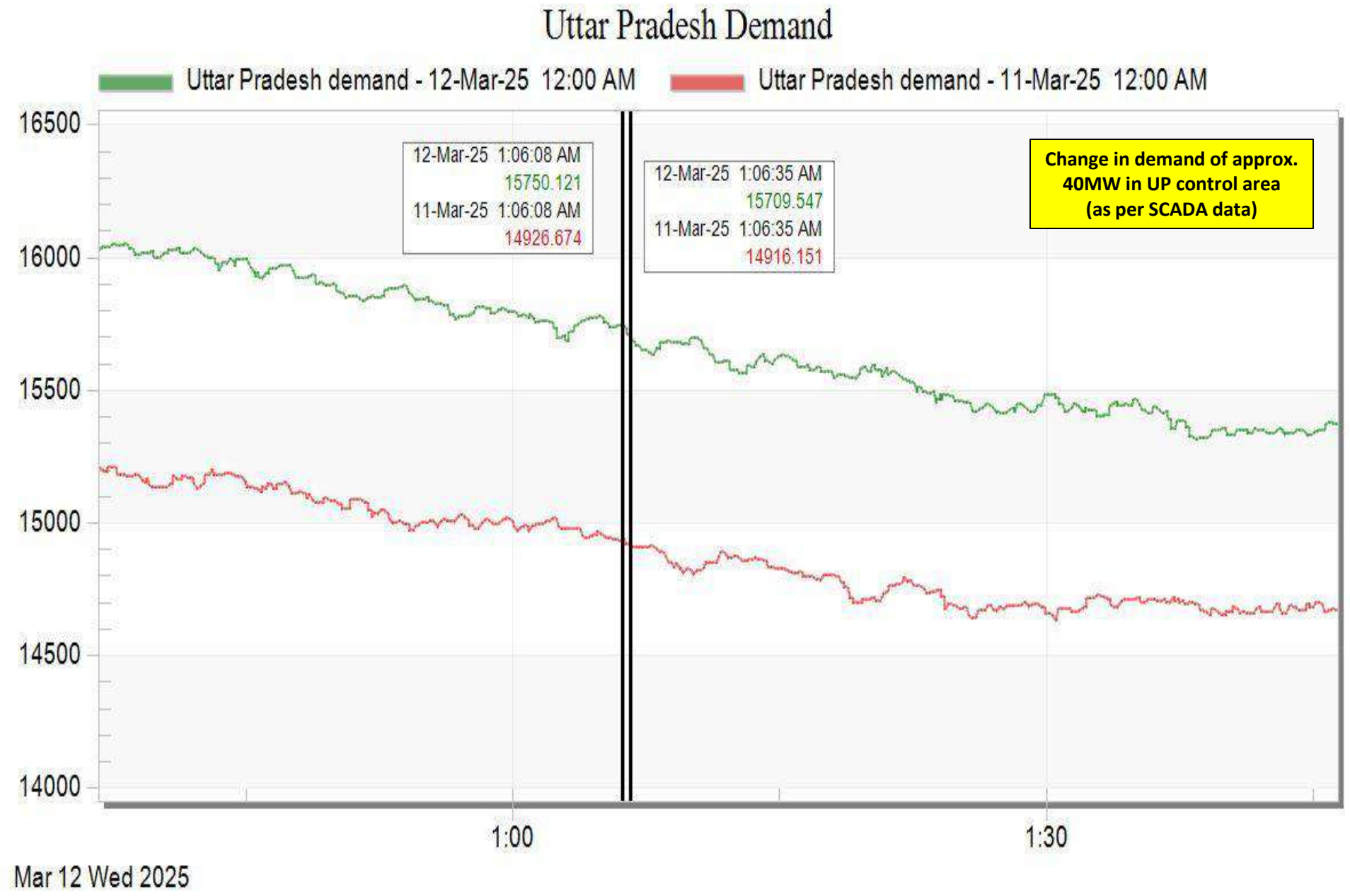
SLD of 220/132/33kV Baraut(UP) before the event



SLD of 220/132/33kV Baraut(UP) after the event

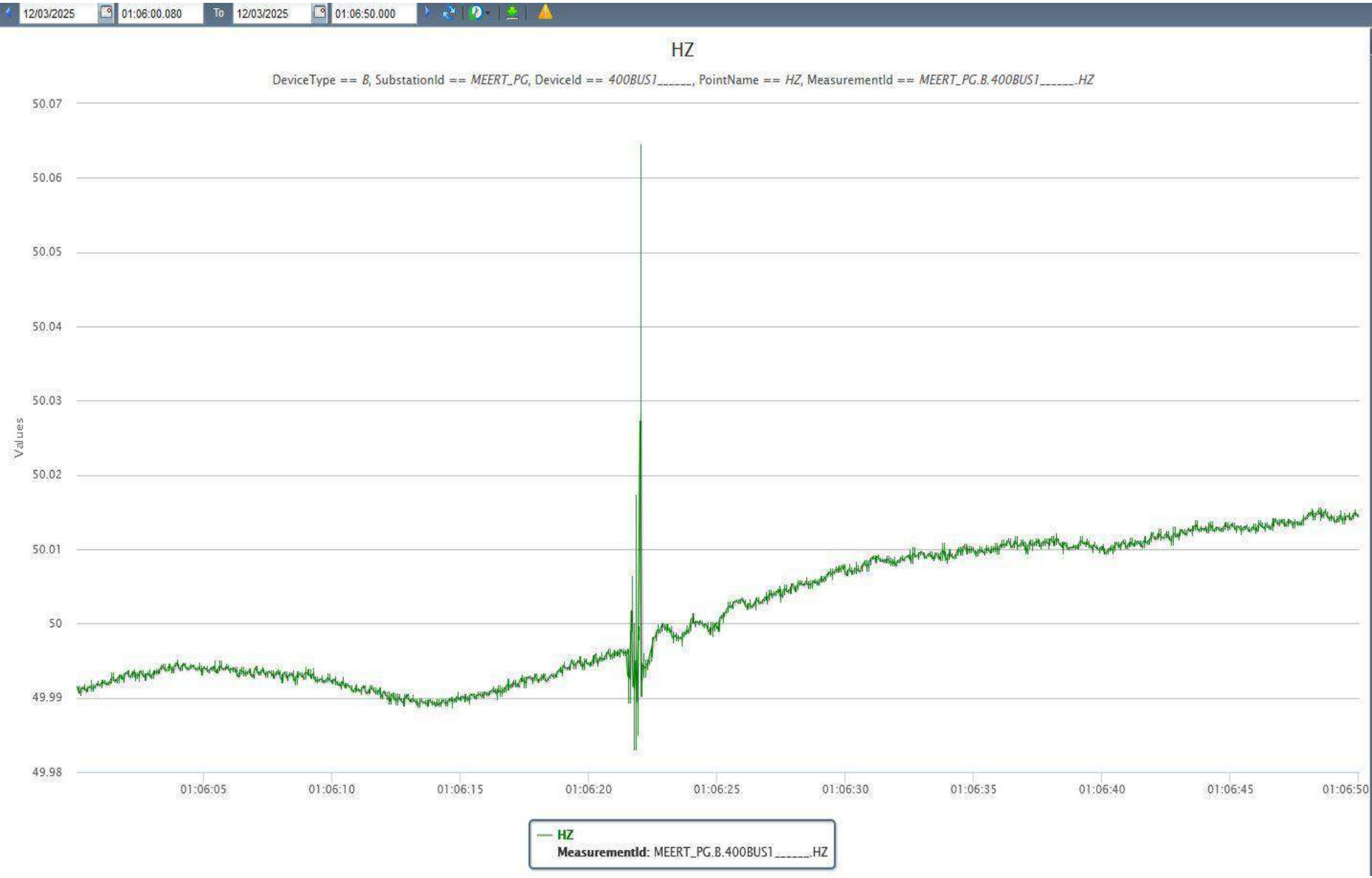


Uttar Pradesh demand during the event



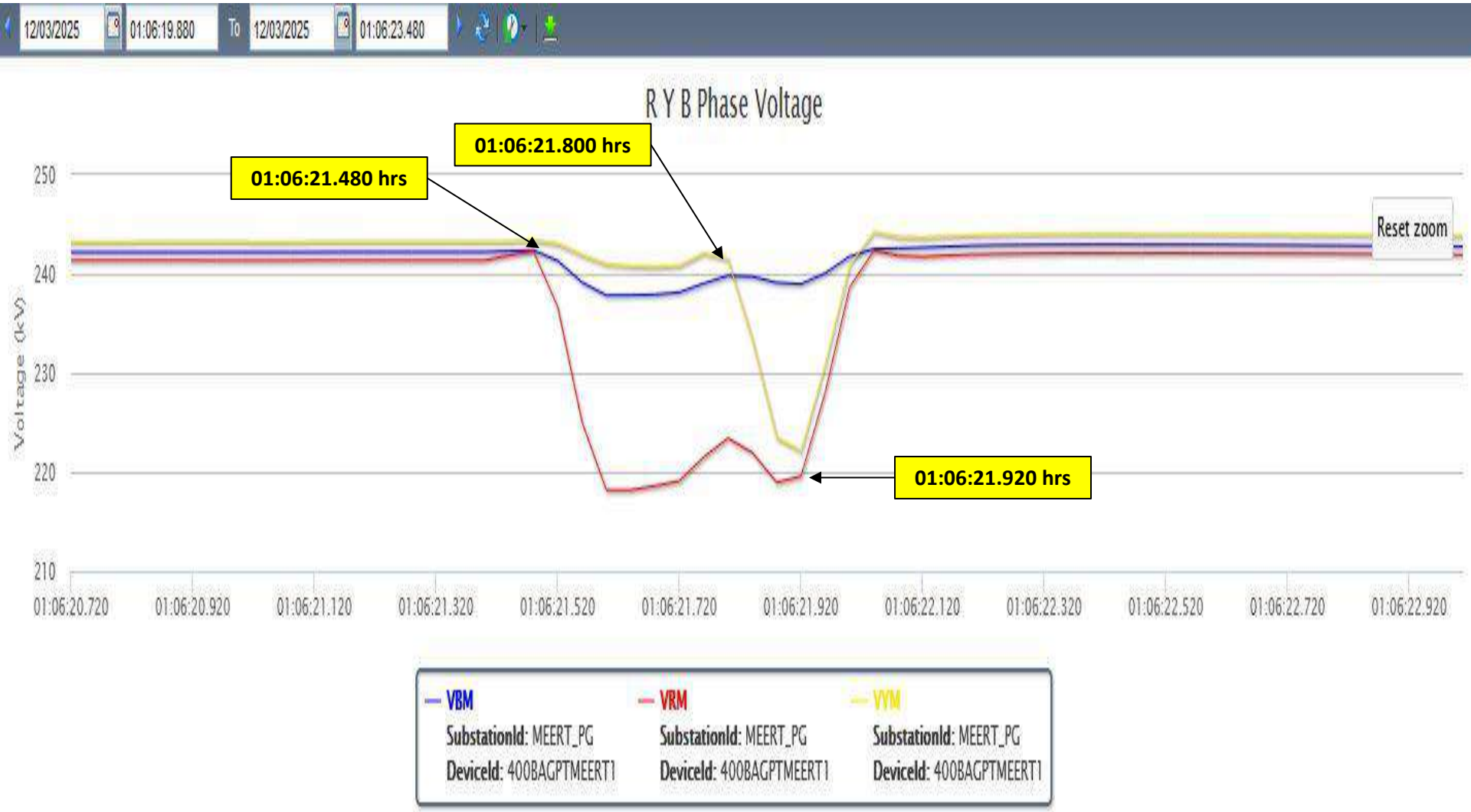
PMU Plot of frequency at Meerut(PG)

01:06hrs/12-Mar-25

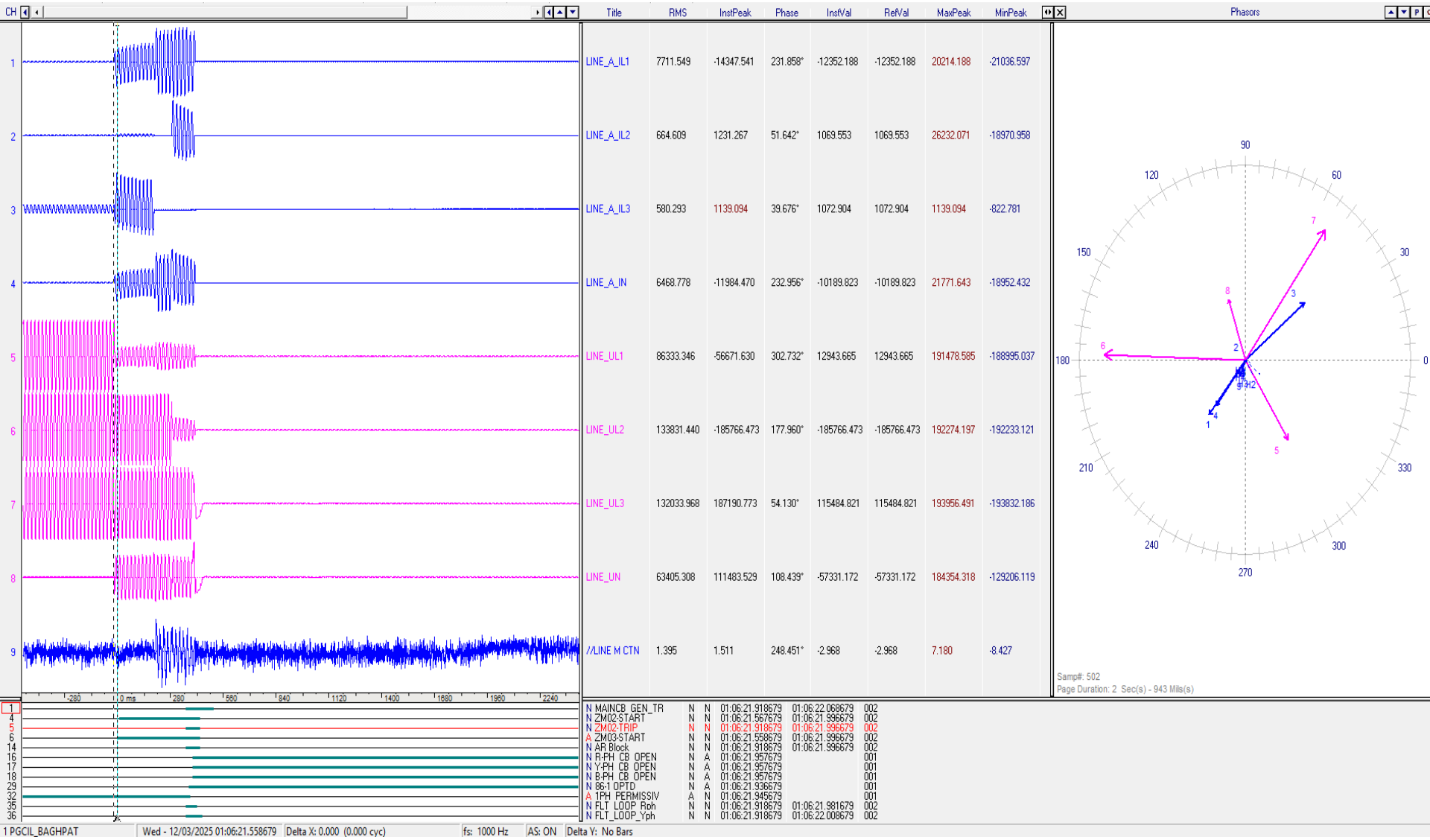


PMU Plot of phase voltage magnitude at Meerut(PG)

01:06hrs/12-Mar-25

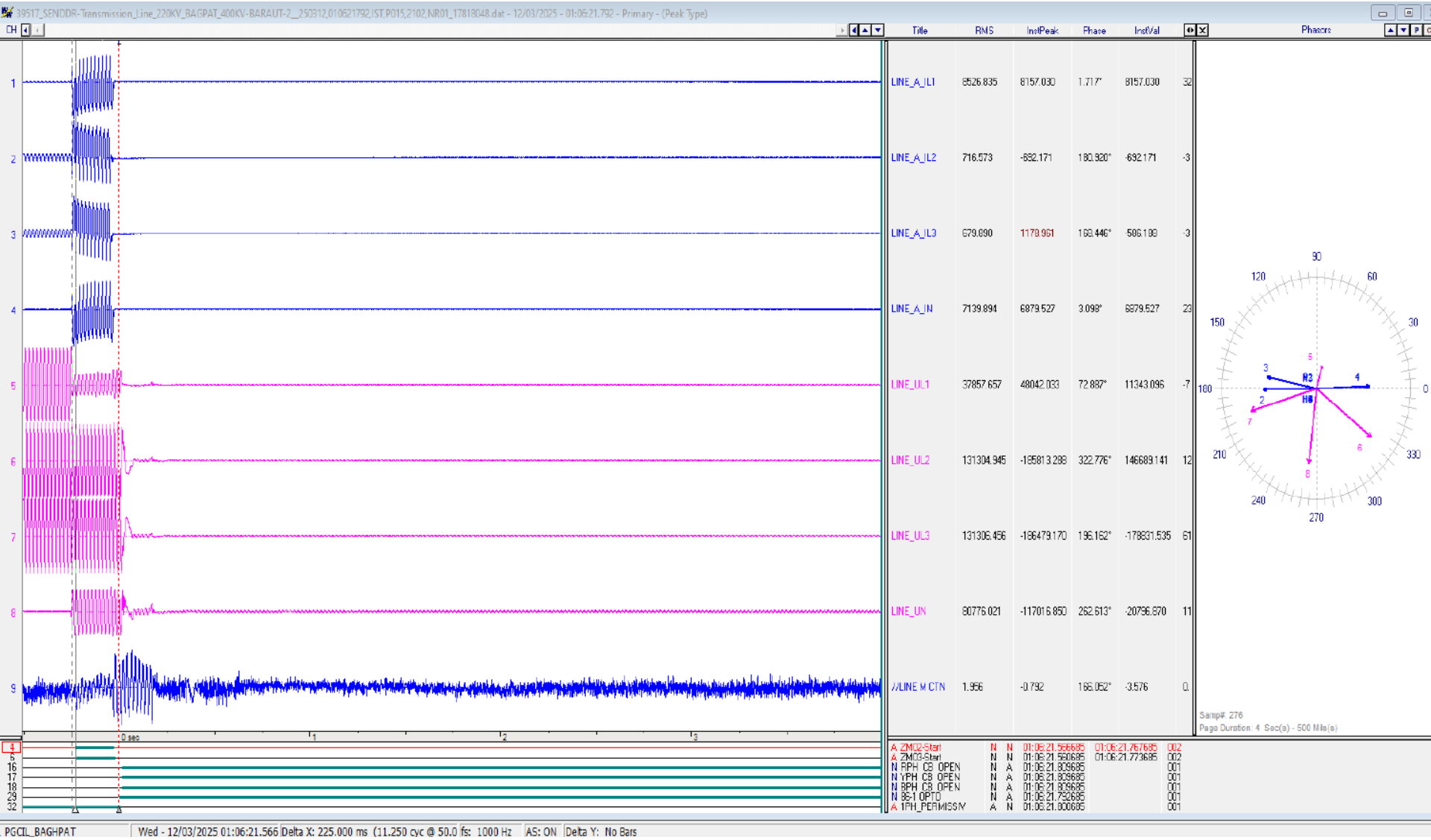


DR of 220 KV Baghpat(PG) (end)-Baraut(UP) (UP) Ckt-1



- ✓ R-N fault (Ir=~7.71kA) converted to R-Y-N fault (Ir=~14.48kA, Iy=~15.87kA)
- ✓ Fault cleared in zone-2 from Baghpat(PG) end
- ✓ Fault clearing time=~440ms

DR of 220 KV Baghpat(PG) (end)-Baraut(UP) (UP) Ckt-2



- ✓ R-N fault (Ir=~8.53kA)
- ✓ Fault sensed in zone-2 at Baghpat(PG) end
- ✓ Fault clearing time=~240ms

SCADA SOE

Time	Station Name	Voltage	Element Name	Element Type	Element Status	Remarks
01:06:21,758	BARUT_UP	132kV	87T2	Circuit Breaker	Open	CB at 132kV side of 220/132kV 160MVA ICT-2 at Baraut(UP) opened
01:06:21,814	BARUT_UP	220kV	02NIRUP	Circuit Breaker	Open	Line CB at Baraut(UP) end of 220 KV Nirpura-Baraut (UP) Ckt opened
01:06:21,849	BAGPT_PG	220kV	10BART2	Circuit Breaker	Open	Line CB at Baghpat(PG) end of 220 KV Baghpat(PG)-Baraut(UP) (UP) Ckt-2 opened
01:06:21,913	SHMLI_UP	220kV	03BAGPT	Circuit Breaker	Open	Line CB at Shamli(UP) end of 220 KV Baghpat(PG)-Shamli(UP) (UP) Ckt opened
01:06:22,126	BAGPT_PG	220kV	12BART1	Circuit Breaker	Open	Line CB at Baghpat(PG) end of 220 KV Baghpat(PG)-Baraut(UP) (UP) Ckt-1 opened

Points for Discussion

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

ii) Exact reason of tripping of 220 KV Baghpat(PG)-Shamli(UP) (UP) Ckt need to be shared.

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

iv) Remedial action taken report need to be shared.

220kV S/S Baraut UPPTCL

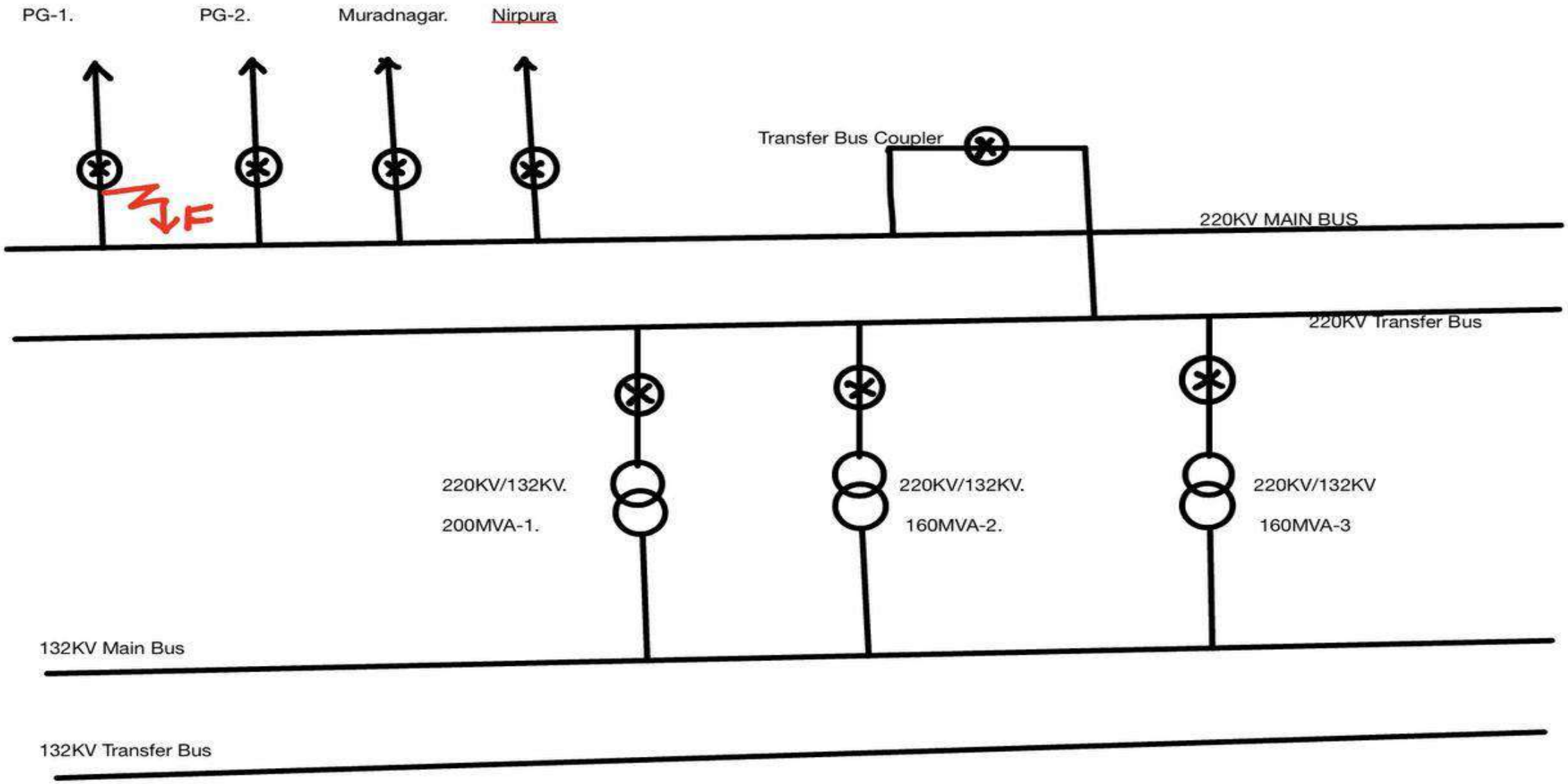
Bus-Bar operation on 12/03/2025 at 01:10 hrs

Antecedent Conditions

- Weather conditions – Clear
- Date – 12/03/2025
- Time – 01:10 hrs
- Sub-Station affected – 220kV Substation Baraut
- Bus Voltage (Affected S/S) – 220kV
- Load condition on Substation – 72MW
- Frequency – 50.01Hz

Tripping Report of Bus-Bar operated at 220KV S/S Baraut on 12/03/2025 at 01:10 Hrs

S.No	Tripping Date/Time	Closing Date/Time	C.B.No./ Direction	Load (in MW)	FLAGS OBSERVED	Analysis
1	2	3	5	6	7	8
1	12/03/2025 01:10	12/03/2025 19:49	CB 86 220 KV Baraut-Baghpat (PG)-1	21	87(Diff.), Zone- 1, phase R,Y 96-01 (200MVA T/F-1) 96-02 (Bus Coupler) 96-03 (160MVA T/F-2) 96-04 (220KV Baraut-Nirpura Line) 96-05 (220KV Barut-Muradnagar Line) 96-06 (160MVAT/F-3) 96-07 (220KV Baraut-Baghpat(PG)-1 Line) 96-08 (220KV Baraut-Baghpat(PG)-2 Line)	Bus bar operated due to damage of R-ph CT of 220 kv Baraut-Baghpat PG-1 line
2	12/03/2025 01:10	12/03/2025 09:20	CB 86 220 KV Baraut-Baghpat (PG)-2	19		
3	12/03/2025 01:10	12/03/2025 02:05	200MVA T/F-I	21		
4	12/03/2025 01:10	12/03/2025 02:05	160MVA T/F-II	2		
5	12/03/2025 01:10	12/03/2025 02:05	160MVA T/F-III	6		
6	12/03/2025 01:10	12/03/2025 02:05	CB 8 220 KV Baraut-Muradnagar	72		
7	12/03/2025 01:10	12/03/2025 02:05	CB 86 220 KV Baraut-Nirpura	charging condition only		


PG-1.
PG-2.
Muradnagar.
Nirpura
F
Transfer Bus Coupler
220KV MAIN BUS
220KV Transfer Bus
220KV/132KV.
200MVA-1.
220KV/132KV.
160MVA-2.
220KV/132KV
160MVA-3
132KV Main Bus
132KV Transfer Bus

Sequence of Events

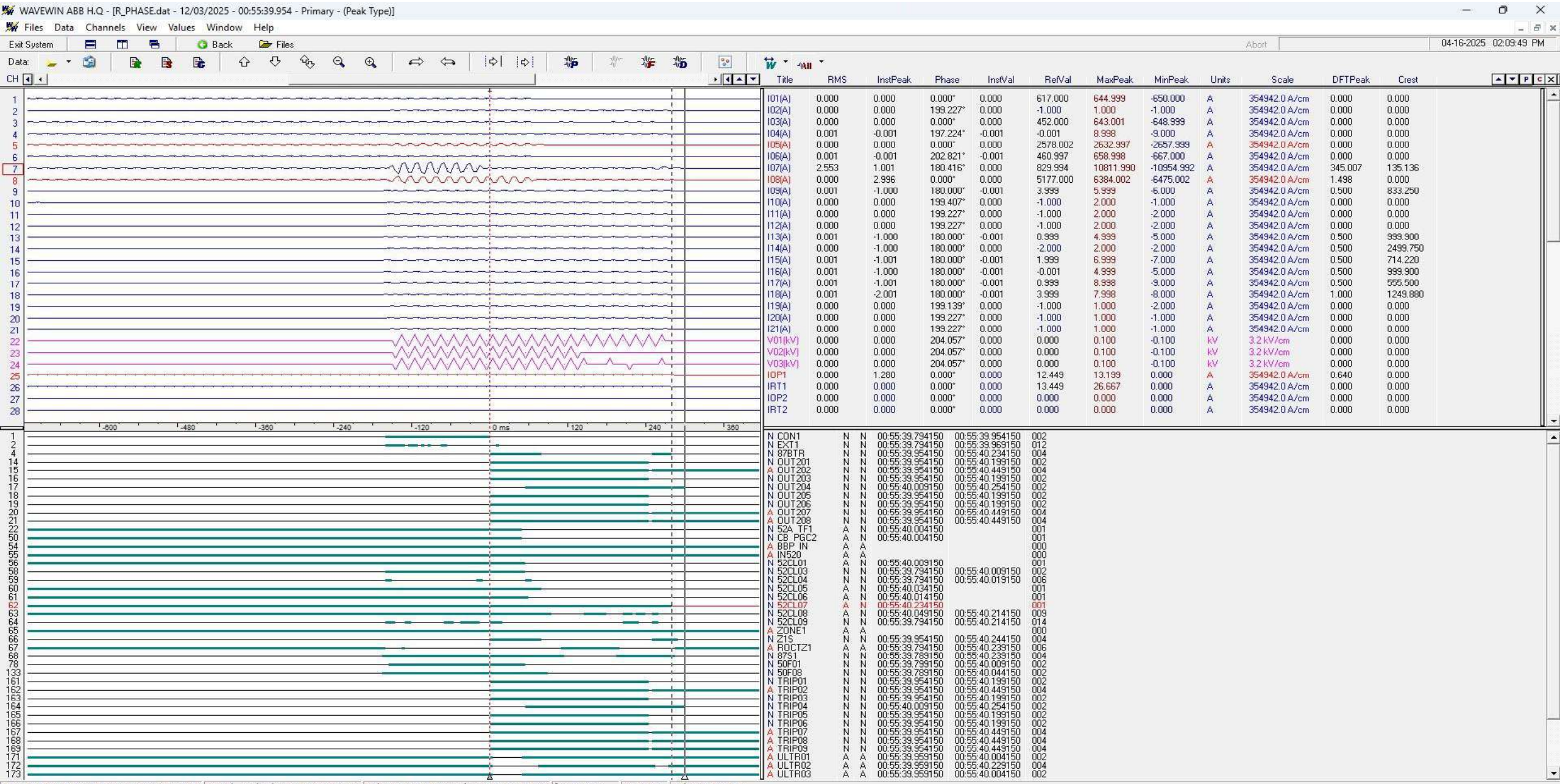
1. R-phase CT of 220KV Baraut-Baghpat (PG)-I line got damage and R-phase Jumper came in range with the Y-phase CT clamp head, thereby fault converted from Single-phase to Phase fault.

2. This CT damage resulted operating current Iop = 10.16A and restraining current Irest = 18.402A in the Bus-Bar relay causing Bus-Bar operation.

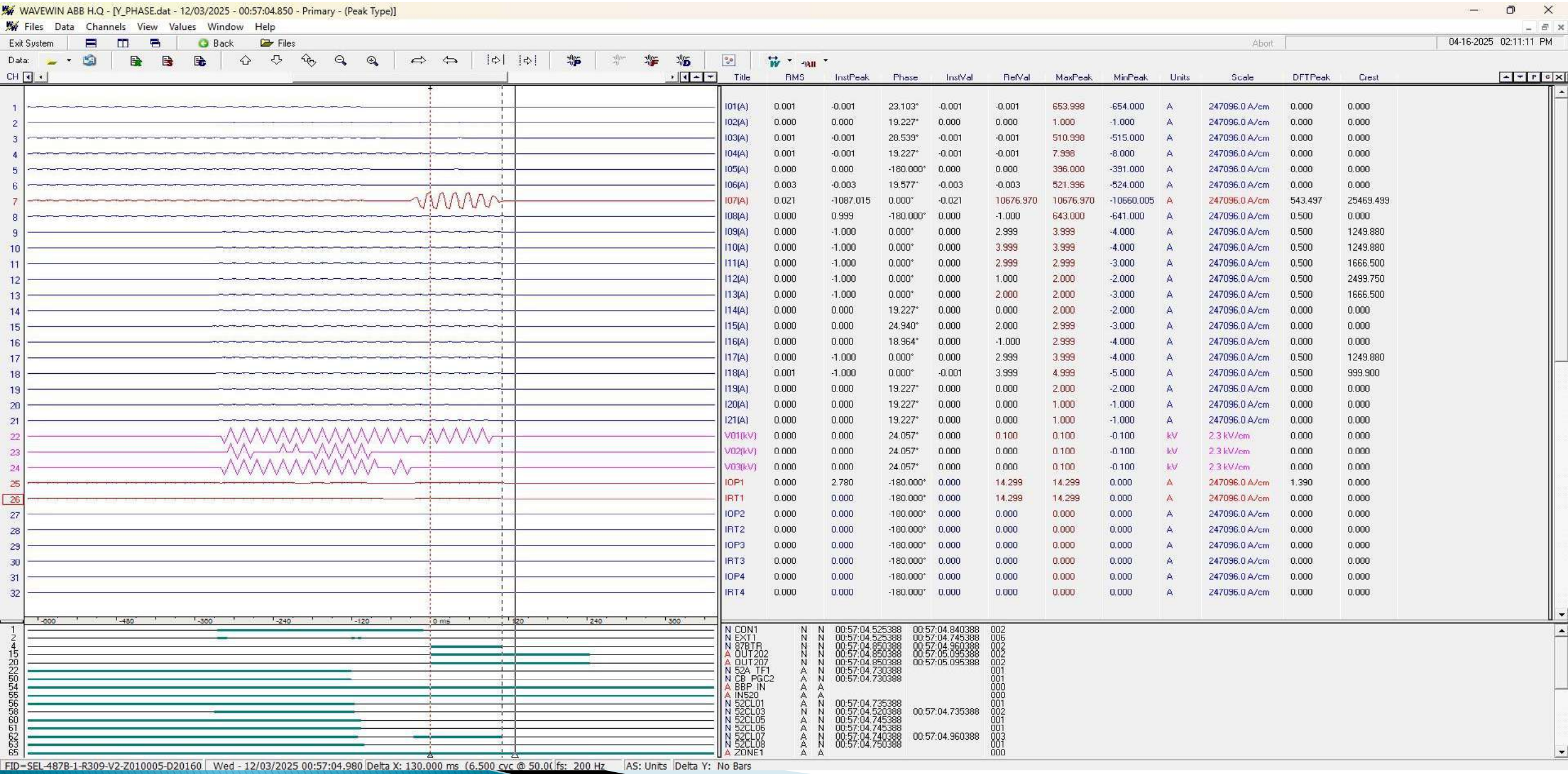
Following elements got tripped due to Bus-Bar operation.

a. Bay1 – 160MVA T/F-II
b. Bay2 – Bus Coupler
c. Bay3 – 200MVA T/F-I
d. Bay4 – 220KV Baraut-Nirpura Line
e. Bay5 – 220KV Baraut-Muradnagar Line
f. Bay6 – 160MVA T/F-III
g. Bay7 - 220KV Baraut-Baghpat (PG)-I Line
h. Bay8 - 220KV Baraut-Baghpat (PG)-II Line

R-phase DR of Bus-Bar



Y-phase DR of Bus-Bar



Event Analysis

- Disturbance record of Busbar protection was closely examined to validate the delay in fault clearance as stated by NRLDC, Following points were observed.
- Busbar relay itself operated after approximately 140ms. owing the fact that restraining current was significantly high.
- After issuance of tripping command the fault got cleared within 3 cycles. One more spike of current was observed in R phase of bay-7 i.e Baghpat PG-I at 250ms which shows that the line was probably still charge from remote end and tripped in zone-2 instead of DT receive at remote end.

Remedial Action

- Thorough checking of healthiness of CT is essential for preventing such incidents. UPPTCL has initiated a program for checking the healthiness of old and vulnerable CTs which includes TAN DELTA and partial discharge test on CTs.
- DT scheme on this line should be jointly checked by UPPTCL and Baghpat PGCIL after availing shutdown of the line.

Thank You

Multiple element tripping event at 220/66/33kV Delhi Rohtak Road(BB)

At 18:34 hrs on 14.03.2025

Tripped Elements

S. No	Name of Elements	Outage Time	Revival Time	Reason of tripping
1.	220 KV Delhi RR(BB)-Narela(DV) (BBMB) Ckt-1	18:34hrs	21:00 hrs	R-B phase to phase fault
2.	220 KV Delhi RR(BB)-Narela(DV) (BBMB) Ckt-2		20:32 hrs	Tripped from Narela end only

Brief details of the event

i) 220/66/33kV Delhi Rohtak Road(BB) S/s has double main bus arrangement at 220kV level.

ii) During antecedent condition, incoming power at Delhi Rohtak Road(BB) through 220 KV Delhi RR(BB)-Narela(DV) (BBMB) D/C was approx. 17 MW each (as per SCADA) which was supplying load of Delhi Rohtak Road(BB) S/s.

iii) As reported, at 18:34hrs, 220 KV Delhi RR(BB)-Narela(DV) (BBMB) Ckt-1 tripped on R-B phase to phase fault with following relay indications: fault distance of 1.185km and fault current of Ir=~2.587kA and Ib=~2.523kA from Delhi RR(BB) end and fault distance of 17.59 km and fault current of Ir=~3.841kA and Ib=~3.878kA from Narela(DV) end. During patrolling, a kite string was found tangled between R and B phases at tower loc. no. 1069A, which was later removed.

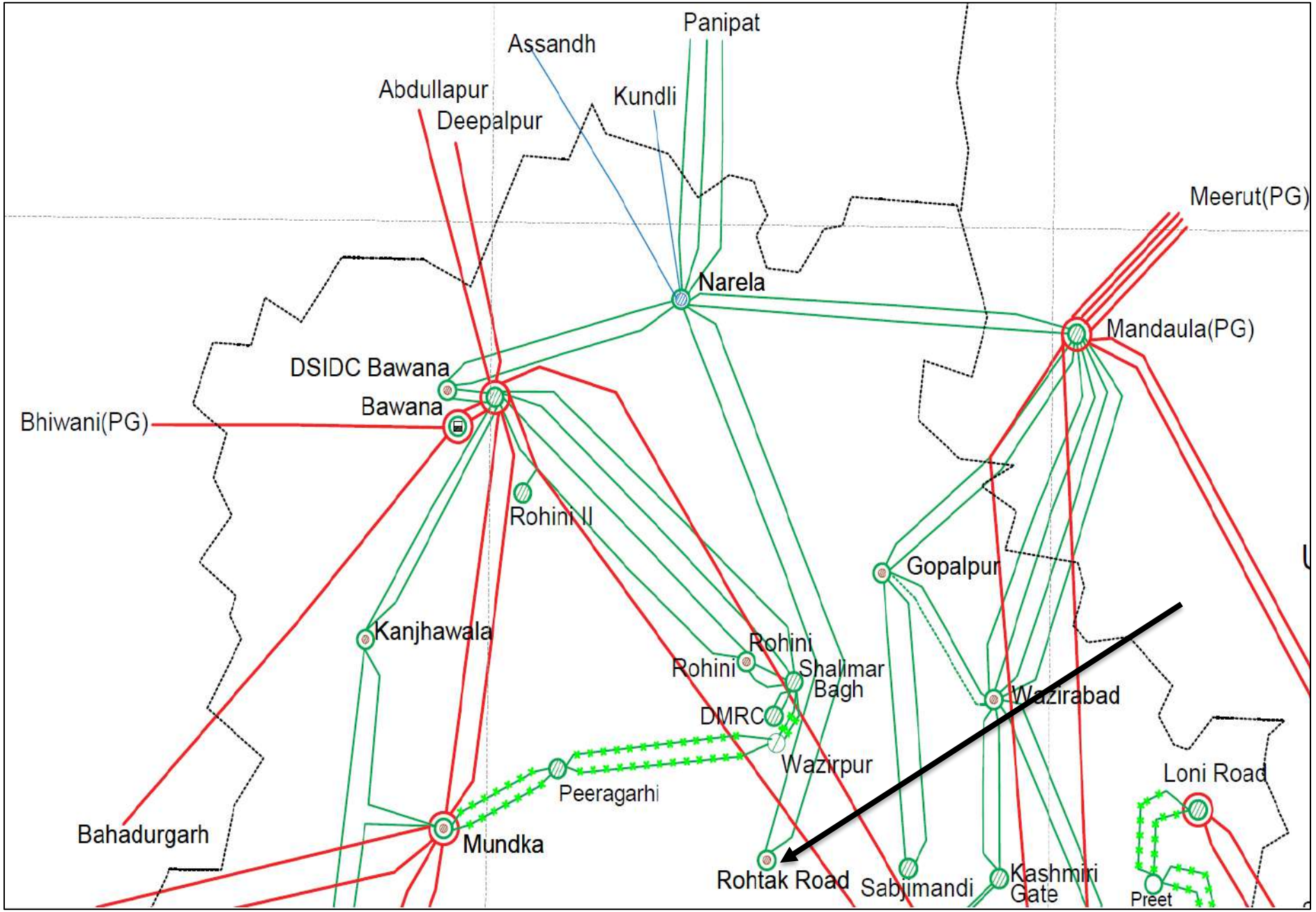
iv) During the same time, 220 KV Delhi RR(BB)-Narela(DV) (BBMB) Ckt-2 also tripped from Narela end only with following relay indications : fault distance of 17.59 km and fault current of Ir=~3.841kA and Ib=~3.878kA from Narela(DV) end (exact reason of fault yet not shared). During patrolling, nothing abnormal was found.

v) Due to tripping of 220 KV Delhi RR(BB)-Narela(DV) (BBMB) D/C, complete blackout occurred at 220/66/33kV Delhi Rohtak Road(BB) S/s.

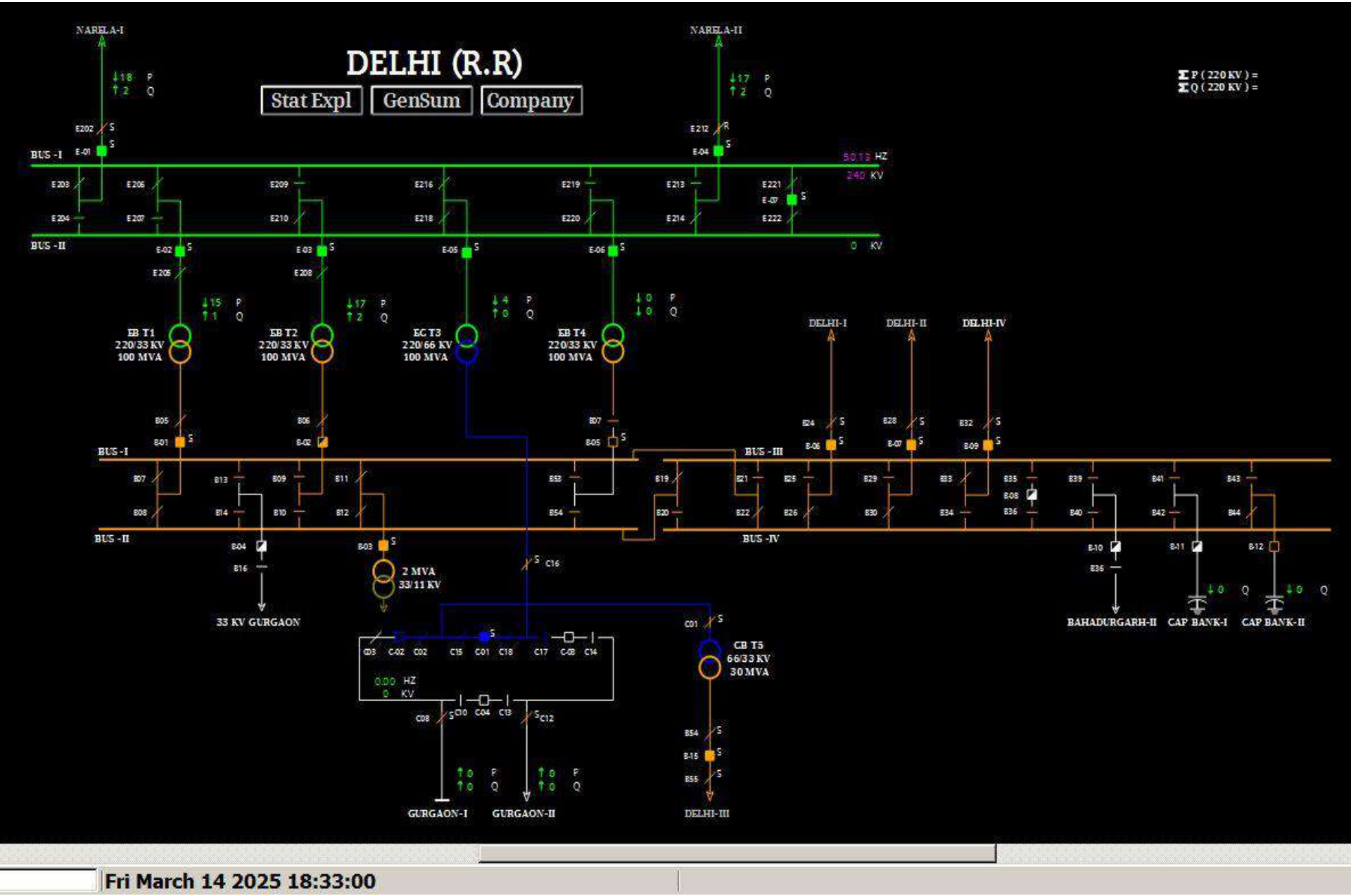
vi) As per PMU at Mandaula(PG), R-B phase to phase fault with fault clearing time of 80 ms is observed.

vii) As per SCADA, change in demand of approx. 30 MW is observed in Delhi control area.

Network Diagram

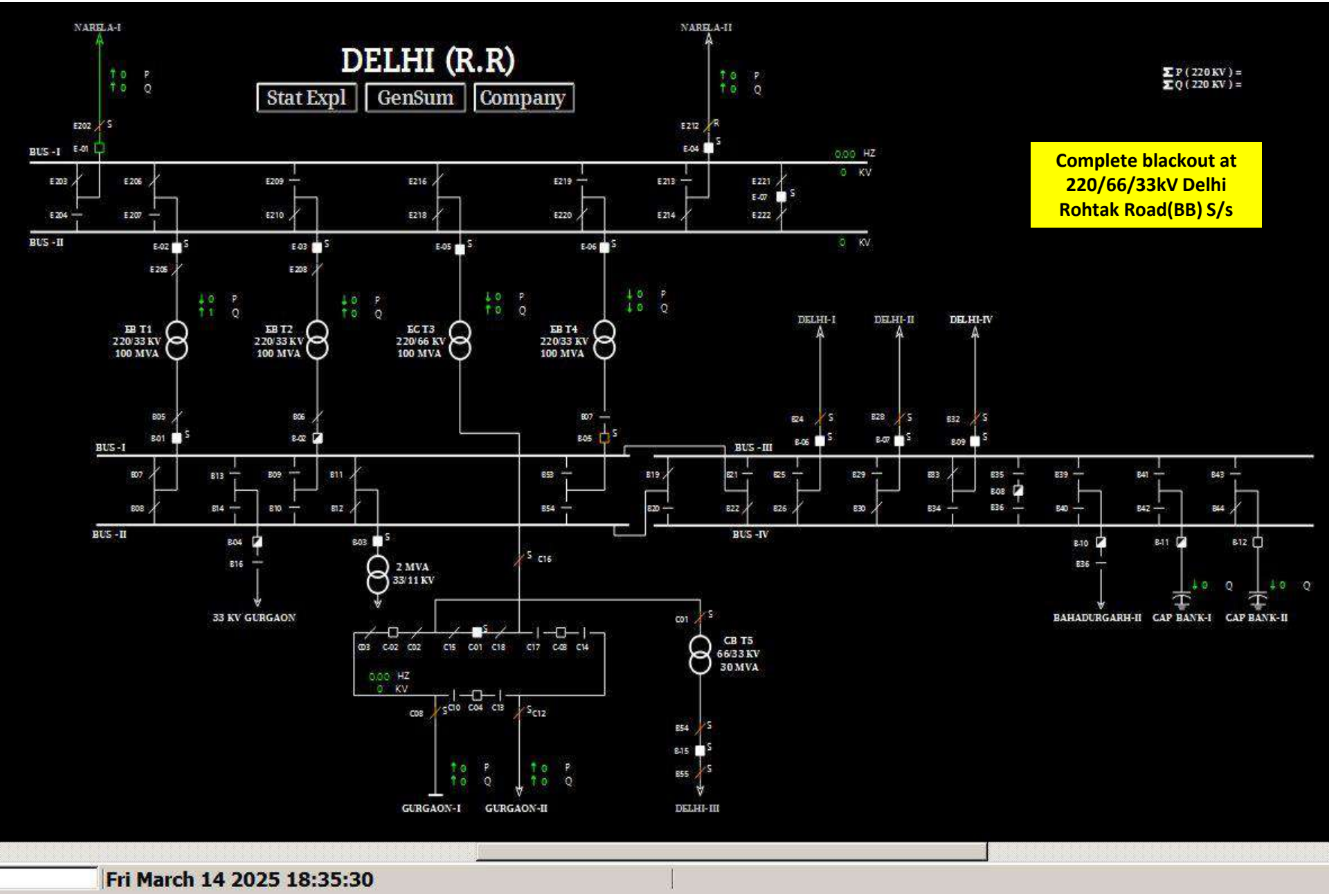


SLD of 220/66/33kV Delhi Rohtak Road(BB) before the event



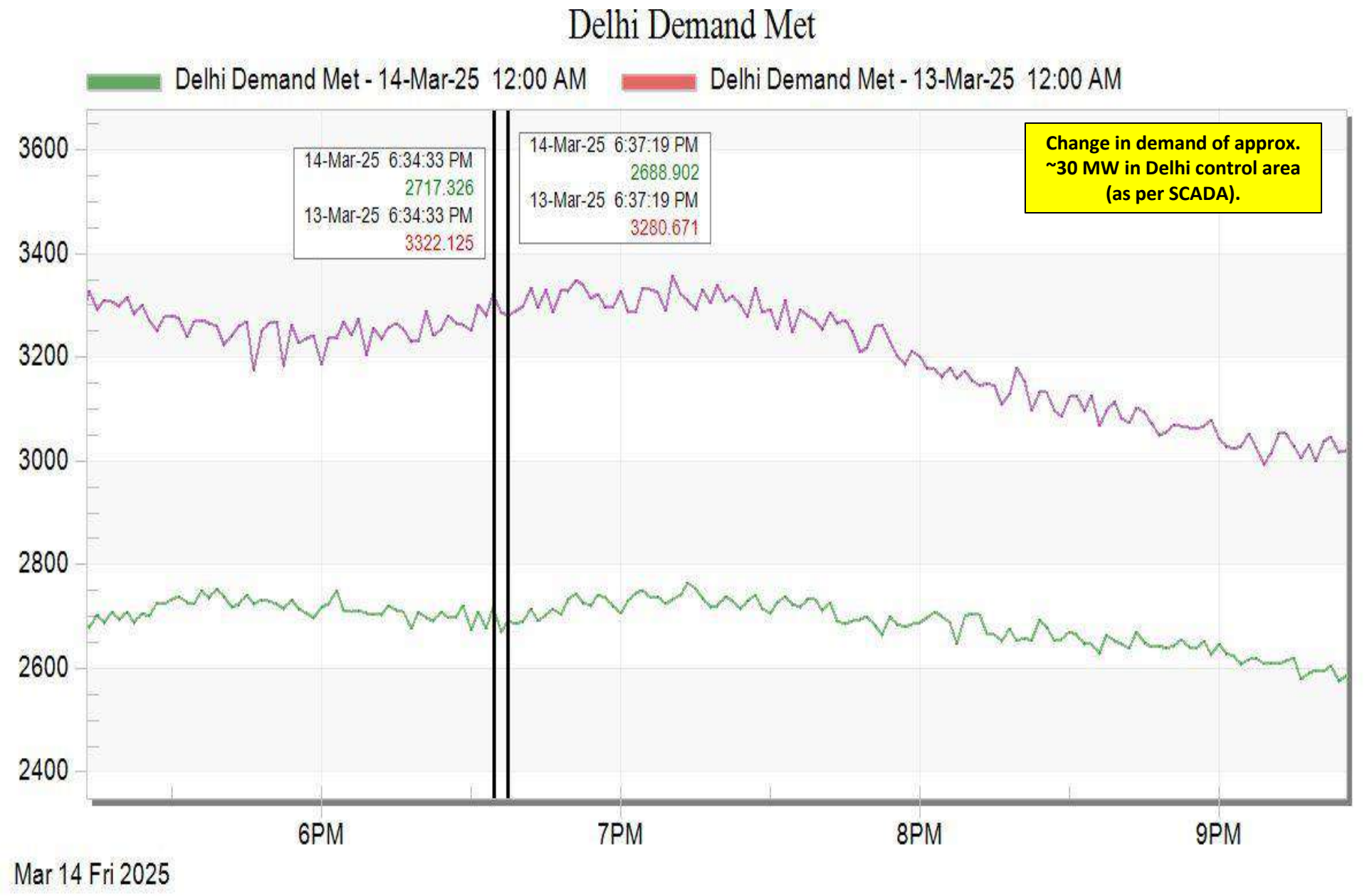
Fri March 14 2025 18:33:00

SLD of 220/66/33kV Delhi Rohtak Road(BB) after the event



Fri March 14 2025 18:35:30

Delhi demand during the event



PMU Plot of frequency at Mandaula(PG)

18:34hrs/14-Mar-2025

PMU Plot of phase voltage magnitude at Mandaula(PG)

18:34hrs/14-Mar-2025

SCADA SOE

Time	Station Name	Voltage	Element Name	Element Type	Element Status	Remarks
18:34:56,321	DELHI_BB	220kV	01NAREL1	Circuit Breaker	Open	Line CB at Delhi Rohtak Road(BB) end of 220 KV Delhi RR(BB)-Narela(DV) (BBMB) Ckt-1 opened

Points for Discussion

i) Exact reason of fault in 220 KV Delhi RR(BB)-Narela(DV) (BBMB) Ckt-2 need to be shared.

ii) DR/EL need to be shared from both the ends for each element.

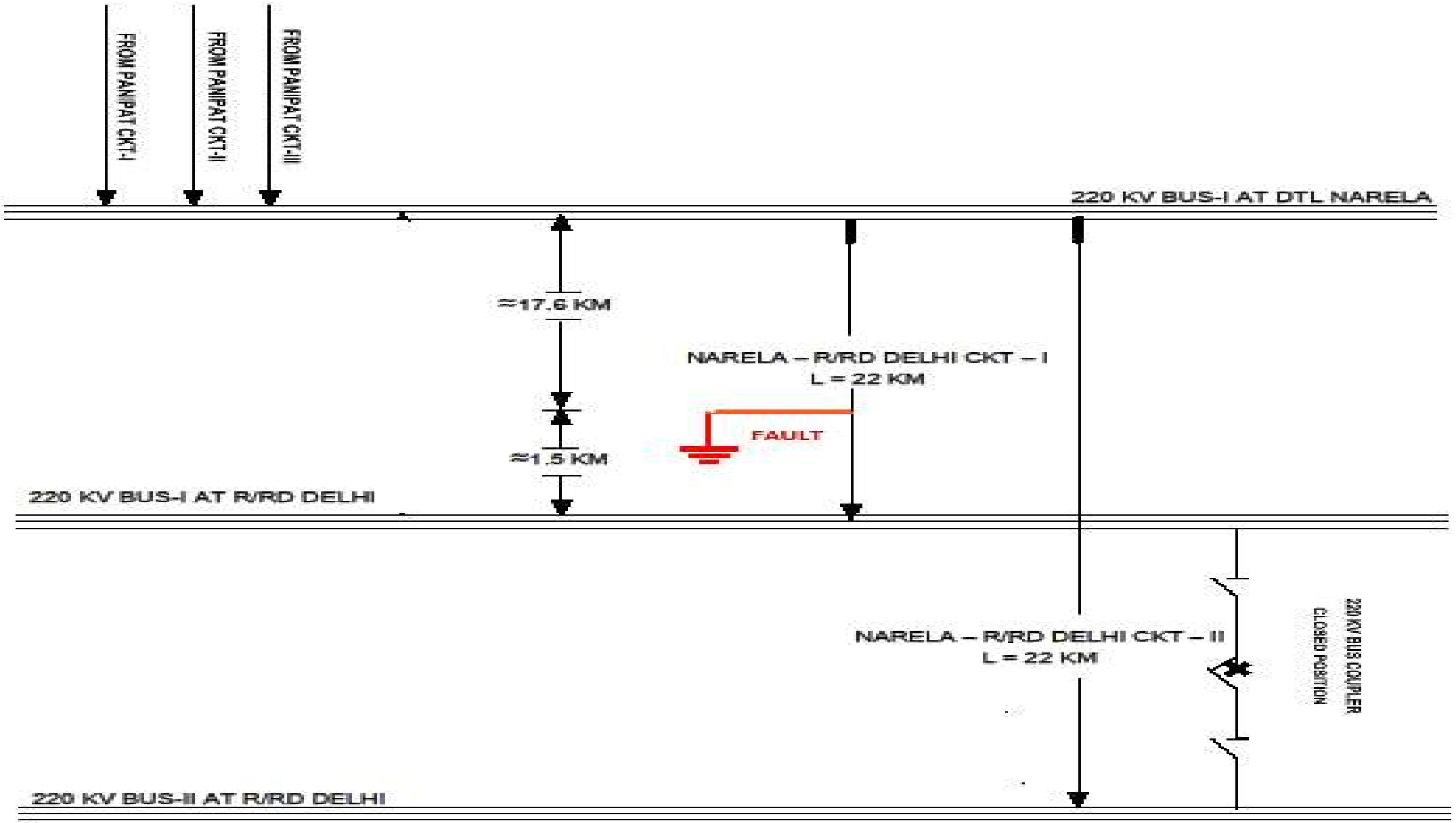
iii) Remedial action taken report to be shared.

Multiple Tripping Analysis Report

Analysis of Multiple Grid Elements tripped

on dated 14.03.2025 at 220 kV DTL Narela Sub-Station

SINGLE LINE DIAGRAM AT 220 KV DTL NARELA AND AT 220 KV R/RD DELHI SUB STATIONS ON DATED : 14/03/2025 AT THE TIME OF OCCURANCE OF FAULT AT 18:33 HRS



BRIEF INTRODUCTION

- As shown in SLD, 220/66/33kV Delhi Rohtak Road(BB) S/s has double main bus arrangement at 220kV level. Source of power for Delhi Rohtak Road(BBMB) sub-station is only 220 kV Sub-station Narela. During antecedent condi□on, 220 KV Delhi RR(BB)-Narela(DV) (BBMB) D/C was supplying load to Delhi Rohtak Road(BB) S/s.
- At 18:34hrs, 220 KV Delhi RR(BB)-Narela(DV) (BBMB) Ckt-1 tripped on R-B phase to phase fault with following relay indica□ons:

At RR Delhi BBMB end	At DTL Narela end
Fault distance-1.185km Fault current: Ir=~2.587kA & Ib=~2.523kA	Fault distance-17.59 km Fault current: Ir=~3.841kA and Ib=~3.878kA

- During patrolling, a kite string was found tangled between R and B phases at tower loc. no. 1069A, which was later removed
- During the same time, 220 KV Delhi RR(BB)-Narela(DV) (BBMB) Ckt-2 also tripped from Narela end only with following relay indica□ons :

  Fault distance- 17.59 km

  Fault current- Ir=~3.841kA and Ib=~3.878kA
- During patrolling, nothing abnormal was found.
- Due to tripping of 220 KV Delhi RR(BB)-Narela(DV) (BBMB) D/C, complete blackout occurred at 220/66/33kV Delhi Rohtak Road(BB) S/s as these two circuits are only source of power.

Detailed Analysis:

- From DTL Narela Sub-station to R. Rd. Delhi BBMb Sub-station, there are 2 Nos. 220kV circuits of line length 22km each.
- On dated 14.03.2025 at 18:34 hrs, there was Ph-A to Ph-C fault (kite string found) on 220 kV Narela-R/R Ckt.-1 which was cleared from both ends within 100ms. As pe the DR & events of DP schemes at DTL Narela end, the fault was in Zone-2 from Narela end which was cleared immediately by Z-2 carrier aided trip.
- As pe the DR & events of DP schemes at BBMB RR Delhi end, the fault was in Zone -1 from Delhi end.
- The distance protection relay (Main-1) provided on other circuit i.e. 220kV Narela-R/R Ckt.-2 sensed the fault in Z-2 and same was reset within 70 msec after tripping of 220 kV Narela-R/R Ckt.-1 from both ends.

- Similarly, the distance protection relay (Main-2) provided on 220kV Narela-R/R Ckt.-2 sensed the fault in Z-2 initially and same was reset within 70 msec after tripping of 220 kV Narela-R/R Ckt.-1 from both ends. However Main-2 DP relay picked up in Zone 1 after 15msec of Z-2 reset which is unreasonable whilst Main 1 DP relay performed correctly after Zone 2 reset and didn't pick up in any zone.

Location & type of Fault:

- The fault occurred due to a kite string tangled between R and B phases at tower loc. no. 1069A.

- As per relay DR & events of DP relay of 220kV DTL Narela-R/R Ckt.-1 at DTL Narela end, the fault was at 17.59 km from Narela end.

Remedial Action :

- The Main-2 DP relay provided on 220kV DTL Narela-R/R Ckt.-2 is very old and did not operate properly on the fault by tripping the healthy ckt.
- DR of the fault was transplayed on Main-1 & 2 relay of 220kV DTL Narela-R/R Ckt.-2 and it was observed that Main-1 relay didn't pick up Zone-1 whereas Main-2 relay picked Zone-1 on same fault during transplay. It was inferred that Main-2 relay operation on such faults is not reliable. As such the said relay has been kept out of service and being replaced with a new relay.

Thank You

Multiple element tripping event at 400kV Parbati_3(NH) and 400kV Sainj HEP(HP)

At 14:46 hrs on 16.03.2025

Tripped Elements

S. No	Name of Elements	Outage Time	Revival Time	Reason of tripping
1.	400 KV Parbati_2(NH)-Sainj(HP) (PKTCL) Ckt	14:46 hrs	19:05 hrs	R-N phase to earth fault
3.	400 KV Parbati_3(NH)-Banala(PG) (PKTCL) Ckt		16:45 hrs	

Brief details of the event

i) Total generated power of Sainj HEP(HP), Parbati_2(NH) and Parbati_3(NH) evacuates through 400 kV Parbati_2(NH)- Banala(PG) (PKTCL) Ckt and 400 kV Parbati_3(NH)-Banala(PG) (PKTCL) Ckt via 400 KV Parbati_2(NH)-Sainj(HP) (PKTCL) Ckt and 400 KV Parbati_3(NH)-Sainj(HP) (PKTCL) Ckt.

ii) During antecedent condition, no generation was there at 400kV Parbati_2(NH), 400kV Parbati_3(NH) and 400kV Sainj HEP(HP).

iii) As reported, at 14:46hrs, 400 KV Parbati_3(NH)- Banala(PG) (PKTCL) Ckt tripped from Banala(PG) end only on R-N phase to earth fault with fault distance of 6.9km and fault current of 5.545kA from Banala(PG) end (exact reason of fault yet to be shared).

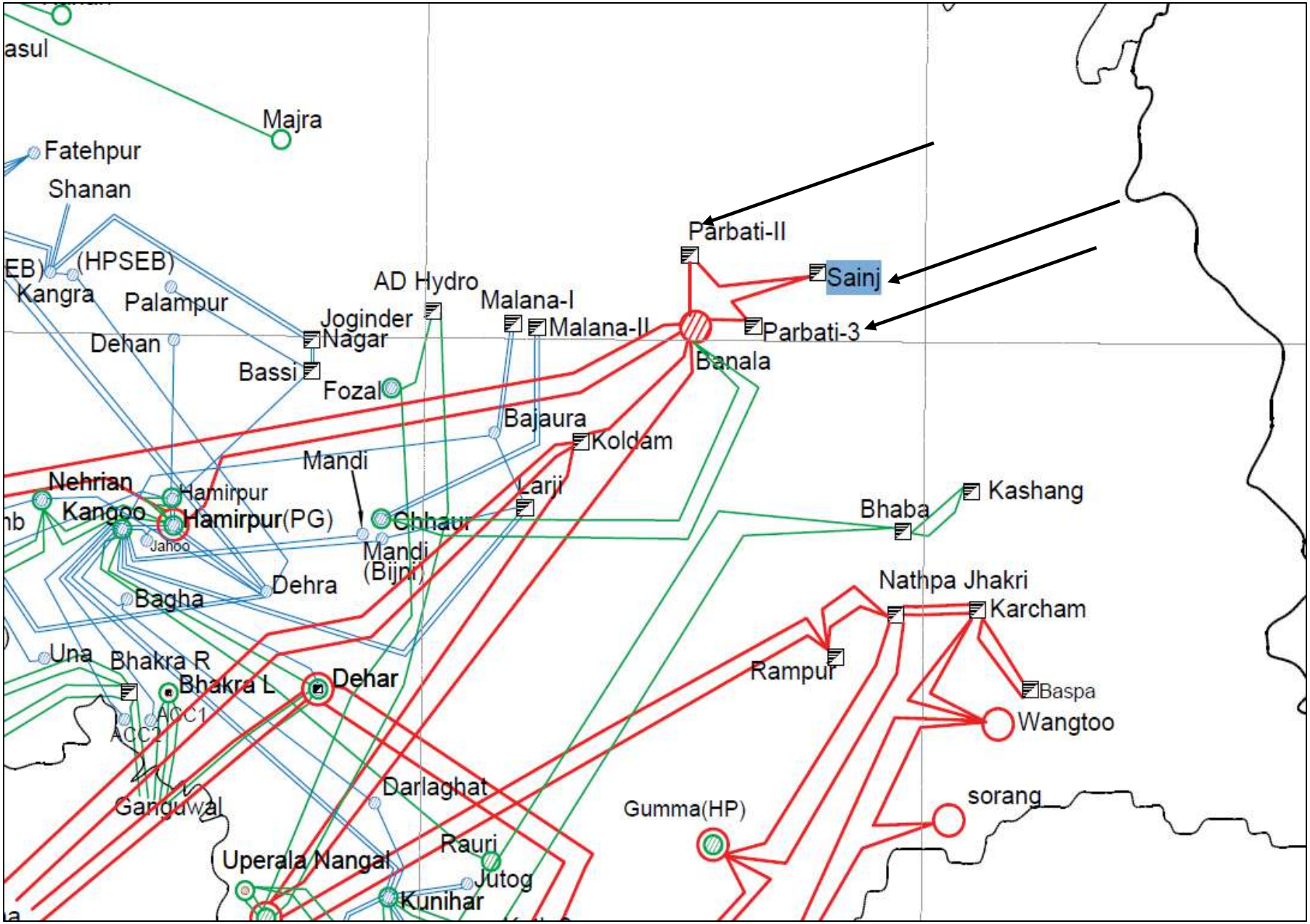
iv) As further reported, 400 KV Parbati_2(NH)-Sainj(HP) (PKTCL) Ckt also tripped at the same time from Sainj end only (exact reason of tripping yet to be shared).

v) Due to tripping of both 400 KV Parbati_3(NH)- Banala(PG) (PKTCL) Ckt and 400 KV Parbati_2(NH)-Sainj(HP) (PKTCL) Ckt, complete blackout occurred at 400kV Parbati_3(NH) and 400kV Sainj HEP(HP) S/s.

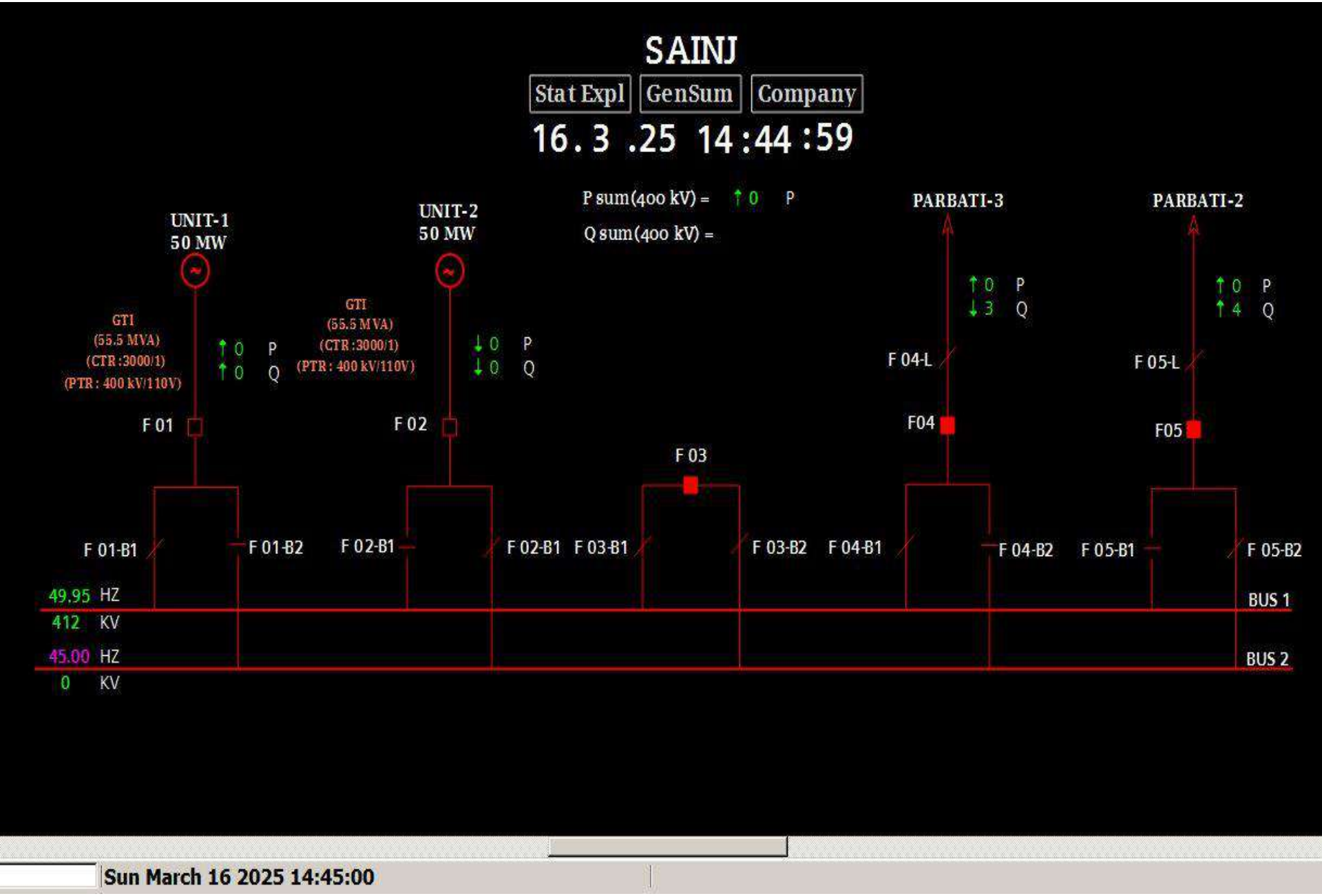
vi) As per PMU at Nallagarh(PG), two consecutive R-N phase to earth fault is observed with delayed fault clearing time of 1240 ms and 1040 ms respectively.

vii) As per SCADA, no generation loss is observed at 400kV Parbati_2(NH), 400kV Parbati_3(NH) and 400kV Sainj HEP(HP) as there was no generation at either of them.

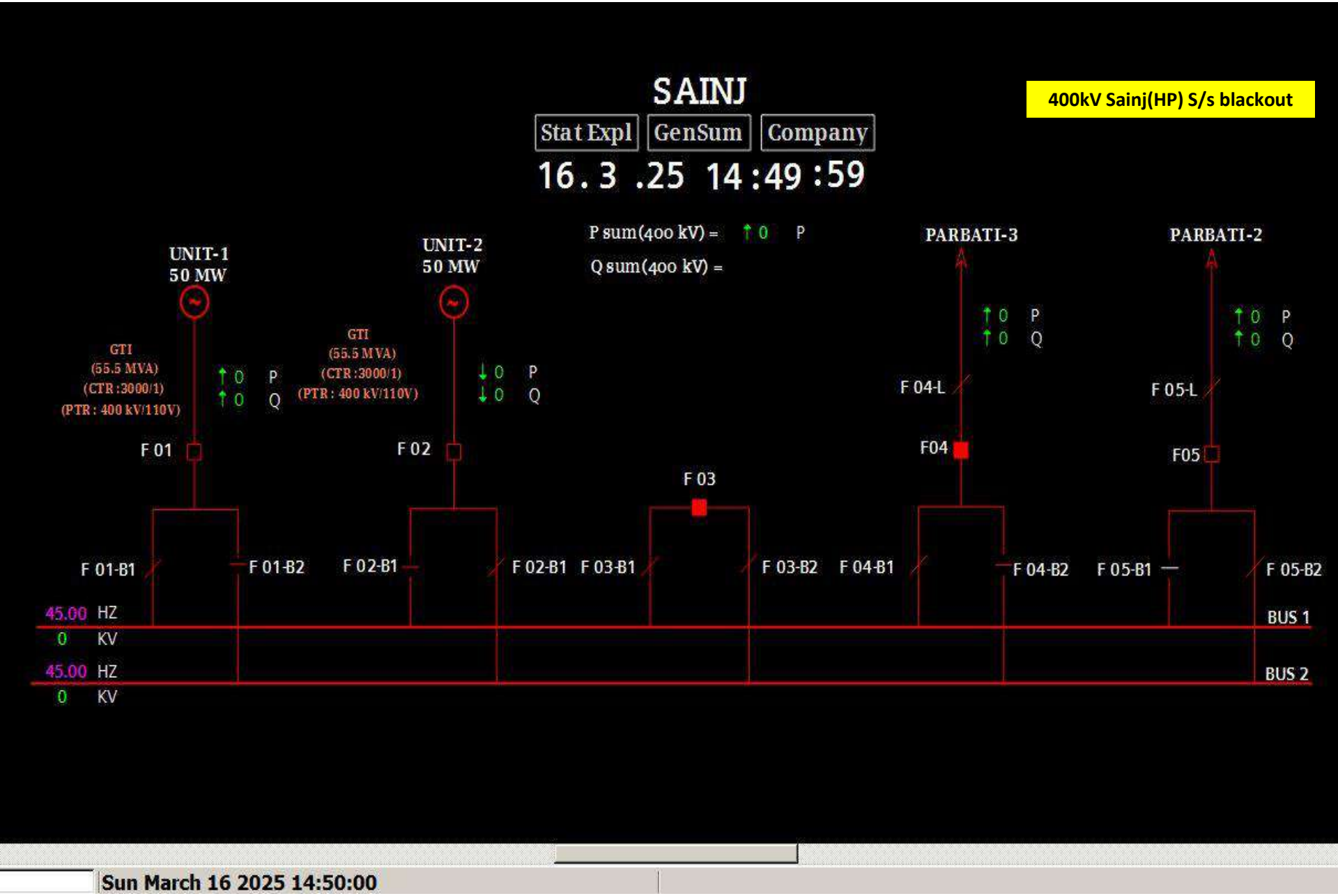
Network Diagram



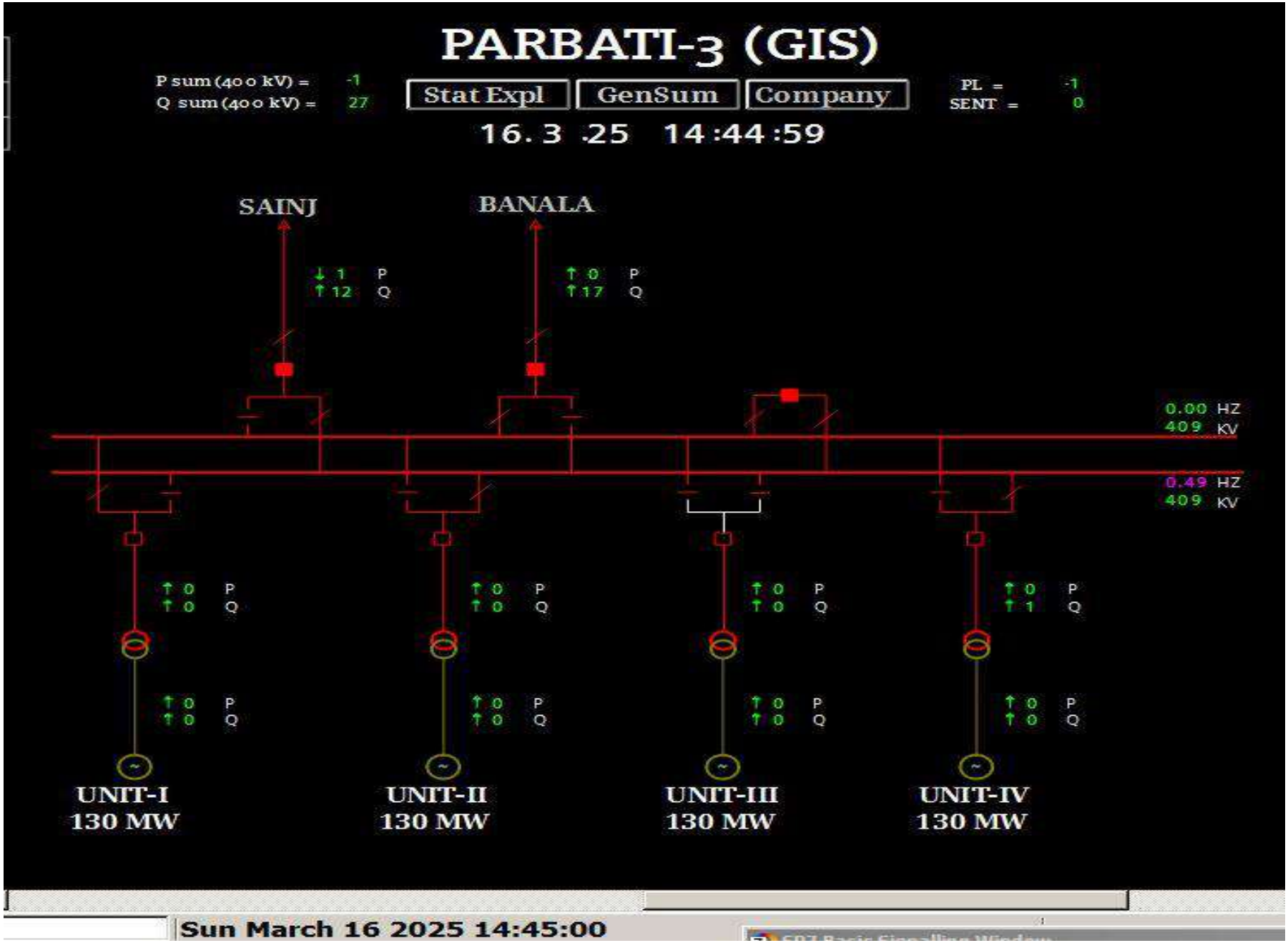
SLD of 400kV Sainj(HP) before the event



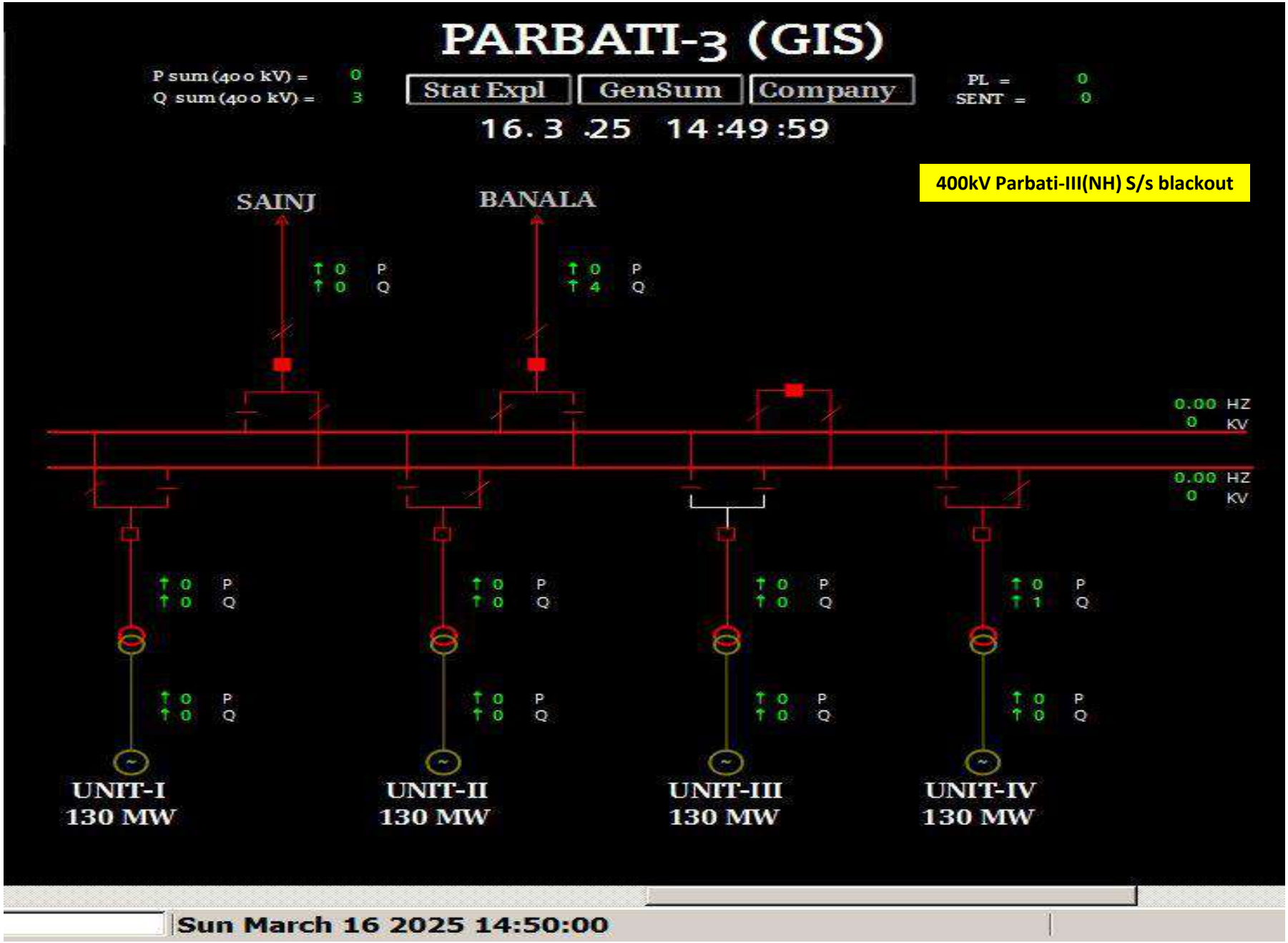
SLD of 400kV Sainj(HP) after the event



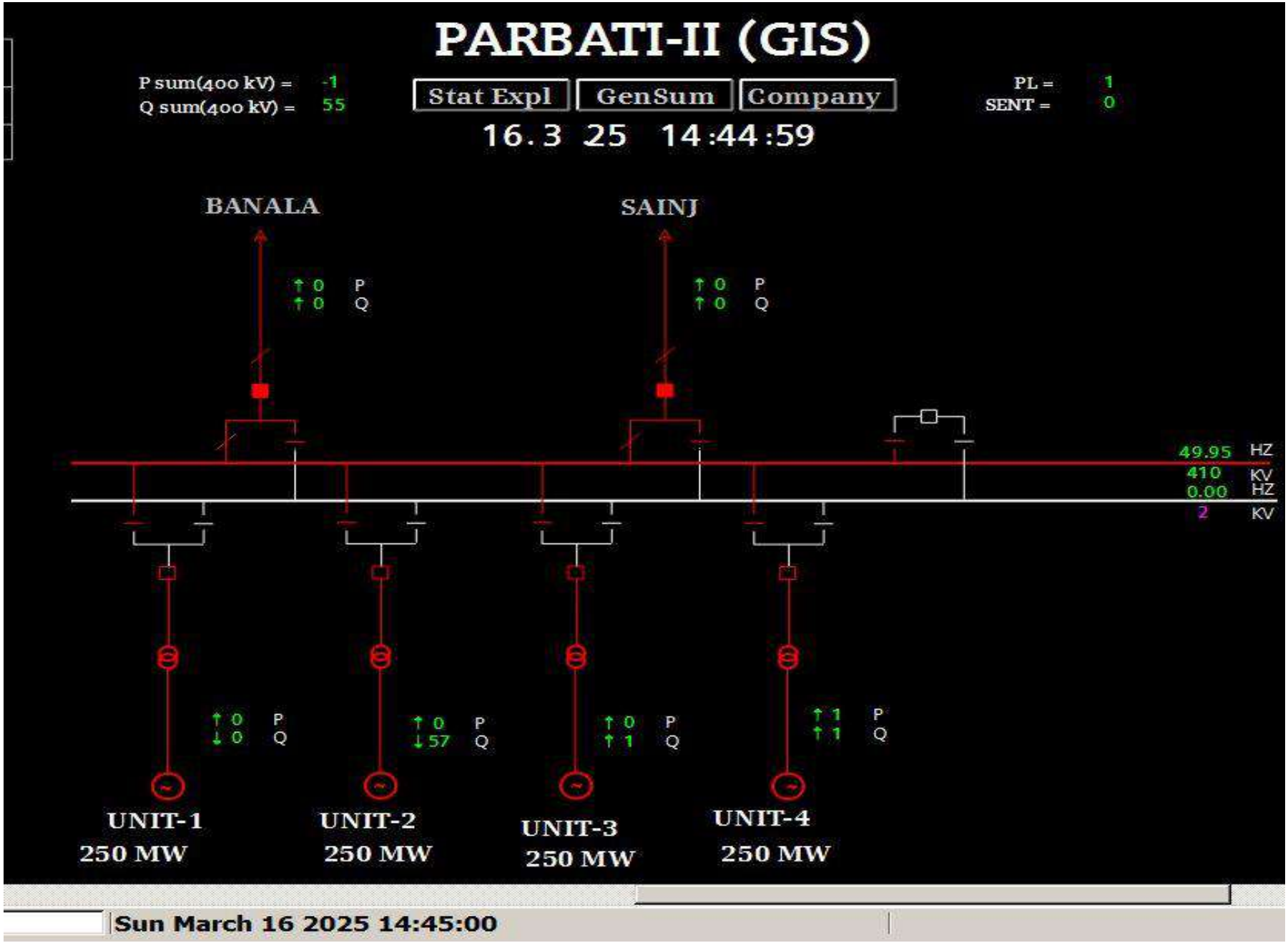
SLD of 400kV Parbati-III(NH) before the event



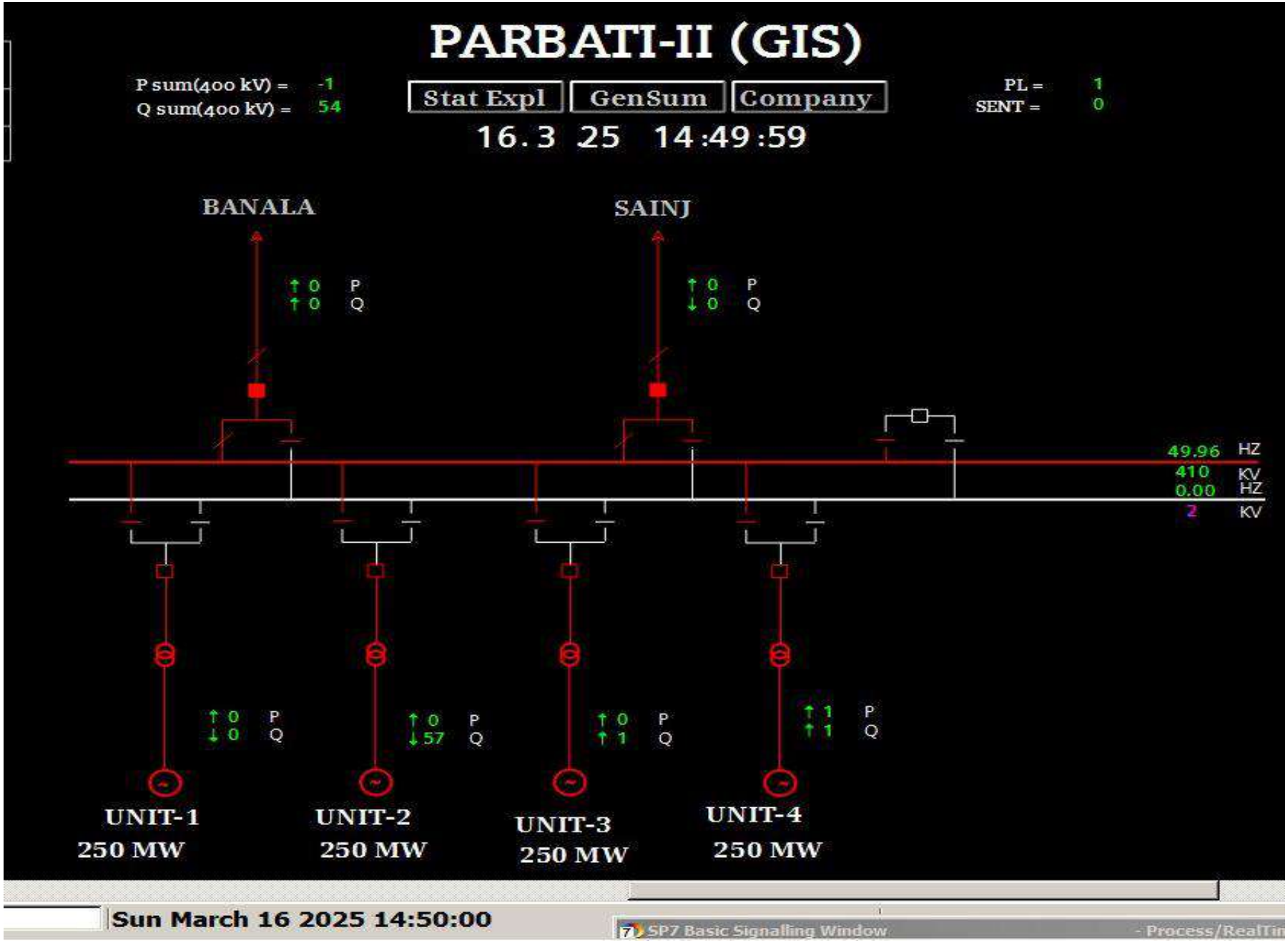
SLD of 400kV Parbati-III(NH) after the event



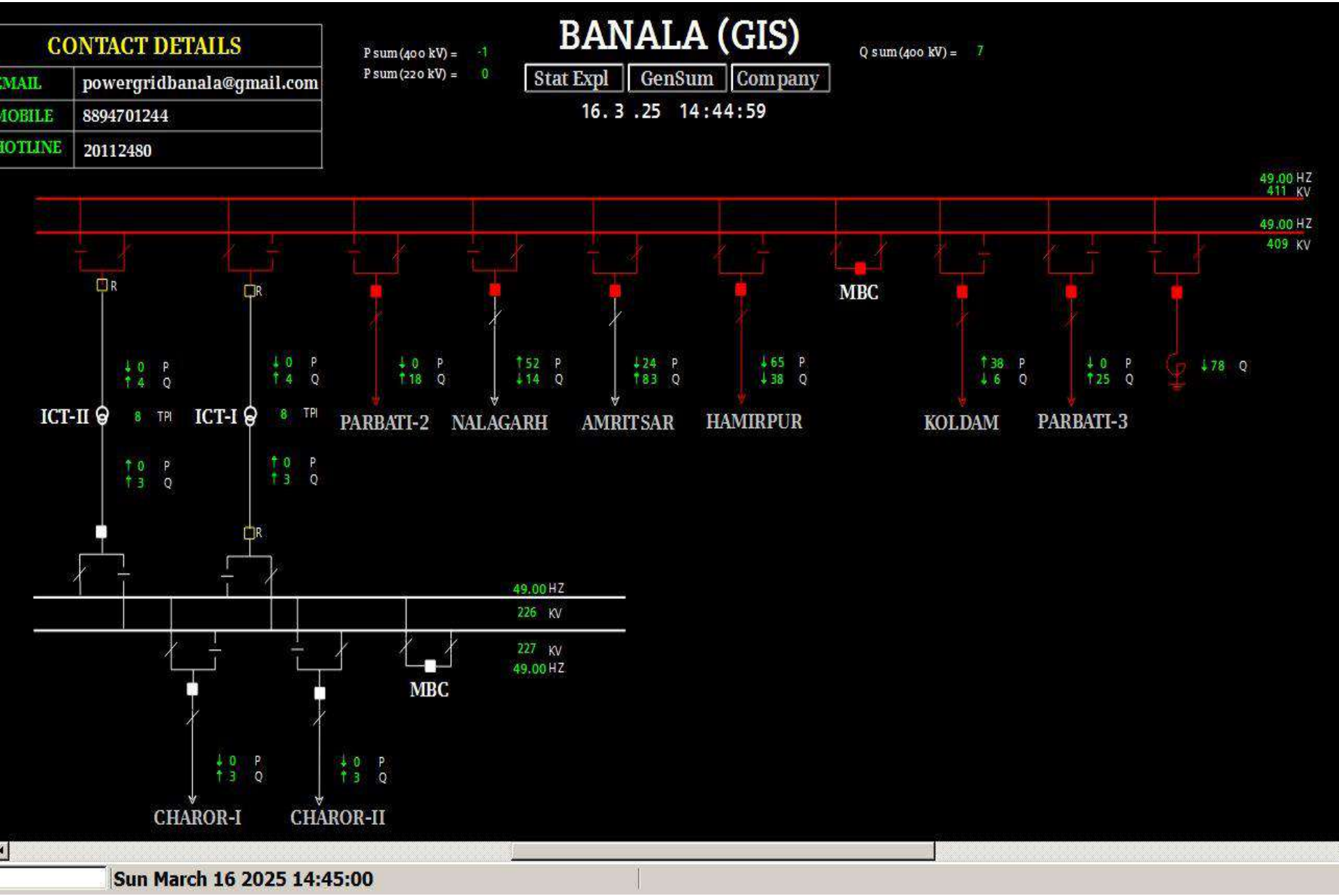
SLD of 400kV Parbati-II(NH) before the event



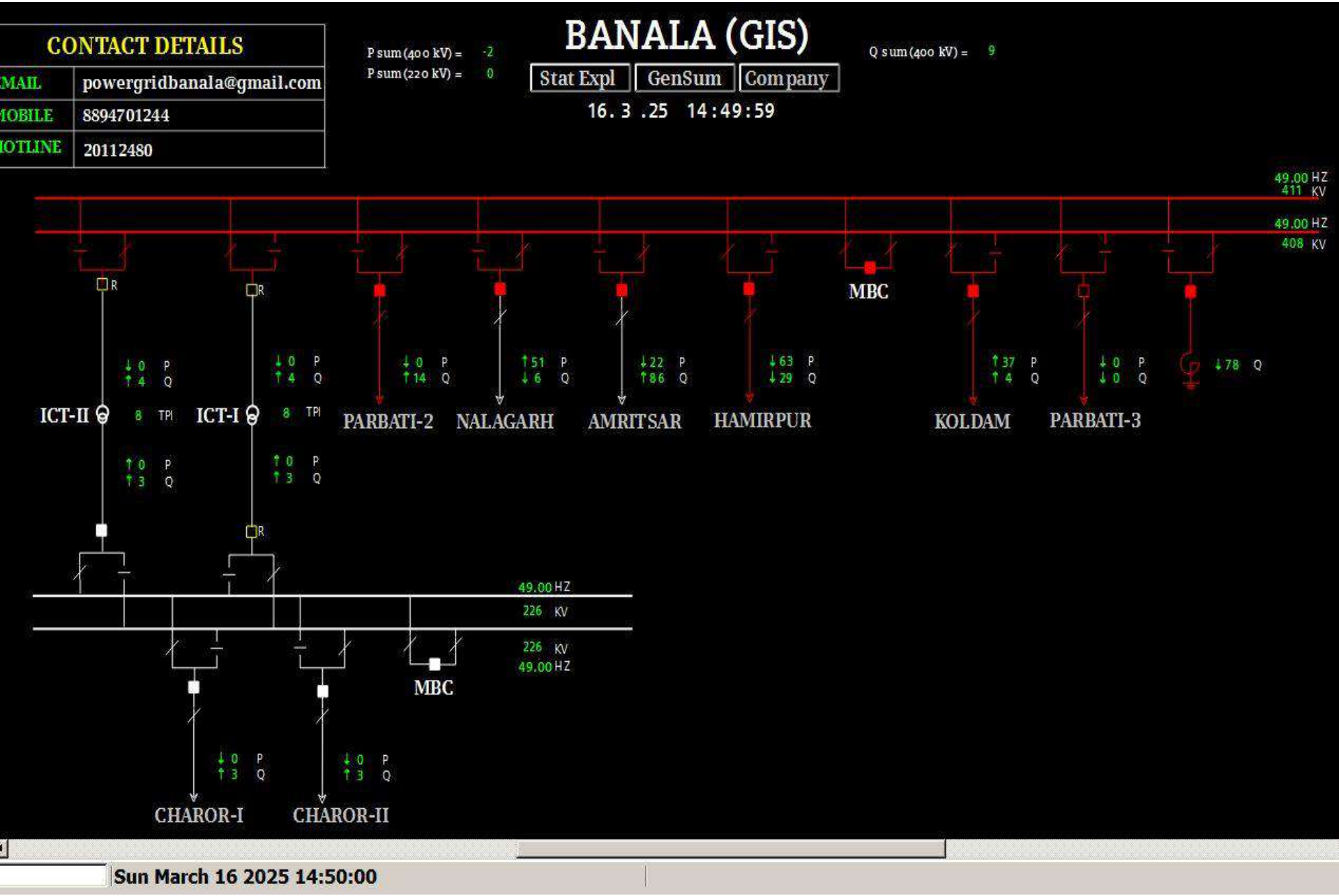
SLD of 400kV Parbati-II(NH) after the event



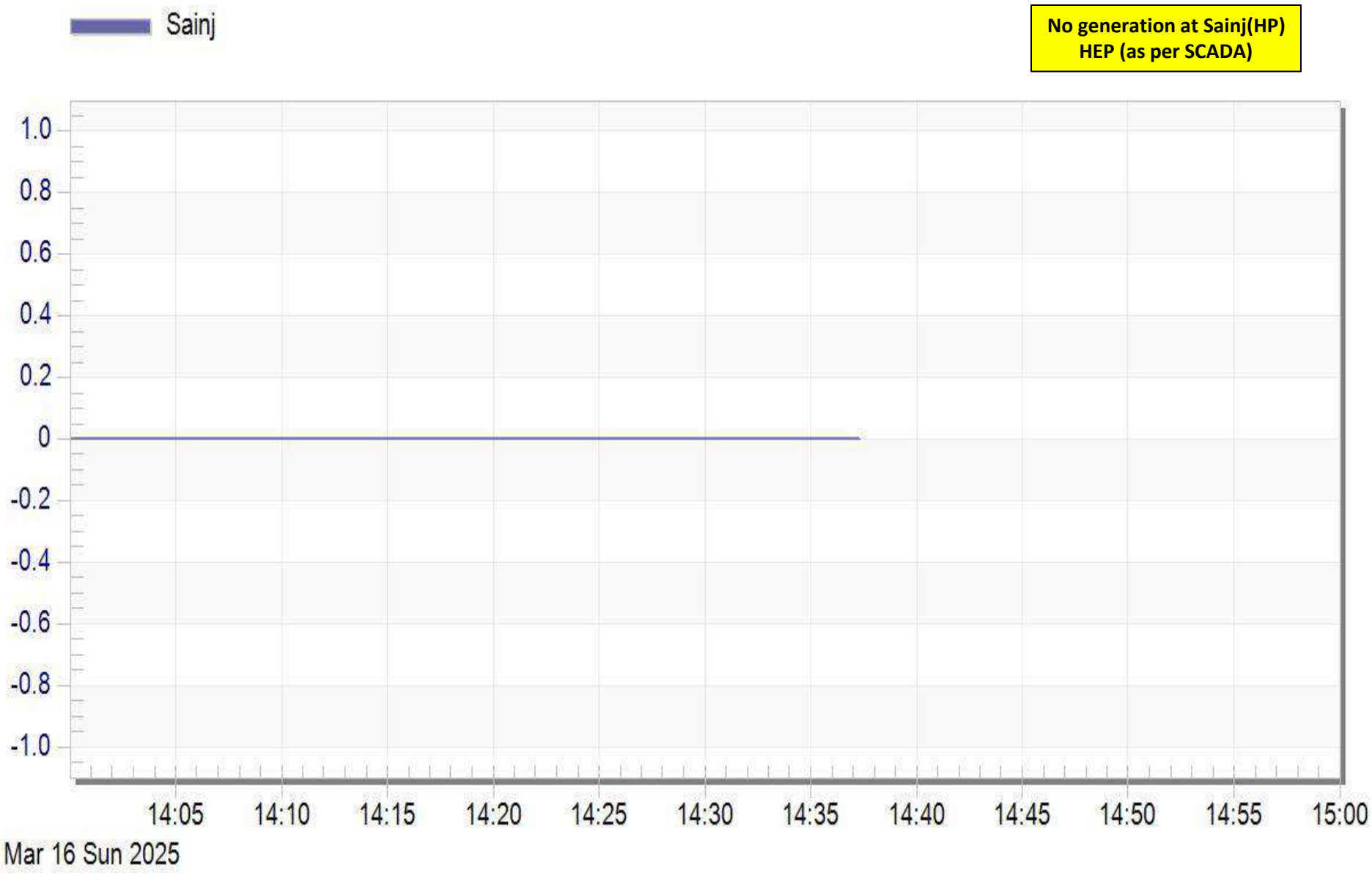
SLD of 400kV Banala(PG) before the event



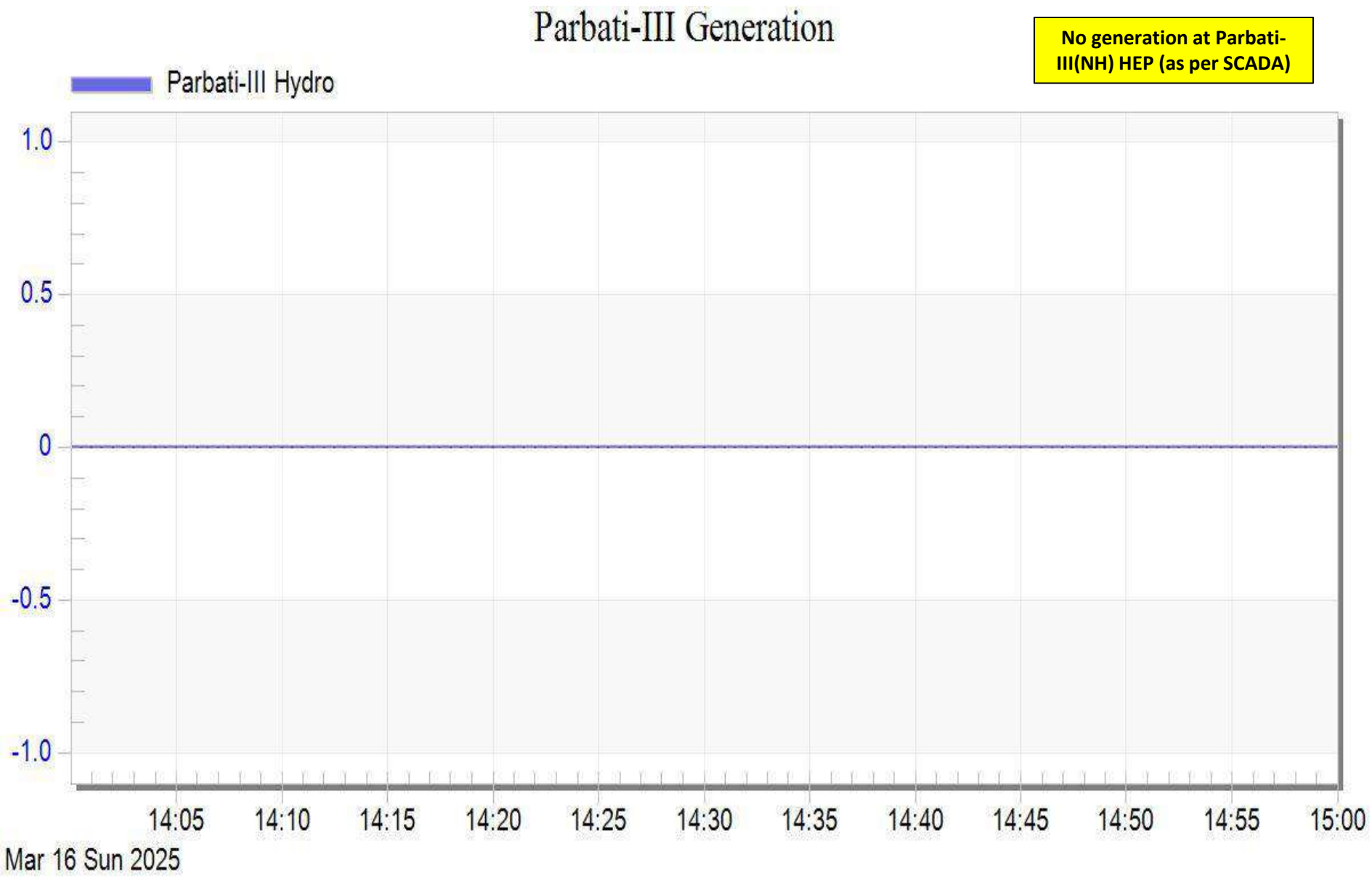
SLD of 400kV Banala(PG) after the event



Sainj(HP) HEP generation during the event



Parbati-III(NH) HEP generation during the event



No generation at Parbati-III(NH) HEP (as per SCADA)

PMU Plot of frequency at Nallagarh(PG)

14:46hrs/16-Mar-25

PMU Plot of phase voltage magnitude at Nallagarh(PG)

14:46hrs/16-Mar-25

SCADA SOE

Time	Station Name	Voltage Level	Element Name	Element Type	Element Status	Remarks
14:46:40,901	BNALA_PG	400kV	10PRBTI3	Circuit Breaker	Open	Line CB at Banala(PG) end of 400 KV Parbati_3(NH)-Parbati Pooling Banala(PG) (PKTCL) Ckt opened

Points for Discussion

i) Exact reason of fault need to be analyzed.

ii) Exact reason of tripping of 400 KV Parbati_2(NH)-Sainj(HP) (PKTCL) Ckt need to be shared.

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

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

v) Remedial action taken report to be shared.

Multiple element tripping event at 400kV AGE25L & 220kV Nokhra(IP)

At 10:00 hrs on 18.03.2025

Tripped Elements

S. No	Name of Elements	Outage Time	Revival Time	Reason of tripping
1.	400/220 KV 500 MVA ICT 6 at Bhadla_2 (PG)	10:00 hrs	13:28 Hrs	Tripped on Y-Ph differential protection
2.	220 KV Nokhra SL_BHD2 (NTPC)-Bhadla_2 (PG) (NTPC_Nokhra) Ckt-1		10:34 Hrs	Details Awaited
3.	400/33kV, 330MVA ICT-2 at AGE25L(IP)			Y-ph Transformer Differential Protection.
4.	400 KV AGE25L SL_BHD2_PG-Bhadla_2 (PG) (AGE25L) Ckt-1		13:24 Hrs	R-N fault in R-ph CVT at AGE25L end.

Brief details of the event

i) Generation of 220kV Nokhra (IP) and 400kV AGE25L stations evacuate through 220 KV Nokhra SL_BHD2 (NTPC)-Bhadla_2 (PG) (NTPC_NOKHRA) Ckt and 400 KV AGE25L SL_BHD2_PG-Bhadla_2 (PG) (AGE25L) Ckt-1 respectively.

ii) During antecedent condition, 220kV Nokhra (IP) and 400kV AGE25L were generating approx. 262 MW and 488 MW respectively (as per PMU).

iii) As reported, at 09:59:46hrs Y-Phase CT of 405-52 bay at AGE25L RE station failed and it triggered Transformer Differential protection of main CB 404-52 and Tie CB 405-52 opened on Bus-Bar Zone-1 protection.

iv) At 09:59:47 hrs, 400 KV AGE25L SL_BHD2_PG-Bhadla_2 (PG) (AGE25L) Ckt-1 tripped on R- Phase line differential protection. During inspection at site, spark in R-phase CVT was found and the same was replaced.

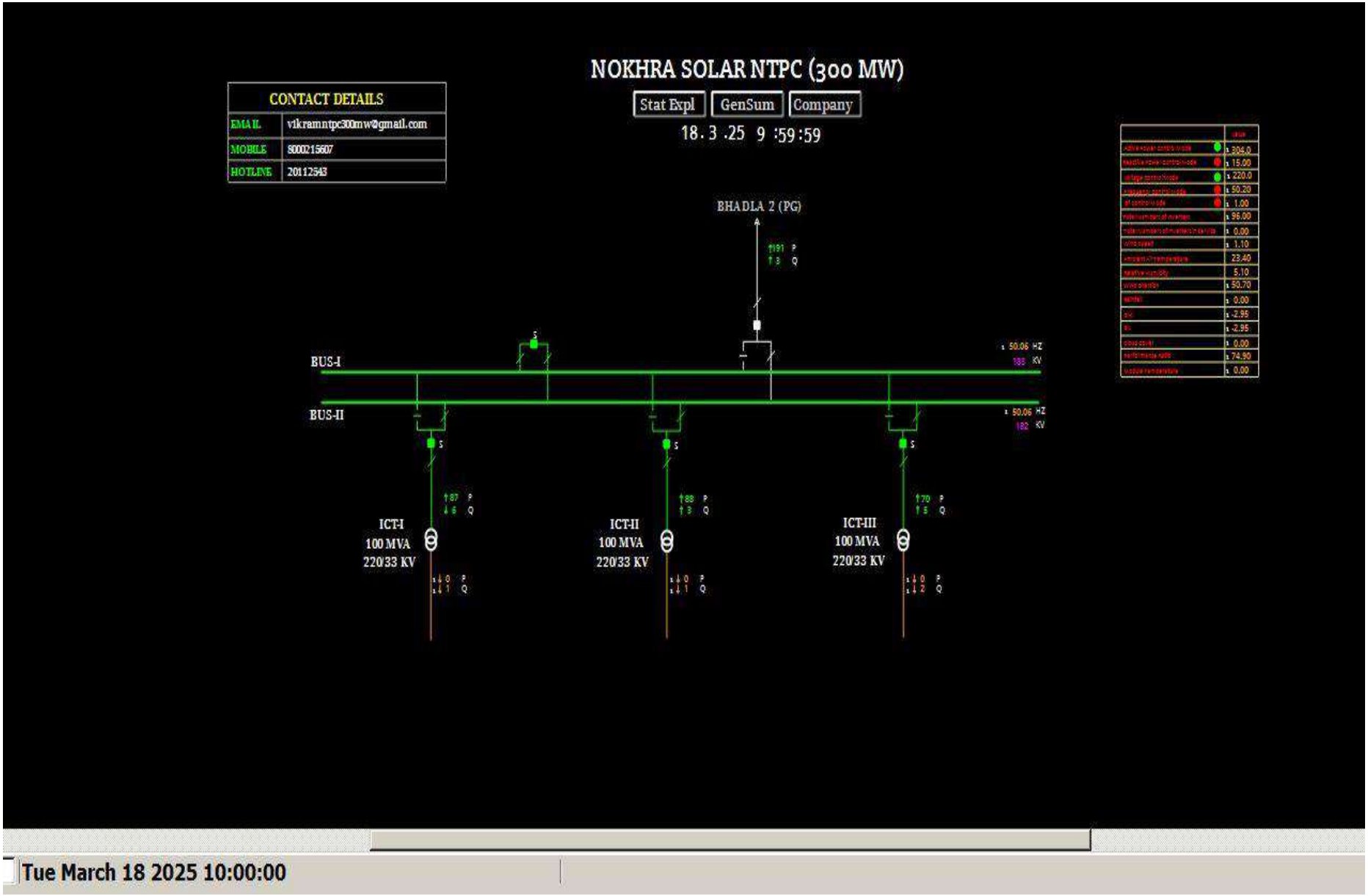
v) As per PMU at 400kV Bhadla2(PG), Y-N fault cleared in 240msec followed by permanent R-N fault is observed is observed with fault clearing time of 80ms.

vi) At the same time, 400/220kV 500MVA ICT-6 at Bhadla2(PG) and 220 KV NOKHRA SL_BHD2 (NTPC)-BHADLA_2 (PG) (NTPC_NOKHRA) CKT-1 also tripped. The reason for the same is yet to be received.

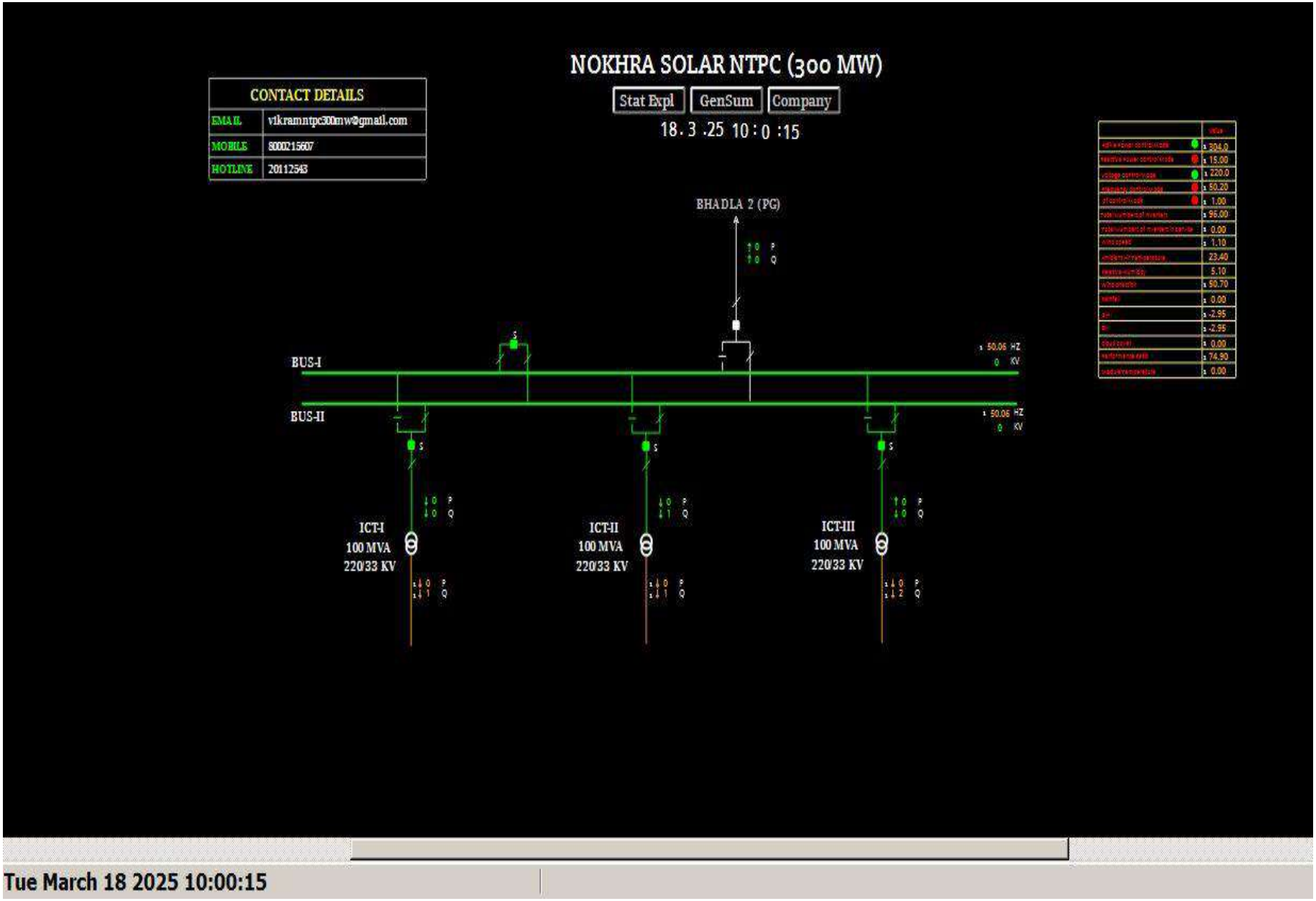
vii) As per PMU, solar generation loss of approx. 487 MW at AGE25L(IP) and 262 MW at Nokra(IP) were observed.

viii) As per SCADA, total Generation loss of 1035MW was observed in NR region.

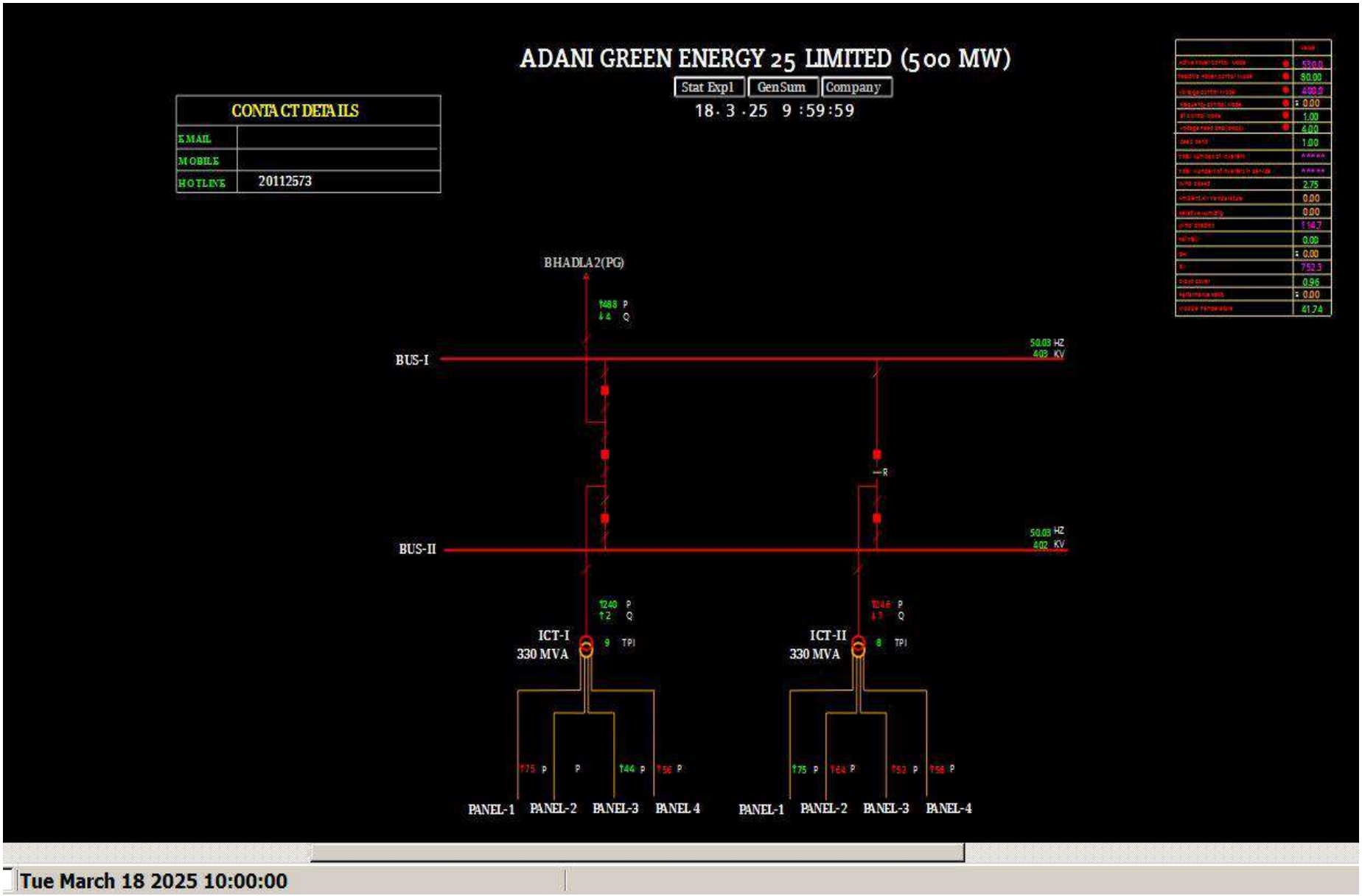
SLD of 220/33KV Nokhra(IP) before the event



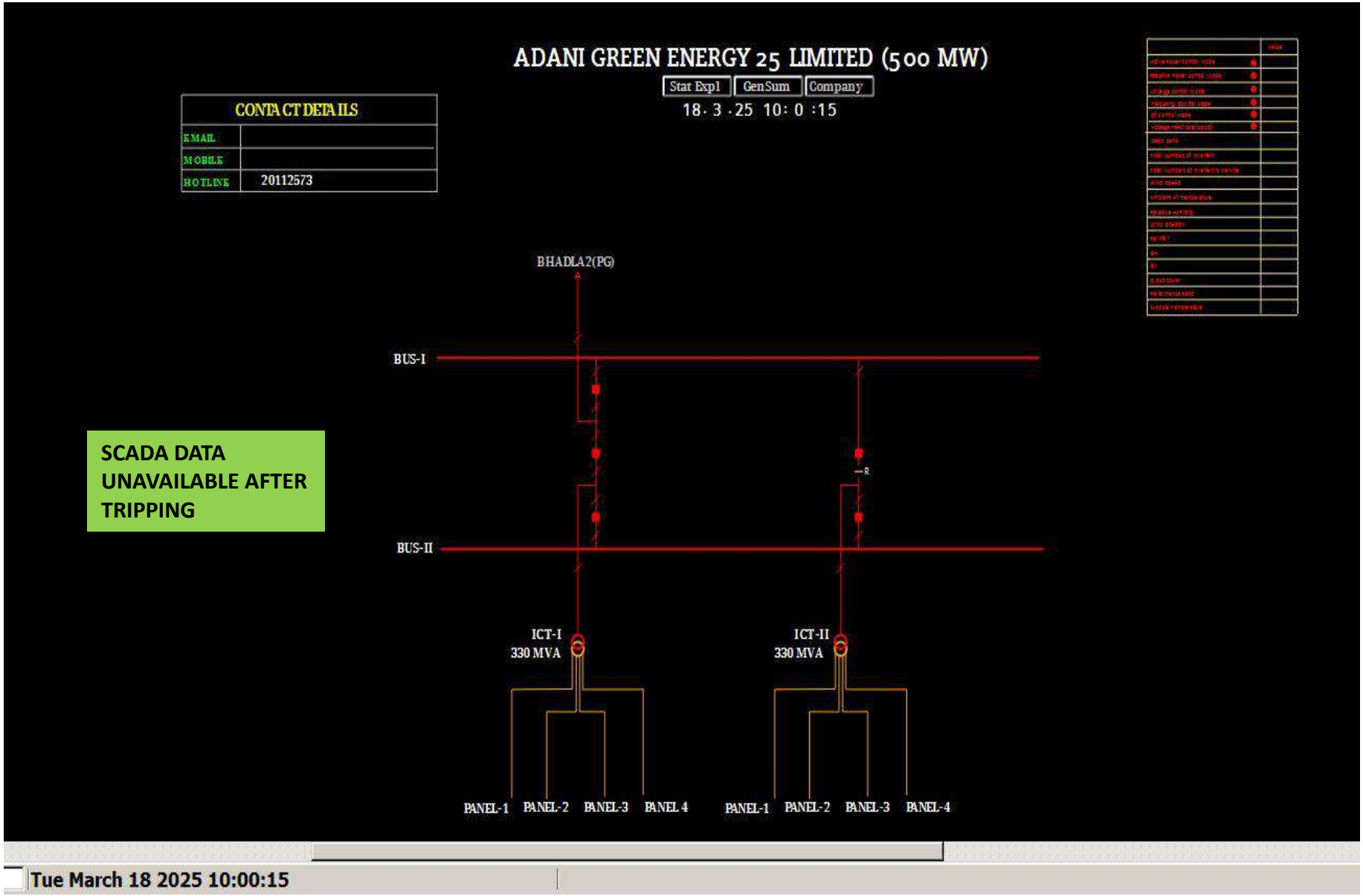
SLD of 220/33KV Nokhra(IP) after the event



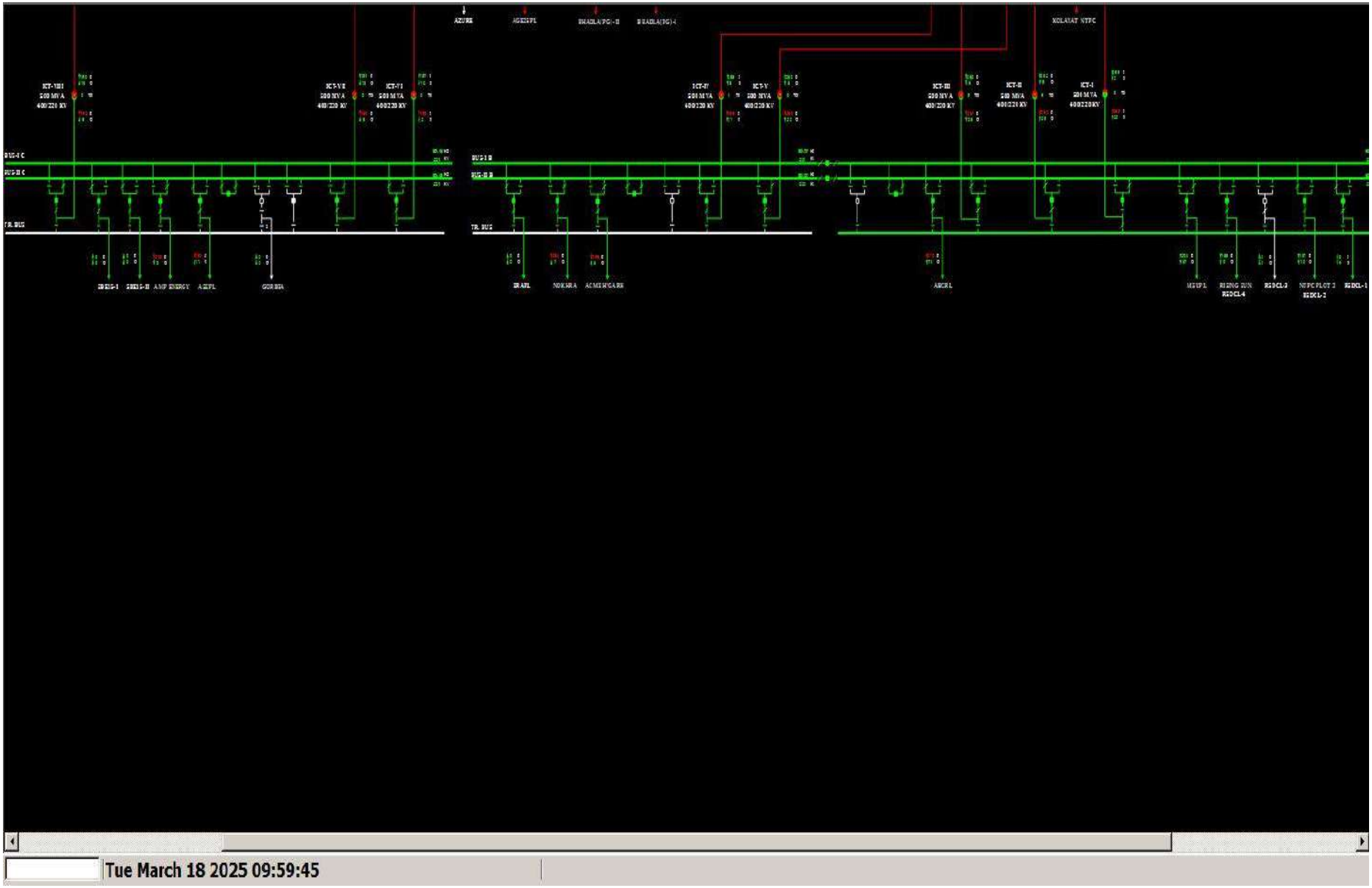
SLD of 400/33KV AGE25L(IP) before the event



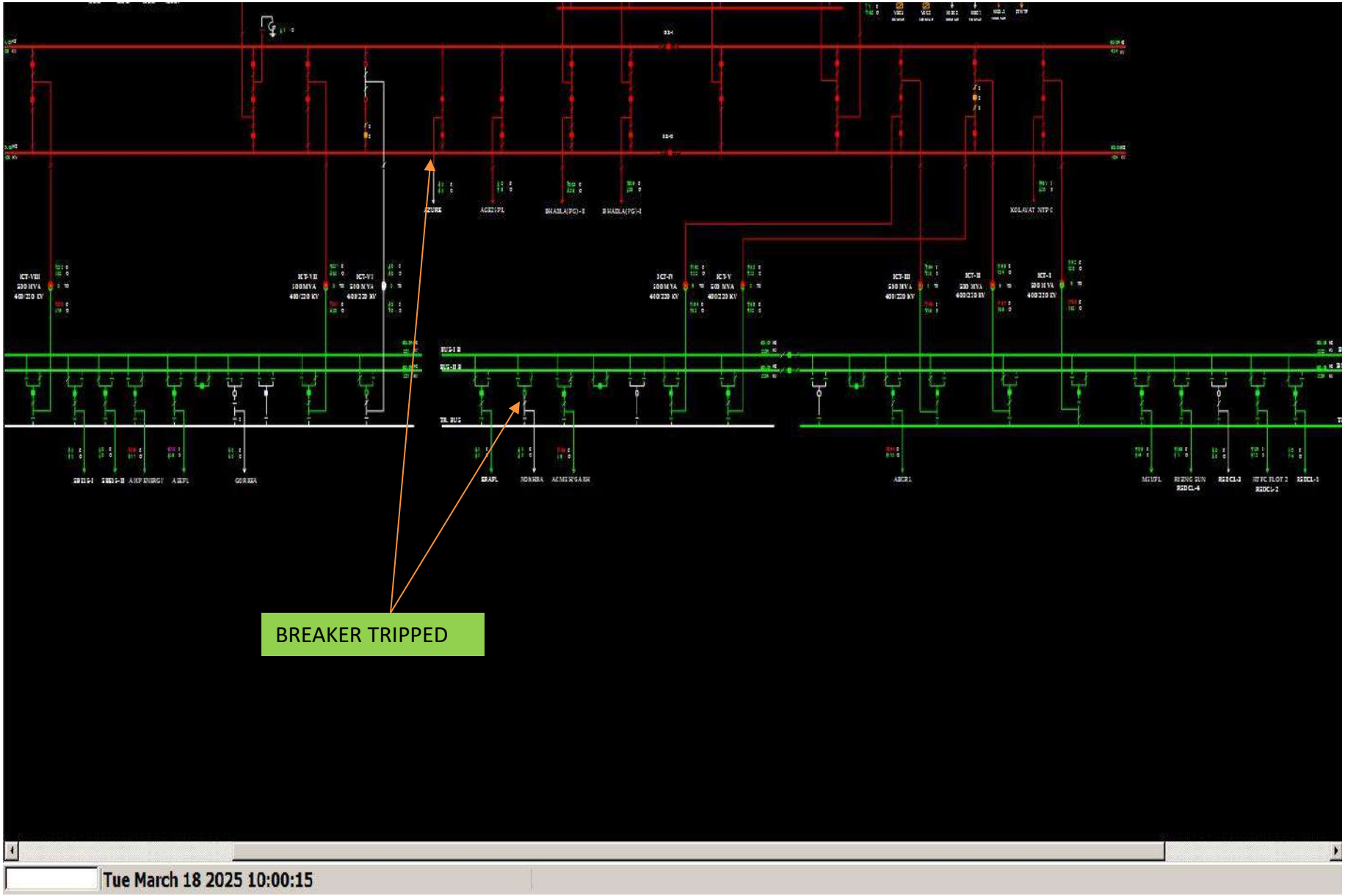
SLD of 400/33KV AGE25L(IP) after the event



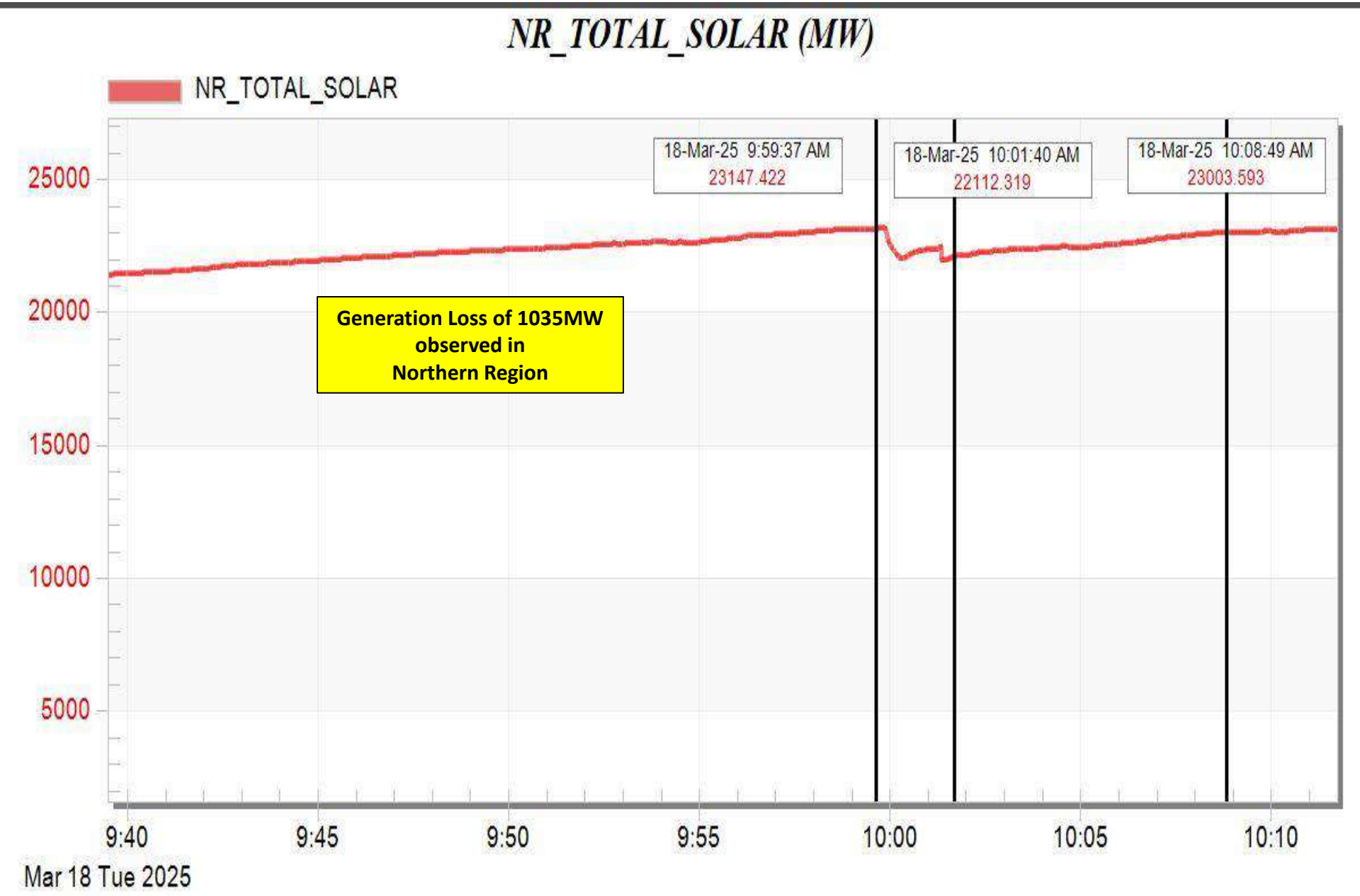
SLD of 765/400/220KV Bhadla_2(PG) before the event



SLD of 765/400/220KV Bhadla_2(PG) after the event

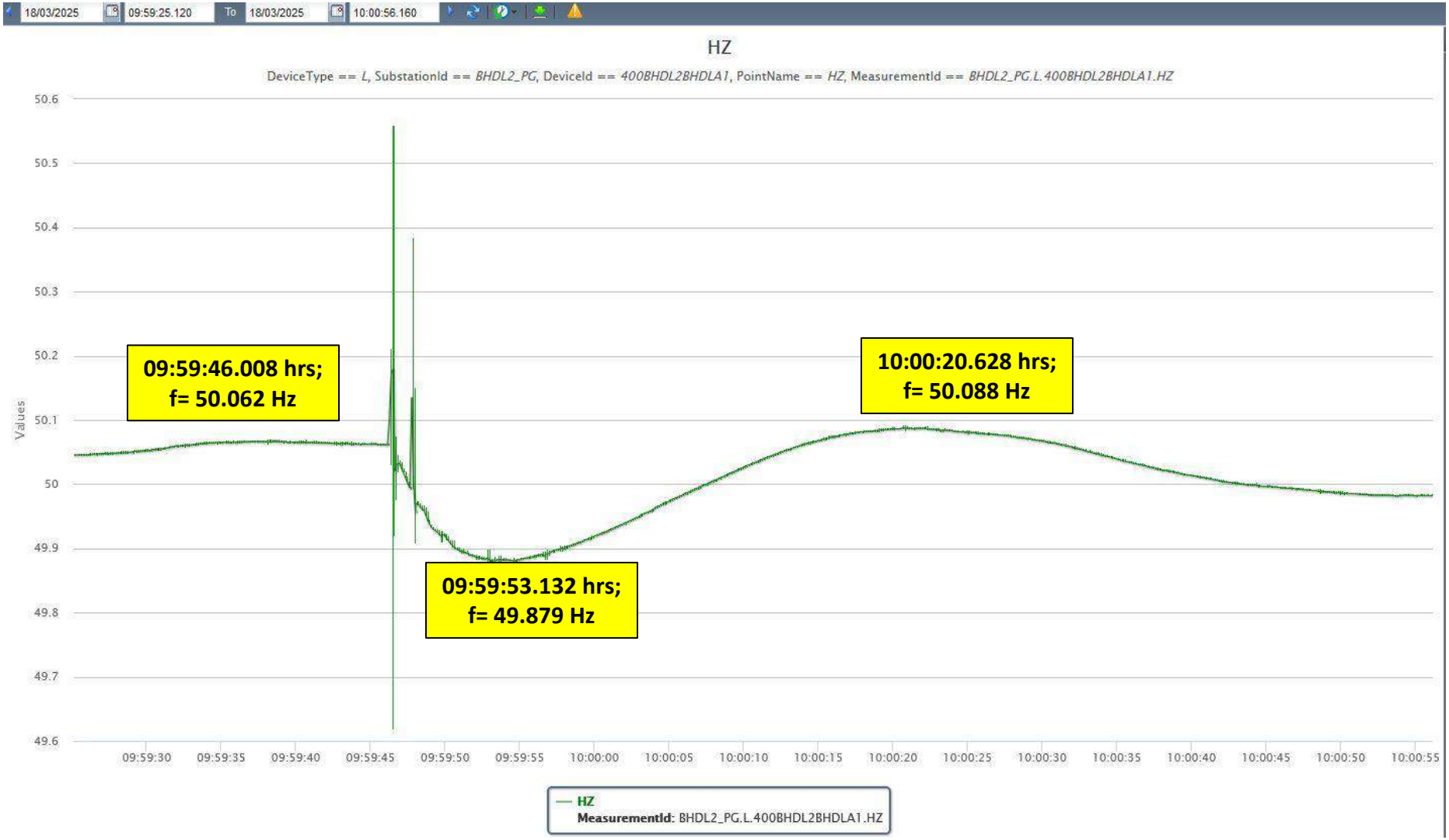


Total Solar Generation in Northern Region



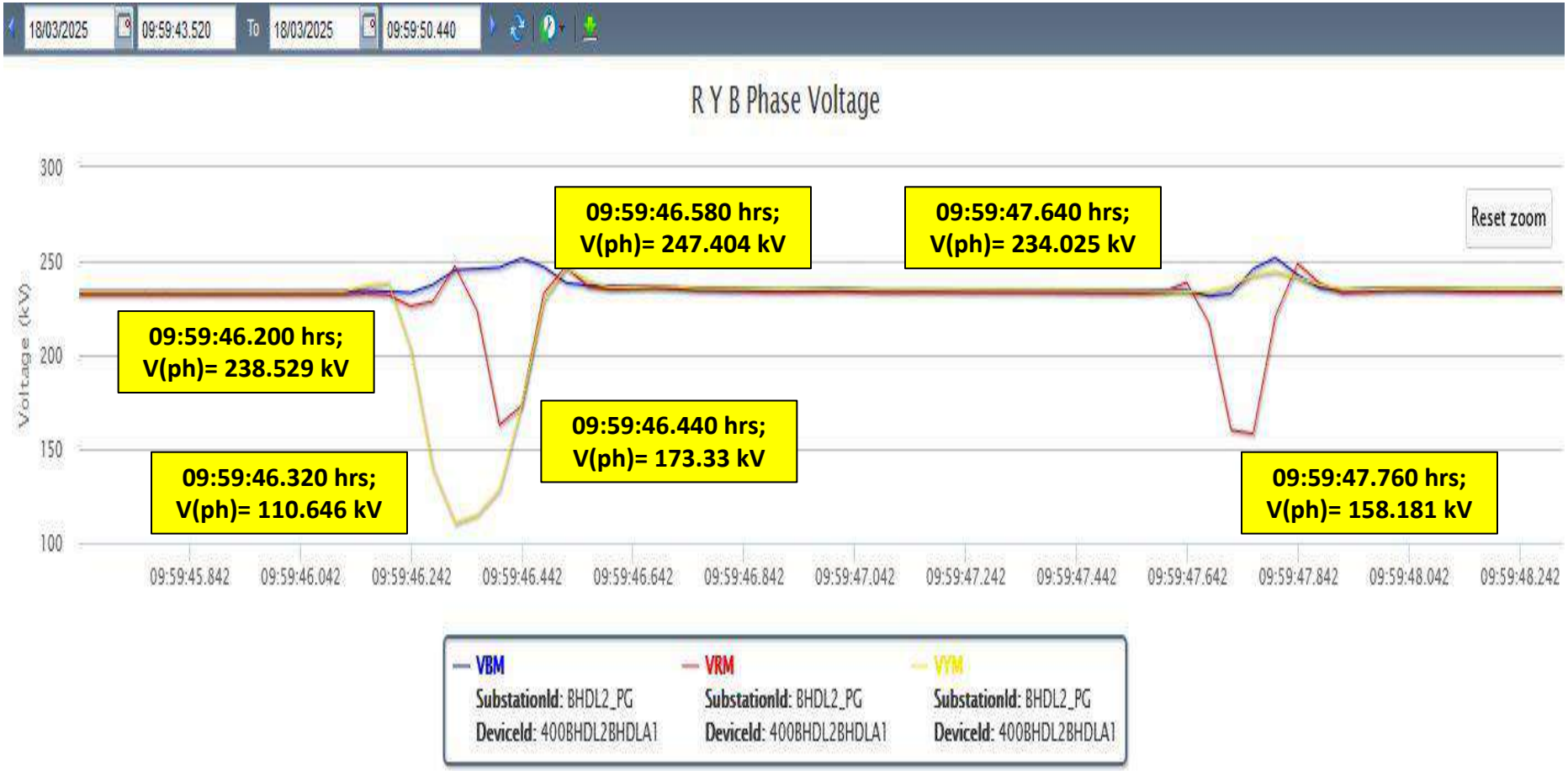
PMU Plot of frequency at Bhadla2(PG)

09:59hrs/18-Mar-25

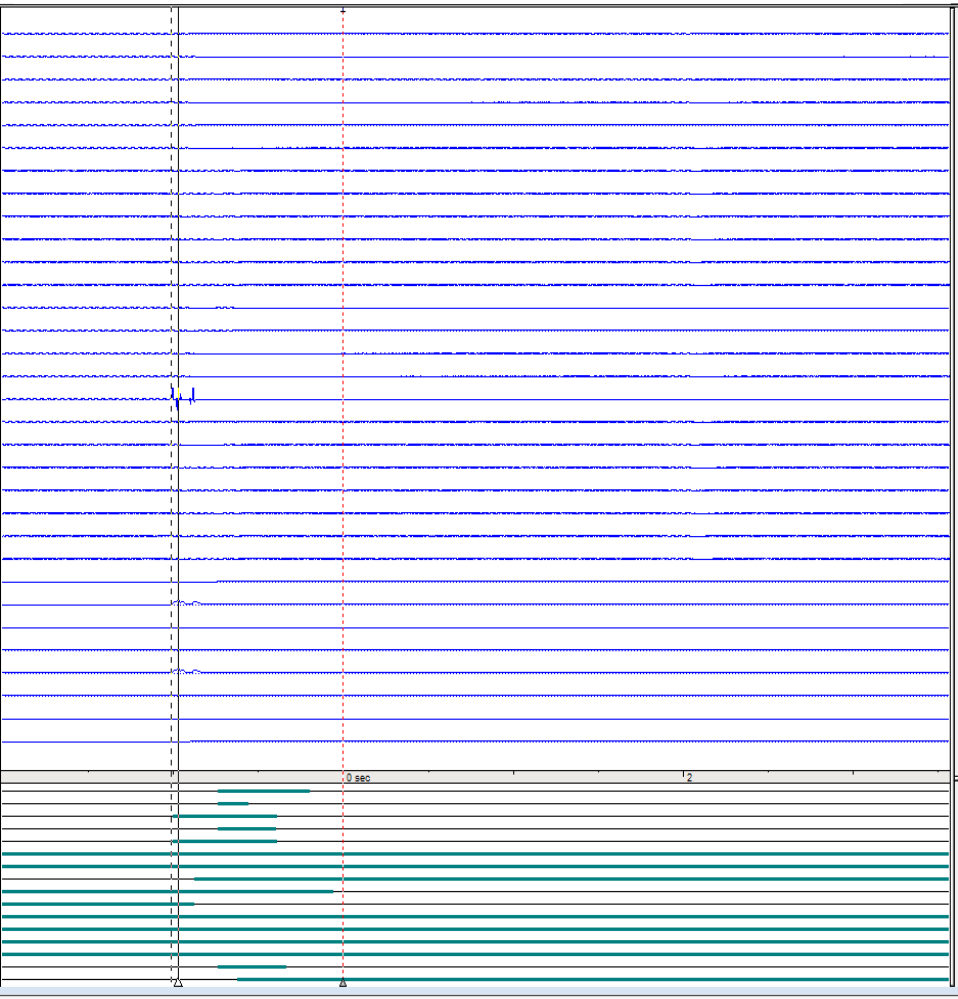


PMU Plot of phase voltages at Bhadla2(PG)

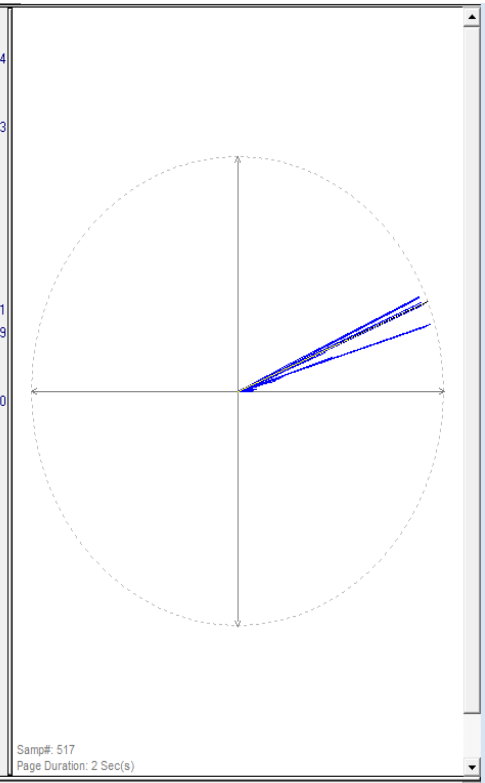
09:59hrs/18-Mar-25



DR of 400 KV AGE25L SL_BHD2_PG-Bhadla_2 (PG) (AGE25L) Ckt-1



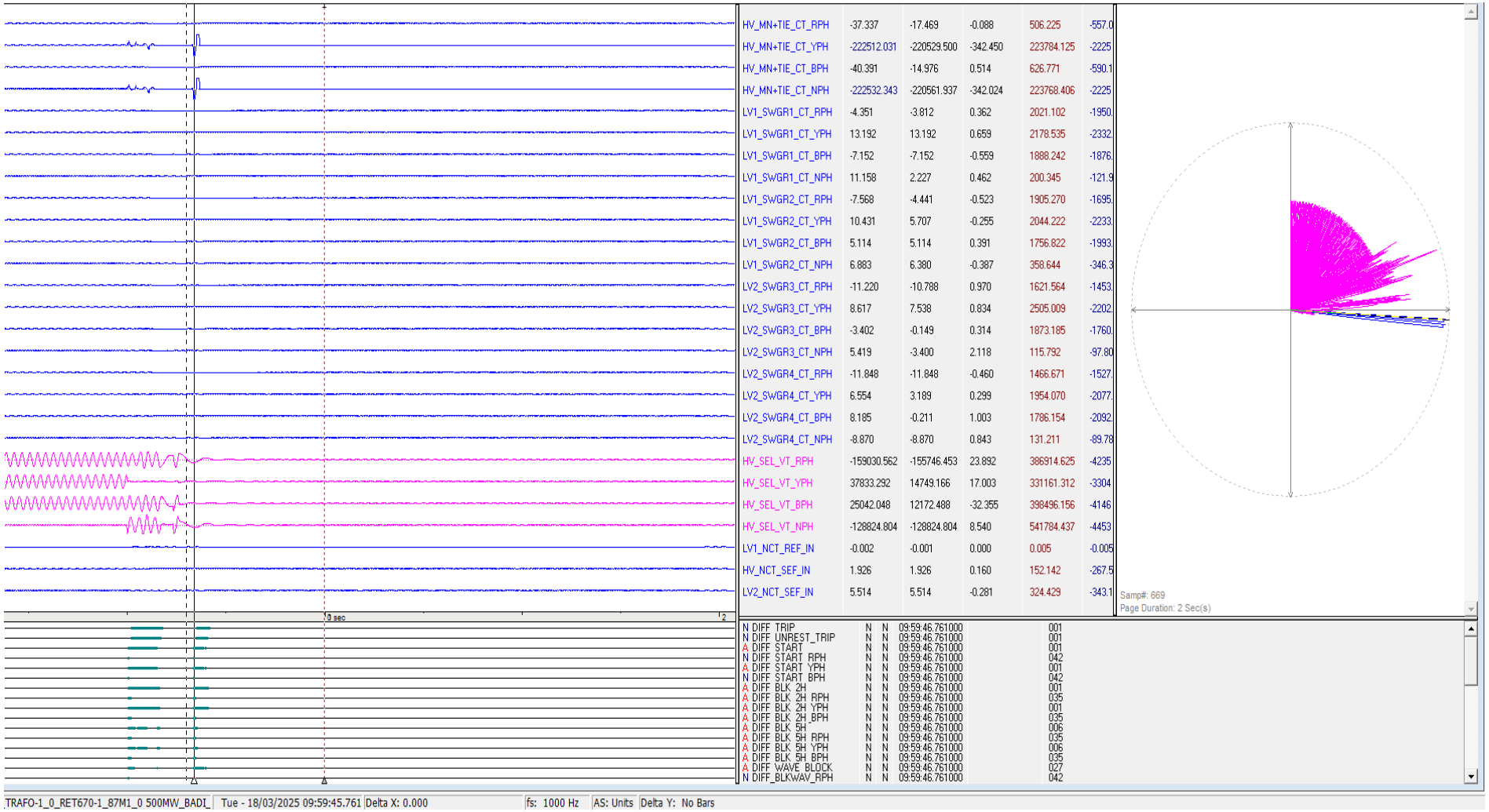
BAY401_CT_RPH	744.487	246.054	0.773	1470.790	-2956.593
BAY401_CT_YPH	-14078.412	-100.720	-21.933	27629.968	-29367.664
BAY401_CT_BPH	-620.663	246.180	0.734	1163.423	-2584.890
BAY404_CT_RPH	-752.504	-251.188	-1.882	2953.314	-1474.797
BAY404_CT_YPH	14060.376	102.065	10.472	29318.498	-27614.193
BAY404_CT_BPH	630.407	-246.436	-0.122	2582.442	-1165.563
BAY407_CT_RPH	10.313	10.313	0.507	12.584	-10.450
BAY407_CT_YPH	7.512	2.047	-0.202	7.512	-9.394
BAY407_CT_BPH	8.369	8.369	-0.098	12.313	-11.237
BAY410_CT_RPH	5.588	4.268	0.928	5.588	-8.612
BAY410_CT_YPH	13.226	12.849	0.563	13.697	-11.787
BAY410_CT_BPH	4.077	-2.588	0.181	4.423	-5.366
BAY403_CT_RPH	-1143.263	-344.677	-303.348	42761.859	-35348.371
BAY403_CT_YPH	15021.464	3102.299	222.510	27950.189	-33852.789
BAY403_CT_BPH	-589.402	-246.913	-0.230	2509.041	-1007.758
BAY405_CT_RPH	1140.932	321.314	-1.133	1349.491	-3103.979
BAY405_CT_YPH	447145.531	19371.652	-491.300	450077.937	-446101.90
BAY405_CT_BPH	596.079	235.945	-0.423	1004.116	-2482.299
BAY409_CT_RPH	-6.158	-4.427	0.079	4.353	-11.149
BAY409_CT_YPH	10.080	-2.921	0.209	10.080	-7.963
BAY409_CT_BPH	7.486	7.486	0.182	9.220	-6.579
BAY412_CT_RPH	5.267	3.380	0.111	5.267	-7.135
BAY412_CT_YPH	13.262	12.976	0.038	15.080	-12.962
BAY412_CT_BPH	5.028	-2.094	0.053	5.028	-5.088
BB1_DIFF_RPH	0.000	0.000	0.327	25788.406	0.000
BB1_DIFF_YPH	144889.437	144889.437	0.486	144889.437	0.000
BB1_DIFF_BPH	0.000	0.000	0.000	0.000	0.000
BB1_REST_RPH	773.727	773.727	0.438	25788.503	0.329
BB1_REST_YPH	146303.093	146303.093	0.548	146303.093	0.288
BB1_REST_BPH	283.424	257.197	0.678	1028.316	0.297
BB2_DIFF_RPH	0.000	0.000	0.000	0.000	0.000
BB2_DIFF_YPH	0.000	0.000	24.298	7278.253	0.000



N BB1_DIFF_TRIP	N	N	09:59:46.763000	001
N BB1_DIFF_TR_RPH	N	N	09:59:46.763000	001
A CHECKZONE_TRIP	N	N	09:59:46.763000	001
N CHECKZONE_TRIP_B	N	N	09:59:46.763000	001
A CHECKZONE_TRIP_Y	N	N	09:59:46.763000	001
A 401_EFP_BLOCK	A	A		000
A 401_CONN_ZB	A	A		000
N 404_FORC_I=ZERO	N	A		001
A 404_EFP_BLOCK	A	N	09:59:46.763000	000
A 404_CONN_ZB	A	N	09:59:46.763000	107
A 407_EFP_BLOCK	A	A		000
A 407_CONN_ZB	A	A		000
A 410_EFP_BLOCK	A	A		000
A 410_CONN_ZB	A	A		000
N 403_BB_TRIP	N	N	09:59:46.763000	001
N 403_FORC_I=ZERO	N	A		000

- ✓ Y-Phase Fault Observed.
- ✓ BUS BAR DIFFERENTIAL ZONE-1 – MAIN-1

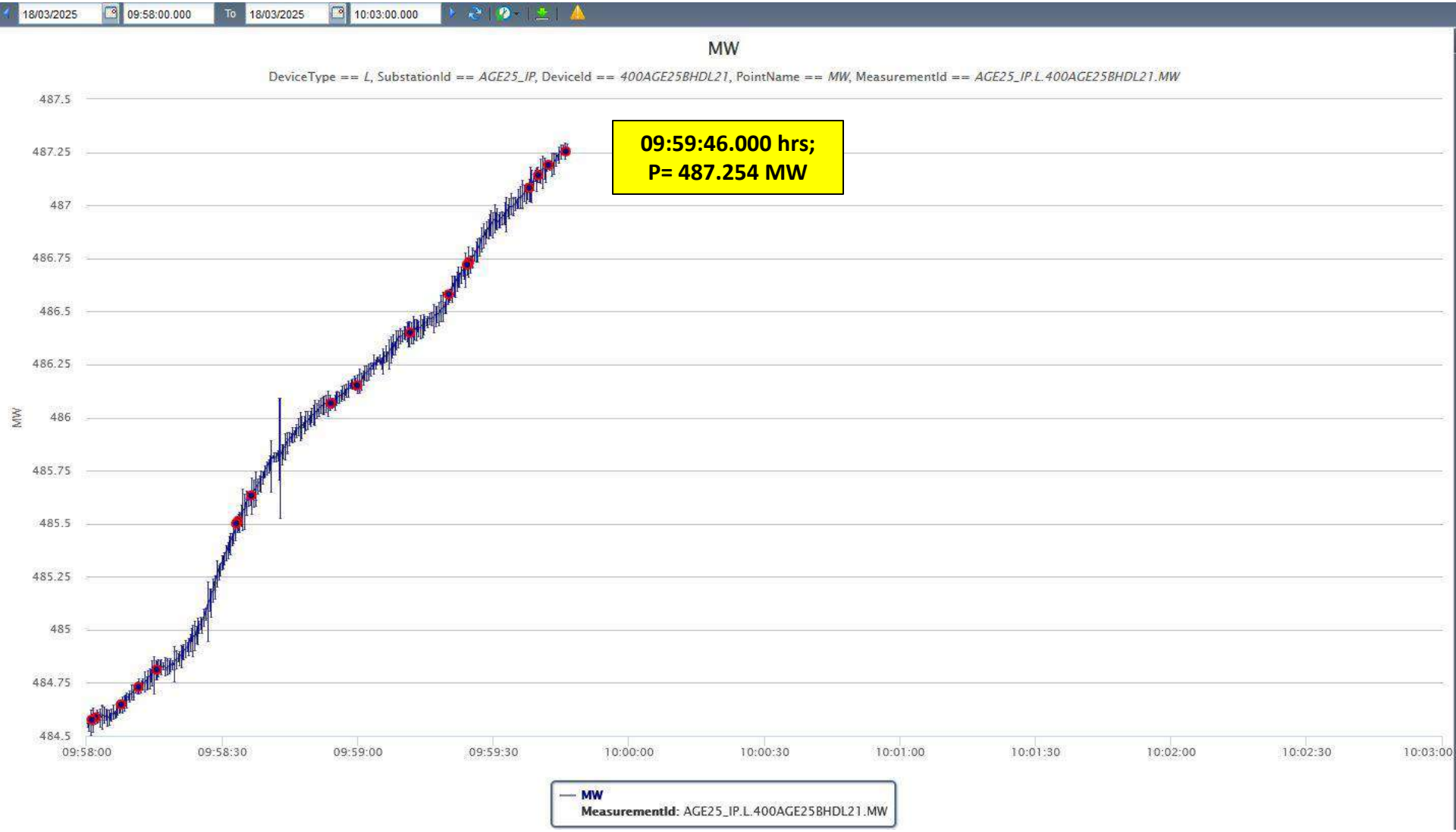
DR of 400/33KV, 330MVA ICT-1 at AGE25L(IP)



✓ Y phase Differential protection operated due to Y phase fault .

PMU Plot of Active Power (MW) at AGE25L(IP)

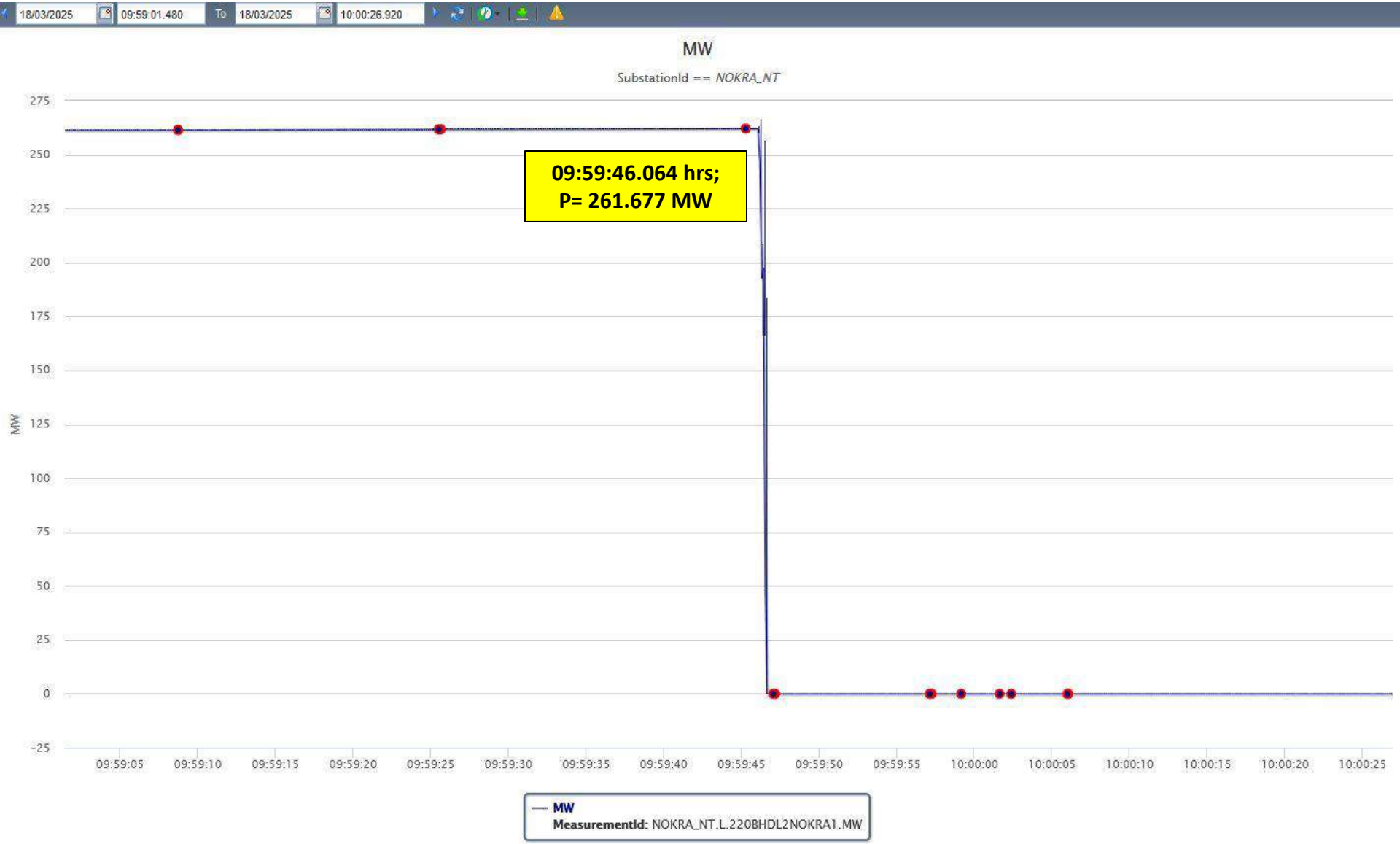
09:59hrs/18-Mar-25



✓ PMU data not available after the event time.

PMU Plot of Active Power (MW) at Nokhra(NT)

09:59hrs/18-Mar-25



SCADA SOE

Time	Station Name	Voltage	Element Name	Element Type	Element Status	Remarks
09:59:46,343	BHDL2_PG	400kV	02TIE	Circuit Breaker	Open	Tie CB at 400kV side of 400/220kV 500MVA ICT-6 at Bhadla2(PG) opened
09:59:46,345	BHDL2_PG	400kV	01T6	Circuit Breaker	Open	Main CB at 400kV side of 400/220kV 500MVA ICT-6 at Bhadla2(PG) opened
09:59:46,350	BHDL2_PG	220kV	A10T6	Circuit Breaker	Open	CB at 220kV side of 400/220kV 500MVA ICT-6 at Bhadla2(PG) opened
09:59:46,541	NOKRA_NT	220kV	05BHDLA2	Circuit Breaker	Open	Line CB at Nokhra(NT) end of 220kV Bhadla2(PG) - Nokhra(NT) Ckt opened
09:59:46,570	BHDL2_PG	220kV	19NOKHRA	Circuit Breaker	Open	Line CB at Bhadla2(PG) end of 220kV Bhadla2(PG) - Nokhra(NT) Ckt opened
09:59:47,744	BHDL2_PG	400kV	15AGE25	Circuit Breaker	disturbe	
09:59:47,758	BHDL2_PG	400kV	14TIE	Circuit Breaker	disturbe	
09:59:49,049	BHDL2_PG	400kV	15AGE25	Circuit Breaker	Close	
09:59:50,106	BHDL2_PG	400kV	14TIE	Circuit Breaker	Close	

Points for Discussion

i) Exact reason of tripping and nature of protection operated in 400/220 KV 500 MVA ICT 6 at Bhadla_2 (PG) and 220 KV Nokhra SL_BHD2 (NTPC)-Bhadla_2 (PG) (NTPC_Nokhra) Ckt-1 need to be shared.

ii) DR/EL along with tripping report need to be shared from both the ends.

iii) Remedial action taken report to be shared.

Adani Green Energy Ltd.

Preliminary Incident Report for Badisid 400kV Substation

Transformer-2 Tie Bay 405 CT-B Y Phase CT Failure

Date: 18.03.2025

Time: 09:59 Hrs.

Substation Details:

Location: Badisid, Rajasthan

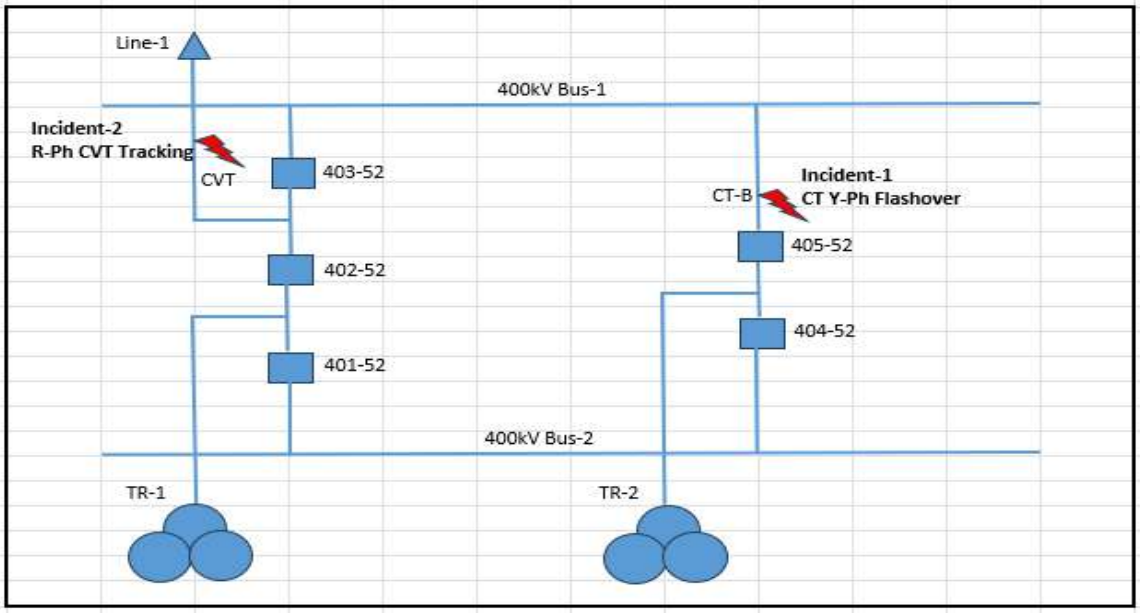
Voltage: 400kV

Breaker arrangement: one and half Breaker

No. of Dia: 2

Equipment Involved: Transformer-2 Tie Bay, Y- phase CT

Description of the system: The 400kV switchyard are of one and half breaker configuration with total 2 No. of Dia. Dia-1 is having Line-Tie-Transformer-1 configuration. Dia-2 is having half Dia connected with Transformer-2 (330MVA ,400/33kV).



Incident:

At around 09:59:46 Hrs., There was a flashover in the 400kV Bay No 405 in the Y-phase CT of Transformer-2 Tie Bay. Due to the flashover there was tripping of TR-2 and Busbar Differential protection of Bus-1. Subsequent to the fault there was operation of 400kV Busbar differential protection also. The detailing of protection with analysis is mentioned in this report as under. The protection system of substation responded correctly and isolating the faulty section to prevent further damage and to maintain grid stability.

Protection Operation details:

Element Name	Protection Operated	Time (Hrs.)	Incident No
Transformer-2	Overall Differential	09:59:46:761	1
Bus-1	Busbar Zone-1	09:59:46:763	
Line-1	R-Ph Line Differential	09:59:47:725	2

Observation:

Incident-1

1. The Transformer-2 Tie Bay CT-B Y phase CT (Mehru Make) Failure triggered a sequence of protection operations, ensuring controlled isolation of the fault.
    a. Opening of Main CB 404-52 operation of Transformer Differential Protection.
    b. Opening of Tie CB 405-52 on operation of Busbar Zone-1 Protection.
2. No cascading tripping were observed, indicating the effectiveness of the protection scheme.
3. A detailed root cause analysis is required to determine the exact reason of the CT failure which has been conveyed to the OEM.

Incident-2

1. It is also observed that 400kV Line was tripped on operation of R-Phase Line differential protection after 1.3sec of above incident.
2. The detailed checking of switchyard and Line side carried out, however apparently nothing was found abnormal.
3. At evening 17:45 Hrs. there was spark observed in R-Phase CVT of line-1. Hence, emergency shutdown was availed and CVT was replaced with new one.

4. With above observation it can be concluded that during the incident-1 there might be tracking in the R-Ph CVT which might led to the development of differential in R-phase caused to the operation of R-phase Line Differential protection as described above.
5. Line Operation Sequence:

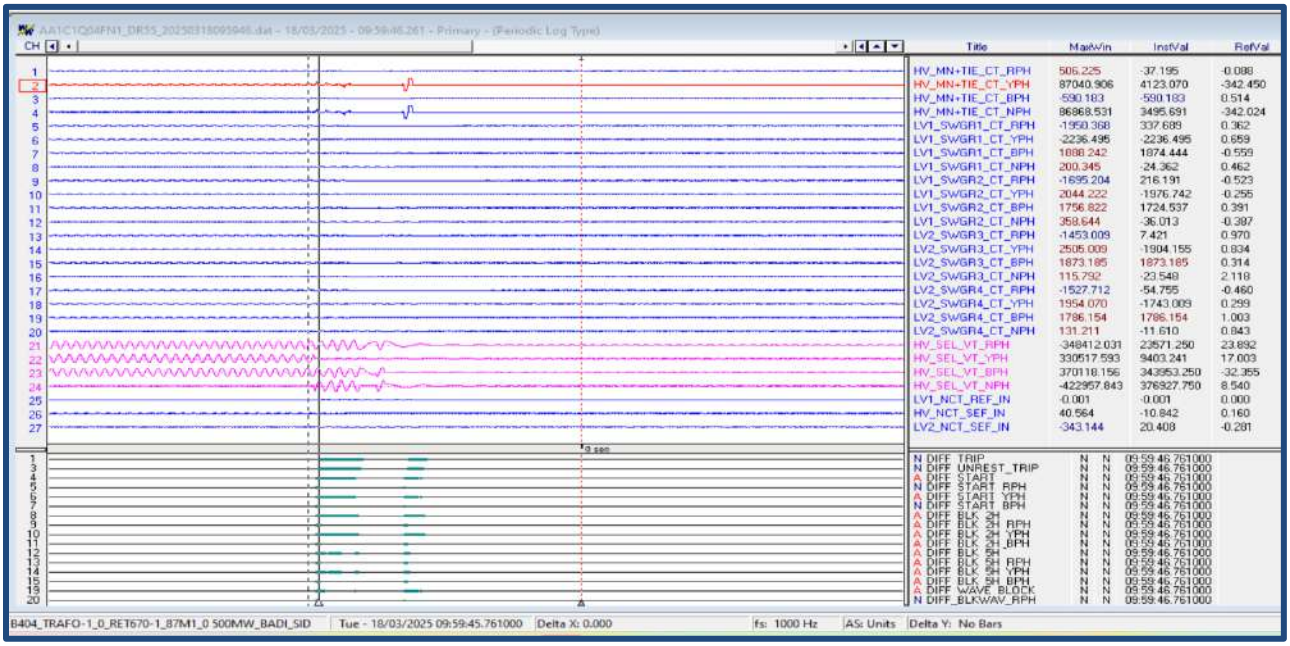
Element Name	Trip/Shutdown/Restore	Date & Time
Line-1	Trip	18.03.2025 & 09:59 Hrs.
Line-1	Restore	18.03.2025 & 13:19 Hrs.
Line-1	Shutdown	18.03.2025 & 17:55 Hrs.
Line-1	Restore	19.03.2025 & 04:48 Hrs.

Immediate Action Taken:

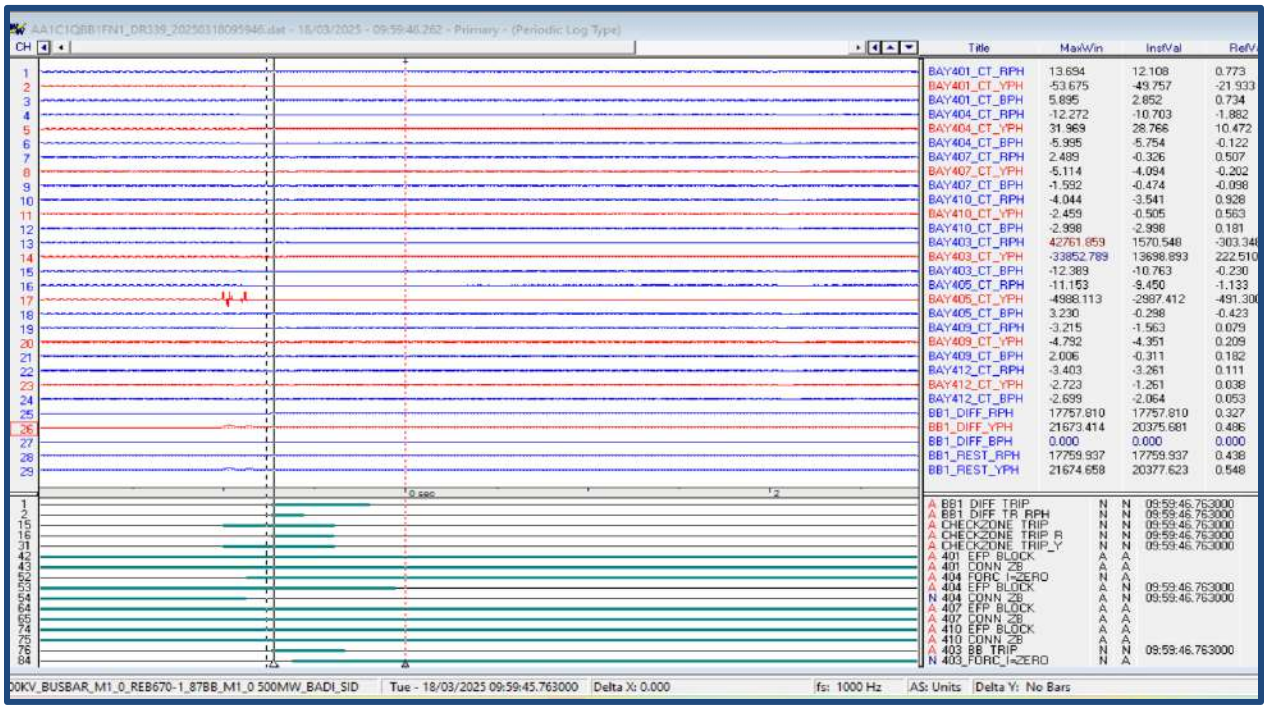
1. Faulty section isolated as per protection action.
2. Faulty CT removed and new CT installed in 405 Tie Bay under restoration work.
3. Line-1 R-phase CVT replaced after found sparking after taking emergency shutdown.
4. Verified the healthiness of associated equipment in Transformer-2 Tie Bay.
5. Inspection and assessment of damaged CT initiated.

Disturbance Recorder Snapshots:

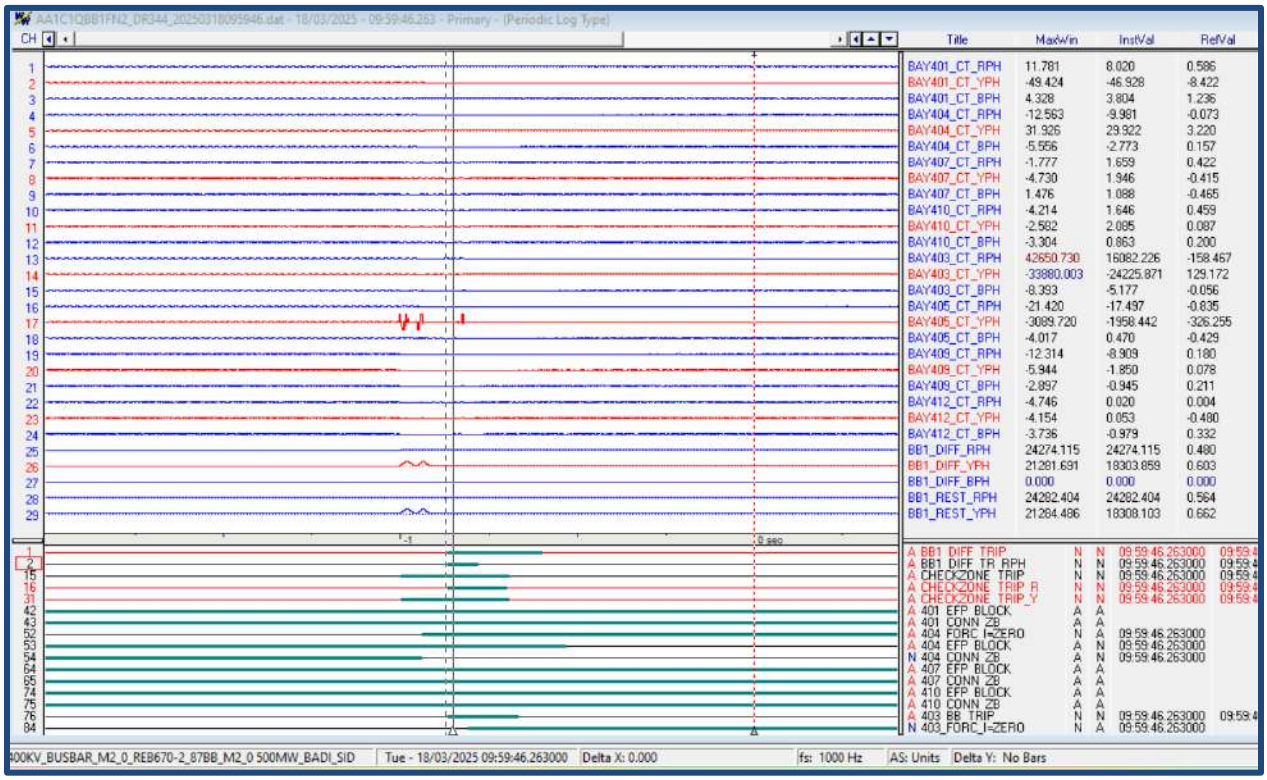
1. **TRANSFORMER -2 – 87- DIFFERENTIAL PROTECTION**



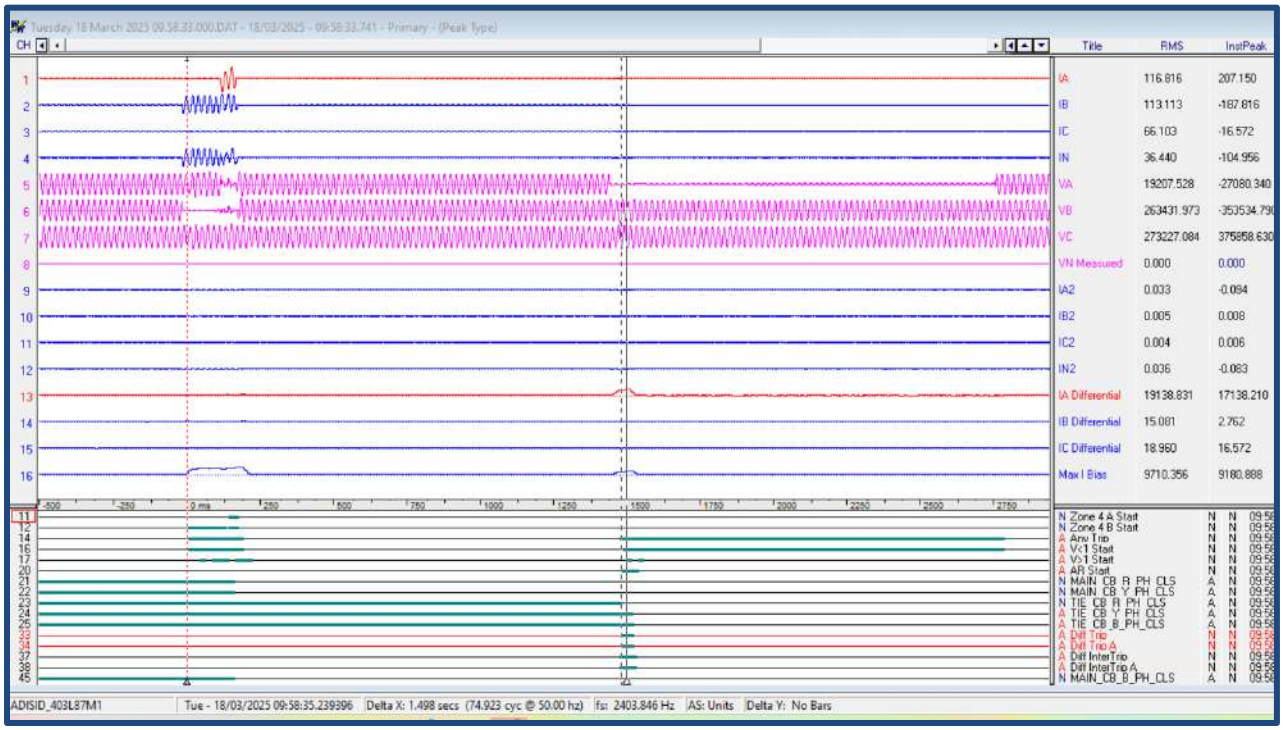
2. BUS BAR DIFFERENTIAL ZONE-1 – MAIN-1



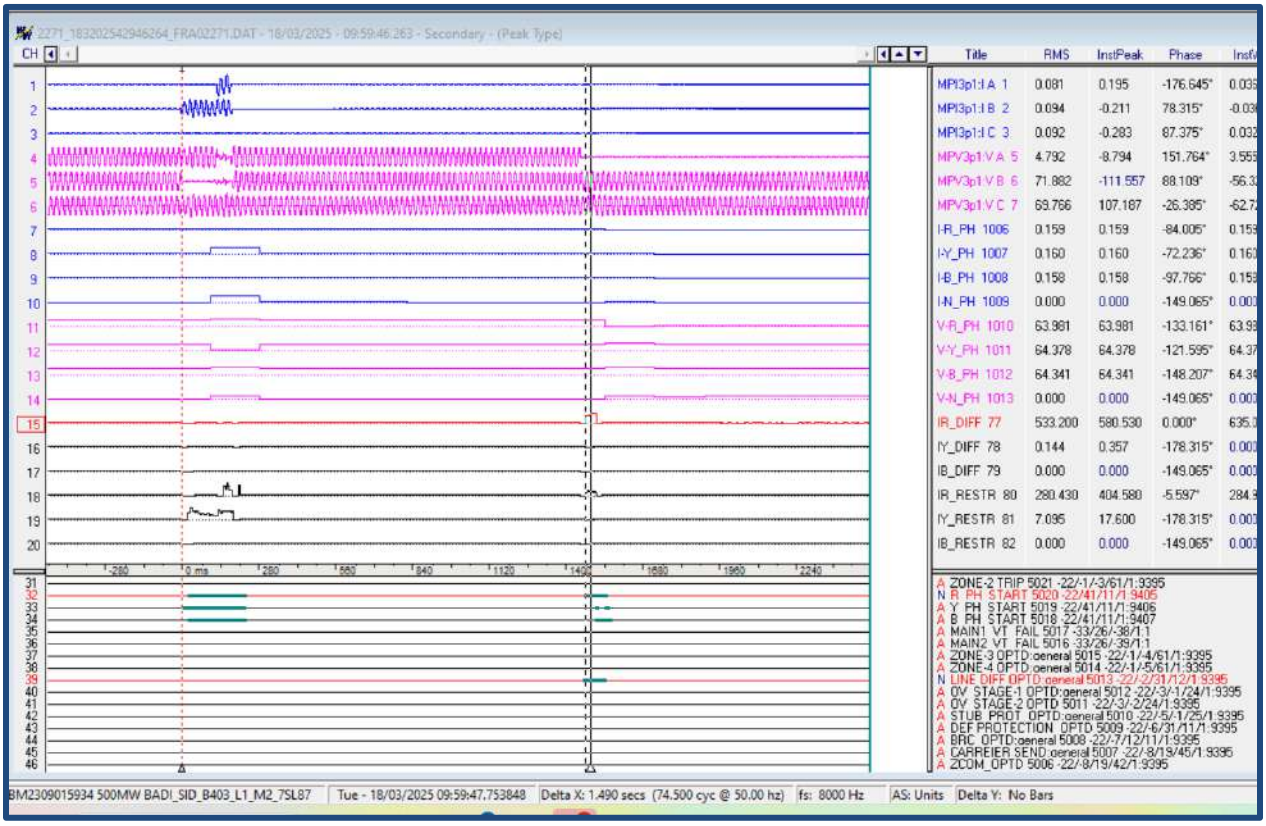
3. BUS BAR DIFFERENTIAL ZONE-1- MAIN-2



4. LINE DIFFERENTIAL PROTECTION M-1



5. LINE DIFFERENTIAL PROTECTION M-2



Attachment List:

1. DR of Transformer-2 Protection Operated
2. DR of Busbar-1 Protection Operated
3. DR of Line Protection Operated

Multiple element tripping event at 220 kV Azure 34 & Azure Maple (IP)

At 13:43 hrs on 31.03.2025

Tripped Elements

S. No	Name of Elements	Outage Time	Revival Time	Reason of tripping
1.	220 KV Bhadla(PG)-Azure Maple PSS SL_BHD_PG (APMPL) (APMPL) Ckt-1	13:43 hrs	15:38 hrs	R-N fault
2	220/33kV 130 MVA ICT1 at Azure 34		14:19 hrs	Differential Protection

Brief details of the event

i) Generation of 220kV Azure Maple(IP) station evacuates through 220 KV Bhadla(PG)-Azure Maple PSS SL_BHD_PG (APMPL) (APMPL) Ckt-1 which was generating approx. 290 MW (as per PMU). Similarly, 220kV Azure 34(IP) station evacuates through 220 KV BHADLA(PG)-AZURE POWER 34 SOLAR(APTFL) (APTFL) CKT-1 which was generating 132MW (as per PMU).

ii) As reported, at 13:43hrs, 220 KV Bhadla(PG)-Azure Maple PSS SL_BHD_PG (APMPL) (APMPL) Ckt-1 tripped on R-N phase to earth fault due to differential protection operation on account of tree fell on the line.

iii) At the same time 130 MVA 220/33KV ICT at 220kv Azure 34 also tripped on account of Differential relay protection (exact reason yet to be shared)

iv) Due to tripping of 220 KV Bhadla(PG)-Azure Maple PSS SL_BHD_PG (APMPL) (APMPL) Ckt-1 and 130 MVA 220/33KV ICT1 at Azure34, Azure Maple(IP) and Azure 34 S/s lost its connectivity from grid and blackout occurred at 220kV Azure Maple(IP) and 220kV Azure 34(IP) S/s.

v) As per PMU at Bhadla(PG), R-N phase to earth fault (voltage dipped upto 0.95 p.u.) is observed with fault clearing time of 160ms. After the fault clearance voltage increased upto 1.04 p.u.

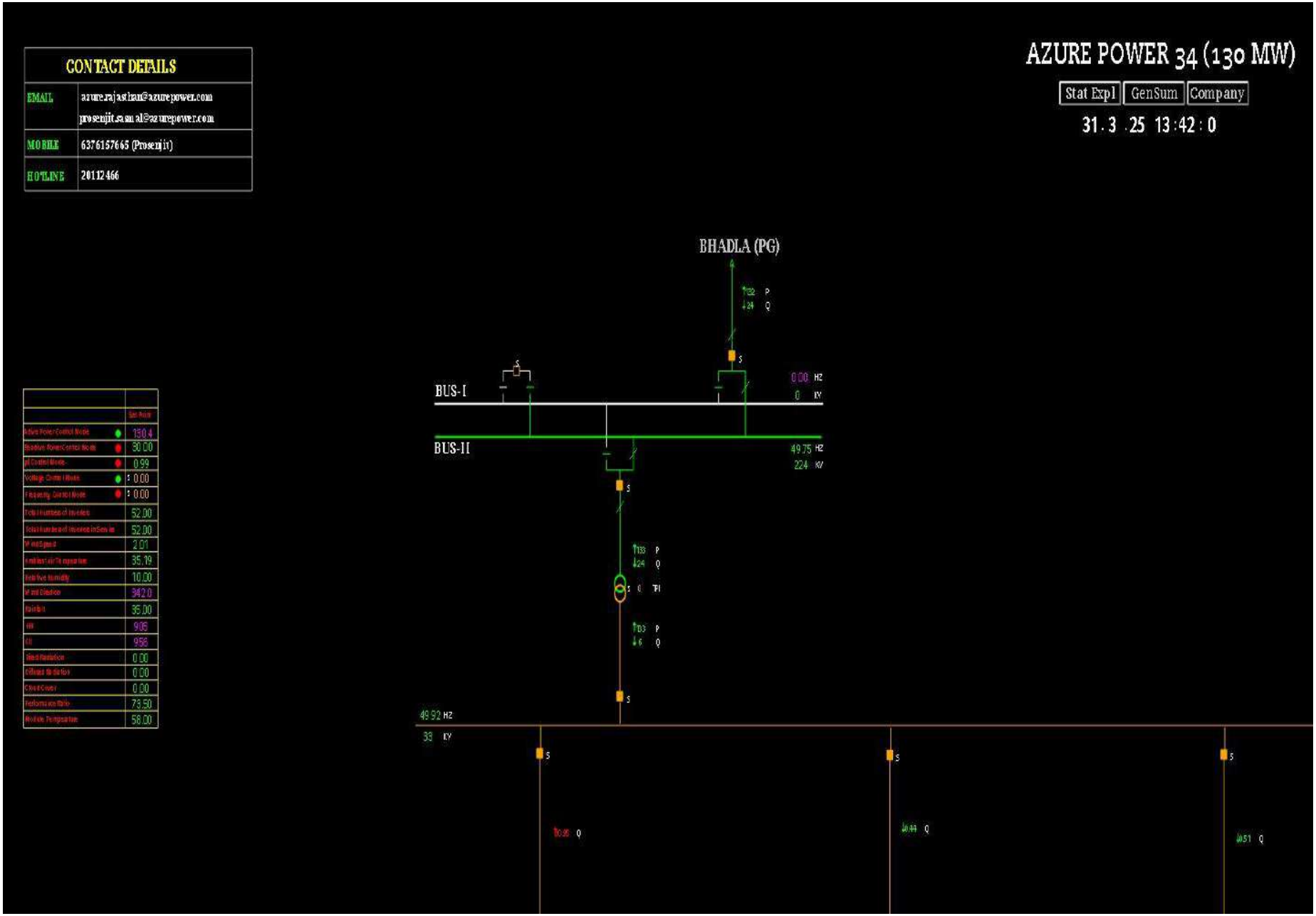
vi) As per PMU at Bassi(PG), a sharp drop in frequency is observed from 49.90 Hz to 49.82 Hz and frequency recovered to 49.91 Hz within 1 min.

vii) As per SCADA, dip in NR total solar generation of approx. 802 MW is observed.

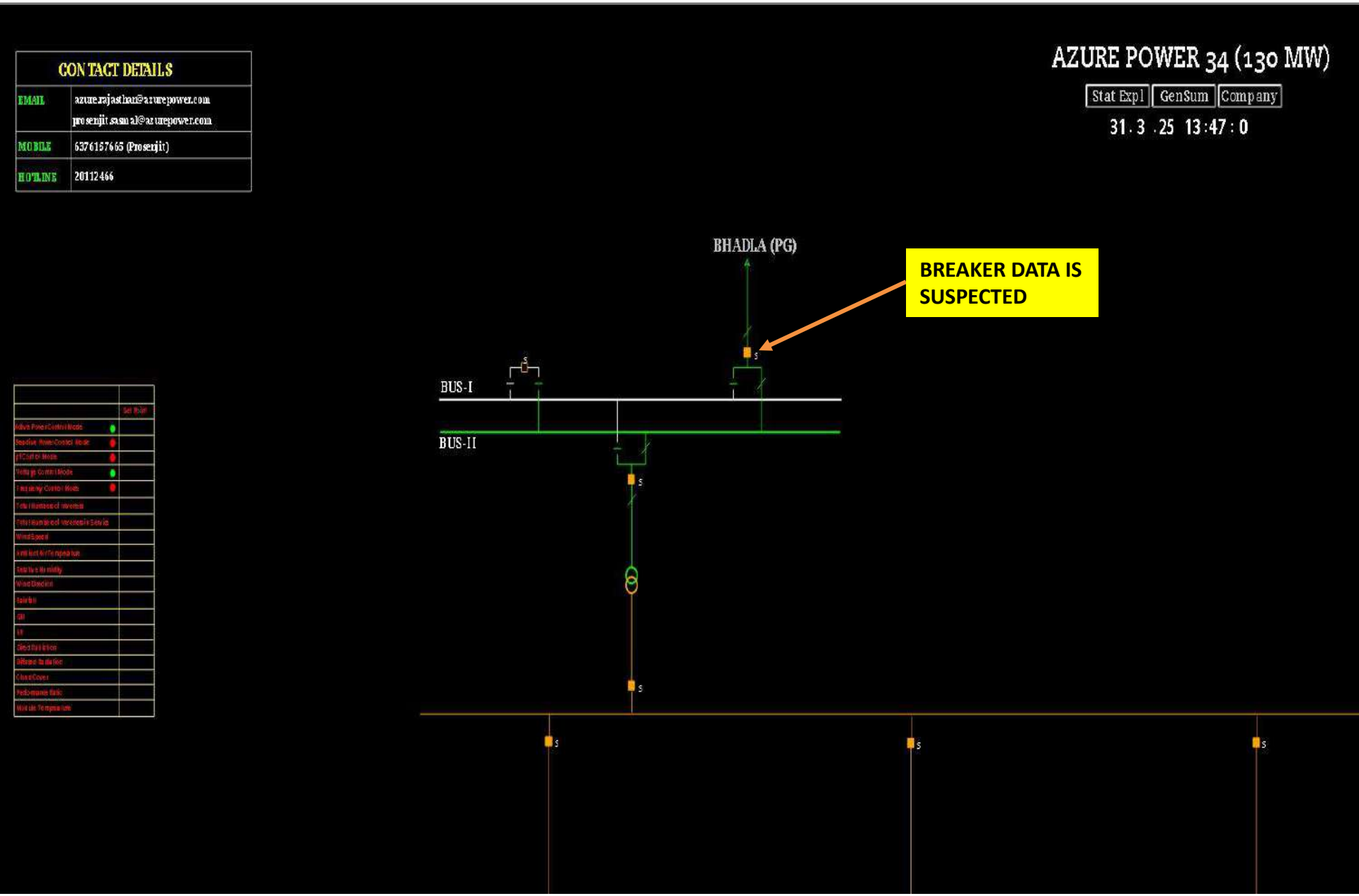
viii) As per SCADA, solar generation loss of approx. 290MW at Azure Mapple, 132MW at Azure34, 115MW at TPREL and 115MW at AHEJ4L RE stations were observed. Drop in generation of TPREL and AHEJ4L is suspected due to LVRT non-compliance. Details is yet to be received from RE stations.

ix) As per DR (Bhadla end) of 220 KV Bhadla(PG)-Azure Maple PSS SL_BHD_PG (APMPL) (APMPL) Ckt-1, R-N phase to earth fault (~7.3kA) with unsuccessful A/R operation is observed. 3-ph A/R was observed instead of 1-ph A/R.

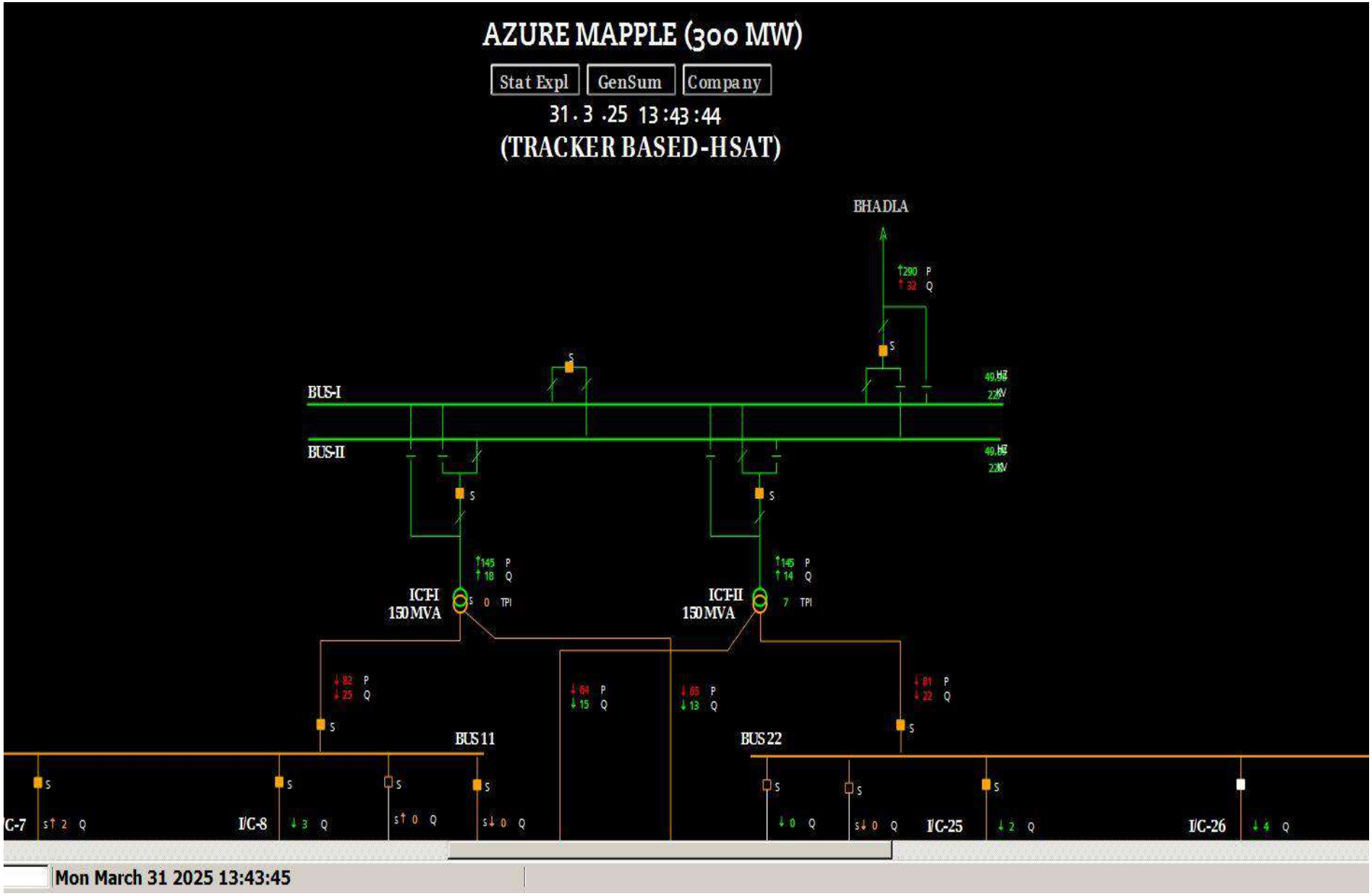
SLD of 220kV Azure 34(IP) before the event



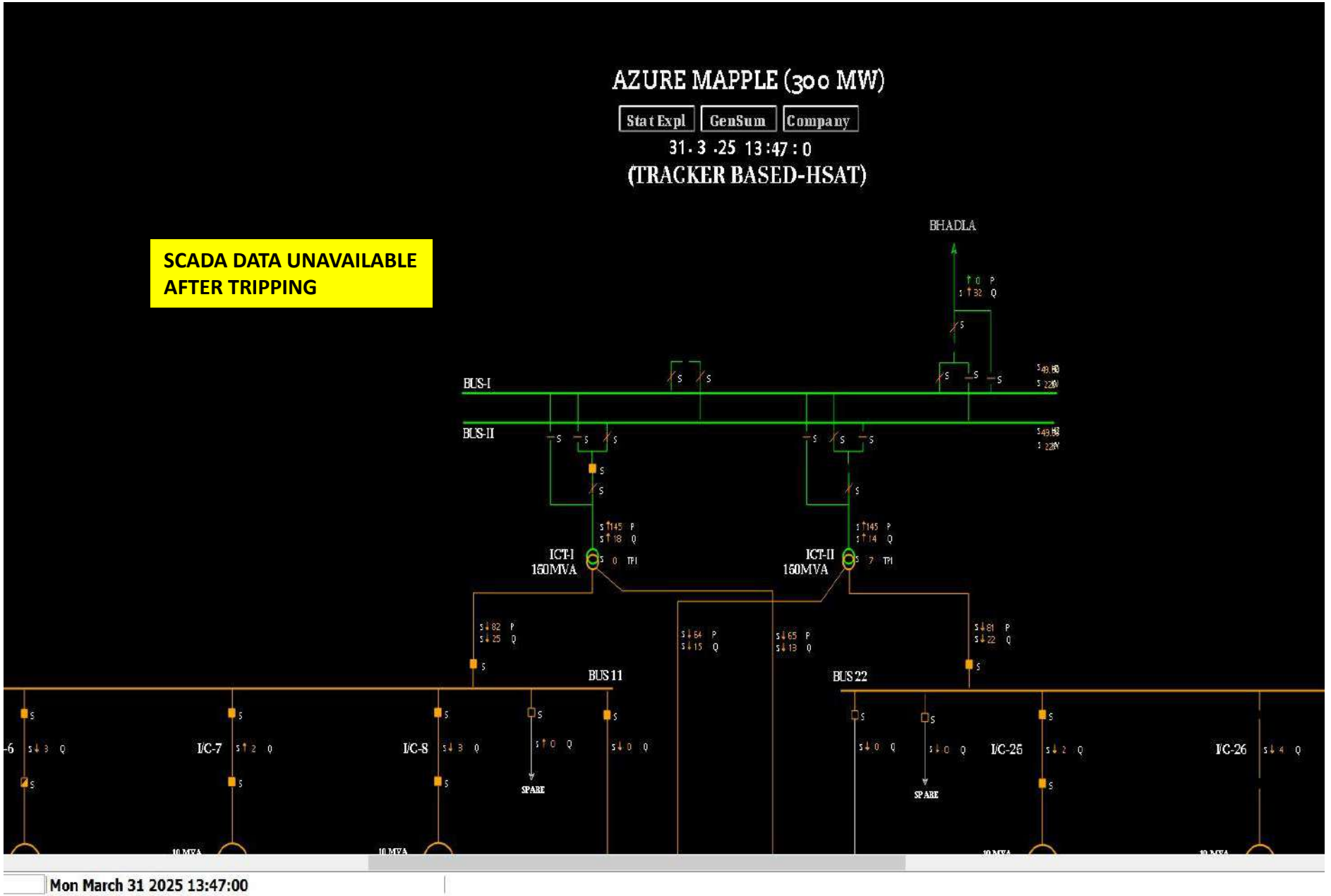
SLD of 220kV Azure 34(IP) after the event



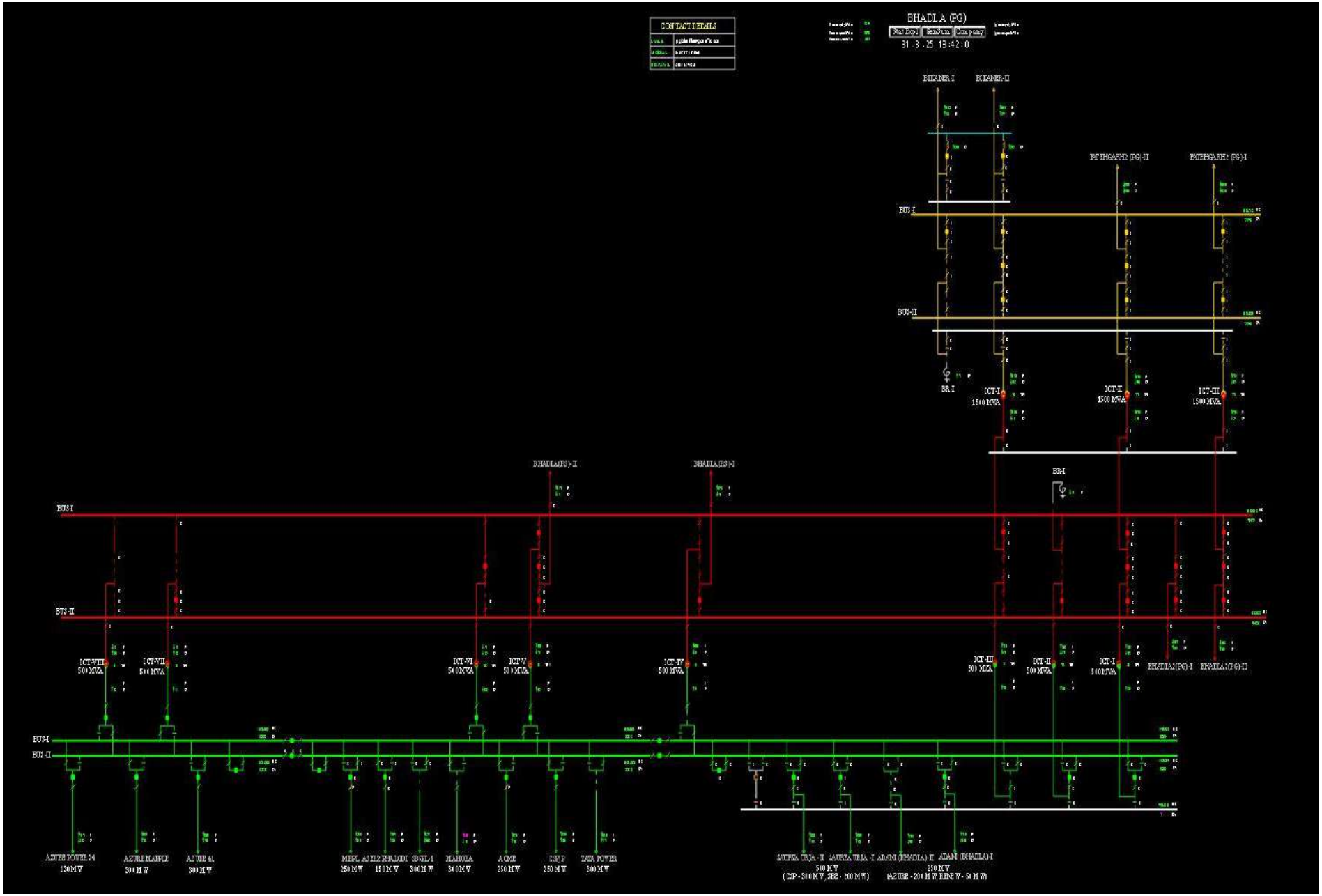
SLD of 220kV Azure_Mapple(IP) before the event



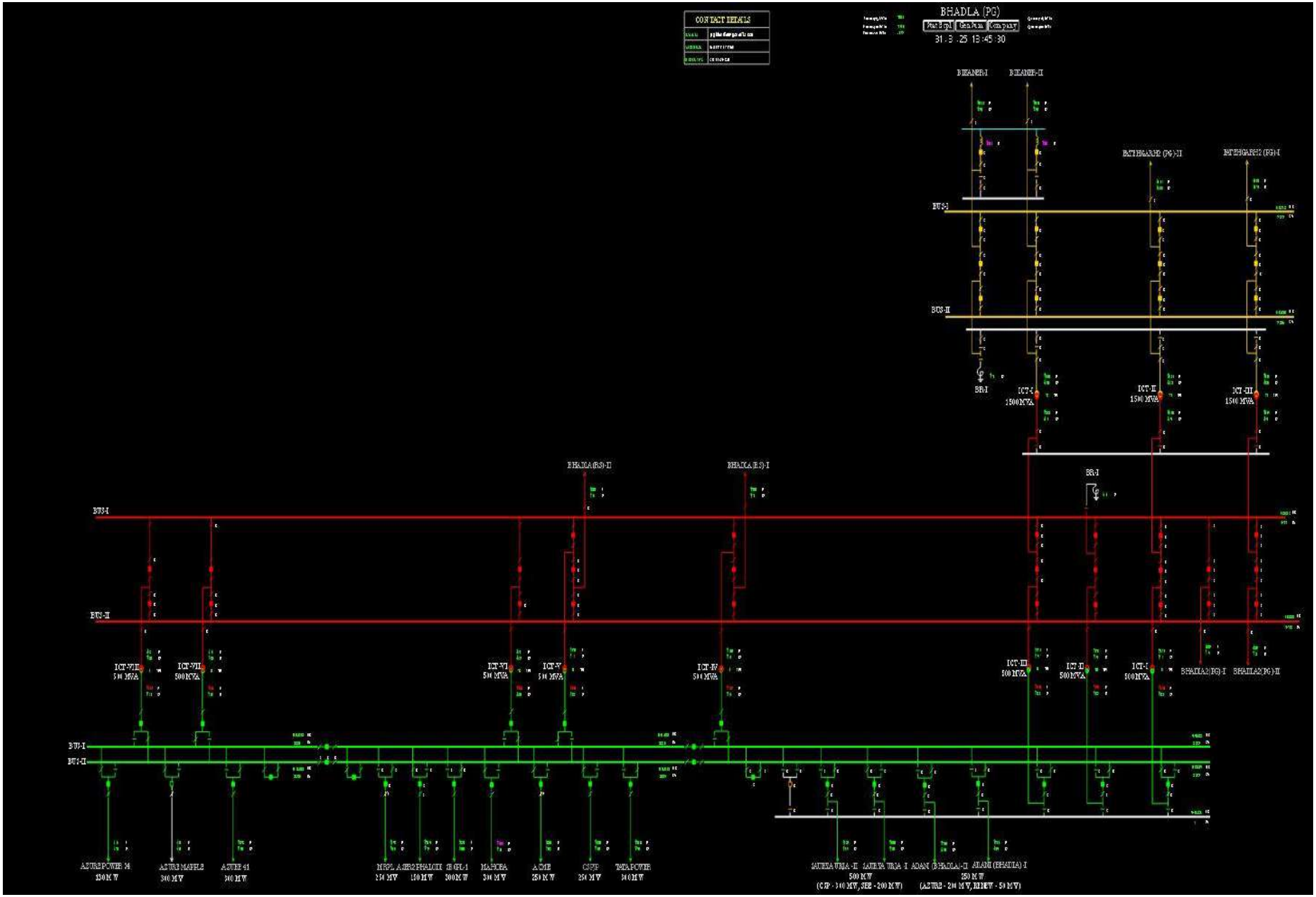
SLD of 220kV Azure Mapple(IP) after the event



SLD of 765/400/220kV Azure Bhadla before the event



SLD of 765/400/220kV Azure Bhadla after the event



RE generation summary before the event

EMSYS	ALMIL	250	250	255	250	250	214	60	45	250
	ARERJL	200	200	197	200	200	207	11	7	200
	ASE4PL	50	50	48	50	49	51	8	1	50
	ASEJ2L	50	50	49	49	49	52	9	3	50
	ASER2PH	150	150	150	150	150	158	30	8	150
	CSPJP	250	250	241	250	250	249	63	-0	250
	CSPR	300	300	294	300	300	304	65	4	300
	RENEW	50	50	48	50	50	52	$ 0	2	50
	SB ENERGY	200	200	188	192	190	190	42	-2	200
	SBE6PL	300	300	293	300	300	295	-53	-5	300
	TPREL	300	300	287	284	283	290	51	7	300
	APTFL	130	130	127	129	128	133	-24	4	130
	AZURE	200	194	180	179	176	182	$ -2	3	200
	AZURE MAPPLE	300	276	262	276	276	280	32	14	300
	AZURE 41	300	300	287	295	295	296	42	1	300
	MRPL	250	250	246	235	236	250	$ 8	15	250
	BHADLA (PG)	3280	3280	2981	3189	3181	3215	$ 280	27	3280

REGEN	Ins CAPACITY	Av. CAPACITY	FORECAST	SCHDL	NEXT SCHL	ACTUAL MW	ACTUAL MVAR	DEV	NOC
AHEJ1L	390 (360+100)	390	386	390	390	381	$ -21	-89	390
AHEJ2L	300 (300+75)	300	294	300	300	307	7	7	300
AHEJ3L	300 (300+75)	300	294	300	300	302	25	2	300
ASEJ1L	450 (421+105)	460	413	430	460	426	52	-24	460
AGE24PL	405	500	417	383	383	405	80	23	500
ASERJ2PL	180	180	149	180	180	190	-9	10	180
DEVIKOT	240	233	215	210	210	197	$ 56	-13	240
EDEN	300	300	296	293	293		80	12	300
RNEWJ3	300	300	280	292	292	293	58	1	300
RSBPL	300	300	291	300	300	296	54	4	300
RSUPL	300	300	292	275	275	300	60	25	300
RSWPL	300	300	283	292	292	300	59	8	300
FTGH2 (PG)	3765	3853	3881	3665	3665	3652	$ 500	-13	3880

	REGEN	Ins CAPACITY	Av. CAPACITY	FORECAST	SCHDL	NEXT SCHL	ACTUAL MW	ACTUAL MVAR	DEV	NOC
MAL	AHEJ4L	700 (600+510)	700	591	632	632	637	12	6	700
	DEOGARH	300	300	295	300	300	309	90	9	300
	DHOLPUR	300	300	297	300	300	306	91	6	300
	PHALODI	300	300	296	300	300	317	90	17	300
	RAISR	300	300	295	300	300	317	90	17	300
	NIDAN(NT)	296	296	289	296	296	306	30	10	296
	FTGH1	2196	2196	880	2128	2128	2193	42	66	2196

REGEN	Ins CAPACITY	Av. CAPACITY	FORECAST	SCHDL	NEXT SCHL	ACTUAL MW	ACTUAL MVAR	DEV
ANTA	90	90	86	86	86	90	30	4
AURAIYA	40	40	34	28	27	32	$ 0	4
DADRI	5	5	3	3	3	3	0	0
SINGRAULI	15	15	10	10	9	$ 0	$ 8	$ -10
UNCHAHAR	10	10	7	6	6	4	0	-2

	SCHDL	NXT SCHL	ACTUAL	DEV
TOTAL	17865	$ 17705	$ 18233	$ 367

EMSYS	AVADA, RJHN	240	240	233	240	240	248	72	8	240
	AVADA, SUNC	350	350	347	350	345	359	84	9	350
	AVADA SSTN	300	300	296	300	300	324	73	24	300
	AYANA	300	300	292	275	275	272	51	-3	300
	RSRPL	300	300	300	258	288	283	6	26	300
	RSPPL BKN	250	250	242	245	245	247	31	2	250
	TPGBL	225	225	208	224	222	201	51	-23	225
	TPSL	110	110	97	104	105	99	10	-5	110
	TS1PL	300	300	293	300	300	304	41	4	300
	ASEJs2L-P1	150	150	148	150	150	155	63	5	150
	ASEJs2L-P2	150	150	139	145	145	140	0	-5	150
	ARP3PL	300	300	274	284	284	329	54	45	300
	AZURE 43	600	600	569	600	600	611	22	11	600
	BIKANER (PG)	3575	3575	3434	3475	3468	3578	640	102	3575

REGEN	Ins CAPACITY	Av. CAPACITY	FORECAST	SCHDL	NEXT SCHL	ACTUAL MW	ACTUAL MVAR	DEV	NOC
ABCRL	300	300	294	284	284	295	80	11	300
AEG4PL	100	$ 0	$ 0	80	80	90	26	10	100
AEG5PL	100	95	97	93	95	96	1	2	100
AEG6PL	100	95	98	93	95	93	26	-1	100
AGE2 5PL	357	500	97	236	236	269	150	33	500
AHPPL	300	300	291	300	300	320	10	20	300
ASEPL	320	320	315	320	320	337	40	17	320
KDLAYAT	550	530	467	525	525	530	116	5	483
MSUPL	250	250	244	241	241	255	49	14	250
NOKHRA	300	284	287	280	280	285	76	5	300
RSEKPL	190	190	178	180	180	199	60	19	190
BHADLA2 (PG)	2867	$ 2864	$ 2368	2635	2635	2769	485	134	2963

	REGEN	Ins CAPACITY	Av. CAPACITY	FORECAST	SCHDL	NEXT SCHL	ACTUAL MW	ACTUAL MVAR	DEV	NOC
	AAPL	100	100	94	85	85	95	44	10	100
	ARTPL	110	110	107	104	104	106	29	2	110
	GEPL	100	100	97	85	85	95	43	10	100
	JGCPL	100	100	98	95	95	96	42	1	R 100
	JNEPL	100			0		0	0	0	
	JUNA	300								
	OVEPL	100	100	91	85	85	93	37	8	100
	SRI4PL	168	168	168	157	157	160	64	3	162
	SRI5PL	176	176	171	166	166	168	52	2	176
	TESPL	844	60	58	57	57	80	34	23	84
	TGEPL	100	100	99	95	95	96	29	2	100
	TPSB	300	200	172	189	189	285	-3	1	300
	TSESPL	50	50	49	47	47	48	4	1	50
	TSES1PL	55.6	0	0	53	53	42	13	-10	R 56
	BIKANER 2	1844	1264	1204	$ 1312	$ 1165	1324	258	59	$ 1438

QCA	RE GEN	Ins CAPACITY	Av. CAPACITY	FORECAST	SCHDL	NEXT SCHL	ACTUAL MW	ACTUAL MVAR	DEV	NOC
MAL	AXPPL	380	380	371	370	370	387	64	17	380
	RSVPL	100	100	98	98	98	98	21	1	100
	RSPPL - FTG3	200	201	198	196	196	204	39	8	200
	RSAPL	300	300	293	290	290	302	65	12	300
	RSRPL FTG3	400	400	386	378	378	384	77	6	400
	FATEHGARH 3	1380	1381	1347	1331	1331	1376	265	44	1380

Mon March 31 2025 13:43:30

RE generation summary after the event

EMSYS	ALMI2	250	250	250	250	250	208	$ 80	42	250
	ARERJL	200	200	195	200	195	207	11	7	200
	ASE4PL	50	50	48	50	49	51	-8	1	50
	ASEJ2L	50	50	49	49	49	52	9	3	50
	ASER2PH	150	150	148	150	150	168	20	8	150
	CSPJP	250	250	239	250	250	249	62	-1	250
	CSPR	300	300	294	300	295	304	65	4	300
	RENEW	50	50	49	50	50	52	$ 0	2	50
	SB ENERGY	200	200	188	189	185	188	42	-3	200
	SBE6PL	300	300	290	300	295	288	-76	-12	300
	TPREL	300	300	284	283	283	169	$ 51	-115	300
	APTFL	130	130	126	129	128	0	$ -23	-128	130
	AZURE	200	194	180	175	168	182	$ -2	6	200
	AZURE MAPPLE	300	276	262	276	276	0	$ 32	-276	300
	AZURE41	300	300	286	295	290	276	$ 42	-19	300
	MRPL	250	250	246	236	235	247	$ -9	12	250
	BHADLA (PG)	3280	3280	2964	3181	3146	2628	$ 255	-554	3280

EMSYS	AVADA, RJHN	240	240	230	240	235	248	72	8	240
	AVADA, SUNC	350	350	344	345	340	389	84	14	350
	AVADA.SS TN	300	300	295	300	300	323	73	23	300
	AYANA	300	300	281	275	275	273	61	-2	300
	RSRPL	300	300	300	250	250	283	6	26	300
	RSPPL BKN	250	250	242	245	245	247	30	2	250
	TPGBL	225	225	203	222	218	189	51	-22	225
	TPSL	110	110	97	104	104	98	10	-5	110
	TS1PL	300	300	291	300	300	304	41	4	300
	ASEJs2L-P1	150	150	148	150	150	$ 194	$ 42	$ 4	150
	ASEJs2L-P2	150	150	139	145	145	141	0	-4	150
	ARP3PL	300	300	274	284	284	328	53	44	300
	AZURE43	600	600	564	600	600	611	22	11	600
	BIKANER (PG)	3575	3575	3417	3487	3452	3369	617	$ 101	3575

RE GEN	Ins CAPACITY	Av. CAPACITY	FORECAST	SCHDL	NEXT SCHL	ACTUAL MW	ACTUAL MVAR	DEV	NOC
AHEJ1L	390 (360+100)	390	386	390	390	391	$ 21	-59	390
AHEJ2L	300 (300+75)	300	294	300	300	307	8	7	300
AHEJ3L	300 (300+75)	300	296	300	300	286	25	-14	300
ASEJ1L	450 (421+105)	450	410	450	450	428	51	-25	450
AGE24PL	405	500	417	383	383	406	79	23	500
ASERJ2PL	180	180	149	180	180	190	-10	10	180
DEVIKOT	240	233	215	210	210	193	$ 56	-17	240
EDEN	300	300	296	293	293		81	11	300
RNEWJB	300	300	280	292	292	292	59	0	300
RSBPL	300	300	291	300	300	295	55	6	300
RSUPL	300	300	292	275	275	300	60	25	300
RSWPL	300	300	282	292	282	300	59	8	300
FTGH2 (PG)	3765	3853	3670	3665	3665	3633	$ 500	-32	3860

RE GEN	Ins CAPACITY	Av. CAPACITY	FORECAST	SCHDL	NEXT SCHL	ACTUAL MW	ACTUAL MVAR	DEV	NOC
ABCRL	300	300	290	284	284	295	80	11	300
AEG4PL	100	$ 0	$ 0	80	80	80	26	10	100
AEG5PL	100	98	97	95	95	96	1	2	100
AEG6PL	100	95	98	95	95	94	26	-1	100
AGE25PL	357	500	97	286	236	269	150	33	500
AHPPL	300	300	290	300	300	320	10	20	300
ASEPL	320	320	315	320	320	337	40	17	320
KDLAYAT	550	530	463	525	525	580	118	5	483
MSUPL	250	250	244	241	241	255	49	14	250
NOKHRA	300	284	284	280	280	285		5	300
RSEKPL	190	190	177	180	180	199	61	19	190
BHADLA2 (PG)	2867	$ 2864	$ 2330	2635	2635	2770	483	135	2948

MAL	RE GEN	Ins CAPACITY	Av. CAPACITY	FORECAST	SCHDL	NEXT SCHL	ACTUAL MW	ACTUAL MVAR	DEV	NOC
	AHEJ4L	700 (600+S10)	700	594	632	632	518	6	-114	700
	DEOGARH	300	300	296	300	300	309	90	9	300
	DHOLPUR	300	300	295	300	300	304	90	4	300
	PHALODI	300	300	295	300	300	315	88	15	300
	RAISR	300	300	293	300	300	310	90	10	300
	NIDAN(NT)	296	296	288	296	296	264	37	-32	296
	FTGH1	2196	2196	880	2128	2128	2021	44	-107	2196

RE GEN	Ins CAPACITY	Av. CAPACITY	FORECAST	SCHDL	NEXT SCHL	ACTUAL MW	ACTUAL MVAR	DEV	NOC
AAPL	100	100	94	85	85	95	44	10	100
ARTPL	110	110	107	104	104	106	29	2	110
GEPL	100	100	97	85	85	95	43	10	100
JGCPL	100	100	97	95	95	96	42	1	R 100
JNEPL	100			0		1	0	1	
JUNA	300								
OVEPL	100	100	91	85	85	94	37	9	100
SRI4PL	168	168	168	157	157	160	41	2	162
SRI5PL	176	176	171	166	166	161	42	-5	176
TESPL	844	60	58	57	57	80	34	23	84
TGEPL	100	100	99	98	95	96	29	2	100
TPSB	300	200	189	189	189	286	9	1	300
TSESPL	50	50	49	47	47	48	4	1	50
TSES1PL	55.6	0	0	53	53	42	14	-10	R 66
BIKANER 2	1844	1264	1198	$ 1312	$ 1165	1316	271	56	$ 1438

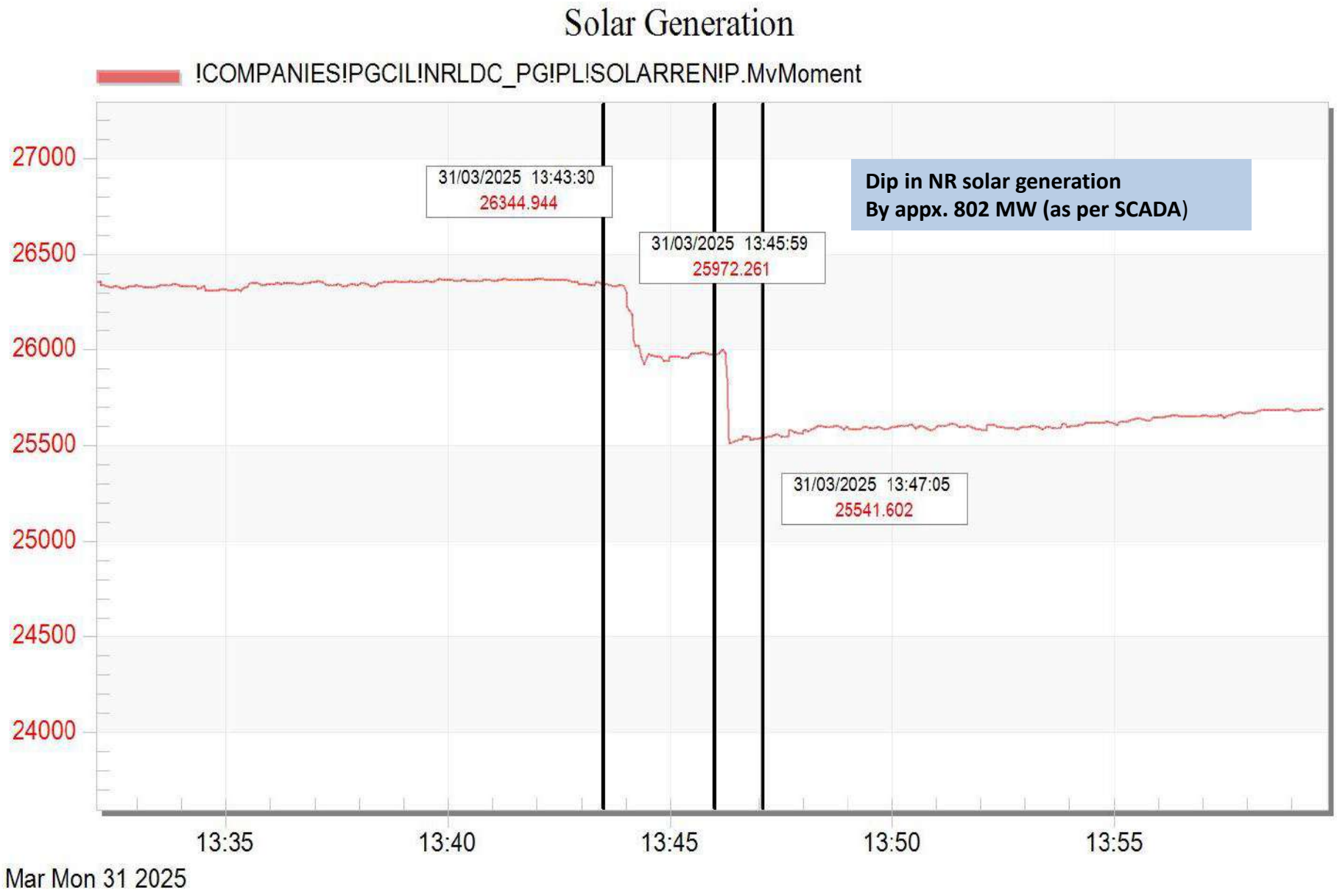
RE GEN	Ins CAPACITY	Av.CAPACITY	FORECAST	SCHDL	NEXT SCHL	ACTUAL MW	ACTUAL MVAR	DEV
ANTA	90	90	86	86	86	90	30	4
AURAIYA	40	40	34	28	27	31	$ 0	4
DADRI	5	5	3	3	3	3	0	0
SINGRAULI	15	15	10	9	9	$ -0	$ -2	$ -9
UNCHAHAR	10	10	7	6	6	4	0	-2

	SCHDL	NXT SCHL	ACTUAL	DEV
TOTAL	17850	$ 17851	$ 17434	$ 416

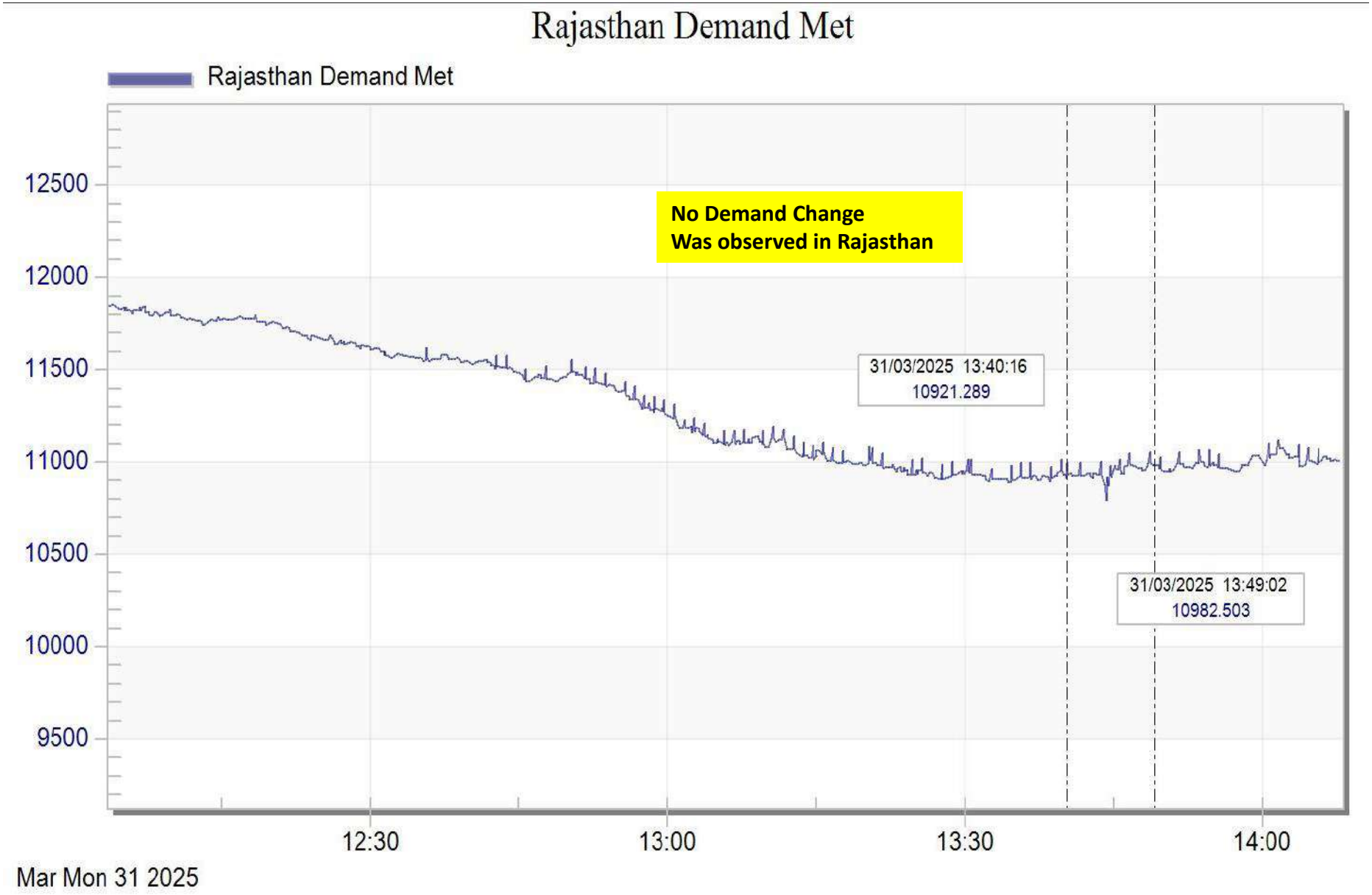
QCA	RE GEN	Ins CAPACITY	Av. CAPACITY	FORECAST	SCHDL	NEXT SCHL	ACTUAL MW	ACTUAL MVAR	DEV	NOC
MAL	AXPPL	380	380	370	370	370	387	63	17	380
	RSVPL	100	100	98	98	98	98	19	1	100
	RSPPL - FTG3	200	201	198	196	196	204	39	8	200
	RSAPL	300	300	293	290	290	298	64	9	300
	RSRPL FTG3	400	400	386	378	378	383	77	5	400
	FATEHGARH 3	1380	1381	1342	1331	1331	1372	260	43	1380

Mon March 31 2025 13:46:30

NR Solar Generation during the event



Demand Change in Rajasthan during the event

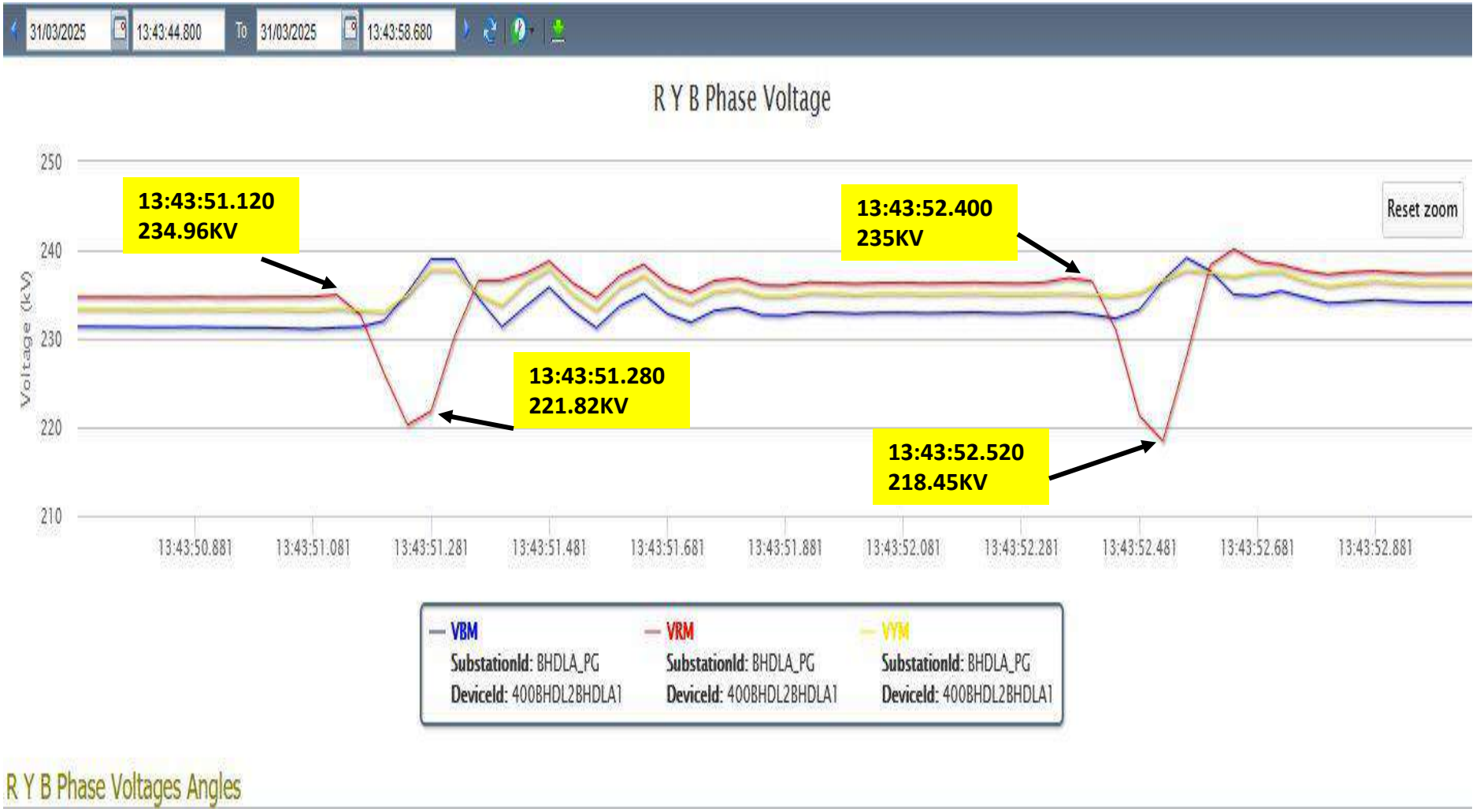


PMU Plot of frequency at Bassi(PG)

13:43hrs/31-Mar-25

PMU Plot of phase voltage at Bhadla(PG)

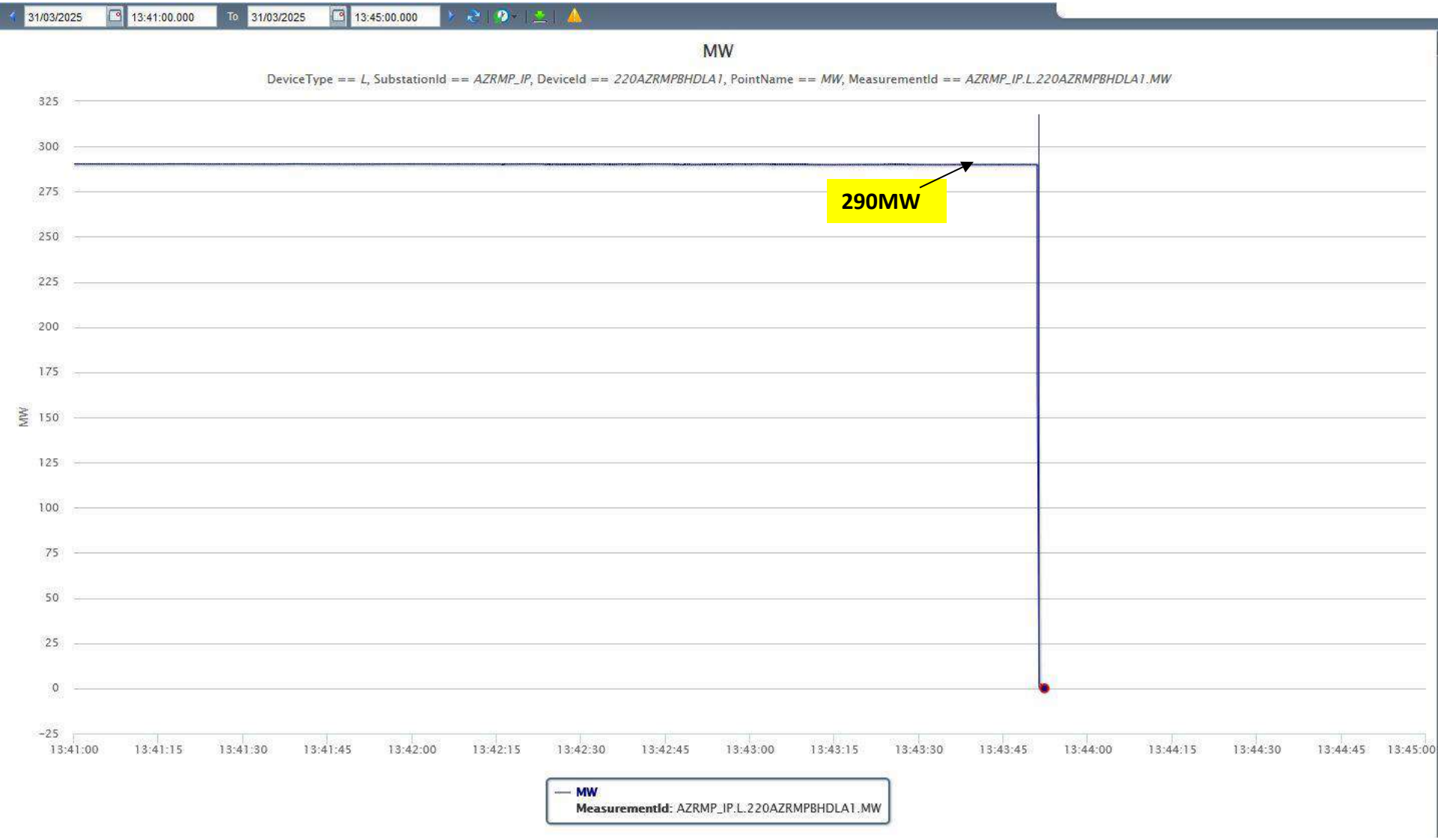
13:43hrs/31-Mar-25



✓ As per PMU, consecutive R-N fault is observed.

PMU Plot of Active Power (MW) at AZRMP(IP)

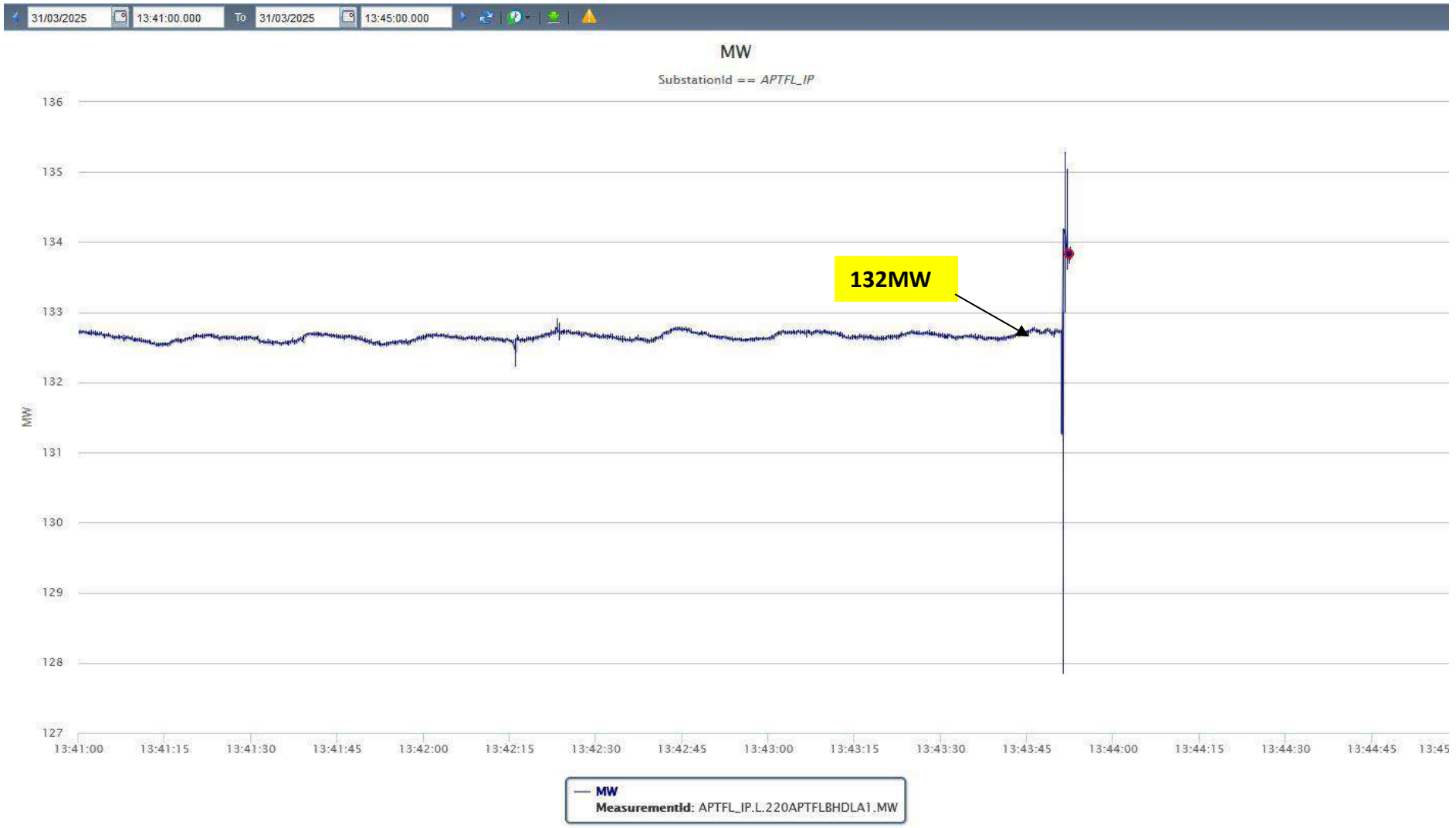
13:43hrs/31-Mar-25



✓ As per PMU, generation loss of approx. 290 MW at AZRMP(IP)

PMU Plot of Active Power (MW) at APTFL(IP)

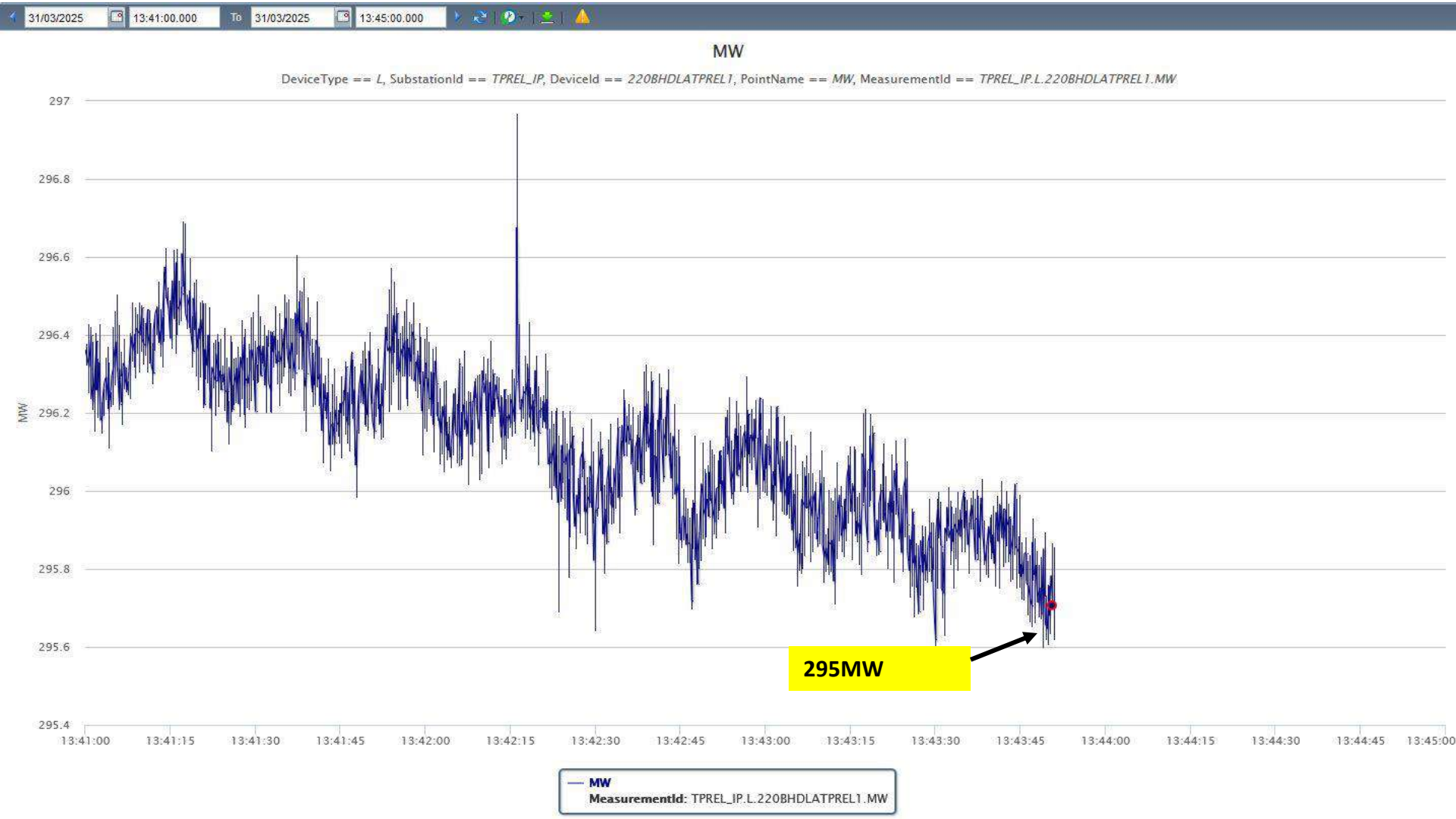
13:43hrs/31-Mar-25



✓ As per PMU, generation loss of approx. 132 MW at APTFL(IP)

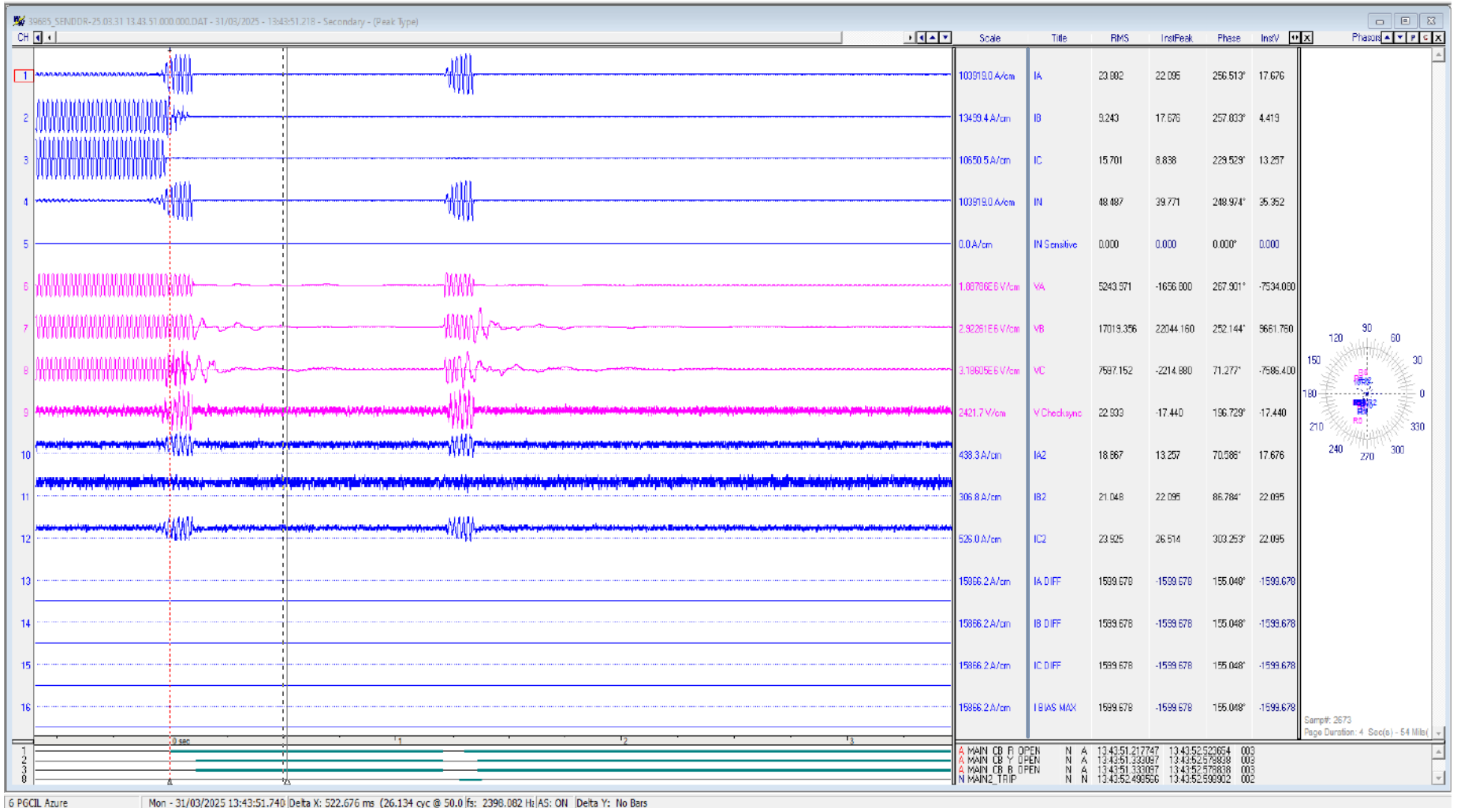
PMU Plot of Active Power (MW) at TPREL(IP)

11:35hrs/ 15-Dec-24



✓ As per PMU, generation loss of approx. 295 MW at TPREL(IP)

DR Of 220kV 220kV Bhadla (end) - Azure Mapple ckt



- ✓ R-N phase to earth fault (~7.3kA) with unsuccessful A/R operation is observed.
- ✓ 3-ph A/R is observed.

SCADA SOE

Time	Station Name	Voltage Level	Element Name	Element Type	Element Status	Remarks
13:43:51,291	AZRML_I	220KV	03T2	Circuit Breaker	Open	Tripping of main CB of 220/33KV, ICT 2 at Azure Maple
13:43:51,311	AZRML_I	220KV	04BHDLA	Circuit Breaker	Open	Tripping of main CB of 220kV Bhadla-Azure Mapple ckt at Azure Maple
13:43:51,316	AZRML_I	220KV	02BC	Circuit Breaker	Open	

Points for Discussion

i) Exact reason of tripping of 130 MVA 220/33KV ICT at 220kv Azure 34 need to be shared.

ii) Details of RE generation loss and reason of the same need to be shared from RE plants and Rajasthan.

iii) DR/EL of Azure34 end also need to be shared.

iv) Remedial action taken report to be shared.

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)	Remarks
			Date	Time								
1	765 KV Orai-Jabalpur (PG) Ckt-1	POWERGRID	15-Mar-25	12:52	Nil	PLCC maloperation	NA	NA	Yes (After 24 hours)	Yes (After 24 hours)	PLCC maloperation at Jabalpur end	As per PMU, no fault in system is observed. As per DR of Orai end, no fault in system is observed and DT received at Orai end.
2	800 KV HVDC Kurukshetra(PG) Pole-4	POWERGRID	15-Mar-25	17:18	Nil	Tripped due to commutation failure detected in Pole-2.	GI-2	NA	Yes (After 24 hours)	Yes (After 24 hours)	Maloperation of C&P system	As per PMU, no fault in system and fluctuation n voltage is observed.Pole-2 blocked due to the false initiation of Blocking Seq 2 due to maloperation of HVDC C&P system due to faulty CIB card. Pole 4 blocked on DC under current protection. Faulty CIB card has been replaced.
3	800 KV HVDC Kurukshetra(PG) Pole-2	POWERGRID	15-Mar-25	17:18	Nil	Commutation failure led to tripping of Pole-2.		NA	Yes (After 24 hours)	Yes (After 24 hours)	Maloperation of C&P system	
4	220 KV Ranpur(RS)-Bhanpura(MP) (RS) Ckt-1	RRVPNL	17-Mar-25	03:46	Nil	Failure of PT	NA	NA	Yes (After 24 hours)	Yes (After 24 hours)		As per PMU at Kota(PG), no fault in system is observed. As per DR of 220 KV Ranpur(RS)-Bhanpura(MP) (RS) Ckt-1 of Ranpur end, R-N fault is observed. As reported, fault occurred due to PT blast at Ranpur end. However, DR(.dat/.cfg) files and event analysis not received.
5	220 KV Modak(RS)-Bhanpura(MP) (MPSEB) Ckt-1	MPSEB	17-Mar-25	03:47	Nil	Failure of PT	NA	NA	Yes (After 24 hours)	No		
6	400 KV RAPS_D(NP)-Shujalpur(PG) (RTCL) Ckt-1	POWERGRID	19-Mar-25	16:55	Nil	Bus Bar Protection Operated	NA	NA	No	No	DR/EL & tripping report not received	As reported, bus bar protection operated at RAPS D end. However, as per PMU, no fault in system is observed. Reason of bus bar protection operation and outage of elements despite of one & half breaker scheme not received.
7	400 KV RAPS_D(NP)-Shujalpur(PG) (RTCL) Ckt-2	POWERGRID	19-Mar-25	16:55	Nil	Bus Bar Protection Operated	NA	NA	No	No	DR/EL & tripping report not received	
8	800 KV HVDC Kurukshetra(PG) Pole-4	POWERGRID	19-Mar-25	19:13	Nil	T-zone protection operated at Champa end	GI-2	NA	Yes (After 24 hours)	Yes (After 24 hours)		Pole-2 and Pole-4 Tripped on T-Zone protection as Pole-2 protection was reading wrong values of DC current of parallel pole. This initiated T-Zone protection. The affected lane was rebooted and after rebooting, analog values of latched protection found ok.
9	800 KV HVDC Kurukshetra(PG) Pole-2	POWERGRID	19-Mar-25	19:13	Nil	T-zone protection operated at Champa end		NA	Yes (After 24 hours)	Yes (After 24 hours)		
10	220 KV Auraiya(NT)-Malanpur(MP) (PG) Ckt-1	POWERGRID	21-Mar-25	05:21	Nil	Phase to Ground Fault Y-N	NA	120 msec	No	No	DR/EL & tripping report not received	As per PMU at Agra(PG). Y-N phase to earth fault with no A/R operation is observed. DR/EL & tripping report not received from Auraiya(NTPC).

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

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

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

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

Reporting of Violation of Regulation for various issues for above tripping

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

Status of Mock Test of SPS in NR

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

Annexure-B.VII

Summary of Grid Event occurred in J&K control area during Jan'24-Mar'25

S.No.	Category of Grid Disturbance (GD-I to GD-V)	Name of Elements (Tripped/Manually opened)	Affected Area	Owner/ Agency	Outage		Event (As reported)	Loss of generation / loss of load during the Grid Disturbance		Fault Clearance time (in ms)
					Date	Time		Generation Loss(MW)	Load Loss (MW)	
1	GD-1	1) 220 KV Alusteng-Dras (PG) Ckt	Jammu and Kashmir	PGCIL, JKPTCL	19-Feb-24	19:19	i) 220/66kV Dras(PG) have double main bus arrangement at 220kV side. ii) During antecedent condition, approx. 25MW power was coming from Alusteng to Dras and approx. 23MW power was going out from Dras to Kargil. iii) As reported, at 19:19 hrs, 220 KV Alusteng-Dras (PG) Ckt tripped on B-N phase to earth fault with distance of 96km from Dras end. iv) Due to this tripping supply to 220 KV Dras (PG)-Kargil Ckt was lost and blackout occurred at 220/66kV Dras(PG) S/s. v) As per PMU at Amargarh, B-N phase to earth fault is observed with fault clearing time of 280ms. vi) As per SCADA, change in demand of approx. 260MW is observed in J&K control area.	0	260	280
2	GD-1	1) 220 KV Alusteng-Dras (PG) Ckt	Jammu and Kashmir	PGCIL, JKPTCL	21-Feb-24	10:00	i) 220/66kV Dras(PG) have double main bus arrangement at 220kV side. ii) During antecedent condition, approx. 47MW power was coming from Alusteng to Dras and approx. 45MW power was going out from Dras to Kargil. iii) As reported, at 10:00 hrs, 220 KV Alusteng-Dras (PG) Ckt tripped on R-B phase to phase fault with fault current of 2kA and 2.2kA from Alusteng end in R and B phases respectively and fault distance of 61km from Alusteng end and 64.9km from Dras end. iv) Due to this tripping supply to 220 KV Dras (PG)-Kargil Ckt was lost and blackout occurred at 220/66kV Dras(PG) S/s. v) As per PMU at Amargarh, R-B phase to phase fault is observed with fault clearing time of 80ms. vi) As per SCADA, change in demand of approx. 115MW is observed in J&K control area.	0	115	80
3	GD-1	1) 220 KV Alusteng-Dras (PG) Ckt	Jammu and Kashmir	PGCIL, JKPTCL	3-Mar-24	00:19	i) 220/66kV Dras(PG) have double main bus arrangement at 220kV side. 220kV Drass is connected with 220/132kV Kargil which is further connected with Khalsti and Leh. Chutak HEP is connected at 66kV level at 220/66kV Kargil and Nimmo Bazgo HEP is connected at 66kV levl at 220/66kV Leh. ii) During antecedent condition (at 00:17hrs) approx. 23MW power was coming from Alusteng to Drass and approx. 22MW power was going out from Dras to Kargil. iii) As reported, at 00:19 hrs, 220 KV Alusteng-Dras (PG) Ckt tripped on B-N phase to earth fault. iv) Due to this tripping supply to 220 KV Dras (PG)-Kargil Ckt was lost and blackout occurred at 220/66kV Dras(PG), Kargil, Khalsti and Leh. v) 220 KV Dras (PG)-Kargil Ckt was charged at 01:31 hrs and supply was restored. vi) As per PMU at Amargarh, B-N phase to earth fault is observed with fault clearing time of 120ms. vii) As per SCADA, load loss of approx. 23MW at 00:19hrs is observed in J&K control area.	0	23	120
4	GD-1	1) 220 KV Alusteng-Dras (PG) Ckt	Jammu and Kashmir	PGCIL, JKPTCL	3-Mar-24	03:09	i) During antecedent condition (at 03:07hrs) approx. 04MW power was coming from Alusteng to Drass and approx. 03MW power was going out from Drass to Kargil. Chutak HEP was generating ~10MW. ii) At 03:39hrs, 220 KV Alusteng-Dras (PG) Ckt tripped on R-N phase to earth fault. This again resulted into blackout at 220/66kV Drass(PG), Kargil, Khalsti and Leh. iii) Due to this tripping supply to 220 KV Dras (PG)-Kargil Ckt was lost and blackout occurred at 220/66kV Drass(PG) S/s. iv) 220 KV Dras (PG)-Kargil Ckt was charged at 04:26 hrs and supply to Dras was restored. v) As per PMU at Amargarh, B-N phase to earth fault is observed with fault clearing time of 120ms. vi) As per SCADA, load loss of approx.14MW at 03:09hrs is observed in J&K control area.	0	14	120
5	GI-1	1) 220 KV Amargarh (INDIGRID)-Zainkote(JK) (PDD JK) Ckt-1 2) 220 KV Amargarh (INDIGRID)-Zainkote(JK) (PDD JK) Ckt-2	Jammu and Kashmir	INDIGRID, PDD JK	18-Mar-24	04:15	i)220/132kV Zainkote S/s have two buses at 220kV side i.e., main bus & reserve bus. ii)During antecedent condition, 220kV Amargarh(INDIGRID) –Zainkote(JK) D/C (carrying 162MW each) was feeding Zainkote load. iii)As reported, at 04:15 hrs, 220 KV Amargarh(INDIGRID)-Zainkote(JK) (PDD JK) Ckt-2 tripped on B-N phase to earth fault from Zainkote end only. But as per DR at Amargarh end, current in R- and Y- phase increased upto ~0.89kA and ~1.43kA respectively. (Exact reason, nature and location of fault yet to be shared) iv)As further reported, at the same time, 220 KV Amargarh(INDIGRID)-Zainkote(JK) (PDD JK) Ckt-1 also tripped on B-N phase to earth fault from Zainkote end only. But as per DR at Amargarh end, current in B- phase increased upto ~1.02kA. (Exact reason, nature and location of fault yet to be shared) v)As per PMU at Amargarh(PG), rise in B-ph voltage is observed.	0	225	NA
6	GD-1	1) 220 KV Alusteng-Dras (PG) Ckt	Jammu and Kashmir	PGCIL	29-Apr-24	06:06	i)Power flows from Alusteng(PG) to Dras(PG) to Kargil to Khalsti to Leh (radial connection). Generation of Chutak is connected to Kargil and generation of Nimoo bazgo is connected to Leh. ii)As reported, at 06:06 hrs, 220 KV Alusteng-Dras (PG) Ckt tripped on R-B phase to phase fault with fault distance of 38.4km from Dras(PG). iii)With the tripping of 220 KV Alusteng-Dras (PG) Ckt, complete blackout occurred at 220/66kV Drass(PG) and supply to Kargil, Khalsti and Leh also failed. iv)Generation of Chutak and Nimoo Bazgo tripped due to loss of evacuation path resulting in generation loss of approx. 7MW each at Chutak and Nimoo Bazgo (as per SCADA). v)As per PMU at Amargarh(INDIGRID), R-B phase to phase fault is observed with fault clearing time of 120ms. vi)As per SCADA, change in demand of approx. 15MW is observed in J&K control area.	14	15	120
7	GI-1	1)220 KV Amargarh (INDIGRID)-Zainkote(JK) (PDD JK) Ckt-1 2)220 KV Amargarh (INDIGRID)-Zainkote(JK) (PDD JK) Ckt-2	Jammu and Kashmir	INDIGRID, JKPTCL	10-May-24	13:06	i)220/132kV Zainkote S/s have two buses at 220kV side i.e., main bus & reserve bus. ii)During antecedent condition, 220kV Amargarh(INDIGRID) –Zainkote(JK) D/C (carrying 70MW each) was feeding Zainkote load. iii)As reported, at 13:06 hrs, 220 KV Amargarh(INDIGRID)-Zainkote(JK) (PDD JK) Ckt-1 tripped on R-Y phase to phase fault with fault current of Ir=~2.11kA and Iy=~2.363kA and fault distance of 4.714km from Zainkote(JK) end; fault sensed in zone-1 at Zainkote(JK) end. (Exact reason yet to be shared) iv)As further reported, at the same time, 220 KV Amargarh(INDIGRID)-Zainkote(JK) (PDD JK) Ckt-2 also tripped on over-current protection operation. v)As per PMU at Amargarh(INDIGRID), R-Y phase to phase fault with fault clearing time of 120ms is observed. vi)As per SCADA, change in demand of approx. 130MW is observed in J&K control area.	0	130	120
8	GD-1	1) 220 KV Wagoora(PG)-Pampore(PDD) (PG) Ckt-1 2) 220 KV Wagoora(PG)-Pampore(PDD) (PG) Ckt-2	Jammu and Kashmir	PDD-JK, PGCIL	23-May-24	14:49	i)220/132kV Pampore(PDD) has Double main Bus arrangement at 220kV side. ii)During antecedent condition, power flow from Wagoora(PG) S/s to Pampore(PDD) S/s was approx. 200 MW through 220 KV Wagoora(PG)-Pampore(PDD) (PG) D/C. 220kV Pampore-Mirbazar(PDD) D/C was not in service. iii)As reported, at 14:49 hrs, 220 KV Wagoora(PG)-Pampore(PDD) (PG) D/C tripped from Wagoora(PG) end on R-N phase to earth fault on 220 KV Wagoora(PG)-Pampore(PDD) (PG) Ckt-2 with fault distance of 2.38km from Wagoora(PG) end. From Pampore(PDD JK) end, only 220 KV Wagoora(PG)-Pampore(PDD) (PG) Ckt-2 tripped. iv)As per DR of Wagoora(PG) end of 220 KV Wagoora(PG)-Pampore(PDD) (PG) ckt-1 & ckt-2, R-N phase to earth fault is observed in zone-2 and zone-1 for 220 KV Wagoora(PG)-Pampore(PDD) (PG) ckt-1 & ckt-2 respectively. Fault current observed is Ir=~7.9kA & Ir=~12.9kA for 220 KV Wagoora(PG)-Pampore(PDD) (PG) ckt-1 & ckt-2 respectively. from relay flags, it is suspected that fault was on 220 KV Wagoora(PG)- Pampore(PDD) (PG) ckt-2 and ckt-1 tripped from Wagoora(PG) end due to delayed clearance from Pampore end. Details of Pampore end yet to be received. v)As per PMU at Wanpoh(PG), R-N phase to earth fault is observed with delayed fault clearing time of 520ms. vi)As per SCADA, change in demand of approx. 235MW is observed in J&K control area.	0	235	520
9	GD-1	1)220 kV Barn(JK)-Kishenpur(PG) Ckt-1 2)220 kV Barn(JK)-Kishenpur(PG) Ckt-2	Jammu and Kashmir	PDD JK, PGCIL	3-Jun-24	17:33	i)As reported, at 17:33hrs, 220 kV Barn(JK)-Kishenpur(PG) Ckt-1 tripped on R-N phase to earth fault with fault current of 5.094kA from Kishepur(PG) end (as per DR). As per DR, zone-1 distance protection operated at Kishepur(PG) end (exact reason and location of fault yet to be shared). ii)During the same time, 220 kV Barn(JK)-Kishenpur(PG) Ckt-2 also tripped from Barn(JK) end only on R-N phase to earth fault with fault current of 3.9kA from Kishepur(PG) end (as per DR). As per DR, fault sensed in zone-2 at Kishenpur(PG) and line remained charged from Kishenpur (PG) end. iii)Due to tripping of both 220 kV Barn(JK)-Kishenpur(PG) Ckt-1 & 2, complete blackout occurred at 220/132kV Barn(J&K) S/s. iv)As per PMU at Kishenpur(PG), R-N phase to earth fault with fault clearing time of 120ms is observed. v)As per SCADA, load loss of approx. 120MW occurred in J&K control area.	0	120	120
10	GD-1	1) 220 KV Alusteng-Dras (PG) Ckt	Jammu and Kashmir	PGCIL	4-Jun-24	19:31	i)Power flows from Alusteng(PG) to Dras(PG) to Kargil to Khalsti to Leh (radial connection). Generation of Chutak is connected to Kargil and generation of Nimoo bazgo is connected to Leh. ii)As reported, at 19:31 hrs, 220 KV Alusteng-Dras (PG) Ckt tripped on B-N phase to earth fault with fault distance of 115km from Alusteng(PG). iii)With the tripping of 220 KV Alusteng-Dras (PG) Ckt, complete blackout occurred at 220/66kV Drass(PG) and supply to Kargil, Khalsti and Leh also failed. iv)Generation of Chutak and Nimoo Bazgo tripped due to loss of evacuation path resulting in generation loss of approx. 37MW & 24MW at Chutak and Nimoo Bazgo respectively (as per SCADA). v)As per PMU at Amargarh(INDIGRID), B-N phase to earth fault is observed with fault clearing time of 80ms. vi)As per SCADA, no change in demand is observed in J&K control area.	61	0	80
11	GI-1	1)220/132kV 160MVA ICT 2 at Barn(J&K) 2)220/132kV 160MVA ICT 1 at Barn(J&K) 3)220/132kV 160MVA ICT 3 at Barn(J&K)	Jammu and Kashmir	PDD JK	7-Jun-24	16:29	i)As reported, at 16:29hrs, 220/132kV 160MVA ICT 2 at Barn(J&K) tripped on over current earth fault protection operation (exact reason, location and type of fault yet to be shared). ii)Due to shifting of loading of 220/132kV 160MVA ICT 2 to 220/132kV 160MVA ICT 1 & 3, both ICTs also tripped on overloading. iii)As per PMU at Kishenpur(PG), R-B phase to phase fault with delayed fault clearing time of 2160 ms is observed. iv)As per SCADA, load loss of approx. 363MW occurred in J&K control area.	0	363	2160
12	GI-1	1)220 KV Samba(PG)-Hiranagar(PDD) (PG) Ckt-1 2)220 KV Samba(PG)-Hiranagar(PDD) (PDD JK) Ckt-2	Jammu and Kashmir	PGCIL, PDD JK	13-Jun-24	06:48	i)220/132kV Hiranagar(J&K) has double main Bus arrangement at 220kV voltage side. ii)As reported, at 06:28hrs, 220 KV Samba(PG)-Hiranagar(PDD) (PG) Ckt-1 tripped on Y-N phase to earth fault. Fault sensed in zone-1, fault current Iy=~4.9kA and fault distance was 0.8km from Hiranagar end (Exact reason of fault yet to be recieved). iii)At the same time, 220 KV Samba(PG)-Hiranagar(PDD) (PDD JK) Ckt-2 also tripped from Hiranagar(J&K) end on overcurrent protection operation. iv)220 KV Samba(PG)-Hiranagar(PDD) (PG) Ckt-1 tripped from both ends(Samba and Hiranagar) and 220 KV Samba(PG)-Hiranagar(PDD) (PDD JK) Ckt-2 tripped from Hiranagar end only. v)As per PMU at Samba(PG), Y-N phase to earth followed by R-B phase to phase fault with fault clearing time of 80 msec is observed. vi)As per SCADA, load loss of approx. 360MW in J&K control area is observed. However, as per SLDC J&K, approx. 100MW load loss is observed in J&K control area.	0	100	80
13	GI-1	1) 220 KV Amargarh (INDIGRID)-Zainkote(JK) (PDD JK) Ckt-1 2) 220 KV Amargarh (INDIGRID)-Zainkote(JK) (PDD JK) Ckt-2	Jammu and Kashmir	PDD JK, INDIGRID	18-Jul-24	11:01	i)220/132kV Zainkote S/s have two bus at 220kV side i.e., main bus & reserve bus. 220kV Amargarh-Zainkote ckt-1&2 are on the same tower (D/C tower) and line length is ~21.4km. ii)During antecedent condition, 220kV Amargarh(INDIGRID) –Zainkote(JK) D/C was carrying 109 MW each and feeding Zainkote load. iii)As reported, at 11:01 hrs, 220 KV Amargarh(INDIGRID)-Zainkote(JK) (PDD JK) D/C tripped from both ends on B-N phase to earth fault. During patrolling it was found that fault occurred due to vegetation fire in bottom of the line. iv)As per DR of both the circuits of Amargarh end, Amargarh end distance protection relay sensed B-N fault in Z-1 (15.66km) in line-1 and in Z-2(21.69km) in line-2. Both the lines tripped instantaneously from Amargarh end. Fault current was ~4kA. v)As confirmed by Amargarh(INDIGRID), in view of non-availability of carrier communication and A/R scheme at Zainkote end, A/R has been kept disabled at Amargarh end and time delay of Z-2 also kept as instantaneous at Amargarh end. vi)As per PMU at Amargarh(PG), B-N phase to earth fault which cleared within 120 msec is observed. vii)As per SCADA, change in demand of approx. 210MW is observed in J&K control area.	0	210	120
14	GI-1	1)220/132kV 160MVA ICT-1 at Barn (JK) 2)220/132kV 160MVA ICT-2 at Barn (JK) 3)220/132kV 160MVA ICT-3 at Barn (JK) 4)132kV Barn-Canal (JK) Ckt-1 5)132kV Barn-Canal (JK) Ckt-2	Jammu and Kashmir	JK PDD	2-Aug-24	15:03	i)As reported, at 15:03hrs, 220/132kV 160MVA ICT-1, 132kV Barn-Canal (JK) D/C tripped at Barn(JK) S/s on Y-B phase to phase fault which occurred on 132kV Barn-Canal (JK) D/C (exact reason, location of fault and type of protection operated is yet to be received). ii)As reported, due to tripping of ICT-1, the complete load shifted on 220/132kV 160MVA ICT-2 & 3 which led to tripping of 220/132kV 160MVA ICT-2 & 3 on overloading at Barn(JK) S/s. iii)As per PMU at Kishenpur(PG), Y-B phase to phase fault with fault clearing time of 120ms is observed. iv)As per SCADA, load loss of approx. 345MW occurred in J&K control area.	0	345	120
15	GI-1	1)220 KV Amargarh (INDIGRID)-Zainkote(JK) (PDD JK) Ckt-1 2)220 KV Amargarh (INDIGRID)-Zainkote(JK) (PDD JK) Ckt-2	Jammu and Kashmir	PDD JK, INDIGRID	26-Aug-24	13:53	i)220/132kV Zainkote S/s have two bus at 220kV side i.e., main bus & reserve bus. 220kV Amargarh-Zainkote ckt-1&2 are on the same tower (D/C tower) and line length is ~21.4km. ii)During antecedent condition, 220kV Amargarh(INDIGRID) –Zainkote(JK) D/C was carrying 104 MW each and feeding Zainkote load. iii)As reported, at 13:53 hrs, 220 KV Amargarh(INDIGRID)-Zainkote(JK) (PDD JK) Ckt-2 tripped from both ends on R-Y phase to phase fault with fault distance of 6.6km and fault current of Ir=~2.15kA & Iy=~2.37kA from Zainkote(JK) end. 220 KV Amargarh(INDIGRID)-Zainkote(JK) (PDD JK) Ckt-1 tripped only from Amargarh(INDIGRID) end on the same R-Y phase to phase fault (Exact reason of fault is yet to be received). iv)As per DR of Amargarh(INDIGRID) end of 220 KV Amargarh (INDIGRID)-Zainkote(JK) (PDD JK) Ckt-1, R-Y phase to phase fault is observed in zone-2 with fault current of Ir=~2.5kA & Iy=~2.1kA. v)As per DR of Amargarh(INDIGRID) end of 220 KV Amargarh (INDIGRID)-Zainkote(JK) (PDD JK) Ckt-2, R-Y phase to phase fault is observed in zone-1 with fault current of Ir=~5.2kA & Iy=~4.9kA. vi)As confirmed by Amargarh(INDIGRID), in view of non-availability of carrier communication and A/R scheme at Zainkote end, A/R has been kept disabled at Amargarh end and time delay of Z-2 also kept as instantaneous at Amargarh end. vii)As per PMU at Amargarh(PG), R-Y phase to phase fault which cleared within 120 msec is observed. viii)As per SCADA, change in demand of approx. 180MW is observed in J&K control area.	0	180	120
16	GI-1	1)220 KV Amargarh (INDIGRID)-Zainkote(JK) (PDD JK) Ckt-1 2)220 KV Amargarh (INDIGRID)-Zainkote(JK) (PDD JK) Ckt-2	Jammu and Kashmir	JKPDD & INDIGRID	11-Oct-24	10:03	i)220/132kV Zainkote S/s have two bus at 220kV side i.e., main bus & reserve bus. 220kV Amargarh-Zainkote ckt-1&2 are on the same tower (D/C tower) and line length is ~21.4km. ii)During antecedent condition, 220kV Amargarh(INDIGRID) –Zainkote(JK) D/C was carrying 114 MW each and feeding Zainkote load. iii)As reported, at 10:03 hrs, Y-phase disc ruptured in 220kV main Bus at Pampore. iv)Due to this, 220kV Wagoora(PG)-Pampore(PDD) (PG) Ckt-1 tripped from Pampore end on Y-N phase to earth fault (exact location of fault and nature of protection operated yet to be shared). v)During the same time, 220kV Wagoora(PG)-Pampore(PDD) (PG) Ckt-2 also tripped from Wagoora end sensing the fault in zone-2 with fault distance of 11.91km from Wagoora end. vi)As per PMU at Amargarh(INDIGRID), Y-N phase to earth fault converted to Y-B-N double phase to earth fault with delayed fault clearing time of 1000ms is observed. vii)As per SCADA, change in demand of approx. 350 MW is observed in J&K control area.	0	350	1000
17	GI-1	1) 220 KV Wagoora(PG)-Pampore(PDD) (PG) Ckt-1 2) 220 KV Wagoora(PG)-Pampore(PDD) (PG) Ckt-2	Jammu and Kashmir	PDD-JK & PGCIL	16-Oct-24	13:45	i)220/132kV Pampore(PDD) has single main and transfer Bus arrangement at 220kV side. ii)During antecedent condition, power flow from Wagoora(PG) S/s to Pampore(PDD) S/s was approx. 140 MW (70 MW each) through 220 KV Wagoora(PG)-Pampore(PDD) (PG) D/C. iii)As reported, at 13:45 hrs, Y-phase disc ruptured in 220kV main Bus at Pampore. iv)Due to this, 220kV Wagoora(PG)-Pampore(PDD) (PG) Ckt-1 tripped from Pampore end on Y-N phase to earth fault (exact location of fault and nature of protection operated yet to be shared). v)During the same time, 220kV Wagoora(PG)-Pampore(PDD) (PG) Ckt-2 also tripped from Wagoora end sensing the fault in zone-2 with fault distance of 11.91km from Wagoora end. vi)As per PMU at Amargarh(INDIGRID), Y-N phase to earth fault converted to Y-B-N double phase to earth fault with delayed fault clearing time of 1000ms is observed. vii)As per SCADA, change in demand of approx. 350 MW is observed in J&K control area.	0	350	1000
18	GI-1	1) 220 KV Amargarh (INDIGRID)-Zainkote(JK) (PDD JK) Ckt-1 2) 220 KV Amargarh (INDIGRID)-Zainkote(JK) (PDD JK) Ckt-2	Jammu and Kashmir	JKPDD, INDIGRID	26-Nov-24	14:13	i)220/132kV Zainkote S/s have two bus at 220kV side i.e., main bus & reserve bus. 220kV Amargarh-Zainkote ckt-1&2 are on the same tower (D/C tower) and line length is ~21.4km. ii)During antecedent condition, 220kV Amargarh (INDIGRID) –Zainkote(JK) D/C was carrying 138 MW each and feeding Zainkote load. iii)As reported, at 14:13 hrs, 220 KV Amargarh (INDIGRID)-Zainkote(JK) (PDD JK) Ckt-1 tripped on B-N phase to earth fault with fault distance of 22.34 km (as per EL) and fault current of Ib=~2.81kA (as per DR) from Amargarh end. Fault sensed in zone-2 at Amargarh end. iv)During the same time, 220 KV Amargarh (INDIGRID)-Zainkote(JK) (PDD JK) Ckt-2 also tripped on B-N phase to earth fault with fault distance of 27.46km (as per EL) and fault current of Ib=~3.43kA (as per DR) from Amargarh end. Fault sensed in zone-2 at Amargarh end. v)As confirmed by Amargarh (INDIGRID), in view of non-availability of carrier communication and A/R scheme at Zainkote end, A/R has been kept disabled at Amargarh end and time delay of Z-2 also kept as instantaneous at Amargarh end. vi)As per PMU at Amargarh (PG), B-N phase to earth fault which cleared within 80 msec is observed. vii)As per SCADA, change in demand of approx. 260 MW is observed in J&K control area.	0	260	80
19	GI-1	i)220 kV Amargarh(NRSS XXII)-Delina(PDD) (PDD JK) Ckt-1 ii)220 kV Amargarh(NRSS XXII)-Delina(PDD) (PDD JK) Ckt-2	Jammu and Kashmir	INDIGRID and JKPDD	31-Dec-24	05:57	i)400/220kV Amargarh S/s have two bus at 220kV side i.e., main bus & reserve bus. ii)During antecedent condition, 220 KV Amargarh (NRSS XXII)-Delina(PDD) (PDD JK) Ckt-1 and Ckt-2 were carrying 105 and 107 MW respectively and feeding Delina load. iii)As reported, at 05:57 hrs, 220 KV Amargarh (NRSS XXII)-Delina(PDD) (PDD JK) D/C tripped from both ends on B-N phase to earth fault. iv)As per PMU at Amargarh(PG), two successive B-N phase to earth fault which cleared within 120 msec is observed. v)As per SCADA, change in demand of approx. 225MW is observed in J&K control area.	0	225	120
20	GI-1	i)220 KV SAMBA(PG)-BISHNAH(JK) (PDD JK) CKT-1 ii)132KV/33KV 50MVA ICT-1 BISHNAH	Jammu and Kashmir	JKPDD	31-Dec-24	13:33	i)220/132/33kV Bisnah S/s have two bus at 220kV side i.e., main bus & reserve bus. ii)During antecedent condition, 132 KV SAMBA(PG)-BISHNAH(JK) (PDD JK) CKT-1 was carrying 76 MW load and feeding Bisnah load. iii)As reported, at 13:33 hrs, 132KV/33KV 50MVA ICT-1 BISHNAH tripped on account of fire incident. At the same time 220 KV SAMBA(PG)-BISHNAH(JK) (PDD JK) CKT-1 also tripped. The tripping details are still awaited. iv)As per PMU at Amargarh(INDIGRID), Y-N phase to earth fault with delayed fault clearing time of 880 msec is observed. v)As per SCADA, change in demand of approx. 78 MW is observed in J&K control area.	0	78	880
21	GI-1	i)220 KV Amargarh (INDIGRID)-Zainkote(JK) (PDD JK) Ckt-1 ii)220 KV Amargarh (INDIGRID)-Zainkote(JK) (PDD JK) Ckt-2	Jammu and Kashmir	INDIGRID and JKPDD	31-Dec-24	19:47	i)220/132kV Zainkote S/s have two bus at 220kV side i.e., main bus & reserve bus. 220kV Amargarh-Zainkote ckt-1&2 are on the same tower (D/C tower) and line length is ~21.4km. ii)During antecedent condition, 220kV Amargarh (INDIGRID) –Zainkote(JK) D/C was carrying 157 MW each and feeding Zainkote load. iii)As reported, at 19:47 hrs, 220 KV Amargarh (INDIGRID)-Zainkote(JK) (PDD JK) Ckt-1 tripped on R-N phase to earth fault with fault distance of 13.18 km and fault current of Ir=~1.199 kA from Zainkote end. Fault sensed in zone-1 at Zainkote end. iv)This led to overloading of 220 KV Amargarh (INDIGRID)-Zainkote(JK) (PDD JK) Ckt-2 and this line tripped from Zainkote end only on over-current protection operation. v)As per PMU at Amargarh(INDIGRID), R-N phase to earth fault with fault clearing time of 80 msec is observed. vi)As per SCADA, change in demand of approx. 235 MW is observed in J&K control area.	0	235	80
22	GI-1	i) 220/132KV 160MVA ICT -1 at Delina (JK) ii) 220/132KV 160MVA ICT -2 at Delina (JK) iii) 220/132KV 160MVA ICT -3 at Delina (JK)	Jammu and Kashmir	PDD-JK	17-Feb-25	0.62083333	i)220/132kV Delina substation has Double main and transfer bus scheme. ii)During antecedent condition, 220kV Amargarh (INDIGRID) –Delina(JK) D/C was carrying 106 MW each and feeding Delina load. iii)As reported, at 14:54 hrs, 132KV Delina – Pattan line tripped due to broken jumper condition while returning the same line from shutdown (exact reason, nature and location of fault need to be shared). iv)During the same time, 220/132KV 160MVA ICT -1 at Delina(JK) tripped on earth fault (exact nature of protection operated need to be shared). v)Subsequently, this led to overloading of 220/132KV 160MVA ICT -2 & 3 at Delina(JK) and got tripped on over-current protection operation. vi)As per PMU at Amargarh (INDIGRID), R-Y-B 3 phase to earth fault with fault clearing time of 80 msec is observed. vii)As per SCADA, change in demand of approx. 210 MW is observed in J&K control area.	0	210	80
23	GI-1	i)220 KV Amargarh (INDIGRID)-Zainkote(JK) (PDD JK) Ckt-1 ii)220 KV Amargarh (INDIGRID)-Zainkote(JK) (PDD JK) Ckt-2	Jammu and Kashmir	INDIGRID & JKPDD	28-Feb-25	0.14583333	i)220/132kV Zainkote S/s have two bus at 220kV side i.e., main bus & reserve bus. 220kV Amargarh-Zainkote ckt-1&2 are on the same tower (D/C tower) and line length is ~21.4km. ii)During antecedent condition, 220kV Amargarh (INDIGRID) –Zainkote (JK) ckt-2 was carrying 139 MW and feeding Zainkote load. 220kV Amargarh (INDIGRID) –Zainkote (JK) ckt-1 was already tripped at 02:40 hrs on R-N fault. iii)As reported, at 03:30 hrs 220 KV Amargarh (INDIGRID)-Zainkote(JK) (PDD JK) Ckt-2 also tripped on R-N fault (details of cause of fault and location of fault yet to be received). iv)As per PMU at Amargarh (INDIGRID), no fault was observed in system. v)As per SCADA, change in demand of approx. 126 MW is observed in J&K control area.	0	126	NA

24	GD-1	i)220 KV LEH(PG) - BUS 1 ii)220/66 KV 50 MVA ICT 1 AT LEH(PG) iii)220 KV KHALSTI-LEH (PG) CKT-1	Jammu and Kashmir	JKPDD & PGCIL	26-Mar-25	0.19722222	i)220/66KV Leh has double main bus system. Nimmo Bazgo HEP is connected at 66kV level at 220/66kV Leh S/s. ii)During antecedent condition, 220 KV KHALSTI-LEH (PG) CKT-1 was carrying 12MW, while 220/66KV, 50MVA ICT-1 and ICT-2 were loaded 6 MW each. iii)As reported, at 04:44 hrs, 220KV Bus Bar protection operated due to flashover in GIS of Bus Coupler Bay resulting in outage of 220KV Khalsti-Leh Line & 220/66kV 50MVA ICT-1 at Leh (PG). Subsequently, 220KV Bus-2 and 220/66kV 50MVA ICT-2 also tripped (Details awaited). iv)Due to tripping of both the ICTs, the generator at Nimoo Bazgo HWP also tripped due to loss of evacuation path along with other 66KV feeders. This led to complete blackout of 220KV Leh substation. v)As per PMU, R-N phase to earth fault with fault clearance time of 120msec was observed. vi)As per SCADA, load loss of approx. 21 MW in J&K control area and generation loss of approx. 6 MW at Nimoo were observed.	6	21	120

Status of submission of FIR/DR/EL/Tripping Report on NR Tripping Portal of J&K

Time Period: Jan 2024- Mar 2025

S. No.	Utility	Total No. of tripping	First Information Report (Not Received)		Disturbance Recorder (Not Received)	Disturbance Recorder (NA) as informed by utility	Disturbance Recorder (Not Received)	Event Logger (Not Received)	Event Logger (NA) as informed by utility	Event Logger (Not Received)	Tripping Report (Not Received)	Tripping Report (NA) as informed by utility	Tripping Report (Not Received)
			Value	%	Value		%	Value		%	Value		%
1	Jan-24	1	0	**0**	1	0	**100**	1	0	**100**	1	0	**100**
2	Feb-24	21	3	**14**	21	0	**100**	21	0	**100**	18	0	**86**
3	Mar-24	9	4	**44**	4	5	**100**	4	5	**100**	4	4	**80**
4	Apr-24	13	6	**46**	7	1	**58**	8	1	**67**	6	0	**46**
5	May-24	23	3	**13**	4	19	**100**	3	20	**100**	4	8	**27**
6	Jun-24	29	2	**7**	28	0	**97**	28	0	**97**	12	0	**41**
7	Jul-24	11	0	**0**	11	0	**100**	11	0	**100**	11	0	**100**
8	Aug-24	16	0	**0**	16	0	**100**	16	0	**100**	16	0	**100**
9	Sep-24	17	0	**0**	15	2	**100**	15	2	**100**	11	6	**100**
10	Nov-24	9	4	**44**	4	5	**100**	5	4	**100**	4	3	**67**
11	Dec-24	11	1	**9**	11	0	**100**	11	0	**100**	8	0	**73**
12	Jan-25	1	0	**0**	1	0	**100**	1	0	**100**	0	0	**0**
13	Feb-25	5	4	**80**	4	1	**100**	4	1	**100**	4	0	**80**
14	Mar-25	8	0	**0**	8	0	**100**	8	0	**100**	8	0	**100**
Total in NR Region		**160**	**23**	**14**	**122**	**32**	**95**	**123**	**32**	**96**	**95**	**21**	**68**

As per the IEGC provision under clause 37.2 (c), detailed tripping report along with DR & EL has to be furnished within 24 hrs of the occurrence of the event

Annexure-B.IX

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

Deepak Kumar

Tue 04-Feb-25 17:04

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

1 attachments (23 KB)

Revised Schedule for Site Visit.xlsx;

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

Dear Sirs,

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

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

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

Thank you.

Regards,

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

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

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

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

Thu 8/29/2024 7:29 PM

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

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

5 attachments (9 MB)

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

Dear Sir,

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

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

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

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

15	Dhanonda	ON	-	OFF

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

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

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

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

Thanks and Regards,

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

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

Sir,

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

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

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

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

Subject- Regarding SPS of HVDC Mundra-Mahendargarh line

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

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

Sangeet

(Sangeeta)
Superintending Engineer (R&A)

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

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

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

(Sangeeta)
Superintending Engineer (R&A)

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

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

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

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

Subject: - Regarding SPS of HVDC Mundra-Mahendargarh.

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

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

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

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

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

(A) In Maximum Load Condition:-

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

(B) In Average Load Condition :-

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

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

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

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

(A). In Maximum Load Condition :-

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

(B). In Average Load Condition :-

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

Submitted for information and necessary action

(Nikhil Kumar)
Superintending Engineer

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

Copy forwarded to the following for information and necessary action :

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

(Nikhil Kumar)
Superintending Engineer

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

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

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

Sub :- SPS related to HVDC Mundra-Mahendargarh.

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

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

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

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

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

(Pramod Kumar Mishra)
Superintending Engineer

No. 82 /ETCC-MT/ Dated/– 30/05/24

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

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

(Pramod Kumar Mishra)
Superintending Engineer

SK/SENew/NewEngLetter01

Rajasthan Details

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

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

Email **Control Room CONTROL ROOM SLDC**

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

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

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

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

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

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

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

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

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

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

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

Regards
XEN/TS Division
HVPNL Rewari.

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

Sir,

Please see the attachments.

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

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

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

Fri 8/30/2024 12:44 PM

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

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

2 attachments (209 KB)

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

Sir,

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

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

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

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

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

This is for information & further necessary action please.

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

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

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

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

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

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

Regards
XEN/TS Division
HVPNL Rewari.

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

Sir,

Please see the attachments.

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

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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			